AX3660S Software Manual

Operation Command Reference Vol. 2

For Version 12.1 Rev. 11

AX38S-S016X-C0

AlaxalA

■ **Relevant products**

This manual applies to the models in the AX3660S series of switches. It also describes the function of OS-L3M version 12.1 of the software.

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■ **Reading and storing this manual**

Before you use the device, carefully read the manual and make sure that you understand all safety precautions.

After reading the manual, keep it in a convenient place for easy reference.

■ **Note**

Information in this document is subject to change without notice.

■ **Editions history**

December 2023 (Edition 1) AX38S-S016X-CO

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Preface

■ Applicable products and software versions

This manual applies to the models in the AX3660S series of switches. It also describes the function of OS-L3M version 12.1 of the software. The described function is that supported by the software licenses and by optional licenses.

Before you operate the Switch, carefully read the manual and make sure that you understand all instructions and cautionary notes. After reading the manual, keep it in a convenient place for easy reference.

Unless otherwise noted, this manual describes the functions common to both the SL-L3A and SL-L3L software licenses. Functions that are not common are indicated as follows.

[SL-L3A]:

> The description applies to the SL-L3A software license.

■ Corrections to the manual

Corrections to this manual might be contained in the Release Notes and Manual Corrections that come with the software.

■ Intended readers

This manual is intended for system administrators who wish to configure and operate a network system that uses the Switch.

Readers must have an understanding of the following:

- The basics of network system management

■ Manual URL

You can view this manual on our website at:

https://www.alaxala.com/en/

■ Reading sequence of the manuals

The following shows the manuals you need to consult according to your requirements determined from the following workflow for installing, setting up, and starting regular operation of the Switch.

● **To learn how to unpack the switch and the basic settings for initial installation**
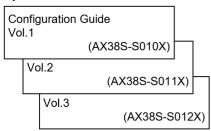
Quick Start Guide

(AX36S-Q002X)

● **To check the hardware equipment conditions and how to handle the hardware**
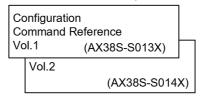
Hardware Instruction Manual

(AX36S-H002X)

Transceiver
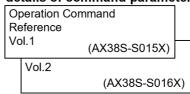Hardware Instruction Manual
(AX-COM-H001X)

● **To learn the software functions, configuration settings, and use of operation commands**

Configuration Guide
Vol.1
(AX38S-S010X)

Vol.2
(AX38S-S011X)

Vol.3
(AX38S-S012X)

● **To learn the entry syntax of configuration commands and the details of command parameters**

Configuration
Command Reference
Vol.1
(AX38S-S013X)

Vol.2
(AX38S-S014X)

● **To learn the entry syntax of operation commands and the details of command parameters**

Operation Command
Reference
Vol.1
(AX38S-S015X)

Vol.2
(AX38S-S016X)

● **To check messages and logs**

Message Log Reference

(AX38S-S017X)

● **To learn how to troubleshoot a problem**

Troubleshooting Guide

(AX36S-T002X)

■ Conventions: The terms "Switch" and "switch"

The term Switch (upper-case "S") is an abbreviation for any or all of the following models:

● AX3660S series switch

The term switch (lower-case "s") might refer to a Switch, another type of switch from the current vendor, or a switch from another vendor. The context decides the meaning.

■ Abbreviations used in the manual

AC	Alternating Current
ACK	ACKnowledge
ADSL	Asymmetric Digital Subscriber Line
AES	Advanced Encryption Standard
ALG	Application Level Gateway
ANSI	American National Standards Institute
ARP	Address Resolution Protocol
AS	Autonomous System
BFD	Bidirectional Forwarding Detection
BGP	Border Gateway Protocol
BGP4	Border Gateway Protocol - version 4
BGP4+	Multiprotocol Extensions for Border Gateway Protocol - version 4
bit/s	bits per second (can also appear as bps)
BPDU	Bridge Protocol Data Unit
BRI	Basic Rate Interface
CA	Certificate Authority
CBC	Cipher Block Chaining
CC	Continuity Check
CDP	Cisco Discovery Protocol
CFM	Connectivity Fault Management
CIDR	Classless Inter-Domain Routing
CIR	Committed Information Rate
CIST	Common and Internal Spanning Tree
CLNP	ConnectionLess Network Protocol
CLNS	ConnectionLess Network System
CONS	Connection Oriented Network System
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSNP	Complete Sequence Numbers PDU
CST	Common Spanning Tree
DA	Destination Address
DC	Direct Current
DCE	Data Circuit terminating Equipment
DES	Data Encryption Standard
DHCP	Dynamic Host Configuration Protocol
DIS	Draft International Standard/Designated Intermediate System
DNS	Domain Name System
DNSSL	Domain Name System Search List
DR	Designated Router
DSA	Digital Signature Algorithm
DSAP	Destination Service Access Point
DSCP	Differentiated Services Code Point
DSS	Digital Signature Standard
DTE	Data Terminal Equipment
DVMRP	Distance Vector Multicast Routing Protocol
E-Mail	Electronic Mail
EAP	Extensible Authentication Protocol
EAPOL	EAP Over LAN
ECDHE	Elliptic Curve Diffie-Hellman key exchange, Ephemeral
ECDSA	Elliptic Curve Digital Signature Algorithm
EFM	Ethernet in the First Mile
ES	End System
FAN	Fan Unit
FCS	Frame Check Sequence
FDB	Filtering DataBase
FQDN	Fully Qualified Domain Name
FTTH	Fiber To The Home
GCM	Galois/Counter Mode
GSRP	Gigabit Switch Redundancy Protocol
HMAC	Keyed-Hashing for Message Authentication
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
IANA	Internet Assigned Numbers Authority
ICMP	Internet Control Message Protocol
ICMPv6	Internet Control Message Protocol version 6

ID	Identifier
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IETF	the Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPCP	IP Control Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPV6CP	IP Version 6 Control Protocol
IPX	Internetwork Packet Exchange
ISO	International Organization for Standardization
ISP	Internet Service Provider
IST	Internal Spanning Tree
L2LD	Layer 2 Loop Detection
LAN	Local Area Network
LCP	Link Control Protocol
LED	Light Emitting Diode
LLC	Logical Link Control
LLDP	Link Layer Discovery Protocol
LLQ+3WFQ	Low Latency Queueing + 3 Weighted Fair Queueing
LSP	Label Switched Path
LSP	Link State PDU
LSR	Label Switched Router
MA	Maintenance Association
MAC	Media Access Control
MC	Memory Card
MD5	Message Digest 5
MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface crossover
MEP	Maintenance association End Point
MIB	Management Information Base
MIP	Maintenance domain Intermediate Point
MLD	Multicast Listener Discovery
MRU	Maximum Receive Unit
MSTI	Multiple Spanning Tree Instance
MSTP	Multiple Spanning Tree Protocol
MTU	Maximum Transmission Unit
NAK	Not AcKnowledge
NAS	Network Access Server
NAT	Network Address Translation
NCP	Network Control Protocol
NDP	Neighbor Discovery Protocol
NET	Network Entity Title
NLA ID	Next-Level Aggregation Identifier
NPDU	Network Protocol Data Unit
NSAP	Network Service Access Point
NSSA	Not So Stubby Area
NTP	Network Time Protocol
OADP	Octpower Auto Discovery Protocol
OAM	Operations,Administration,and Maintenance
OSPF	Open Shortest Path First
OUI	Organizationally Unique Identifier
packet/s	packets per second (can also appear as pps)
PAD	PADding
PAE	Port Access Entity
PC	Personal Computer
PCI	Protocol Control Information
PDU	Protocol Data Unit
PGP	Pretty Good Privacy
PICS	Protocol Implementation Conformance Statement
PID	Protocol IDentifier
PIM	Protocol Independent Multicast
PIM-DM	Protocol Independent Multicast-Dense Mode
PIM-SM	Protocol Independent Multicast-Sparse Mode
PIM-SSM	Protocol Independent Multicast-Source Specific Multicast
PMTU	Path Maximum Transmission Unit

PRI	Primary Rate Interface
PS	Power Supply
PSNP	Partial Sequence Numbers PDU
PTP	Precision Time Protocol
QoS	Quality of Service
QSFP+	Quad Small Form factor Pluggable Plus
QSFP28	28Gbps Quad Small Form factor Pluggable
RA	Router Advertisement
RADIUS	Remote Authentication Dial In User Service
RDI	Remote Defect Indication
RDNSS	Recursive Domain Name System Server
REJ	REJect
RFC	Request For Comments
RIP	Routing Information Protocol
RIPng	Routing Information Protocol next generation
RMON	Remote Network Monitoring MIB
RPF	Reverse Path Forwarding
RQ	ReQuest
RSA	Rivest, Shamir, Adleman
RSTP	Rapid Spanning Tree Protocol
SA	Source Address
SD	Secure Digital
SDH	Synchronous Digital Hierarchy
SDU	Service Data Unit
SEL	NSAP SELector
SFD	Start Frame Delimiter
SFP	Small Form factor Pluggable
SFP+	enhanced Small Form-factor Pluggable
SHA	Secure Hash Algorithm
SMTP	Simple Mail Transfer Protocol
SNAP	Sub-Network Access Protocol
SNMP	Simple Network Management Protocol
SNP	Sequence Numbers PDU
SNPA	Subnetwork Point of Attachment
SPF	Shortest Path First
SSAP	Source Service Access Point
SSH	Secure Shell
SSL	Secure Socket Layer
STP	Spanning Tree Protocol
Sync-E	Synchronous Ethernet
TA	Terminal Adapter
TACACS+	Terminal Access Controller Access Control System Plus
TCP/IP	Transmission Control Protocol/Internet Protocol
TLA ID	Top-Level Aggregation Identifier
TLS	Transport Layer Security
TLV	Type, Length, and Value
TOS	Type Of Service
TPID	Tag Protocol Identifier
TTL	Time To Live
UDLD	Uni-Directional Link Detection
UDP	User Datagram Protocol
UPC	Usage Parameter Control
UPC-RED	Usage Parameter Control - Random Early Detection
VLAN	Virtual LAN
VNI	VXLAN Network Identifier
VPN	Virtual Private Network
VRF	Virtual Routing and Forwarding/Virtual Routing and Forwarding Instance
VRRP	Virtual Router Redundancy Protocol
VTEP	VXLAN Tunnel End Point
VXLAN	Virtual eXtensible Local Area Network
WAN	Wide Area Network
WDM	Wavelength Division Multiplexing
WFQ	Weighted Fair Queueing
WRED	Weighted Random Early Detection
WS	Work Station
WWW	World-Wide Web

■ Conventions: KB, MB, GB, and TB

This manual uses the following conventions: 1 KB (kilobyte) is 1024 bytes, 1 MB (megabyte) is 1024^2 bytes, 1 GB (gigabyte) is 1024^3 bytes, 1 TB (terabyte) is 1024^4 bytes.

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1 Reading the Manual

Command description format

Each command is described in the following format:

Function

Describes the purpose of the command.

Syntax

Defines the input format of the command. The format is governed by the following rules:

1. Parameters for setting values or character strings are enclosed in angle brackets (<>).

2. Characters that are not enclosed in angle brackets (<>) are keywords that must be typed exactly as they appear.

3. {A|B} indicates that either A or B must be selected.

4. Parameters or keywords enclosed in square brackets ([]) are optional and can be omitted.

5. For details on the parameter input format, see "Specifiable values for parameters".

Input mode

Indicates the mode required to enter the command.

Parameters

Describes in detail the parameters that can be set by the command. For details on the behavior of a command when all omissible parameters are omitted, see Behavior when all parameters are omitted.

For details on the behavior when only a specific parameter is omitted, see Behavior when this parameter is omitted. For details on the behavior when each parameter is omitted, see Behavior when each parameter is omitted.

Operation when a stack configuration is used

Describes the behavior in a stack configuration. This description does not apply if the software license or optional license you are using does not include the stack function.

The commands that can use the "remote command" command are described with the input format of each command. For details on the input mode and general notes on the "remote command" command, see the description for the "remote command" command.

Example

Provides examples of appropriate command usage.

Display Items

Describes the display items generated by the example.

The following table describes the Switch displayed in the execution result of each command in [Example] when a stack is configured.

Table 1-1: Display of switch number and switch status

Display Items	Meaning	Displayed detailed information

Switch	Switch number. The switch status is displayed in parentheses.	Switch number
		Switch status
		   Init: Now configuring a stack
		   Master: Stack configuration (Master)
		   Backup: Stack configuration (Backup)
		   -------: Out of stack configuration

The following table describes the Date display items displayed immediately after the command in the example is executed.

Table 1-2: Display of the time the command was received

Display Items	Displayed information
Date	yyyy/mm/dd hh:mm:ss timezone year/month/day hour:minute:second time zone Displays the time that the command was accepted.

The Switch assigns names to corresponding interfaces set by configuration. If <interface name> is shown in Display items, the Switch displays any of the interface names shown in the following table.

Table 1-3: List of interface names assigned for input format

Input format	Interface name <interface name>
interface gigabitethernet	geth1/0/1 The numeric values represent <switch no.>/<nif no.>/<port no.>.
interface tengigabitethernet	tengeth1/0/24 The numeric values represent <switch no.>/<nif no.>/<port no.>.
interface fortygigabitethernet	ftygeth1/0/52 The numeric values represent <switch no.>/<nif no.>/<port no.>.
interface hundredgigabitethernet	hndgeth1/0/52 The numeric values represent <switch no.>/<nif no.>/<port no.>.
interface vlan <vlan id>	VLAN0002 The last four digits represent <vlan id>.
interface loopback 0	loopback0
interface loopback <loopback id> [SL-L3A]	loopback1 The number is <loopback id>.
interface null 0	null0
interface mgmt 0	MGMT0

Impact on communication

If a setting has an impact on communication, such as interruptions to communication, that impact is described here.

Response messages

Lists the response messages that can be displayed after the command execution.

Note that error messages displayed by the entry-error location detection function are not described here. For details on these messages, see "Error messages displayed by the entry-error location detection function".

The Switch assigns names to corresponding interfaces set by configuration. If <interface name> is shown in Response messages, the Switch displays the interface names listed in "Table 1-3: List of interface names assigned for input format".

Notes

Provides cautionary information on using the command.

Specifiable values for parameters

The following table describes the values that can be specified for parameters.

Table 1-4: Display of switch number and switch status

Parameter type	Description	Input example
Name	For the names of access lists, alphabetic characters can be used for the first character, and alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the second and subsequent characters. Note that if the command input format permits specification of either a name, or a command name and parameters (or keywords), and you specify a name that is identical to a command name or a parameter (or keyword), the system assumes that the command or the parameter (or keyword) has been entered.	ip access-list standard <u>inbound1</u>
MAC address, MAC address mask	Specify these items in hexadecimal format, separating 2-byte hexadecimal values by periods (.).	1234.5607.08ef 0000.00ff.ffff
IPv4 address, subnet mask	Specify these items in decimal format, separating 1-byte decimal values by periods (.).	192.168.0.14 255.255.255.0
IPv6 address	Specify this item in hexadecimal format, separating 2-byte hexadecimal values by colons (:).	3ffe:501:811:ff03::87ff:fed0:c7e0 fe80::200:87ff:fe5a:13c7
IPv6 address with an interface name (for a link-local address only)	Specify a percent (%) between an IPv6 address and an interface name. Only link-local IPv6 addresses can be used as this parameter type.	fe80::200:87ff:fe5a:13c7%VLAN0001

■ Range of \<switch no.>, \<nif no.>, and \<port no.> values

The following tables list the range of parameter \<switch no.>, \<nif no.>, and \<port no.> values. If the command does not support stacking, specify it in a format that does not include \<switch no.>.

Table 1-5: Range of \<switch no.>, \<nif no.>, and \<port no.> values for AX3660S

Model	Range of values		
	\<switch no.>	\<nif no.>	\<port no.>
AX3660S-24T4X	1 to 2	0	1 to 30
AX3660S-24T4XW			1 to 30
AX3660S-48T4XW			1 to 54
AX3660S-16S4XW			1 to 46
AX3660S-24S8XW			1 to 46
AX3660S-48XT4QW			1 to 52
AX3660S-24X4QW			1 to 52
AX3660S-48X4QW			1 to 52

■ How to specify <port list>

For <port list>, use a hyphen (-), comma (,), or asterisk (*) in the <switch no.>/<nif no.>/<port no.> format to specify multiple ports. You can also specify one port, as when <switch no.>/<nif no.>/<port no.> is written as the parameter input format. The range of permitted values is the same as the range of <switch no.>, <nif no.>, and <port no.> values in the above tables.

Example of a range specification that uses a hyphen (-) and comma (,):

For a command applicable to a stack configuration:

1/0/1-3,5: A hyphen (-) cannot be specified in a switch number.

For a command not applicable to a stack configuration:

0/1-3,5

Example of a range specification that uses asterisks (*):

For a command applicable to a stack configuration:

1/*/*: Specify all ports on a device. Note that an asterisk (*) cannot be specified in a switch number.

For a command not applicable to a stack configuration:

/: Specify all ports on a device.

■ Range of <channel group number>

The following table lists the range of <channel group number> values.

Table 1-6: Range of <channel group number> values

No.	Model	Range of values
1	All models (When a stack configuration is used)	1 to 96
2	All models (When a standalone configuration is used)	1 to 48

■ How to specify <channel group list>

For <channel group list>, use a hyphen (-) or comma (,) to specify multiple channel group numbers. You can also specify one channel group number. The range of permitted values is all the channel group numbers set by the configuration command.

Example of a range specification that uses a hyphen (-) and comma (,):

1-3,5,10

■ Range of <vlan id>

The range of <vlan id> values is 1 to 4094.

■ How to specify <vlan id list>

Multiple VLAN IDs can be specified in the <vlan id list> using hyphens (-) and commas (,). You can also specify one VLAN ID. The range of permitted values is VLAN ID=1 (VLAN ID for the default VLAN) and other VLAN IDs set by the configuration command.

Example of a range specification that uses a hyphen (-) and comma (,):

1-3,5,10

■ **How to specify <vni list> [SL-L3A]**

Multiple VNIs can be specified in the <vni list> using hyphens (-) and commas (,). You can also specify one VNI. The range of permitted values is any VNI set by the configuration command. Note that the maximum number of VNIs that can be specified at one time is 8191.

Example of a range specification that uses a hyphen (-) and comma (,):

    1-3,5000,1010020-1010049

■ **Range of <loopback id> [SL-L3A]**

The range of <loopback id> values is 1 to 256.

■ **Interface specification method**

The following table shows how to specify the parameter <interface type> <interface number> corresponding to an interface type group.

Table 1-7: How to specify an interface

Interface type Group	Interface name to be specified for <interface type>	Interface number to be specified for <interface number>
Ethernet interface	gigabitethernet	<switch no.>/<nif no.>/<port no.>
	tengigabitethernet	<switch no.>/<nif no.>/<port no.>
	fortygigabitethernet	<switch no.>/<nif no.>/<port no.>
	hundredgigabitethernet	<switch no.>/<nif no.>/<port no.>
Port channel interface	port-channel	<channel group number>
VLAN interface	vlan	<vlan id>
Loopback interface	loopback	0
		<loopback id>[SL-L3A]
Null interface	null	0
Management port	mgmt	0

List of character codes

Character codes are listed in the following table.

Table 1-8: List of character codes

Char-acter	Code	Char-acter	Code	Char-acter	Code	Char-acter	Code	Char-acter	Code	Char-acter	Code
Space	0x20	0	0x30	@	0x40	P	0x50	`	0x60	p	0x70
!	0x21	1	0x31	A	0x41	Q	0x51	a	0x61	q	0x71
"	0x22	2	0x32	B	0x42	R	0x52	b	0x62	r	0x72
#	0x23	3	0x33	C	0x43	S	0x53	c	0x63	s	0x73
$	0x24	4	0x34	D	0x44	T	0x54	d	0x64	t	0x74
%	0x25	5	0x35	E	0x45	U	0x55	e	0x65	u	0x75
&	0x26	6	0x36	F	0x46	V	0x56	f	0x66	v	0x76
'	0x27	7	0x37	G	0x47	W	0x57	g	0x67	w	0x77
(	0x28	8	0x38	H	0x48	X	0x58	h	0x68	x	0x78
)	0x29	9	0x39	I	0x49	Y	0x59	i	0x69	y	0x79
*	0x2A	:	0x3A	J	0x4A	Z	0x5A	j	0x6A	z	0x7A
+	0x2B	;	0x3B	K	0x4B	[	0x5B	k	0x6B	{	0x7B
,	0x2C	<	0x3C	L	0x4C	\	0x5C	l	0x6C	|	0x7C
-	0x2D	=	0x3D	M	0x4D	]	0x5D	m	0x6D	}	0x7D
.	0x2E	>	0x3E	N	0x4E	^	0x5E	n	0x6E	~	0x7E
/	0x2F	?	0x3F	O	0x4F	_	0x5F	o	0x6F	—	—

Notes

To enter a question mark (?, or 0x3F), press Ctrl + V, and then type a question mark.

Error messages displayed by the entry-error location detection function

The following table shows the error messages output by the entry-error location detection function (see "Configuration Guide Vol. 1, 5.2.3 Entry-error location detection function").

Table 1-9: List of error messages output by the entry-error location detection function

No.	Message	Description	Conditions for occurrence
1	% illegal parameter at '^' marker	An invalid command or parameter is entered at '^'.	When an unsupported command or parameter is entered
2	% too long at '^' marker	A parameter entered at '^' exceeds the limit for the number of digits.	When a parameter that exceeds the limit for the number of digits is entered
3	% Incomplete command at '^' marker	Some parameters are missing.	When some parameters are missing
4	% illegal option at '^' marker	An invalid option is entered at '^'.	When an invalid option is entered
5	% illegal value at '^' marker	An invalid numeric value is entered at '^'.	When an invalid numeric value is entered
6	% illegal name at '^' marker	An invalid name is entered at '^'.	When an invalid name is entered
7	% out of range '^' marker	A numeric value entered at '^' is out of the valid range.	When a numeric value that is out of the valid range is entered
8	% illegal IP address format at '^' marker	An invalid IPv4 address or IPv6 address is entered at '^'.	When the input format of the IPv4 address or IPv6 address is invalid
9	% illegal combination or already appeared at '^' marker	A parameter entered at '^' has already been entered.	When a parameter that has already been entered is re-entered
10	% illegal format at'^' marker	A parameter entered at '^' is an invalid format.	When the input format of the parameter is invalid
11	% Permission denied	This command cannot be executed in user mode.	When a command that can be executed only in administrator mode is executed in user mode.
12	% internal program error	A program is faulty. Contact maintenance personnel.	When an invalid action other than described above occurs
13	% Command not authorized.	The executed command is not authorized.	When the executed command is not authorized by the RADIUS/ TACACS+ server via "RADIUS/TACACS+" command authorization function.
14	% illegal parameter at '<word>' word	An invalid character '<word>' is entered. <word>: Invalid word	When '<word>' is entered at positions where a character cannot be entered
15	% illegal switch number at '^' marker	An invalid switch number is entered at '^'.	When an invalid switch number is entered

No.	Message	Description	Conditions for occurrence
16	% list entry over at '^' marker	A list that exceeds the number of entries that can be specified is specified at '^'.	When a list that exceeds the number of entries that can be specified is specified

2 **IPv4, ARP, ICMP**

show ip-dual interface

Displays the status of IPv4 and IPv6 interfaces.

Syntax

```
show ip-dual interface [vrf [<vrf id>]]
show ip-dual interface summary
show ip-dual interface up [vrf [<vrf id>]]
show ip-dual interface down [vrf [<vrf id>]]
show ip-dual interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf [<vrf id>][SL-L3A]

Displays detailed information about interfaces for which a VRF is configured.

If <vrf id> is omitted, all interfaces for which a VRF is configured are displayed.

If <vrf id> is specified, only the interface with the specified <vrf id> is displayed.

For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays all interfaces, including the global network.

summary

Displays a summary of the status of all interfaces.

up

Displays detailed information about interfaces in the UP status.

down

Displays detailed information about interfaces in the DOWN status.

<interface type> <interface number>

Displays detailed information about the applicable interface.

For <interface type> <interface number>, you can specify the interface name and interface number cor-responding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface
- Management port

Behavior when all parameters are omitted:

Displays the detailed status of all interfaces, including the global network.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example 1

Displays a summary of the status of all interfaces.

```
>show ip-dual interface summary
```

Figure 2-1: Example of displaying a summary of all interfaces

```
> show ip-dual interface summary
Date 20XX/12/10 12:00:00 UTC
VLAN0002: UP 192.168.0.60/24
VLAN0003: UP 192.171.0.64/24 VRF: 10
VLAN0004: UP 3ffe::1:1/64
>
```

Display format

```
Interface name : Status  IP-address  Subnet-mask  VRF
Interface name : Status  IPv6-address  Prefix-len  VRF
```

Display items in Example 1

Table 2-1: Information displayed for a summary of all interfaces

Display Items	Meaning	Displayed information
Interface name	Interface name	—
Status	Status of the interface	UP/DOWN
IP-address	IPv4 address	—
Subnet-mask	Subnet mask	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
IPv6-address	IPv6 address	—
Prefix-len	Prefix length	—

Example 2

- This example shows how to display detailed information about interfaces in the UP status.

  ```
  >show ip-dual interface up
  ```

- Display the detailed status of an interface.

  ```
  > show ip-dual interface vlan 10
  ```

The following shows an example of executing the command with an interface specified.

Figure 2-2: Example of executing the command with an interface specified

```
>show ip-dual interface vlan 10
Date 20XX/12/10 12:00:00 UTC
VLAN0010: flags=80e3<UP,BROADCAST,NOTRAILERS,RUNNING,NOARP,MULTICAST>
  mtu 1500
  inet 158.214.178.30/25 broadcast 158.214.178.127
  inet 158.214.178.33/32 (virtual router ip address)         <----------1
  inet6 3ffe::1:1/64
  inet6 fe80::60:972e:1d4c%VLAN0010/64
  Switch01/NIF00/Port01: UP media 100BASE-TX full(auto) 0012.e22e.1d4c
  Switch02/NIF00/Port02: UP media ----- 0012.e22f.1d4f ChGr:5 (-)  <-------2
  Time-since-last-status-change: 30,00:10:00
  Last down at: 11/10 11:45:00            <------------------------------3
  VLAN: 10                                <------------------------------4
>show ip-dual interface vlan 100
Date 20XX/12/10 12:00:00 UTC
VLAN0100: flags=8863<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MULTICAST>
```

```
    mtu 1500
    inet 192.182.0.67/24 broadcast 192.182.0.255
    Switch01/NIF00/Port03: UP media 100BASE-TX full(auto) 0012.e220.5200
    Time-since-last-status-change: 00:22:10
    Last down at: -----
    VLAN : 100    VRF: 10                    <--------------------------------4
>
```

1. Indicates that the IPv4 address is the address for the VRRP virtual router.

2. Displayed for a link aggregation line.

3. The reason that the interface is down is a line failure or a change in the configuration of the IP information or the line. If the configuration is changed during a line failure, the time the line failure occurred is displayed instead of the time the information was updated because the status when the configuration was changed was the Down status.

4. The VLAN ID is displayed for a VLAN. The VRF ID is displayed for a VRF.

Display items in Example 2

Table 2-2: Contents of the displayed detailed information (common display items)

Display Items	Meaning	Displayed information
flags	Status of the target interface, and the configuration items	—
mtu	MTU for the interface	See "Configuration Guide Vol. 3, 1.4.3 MTU and fragmentation".
inet	IPv4 address	—
inet6	IPv6 address	duplicated: The address is duplicated. tentative: The address is being checked for duplication.
broadcast	Broadcast address	Displayed when the IP interface type is broadcast.
virtual router ip address	IPv4 address of the VRRP virtual router	This information is displayed when a VRRP that was set up in accept mode becomes the master.
UP/DOWN	Status of the interface	UP: In operation (Normal running state) DOWN: In operation (line has failed), or not in operation
media	Line type	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command".
Time-since-last-status-change	Time elapsed since the status changed to UP or DOWN.	Time elapsed since the status of the interface last changed. The display format is hour:minute:second or number-of-days,hour:minute:second. "Over 100 days" is displayed if the number of days exceeds 100. "-----" is displayed if there has never been an UP or DOWN status.
Last down at	Time the interface went down	Time the interface last went down. The display format is month/day hour:minute:second. "-----" is displayed if the interface has never gone down.
VLAN	VLAN ID	—

Display Items	Meaning	Displayed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Table 2-3: Contents of the displayed detailed information (Ethernet interface display items)

Display Items	Meaning	Displayed information
Switch<switch no.>	Switch number	—
NIF<nif no.>	NIF number	—
Port<port no.>	Port number	—
media	Line type/line speed	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command". In a stack configuration, "-----" is displayed for any switch other than the member switch on which the command was executed.
xxxx.xxxx.xxxx	MAC address	The MAC address used by packets sent from the interface. For a VLAN interface, a MAC address of all zeros might be displayed if the line cannot communicate.
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	In a stack configuration, "-" is displayed for the channel group status of any switch other than the member switch on which the command was executed.

Impact on communication

None

Response messages

Table 2-4: List of response messages for the show ip-dual interface command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such interface -- <interface name>.	The specified interface has not been set. <interface name>: Name assigned to the specified interface

Notes

None

show ip interface

Shows the status of IPv4 interfaces.

Syntax

```
show ip interface [vrf [<vrf id>]]
show ip interface summary
show ip interface up [vrf [<vrf id>]]
show ip interface down [vrf [<vrf id>]]
show ip interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf [<vrf id>][SL-L3A]

Displays detailed information about interfaces for which a VRF is configured.

If <vrf id> is omitted, all interfaces for which a VRF is configured are displayed.

If <vrf id> is specified, only the interface with the specified <vrf id> is displayed.

For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays all interfaces, including the global network.

summary

Displays a summary of the status of all interfaces.

up

Displays detailed information about interfaces in the UP status.

down

Displays detailed information about interfaces in the DOWN status.

<interface type> <interface number>

Displays detailed information about the applicable interface.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface
- Management port

Behavior when all parameters are omitted:

Displays the detailed status of all interfaces, including the global network.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example 1

Displays a summary of the status of all interfaces.

```
>show ip interface summary
```

Figure 2-3: Example of displaying a summary of all interfaces

```
> show ip interface summary
Date 20XX/12/10 12:00:00 UTC
VLAN0010: UP 158.215.100.1/24
VLAN0020: UP 192.168.0.60/24 VRF: 10
>
```

Display format

```
Interface name : Status IP-address Subnet-mask VRF
```

Display items in Example 1

Table 2-5: Information displayed for a summary of all interfaces

Display Items	Meaning	Displayed information
Interface name	Interface name	—
Status	Status of the interface	UP/DOWN
IP-address	IPv4 address	—
Subnet-mask	Subnet mask	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Example 2

- This example shows how to display detailed information about interfaces in the UP status.

  ```
  >show ip interface up
  ```

- Display the detailed status of an interface.

  ```
  > show ip interface vlan 3
  ```

The following shows an example of executing the command with an interface specified.

Figure 2-4: Example of executing the command with an interface specified

```
>show ip interface vlan 3
Date 20XX/12/10 12:00:00 UTC
VLAN0003: flags=80e3<UP,BROADCAST,NOTRAILERS,RUNNING,NOARP,MULTICAST>
  mtu 1500
  inet 158.214.178.30/25 broadcast 158.214.178.127
  inet 158.214.178.33/32 (virtual router ip address)        <--------------1
  Switch01/NIF00/Port01: UP media 100BASE-TX full(auto) 0012.e22e.1d4c
  Switch02/NIF00/Port02: UP media ----- 0012.e22f.1d4f ChGr:5 (-)   <------2
  Time-since-last-status-change: 30,00:10:00
  Last down at: 11/10 11:45:00           <-----------------------------3
  VLAN: 3    VRF: 10    <------------------------------------------------4
```

1. Indicates that the IPv4 address is the address for the VRRP virtual router.

2. Displayed for a link aggregation line.

3. The reason that the interface is down is a line failure or a change in the configuration of the IP information or the line. If the configuration is changed during a line failure, the time the line failure occurred is displayed instead of the time the information was updated because the status when the configuration was changed was the Down status.

4. The VLAN ID is displayed for a VLAN. The VRF ID is displayed for a VRF.

Display items in Example 2

Table 2-6: Contents of the displayed detailed information (common display items)

Display Items	Meaning	Displayed information
flags	Status of the target interface, and the configuration items	—
mtu	MTU for the interface	See "Configuration Guide Vol. 3, 1.4.3 MTU and fragmentation".
inet	IPv4 address	—
broadcast	Broadcast address	Displayed when the IP interface type is broadcast.
virtual router ip address	IPv4 address of the VRRP virtual router	This information is displayed when a VRRP that was set up in accept mode becomes the master.
UP/DOWN	Status of the interface	UP: In operation (Normal running state) DOWN: In operation (line has failed), or not in operation
media	Line type	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command".
Time-since-last-status-change	Time elapsed since the status changed to UP or DOWN.	Time elapsed since the status of the interface last changed. The display format is hour:minute:second or number-of-days,hour:minute:second. "Over 100 days" is displayed if the number of days exceeds 100. "-----" is displayed if there has never been an UP or DOWN status.
Last down at	Time the interface went down	Time the interface last went down. The display format is month/day hour:minute:second. "-----" is displayed if the interface has never gone down.
VLAN	VLAN ID	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Table 2-7: Contents of the displayed detailed information (Ethernet interface display items)

Display Items	Meaning	Displayed information
Switch<switch no.>	Switch number	—
NIF<nif no.>	NIF number	—
Port<port no.>	Port number	—
media	Line type/line speed	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command". In a stack configuration, "-----" is displayed for any switch other than the member switch on which the command was executed.

Display Items	Meaning	Displayed information
xxxx.xxxx.xxxx	MAC address	The MAC address used by packets sent from the interface. For a VLAN interface, a MAC address of all zeros might be displayed if the line cannot communicate.
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	In a stack configuration, "-" is displayed for the channel group status of any switch other than the member switch on which the command was executed.

Impact on communication

None

Response messages

Table 2-8: List of response messages for the show ip interface command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such interface -- <interface name>.	The specified interface has not been set. <interface name>: Name assigned to the specified interface

Notes

None

show ip arp

Shows ARP information.

Syntax

```
show ip arp [vrf {<vrf id> | all}]
show ip arp interface <interface type> <interface number>
show ip arp [vrf <vrf id>] <ip address>
show ip arp <host>
show ip arp summary
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> │ all} [SL-L3A]

> Displays the ARP information for the specified VRF. If <vrf id> is specified, the ARP information only for the specified VRF is displayed. If all is specified, the ARP information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

> > Displays the ARP information for the global network.

interface <interface type> <interface number>

> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

> - VLAN interface
> - Management port

<ip address>

> Specifies an IP address.

<host>

> Specifies the destination host name.

summary [SL-L3A]

> Provides an overview of the ARP information for all VRFs including the global network.

Behavior when all parameters are omitted:

> Displays the ARP information registered on all interfaces of the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 2-5: Execution result when a VLAN interface is specified

```
>show ip arp interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 6 entries
 IP Address Linklayer Address  Netif      Expire    Type
 192.0.0.1  0012.e240.0a00     VLAN0100   Static    arpa
 192.0.0.2  0012.e240.0a01     VLAN0100   3h59m0s   arpa
```

```
 192.0.0.3  0012.e240.0a02    VLAN0100   3h45m30s  arpa
 192.0.1.1  0012.e240.0a10    VLAN0100   Static    arpa
 192.0.2.1  0012.e240.0a20    VLAN0100   Static    arpa
 192.0.2.2  0012.e240.0a21    VLAN0100   3h55m15s  arpa
>
```

Figure 2-6: Execution result when all ARP information is displayed

```
>show ip arp
Date 20XX/07/14 12:00:00 UTC
Total: 12 entries
 IP Address  Linklayer Address  Netif      Expire    Type
 192.0.0.1   0012.e240.0a00     VLAN0100   Static    arpa
 192.0.0.2   0012.e240.0a01     VLAN0100   3h49m0s   arpa
 192.0.0.3   0012.e240.0a02     VLAN0100   3h59m30s  arpa
 192.0.1.1   0012.e240.0a10     VLAN0100   Static    arpa
 192.0.2.1   0012.e240.0a20     VLAN0100   Static    arpa
 192.0.2.2   0012.e240.0a21     VLAN0100   3h48m15s  arpa
 192.0.10.1  0012.e240.0b01     VLAN0101   Static    arpa
 192.0.10.2  0012.e240.0b02     VLAN0101   9m30s     arpa
 192.0.10.3  0012.e240.0b03     VLAN0101   8s        arpa
 192.0.20.1  0012.e240.0c10     VLAN0102   Static    arpa
 192.0.20.2  0012.e240.0c20     VLAN0102   3h0m5s    arpa
 192.0.20.3  0012.e240.0c20     VLAN0102   3h14m15s  arpa
 >
```

Figure 2-7: Execution result when an IP address is specified

```
>show ip arp 192.0.0.1
Date 20XX/07/14 12:00:00 UTC
 IP Address  Linklayer Address  Netif      Expire    Type
 192.0.0.1   0012.e240.0a00     VLAN0100   Static    arpa
 >
```

Figure 2-8: Execution result when a host name is specified

```
>show ip arp Department-3
Date 20XX/07/14 12:00:00 UTC
 IP Address  Linklayer Address  Netif      Expire    Type
 192.0.0.3   0012.e240.0a02     VLAN0100   3h59m30s  arpa
 >
```

Figure 2-9: Execution result when VRF is specified [SL-L3A]

```
>show ip arp vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 3 entries
 IP Address  Linklayer Address  Netif      Expire      Type
 192.0.0.1   0012.e240.0a00     VLAN0100   3h52m45s    arpa
 192.0.0.3   0012.e240.0a02     VLAN0100   3h33m27s    arpa
 192.0.10.2  0012.e240.0b02     VLAN0101   Extra-VRF   arpa

VRF: 2  Total: 3 entries
 IP Address  Linklayer Address  Netif      Expire      Type
 192.0.10.1  0012.e240.0b01     VLAN0101   3h37m2s     arpa
 192.0.10.2  0012.e240.0b02     VLAN0101   3h37m2s     arpa
 192.0.20.2  0012.e240.0c01     VLAN0102   Extra-VRF   arpa

VRF: 3  Total: 2 entries
 IP Address  Linklayer Address  Netif      Expire      Type
 192.0.10.1  0012.e240.0b01     VLAN0101   Extra-VRF   arpa
 192.0.20.2  0012.e240.0c01     VLAN0102   2h11m21s    arpa
>
```

Figure 2-10: Execution result when summary is specified [SL-L3A]

```
>show ip arp summary
Date 20XX/12/10 12:00:00 UTC
Total : 15
 VRF          Limit    Entries  Extra-VRF
 global       unlimit  10       5
 2            1000     5        5
 3            unlimit  0        0
```

Display Items

Display format of the result of executing the "show ip arp" command is as follows:

If summary is not specified:

```
VRF: <vrf id>  Total: <entry> entries
IP Address   Linklayer Address  Netif           Expire      Type
<IP Address> <MAC Address>      <interface name> <Entry Type> <Hardware Type>
```

Table 2-9: Contents of the displayed ARP information (If summary is not specified)

Display Items	Displayed information	
	Detailed information	**Meaning**
VRF: <vrf id> [SL-L3A]	VRF ID	—
	global	Global network
Total: <entry> entries	Number of entries	Number of used ARP table entries
<IP Address>	Next hop IP address	—
<MAC Address>	(incomplete)	Resolution of the address is incomplete.
	(deleting)	Entries are being deleted.
	MAC address of a neighboring device	—
<interface name>	Interface name	—
<Entry Type>	Static	Created in a configuration
	Extra-VRF [SL-L3A]	Imported from another VRF
	--	The entry being deleted
	XXhXXmXXs	Remaining aging time (hours, minutes, and seconds)
<Hardware Type>	arpa	Ethernet interface

If summary is specified: [SL-L3A]

```
Total : <entry> entries
VRF      Limit    Entries  Extra-VRF
<vrf id> <limit>  <entry>  <import entry>
```

Table 2-10: Contents of the displayed ARP information (If summary is specified)

Display Items	Displayed information	
	Detailed information	**Meaning**
Total: <entry> entries	Number of entries	Number of used ARP table entries for all VRFs
<vrf id>	VRF ID	—
	global	Global network
<limit>	Upper limit for ARP	Upper limit for ARP for a VRF
	unlimit	No upper limit is set.
<entry>	Number of entries	Number of ARP table entries used for a VRF (including the <import entry> value)
<import entry>	Number of entries	Number of ARP entries imported from another VRF

Impact on communication

None

Response messages

Table 2-11: List of response messages for the show ip arp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Incomplete command.	The entered parameter was invalid. Make sure the specified parameter is correct, and then try again.
No arp entry.	ARP information does not exist.

Notes

1. Entries that are created by learning from other devices are not displayed in the following cases:
    - There has been no communication since the interface started up.
    - The aging time since registration in the ARP cache table has been exceeded.

2. If a route is imported from another VRF, the ARP information for that VRF might be imported. Like regular ARP information, the imported ARP information consumes the resources of one entry. In this case, this command displays Extra-VRF in the Expire field. [SL-L3A]

clear arp-cache

Clears the ARP information registered dynamically.

Syntax

```
clear arp-cache [vrf {<vrf id> | all}]
clear arp-cache interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> │ all} [SL-L3A]

> Clears the ARP information for the specified VRF. If <vrf id> is specified, only the ARP information for the specified VRF is cleared. If all is specified, the ARP information for all VRFs including the global network is cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Clears the ARP information registered on the global network.

interface <interface type> <interface number>

> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".
>
> - VLAN interface
> - Management port

Behavior when all parameters are omitted:

> Clears the ARP information registered on the global network.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

- Clearing the ARP information (when deleting the ARP information for a specific VLAN interface)

  The following shows an example of clearing the ARP information registered on a specific VLAN interface.

  Figure 2-11: Execution result of clearing the ARP information (deleting the ARP information for a specific VLAN interface)

```
>show ip arp interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 6 entries
 IP Address  Linklayer Address  Netif      Expire    Type
 192.0.0.1   0012.e240.0a00     VLAN0100   Static    arpa
 192.0.0.2   0012.e240.0a01     VLAN0100   3h39m0s   arpa
 192.0.0.3   0012.e240.0a02     VLAN0100   3h40m0s   arpa
 192.0.1.1   0012.e240.0a10     VLAN0100   Static    arpa
 192.0.2.1   0012.e240.0a20     VLAN0100   Static    arpa
 192.0.2.2   0012.e240.0a21     VLAN0100   3h39m0s   arpa
>clear arp-cache interface vlan 100
Deleted arp entry
```

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```
>show ip arp interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 3 entries
 IP Address Linklayer Address  Netif      Expire   Type
 192.0.0.1  0012.e240.0a00     VLAN0100   Static   arpa
 192.0.1.1  0012.e240.0a10     VLAN0100   Static   arpa
 192.0.2.1  0012.e240.0a20     VLAN0100   Static   arpa
>
```

- Clearing the ARP information (when deleting all the ARP information on the global network)

  The following shows an example of clearing all the ARP information for the global network registered on the Switch.

  Figure 2-12: Execution result of clearing the ARP information (when deleting all the ARP information on the global network)

```
>show ip arp interface vlan 101
Date 20XX/07/14 12:00:00 UTC
Total: 3 entries
 IP Address  Linklayer Address  Netif      Expire   Type
 192.0.10.1  0012.e240.0b01     VLAN0101   Static   arpa
 192.0.10.2  0012.e240.0b02     VLAN0101   3h39m0s  arpa
 192.0.10.3  0012.e240.0b03     VLAN0101   3h58m0s  arpa
>show ip arp interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 6 entries
 IP Address  Linklayer Address  Netif      Expire   Type
 192.0.0.1   0012.e240.0a00     VLAN0100   Static   arpa
 192.0.0.2   0012.e240.0a01     VLAN0100   3h49m0s  arpa
 192.0.0.3   0012.e240.0a02     VLAN0100   3h59m0s  arpa
 192.0.1.1   0012.e240.0a10     VLAN0100   Static   arpa
 192.0.2.1   0012.e240.0a20     VLAN0100   Static   arpa
 192.0.2.2   0012.e240.0a21     VLAN0100   3h48m0s  arpa
>clear arp-cache
Deleted arp entry
>show ip arp interface vlan 101
Date 20XX/07/14 12:00:00 UTC
Total: 1 entries
 IP Address  Linklayer Address  Netif      Expire   Type
 192.0.10.1  0012.e240.0b01     VLAN0101   Static   arpa
>show ip arp interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 3 entries
 IP Address  Linklayer Address  Netif      Expire   Type
 192.0.0.1   0012.e240.0a00     VLAN0100   Static   arpa
 192.0.1.1   0012.e240.0a10     VLAN0100   Static   arpa
 192.0.2.1   0012.e240.0a20     VLAN0100   Static   arpa
>
```

- Clearing the ARP information (when deleting the ARP information for a specific VRF) [SL-L3A]

  Figure 2-13: Execution result of clearing the ARP information (deleting the ARP information for a specific VRF)

```
>show ip arp vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 3 entries
 IP Address  Linklayer Address  Netif       Expire     Type
 192.0.0.1   0012.e240.0a00     VLAN0100    3h52m45s   arpa
 192.0.0.3   0012.e240.0a02     VLAN0100    3h33m27s   arpa
 192.0.10.2  0012.e240.0b02     VLAN0101    Extra-VRF  arpa

VRF: 2  Total: 3 entries
 IP Address  Linklayer Address  Netif       Expire     Type
 192.0.10.1  0012.e240.0b01     VLAN0101    3h37m2s    arpa
 192.0.10.2  0012.e240.0b02     VLAN0101    3h37m2s    arpa
 192.0.20.2  0012.e240.0c01     VLAN0102    Extra-VRF  arpa

VRF: 3  Total: 2 entries
 IP Address  Linklayer Address  Netif       Expire     Type
 192.0.10.1  0012.e240.0b01     VLAN0101    Extra-VRF  arpa
```

```
    192.0.20.2  0012.e240.0c01    VLAN0102    2h11m21s  arpa
>
>clear arp-cache vrf 2
Deleted arp entry
>show ip arp vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 2 entries
 IP Address  Linklayer Address  Netif       Expire    Type
 192.0.0.1   0012.e240.0a00     VLAN0100    3h52m45s  arpa
 192.0.0.3   0012.e240.0a02     VLAN0100    3h33m27s  arpa

VRF: 3  Total: 1 entries
 IP Address  Linklayer Address  Netif       Expire    Type
 192.0.20.2  0012.e240.0c01     VLAN0102    2h11m21s  arpa
```

Display Items

None

Impact on communication

Communication might stop temporarily until the ARP entry is created again.

Response messages

Table 2-12: List of response messages for the clear arp-cache command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No such interface.	The specified interface does not exist. Make sure the specified parameter is correct, and then try again.
No such VRF.	The specified VRF does not exist. Make sure the specified parameter is correct, and then try again.

Notes

• Because the connection is maintained for one minute after disconnection of TCP communication, the "(incomplete)" state is still displayed for a maximum of one minute after execution of the deletion command.

• One minute after disconnection of the TCP communication, information is deleted without displaying the "(incomplete)" state.

• If you delete the ARP information for a specific VRF by using the command with the vrf parameter specified, the ARP information for other VRFs created by importing that ARP information is also deleted. [SL-L3A]

show netstat(netstat)

Shows the network status and statistics.

Syntax

```
[show] netstat [detail][numeric][addressfamily <address family>]
[show] netstat all-protocol-address [detail][numeric]
             [addressfamily <address family>]
[show] netstat interface [<interface type> <interface number> [wait <time>]]
[show] netstat {memory | protocol <protocol> | system}
[show] netstat statistics [addressfamily <address family>]
[show] netstat routing-table[{[detail][numeric]
             [addressfamily <address family>][vrf {<vrf id> | all}]
             | statistics [addressfamily <address family>]}]
[show] netstat multicast [{[detail][numeric]
             [addressfamily <address family>][vrf {<vrf id> | all}]
             | [statistics] [addressfamily <address family>]}]
```

Input mode

User mode and administrator mode

Parameters

detail

>   Displays detailed information about the routing table and full IP addresses.

>   Behavior when this parameter is omitted:

>>   Detailed information for the routing table is not displayed. IP addresses are displayed in abbreviated form.

numeric

>   Displays network addresses by their address numbers, not by their host names, and displays ports by their port numbers, not by their service names. This option can be used in any display format.

>   Behavior when this parameter is omitted:

>>   Displays network addresses by host names, and ports by service names.

addressfamily <address family>

>   Reports statistics or address control blocks for the specified address family only.

>   For <address family>, you can specify inet, local, inet6, unix, or arp. The specifiable address families vary depending on the combination with other parameters.

>   Behavior when this parameter is omitted:

>>   Displays information for all address families.

all-protocol-address

>   Displays all protocol control block addresses related to the socket. This parameter is used for debugging.

interface <interface type> <interface number>

>   Displays the status of the target interface.

>   For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

>   - VLAN interface
>   - Loopback interface

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- Management port

Behavior when this parameter is omitted:

Displays the status of all interfaces.

wait <time>

Displays the network interface statistics at intervals of seconds specified in <time>. You can specify a decimal number in the range from 1 to 2^{64}-1.

Behavior when this parameter is omitted:

Statistics are not displayed at regular intervals.

{ memory | protocol <protocol> | system }

memory

Displays the statistics used for managing memory.

protocol <protocol>

Displays statistics for the specified protocol. The specifiable protocols are tcp, ip, udp, icmp, igmp, and arp.

system

Displays statistics such as the total number of packets received by the Switch.

statistics

Displays statistics for each protocol. If the routing-table option is specified at the same time, routing statistics will be displayed.

routing-table

Displays the routing table (if the statistics option is specified at the same time, routing statistics will be displayed instead).

vrf {<vrf id> | all} [SL-L3A]

Specifies the VRF to be displayed. If <vrf id> is specified, only the specified VRF is displayed. If all is specified, all VRFs including the global network are displayed. For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays the global network.

multicast

Displays the multicast virtual interface and routing information.

By default, information for both IPv4 and IPv6 is displayed.

(You can display information for either IPv4 only or IPv6 only by specifying the address family at the same time. Specifying inet displays information for IPv4, and specifying inet6 displays information for IPv6.)

(If the statistics option is specified at the same time, multicast statistics will be displayed.)

Behavior when all parameters are omitted:

Displays information about all sockets including the global network. Normally, sockets used by server processes are not displayed.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} [show] netstat [detail][numeric][addressfamily <address fam
ily>]
remote command {<switch no.> | all} [show] netstat all-protocol-address [detail][numeric][addre
ssfamily <address family>]
remote command {<switch no.> | all} [show] netstat interface [<interface type> <interface numbe
r> [wait <time>]]
remote command {<switch no.> | all} [show] netstat {memory | protocol <protocol> | system}
remote command {<switch no.> | all} [show] netstat statistics [addressfamily <address family>]
remote command {<switch no.> | all} [show] netstat routing-table[{[detail][numeric][addressfami
ly <address family>][vrf {<vrf id> | all}] | statistics [addressfamily <address family>]}]
remote command {<switch no.> | all} [show] netstat multicast [{[detail][numeric][addressfamily
<address family>][vrf {<vrf id> | all}] | [statistics] [addressfamily <address family>]}]
```

Example and display items

The following figure shows an example displayed after execution of the "show netstat" command.

Figure 2-14: Socket interface usage

```
> show netstat
Date 20XX/04/01 12:00:00 UTC
Active Internet connections
Proto Recv-Q Send-Q  Local Address    Foreign Address     State
tcp      0     51  192.169.11.99.23  192.169.11.71.65501  ESTABLISHED
tcp      0      0  192.168.11.99.23  192.168.11.71.65502  ESTABLISHED VRF:10
tcp      0      0  localhost.51623   *.*                  LISTEN
tcp      0      0  localhost.56172   *.*                  LISTEN
tcp      0      0  localhost.56165   *.*                  LISTEN
tcp      0      0  localhost.56161   *.*                  LISTEN
udp      0      0  localhost.51611   *.*
udp      0      0  localhost.51621   *.*
udp      0      0  localhost.51612   *.*
Active Internet6 connections
Proto Recv-Q Send-Q  Local Address    Foreign Address     (state)
tcp6     0      0  localhost.56165   *.*                  LISTEN
tcp6     0      0  localhost.56161   *.*                  LISTEN
Active UNIX domain sockets
Address  Type    Recv-Q Send-Q   Inode  Conn  Refs  Nextref Addr
 9f0bcb0 dgram      0      0   a1dc4a8    0     0        0 /var/tmp/vrrp_raif
```

Table 2-13: Information displayed for the socket interface usage

Display Items	Description
Proto	Protocol type of the socket
Recv-Q	Number of data bytes in the input queue
Send-Q	Number of data bytes in the output queue
Local Address	Local address and port number of the socket
Foreign Address	Remote address and port number of the socket
State , (state)	TCP status transition
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.
Address	Internal memory address of the UNIX domain control block
Type	Data communication type of the UNIX socket
Inode	Internal memory address of the i-node information control table
Conn	Internal memory address of the remote control block for the UNIX Stream socket

Display Items	Description
Refs	Internal memory address of the remote control block received at the end of a UNIX Datagram socket
Nextref Addr	Internal memory address of the remote control block sent at the end of a UNIX Datagram socket

Figure 2-15: Status of each interface

```
>show netstat interface
Date 20XX/04/01 12:00:00 UTC
Name        Mtu    Network      Address      Ipkts  Ierrs   Opkts Oerrs Colls
VLAN0002    1500   192.168/24   192.168.0.60    3896      2    2602     0     0
VLAN0002    1500   1234::       1234::60        3896      2    2602     0     0
VLAN0002    1500   fe80::       fe80::4036:30ff 3896      2    2602     0     0
VLAN0005    1500   192:169:11:  192:169:11::99 159712      0  204354     0     0
VLAN0011    1536   192.168.11/  192.168.11.99      0      0       0     0     0
 VRF:10
VLAN0012    1500   192.168.12/  192.168.12.99     12      0    2328     0     0
 VRF:20
VLAN0013    1500   192.168.13/  192.168.13.99      0      0    2317     0     0
 VRF:30
loopback0   33180  loopback/8   127.0.0.1       4083      0    4083     0     0
loopback0   33180  localhost    ::1             4083      0    4083     0     0
loopback0   33180  fe80::       fe80::1         4083      0    4083     0     0
localhost   33180  127/8        127.0.0.1       4083      0    4083     0     0
 VRF:10
loopback20  33180  127/8        127.0.0.1       4083      0    4083     0     0
 VRF:20
loopback20  33180  192.168.112  192.169.112.99  4083      0    4083     0     0
 VRF:20
null0       33180  -----        -----              -      -       -     -     -

> show netstat interface vlan 2
Date 20XX/04/01 12:00:00 UTC
Name        Mtu    Network      Address      Ipkts  Ierrs   Opkts Oerrs Colls
VLAN0002    1500   192.168/24   192.168.0.60    3896      2    2602     0     0
VLAN0002    1500   1234::       1234::60        3896      2    2602     0     0
VLAN0002    1500   fe80::       fe80::4036:30ff 3896      2    2602     0     0
>
```

Table 2-14: Information displayed for the status of each interface

Display Items	Description
Name	Interface name
Mtu	MTU length
Network	IP network address "- - -" is displayed for an interface other than an IP interface.
Address	Host name (if not set, the IP address is displayed). "- - -" is displayed for an interface other than an IP interface.
Ipkts	Number of receive packets (total number of IPv4 packets and IPv6 packets for an IP interface)
Ierrs	Number of received errors (total number of IPv4 packets and IPv6 packets for an IP interface)
Opkts	Number of sent packets (total number of IPv4 packets and IPv6 packets for an IP interface)

Display Items	Description
Oerrs	Number of send errors (total number of IPv4 packets and IPv6 packets for an IP interface)
Colls	Number of times collisions occurred (total number of IPv4 packets and IPv6 packets for an IP interface)
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.

Figure 2-16: Total statistics of the interface

```
> show netstat interface vlan 2 wait 5
Date 20XX/04/01 12:00:00 UTC
Name : VLAN0002 VRF:10
      in              out                total in      total out
 packets  errs  packets  errs  colls   packets  errs  packets  errs  colls
    3905     2     2603     0      0      3905    40     2603     0      0
       0     0        0     0      0         0     0        0     0      0
       0     0        0     0      0         0     0        0     0      0
^C>
```

Table 2-15: Information displayed for total statistics of the interface

Display Items	Description
Name	Interface name
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.
in/packets	Number of receive packets for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of receive packets.
in/errs	Number of received errors for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of received errors.
out/packets	Number of packets sent for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of sent packets.
out/errs	Number of send errors for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of sent errors.
colls	Number of times collisions occurred for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of times collisions occurred.

Figure 2-17: Routing table status

```
>show netstat routing-table
Date 20XX/04/01 12:00:00 UTC
Routing tables

Internet:
Destination       Gateway           Flags           Refs    Use   Interface
Site1             192.168.0.1       UHLc               0   60428   VLAN0002
>
>show netstat routing-table vrf all
Date 20XX/12/10 12:00:00 UTC
```

```
Routing tables
Internet:
VRF: global
Destination        Gateway            Flags           Refs    Use   Interface
loopback/8         localhost          UR/DfA            0       0   loopback0
localhost          localhost          UH/DfA            3    3194   loopback0
192.169.11/24      link#2             UC/DA             0       0   VLAN0005
192.169.11.99      link#2             UHC/DA            0       0   loopback0
192.169.111.99     192.169.111.99     UH/DA             0       0   loopback0
VRF: 10
Destination        Gateway            Flags           Refs    Use   Interface
loopback/8         localhost          UR/DfA            0       0   localhost
localhost          localhost          UH/DfA            3    3194   localhost
192.168.11/24      link#5             UC/DA             0       0   VLAN0011
192.168.11.99      link#5             UHC/DA            0       0   localhost
VRF: 20
Destination        Gateway            Flags           Refs    Use   Interface
loopback/8         localhost          UR/DfA            0       0   loopback20
localhost          localhost          UH/DfA            3    3194   loopback20
192.168.12/24      link#6             UC/DA             0       0   VLAN0012
192.168.12.99      link#6             UHC/DA            0       0   loopback20
192.169.112.99     192.169.112.99     UH/DA             0       0   loopback20
VRF: 30
Destination        Gateway            Flags           Refs    Use   Interface
loopback/8         localhost          UR/DfA            0       0   loopback30
localhost          localhost          UH/DfA            3    3194   loopback30
192.168.13/24      link#7             UC/DA             0       0   VLAN0013
192.168.13.99      link#7             UHC/DA            0       0   loopback30
192.169.113.99     192.169.113.99     UH/DA             0       0   loopback30
>
```

Table 2-16: Information displayed for the routing table status

Display Items	Description
VRF [SL-L3A]	VRF ID
Destination	Destination host name (if not set, the IP address is displayed)
Gateway	Gateway address (MAC address for an ARP entry)
Flags	Route status flag
Refs	Total number of sockets that are currently referencing the target route
Use	Total number of sockets that have been referencing the target route
Interface	Sending interface

Figure 2-18: Statistics for the icmp protocol

```
>show netstat protocol icmp
Date 20XX/07/14 12:00:00 UTC
icmp:
        284 calls to icmp_error
        0 errors not generated because old message was icmp
        Output histogram:
                destination unreachable: 284
        3 messages with bad code fields
        0 messages < minimum length
        0 bad checksums
        0 messages with bad length
        Input histogram:
                destination unreachable: 293
        0 message responses generated
>
```

Table 2-17: Information displayed for the icmp protocol statistics

Display Items	Description
calls to icmp_error	Number of attempts to issue ICMP error messages
errors not generated because old message was icmp	Number of times an ICMP error message was not issued because the packet that caused the issuance of ICMP message was an ICMP message
Output histogram:	Histogram of number of ICMP messages sent vs. message type
messages with bad code fields	Total number of the following ICMP packets received. 1. ICMP messages with an undefined code 2. ICMP messages whose destination was a multicast address
messages < minimum length	Total number of the following ICMP packets received. 1. ICMP messages whose size was smaller than 8 bytes 2. Messages received when either kernel reception buffer size was smaller than the packet length excluding the IP header (less than 36 bytes), or kernel reception buffer size was less than 36 bytes
bad checksums	Number of received packets for which the value of the ICMP message checksum field was invalid
messages with bad length	Total number of the following ICMP packets received. 1. The ICMP message size was smaller than 36 bytes. 2. The ICMP message size was smaller than the sum of the IP option size and +36 bytes. 3. The header length field of the IP packet that caused the ICMP message was invalid. 4. The size of the ICMP timestamp request was smaller than 20 bytes.
Input histogram:	Histogram of number of ICMP messages received vs. message type
message responses generated	Number of received ICMP messages (Echo, Timestamp, or Address Mask) that returned responses

Figure 2-19: show netstat system statistics

```
>show netstat system
Date 20XX/12/10 12:00:00 UTC
SYSTEM:
        1039 packets received
                0 ip
                0 ip6
                0 arp
                1039 control
        0 input packets discarded
                0 no memory
                0 bad length
        0 times ip queue full
        0 times ip6 queue full
        0 times arp queue full
        0 times control queue full
        1 times receiver disabled
        1 times receiver restarted
        1016 packets sent
                0 ip
                0 ip6
                0 arp
                1016 control
>
```

Table 2-18: Information displayed for the show netstat system statistics command

Display Items	Description
packets received	Total number of packets received by the Switch
ip	Number of IPv4 packets received by the Switch
ip6	Number of IPv6 packets received by the Switch
arp	Number of ARP packets received by the Switch
control	Number of control packets received by the Switch (including L2 control)
input packets discarded	Total number of packets discarded by the Switch during reception
no memory	Number of packets discarded by the Switch due to insufficient buffers during reception
bad length	Number of packets discarded by the Switch due to invalid packet length during reception
times ip queue full	Number of times the Switch detected IPv4 queue full during reception
times ip6 queue full	Number of times the Switch detected IPv6 queue full during reception
times arp queue full	Number of times the Switch detected ARP queue full during reception
times control queue full	Number of times the Switch detected control queue full during reception
times receiver disabled	Number of times the Switch stopped receiving packets (excessive load control)
times receiver restarted	Number of times the Switch resumed receiving packets (excessive load control)
packets sent	Total number of packets sent by the Switch
ip	Number of IPv4 packets sent by the Switch
ip6	Number of IPv6 packets sent by the Switch
arp	Number of ARP packets sent by the Switch
control	Number of control packets sent by the Switch (including L2 control)

Figure 2-20: Multicast routing table status

```
> show netstat multicast vrf 10
Date 20XX/12/10 12:00:00 UTC

Virtual Interface Table
 Vif   Thresh  Limit   Local-Address    Remote-Address   Pkt_in  Pkt_out
   0       1       0   127.0.0.1                              0        0
   1       1       0   192.168.10.1                           0        0   VRF:10
   2       1       0   192.168.20.1                           0        0   VRF:10
   3       1       0   192.168.30.1                           0        0   VRF:20
   4       1       0   192.168.40.1                           0        0   VRF:30
   5       1       0   192.168.50.1                           0        0   VRF:20
   6       1       0   192.168.60.1                           0        0   VRF:30
   7       1       0   192.168.70.1                           0        0   VRF:20
   8       1       0   192.168.80.1                           0        0

Multicast Forwarding Cache
VRF : 10
 Hash  Origin          Mcastgroup       Traffic  In-Vif  Out-Vifs/Forw-ttl
```

```
  106  192.168.10.100   232.10.10.1           4         1 2

Total no. of entries in cache: 1

> show netstat multicast vrf all
Date 20XX/12/10 12:00:00 UTC

Virtual Interface Table
 Vif  Thresh  Limit  Local-Address   Remote-Address   Pkt_in  Pkt_out
  0      1      0  127.0.0.1                            0       0
  1      1      0  192.168.10.1                         0       0  VRF:10
  2      1      0  192.168.20.1                         0       0  VRF:10
  3      1      0  192.168.30.1                         0       0  VRF:20
  4      1      0  192.168.40.1                         0       0  VRF:30
  5      1      0  192.168.50.1                         0       0  VRF:20
  6      1      0  192.168.60.1                         0       0  VRF:30
  7      1      0  192.168.70.1                         0       0  VRF:20
  8      1      0  192.168.80.1                         0       0

Multicast Forwarding Cache
VRF : 10
 Hash  Origin          Mcastgroup       Traffic  In-Vif  Out-Vifs/Forw-ttl
  106  192.168.10.100   232.10.10.10         4       1  2

Total no. of entries in cache: 1

VRF : 20
 Hash  Origin          Mcastgroup       Traffic  In-Vif  Out-Vifs/Forw-ttl
  106  192.168.30.100   232.10.10.20         4       3  5

Total no. of entries in cache: 1

VRF : 30
 Hash  Origin          Mcastgroup       Traffic  In-Vif  Out-Vifs/Forw-ttl
  106  192.168.40.100   232.10.10.20         4       4  6

Total no. of entries in cache: 1
```

Table 2-19: Information displayed for the multicast routing table (Virtual Interface Table)

Display Items	Description
Vif	Virtual interface number
Thresh	TTL value
Limit	Limit value (0 is invalid)
Local-Address	Local IP address
Remote-Address	Remote IP address
Pkt_in	Number of receive packets
Pkt_out	Number of send packets
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.

Table 2-20: Information displayed for the multicast routing table (Multicast Forwarding Cache)

Display Items	Description
VRF [SL-L3A]	VRF ID
Hash	Entry management number

Display Items	Description
Origin	Source address
Mcastgroup	Group address
Traffic	Number of software-forwarded packets
In-Vif	Receive VIF number
Out-Vifs/Forw-ttl	Send VIF number
Total no. of entries in cache	Number of multicast forwarding entries

Impact on communication

None

Response messages

Table 2-21: List of response messages for the show netstat (netstat) command

Message	Description
mfchashtbl: symbol not in namelist	Multicast forwarding entries could not be obtained. Re-execute the command.
Multicast Forwarding Cache is empty	There are no multicast forwarding entries.
Since cache changed, please try again.	Information was changed during execution of the command. Re-execute the command.
Socket open error.	An attempt to generate a socket failed.
Virtual Interface Table is empty	A virtual interface does not exist.

Notes

- To terminate the command that was started with the wait parameter specified, press Ctrl+C.
- If this command terminates abnormally, a core file might be output. If this occurs, re-execute the command.

clear netstat

Clears protocol statistics.

Syntax

```
clear netstat statistics [{ protocol <protocol> | system }]
```

Input mode

User mode and administrator mode

Parameters

statistics

> Clears the statistics.

{ protocol <protocol> | system }

> protocol <protocol>
>
>> Clears the statistics for the specified protocol. The specifiable protocols are tcp, ip, udp, icmp, igmp, and arp.
>
> system
>
>> Clears statistics such as the total number of packets received by the Switch.
>
> Behavior when this parameter is omitted:
>
>> Clears all protocol statistics.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} clear netstat statistics [{ protocol <protocol> | system }]
```

Example

None

Display Items

None

Impact on communication

None

Response messages

Table 2-22: List of response messages for the clear netstat command

Message	Description
Socket open error.	An attempt to generate a socket failed.

Notes

None

clear tcp

Forcibly disconnects the specified TCP connection.

Syntax

```
clear tcp [-f] {pcb <pcb address> |
              local <ip address> <port> remote <ip address> <port> |
              local <hostname> <port> remote <hostname> <port> }
              [reset-flag]
```

Input mode

User mode and administrator mode

Parameters

-f

Forcibly releases the resources of the device.

pcb <pcb address>

Specifies the connection by the PCB address displayed by the "show netstat all-protocol-address" command (see "show netstat(netstat)").

local <ip address> <port> remote <ip address> <port>

Specifies the connection by the local IPv4 address, local port, remote IPv4 address, and remote port.

local <hostname> <port> remote <hostname> <port>

Specifies the connection by the local host name, local port, remote host name, and remote port.

reset-flag

Forces disconnection by sending RST flag.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} clear tcp [-f] {pcb <pcb address> | local <ip address> <por
t> remote <ip address> <port> | local <hostname> <port> remote <hostname> <port> } [reset-flag]
```

Example

Figure 2-21: Example of executing the clear tcp command

```
> clear tcp local 192.168.0.1 1027 remote 192.168.0.2 23
>
```

Display Items

None

Impact on communication

Communication stops because the TCP connection is disconnected.

Response messages

Table 2-23: List of response messages for the clear tcp command

Message	Description
<hostname>: Unknown host	The host name specified by <hostname> is invalid.
connection not found	The specified connection does not exist.
missing pcb address	The PCB address is not specified.
missing remote address	The remote address or port is not specified.
pcb not found	The specified pcb does not exist.

Notes

Disconnection using this command might adversely affect system operation. This command must be used with care and used only when unavoidable.

ping

The "ping" command is used to determine whether communication is possible to the device with the specified IP address.

Syntax

```
ping <host> [numeric] [summary] [record-route] [direct] [verbose]
     [count <count>] [interval <wait>] [preload <preload>]
     [pad-byte <pattern>] [packetsize <size>] [[specific-route]
     source <source address>] [ttl <ttl>] [vrf <vrf id>]
ping <host> {compact | simple} [numeric] [record-route] [direct]
     [count <count>] [interval <wait>] [pad-byte <pattern>]
     [packetsize <size>] [[specific-route] source <source address>]
     [ttl <ttl>] [vrf <vrf id>]
ping <host> [numeric] [summary] [record-route] [direct] [verbose]
     [count <count>] [interval <wait>] [preload <preload>]
     [pad-byte <pattern>] [packetsize <size>] [source <source address>]
     [nexthop <nexthop address>][ttl <ttl>] [vrf <vrf id>]
ping <host> {compact | simple} [numeric] [record-route] [direct]
     [count <count>] [interval <wait>] [pad-byte <pattern>]
     [packetsize <size>] [source <source address>]
     [nexthop <nexthop address>] [ttl <ttl>] [vrf <vrf id>]
```

Input mode

User mode and administrator mode

Parameters

<host>

>   Specifies the destination host name or IP address.

>   If vrf <vrf id> is specified, only an IP address can be specified for <host>, but a destination host name cannot. [SL-L3A]

compact

>   Displays the execution results in a simplified format using the following symbols. If this parameter is specified, the initial value of the ping transmission count is set to 5.

>   !: Response received (ICMP Echo Reply)

>   .: No response

>   U: Destination unreachable (ICMP Destination Unreachable)

>   C: Source suppressed (ICMP Source Quench)

>   &: TTL exceeded (ICMP Time Exceeded)

>   ?: Unidentified ICMP packet type

>   If no response is sent within the sending interval, it is determined that no response (a timeout) occurred.

>   This parameter cannot be specified together with the simple, summary, verbose, or preload parameter.

simple

>   Displays the execution results in a simplified format using the following symbols. If this parameter is specified, the initial value of the ping transmission count is set to 5.

>   !: Response received (ICMP Echo Reply)

>   .: No response

Note that "no response" symbols are displayed together with a "response received" symbol when a response is received after the time that no response was received (echo reply was missing). Therefore, no-response symbols are displayed real-time while no response is received.

This parameter cannot be specified together with the compact, summary, verbose, or preload parameter.

numeric

Displays the IP address of the host without converting it to a name.

Behavior when this parameter is omitted:

Displays the name converted from the host IP address if an ICMP error has occurred.

summary

Restricts the output. Only the summary lines of the first and last lines are displayed.

Behavior when this parameter is omitted:

Displays one line for one response as regular display mode.

record-route

Records the route to the specified host. The RECORD_ROUTE option is assigned to the ECHO_RE-QUEST packet, and the route buffer on the reply packet is displayed. Note that the IP header can contain only a maximum of nine routes. Most hosts ignore or discard this option.

Behavior when this parameter is omitted:

The RECORD_ROUTE option is not used.

direct

Ignores the normal routing table and sends data to the hosts on the directly connected network. If no host exists on the specified network connected, an error is returned. This option is used to send ping to the local host via an interface that has no routing information.

Behavior when this parameter is omitted:

Uses the normal routing table to send data.

verbose

Enables verbose output. Received ICMP packets other than ECHO_RESPONSE and this command are also displayed.

Behavior when this parameter is omitted:

Displays ECHO_RESPONSE and other errors only.

count <count>

Sends packets for the number of times specified for <count>, and then finishes the processing. To interrupt the processing, press Ctrl+C. The specifiable values are from 1 to 2147483647. Note that if the simple parameter is specified, packets are sent a maximum of 65536 times.

Behavior when this parameter is omitted:

Sends packets indefinitely. However, if the compact or simple parameter is specified, packets are sent five times.

interval <wait>

Sets the packet sending interval to the number of seconds specified for <wait>. The specifiable values are from 0.01 to 0.09, from 0.1 to 0.9, and from 1 to 2147483647. Values from 0.01 to 0.09 second can be specified in units of 0.01 second. Values from 0.1 to 0.9 second can be specified in units of 0.1 second. Values from 1 to 2147483647 seconds can be specified in units of seconds.

Behavior when this parameter is omitted:

The sending interval defaults to 1 second.

preload <preload>

Sends the number of packets specified in <preload> as fast as possible, and then returns to normal behavior. The specifiable values are from 1 to 2147483647. Do not use this parameter for normal operations. When using this parameter, the CPU usage rises and the send bandwidth is significantly consumed, which might affect other processes, services, and communications.

Behavior when this parameter is omitted:

Preload sending is not performed.

pad-byte <pattern>

Specifies the pad bytes for packets to be sent. The maximum size of the pad is 16 bytes. This is effective for diagnosing data-dependent problems on the network. For example, specify pad-byte ff to generate an all-ones packet to be sent. You can specify a hexadecimal number consisting of 1 to 32 digits.

Behavior when this parameter is omitted:

Generates pad characters by incrementing from 00 to ff.

packetsize <size>

Specifies how many bytes of data are to be sent. The specifiable values are from 1 to 65467.

Behavior when this parameter is omitted:

The number of bytes of data to be sent is 56. By adding 8 bytes of ICMP header data, a total of 64 bytes will be sent.

specific-route

Sends packets only to a specific route when the destination has multipath routes. Packets are sent by the interface for which the IP address specified for <source address> of the source option is set.

Note that this parameter cannot be specified when the nexthop <nexthop address> parameter is specified.

Behavior when this parameter is omitted:

A specific route is not specified.

source <source address>

Uses the IP address specified for <source address> as the source address of an output packet. Only the IP addresses set on the Switch can be specified.

Behavior when this parameter is omitted:

The source IP address selected by the Switch is used.

nexthop <nexthop address>

Sends packets to the IP address specified for <nexthop address>. For <nexthop address>, specify an IPv4 address. Note, however, that you cannot specify a class-D address or "255.255.255.255".

Also note that this parameter cannot be specified when the specific-route parameter is specified.

Behavior when this parameter is omitted:

Packets are sent according to the normal routing table.

ttl <ttl>

Sets the value specified for <ttl> to the ttl field of the IP header. The specifiable values are from 1 to 255.

Behavior when this parameter is omitted:

If a unicast address is specified for <host>, 255 is set. If a multicast address is specified, 1 is set.

vrf <vrf id>[SL-L3A]

Specifies the VRF to be displayed. For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays the global network.

Behavior when all parameters are omitted:

Displays information in the usual "one line for one response" display mode for the global network.

Operation when a stack configuration is used

The command can be used in the same way as for a standalone configuration.

Example

- This example shows how to execute an echo test by specifying the default values (unlimited attempts, data size of 56 bytes, and sending interval of 1 second).

    Figure 2-22: Example of executing the ping command with default values

    ```
    >ping 192.168.0.1
    PING 192.168.0.1 (192.168.0.1): 56 data bytes
    64 bytes from 192.168.0.1: icmp_seq=0 ttl=255 time=0.286 ms
    64 bytes from 192.168.0.1: icmp_seq=1 ttl=255 time=0.271 ms
    64 bytes from 192.168.0.1: icmp_seq=2 ttl=255 time=0.266 ms
    ^C
    --- 192.168.0.1 PING statistics ---
    3 packets transmitted, 3 packets received, 0.0% packet loss
    round-trip min/avg/max = 0.266/0.274/0.286 ms
    >
    ```

- This example shows how to execute an echo test by specifying 3attempts, data size of 120 bytes, and sending interval of 2 seconds.

    Figure 2-23: Example of executing the ping command by specifying 3 attempts, data size of 120 bytes, and sending interval of 2 seconds

    ```
    >ping 192.168.0.1 count 3 packetsize 120 interval 2
    ```

- This example shows how to execute an echo test by specifying the compact parameter and 10 attempts.

    Figure 2-24: Example of executing the ping command by specifying the compact parameter and 10 attempts

    ```
    >ping 192.168.0.1 compact count 10
    PING 192.168.0.1 (192.168.0.1): 56 data bytes
    !!!!!!!!!!
    10 packets transmitted, 10 packets received, 0.0% packet loss
    round-trip min/avg/max = 0.481/0.515/0.57 ms
    >
    ```

- This example shows how to execute an echo test by specifying the simple parameter, 100 attempts, and a sending interval of 0.5 seconds.

    Figure 2-25: Example of executing the ping command by specifying the simple parameter, 100 attempts, and sending interval of 0.5 second

    ```
    >ping 192.168.0.1 simple count 100 interval 0.5
    PING 192.168.0.1 (192.168.0.1): 56 data bytes
    !!!!!!!!!!!!!!!!!!!!!!!!!........................!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
    !!!!!!!!!
    100 packets transmitted, 75 packets received, 25.0% packet loss
    round-trip min/avg/max = 0.481/0.515/0.57 ms
    >
    ```

Display Items

None

Impact on communication

When using the preload parameter, the CPU usage rises and the send bandwidth is significantly consumed, which might affect communications.

Response messages

Table 2-24: List of response messages for the ping command

Message	Description
Bad/invalid number of packets	The sending count specified for count is too large. Reduce the sending count.
Can't set source interface/address: Can't assign requested address	The specified IP address has not been set on the Switch (when the source option is specified).
Cannot resolve "<host>" (Unknown host)	An attempt to resolve the address of the specified host failed. <host>: Host name
Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
Invalid IPv4 address. -- <nexthop address>	The value specified for <nexthop address> is incorrect. You cannot specify a class-D address or "255.255.255.255" for <nexthop address>. Specify an IPv4 address other than a class-D address and 255.255.255.255. <nexthop address> IPv4 address
packet too short (<receive> bytes) from <host>	The packet length from the specified host is too short. <receive>: Length of the data received <host>: Host name or IP address
recvfrom: <error message>	An attempt to receive data from a socket failed. <error message>: Error message
sendto: <error message>	An attempt to send data to a socket failed. <error message>: Error message
socket: <error message>	An attempt to open a socket failed. <error message>: Error message
unknown protocol icmp	An attempt to obtain the icmp protocol information failed.
wrote <host> <send> chars, ret=<sent>	Packets cannot be sent to the specified host. <host>: Host name or IP address <send>: Length of the data to be sent <sent>: Length of the data sent

Notes

- To halt execution of the "ping" command, press Ctrl + C. If you interrupt the command with the simple parameter specified, "no response" symbols (.) corresponding to echo replies which have not been received are displayed after the command is interrupted. As a result, the number of "no response" symbols might not be exactly correct.

- When the compact or simple parameter is specified, the summary, verbose, or preload parameter cannot be specified.

- When the compact or simple parameter is specified, you cannot specify the sending of unlimited numbers of ping transmissions.

- If a small value is specified for interval, "no response" might be displayed and no data is sent or received. Therefore, adjust the value according to the usage environment.

- If a small value is specified for interval and the command is executed on a terminal with a slow communication data rate, such as a console, "no response" might be displayed because the display takes time. In such a case, execute the command on a remote operation terminal with a fast communication data rate or execute the command with the simple or summary parameter specified.

- If a small value is specified for interval, the actual sending of interval for packets depends on the load on the device. Therefore, the sending interval is not exactly the same as the time specified for interval. Packets are sent at the sending interval specified for interval when viewed as the average time for the entire ping test.

- Unlike the compact parameter, the simple parameter does not have timeout for each sending interval. Therefore, "no response" symbols are displayed together with a "response received" symbol when a response is received after the time that no response was received (echo reply was missing). No response symbols are displayed in real-time while no response is received.

traceroute

Displays the route (the route of gateways that have been passed through and the response time between the gateways) over which UDP messages are sent to the destination host.

Syntax

```
traceroute <host> [numeric] [direct] [verbose] [gateway <gateway address>…] [ttl <ttl>] [port
 <port>] [probes <Count>] [[specific-route] source <source address>] [waittime <time>] [packetsi
ze<size>] [vrf <vrf id>]
```

Input mode

User mode and administrator mode

Parameters

\<host\>

Specifies the destination host name or host IP address of the test target (IP destination).

If vrf \<vrf id\> is specified, only an IP address can be specified for \<host\>, but a destination host name cannot. [SL-L3A]

numeric

Displays the gateway address by the IP address alone, not by the host name and IP address.

Behavior when this parameter is omitted:

Displays the name converted from the host IP address.

direct

Directly sends the probe packet to the host on the connected network. The normal routing table is not used. If the host does not exist on the directly connected network, an error is returned. You can use this option when using an interface without routes to execute the traceroute command on the host.

Behavior when this parameter is omitted:

Uses the normal routing table to send data.

verbose

Enables verbose output. The received ICMP packets other than TIME_EXCEEDED and UNREACH-ABLE are displayed.

Behavior when this parameter is omitted:

Displays only TIME_EXCEEDED and UNREACHABLE.

gateway \<gateway address\>

Specifies a source route gateway. A maximum of eight gateways can be specified.

Behavior when this parameter is omitted:

A source route gateway is not specified.

ttl \<ttl\>

Specify the maximum time-to-live (the maximum number of hops) for the probe packets to be sent. The specifiable values are from 2 to 255.

Behavior when this parameter is omitted:

The maximum number of hops is 30.

port \<port\>

Specifies the port number of the UDP packet to be used. The port number for a probe packet starts with the <port> value plus 1, and is incremented by one for a probe packet.

Behavior when this parameter is omitted:

The port number is set to 33434 (the port number for probe packets starts from 33435).

probes <Count>

Specify the number of times a search is performed for each "ttl" in <Count>. The specifiable values are from 1 to 2147483647.

Behavior when this parameter is omitted:

A search is performed 3 times.

specific-route

This option is used with the source option for multipath routes. The IP address specified for <source address> is used as the source address of an output packet, and data is sent from the line with that IP address specified. The local IP address of an interface of multipath routes can be specified.

Behavior when this parameter is omitted:

A specific route is not set.

source <source address>

Uses the IP address of an argument (specified by number, not by host name) as the source address of the probe packet to be sent (address to be sent). For a host with multiple IP addresses, this parameter can be used to assign another source address to the probe packet. If the specified IP address is not one of the interface addresses of that host, an error is returned and not data is sent.

Behavior when this parameter is omitted:

The source IP address selected by the Switch is used.

waittime <time>

Specify the time (in seconds) to wait for a probe packet. The specifiable values are from 2 to 86400.

Behavior when this parameter is omitted:

The wait time for a response is 5 seconds.

packetsize <size>

Specify, in bytes, the data size of a probe packet. The specifiable values are from 40 to 32768.

Behavior when this parameter is omitted:

The data size is set to 40 bytes.

vrf <vrf id>[SL-L3A]

Specifies the VRF and displays the route. For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays the global network route.

Behavior when all parameters are omitted:

Displays the route to the specified <host>.

Operation when a stack configuration is used

The command can be executed only on the master switch.

Example

```
>traceroute 192.168.3.24 numeric
traceroute to 192.168.3.24 (192.168.3.24), 30 hops max, 40 byte packets
 1  192.168.2.101  0.612 ms *  0.532 ms
```

```
 2  192.168.3.24  0.905 ms  0.816 ms  0.807 ms
>
```

Display Items

None

Impact on communication

None

Response messages

Table 2-25: List of response messages for the traceroute command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
packet too short (<receive> bytes) from <host>	The packet length from the specified host is too short. <receive>: Length of the data received <host>: Host name or IP address
sendto: <error message>	An attempt to send data to a socket failed. <error message>: Error message
traceroute: <address> is not a valid local address.	<address> was selected as the source IP address, but it is not valid on the Switch. <address>: IP address
traceroute: bind: Can't assign requested address	The specified IP address has not been set on the Switch (when the source option is specified).
traceroute: Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
traceroute: icmp socket: <error message>	An attempt to open an icmp socket failed. <error message>: Error message
traceroute: raw socket: <error message>	An attempt to open a raw socket failed. <error message>: Error message
traceroute: unknown host <host>	The host name is not correct. Specify the correct host name. <host>: Host name
traceroute: Warning: <host> has multiple addresses; using <address>	The specified <host> had multiple addresses, but <address> was used. <host>: Host name <address>: IP address
traceroute: wrote <host> <send> chars, ret=<sent>	Packets cannot be sent to the specified host. <host>: Host name or IP address <send>: Length of the data to be sent <sent>: Length of the data sent

Notes

None

3 Policy-based Routing

[SL-L3A]

show ip policy

Shows VLAN ID and access list information about the VLAN interfaces for which IPv4 policy-based routing is enabled.

Syntax

```
show ip policy [<vlan id list>]
```

Input mode

User mode and administrator mode

Parameters

<vlan id list>

Specify a list of VLAN IDs for which you want to display access list information.

For <vlan id list>, specify VLAN IDs of the VLAN interfaces for which IPv4 policy-based routing is enabled. For details about how to specify VLAN IDs, see "Specifiable values for parameters".

Behavior when this parameter is omitted:

The access list information of all VLAN interfaces for which IPv4 policy-based routing is enabled is displayed.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example

Figure 3-1: Result of displaying the access list for the specified VLAN interface

```
> show ip policy 10,100-120
Date 20XX/01/11 16:20:40 UTC
VLAN ID  Access List Name/Number        Sequence  Policy List
     10  policy-route1                       100           10
     10  policy-route1                       110           10
    100  policy-route10                     1010          110
    120  policy-route20                     1200          120
>
```

Figure 3-2: Result of displaying the access list for all VLAN interfaces

```
> show ip policy
Date 20XX/01/11 16:20:40 UTC
VLAN ID  Access List Name/Number        Sequence  Policy List
     10  policy-route1                       100           10
     10  policy-route1                       110           10
     20  policy-route2                       200           20
     20  policy-route2                       220           20
     50  policy-route5                        10          100
     50  policy-route5                        20          100
    100  policy-route10                     1010          110
    200  policy-route20                     1200          120
>
```

Display Items

Table 3-1: Items displayed by the show ip policy command

Display Items	Displayed information
VLAN ID	The VLAN ID of each VLAN interface whose access list contains policy-based routing list information
Access List Name/Number	The name or number of each access list
Sequence	Sequence number of the access list
Policy List	The list number of policy-based routing list information

Impact on communication

None

Response messages

Table 3-2: List of response messages for the show ip policy command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	An access group with policy-based routing function enabled has not been set for the VLAN interface. Check the configuration.
No policy base routing list configuration on the VLAN list.	No policy-based routing list information is set for a specified VLAN interface.

Notes

None

show ip cache policy

Displays the route and state information for policy-based routing list information.

Syntax

```
show ip cache policy [<policy list no.> [track-object [<track object id>]]]
```

Input mode

User mode and administrator mode

Parameters

<policy list no.>

> Specifies the list whose route and state information you want to display.
>
> For <policy list no.>, specify the list number of policy-based routing list information. The specifiable values are from 1 to 256.

track-object [<track object id>]

> Specifies the track ID whose route and state information you want to display.
>
> For <track object id>, specify the ID of a monitoring-target track set for the routing information in the policy-based routing list information. The specifiable values are from 1 to 1024.
>
> If you omit <track object id>, all objects linked to the tracking function of policy-based routing are displayed.

Behavior when each parameter is omitted:

> This command can display only the information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

> The route and state information for all policy-based routing list information items is displayed.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example

Figure 3-3: Result of displaying the route information for the specified list number

```
> show ip cache policy 1
Date 20XX/01/11 16:20:40 UTC
Policy Base Routing Default Init Interval :  240
   Start Time : 20XX/01/11 15:00:00
   End Time   : 20XX/01/11 15:04:00
Policy Base Routing List :   1
   Default : Permit
   Recover : On
   Priority     Sequence  VLAN ID  Status  Next Hop         Track Object ID
 *>        1          10       10  Up      200.1.1.10                     1
           2          20      100  Down    200.1.2.20                     -
           3          30      110  Up      200.1.3.30                    11
           4          40      120  Up      200.1.4.40                     2
>
```

Figure 3-4: Result of displaying the routing information for the specified list number and track ID (stack configuration)

```
> show ip cache policy 1
Date 20XX/01/11 16:20:40 UTC
Policy Base Routing Default Init Interval :  240
   Start Time : 20XX/01/11 15:00:00
   End Time   : 20XX/01/11 15:04:00
Policy Base Routing Default Aging Interval :  240
   Start Time : 20XX/01/11 16:00:00
   End Time   : 20XX/01/11 16:04:00
Policy Base Routing List :  1
   Default : Permit
   Recover : On
   Priority    Sequence   VLAN ID  Status   Next Hop         Track Object ID
 *>     1          10        10  Up       200.1.1.10                     1
        2          20       100  Down     200.1.2.20                     -
        3          30       110  Up       200.1.3.30                    11
        4          40       120  Up       200.1.4.40                     2
>
```

Figure 3-5: Result of displaying the routing information for the specified list number and track ID

```
> show ip cache policy 11 track-object 1
Date 20XX/01/11 16:20:40 UTC
Policy Base Routing Default Init Interval :  240
   Start Time : 20XX/01/11 15:00:00
   End Time   : 20XX/01/11 15:04:00
Policy Base Routing List :  11
   Default : Permit
   Recover : On
   Priority    Sequence   VLAN ID  Status   Next Hop         Track Object ID
 *>     1          10        10  Up       200.1.1.10                     1
        4          40       120  Up       200.1.4.40                     1
>
```

Figure 3-6: Result of displaying all route information

```
> show ip cache policy
Date 20XX/01/11 16:20:40 UTC
Policy Base Routing Default Init Interval :  240
   Start Time : 20XX/01/11 15:00:00
   End Time   : 20XX/01/11 15:04:00
Policy Base Routing List :  1
   Default : Permit
   Recover : On
   Priority    Sequence   VLAN ID  Status   Next Hop         Track Object ID
 *>     1          10        10  Up       200.1.1.10                     1
        2          20       100  Down     200.1.2.20                     -
        3          30       110  Up       200.1.3.30                    11
        4          40       120  Up       200.1.4.40                     2
Policy Base Routing List : 200
   Default : Permit
   Recover : On
   Priority    Sequence   VLAN ID  Status   Next Hop         Track Object ID
        1          10       100  Down     201.1.1.10                     2
        2          20       110  Down     201.1.2.20                     2
 *>     3          30       200  Up       201.1.3.30                    18
        4          40       210  Up       201.1.4.40                     1
>
```

Display Items

Table 3-3: Items displayed by the show ip cache policy command

Display Items	Meaning	Displayed detailed information
Policy Base Routing Default Init Interval	Time during which the route is placed in the Init status	The time period during which the monitoring of policy-based routing routes is temporarily stopped (for example, when the device is being started up)

Display Items	Meaning	Displayed detailed information
Policy Base Routing Default Aging Interval	Time during which the route is placed in the switching status	The time period during which the monitoring of policy-based routing routes is temporarily stopped (for example, when the master switch is being switched) Displayed only in a stack configuration
Start Time	Start time of the temporary non-monitoring period for policy-based routing routes	yyyy/mm/dd hh:mm:ss year/month/day hour:minute:second A hyphen (-) is displayed when monitoring is not performed.
End Time	End time of the temporary non-monitoring period for policy-based routing routes	yyyy/mm/dd hh:mm:ss year/month/day hour:minute:second A hyphen (-) is displayed when monitoring is not performed or when it is being executed.
Policy Base Routing List	The list number of policy-based routing list information	—
Default	Default behavior (how packets are handled if the status of all routes is Down)	Permit: Packets are forwarded normally. Deny: Packets are discarded.
Recover	Whether to enable the switching back of routes	On: Switchbacks are enabled. Off: Switchbacks are disabled.
*>	Routes in use	The routes that are currently being used are marked "*>". This information is not displayed if the status of all routes is "Down" or "Init".
Priority	Priority of the route	Priority of the destination interface
Sequence	Route application sequence	Destination interface application sequence
VLAN ID	VLAN ID of a route	VLAN ID of the destination interface
Status	Routing information status	Up: Packets can be forwarded. Down: Packets cannot be forwarded. Init: Now starting up Aging: Switching
Next Hop	Next hop IP address	IP address of a next hop that is used to send packets
Track Object ID	ID of a route failure monitoring track	A hyphen (-) is displayed when this ID is not set.

Impact on communication

None

Response messages

Table 3-4: List of response messages for the show ip cache policy command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such list number.	The specified policy-based routing list number does not exist. Make sure the specified parameter is correct, and then try again.
No such track object id.	The specified track object ID is not set. Make sure the specified parameter is correct, and then try again.
No such track object.	The tracking function is not set in the specified policy-based routing list information. Make sure the specified parameter is correct, and then try again.
Policy base routing is not configured.	Policy-based routing function is not set. Check the configuration.

Notes

None

reset policy-list

Used to reselect the priority of routing information for policy-based routing list information.

Syntax

```
reset policy-list [<policy list no.>]
```

Input mode

User mode and administrator mode

Parameters

\<policy list no.>

Specifies the number of the list for which you want to reselect the routing information priority.

For \<policy list no.>, specify the list number of policy-based routing list information. The specifiable values are from 1 to 256.

Behavior when this parameter is omitted:

The priority of routing information for all policy-based routing list information is reselected.

Operation when a stack configuration is used

The command can be executed only on the master switch.

Example

Figure 3-7: Reselecting the priority of the route information for the specified list number

```
> reset policy-list 1
Date 20XX/12/10 16:20:40 UTC
>
```

Figure 3-8: Reselecting the priority of the route information for all list numbers

```
> reset policy-list
Date 20XX/12/10 16:20:40 UTC
>
```

Display Items

None

Impact on communication

If routing information is changed by reselecting the priority, affected packets might be discarded temporarily.

Response messages

Table 3-5: List of response messages for the reset policy-list command

Message	Description
Can't execute during system starting or switchover.	The command cannot be executed because the system is being started or switched. Wait until the system has started or switched, and then re-execute the command.

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such list number.	The specified policy-based routing list number does not exist. Make sure the specified parameter is correct, and then try again.
Policy base routing is not configured.	Policy-based routing function is not set. Check the configuration.

Notes

You cannot execute the command by specifying the list number of policy-based routing list information while the system is being started or switched.

dump policy

Outputs to a file event trace information and control table information collected by the policy-based program.

Syntax

```
dump policy
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

Executes the command for all member switches that configure the stack from the master switch.

You can also use the "remote command" command.

```
remote command {<switch no.> | all} dump policy
```

Example

Figure 3-9: Dumping the policy-based program

```
> dump policy
>
```

Display Items

None

Impact on communication

None

Response messages

Table 3-6: List of response messages for the dump policy command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
Policy base routing is not configured.	Policy-based routing function is not set. Check the configuration.
Switch <switch no.> was deleted from stack.	The member switch was deleted from the stack configuration. <switch no.>: Indicates the switch number.

Notes

The storage directory and the name of the output dump file are as follows.

Storage directory: /usr/var/policy/

File: policyd_dump.gz

If a file with this name already exists, the file is overwritten unconditionally. Therefore, back up the file in advance, if necessary.

restart policy

Restarts the policy-based program.

Syntax

```
restart policy [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the policy-based program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file of the policy-based program when it is restarted.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Restarts the policy-based program after displaying a restart confirmation message.

Operation when a stack configuration is used

Executes the command for all member switches that configure the stack from the master switch.

You can also use the "remote command" command.

```
remote command {<switch no.> | all} restart policy [-f] [core-file]
```

Example

Figure 3-10: Restarting the policy-based program

```
> restart policy
Policy base program restart OK? (y/n) : y
>
```

Display Items

None

Impact on communication

Communication that is using the routing information selected by policy-based routing temporarily stops.

Response messages

Table 3-7: List of response messages for the restart policy command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
Policy base routing is not configured.	Policy-based routing function is not set. Check the configuration.
Switch <switch no.> was deleted from stack.	The member switch was deleted from the stack configuration. <switch no.>: Indicates the switch number.

Notes

The storage directory and the name of the core file are as follows:

Storage directory: /usr/var/core/

Core file: policyd.core

If a file with this name already exists, the file is overwritten unconditionally. Therefore, back up the file in advance, if necessary.

show track-object

Displays the track information for the tracking function of policy-based routing.

Syntax

```
show track-object <track object id>
show track-object [icmp] [detail]
```

Input mode

User mode and administrator mode

Parameters

<track object id>

Specifies the ID of the track whose detailed information you want to display.

For <track object id>, specify the track ID that has been set by the tracking function of policy-based routing.

icmp

Specify this parameter to display information about the tracks whose type is IPv4 ICMP polling monitoring.

Behavior when this parameter is omitted:

Information of all types of tracks is displayed.

detail

Specify this parameter to display detailed track information.

Behavior when this parameter is omitted:

A listing of track information is displayed.

Behavior when all parameters are omitted:

Lists all track information.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1

Displays track information in a list.

Figure 3-11: Result of displaying the track information list

```
> show track-object
Date 20XX/12/15 12:00:00 UTC
Track State          Type         Target
101   UP(Active)     ICMP         172.16.1.1
102   UP(Transit)    ICMP         172.16.2.1
201   DOWN(Transit) ICMP          172.16.3.1
>
```

Display items in Example 1

Table 3-8: Contents of the displayed track information list

Display Items	Meaning	Displayed detailed information
Track	Track ID	—
State	Track status (running status)	• Track status UP: Indicates the Up status. DOWN: Indicates the Down status. • Running status Active: Running. Disable: Disabled Init: Now starting up Aging: Switching Backup: Backup Transit: The track is currently under failure verification or failure recovery verification.
Type	Track type	ICMP: IPv4 ICMP polling monitoring UNSPECIFIED: Not specified
Target	Track object	If Type is ICMP: VRF: VRF ID (This is not displayed when the target is a global network.) IP address: The monitored address is displayed. If Type is UNSPECIFIED: A hyphen (-) is displayed.

Example 2

The following figure shows an example of displaying detailed track information.

Figure 3-12: Result of displaying the detailed track information

```
> show track-object 102
Date 20XX/12/15 12:00:00 UTC
Track: 102
   State: UP(Transit),   Last Change: 20XX/10/10 18:11:23
   Type: ICMP
     Destination: 172.16.2.1
     Source: 172.16.2.100, Nexthop: 172.16.2.200
     TOS: max-reliability(2), Precedence: flash(3)
     Interval: 2sec, Timeout: 2sec
     Failed: 1/2, Tried: 1/3
>
> show track-object 201
Date 20XX/12/15 12:00:00 UTC
Track: 201
   State: DOWN(Transit),   Last Change: 20XX/10/10 18:11:23
   Type: ICMP
     Destination: 172.16.3.1
     Source: -, Nexthop: -
     TOS: normal(0), Precedence: flash(3)
     Interval: 2sec, Timeout: 2sec
     Succeeded: 1/2, Tried: 1/3
>
```

Display items in Example 2

Table 3-9: Contents of the displayed detailed track information

Display Items	Meaning	Displayed detailed information
Track	Track ID	—
State	Track status (running status)	• Track status UP: Indicates the Up status. DOWN: Indicates the Down status. • Running status Active: Running. Disable: Disabled Init: Now starting up Aging: Switching Backup: Backup Transit: The track is currently under failure verification or failure recovery verification.
Last Change	Time that the track status was changed last	yyyy/mm/dd hh:mm:ss year/month/day hour:minute:second If the track status does not change after tracks are added or the track type is changed, a hyphen (-) is displayed.
Type	Track type	ICMP: IPv4 ICMP polling monitoring UNSPECIFIED: Not specified
VRF	VRF ID	This item is displayed if Type is ICMP. Note, however, that this item is not displayed if no information has been set by a configuration command.
Destination	Monitored address	This item is displayed if Type is ICMP.
Source	Address used as the sender of ICMP Echo packets	This item is displayed if Type is ICMP. If this information is not set by using a configuration command, a hyphen (-) is displayed.
Nexthop	A next hop address used to send ICMP Echo packets	This item is displayed if Type is ICMP. If this information is not set by using a configuration command, a hyphen (-) is displayed.
TOS	The tos value of the ToS field set in ICMP Echo packets	This item is displayed if Type is ICMP. max-reliability(2) max-throughput(4) min-delay(8) min-monetary-cost(1) normal(0) In cases other than the above, the specified value is displayed.
Precedence	The precedence value of the ToS field set in ICMP Echo packets	This item is displayed if Type is ICMP. critical(5) flash(3) flash-override(4) immediate(2) internet(6)

Display Items	Meaning	Displayed detailed information
		network(7) priority(1) routine(0) In cases other than the above, the specified value is displayed.
Interval	Polling interval per-formed when the track is active	This item is displayed if Type is ICMP. For tracks in the Disable, Init, Aging, or Backup state, the poll-ing interval used in the Active state is displayed.
Timeout	Polling reply wait time	This item is displayed if Type is ICMP.
Succeeded	Number of times polling succeeded during failure recovery verification	This item is displayed if State is Transit. xxx/yyy: • xxx: Current number of times polling succeeded • yyy: Number of times polling needs to succeed for the state to be judged Up
Failed	Number of times polling failed during failure veri-fication	This item is displayed if State is Transit. xxx/yyy: • xxx: Current number of times polling failed • yyy: Number of times polling needs to fail for the state to be judged Down
Tried	Number of times polling was attempted during failure recovery verifica-tion or failure verification	This item is displayed if State is Transit. xxx/yyy: • xxx: Current number of times polling was attempted • yyy: Preset number of times polling is attempted

Impact on communication

None

Response messages

Table 3-10: List of response messages for the show track-object command

Message	Description
Can't execute.	The command could not be executed. Re-execute the com-mand.
no entries	There are no applicable tracks.
no such track object id	The specified track object ID is not set. Make sure the spec-ified parameter is correct, and then try again.
trackobjd doesn't seem to be running.	This command failed because the track object program is not started. Check the configuration.

Notes

None

dump protocols track-object

Outputs debug information collected by the track object program.

Syntax

```
dump protocols track-object
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} dump protocols track-object
```

Example

Figure 3-13: Dumping the track object program

```
> dump protocols track-object
>
```

Display Items

None

Impact on communication

None

Response messages

Table 3-11: List of response messages for the dump protocols track-object command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.

Notes

The storage directory and the name of the output dump file are as follows.

Storage directory: /usr/var/trackobj/

State database file: objstate.db

Track database file: trackobj.db

If a file with this name already exists, the file is overwritten unconditionally. Therefore, back up the file in advance, if necessary.

restart track-object

Restarts the track object program.

Syntax

```
restart track-object [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

> Restarts the track object program without displaying a restart confirmation message.
>
> Behavior when this parameter is omitted:
>
>> A confirmation message is displayed.

core-file

> Outputs the core file of the track object program when it is restarted.
>
> Behavior when this parameter is omitted:
>
>> A core file is not output.

Behavior when all parameters are omitted:

> Restarts the track object program after displaying a restart confirmation message.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} restart track-object [-f] [core-file]
```

Example

Figure 3-14: Restarting the track object program

```
> restart track-object
track-object program restart OK? (y/n):y
>
```

Display Items

None

Impact on communication

None

Response messages

Table 3-12: List of response messages for the restart track-object command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
trackobjd doesn't seem to be running.	This command failed because the track object program is not started. Wait until the track object program restarts, and then re-execute the command.

Notes

The storage directory and the name of the core file are as follows:

Storage directory: /usr/var/core/

Core file: trackobjd.core

If a file with this name already exists, the file is overwritten unconditionally. Therefore, back up the file in advance, if necessary.

4

DHCP Relay Function

show dhcp traffic

Shows the statistics for DHCP/BOOTP relay agents.

Syntax

```
show dhcp traffic
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display the relay agent statistics.

Figure 4-1: Displaying the relay agent statistics

```
>show dhcp traffic
Date 20XX/10/15 12:00:00 UTC
<<Request Packets Count>>
<Number of Receive Packets>  <Number of Send Packets>
  Receive Packets              Relay Address      Send Packets       Error Packets
          1764                 172.16.11.2                 190                 190
                               172.8.14.4                 1598                   0
                               200.10.10.10               3756                   0
                               172.17.19.10                 20                   0
  Total    1764                                           5564                 190
<<Reply Packets Count>>
<Number of Receive Packets>                        <Number of Send Packets>
  Receive Packets                                    Send Packets       Error Packets
          6102                                               2150                 365
<<DHCP Packets Count>>
<Number of Discard Packets>
  udp port number error    :3
  ip header error          :3
  giaddr error packets     :4
  yiaddr error packets     :4
  hops over packets        :4
  not dhcp/bootp packets   :6
>
```

Display Items

Table 4-1: Information displayed for the relay agent statistics

Category	Sub-catego-ry	Item	Meaning
Request Packets Count	Receive Packets	VRF [SL-L3A]	VRF ID (This is not displayed when the target is a global network.)
		Receive packets	Number of received bootp request packets

Category	Sub-category	Item	Meaning
	Send Packets	Relay Address	Relay-address information specified in the DHCP configuration
		Send packets	Number of bootp request packets sent to the displayed relay address
		Error Packets	Number of bootp request packets that caused an error when being sent to the displayed relay address
Reply Packets Count	Receive Packets	Receive packets	Number of received bootp reply packets
	Send Packets	Send packets	Number of bootp reply packets sent to the displayed relay address
		Error Packets	Number of bootp reply packets that caused an error when being sent to the displayed relay address
DHCP Packets Count	Discard Packets	udp port number error	Number of packets discarded due to invalid UDP port number information
		ip header error	Number of packets discarded due to invalid IP header information and IP/UDP checksum
		giaddr error packets	Number of packets discarded due to invalid giaddr information in the DHCP header
		yiaddr error packets	Number of packets discarded due to invalid yiaddr information in the DHCP header
		hops over packets	Number of packets discarded because the hops value was greater than the defined hops value
		not dhcp/bootp packets	Number of non-DHCP and non-BOOTP packets received

Impact on communication

None

Response messages

Table 4-2: List of response messages for the show dhcp traffic command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP/BOOTP relay agent function is disabled.

Notes

None

clear dhcp traffic

Clears the relay agent statistics.

Syntax

```
clear dhcp traffic
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example and display items

None

Impact on communication

None

Response messages

Table 4-3: List of response messages for the clear dhcp traffic command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP/BOOTP relay agent function is disabled.

Notes

None

show dhcp giaddr

Shows the IP address on which DHCP or BOOTP packets from the DHCP or BOOTP server are received.

Syntax

```
show dhcp giaddr interface vlan <vlan id>
show dhcp giaddr all
show dhcp giaddr vrf <vrf id>
```

Input mode

User mode and administrator mode

Parameters

interface vlan <vlan id>

> Displays the relay agent IP address used for transferring DHCP and BOOTP packets for the specified interface.

> For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

all

> Displays the relay agent IP address used for transferring DHCP and BOOTP packets for all interfaces.

vrf <vrf id>[SL-L3A]

> Displays the relay agent IP address used for transferring DHCP/BOOTP packets for the interface that has the specified <vrf id>.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

- This example shows how to display the IP address on which DHCP packets from the DHCP and BOOTP servers configured for the specified interface are received.

  Figure 4-2: Displaying DHCP and BOOTP giaddr

  ```
  >show dhcp giaddr interface vlan 10
  Date 20XX/10/15 12:00:00 UTC
  DHCP GIADDR <vlan 10> : 170.10.10.1
  >
  ```

- This example shows how to display the IP address on which DHCP packets from the DHCP and BOOTP servers configured for all interfaces are received.

  Figure 4-3: Displaying DHCP and BOOTP giaddr

  ```
  >show dhcp giaddr all
  Date 20XX/10/15 12:00:00 UTC
  DHCP GIADDR <vlan 10> : 170.10.10.1
  DHCP GIADDR <vlan 20> : 172.10.21.1
  DHCP GIADDR <vlan 30> : 179.10.18.1
  >
  ```

Display Items

Table 4-4: Information displayed for the IP address on which DHCP packets are received

Display Items	Meaning	Displayed detailed information
DHCP GIADDR <interface name>: <IP Address>	The giaddr address of the specified interface	—
VRF: <vrf id> [SL-L3A]	VRF ID of the interface	This item is not displayed when the target is a global network.

Impact on communication

None

Response messages

Table 4-5: List of response messages for the show dhcp giaddr command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP/BOOTP relay agent function is disabled.
No DHCP configuration on this interface -- <interface name>.	An interface on which the DHCP configuration has not been set was specified. <interface name>: Name assigned to the specified interface
No DHCP configuration.	The DHCP configuration has not been set on the Switch.
No such interface -- <interface name>.	The specified interface has not been set. <interface name>: Name assigned to the specified interface
No such VRF <vrf id>.	The specified VRF was not found. <vrf id>: Specified VRF ID

Notes

None

5 DHCP Server Function

show ip dhcp binding

Shows the binding information on the DHCP server.

Syntax

```
show ip dhcp binding [ {<IP Address> | sort } ]
```

Input mode

User mode and administrator mode

Parameters

{<IP Address> | sort }

    <IP Address>

        Displays the binding information for the specified IP address.

    sort

        Displays the binding information sorted in ascending order using the IP address as the key.

    Behavior when this parameter is omitted:

        Displays all binding information on the DHCP server without sorting.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-1: Execution result of displaying binding information on the DHCP server

```
> show ip dhcp binding
Date 20XX/10/15 12:00:00 UTC
<IP address>      <MAC address>    <Lease expiration>    <Type>
192.168.200.9     0012.e248.e92d   XX/12/06 19:59:40     Automatic
192.168.200.99    0012.e292.f7b9                         Manual
>
```

Display Items

Table 5-1: Items displayed for biding information on the DHCP server

Display Items	Meaning	Detailed information
IP address	Current IP address connected to the DHCP server	—
MAC address	MAC address	—
Lease expiration	Lease expiration date and time (year/month/day hour:minute:second) However, this item is not displayed for the Manual connection type.	—
Type	Connection type (Manual or Automatic)	Manual: Binding information assigned based on host settings Automatic: Binding information assigned dynamically

Impact on communication

None

Response messages

Table 5-2: List of response messages for the show ip dhcp binding command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.
IP Address check error <IP Address>.	The format of the specified IP address is not correct.
No such IP Address.	The specified IP address could not be found.

Notes

Binding information for which the lease has been expired is not displayed.

clear ip dhcp binding

Deletes the binding information from the DHCP server database.

Syntax

```
clear ip dhcp binding [ {<IP Address> | all } ]
```

Input mode

User mode and administrator mode

Parameters

{<IP Address> | all }

    <IP Address>

        Deletes binding information for the specified IP address.

    all

        Deletes all the binding information on the DHCP server.

    Behavior when this parameter is omitted:

        Deletes all the binding information on the DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-2: Execution result of deleting binding information on the DHCP server

```
> clear ip dhcp binding
>
```

Display Items

None

Impact on communication

When dynamic DNS linkage is enabled, the corresponding entry records are deleted from a dynamic DNS server (DNS updates) concurrently, so name resolution cannot be performed.

Response messages

Table 5-3: List of response messages for the clear ip dhcp binding command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.
IP Address check error <IP Address>.	The format of the specified IP address is not correct.
No such IP Address.	The specified IP address could not be found.

Notes

None

show ip dhcp import

Shows additional information to be distributed to clients specified in the DHCP address pool definition for the DHCP server.

Syntax

```
show ip dhcp import
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display additional information to be distributed to clients specified in the DHCP address pool definition for the DHCP server. Additional information is not displayed unless additional information to be distributed to clients has been set.

Figure 5-3: Execution result of displaying the DHCP server configuration (additional information)

```
> show ip dhcp import
Date 20XX/10/15 12:00:00 UTC
subnet 192.168.200.0 netmask 255.255.255.0
        routers 192.168.200.1
        domain-name-servers 200.10.10.2
        domain-name "Tokyo1"
        netbios-name-servers 192.168.200.30
subnet 200.10.10.0 netmask 255.255.255.0
        routers 200.10.10.1
        domain-name-servers 200.10.10.2
        domain-name "Tokyo2"
        netbios-name-servers 200.10.10.3
        netbios-node-type 4
host Nagoya1
        routers 192.168.200.1
        domain-name-servers 200.10.10.2
        host-name "Nagoya1"
        domain-name "Tokyo1"
        netbios-name-servers 192.168.200.30
        netbios-node-type 1
host Nagoya2
        routers 200.10.10.1,200.10.1.1
        domain-name-servers 200.10.10.5
        domain-name "Tokyo2"
        netbios-name-servers 200.10.10.3
        netbios-node-type 4
>
```

Display Items

Table 5-4: Items displayed for the DHCP server configuration (additional information)

Display Items	Meaning	Detailed information
subnet	Information set by the "network" configuration command	—

Display Items	Meaning	Detailed informa-tion
host	DHCP address pool name of the DHCP address pool defi-nition in which the "host" configuration command is defined	—
routers	Information set by the "default-router" configuration com-mand	—
domain-name-servers	Information set by the "dns-server" configuration com-mand	—
domain-name	Information set by the "domain-name" configuration com-mand	—
host-name	Information set by the "client-name" configuration com-mand	—
netbios-name-server	Information set by the "netbios-name-server" configura-tion command	—
netbios-node-type	Information set by the "netbios-node-type" configuration command	—

Impact on communication

None

Response messages

Table 5-5: List of response messages for the show ip dhcp import command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

None

show ip dhcp conflict

Shows an IP address conflict detected by the DHCP server. An IP address conflict refers to an IP address assigned to a terminal over the network, although it is blank as a DHCP address pool on the DHCP server. Before the DHCP server assigns the IP address to a DHCP client, the DHCP server detects an IP address conflict by checking for a response to a sent ICMP packet.

Syntax

```
show ip dhcp conflict [ <IP Address> ]
```

Input mode

User mode and administrator mode

Parameters

<IP Address>

    Displays the IP address conflict information for the specified IP address.

    Behavior when this parameter is omitted:

        Shows all IP address conflict detected by the DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-4: Execution result of displaying IP address conflict information detected by the DHCP server

```
> show ip dhcp conflict
Date 20XX/10/15 12:00:00 UTC
<IP address>       <Detection time>
192.168.200.9      XX/10/05 15:39:55
192.168.200.15     XX/10/05 16:51:45
>
```

Display Items

Table 5-6: Items displayed for IP address conflict information detected by DHCP server

Display Items	Meaning	Detailed information
IP address	Conflict IP address detected by the DHCP server	—
Detection time	Detection time (year/month/day hour:minute:second)	—

Impact on communication

None

Response messages

Table 5-7: List of response messages for the show ip dhcp conflict command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.
No such IP Address.	The specified IP address could not be found.

Notes

A maximum of 200 items of IP address conflict information are stored in the DHCP server.

clear ip dhcp conflict

Clears the IP address conflict information from the DHCP server.

Syntax

```
clear ip dhcp conflict [ {<IP Address> | all} ]
```

Input mode

User mode and administrator mode

Parameters

{<IP Address> | all}

    <IP Address>

        Deletes IP address conflict information for the specified IP address.

    all

        Deletes all IP address conflict information on the DHCP server.

    Behavior when this parameter is omitted:

        Deletes all IP address conflict information on the DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-5: Execution result of deleting IP address conflict information on the DHCP server

```
> clear ip dhcp conflict 172.16.1.11
>
```

Display Items

None

Impact on communication

None

Response messages

Table 5-8: List of response messages for the clear ip dhcp conflict command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.
IP Address check error <IP Address>.	The format of the specified IP address is not correct.
No such IP Address.	The specified IP address could not be found.

Notes

None

show ip dhcp server statistics

Shows statistics about the DHCP server.

Syntax

```
show ip dhcp server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-6: Execution result of displaying DHCP server statistics

```
> show ip dhcp server statistics
Date 20XX/10/15 12:00:00 UTC
   < DHCP Server use statistics >
     address pools           :19
     automatic bindings      :170
     manual bindings         :1
     expired bindings        :3
     over pools request      :0
     discard packets         :0
   < Receive Packets >
     BOOTREQUEST             :0
     DHCPDISCOVER            :178
     DHCPREQUEST             :178
     DHCPDECLINE             :0
     DHCPRELEASE             :1
     DHCPINFORM              :0
   < Send Packets >
     BOOTREPLY               :0
     DHCPOFFER               :178
     DHCPACK                 :172
     DHCPNAK                 :6
>
```

Display Items

Table 5-9: Items displayed for the DHCP server statistics

Category	Item	Meaning
DHCP Server use statistics	address pools	Number of unassigned DHCP addresses
	automatic bindings	Number of DHCP addresses automatically assigned
	manual bindings	Number of DHCP addresses fixed assigned
	expired bindings	Number of DHCP addresses already assigned

Category	Item	Meaning
	over pools request	Number of insufficient DHCP addresses that has been detected
	discard packets	Number of discarded packets
Receive Packets	BOOTREQUEST	Number of received BOOTREQUEST packets
	DHCPDISCOVER	Number of received DHCPDISCOVER packets
	DHCPREQUEST	Number of received DHCPREQUEST packets
	DHCPDECLINE	Number of received DHCPDECLINE packets
	DHCPRELEASE	Number of received DHCPRELEASE packets
	DHCPINFORM	Number of received DHCPINFORM packets
Send Packets	BOOTREPLY	Number of sent BOOTREPLY packets
	DHCPOFFER	Number of sent DHCPOFFER packets
	DHCPACK	Number of sent DHCPACK packets
	DHCPNAK	Number of sent DHCPNAK packets

Impact on communication

None

Response messages

Table 5-10: List of response messages for the show ip dhcp server statistics command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

None

clear ip dhcp server statistics

Resets statistics on the DHCP server.

Syntax

```
clear ip dhcp server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-7: Execution result of resetting DHCP server statistics
```
> clear ip dhcp server statistics
>
```

Display Items

None

Impact on communication

None

Response messages

Table 5-11: List of response messages for the clear ip dhcp server statistics command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

None

restart dhcp

Restarts the DHCP server daemon process.

Syntax

```
restart dhcp [ -f ][ core-file ]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the DHCP server program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file (dhcp_server.core) for the DHCP server program during restart.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Displays a restart confirmation message and then restarts the DHCP server program.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-8: Execution result of restarting the DHCP server daemon

```
> restart dhcp
DHCP Server program restart OK? (y/n):y
dhcp_server terminated.
>
```

Display Items

None

Impact on communication

Distribution, update, and release of IP addresses cannot be performed, because the sending and receiving of DHCP packets temporarily stops.

Response messages

Table 5-12: List of response messages for the restart dhcp command

Message	Description
Canceled dhcp restart command.	The command on the DHCP server was canceled by the user.
dhcp_server doesn't seem to be running.	The command failed because the DHCP server program was not running. Wait until the DHCP server program is restarted, and then re-execute the command.
dhcp_server failed to terminate.	An attempt to restart the DHCP server by using the command failed. Re-execute the command.
dhcp_server has already stopped.	The command failed because the DHCP server program already stopped. The DHCP server program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
dhcp_server restarted after termination: old pid \<PID\>, new pid \<PID\>	The command failed because the PID was changed during command execution. The DHCP server program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. \<PID\>: Process ID
dhcp_server signaled but still running, waiting 6 seconds more.	The command is restarting the DHCP server program. Wait a while.
dhcp_server still running, sending a kill signal.	A Kill signal is being sent to the DHCP server program for a restart by the command. Wait a while.
dhcp_server still running, sending another terminate signal.	This command is sending a terminate signal to the DHCP server program, to restart it. Wait a while.
dhcp_server terminated.	The DHCP server was stopped by the command. The program will restart automatically. Wait a while.
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.
Input Data Error.	The input data is not correct. Enter y or n.
pid file \<File Name\> mangled!	The PID file for the DHCP server program is corrupted. \<File Name\>: PID file name
pid in file \<File Name\> unreasonably small (\<PID\>)	The PID file for the DHCP server program is corrupted. \<File_Name\>: PID file name \<PID\>: Process ID in the PID file
program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error

Notes

Core output file: /usr/var/core/dhcp_server.core

dump protocols dhcp

Outputs the server log data and the packet sending and receiving log data collected by the DHCP server program to a file.

Syntax

```
dump protocols dhcp
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-9: Execution result of outputting DHCP server log data

```
> dump protocols dhcp
>
```

Display Items

None

Impact on communication

None

Response messages

Table 5-13: List of response messages for the dump protocols dhcp command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

Server log data is always collected. Packet sending and receiving log data is collected only when requested.

Output file: /usr/var/dhcp/dhcp.trc

dhcp server monitor

Starts collection of sending and receiving log data for packets which are sent and received by the DHCP server.

Syntax

```
dhcp server monitor
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-10: Execution result of starting the collection of sending and receiving packet log data on the DHCP server

```
> dhcp server monitor
>
```

Display Items

None

Impact on communication

None

Response messages

Table 5-14: List of response messages for the dhcp server monitor command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

To collect packet log data, execute the "dump protocols dhcp" command after execution of this command.

no dhcp server monitor

Stops collection of the sending and receiving log data for packets on the DHCP server.

Syntax

```
no dhcp server monitor
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 5-11: Execution result of stopping the collection of sending and receiving packet log data on the DHCP server

```
> no dhcp server monitor
>
```

Display Items

None

Impact on communication

None

Response messages

Table 5-15: List of response messages for the no dhcp server monitor command

Message	Description
For the feature to be stopping, it isn't possible to use this command.	This command cannot be used because the DHCP server function is disabled.

Notes

None

6　UDP Broadcast Relays

show ip udp forward

Shows the UDP broadcast relay information.

Syntax

```
show ip udp forward [statistics]
show ip udp forward interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

statistics

Shows statistics for each device.

interface <interface type> <interface number>

Displays information about the specified interface.

For <interface type> <interface number>, you can specify the interface name and interface number cor-responding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface

Behavior when all parameters are omitted:

Displays statistics for each device and information on all interfaces on which UDP broadcast relays are running.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 6-1: Example of displaying the information about all interfaces

```
> show ip udp forward
Date 20XX/12/14 12:00:00 UTC
UDP Broadcast Relay Interface Information
Name     SubnetBcast      Port
VLAN0025 SubnetBcast: ON, Port:[53,123]
         Receive:            100 InDiscard:              7
         Helper Address         Forward     OutDiscard       RateLimit
         192.0.2.2                   93              5               5
         198.51.100.255              93              0               0
VLAN0113 SubnetBcast:OFF, Port:[1024]
         Receive:           1230 InDiscard:             14
         Helper Address         Forward     OutDiscard       RateLimit
         203.0.113.2               1216              0               0
         203.0.113.11              1216             37               0

UDP Broadcast Relay Statistics
    Receive: 1330
    InDiscard: 21
       TTL Exceeded: 21
       Source Route Suppressed: 0
    Forward: 2618
    OutDiscard: 42
       RateLimit: 5
       Forwarding Suppressed: 0
```

```
        Memory Allocation Failed: 0
        Invalid Option: 0
        No Route: 37
        Reject Route: 0
        Interface Down: 0
        MTU Exceeded: 0
        Transmit Error: 0
        Fragmentation Failed: 0
        ARP Resolve Failed: 0
>
```

Figure 6-2: Example of displaying the statistics for each device

```
> show ip udp forward statistics
Date 20XX/12/14 12:00:00 UTC
UDP Broadcast Relay Statistics
    Receive: 1330
    InDiscard: 21
        TTL Exceeded: 21
        Source Route Suppressed: 0
    Forward: 2618
    OutDiscard: 42
        RateLimit: 5
        Forwarding Suppressed: 0
        Memory Allocation Failed: 0
        Invalid Option: 0
        No Route: 37
        Reject Route: 0
        Interface Down: 0
        MTU Exceeded: 0
        Transmit Error: 0
        Fragmentation Failed: 0
        ARP Resolve Failed: 0

>
```

Figure 6-3: Example of displaying the statistics with an interface specified

```
> show ip udp forward interface vlan 25
Date 20XX/12/14 12:00:00 UTC
UDP Broadcast Relay Interface Information
Name     SubnetBcast     Port
VLAN0025 SubnetBcast: ON, Port:[53,123]
        Receive:           100 InDiscard:             7
        Helper Address        Forward     OutDiscard      RateLimit
        192.0.2.2                  93          5              5
        198.51.100.255             93          0              0
>
```

Display Items

Table 6-1: Display items of statistics for each device

Display Items	Meaning
Receive	Number of received UDP packets to be transferred
InDiscard	Number of packets received but discarded due to checks on reception
TTL Exceeded	Number of packets discarded due to TTL less than or equal to 1
Source Route Suppressed	Number of packets discarded because they contained a source route option
Forward	Number of packets sent to the destination IPv4 address
OutDiscard	Number of packets sent to the destination IPv4 address but discarded
RateLimit	Number of packets discarded due to the rate limit during transmission

Display Items	Meaning
Forwarding Suppressed	Number of packets discarded because subnet broadcast forwarding is suppressed
Memory Allocation Failed	Number of packets discarded due to failure to allocate memory
Invalid Option	Number of packets discarded due to invalid IP option specification
No Route	Number of packets discarded because there is no route to the destination IPv4 address
Reject Route	Number of packets discarded because the route to the destination IPv4 address is a reject route
Interface Down	Number of packets discarded because the sending interface is DOWN or no IPv4 address is set
MTU Exceeded	Number of packets discarded due to exceeding the MTU of the sending interface
Transmit Error	Number of packets discarded due to send errors
Fragmentation Failed	Number of packets discarded due to an IP fragmentation failure
ARP Resolve Failed	Number of packets discarded due to an ARP resolution failure

Table 6-2: Interface information display items

Display Items	Meaning
Name	Interface name
SubnetBcast	Whether to forward if the destination IPv4 address is the subnet broadcast address of the receiving interface of the Switch ON: Transfer OFF: Do not transfer
Port	Destination port number in the UDP packet to be transferred
Receive	Number of received UDP packets to be transferred
InDiscard	Number of packets received but discarded due to checks on reception
Helper Address	Destination IPv4 address
Forward	Number of packets sent to the destination IPv4 address
OutDiscard	Number of packets sent to the destination IPv4 address but discarded
RateLimit	Number of packets discarded due to the rate limit during transmission (Included in OutDiscard)

Impact on communication

None

Response messages

Table 6-3: List of response messages for the show ip udp forward command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
No such interface.	The specified interface does not exist. Make sure the specified parameter is correct, and then try again.
No UDP relay information exists.	UDP relay information does not exist.

Notes

None

clear ip udp forward

Clears the statistics on the UDP broadcast relay.

Syntax

```
clear ip udp forward statistics
clear ip udp forward interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

statistics

> Clears the statistics on each device, as well as the statistics on all interfaces on which UDP broadcast relays are running.

interface <interface type> <interface number>

> Clears the statistics for the specified interface.
>
> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".
>
> - VLAN interface

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

None

Display Items

None

Impact on communication

None

Response messages

Table 6-4: List of response messages for the clear ip udp forward command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No such interface.	The specified interface does not exist. Make sure the specified parameter is correct, and then try again.
No UDP relay information exists.	UDP relay information does not exist.

Notes

None

7 IPv4 Routing Protocols

show ip route

Displays routing information stored in the routing table.

The routing table stores routing information learned by using unicast routing protocols.

Syntax

```
show ip route [[all-routes] [-FSimpaPTAscB]][vrf {<vrf id> | all}]
              [<Protocol>] [<Address> longer-prefixes]
show ip route [all-routes] [vrf {<vrf id> | all}] [<Address>]
show ip route [vrf {<vrf id> | all}] [<Protocol>] [<Address>] summary
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays routing information for VRFs. If <vrf id> is specified, routing information for only the specified VRF is displayed. If all is specified, routing information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Displays routing information for the global network.

all-routes

> Displays all routing information, including alternate routes, in a standard format (equivalent to specifying -Smpai).
>
> You can change the display format by specifying the -FSimpaPTAscB options.

-F

> Displays routing information in full format. (equivalent to specifying -PTAscB)

-S

> Displays routing information in minimum format. (Only the destination network and next hop address are displayed.)

-i

> Displays the name of the send interface.

-m

> Displays the metrics (Metric and Metric2) of the routing information.

-p

> Displays the protocol that was used to learn the routing information.

-a

> Displays the aging information for the routing information.

-P

> Displays the distance values (distance, distance2, and distance3) of the routing information.

-T

> Displays tag information of the routing information.

-A

Displays the AS path information of the routing information.

-s

Displays the status of the routing information.

-c

Displays Community attributes of the routing information.

-B

Displays the Local_Pref attributes of the routing information.

<Protocol>

Displays routing information for each of the protocol types below.

The following types can be specified for <Protocol>:

- connected: Directly connected route

- kernel: A route learned from the kernel

- default: BGP4 default route

- ospf: Displays all routes for OSPF

  If ospf is specified, you can specify any of the protocol types below. Note that, however, if summary is specified after specifying a type, summary information for the entire OSPF is displayed.

  (Input example: ospf intra-area)

  - intra-area: Intra-area route

  - inter-area: Inter-area route

  - external: External AS route

  - nssa: External AS route for an NSSA

- ospf_ase: External AS route for OSPF

- rip: RIP route

- bgp: BGP4 route

- static: Static route

- summary_routes: Summarized route

- dhcp: DHCP default route

- extra-vrf: A route imported from another VRF or global network [SL-L3A]

<Address>

If the destination network is specified in <Address>, detailed information about all the routes for the specified destination network is displayed.

You can specify a value for <Address> in any of the following formats:

- <IP Address>

- <IP Address> <Mask>

- <IP Address>/<Masklen>

For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

If a network mask has been specified for <Address>, detailed information about the exact-match routes for the specified <Address> is displayed.

If no network mask has been specified for <Address>, detailed information about the longest-match routes for the specified <Address> is displayed.

longer-prefixes

> Displays all routing information for the specified destination network.

summary

> Displays the number of active routes and inactive routes that are known by each protocol.

> The number of active routes shows the number of routes that are registered in the forwarding table.

Behavior when each parameter is omitted:

> This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

> Displays information in standard format about active routes (routes that are registered in the forwarding table) of the global network.(The same information is displayed when -Smpai is specified.)

> You can change the display format by specifying the -FSimpaPTAscB options.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ip route [vrf {<vrf id> | all}] [[all-routes] [-FSimpaPTAscB]] [<Protocol>] [<Address> longer-prefixes]

Figure 7-1: Displaying active route information in standard format

```
>show ip route
Date 20XX/10/17 12:00:00 UTC
Total: 106 routes
Destination        Next Hop        Interface      Metric  Protocol   Age
0.0.0.0/0          172.16.178.114  VLAN0010       0/0     Static     365d
127/8              ----            localhost      0/0     Connected  365d
127.0.0.1/32       127.0.0.1       localhost      0/0     Connected  365d
    :
172.16.178.25      172.16.178.21   VLAN0010       0/0     Connected  365d
172.16.178.21/32   172.16.178.21   VLAN0010       0/0     Connected  365d
192.168.20/24      172.16.101.115  VLAN0012       3/0     RIP        5s
192.168.30/24      172.16.101.115  VLAN0012       0/0     Static     90d 20h
                   172.16.171.116  VLAN0013       -       -          -
>
```

Note: For a multipath route, only NextHop and Interface are displayed for the second and subsequent paths.

Figure 7-2: Displaying active route information in full format

```
>show ip route -F
Date 20XX/10/17 12:00:00 UTC
Total: 106 routes
Destination        Next Hop        Interface      Metric  Protocol   Age
0.0.0.0/0          172.16.178.114  VLAN0010       0/0     Static     365d
 Distance: 60/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <Int Active Gatew
ay>
127/8              ----            localhost      0/0     Connected  365d
 Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <NoAdvise Int Acti
ve Retain Reject>
127.0.0.1/32       127.0.0.1       localhost      0/0     Connected  365d
 Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <NoAdvise Int Acti
ve Retain>
    :
172.16.178.25      172.16.178.21   VLAN0012       0/0     Connected  365d
 Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <Int Active Retain
>
172.16.178.21/32   172.16.178.21   VLAN0012       0/0     Connected  365d
 Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <NoAdvise Int Acti
ve Retain >
172.16.20/24       172.16.178.115  VLAN0013       3/0     RIP        5s
```

```
 Distance: 100/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <Int Active Gate
way>
172.16.30/24      172.16.178.115 VLAN0013     0/0     Static    90d 20h
 Distance: 60/0/0,  Tag: 0, AS-Path: IGP (Id 1), Communities: -, Localpref: -, <Int Active Gate
way>
                  172.16.171.116 VLAN0014     -      -       -
172.158.1/24      192.168.10.1  VLAN0010     -/-    BGP       6m 44s
 Distance: 170/0/0, Tag: 0, AS-Path: 200 10 IGP (Id 1), Communities: 400:500, Localpref: 100,
<Ext Active Gateway>
>
```

Figure 7-3: Example of displaying all VRF route information [SL-L3A]

```
>show ip route vrf all
Date 20XX/12/20 12:00:00 UTC
VRF: global Total: 3 routes
Destination       Next Hop      Interface    Metric   Protocol Age
127/8             127.0.0.1     localhost    0/0      Connected 2d 11h
127.0.0.1/32      127.0.0.1     localhost    0/0      Connected 2d 11h
158.215.10/24     168.10.1.1    VLAN0024     2/0      BGP       8d  2h
VRF: 5 Total: 4 routes
Destination       Next Hop      Interface    Metric   Protocol Age
127/8             127.0.0.1     localhost    0/0      Connected 2d 11h
127.0.0.1/32      127.0.0.1     localhost    0/0      Connected 2d 11h
172.30.180/24     10.1.2.92     VLAN0100     2/0      BGP       8d  2h
172.30.191/24     10.1.2.92     VLAN0100     2/0      BGP       8d  2h
VRF 20 Total: 3 routes
Destination       Next Hop      Interface    Metric   Protocol Age
127/8             127.0.0.1     localhost    0/0      Connected 2d 11h
127.0.0.1/32      127.0.0.1     localhost    0/0      Connected 2d 11h
192.168.51/24     10.1.4.32     VLAN0015     2/2      Extra-VRF 1d  2h
>
```

Figure 7-4: Displaying active route information learned by RIP

```
>show ip route rip
Date 20XX/07/14 12:00:00 UTC
Total: 1 routes
Destination       Next Hop       Interface    Metric   Protocol   Age
192.168.20/24     172.16.101.115 VLAN0012     3/0      RIP        5s
>
```

Figure 7-5: Displaying information about active routes included in the specific network 172.16

```
>show ip route 172.16.0.0/16 longer-prefixes
Date 20XX/07/14 12:00:00 UTC
Total: 2 routes
Destination       Next Hop       Interface    Metric   Protocol   Age
172.16.178/25     172.16.178.114 VLAN0010     0/0      Connected  365d
172.16.178.21/32  172.16.178.21  VLAN0010     0/0      Connected  365d
>
```

Figure 7-6: Displaying information about all routes including alternate routes

```
>show ip route all-routes
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
Total: 156 routes
   Destination       Next Hop       Interface   Metric   Protocol   Age
*> 0.0.0.0/0         172.16.178.114 VLAN0010    0/0      Static     365d
*> 127/8             ----           localhost   0/0      Connected  365d
*> 127.0.0.1/32      127.0.0.1      localhost   0/0      Connected  365d
        :
*> 172.16.178/25     172.16.178.21  VLAN0010    0/0      Connected  365d
*> 172.16.178.21/32  172.16.178.21  VLAN0010    0/0      Connected  365d
*> 172.168.20/24     172.16.101.115 VLAN0012    3/0      RIP        5s
*  172.168.20/24     172.16.178.21  VLAN0010    4/0      Static     19h 20m
*> 192.168.30/24     172.16.101.115 VLAN0012    0/0      Static     90d 20h
*>                   172.16.171.116 VLAN0012    -        -          -
>
```

Display items in Example 1

Table 7-1: Displayed routing information stored in the routing table

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total xxx routes [SL-L3A]	Number of routes in the VRF	xxx: The number of routes in the VRF
Status Codes	Routing information status	* valid: Valid routing information
		r: The number of routes exceeded the maximum number of routes specified by the \<limit\> parameter of the "maximum routes" configuration command. [SL-L3A]
		> active: Information about routes that are currently selected
Total	Number of routes	—
Destination	Destination network	Destination address/network mask length
Next Hop	Next hop address	• Display of "*" immediately before the next hop address indicates that the routing table in the unicast routing program and the forwarding table temporarily do not match due to a route change. • Reject routes are displayed as "- - - -".
Interface	Send interface name	—

Metric	Route metric	• xxx/yyy:
		 xxx: The first metric value
		 yyy: The second metric value
		• If Protocol is OSPF ext1, OSPF ext2, OSPF nssa1, or OSPF nssa2, the following is displayed for each OSPF type:
		 For TYPE1 series switches:
		  First-metric value = metric value + cost value
		  Second-metric value = "-"
		 For TYPE2 series switches:
		  First-metric value = metric value
		  Second-metric value = cost value
		• If Protocol is OSPF intra or OSPF inter, the following is displayed:
		 First-metric value = cost value
		 Second-metric value = "-"

Protocol	The protocol that was used to learn the routing information	Connected: Directly connected route
		Kernel: A route learned from the kernel (a route temporarily created due to restarting of the unicast routing program)
		Default: BGP default route

Display Items	Meaning	Displayed detailed information
		OSPF intra: Intra-area route for OSPF
		OSPF inter: Inter-area route for OSPF
		OSPF ext1: External AS route for OSPF (TYPE 1)
		OSPF ext2: External AS route for OSPF (TYPE 2)
		OSPF nssa1: External AS route for an OSPF NSSA (TYPE 1)
		OSPF nssa2: External AS route for an OSPF NSSA (TYPE 2)
		RIP: RIP route
		BGP: BGP route
		Static: Static route
		Summary: Summarized route
		DHCP: DHCP default route
		Extra-VRF: A route imported from another VRF or global network [SL-L3A]
		Any: Other
Age	Route aging time	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Distance	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Tag	Route tag	—
AS Path	The AS path for the route	xxx(Id yyy): • xxx: IGP/EGP/Incomplete • yyy: The ID number of the AS path displayed by using show ip bgp paths
Communities	The Community attributes of the route	Displays the Community attributes. no-advertise no-export local-AS xx:yy

Display Items	Meaning	Displayed detailed information
		• xx: AS number • yy: Community ID Other: Hexadecimal notation "-" is displayed if there is no information.
LocalPref	The Local_Pref attribute of the route	"-" is displayed if there is no information.
<...>	Route status	NotInstall (A route not to be registered in the forwarding table)
		NoAdvise (A route that is not advertised)
		Int (Internal route)
		Ext (External route)
		Pending (A route for which route advertisements are temporarily suppressed due to a RIP hold-down processing)
		Delete (Deleted route)
		Hidden (A route that was assumed to be invalid)
		OnList (A route change is being reported to routing protocols.)
		Retain (A route that is always retained as active while the interface is up)
		Gateway (A route used for forwarding)
		Reject (A route that rejects forwarding due to unreachable state)
		IfSubnetMask (A route to which the subnet mask for the interface learned by RIP has been applied)
		Active (Valid route)
		Suppressed (A route that is being suppressed by the route flap dampening function)
		Remote (Remote gateway route)
		Stale (A stale route in the graceful restart)
		Delay (A route for which deletion is suspended by the route deletion delay function)

Example 2: show ip route [all-routes] [vrf {<vrf id> | all}] <Address>

This example shows how to display the details of the active route bound for the specific network 172.16.178/25.

Figure 7-7: Displaying detailed information about specific routes

```
>show ip route 172.16.178.0/25
Date 20XX/12/20 12:00:00 UTC
Route codes: * = active,    + = changed to active recently
             ' ' = inactive,  - = changed to inactive recently
```

```
          r = RIB failure

Route 172.16.178/25
Entries 1 Announced 1 Depth 0 <>

* NextHop 172.16.178.21 Interface   : VLAN0010
      Protocol <Static>
      Source Gateway ----
      Metric/2     : 0/0
      Distance/2/3 : 0/0/0
      Tag : 0, Age : 365d
      AS Path : IGP (Id 1)
      Communities: -
      Localpref: -
      RT State: <Int Active Retain>
>
```

Note: For a multipath route, NextHop and Interface are displayed on multiple lines.

Figure 7-8: Displaying detailed information about specific routes

```
>show ip route 172.16.178.1
Date 20XX/12/20 12:00:00 UTC
Route codes: * = active,     + = changed to active recently
             ' ' = inactive,  - = changed to inactive recently
             r = RIB failure

Route 172.16.178/25
Entries 1 Announced 1 Depth 0 <>

* NextHop 172.16.178.21 Interface   : VLAN0010
        Protocol <Static>
        Source Gateway ----
        Metric/2     : 0/0
        Distance/2/3 : 0/0/0
        Tag : 0, Age : 365d
        AS Path : IGP (Id 1)
        RT State: <Int Active Retain>
>
```

Display items in Example 2

Table 7-2: Displayed specific route information

Display Items	Meaning	Displayed detailed information
Route	Destination network	Destination address/network mask
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Entries	Number of entries registered for the route	—
Announced	Whether route advertisement is performed	0: The route is neither advertised nor registered in the forwarding table.
		1: The route is either advertised or registered in the forwarding table.
Depth	Number of layers for summarized routes	—
<...>	Route status	See the <...> item in the previous table for show ip route.
Route codes	Routing information status	*: Active route
		+: A route that has been changed to active recently

Display Items	Meaning	Displayed detailed information
		—: A route that has been changed to inactive recently
		' ': Inactive route
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command. [SL-L3A]
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Send interface name	—
Source Gateway	Gateway address	—
Protocol	The protocol that was used to learn the routing information	See the protocol item in the previous table for show ip route.
Distance/2/3	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Metric/2	Route metric	See the Metric item in the previous table for show ip route.
Tag	Route tag	—
Age	Route aging time	See the Age item in the previous table for show ip route.
AS Path	The AS path for the route	See the AS Path item in the previous table for show ip route.
Communities	The Community attributes of the route	See the Communities item in the previous table for show ip route.
LocalPref	The Local_Pref attribute of the route	See the LocalPref item in the previous table for show ip router.
RT State	Route status	See the above <...> item.

Example 3: show ip route [vrf {<vrf id> | all}] [<Protocol>] [<Address>] summary

This example shows how to display, for each protocol, the number of routes learned by the protocol.

Figure 7-9: Displaying, for each protocol, the number of routes learned by the protocol

```
>show ip route summary
Date 20XX/12/20 12:00:00 UTC
Protocol     Active Routes  InActive Routes
Connected    10             0
Kernel       0              0
Default      1              0
OSPF         15             5
  intra-area       10              0
  inter-area       0               0
  external-1       5               5
  external-2       0               0
  nssa-1           0               0
  nssa-2           0               0
RIP          10             0
```

```
BGP           100           0
Static        5             0
Summary       5             0
DHCP          0             0
Extra-VRF     0             0
Total         146           5
>
```

Figure 7-10: Displaying the number of routes learned by RIP

```
>show ip route rip summary
Date 20XX/07/14 12:00:00 UTC
Protocol     Active Routes  InActive Routes
RIP          10             0
>
```

Figure 7-11: Displaying the number of routes included in the specific network 172.16

```
>show ip route 172.16.0.0/16 summary
Date 20XX/12/20 12:00:00 UTC
Protocol     Active Routes  InActive Routes
Connected    2             0
Kernel       0             0
Default      0             0
OSPF         0             0
  intra-area        0              0
  inter-area        0              0
  external-1        0              0
  external-2        0              0
  nssa-1            0              0
  nssa-2            0              0
RIP          0             0
BGP          0             0
Static       0             0
Summary      0             0
DHCP         0             0
Extra-VRF    0             0
Total        2             0
>
```

Display items in Example 3

Table 7-3: Displayed information about the number of routes learned by each protocol

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Protocol	The protocol that was used to learn the routing information	Connected: Number of directly connected routes
		Kernel: Number of routes learned from the kernel (routes temporarily created due to restarting of the unicast routing program)
		Default: Number of BGP default routes
		OSPF: The total number of routes for OSPF • Intra-area: Number of intra-area routes • Inter-area: Number of inter-area routes • external-1: Number of external AS routes (TYPE 1) • external-2: Number of external AS routes (TYPE 2) • nssa-1: Number of external AS routes (TYPE 1) for an NSSA • nssa-2: Number of external AS routes (TYPE 2) for an NSSA

Display Items	Meaning	Displayed detailed information
		RIP: Number of RIP routes
		BGP: Number of BGP routes
		Static: Number of static routes
		Summary: Number of summarized routes
		DHCP: Number of DHCP default routes
		Extra-VRF: A route imported from another VRF or global network [SL-L3A]
		Total: Total number of routes (the total value of the routes for all protocols)
Active Routes	Number of active routes	The number of routes that are registered in the forwarding table
InActive Routes	Number of inactive routes	A number of routes that cannot be registered in the forwarding table (including alternate routes)

Impact on communication

None

Response messages

Table 7-4: List of response messages for the show ip route command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no route <IP Address>	The specified route was not found <IP Address>: IP address
5	no route <IP Address> mask <Mask>	The specified network was not found. <IP Address>: IP address <Mask>: Network mask
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

clear ip route

Temporarily clears the hardware forwarding entries, and re-registers routing entries stored by the unicast routing program.

Syntax

```
clear ip route [vrf {<vrf id> | all}] { * | <Address> }
clear ip route unicast
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> This command applies to the routes for VRFs. If <vrf id> is specified, this command applies to the routes for only the specified VRF.If all is specified, this command applies to the routes for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

> > This command applies to global network routes.

*

> Updates all routing information.

<Address>

> Updates routing information for the specified network.

> You can specify a value for <Address> in any of the following formats:

> - <IP Address>
> - <IP Address> <Mask>
> - <IP Address>/<Masklen>

> For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. If the network mask is omitted, information about the longest-match routes for the specified destination address is updated. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32. Note that a loopback address, multicast address, or class E address cannot be specified for the network.

unicast

> Revaluate the routing information on the device in accordance with the configuration.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

```
> clear ip route unicast
>
```

Display Items

None

Impact on communication

Because hardware forwarding entries are cleared and routing entries stored by the unicast routing program are re-registered, communication might stop temporarily.

Response messages

Table 7-5: List of response messages for the clear ip route command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal parameter class -- <Parameter>	The route for the specified address could not be cleared. <Parameter>: Specified parameter name
3	illegal parameter mask -- <Parameter>	The specified mask is invalid. 1 is set for the unmasked part of the destination network. <Parameter>: Specified parameter name
4	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
5	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	no route <IP Address>	The specified route was not found. <IP Address>: Specified network address
7	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
8	pid file <File Name> mangled!	The PID file for the unicast routing program is invalid. <File Name>: PID file name
9	pid in file <File Name> unreasonably small(<PID>)	The PID file for the unicast routing program is invalid. <File_Name>: PID file name <PID>: Process ID in the PID file
10	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

No.	Message	Description
11	rtm appears to be running as pid <PID>, but pid <PID> doesn't exist!	The process listed in the PID file for the unicast routing program was not found.
		The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
		<PID>: Process ID
12	rtm doesn't seem to be running.	The command failed because the unicast routing program was not running.
		Wait until the unicast routing program has been restarted, and then re-execute the command.

Notes

1. Executing clear ip route unicast also revaluates routing information for the IPv6 routes.

2. Executing clear ip route * also deletes ARP entries that were registered dynamically.

show ip entry

Displays detailed information about specific routes.

Syntax

```
show ip entry [vrf {<vrf id> | all}] <Address>
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays routing information for VRFs. If <vrf id> is specified, routing information for only the specified VRF is displayed. If all is specified, routing information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays routing information for the global network.

<Address>

> If the destination network is specified in <Address>, detailed information about the routes that match the destination network is displayed.

> You can specify a value for <Address> in any of the following formats:

> - <IP Address>
> - <IP Address> <Mask>
> - <IP Address>/<Masklen>

> For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. If <Mask> or <Masklen> is omitted, detailed information about the longest-match routes for the specified <IP Address> is displayed. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display information about the route that has the network address 172.16.178.0 and the 25-bit network mask as the destination address.

Figure 7-12: Displaying detailed information about specific routes

```
>show ip entry 172.16.178.0/25
Date 20XX/12/20 12:00:00 UTC
Route codes: * = active,    + = changed to active recently
             ' ' = inactive,  - = changed to inactive recently
             r = RIB failure

Route 172.16.178/25
Entries 1 Announced 1 Depth 0 <>

* NextHop 172.16.178.21 Interface   : VLAN0010
     Protocol <Static>
     Source Gateway ----
     Metric/2    : 0/0
     Distance/2/3 : 0/0/0
```

```
        Tag : 0, Age : 365d
        AS Path : IGP (Id 1)
        Communities: -
        Localpref: -
        RT State: <Int Active Retain>
>
```

Note: For a multipath route, NextHop and Interface are displayed on multiple lines.

Display Items

Table 7-6: Displayed detailed information about specific routes

Display Items	Meaning	Displayed detailed information
Route	Destination network	Destination address/network mask
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Entries	Number of entries registered for the route	—
Announced	Whether route advertisement is performed	0: The route is neither advertised nor registered in the forwarding table.
		1: The route is either advertised or registered in the forwarding table.
Depth	Number of layers for summarized routes	—
<...>	Route status	See the <...> item in the previous table for show ip route.
Route codes	Routing information status	*: Active route
		+: A route that has been changed to active recently
		—: A route that has been changed to inactive recently
		' ': Inactive route
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command. [SL-L3A]
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Send interface name	—
Source Gateway	Gateway address	—
Protocol	The protocol that was used to learn the routing information	See the protocol item in the previous table for show ip route.
Distance/2/3	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Metric/2	Route metric	See the Metric item in the previous table for show ip route.

Display Items	Meaning	Displayed detailed information
Tag	Route tag	—
Age	Route aging time	See the Age item in the previous table for show ip route.
AS Path	The AS path for the route	See the AS Path item in the previous table for show ip route.
Communities	The Community attributes of the route	See the Communities item in the previous table for show ip route.
LocalPref	The Local_Pref attribute of the route	See the LocalPref item in the previous table for show ip route.
RT State	Route status	See the above <...> item.

Impact on communication

None

Response messages

Table 7-7: List of response messages for the show ip entry command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no route <IP Address>	The specified route was not found <IP Address>: IP address
5	no route <IP Address> mask <Mask>	The specified network was not found. <IP Address>: IP address <Mask>: Network mask
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ip rip

Shows information about the RIP protocol.

Syntax

```
show ip rip [vrf {<vrf id> | all}] [{ target | neighbor }]
show ip rip [vrf {<vrf id> | all}] route [{<Address> | summary}]
show ip rip [vrf {<vrf id> | all}] received-routes
            [{ <Neighbor-Address> | <Host-name> }] [{<Address> | summary}]
show ip rip [vrf {<vrf id> | all}] advertised-routes
            [{ <Target-Address> | <Host-name> }] [{<Address> | summary}]
show ip rip [vrf {<vrf id> | all}] statistics
            [ { neighbor { <Neighbor-Address> | <Host-name> } |
            target { <Target-Address> | <Host-name> } } ]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Shows VRF RIP information. If <vrf id> is specified, the RIP information for only the specified VRF is displayed. If all is specified, the RIP information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The RIP information for the global network is displayed.

target

Displays information about the RIP target (the destination of the RIP packets).

neighbor

Displays information about the RIP neighboring router (the source of the RIP packets).

<Address>

Displays only the routing information for the specified destination network.

You can specify a value in <Address> in either of the following formats:

- <IP Address> <Mask>

- <IP Address> / <Masklen>

For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

<Neighbor-Address>

Specify the neighboring router address in IPv4 format.

<Host-name>

Specify the host name.

Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

<Target-Address>

Specify the target address (the broadcast address for the interface, if a broadcast type interface is used) in IPv4 format.

summary

>   Displays the number of routes.

route

>   Displays the routing information that is learned by RIP and stored in the routing table.

received-routes

>   Displays for each neighboring router the routing information that is learned by RIP and stored in the routing table.

advertised-routes

>   Displays for each target the routing information advertised by RIP.

statistics

>   Shows RIP statistics.

>   neighbor { <Neighbor-Address>|<Host-name> }

>   Displays detailed statistics about the status of received RIP routes for the specified neighboring router.

>   target { <Target-Address>|<Host-name> }

>   Displays detailed statistics about the status of sent RIP routes for the specified target.

>   Specify <Neighbor-Address> and <Target-Address> in IPv4 format, and a host name for <Host-name>.

Behavior when each parameter is omitted:

>   This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

>   Global RIP information for the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ip rip [vrf {<vrf id> | all}]

Figure 7-13: Displaying global information

```
>show ip rip
Date 20XX/07/14 12:00:00 UTC
RIP Flags: <ON>
Default Metric: 16, Distance: 100
Timers (seconds)
 Update            : 30
 Aging             : 180
 Garbage-Collection : 120
>
```

Display items in Example 1

Table 7-8: Displayed global information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
RIP Flags	RIP flag	ON: RIP is running

Display Items	Meaning	Displayed detailed information
		InheritMetric: Inherits metrics when advertising routes
		SecondaryRoute: creates priority 2 route.
		AutoSummary: The function for automatically summarizing advertised routes is enabled.
Default Metric	The default metric added to the route to be advertised	—
Distance	Route distance that is learned by RIP and stored in the routing table	—
Timer information		
Update	Periodic advertisement time (seconds)	—
Aging	Aging time (seconds)	—
Garbage-Collection	Hold-down time (seconds)	—

Example 2: show ip rip [vrf {<vrf id> | all}] target

Figure 7-14: Displaying target information

```
>show ip rip target
Date 20XX/04/08 12:00:00 UTC
Source Address   Destination     Flags
192.168.50.180  192.168.50.255  <V1 Broadcast>
192.168.60.29   192.168.60.255  <V1 Broadcast>
192.168.70.29   192.168.70.255  <V2 Multicast AuthMD5>
>
```

Display items in Example 2

Table 7-9: Displayed target information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Source Address	Source address	—
Destination	Destination address	—
Flags	Target flag	V1: Sends RIP-1 packets.
		V2: Sends RIP-2 packets.
		Unicast: A unicast address is used for the destination address for the packets sent to this target.
		Broadcast: A broadcast address is used for the destination address for the packets sent to this target.
		Multicast: A multicast address is used for the destination address for the packets sent to this target.

Display Items	Meaning	Displayed detailed information
		Passive: Transmission of the packets to this target is being suppressed.
		AuthText: Plain-text password authentication is used as the authentication method.
		AuthMD5: Encrypted authentication (Keyed-MD5) is used as the authentication method.

Example 3: show ip rip [vrf {<vrf id> | all}] neighbor

Figure 7-15: Displaying neighboring router information

```
>show ip rip neighbor
Date 20XX/07/14 12:00:00 UTC
Neighbor Address Age      Flags
192.168.50.185   1s      < >
192.168.60.30   14s      < >
192.168.70.30    9s      < >
>
```

Display items in Example 3

Table 7-10: Displayed neighboring router information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Neighbor Address	Neighboring router address	—
Age	Time elapsed since the last UPDATE packet was received	—
Flags[#]	Neighboring router flag	Query: A request packet was received.
		ImportRestrict: Packet reception is restricted by the import policy.
		Format: A packet with a format error was received.
		AuthFail: A packet with an authentication error was received.

#: This flag indicates that the applicable event occurred one or more times up to now, since the neighboring router was recognized.

Example 4: show ip rip [vrf {<vrf id> | all}] route <Address>

Figure 7-16: Displaying routing information learned by RIP and stored in the routing table

```
>show ip rip route 172.0.0.0/8
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination      Next Hop       Interface      Metric Tag   Timer
*> 172.16/16        192.168.11.65  VLAN0011       6      0     28s
*  172.16/16        192.106.10.29  VLAN0013       3      0     28s
*> 172.17/16        192.168.19.212 VLAN0012       4      0     10s
*> 172.18/16        192.168.11.65  VLAN0011       6      0     28s
*  172.18/16        192.106.10.29  VLAN0013       3      0     28s
*> 172.19/16        192.168.19.212 VLAN0012       4      0     10s
>
```

Display items in Example 4

Table 7-11: Displayed routing information learned by RIP and stored in the routing table

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command. [SL-L3A]
Destination	Destination network	Destination address/network mask length
Next Hop	Next hop address	Reject routes are displayed as "- - - -"
Interface	Send interface name	—
Metric	Metric after route calculation	—
Tag	Route tag	—
Timer	Time elapsed since the last route update	—

Example 5: show ip rip route summary

Figure 7-17: Displaying the number of routes learned by RIP and stored in the routing table

```
> show ip rip route summary
Date 20XX/07/14 12:00:00 UTC
RIP: 28 active route
>
```

Display items in Example 5

None

Example 6: show ip rip [vrf {<vrf id> | all}] received-routes [{<Neighbor-Address>|<Host-name>}] [<Address>]

This example shows how to display the routing information learned by RIP and stored in the routing table, based on the specified neighboring router and destination network.

Figure 7-18: Displaying for each neighboring router the routes learned by RIP and stored in the routing table

```
>show ip rip received-routes 192.168.19.212
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure

Neighbor Address: 192.168.19.212
   Destination        Next Hop        Interface       Metric Tag    Timer
*> 172.17/16          192.168.19.212  VLAN0012        4      0      10s
*> 172.19/16          192.168.19.212  VLAN0012        4      0      10s
      :
>
>show ip rip received-routes 172.16.0.0/15
```

```
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
Neighbor Address: 192.168.11.65
   Destination        Next Hop       Interface      Metric Tag   Timer
*> 172.16/16          192.168.11.65  VLAN0011       6      0     28s
Neighbor Address: 192.168.19.212
   Destination        Next Hop       Interface      Metric Tag   Timer
*  172.16/16          192.168.19.212 VLAN0012       4      0     10s
*> 172.17/16          192.168.19.212 VLAN0012       4      0     10s
>
>show ip rip received-routes 192.168.19.212 172.16/15
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
Neighbor Address: 192.168.19.212
   Destination        Next Hop       Interface      Metric Tag   Timer
*  172.16/16          192.168.19.212 VLAN0012       4      0     10s
>
```

Display items in Example 6

Table 7-12: Displayed RIP routes for each neighboring router

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected
		r: The number of routes exceeded the maximum number of routes specified by the \<limit\> parameter of the "maximum routes" configuration command. [SL-L3A]
Neighbor Address	Neighboring router address	—
Destination	Destination network	Destination address/network mask length
Next Hop	Next hop address	—
Interface	Send interface name	—
Metric	Metric for the received route	—
Tag	Received route tag	"-" is displayed for version 1.
Timer	Time elapsed since the last route update	—

Example 7: show ip rip [vrf {\<vrf id\> | all}] received-routes summary

Figure 7-19: Displaying for each neighboring router the number of routes learned by RIP and stored in the routing table

```
>show ip rip received-routes summary
Date 20XX/07/14 12:00:00 UTC
Neighbor Address: 192.168.11.65    4 routes received
Neighbor Address: 192.168.19.212   4 routes received
>
```

Display items in Example 7

None

Example 8: show ip rip [vrf {<vrf id> | all}] advertised-routes [{<Target-Address>|<Host-name>}] [<Address>]

This example shows how to display the routing information advertised by RIP, based on the specified target and destination network.

Figure 7-20: Displaying RIP advertised routes for each target

```
>show ip rip advertised-routes 192.168.19.255
Date 20XX/04/19 12:00:00 UTC
Target Address: 192.168.19.255
Destination          Next Hop        Interface      Metric Tag   Age
172.16/16            192.168.11.65   VLAN0012       6      0     28s
172.18/16            192.168.11.65   VLAN0011       6      0     28s
192.10.281/24        -               -              2      0     -    ←#1
  192.10.281.128/25  192.158.22.21   VLAN0022       3      0     21s┐#2
  192.10.281.240/28  192.158.18.5    VLAN0018       2      0     18s┘
201.182.16/24        158.18.14.102   VLAN0005       3      0     25s
>
>show ip rip advertised-routes 172.16.0.0/15
Date 20XX/04/19 12:00:00 UTC
Target Address: 192.168.11.255
Destination          Next Hop        Interface      Metric Tag   Age
172.17/16            192.168.19.212  VLAN0012       4      0     10s
Target Address: 192.168.19.255
Destination          Next Hop        Interface      Metric Tag   Age
172.16/16            192.168.11.65   VLAN0011       6      0     28s
>
>show ip rip advertised-routes 192.168.19.255 172.16/15
Date 20XX/04/19 12:00:00 UTC
Target Address: 192.168.19.255
Destination          Next Hop        Interface      Metric Tag   Age
172.16/16            192.168.11.65   VLAN0011       6      0     28s
>
```

#1: Route information advertised after automatic route aggregation (aggregated advertised route)

If "auto-summary" configuration command is set in the RIP and there are routes that are summarized, information about the route that was advertised after summarization is displayed.

#2: Information about the routes that served as sources for an aggregated advertised route (aggregated source routes)

If "auto-summary" configuration command is set in the RIP and there are routes that are summarized, all summarization source routes included in the summarized advertised route are displayed. If summarization source routes are automatically summarized, they are not individually advertised. If summarization source routes are not automatically summarized, the routes that must be advertised are displayed. Note that the destination network is displayed indented by two characters.

Display items in Example 8

Table 7-13: Displayed RIP advertised routes for each target

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Target Address	Advertisement target address	—

Display Items	Meaning	Displayed detailed information
Destination	Destination network	Destination address/network mask length If routes are advertised after being automatically summarized, display of the summarization source routes is indented.
Next Hop	Next-hop address for the route	• For a Reject route, this is displayed as "-". • For a summarized advertised route, this is displayed as "-".
Interface	Interface name for the route	For a summarized advertised route, this is displayed as "-".
Metric	Advertised route metric	For a summarization source route, the advertised route metric is not displayed, but the summarization source route metric is displayed.
Age	Route aging time	• Time elapsed since the route was generated • For a summarized advertised route, this is displayed as "-".
Tag	Advertised route tag	• For the advertisement of a RIP-1 route, "-" is displayed. • For a summarization source route, the advertised route tag is not displayed, but the summarization source route tag is displayed. For an RIP-1 route, "-" is displayed.

Example 9: show ip rip [vrf {<vrf id> | all}] advertised-routes summary

Figure 7-21: Displaying the number of RIP advertised routes for each target

```
>show ip rip advertised-routes summary
Date 20XX/07/14 12:00:00 UTC
Target Address: 192.168.11.255   4 routes sent
Target Address: 192.168.19.255   4 routes sent
    :
>
```

Display items in Example 9

None

Example 10: show ip rip [vrf {<vrf id> | all}] statistics

Figure 7-22: Displaying summary statistics for sent and received RIP packets to and from each neighboring router and target

```
>show ip rip statistics
Date 20XX/07/14 12:00:00 UTC
Collection Time: 19:02:31 and 4days
Received
Neighbor        Request     Response    Entries
192.168.11.120  103         220120      392010900
192.168.19.200  1021        221094      1091020
192.168.20.19   102         104502      843095
192.168.21.19   22          255012      1382908
192.168.22.19   129         190201      1021880
Total           1377        896879      396349803
```

```
Advertised
Target          Request   Response   Entries
192.168.11.255  5         220120     392010900
192.168.19.255  12        221094     1091020
192.168.20.255  2         104502     843095
192.168.21.19   5         255012     1382908
192.168.22.255  2         190201     1021880
Total           26        896879     396349803
>
```

Display items in Example 10

Table 7-14: Displayed summary statistics for sent and received RIP packets

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Collection Time	Time elapsed for collecting statistics	—
Received information		
Neighbor	Neighboring router address	—
Request	Total number of received Request messages	—
Response	Total number of received Response messages	—
Entries	Total number of received RIP routes	—
Total	Total of Request, Response, and Entries	—
Advertised information		
Target	Target address	—
Request	Total number of sent Request messages	—
Response	Total number of sent Response messages	—
Entries	Total number of sent RIP routes	—
Total	Total of Request, Response, and Entries	—

Example 11: show ip rip [vrf {<vrf id> | all}] statistics neighbor {<Neighbor-Address>|<Host-name>}

Figure 7-23: Displaying statistics for received RIP packets from the specified neighboring router

```
>show ip rip statistics neighbor 192.168.20.19
Date 20XX/04/08 12:00:00 UTC
Neighbor 192.168.20.19
 Request
   Total Messages          5
     Bad Version           0
     Bad Source            0
     Message Format Error  0
```

```
      Passive              0
      Authentication Failure  0
      Bad Authentication Type  0
      Bad Key-ID           0
      Bad Sequence Number  0
      Other Error          0
 Response
   Total Messages          42
      Bad Source           0
      Message Format Error  0
      Authentication Failure  0
      Bad Authentication Type  0
      Bad Key-ID           0
      Bad Sequence Number  0
      Other Error          0
   Total Entries           80
      Import Restrict      10
      Unreachable          4
      Invalid              0
 Invalid or Not Support
   Total Messages          0
 Added                    20
 Changed                  25
 Deleted                  10
>
```

Display items in Example 11

Table 7-15: Displayed statistics for RIP packets received from the specified neighboring router

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Neighbor	Neighboring router address	—
Received Request message information (Request)		
Total Messages	Total number of received messages	—
Bad Version	Total number of messages that have invalid versions	—
Bad Source	Total number of messages that were sent from invalid sources	—
Message Format Error	Total number of messages that have invalid formats	—
Passive	Total number of messages that were received on passive interfaces	—
Authentication Failure	Total number of the messages that do not match the password in plain-text password authentication and the messages that do not match the digest in encrypted authentication	—
Bad Authentication Type	Total number of messages whose authentication types in the authentication information are invalid	—
Bad Key-ID	Total number of messages whose key identifications in the authentication information are invalid	—

Display Items	Meaning	Displayed detailed information
Bad Sequence Number	Total number of messages whose sequence numbers in the authentication information are invalid	—
Other Error	Total number of other reception errors	—
Received Response message information (Response)		
Total Messages	Total number of received messages	—
Bad Source	Total number of messages that were sent from invalid sources	—
Message Format Error	Total number of messages that have invalid formats	—
Authentication Failure	Total number of the messages that do not match the password in plain-text password authentication and the messages that do not match the digest in encrypted authentication	—
Bad Authentication Type	Total number of messages whose authentication types in the authentication information are invalid	—
Bad Key-ID	Total number of messages whose key identifications in the authentication information are invalid	—
Bad Sequence Number	Total number of messages whose sequence numbers in the authentication information are invalid	—
Other Error	Total number of other reception errors	—
Total Entries	Total number of received RIP routes	—
Import Restrict	Total number of the RIP routes for which reception is restricted	—
Unreachable	Total number of the RIP routes that have the metric of 16	—
Invalid	Total number of the RIP routes on which errors occur	—
Received error message information (Invalid or Not Support)		
Total Messages	Total number of received error messages	—
Added	Number of times RIP routes were added to the routing table	—
Changed	Number of times RIP routes on the routing table were changed	—
Deleted	Number of times RIP routes on the routing table were deleted	—

Example 12: show ip rip [vrf {<vrf id> | all}] statistics target {<Target_Address>|<Host-name>}

Figure 7-24: Displaying statistics for sent RIP packets to the specified target

```
>show ip rip statistics target 192.168.11.255
Date 20XX/07/14 12:00:00 UTC
```

```
Target 192.168.11.255
 Request
   Total Messages         1
 Response
   Total Messages         5
   Total Entries         13
   Triggered Update       1
   Responses to Request   1
>
```

Display items in Example 12

Table 7-16: Displayed statistics for sent RIP packets to the specified target

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Target	Target address	—
Sent Request message information (Request)		
Total Messages	Total number of sent Request messages	—
Sent Response message information (Response)		
Total Messages	Total number of sent Response messages	—
Total Entries	Total number of sent RIP routes	—
Triggered Update	Number of triggered updates	—
Responses to Request	Number of updates in response to Request messages	—

Impact on communication

None

Response messages

Table 7-17: List of response messages for the show ip rip command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address	The specified destination network is invalid. Check the correct destination network by executing the "show ip rip route" command.
3	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid, or a host name and VRF were specified at the same time.
4	IP routing is not configured	The routing protocol has not been set. Check the configuration.

No.	Message	Description
5	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	no route	No route was found.
7	no such neighbor	The specified neighbor was not found. Check the correct neighbor by executing the "show ip rip neighbor" command.
8	no such neighbor in vrf <vrf id>	The specified neighbor was not found in the specified VRF. Check the correct neighbor by executing the "show ip rip neighbor" command. <vrf id>: Specified VRF ID
9	no such neighbor or statistics "<Neighbor Address>"	The specified neighbor was not found. Check the correct neighbor by executing the "show ip rip neighbor" command. <Neighbor Address>: Specified neighboring router address
10	no such neighbor or statistics "<Neighbor Address>" in vrf <vrf id>	The specified neighbor was not found in the specified VRF. Check the correct neighbor by executing the "show ip rip neighbor" command. <Neighbor Address>: Specified neighboring router address <vrf id>: Specified VRF ID
11	no such target	The specified target was not found. Check the correct target by executing the "show ip rip target" command.
12	no such target in vrf <vrf id>	The specified target was not found in the specified VRF. <vrf id>: Specified VRF ID
13	no such target or statistics "<Target Address>"	The specified target was not found. Check the correct target by executing the "show ip rip target" command. <Target Address>: Specified target address
14	no such target or statistics "<Target Address>" in vrf <vrf id>	The specified target was not found in the specified VRF. Check the correct target by executing the "show ip rip target" command. <Target Address>: Specified target address <vrf id>: Specified VRF ID
15	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
16	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
17	RIP not active in vrf <vrf id>	RIP is not running in the specified VRF. <vrf id>: Specified VRF ID
18	RIP not active.	RIP is not running.

Notes

None

clear counters rip ipv4-unicast

Clears information about the RIP protocol.

Syntax

```
clear counters rip [vrf {<vrf id> | all}] ipv4-unicast all
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Clears the RIP statistics for VRFs. If <vrf id> is specified, the RIP statistics for only the specified VRF is cleared. If all is specified, the RIP statistics for all VRFs including the global network is cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

> > The RIP statistics for the global network are cleared.

all

> Clears the RIP statistics.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Clears the RIP statistics.

Figure 7-25: Clearing the RIP statistics

```
>clear counters rip ipv4-unicast all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 7-18: List of response messages for the clear counters rip ipv4-unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.

No.	Message	Description
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such VRF \<vrf id\>	The specified VRF was not found. \<vrf id\>: Specified VRF ID
5	program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error
6	RIP not active in vrf \<vrf id\>	RIP is not running in the specified VRF. \<vrf id\>: Specified VRF ID
7	RIP not active.	RIP is not running.

Notes

None

show ip ospf [SL-L3A]

Shows information about the OSPF protocol.

Syntax

```
show ip ospf [vrf {<vrf id> | all}] [<Domain>]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] interface
            [{ detail | <IP Address> }]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] neighbor
            [{ detail | interface <IP Address> | <Router-id> }]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] area
show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>]
            database database-summary
show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>] database
            [{ adv-router <Router-id> | self-originate }]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>] database <LS-Type>
            [<LSA-information>][{ adv-router<Router-id>|self-originate }]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] virtual-links
             [{ detail | area <Area-id> [neighbor <Router-id>] }]
show ip ospf [vrf {<vrf id> | all}] [<Domain>] border-routers
show ip ospf [vrf {<vrf id> | all}] statistics
show ip ospf discard-packets
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all}

Shows VRF OSPF information. If <vrf id> is specified, the OSPF information for only the specified VRF is displayed. If all is specified, the OSPF information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The OSPF information for the global network is displayed.

<Domain>

Specify an OSPF domain number to display information about the domain.

For <Domain>, specify a value in the range from 1 to 65535.

Behavior when this parameter is omitted:

Information about all domains is displayed.

interface

Displays information about OSPF interfaces.

If only interface is specified, summary information about all interfaces is displayed.

{detail | <IP Address>}

detail

Displays detailed information about all interfaces.

<IP Address>

Displays detailed information about the specified interface. Specify the IP address of the interface in IPv4 format.

neighbor

> Displays the status of neighboring routers. If only neighbor is specified, summary information about all neighboring routers is displayed.

{detail | interface <IP Address> | <Router-id>}

> detail
>
> > Displays detailed information about all neighboring routers.
>
> interface <IP Address>
>
> > Displays summary information about the neighboring routers for the specified interface. For <IP Address>, specify an interface address in IPv4 format.
>
> <Router-id>
>
> > Displays detailed information about the specified router. For <Router-id>, specify the router ID for the neighboring router in IPv4 format.

area

> Displays summary information for all areas.

area <Area-id>

> Displays information for all areas. For <Area-id>, specify the backbone or area ID in IPv4 format or in decimal number format.

database database-summary

> Displays the number of LS-Databases for each LS type.

database

> Displays all LS-Databases in summary format.

{adv-router <Router-id> | self-originate}

> adv-router <Router-id>
>
> > Displays the LS-Databases that were advertised by the router with the specified router ID. For <Router-id>, specify an address in IPv4 format.
>
> self-originate
>
> > Displays the LS-Database generated by this router.

database <LS-Type>

> Displays the detailed information about the LS-Databases with the specified LS type. For <LS-Type>, you can specify any of the following LS types:
>
> - router: Router link
> - network: Network link
> - summary: Summary network link
> - asbr-summary: Summary link
> - external: AS external link
> - nssa-external: NSSA AS external link
> - opaque-link: Link-local Opaque link

<LSA-information>

> Displays detailed information about the LS-Databases that have the specified <LSA-information>.
>
> For <LSA-information>, specify any of the following:

<LS-Type>: <LSA-information>

- router: Router ID for each router (specified as an IPv4 address)

- network: Designated router address (specified as an IPv4 address)

- summary: summary network address (specified in <IP Address>[/<Mask>] format)

- asbr-summary: Router ID for an AS boundary router (specified as an IPv4 address)

- external: external network address (specified in <IP Address>[/<Mask>] format)

- nssa-external: NSSA external network address (specified in <IP Address>[/<Mask>] format)

- opaque-link: Opaque link interface address (specified in an IPv4 format)

If <Mask> is omitted when summary or external is specified, all LS-Databases that match the specified <IP Address> are displayed. If <Mask> is specified, only the LS-Databases that have mask length identical to <Mask> are displayed.

For <IP Address>, use an IPv4 address. For <Mask>, specify a value in the range from 0 to 32.

virtual-links

Displays information about OSPF virtual links. If only virtual-links is specified, summary information about all virtual links is displayed.

{detail | area <Area-id> [neighbor <Router-id>]}

detail

Displays detailed information about all virtual links.

area <Area-id> [neighbor <Router-id>]

Displays summary information about the virtual links passing through the specified area. If neighbor <Router-id> is specified, more detailed information about the virtual links for the specified router is displayed. For <Area-id>, specify an area ID in IPv4 format or in decimal number format. For <Router-id>, specify an address in IPv4 format.

border-routers

Displays information about OSPF area boundary routers and AS boundary routers.

statistics

Displays statistics for sent and received packets collected by OSPF.

discard-packets

Displays information about discarded OSPF packets.

The contents of the packet are displayed, starting with the beginning of the IP header.

Only the information about the single last-discarded packet can be displayed for each cause in an entire OSPF environment.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Global OSPF information for the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ip ospf [vrf {< vrf id > | all}] [<Domain>]

Figure 7-26: Displaying global information

```
>show ip ospf
Date 20XX/02/14 12:00:00 UTC
OSPF protocol: ON

Domain: 1
Router ID: 172.16.1.1
Distance:
  Intra Area: 10, Inter Area: 10, External: 150
Flags: <AreaBorder ASBoundary>
SPF Interval: 7s, SPF Delay: 3s
Graceful Restart: Both
  Restart Time : 60s
  Restart Status: Finished  20XX/12/13 18:11:23
  Helper Status : Finished  20XX/02/13 14:12:22
Stub Router    : On-Startup 30s
  Status       : Active 20XX/01/24 16:29:32
Area           Interfaces  Network Range     State
0              1           -                 -
10             1           192.168.1/24      Advertise
                           172.19/18         DoNotAdvertise
>
```

Display items in Example 1

Table 7-19: Displayed global information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
OSPF protocol	OSPF behavior flag	ON: OSPF is running
Router ID	Router ID	—
Domain	Domain number	—
Distance:		
Intra Area	Distance for the OSPF intra-area route	—
Inter Area	Distance for the OSPF inter-area route	—
External	Distance for the OSPF external AS route	—
SPF Interval	Value set for the interval timer for SPF calculation (seconds)	—
SPF Delay	Value set for delay time for SPF calculation (seconds)	—
Graceful Restart[1]	Running mode of the graceful restart function	Restart: Runs as a restart router.
		Helper: Runs as the helper router.
		Both: Runs as a restart router and helper router.
Restart Time[1]	Time allowed for reconnection after restart (seconds)	—
Restart Status[1]	Operating status and execution results as a restart router (the latest information is displayed.)	Receiving: Learning routes.

Display Items	Meaning	Displayed detailed information
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		—: Not executed.
	Time the router went into operating status as a restart router	Date and time when the router went into operating status as a restart router (Date and time are not displayed if the operating status is "Not executed".)
Helper Status[#1]	Operating status and execution results as the helper router (the latest information is displayed.)	Receiving: Learning routes.
		Finished: Ended normally.
		Failed: Failed.
		—: Not executed.
	Time the router went into operating status as a helper router	Date and time when the router went into the running status as the helper router (Date and time are not displayed if the operating status is "Not executed".)
Stub Router[#2]	Stub router behavior	Always: Continuously running.
		On-Startup <Time>: Running during the set time (in seconds) after the device has started.
Status[#2]	Stub router status	Active: Running.
		InActive: Not running.
	Date and time the stub router started	Date and time the stub router started behavior (This is not displayed if Stub Router status is Always or Status is Inactive.)
Flags	Router type	AreaBorder: Area boundary router
		ASBoundary: AS boundary router
		VLink: There is a virtual link.
		NSSATranslator: Translation for an external AS route is applied. (Translation from Type 7 to Type 5)
		SuppressFA: The forwarding address for an external AS route is set to 0.0.0.0.
Area	Area ID for the area to which the router belongs	—
Interfaces	Number of interfaces belonging to the area	—
Network Range	Summary network range	—

Display Items	Meaning	Displayed detailed information
State	Whether the summary network is advertised	Advertise: The summary network is advertised.
		DoNotAdvertise: The summary network is not advertised.

#1: This item is displayed only when the graceful restart function is being used.

#2: This item is displayed only when the stub router function is being used.

The stub router behavior displays the settings in configuration. Also, the stub router status displays its running status. If configuration is changed while the stub router is running, the behavior and status might become different.

Example 2: show ip ospf [vrf {<vrf id> | all}] [<Domain>] interface

Figure 7-27: Displaying summary information about all OSPF interfaces

```
>show ip ospf interface
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area 0
Address          State     Priority Cost  Neighbor DR            Backup DR
172.16.10.10     DR        1        1      1        172.17.1.1    172.16.1.1
Area 1
Address          State     Priority Cost  Neighbor DR            Backup DR
172.18.10.11     DR        1        1      1        172.18.1.1    172.16.1.1
>
```

Display items in Example 2

Table 7-20: Displayed summary information about all interfaces

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Address	IP address on the interface	—
State	Status of the interface	Loopback: Loopback
		Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
Priority	Priority for determining the designated router	—
Cost	Interface cost	—
Neighbor	Number of neighboring routers	—

Display Items	Meaning	Displayed detailed information
DR	ID of the designated router	none: The designated router does not exist or has been selected.
Backup DR	ID of the backup designated router	none: The backup designated router does not exist or has been selected.

Example 3: show ip ospf [vrf {<vrf id> | all}] [<Domain>] interface {<IP Address> | detail}

Figure 7-28: Displaying detailed information about the specific OSPF interface (172.16.10.10)

```
>show ip ospf interface 172.16.10.10
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Index: 2, Name: VLAN0010, Address: 172.16.10.10, State: BackupDR
Auth Type: Simple
MTU: 1436, DDinPacket: 70, LSRinPacket: 117, ACKinPacket: 70
Router ID: 172.16.1.1, Network Type: Broadcast
Area: 0, DR: 172.17.1.1, Backup DR: 172.16.1.1
Priority: 1, Cost: 1
Transmit Delay: 1s
Intervals
  Hello: 10s, Dead: 40s, Retransmit: 5s

Neighbor List (1):
Address         State      RouterID     Priority DR             Backup DR
172.16.10.11    Full       172.17.1.1       1    172.16.10.11   172.16.10.10
>
```

Note: When detail is specified, the detailed information about all interfaces is displayed.

Display items in Example 3

Table 7-21: Displayed detailed information about a specific interface

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Index	Index number	—
Name	Interface name	—
Address	IP address on the interface	—
State	Status of the interface	Loopback: Loopback
		Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
Auth Type	Authentication type	None: No authentication
		Simple: Plain-text password authentication

Display Items	Meaning	Displayed detailed information
		md5: MD5 authentication
MTU	Maximum data length of sending OSPF packets (bytes)	The length of the IP header and message digest is not included.
DDinPacket	Number of entries that can be sent in a database exchange packet	—
LSRinPacket	Number of entries that can be sent in an LS request packet	—
ACKinPacket	Number of entries that can be sent in an ACK packet	—
Router ID	ID of the router	—
Network Type	Network type	Loopback: Loopback interface
		Broadcast: Broadcast type interface
		NonBroadcast: Non-broadcast type interface
		P to P: Point-to-point interface
Area	Area to which the interface belongs	—
DR	ID of the designated router for the interface	—
Backup DR	ID of the backup designated router for the interface	—
Priority	Priority for determining the designated router	—
Cost	Interface cost	—
Transmit Delay	Necessary period of time to send the link state update packet (seconds)	—
Intervals:		
Hello	Sending interval for hello packets (seconds)	—
Dead	The maximum permissible receiving interval of hello packets (seconds)	—
Retransmit	The interval for retransmitting OSPF packets (seconds)	—
Neighbor List(n): n indicates the number of neighboring routers.		
Address	IP address of the neighboring router	—
State	Status of connection with the neighboring router	Down
		Attempt
		Init
		Two Ways
		Exch Start

Display Items	Meaning	Displayed detailed information
		Exchange
		Loading
		Full
Router ID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Priority	Priority of the neighboring router	—
DR	IP address for the designated router as per the neighboring router	none: The designated router does not exist or has been selected.
Backup DR	IP address for the backup designated router as per the neighboring router	none: The backup designated router does not exist or has been selected.

Example 4: show ip ospf [vrf {<vrf id> | all}] [<Domain>] neighbor [interface <IP ADDRESS>]

Figure 7-29: Displaying summary information about all neighboring routers

```
>show ip ospf neighbor
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
Address         State             RouterID        Priority Interface
172.16.10.11    Full/BackupDR     172.16.1.1         1    172.16.10.10
172.16.10.12    Full/DR Other     172.16.1.2         1    172.16.10.10
172.126.110.111 Exch Start/BackupDR 172.126.123.111  1    172.126.120.130

Area: 1
Address         State             RouterID        Priority Interface
192.168.120.121 Full/DR           192.168.110.111   1    192.168.120.130

Virtual Neighbor
Transit Area    State     Router ID      Interface       VirtualNeighbor  Cost
0.0.0.1         Full      192.168.10.1   172.168.10.11   192.168.10.11        5
>
```

Note: If interface <IP ADDRESS> is specified, summary information about the neighboring router for the specified interface is displayed.

Display items in Example 4

Table 7-22: Displayed summary information about all neighboring routers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Address	IP address of the neighboring router	—
State	Status of connection with the neighboring router	Down
		Attempt

Display Items	Meaning	Displayed detailed information
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full
	DR for the neighboring router	DR Other: Other than the designated router or backup designated router
		BackupDR: Backup designated router
		DR: Designated router
		Blank: The designated router does not exist or has been selected.
RouterID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Priority	Priority of the neighboring router	—
Interface	IP address on the interface	none: The router is not connected to neighboring routers.
Virtual Neighbor		
Transit Area	Area through which the virtual link passes	—
Router ID	ID of the remote router on the virtual link	—
Interface	IP address on the interface	—
Virtual Neighbor	IP address on the remote interface	—
Cost	Interface cost	—
State	Status of the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full

Example 5: show ip ospf [vrf {<vrf id> | all}] [<Domain>] neighbor {<Router-id> | detail}

Figure 7-30: Displaying detailed information about the specific neighboring router (172.17.1.1)

```
>show ip ospf neighbor 172.17.1.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
Interface Address: 172.16.10.10, Interface State: BackupDR
    Interface Name: VLAN0010
    Neighbor Router ID: 172.17.1.1, Neighbor State: Full/DR
    Neighbor Address: 172.16.10.11, Priority: 1, Poll Interval: 120s
    Last Hello: 6s, Last Exchange: 45d 12h
    DR: 172.16.10.11, Backup DR: 172.16.10.10
    DS: 0, LSR: 0, Retrans: 0, <Master>
>
```

Note: If detail is specified, detailed information about all neighboring routers is displayed.

Display items in Example 5

Table 7-23: Displayed detailed information about a specific neighboring router

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Interface Address	Interface address	none: The router is not connected to neighboring routers.
Interface State	Status of the interface	Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
Interface Name	Interface name	—
Neighbor Router ID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Neighbor State	Status of the neighboring router	Down
		Attempt
		Init
		Two Ways
		Exch Start

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Display Items	Meaning	Displayed detailed information
		Exchange
		Loading
		Full
	DR for the neighboring router	DR Other: Other than the designated router or backup designated router
		BackupDR: Backup designated router
		DR: Designated router
		Blank: The designated router does not exist or has been selected.
Neighbor Address	IP address of the neighboring router	—
Priority	Priority of the neighboring router	—
Poll Interval	Sending interval for hello packets while adjacency is down in an NBMA network (seconds)	—
Last Hello	Time elapsed since the last hello packet was received (hour:minute:second)	The elapsed number of days and time xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Last Exchange	Time elapsed since the last database exchange finished (hh:mm:ss)	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
DR	IP address for the designated router as per the neighboring router	none: The designated router does not exist or has been selected.
Backup DR	IP address for the backup designated router as per the neighboring router	none: The backup designated router does not exist or has been selected.
DS	Total number of database summary queues	—

Display Items	Meaning	Displayed detailed information
LSR	Total number of link state request queues	—
Retrans	Total number of retrans queues	—
<...>	Option for the neighboring router	Initialize
		More
		Master

Example 6: show ip ospf [vrf {<vrf id> | all}] [<Domain>] area

Figure 7-31: Displaying summary information for all areas

```
>show ip ospf area
Date 20XX/07/14 12:00:00 UTC
Domain: 1
ID              Neighbor   SPFcount   Flags
0               2          14         <ASBoundary>
1               2          8          <ASBoundary>
>
```

Display items in Example 6

Table 7-24: Displayed summary information for all areas

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
ID	Area ID	—
Neighbor	Number of neighboring routers	—
SPFcount	Number of executed SPF calculations (routing table registration processing)	—
Flags	Flag	Stub: The area is a stub area.
		ASBoundary: There is an AS boundary router in the area.
		NSSA: The area is an NSSA.
		SuppressFA-7to5: When the external AS routes learned from an NSSA are translated to an area other than the NSSA and advertised, the forwarding address is set to 0.0.0.0.

Example 7: show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>] database database-summary

Figure 7-32: Displaying the number of link-states for the specific area (backbone)

```
>show ip ospf area backbone database database-summary
Date 20XX/07/14 12:00:00 UTC
Domain: 1
```

```
Local Router ID: 172.16.1.1
Area            Router Network Summary Asb-     NSSA   Area   External Opaque-
                                       summary         Total           link
0               4      2       1       2        0      9      2        1
>
```

Display items in Example 7

Table 7-25: Displayed information about the number of link-states for a specified area

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Local Router ID	ID of the router	—
Area	Area ID	—
Router	Number of router links	—
Network	Number of network links	—
Summary	Number of summary network links	—
Asb-summary	Number of summary links	—
NSSA	Number of NSSA external links	—
Area Total	Total number of LSAs in the area	—
External	Number of external links	—
Opaque-link	Total number of link-local Opaque link LSAs	—

Example 8: show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>] database [{adv-router <Router-id> | self-originate}]

Figure 7-33: Displaying link-states for the specific area (1) in summary format

```
>show ip ospf area 1 database
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area : 1
 LS Database:  Router Link
  Router ID        LSID            ADV Router     Age  Sequence Link Count
  172.16.1.1       172.16.1.1      172.16.1.1     1731 80002CFB 2
  172.17.1.1       172.17.1.1      172.17.1.1     1112 800009D2 1
  172.17.1.2       172.17.1.2      172.17.1.2     1002 8000000F 1
 LS Database : Network Link
  DR Interface     LSID            ADV Router      Age  Sequence
  172.16.10/24     172.16.10.255   172.17.1.1      1390 80000002
 LS Database : Summary Link (Network)
   Network Address  LSID           Area Border Router Age  Sequence
  172.18.10/24     172.18.10.255   172.16.1.1         1117 80000007
 LS Database : Summary Link (AS Boundary Router)
  AS Boundary Router LSID          Area Border Router Age  Sequence
  172.16.1.1       172.16.1.1      172.19.1.1         1685 80000077
 LS Database : NSSA AS External link
  Network Address   LSID           AS Boundary Router Age  Sequence
  10.1.1/24        10.1.1.255      172.16.1.1         1685 8002002
```

```
   10.2.1/24          10.2.1.255      172.17.1.1          1685 8002002

LS Database : Opaque Link
  Interface         LSID            ADV Router          Age  Sequence
  192.168.1.1       3.0.0.0         192.168.1.2         160  80000001

LS Database : AS External Link
  Network Address   LSID            AS Boundary Router  Age  Sequence
  172.15.10/24      172.15.10.255   172.16.1.1          788  80000002
>
```

Note 1: If area<Area-id> is omitted, link-states for all areas are displayed in summary format.

Note 2: If adv-router is specified, LSAs advertised by the router that has the designated router ID is displayed.

Note 3: If self-originate is specified, LSAs generated by the router are displayed.

Display items in Example 8

Table 7-26: Summary display of area information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local Router ID	ID of the router	—
Domain	Domain number	—
Area	Area ID	—
LS Database section		
LS Database	Link-state name	Router Link: Router link
		Network Link: Network link
		Summary Link (Network): Summary network link
		Summary Link (AS Boundary Router): Summary link
		NSSA AS External Link: NSSA AS external link
		AS External Link: AS external link
		Opaque Link: Link-local Opaque link
(Common items)		
Age	Aging time for the link-state (seconds)	—
Sequence	Sequence number of the link-state	—
(Items when LS Database = Router Link)		
Router ID	Router ID	—
LSID	Link-state ID	—
ADV Router	ID of the advertising router	—
Link Count	Number of links	—
(Items when LS Database = Network Link)		

Display Items	Meaning	Displayed detailed information
DR Interface	IP address of the designated router	Interface address/mask length
LSID	Link-state ID	—
ADV Router	ID of the designated router	—
(Items when LS Database = Summary Link (Network))		
Network Address	Network address	Destination address/network mask length
LSID	Link-state ID	—
Area Border Router	ID of the area boundary router	—
(Items when LS Database = Summary Link (AS Boundary Router))		
AS Boundary Router	IP address of the AS boundary router	—
LSID	Link-state ID	—
Area Border Router	ID of the area boundary router	—
(Items when LS Database = AS External Link)		
Network Address	Network address	Destination address/network mask length
LSID	Link-state ID	—
AS Boundary Router	ID of the area boundary router	—
(Items when LS Database = Opaque-Link)		
Interface	IP address on the interface sent or received an Opaque-link	—
LSID	Link-state ID	—
ADV Router	ID of the advertising router	—
(Items when LS Database = NSSA AS External Link)		
Network Address	Network address	Destination address/network mask length
LSID	Link-state ID	—
AS Boundary Router	ID of the area boundary router	—

Example 9: show ip ospf [vrf {<vrf id> | all}] [<Domain>] [area <Area-id>] database <LS-Type> [<LSA-information>] [{adv-router <Router-id> | self-originate}]

- This example shows how to display the router link information in the specific area (1) in which OSPF protocol is running.

Figure 7-34: Displaying the detailed information (router link)

```
>show ip ospf area 1 database router
Date 20XX/07/14 12:00:00 UTC
```

```
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address          State    Priority Cost  Neighbor DR              Backup DR
172.16.10.10     DR          1     1       1       172.17.1.1     172.16.1.1

LS Database: Router Link
Router ID: 172.16.1.1
   LSID: 172.16.1.1
   Age:  962, Length: 36, Sequence: 80000006, Checksums: DF66
   Flags: <AreaBorder ASBoundary>
       -> StubNet, Network Address: 172.18.10.11/24, Cost: 0
Router ID: 172.17.1.1
   LSID: 172.17.1.1
   Age:  962, Length: 36, Sequence: 80000006, Checksums: DF66
   Flags: <AreaBorder ASBoundary>
       -> TransNet, DR Address: 172.16.10.11,
          Router Interface Address: 172.16.10.10, Cost: 0
       -> Router, Neighbor Router ID: 172.20.1.1,
          Router Interface Address: 172.20.1.101, Cost: 0
       -> Virtual, Neighbor Router ID: 172.21.1.1,
          Router Interface Address: 172.21.1.101, Cost: 0
>
```

Note 1: If area<Area-id> is omitted, router link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the network link information in the specific area (1) in which OSPF protocol is running.

Figure 7-35: Displaying detailed area information (network link)

```
>show ip ospf area 1 database network
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address          State Priority Cost  Neighbor  DR              Backup DR
172.16.10.10     BackupDR 1     1       1       172.17.1.1     172.16.1.1

LS Database: Network Link
DR Interface Address: 172.16.10.11/24, Advertising Router: 172.17.1.1
   LSID: 172.16.10.255
   Age: 1390, Length: 32 , Sequence: 80000002, Checksums: 2FIC
      ->Attached Router:172.16. 1. 1
                        172.16.10.11
                        172.16.10.12
                        172.16.10.101
>
```

Note 1: If area<Area-id> is omitted, network link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the summary network link information in the specific area (1) in which OSPF protocol is running.

Figure 7-36: Displaying detailed area information (summary network link)

```
>show ip ospf area 1 database summary
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address          State Priority Cost  Neighbor  DR              Backup DR
172.16.10.10     BackupDR 1     1       1       172.17.1.1     127.16.1.1

LS Database: Summary Link (Network)
Network Address: 172.18.10/24, Area Border Router: 172.16.1.1
```

```
      LSID: 172.18.10.255
      Age: 1117, Length: 28 , Sequence: 80000007, Checksums: DBF4
       ->Metric: 1
>
```

Note 1: If area<Area-id> is omitted, summary network information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the summary link information in the specific area (1) in which OSPF protocol is running.

Figure 7-37: Displaying the detailed area information (summary link)

```
>show ip ospf area 1 database asbr-summary
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address         State Priority Cost  Neighbor   DR            Backup DR
172.16.10.10    BackupDR 1     1     1          172.17.1.1    172.16.1.1

LS Database: Summary Link (AS Boundary Router)
AS Boundary Router: 172.16.1.1, Area Border router: 158.214.15.129
    LSID: 172.16.1.1
    Age: 1685, Length: 36 , Sequence: 80000006, Checksums: DF66
     ->Metric: 1
>
```

Note 1: If area<Area-id> is omitted, summary link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the NSSA AS external link information in the specific area (1) in which OSPF protocol is running.

Figure 7-38: Displaying the detailed area information (NSSA AS external link)

```
>show ip ospf area 1 database  nssa-external
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address         State    Priority Cost  Neighbor DR         Backup DR
125.16.10.10    BackupDR 1        1     1        172.17.1.1 172.16.1.1

LS Database: NSSA AS External Link
Network Address: 10.1.1/24, AS Boundary router: 172.16.1.1
  LSID: 10.1.1.255
  Age: 788, Length: 36, Sequence: 80000002, Checksums: CCC0
    -> Type: 2, Metric: 1, Tag: c0000000, Forward: 0.0.0.0
Network Address: 10.2.1/24, AS Boundary Router: 172.17.1.1
  LSID: 10.2.1.255
  Age: 1564, Length: 36, Sequence: 8000000b, Checksums: 9AE6
    -> ImportRoute: 172.17.10/24, NextHop: 172.16.10.11
       Type: 2, Metric: 1, Tag: c0000000, Forward: 0.0.0.0
       <Int Ext Active Gateway>
>
```

Note 1: If area<Area-id> is omitted, NSSA AS external link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the AS external link information in the specific area (1) in which OSPF protocol is running.

Figure 7-39: Displaying the detailed area information (AS external link)

```
>show ip ospf area 1 database external
```

```
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Address         State Priority Cost  Neighbor   DR            Backup DR
125.16.10.10    BackupDR 1     1     1          172.17.1.1    172.16.1.1

LS Database: AS External Link
Network Address: 172.15.10/24 AS Boundary router: 172.16.1.1
    LSID: 172.15.10.255
    Age: 788, Length: 36 , Sequence: 80000002, Checksums: CCC0
     -> Type: 2, Metric: 1, Tag: c0000000, Forward: 0.0.0.0
Network Address: 172.17.10/24, AS Boundary Router: 172.17.1.1
    LSID: 172.17.10.255
    Age: 1564, Length: 36 , Sequence: 8000000b, Checksums: 9AE6
     -> ImportRoute: 172.17.10/24, NextHop: 172.16.10.11
        Type: 2, Metric: 1, Tag: c0000000, Forward: 0.0.0.0
        <Int Ext Active Gateway>
>
```

Note 1: Displayed information is the same whether area <Area-id> is specified or not.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the router link information that has the specific router link ID (172.17.1.1) in the specific area (1) in which OSPF protocol is running.

Figure 7-40: Displaying the detailed area information (specific router link)

```
>show ip ospf area 1 database router 172.17.1.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 1
Address         State     Priority Cost  Neighbor DR          Backup DR
172.16.10.10    DR        1        1     1        172.17.1.1  172.16.1.1

LS Database: Router Link
Router ID: 172.17.1.1
   LSID: 172.17.1.1
   Age:  962, Length: 36, Sequence: 80000006, Checksums: DF66
   Flags: <AreaBorder ASBoundary>
      -> TransNet, DR Address: 172.16.10.11,
         Router Interface Address: 172.16.10.10, Cost: 0
      -> Router, Neighbor Router ID: 172.20.1.1,
         Router Interface Address: 172.20.1.101, Cost: 0
      -> Virtual, Neighbor Router ID: 172.21.1.1,
         Router Interface Address: 172.21.1.101, Cost: 0
>
```

Note 1: If area<Area-id> is omitted, router link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

- This example shows how to display the link-local Opaque link LSA information in the specific area (1) in which OSPF protocol is running.

Figure 7-41: Displaying detailed area information (link-local Opaque link)

```
>show ip ospf area 1 database opaque-link
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 0
Address         State Priority Cost  Neighbor   DR            Backup DR
125.16.10.10    BackupDR 1     1     1          172.17.1.1    172.16.1.1
125.16.1.1      BackupDR 1     1     1          125.17.1.1    125.16.1.1

LS Database: Opaque-Link
 Interface: 125.16.10.10
   LSID: 3.0.0.0
```

```
        Opaque Type: 3, Opaque ID: 000000, Advertising Router: 172.16.1.1
        Age: 788, Length: 36 , Sequence: 80000002, Checksums: CCC0
        Type: Grace Period, Length: 4
        -> 1800
        Type: Graceful Restart Reason, Length: 1
        -> Software Restart
        Type: IP Interface Address, Length: 4
        -> 192.168.11.101

 Transit Area: 0.0.0.1, Virtual Neighbor Router ID: 192.168.10.1
    LSID: 3.0.0.0
    Opaque Type: 3, Opaque ID: 000000, Advertising Router: 125.16.1.1
    Age: 788, Length: 36 , Sequence: 80000002, Checksums: CCC0
    Type: Grace Period, Length: 4
    -> 1800
    Type: Graceful Restart Reason, Length: 1
    -> Software Restart
>
```

Note 1: Displayed information is the same whether area <Area-id> is specified or not.

Note 2: Same as Note 2 and Note 3 for "Figure 7-33: Displaying link-states for the specific area (1) in summary format".

Display items in Example 9

Table 7-27: Displayed detailed area information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Local Router ID	ID of the router	—
Area	Area ID	—
Interface section		
Address	IP address on the interface	none: The router is not connected to neighboring routers.
State	Status of the interface	Waiting: Waiting for the designated router to be determined.
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
Priority	Priority for determining the designated router	—
Cost	Interface cost	—
Neighbor	Number of neighboring routers	—
DR	ID of the designated router	none: The designated router does not exist or has been selected.
Backup DR	ID of the backup designated router	none: The backup designated router does not exist or has been selected.

Display Items	Meaning	Displayed detailed information
LS Database section		
LS Database	Specified <LS Type>	Router Link: Router link
		Network Link: Network link
		Summary Link (Network): Summary network link
		Summary Link (AS Boundary Router): Summary link
		NSSA AS External Link: NSSA AS external link
		AS External Link: AS external link
		Opaque Link: Link-local Opaque link
(Common items)		
LSID	Link-state ID	—
Age	Aging time for the LSA (seconds)	—
Length	LSA size (bytes)	—
Sequence	Sequence number of the LSA	—
Checksums	Checksums of the LSA	—
(Items when LS Database = Router Link)		
Router ID	Router ID	—
Flags	Router type	AreaBorder: Area boundary router
		ASBoundary: AS boundary router
		NSSATranslator: NSSA boundary router
		VLink: Endpoint of the virtual link
LinkType	Link type	Router: Connection to the neighboring router
		TransNet: Connection to the designated router
		StubNet: Connection to the network
		Virtual: Connection to the virtual link
Items when LinkType = Router		
Neighbor Router ID	ID of the neighboring router to connect	—
Router Interface Address	Interface address of the router	—
Cost	Interface cost	—
Items when LinkType = TransNet		

Display Items	Meaning	Displayed detailed information
DR Address	IP address of the designated router	—
Router Interface Address	IP address on the interface	—
Cost	Interface cost	—
Items when LinkType = StubNet		
Network Address	Network address	Destination address/network mask length
Cost	Interface cost	—
Items when LinkType = Virtual		
Neighbor Router ID	ID of the remote router connected with the virtual link	—
Router Interface Address	Interface address of the router	—
Cost	Interface cost	—
(Items when LS Database = Network Link)		
DR Interface Address	IP address of the designated router	Interface address/mask length
Advertising Router	ID of the designated router	—
Attached Router	ID of the router connected to the network	—
(Items when LS Database = Summary Link (Network))		
Network Address	Network address	Destination address/network mask length
Area Border Router	ID of the area boundary router	—
Metric	Cost	—
(Items when LS Database = Summary Link (AS Boundary Router))		
AS Boundary Router	IP address of the AS boundary router	—
Area Border Router	ID of the area boundary router	—
Metric	Cost	—
(Items when LS Database = AS External Link or LS Database = NSSA AS External Link)		
Network Address	Network address	Destination address/network mask length
AS Boundary Router	ID of the area boundary router	—

Display Items	Meaning	Displayed detailed information
ImportRoute	Import route address	—
NextHop	Next hop address	—
Type	Cost type	1 or 2
Metric	Cost	—
Tag	Tag used by the AS external router	—
Forward	Next hop address	0 indicates that the next hop is an AS external router. Also, if the path bound for this network passes through an AS boundary router, this item becomes 0.
<...>	Route status	NotInstall
		NoAdvise
		Int
		Ext
		Pending
		Delete
		Hidden
		Initial
		Release
		Flash
		OnList
		Retain
		Static
		Gateway
		Reject
		Blackhole
		IfSubnetMask
		Active
		• If Active is included in the display for this item, it indicates that the LSA was imported. • If Active is not included in this item, it indicates that import was suppressed for the LSA. • For an LSA generated by the Switch, ImportRoute, NextHop, and Flags are not displayed.

(Items when LS Database = Opaque-Link)[#]

Display Items	Meaning	Displayed detailed information
Interface	Address on the interface that received an Opaque-Link	—
Transit Area	Area through which the virtual link passes	—
Virtual Neighbor Router ID	ID of the remote router on the virtual link	—
LSID	Link-state ID	—
Opaque Type	Opaque type of the Opaque LSA	—
Opaque ID	Opaque ID of the Opaque LSA	—
Advertising Router	ID of the LSA advertising router	—
Age	LSA age (seconds)	—
Length	LSA size (bytes)	—
Sequence	Sequence number of the LSA	—
Checksums	Checksums of the LSA	—

Items in the TLV display section when LS Database = Opaque-Link

Display Items	Meaning	Displayed detailed information
Type	Opaque-Link TLV type	Grace Period: Time period in which adjacency with the restart router must be established on the helper router while the restart router is restarting.
		Graceful Restart Reason: Reason of why the router restarted
		IP Interface Address: IP address on the interface associated with the grace-LSA
		For other types, the value is displayed in decimal number format.
Length	Opaque-Link TLV length	—

Items that explain the Value field in the TLV display section when LS Database = Opaque-Link

Display Items	Meaning	Displayed detailed information
Reason	The reason why the graceful restart was executed.	Unknown (Code=0): Unknown
		Software restart (Code=1): Software restart
		Software reload/upgrade (Code=2): Software reload or software upgrade
		Switch to redundant control processor (Code=3): Switching redundancy control processors
		For other codes, the value is displayed in decimal number format.
Value	The reason why the graceful restart was executed.	For the other Reason values than the above, the value in the Value field is displayed in hexadecimal format.

#: These items are displayed only when the graceful restart function is being used.

Example 10: show ip ospf [vrf {<vrf id> | all}] [<Domain>] virtual-links [area <Area-id>]

Figure 7-42: Displaying virtual link information

```
>show ip ospf virtual-links
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area      Router ID       Interface        VirtualNeighbor   Cost State
1                 192.168.10.1    172.18.10.11     192.168.10.11     5    FULL
1                 192.168.11.1    172.18.10.11     192.168.10.12     6    FULL
2                 192.168.1.1     172.19.10.10     192.168.1.11      5    FULL
>
> show ip ospf virtual-links area 0.0.0.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area      Router ID       Interface        VirtualNeighbor   Cost State
1                 192.168.10.1    172.18.10.11     192.168.10.11     5    FULL
1                 192.168.11.1    172.18.10.11     192.168.10.12     6    FULL
>
```

Display items in Example 10

Table 7-28: Displayed virtual link information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Transit Area	Area through which the virtual link passes	—
Router ID	ID of the remote router on the virtual link	—
Interface	IP address on the interface	—
Virtual Neighbor	IP address on the remote interface	—
Cost	Interface cost	—
State	Status of connection with the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full

Example 11: show ip ospf [vrf {<vrf id> | all}] [<Domain>] virtual-links {area <Area-id> neighbor <Router-id> | detail}

Figure 7-43: Displaying detailed virtual link information

```
>show ip ospf virtual-links area 1 neighbor 192.168.10.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area: 1, Virtual Neighbor Router ID: 192.168.10.1
    Virtual Link State:Up
    Interface Address: 172.18.10.11, Virtual Neighbor Address: 192.168.10.11
    Auth Type: Simple
    Cost:10, State: FULL
    Transmit Delay: 1s
    Intervals:
        Hello: 10s, Dead: 40s, Retransmit: 5s
    Last Hello: 3s, Last Exchange: 1m 25s
    DS: 0, LSR: 0, Retrans: 0, <Master>
>
```

Note: When detail is specified, the detailed information about all virtual links is displayed.

Display items in Example 11

Table 7-29: Displayed detailed virtual link information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Transit Area	Area through which the virtual link passes	—
Virtual Neighbor Router ID	ID of the remote router on the virtual link	—
Virtual Link State	Virtual link status	UP
		DOWN
Interface Address	IP address on the interface	—
Auth Type	Authentication type	none
		simple
		md5
Virtual Neighbor Address	IP address on the remote interface	—
Cost	Interface cost	—
State	Status of connection with the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start

Display Items	Meaning	Displayed detailed information
		Exchange
		Loading
		Full
Transmit Delay	Necessary period of time to send the link state update packet (seconds)	—
Intervals:		
Hello	Sending interval for hello packets (seconds)	—
Dead	The maximum permissible receiving interval of hello packets (seconds)	—
Retransmit	The interval for retransmitting OSPF packets (seconds)	—
Last Hello	Time elapsed since the last hello packet was received	The elapsed number of days and time xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Last Exchange	Time elapsed since the last database exchange finished	The elapsed number of days and time xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
DS	Total number of database summary queues	—
LSR	Total number of link state request queues	—
Retrans	Total number of retrans queues	—
<...>	Option for the neighboring router	Initialize
		More
		Master

Example 12: show ip ospf [vrf {<vrf id> | all}] [<Domain>] border-routers

Figure 7-44: Displaying information about area boundary routers and AS boundary routers

```
>show ip ospf border-routers
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Router ID       Next Hop       Cost  Area        Type        Flags
172.19.1.1      172.19.10.10   10    2           Inter-Area  AreaBorder
172.17.1.1      172.17.3.1     20    0           Inter-Area  ASBoundary
172.20.3.1      192.168.3.11   22    3           Intra-Area  ASBoundary
>
```

Display items in Example 12

Table 7-30: Displayed information about area boundary routers and AS boundary routers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Router ID	ID of the area boundary router or AS boundary router	—
Next Hop	Next hop for the area boundary router or AS boundary router	—
Cost	Cost for the area boundary router or AS boundary router	—
Area	ID of the area that has the area boundary router or AS boundary router	—
Type	Route type	Intra-Area: Intra-area route
		Inter-Area: Inter-area route
Flags	Router type	AreaBorder: Area boundary router
		ASBoundary: AS boundary router

Example 13: show ip ospf [vrf {<vrf id> | all}] statistics

Figure 7-45: Displaying statistics about sent and received packets collected by OSPF

```
> show ip ospf statistics
Date 20XX/07/14 12:00:00 UTC
Packets:
  Received                     Sent
  Hello             : 141012   Hello              : 140932
  DB description    : 155      DB description     : 31
  Link-State request: 49       Link-State request: 34
  Link-State update : 23362    Link-State update : 23282
  Link-State ack    : 22134    Link-State ack     : 23308
Errors:
  IP: bad destination           : 0
  IP: bad protocol              : 0
  IP: received my own packet    : 0
  OSPF: bad packet type         : 0
  OSPF: bad version             : 0
  OSPF: bad checksum            : 0
  OSPF: bad area id             : 0
  OSPF: area mismatch           : 0
  OSPF: bad virtual link        : 0
  OSPF: bad authentication type : 0
  OSPF: bad authentication key  : 0
  OSPF: packet too small        : 0
  OSPF: packet size > ip length : 0
  OSPF: transmit error          : 0
  OSPF: interface down          : 0
```

```
    OSPF: unknown neighbor      : 0
    HELLO: netmask mismatch     : 0
    HELLO: hello timer mismatch : 0
    HELLO: dead timer mismatch  : 0
    HELLO: extern option mismatch : 0
    HELLO: router id confusion  : 0
    HELLO: unknown virtual neighbor: 0
    HELLO: unknown NBMA neighbor : 0
    DD: neighbor state low      : 0
    DD: router id confusion     : 0
    DD: extern option mismatch  : 0
    DD: unknown LSA type        : 0
    LS ACK: neighbor state low  : 0
    LS ACK: bad ack             : 0
    LS ACK: duplicate ack       : 0
    LS ACK: unknown LSA type    : 0
    LS REQ: neighbor state low  : 0
    LS REQ: empty request       : 0
    LS REQ: bad request         : 0
    LS UPDATE: neighbor state low : 0
    LS UPDATE: bad LSA checksum   : 0
    LS UPDATE: received less recent LSA: 0
    LS UPDATE: unknown LSA type  : 0
>
```

Display items in Example 13

Table 7-31: Displayed statistics about sent and received packets

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Packets	Total number of received packets	—
Received	Number of receive packets	—
Sent	Number of send packets	—
Hello	Number of hello packets	—
DB description	Number of database description packets	—
Link-State request	Number of link-state request packets	—
Link-State update	Number of link-state update packets	—
Link-State ack	Number of link-state ACK packets	—
Errors	Total number of received error packets	—
IP: bad destination	Number of invalid-destination packets	—
IP: bad protocol	Number of invalid-protocol packets	—
IP: received my own packet	Number of packets originating from the device	—
OSPF: bad packet type	Number of packets whose packet type is invalid	—
OSPF: bad version	Number of invalid-version packets	—
OSPF: bad checksum	Number of packets whose checksum is invalid	—

Display Items	Meaning	Displayed detailed information
OSPF: bad area id	Number of packets whose area ID is invalid	—
OSPF: area mismatch	Number of packets whose area is mismatched	—
OSPF: bad virtual link	Number of packets whose virtual link is invalid	—
OSPF: bad authentication type	Number of packets whose authentication type is invalid	—
OSPF: bad authentication key	Number of packets whose authentication key is invalid	—
OSPF: packet too small	Number of packets whose OSPF packet length is invalid	—
OSPF: packet size > ip length	Number of packets whose OSPF packet length is invalid	—
OSPF: transmit error	Number of packets that failed to be transmitted	—
OSPF: interface down	Number of receive packets from down interfaces	—
OSPF: unknown neighbor	Number of unknown OSPF neighbor packets	—
HELLO: netmask mismatch	Number of packets whose netmask is mismatched	—
HELLO: hello timer mismatch	Number of packets whose hello timer is mismatched	—
HELLO: dead timer mismatch	Number of packets whose dead timer is mismatched	—
HELLO: extern option mismatch	Number of packets whose stub area settings are mismatched	—
HELLO: router id confusion	Number of received packets that have duplicate router-id	—
HELLO: unknown virtual neighbor	Number of unknown OSPF virtual neighbor packets	—
HELLO: unknown NBMA neighbor	Number of unknown OSPF NBMA neighbor packets	—
DD: neighbor state low	Number of receive packets that were discarded due to mismatch of the neighbor state	—
DD: router-id confusion	Number of received packets that have duplicate router-id	—
DD: extern option mismatch	Number of packets whose stub area settings are mismatched	—
DD: unknown LSA type	Number of packets whose LSA type is unknown	—

Display Items	Meaning	Displayed detailed information
LS ACK: neighbor state low	Number of receive packets that were discarded due to mismatch of the neighbor state	—
LS ACK: bad ack	Number of invalid-ACK packets	—
LS ACK: duplicate ack	Number of duplicate-ACK packets	—
LS ACK: unknown LSA type	Unknown LSA type	—
LS REQ: neighbor state low	Number of receive packets that were discarded due to mismatch of the neighbor state	—
LS REQ: empty request	Number of empty request packets	—
LS REQ: bad request	Number of invalid request packets	—
LS UPDATE: neighbor state low	Number of receive packets that were discarded due to mismatch of the neighbor state	—
LS UPDATE: bad LSA checksum	Number of LSAs discarded due to invalid checksum	—
LS UPDATE: received less recent LSA	Number of LSAs discarded due to invalid sequence number	—
LS UPDATE: unknown LSA type	Number of LSAs discarded due to invalid type	—

Example 14: show ip ospf discard-packets

Figure 7-46: Displaying OSPF discarded packets

```
> show ip ospf discard-packets
Date 20XX/12/20 12:00:00 UTC
Collection Time: 20XX/12/10 11:11:48
OSPF RECV: 10.0.0.1 -> 224.0.0.5 (VRF:10, Router ID: 192.168.33.210)
Errors   : OSPF: bad packet type
Received Data:
  (0000)  4500 0040  0000 0000  0059 0000  0a00 0001
  (0010)  d000 0005  0208 0028  0000 0001  0000 0000
  (0020)  0000 0000  0000 0000  0000 0000  ffff ff00
  (0030)  000a 0001  0000 0028  0000 0001  0000 0002
  (0040)  0000 0000  0000 0000
  OSPF Length: 64

Collection Time: 20XX/12/11 11:11:23
OSPF RECV: 10.0.0.1 -> 224.0.0.5 (VRF:20, Router ID: 192.168.30.88)
Errors   : OSPF: packet size > ip length
Received Data:
  (0000)  4500 0040  0000 0000  0059 0000  0a00 0001
  (0010)  d000 0005  0208 0040  0000 0001  0000 0000
  (0020)  0000 0000  0000 0000  0000 0000  ffff ff00
  (0030)  000a 0001  0000 0028  0000 0001  0000 0002
  (0040)  0000 0000  0000 0000
    OSPF Length: 64
>
```

Display items in Example 14

Table 7-32: Displayed OSPF discarded packets

Display Items	Meaning	Displayed detailed information
Collection Time :	Time the message was collected	—

Display Items	Meaning	Displayed detailed information
OSPF RECV	Remote device	In a case other than a transmit error
OSPF SEND	Remote device	In the case of a transmit error
VRF	VRF ID of the connection target	This item is not displayed when the target is a global network.
Router ID	ID of the connection target router	If the router ID cannot be identified, unspecified is displayed.
error code	Error code for transmit error	—
Errors	Cause of why the packet was discarded	—
Received Data	Discarded IP packet data	—
OSPF Length	OSPF packet length	—

Impact on communication

None

Response messages

Table 7-33: List of response messages for the show ip ospf command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.
3	no Area Border Router or AS Boundary Router exist	There is no area boundary router or AS boundary router.
4	no domain exists	There is no domain.
5	no interface exists	There is no interface.
6	no neighbor exists	There is no neighboring router.
7	no OSPF Virtual Link is configured	There is no virtual link configured.
8	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
9	no such area	The specified area was not found.
10	no such domain"<id>"	The specified domain was not found.
11	no such interface"<IP Address>"	The specified interface name is invalid. <IP Address>: Interface address
12	no such LSA	The specified LSA was not found.

No.	Message	Description
13	no such neighbor"<RouterID>"	The specified neighboring router was not found.
14	no such transit area"<AreaID>"	The specified transit area was not found.
15	no such virtual neighbor"<RouterID>"	The specified neighboring router was not found.
16	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
17	OSPF not active in vrf <vrf id>	OSPF is not running in the specified VRF. <vrf id>: Specified VRF ID
18	OSPF not active.	OSPF is not running.
19	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

clear ip ospf [SL-L3A]

Clears information about the OSPF protocol.

Syntax

```
clear ip ospf [vrf {<vrf id> | all}] [<Domain>] stub-router
clear ip ospf discard-packets
clear ip ospf [vrf {<vrf id> | all}] statistics
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all}

>   Clears information about packets collected by OSPF in VRFs. If <vrf id> is specified, the OSPF statistics for only the specified VRF is cleared. If all is specified, the OSPF statistics for all VRFs including the global network is cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

>   Behavior when this parameter is omitted:

>>   The packet information collected by OSPF in the global network is cleared.

<Domain>

>   Specify the OSPF domain number.

>   For <Domain>, specify a value in the range from 1 to 65535.

>   Behavior when this parameter is omitted:

>>   This command applies to all domains.

stub-router

>   Stops any stub router running in OSPF.

>   You cannot execute the command with this parameter under the following statuses:

>   • The stub router function is not set in configuration commands.

>   • The stub router function is in InActive status.

>   • The stub router function runs in Always mode.

discard-packets

>   Clears any discarded packets collected by OSPF.

statistics

>   Clears statistics about the packets collected by OSPF.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Figure 7-47: Clearing the stub router running in OSPF

```
> clear ip ospf stub-router
>
```

Figure 7-48: Clearing OSPF discarded packets

```
> clear ip ospf discard-packets
>
```

Figure 7-49: Clearing statistics about OSPF packets

```
> clear ip ospf statistics
>
```

Display Items

None

Impact on communication

When the stub router function is running (except for when it runs "Always"), executing the command with the stub-router parameter specified changes the cost value of the OSPF interface.

Response messages

Table 7-34: List of response messages for the clear ip ospf command

No.	Message	Description
1	can't reset stub-router	The stub router function is not running, or stub-router has not been set. Alternatively, the stub router function runs all the time and could not be ended. (The target of the command is the specified domains. If the target of the command is all domains, an error occurs if the command cannot be executed in all domains.)
2	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
3	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
5	no such domain "<id>"	The specified domain was not found. <id>: Domain number
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	OSPF not active in vrf <vrf id>	OSPF is not running in the specified VRF. <vrf id>: Specified VRF ID
8	OSPF not active.	OSPF is not running.
9	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ip bgp [SL-L3A]

Shows information about the BGP protocol.

Syntax

```
show ip bgp [vpnv4 vrf {<vrf id> | all}] summary
show ip bgp [vpnv4 vrf {<vrf id> | all}] neighbors
          [{ <As> | <Peer Group> | <Peer Address> | <Host name> | detail }]
show ip bgp [vpnv4 vrf {<vrf id> | all}] peer-group <Peer Group>
show ip bgp [vpnv4 vrf {<vrf id> | all}] [-Faco] [<Address> [longer-prefixes]]
show ip bgp [vpnv4 vrf {<vrf id> | all}] received-routes summary
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          [neighbors {<Peer Address> | <Host name>}]
            received-routes [-Faco] [<Address> [longer-prefixes]]
show ip bgp [vpnv4 vrf {<vrf id> | all}] routes summary
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          [neighbors {<Peer Address> | <Host name>}]
            routes [-Faco] [<Address> [longer-prefixes]]
show ip bgp [vpnv4 vrf {<vrf id> | all}] advertised-routes summary
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          [neighbors {<Peer Address> | <Host name>}]
            advertised-routes [-Faco][<Address> [longer-prefixes]]
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          {regexp | quote-regexp} <Aspath> [unmatch]
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          aspath-regexp <Extended Regular Expression>
show ip bgp [vpnv4 vrf {<vrf id> | all}] community [none]
show ip bgp [vpnv4 vrf {<vrf id> | all}] community <Community>...[exact]
show ip bgp [vpnv4 vrf {<vrf id> | all}]
          community-regexp <Extended Regular Expression>
show ip bgp neighbors {<Peer Address> | <Host name>}
          dampened-routes [<Address>[longer-prefixes]]
show ip bgp dampened-paths [<Address>[longer-prefixes]]
show ip bgp [neighbors {<Peer Address> | <Host name>}]
          flap-statistics [<Address>[longer-prefixes]]
show ip bgp [vpnv4 vrf {<vrf id> | all}] inconsistent-as
show ip bgp paths [<Aspath> [unmatch]]
show ip bgp paths-regexp <Extended Regular Expression>
show ip bgp [vpnv4 vrf {<vrf id> | all}] notification-factor
          [{ <Peer Address> | <Host name> }]
show ip bgp [vpnv4 vrf {<vrf id> | all}] stale [summary]
```

Input mode

User mode and administrator mode

Parameters

vpnv4 vrf {<vrf id> | all}

> Displays BGP4 information for VRFs. If <vrf id> is specified, BGP4 information for only the specified VRF is displayed. If all is specified, BGP4 information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> The BGP4 information for the global network is displayed.

summary

> Displays the peering status of all peers.

neighbors

> Displays a summary of all peering information.

{<As> | <Peer Group> | <Peer Address> | <Host name> | detail}

    <As>

        Displays summary information about peers in the specified AS. Specify an AS number.

    <Peer Group>

        Displays summary information about the specified peer group. Specify a peer group name.

        You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".

    <Peer Address>

        Displays information about the specified peer in detail. Specify the IP address of the peer in IPv4 format.

    <Host name>

        Displays information about the specified peer in detail. Specify the host name.

        Note that you cannot specify this parameter if vpnv4 vrf {<vrf id> | all} is specified.

    detail

        Displays information about all peers in detail.

peer-group <Peer Group>

    Displays peering information about the peers belonging to the specified peer group.

    <Peer Group>

        Specify a peer group name.

        You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".

-F

    Displays attributes of the routing information in full format (equivalent to specifying -aco).

-a

    Displays the atomic_aggregate and aggregator attributes in the routing information.

-c

    Displays Community attributes of the routing information.

-o

    Displays the originator_id and cluster_list attributes in the routing information.

<Address> [longer-prefixes]

    Displays routing information known by BGP4. Specifying the destination network for this parameter filters the routing information to be displayed.

    <Address>

        You can specify a value in any of the following formats:

        • <IP Address>

        • <IP Address> <Mask>

        • <IP Address>/<Masklen>

        For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

longer-prefixes

> This command applies to the routing information included in the specified destination network. If no network mask has been specified for <Address>, the natural mask for <IP Address> is used as the network mask for filtering.
>
> Behavior when this parameter is omitted:
>
> > This command applies to only the routing information that matches the specified destination network. If no network mask has been specified for <Address>, this command applies to the longest-match routing information for the specified <IP Address>.

received-routes summary

> Displays the number of routing information entries received from each peer.

neighbors {<Peer Address>|<Host name>}

> Displays routing information about only the specified peer.
>
> <Peer Address>
>
> > Specify the IP address of the peer. Specify this in IPv4 format.
>
> <Host name>
>
> > Specify a host name. Note that you cannot specify this parameter if vpnv4 vrf {<vrf id> | all} is specified.

received-routes

> Displays routing information received from the peers.
>
> If only received-routes is specified, all routing information for all peers is displayed.

routes summary

> Displays the number of information entries for the valid routes (which are not suppressed by filters) received from each peer.

routes

> Displays information about the valid routes (which are not suppressed by filters) received from the peers.
>
> If only routes is specified, all routing information about all peers is displayed.

advertised-routes summary

> Displays the number of routing information entries advertised to each peer.

advertised-routes

> Displays routing information advertised to the peers.
>
> If only advertised-routes is specified, all routing information about all peers is displayed.

{regexp | quote-regexp} <Aspath>

> Displays routing information for the ASPATH attribute that matches the specified AS path regular expression. Note that path comparison applies to only AS_SEQUENCE of the ASPATH attribute.
>
> <Aspath>
>
> > When regexp is specified, specify the ASPATH attribute.
> >
> > When quote-regexp is specified, specify <Aspath> enclosed in double quotation marks (") and the AS path regular expression in the following format:
> >
> > ```
> > <Aspath> := <Aspath_Term>...
> > <Aspath_Term> := <Aspath_Symbol>[{ {m,n} | {m} | {m,} | * | + | ? }]
> > <Aspath_Symbol> := { <As> | . }
> > ```
> >
> > {m,n}: Indicates that Aspath_Symbol is repeated m to n times.
> >
> > > (Valid setting range for m and n: 0 to 255)

{m}: Indicates that Aspath_Symbol is repeated m times.
(Valid setting range for m: 0 to 255)

{m,}: Indicates that Aspath_Symbol is repeated m times or more.
(Valid setting range for m: 0 to 255)

*: Indicates that Aspath_Symbol is repeated 0 times or more.

+: Indicates that Aspath_Symbol is repeated 1 time or more.

?: Indicates that Aspath_Symbol is repeated 0-1 times.
(Press Ctrl + V, and then ?.)

<As>: Indicates the specified AS number.

.: Indicates any AS number.

unmatch

Displays routing information for the ASPATH attribute that does not match the specified AS path regular expression.

aspath-regexp

Displays routing information for the AS_PATH attribute that matches the specified extended regular expression. Note that path comparison applies to AS_SEQ, AS_SET, and AS_CONFED_SEQUENCE of the ASPATH attribute.

<Extended Regular Expression>

Specify this in extended regular expression. Enclose <Extended Regular Expression> in double quotations (").

For details on how to specify the extended regular expression, see "Configuration Guide Vol. 3, 14.1.2 (3) (d) Regular expressions".

community

Displays routing information with the Community attribute (when none has not been set).

Displays routing information with no Community attribute.

community <Community>...

Displays routing information with the specified Community attribute.

<Community>

Multiple communities can be specified.

Specify <Community> in the following format:

```
<Community> := { <Community-Number> | <Well-Known-Community> }
<Community-Number> := { AS number specification (AS:Community id, where AS = 0-65535 and
Community id = 0-65535) | Hexadecimal specification (0xhhhhhhhh, where h = 0-9 or a-f) }
<Well-Known-Community> := { no-export | no-advertise | local-AS }
```

exact

Displays only routing information that contains all the specified communities.

Behavior when this parameter is omitted:

Displays routing information that contains some of the specified communities.

community-regexp

Displays routing information with the Community attribute that matches the specified extended regular expression.

dampened-routes

Displays suppressed-routing information.

dampened-paths

> Displays suppressed-routing information.

flap-statistics

> Displays information about the routes on which flapping has occurred.

inconsistent-as

> Displays information about the routes on which AS path conflict has occurred (the routes whose destination network is the same, but whose source ASs are different).

paths

> Displays the ASPATH attribute of all the known routing information.

paths-regexp

> Displays the AS_PATH attribute that matches the specified extended regular expression. Note that path comparison applies to AS_SEQ, AS_SET, and AS_CONFED_SEQUENCE of the ASPATH attribute.

notification-factor [{<Peer Address> | <Host name>}]

> Displays the message that caused disconnection of the BGP4 connection.
>
> The packet contents are displayed, starting with the beginning of the BGP4 header.
>
> <Peer Address>
>
> > Displays the message, which was received from the specified peer, that caused disconnection.
>
> <Host name>
>
> > Displays the message, which was received from the specified host, that caused disconnection.
> >
> > Note that you cannot specify this parameter if vpnv4 vrf {<vrf id> | all} is specified.

stale

> Displays stale routing information received from the peers.
>
> The stale information is displayed on the receiving router only.

Behavior when each parameter is omitted:

> This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

> The routing information known by BGP4 in the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ip bgp [vpnv4 vrf {<vrf id> | all}] summary

Figure 7-50: Displaying the peering status of all peers

```
>show ip bgp summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP Peer        AS      Received    Sent        Up/Down             Status
172.18.109.21   200     32645       2973        20XX/07/12 01:27:11 Established
192.168.25.172  300     0           0           -                   Active
192.168.50.21   1800    2091        913         20XX/07/13 12:24:39 Established
>
```

Display items in Example 1

Table 7-35: Displayed peering status for all peers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	AS number of the router	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	ID of the router	—
BGP Peer	IP address for the peer	—
AS	AS number for the peer	—
Received	Number of received messages	—
Sent	Number of sent messages	—
Up/Down	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 2: show ip bgp [vpnv4 vrf {<vrf id> | all}] neighbors [<As> | <Peer Group>]

Figure 7-51: Displaying summary information about all peers

```
>show ip bgp neighbors
Date 20XX/01/26 12:00:00 UTC
Peer address      Peer AS  Local address      Local AS  Type      Status
192.168.16.1      1800     192.168.2.36       2735      External  Established
192.168.22.1      1810     192.168.23.214     2735      External  OpenConfirm
192.168.25.1      1802     192.168.242.214    2735      External  Active
>
```

Note: If <As> or <Peer Group> is specified, summary information about the peers that have the specified AS number or the specified peer group name is displayed.

Display items in Example 2

Table 7-36: Displayed summary information about all peers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Confederation ID[#1]	Confederation AS number	—
Member AS[#1]	Member AS number	—
Peer Address	IP address for the peer	—
Peer AS	AS number for the peer	—
Local Address	Local IP address	If the local IP address cannot be identified, unspecified is displayed.[#2]
Local AS	Local AS number	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established
…	Peer name	Displayed only when the peer name has been set in the configuration file.

#1: This item is displayed only in a confederation configuration.

#2: If the connections to peers are direct connections, information is displayed when the following conditions are satisfied:

- The interface used for peering is not up and running (for both external and internal peers).
- No TCP session has been established (for only internal peers).

Example 3: show ip bgp [vpnv4 vrf {<vrf id> | all}] neighbors [{<Peer Address> | <Host name> | detail}]

Figure 7-52: Displaying detailed information about a specific peer

```
>show ip bgp neighbors 192.168.22.1
 Date 20XX/01/26 18:43:00 UTC
 BGP Peer: 192.168.22.1, Remote AS: 65531
 Remote Router ID: 192.168.22.200, Peer Group: office10
    BGP Status: Active          HoldTime: 90, Keepalive: 30
    Established Transitions: 1   Established Date: 20XX/07/13 18:42:26
```

```
        BGP Version: 4                    Type: External
        Local Address: 192.168.23.214,  Local AS: 2735
        Local Router ID: 192.168.22.100
        Next Connect Retry: 00:32,        Connect Retry Timer: 00:32
        Last Keep Alive Sent: 18:42:20, Last Keep Alive Received: 18:42:20
        Graceful Restart: Both
         Restart Status : Finished    20XX/12/08 10:18:43
         Receive Status : Finished    20XX/07/13 18:42:29
          Stalepath Time: 30
        NLRI of End-of-RIB Marker: Advertised and Received
        BGP Message   UpdateIn UpdateOut TotalIn TotalOut
                    12        14        36        42
        BGP Peer Last Error: Cease
        BGP Routes   Accepted      MaximumPrefix RestartTime Threshold
                    94295          100000        none        75%
        BGP Capability Negotiation: <IPv4-Uni, GracefulRestart>
          Send   : <Refresh Refresh(v) IPv4-Uni, GracefulRestart(RestartTime:120s)>
          Receive: <IPv4-Uni, GracefulRestart(RestartTime:300s, IPv4-Uni)>
        Password : Configured
        BFD Name: -, BFD ID: -, BFD State: -
>
```

Note: If detail is specified, detailed information about all peers is displayed.

Display items in Example 3

Table 7-37: Displayed detailed information about a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Confederation ID[#1]	Confederation AS number	—
Member AS[#1]	Member AS number	—
BGP Peer	IP address for the peer	—
Remote AS	AS number for the peer	—
Remote Router ID	Router ID for the peer	Displays the ID for the connection-destination router "-" is displayed when no connection has been made
Peer Group	Peer group name	—
Description	Peer name	Displayed only when the peer name has been set in the configuration file.
BGP Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established
HoldTime	Hold time (seconds)	—

Display Items	Meaning	Displayed detailed information
Keepalive	Sending interval (seconds)	—
Established Transitions	Number of transitions to the Established status	—
Established Date	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
BGP Version	BGP4 version	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		Internal RRclient: Internal peer and route reflector client
		Internal RRclient no-client-reflect: Internal peer and route reflector non-client
		ConfedExt: Member AS peer
Local Address	Local IP address	If the local IP address cannot be identified, unspecified is displayed.[#2]
Local AS	Local AS number	—
Local Router ID	Local router ID	Displays the ID of the router.
Next Connect Retry	Time until the next retry for establishing the BGP4 connection (minute:second)	—
Connect Retry Timer	Current interval for retrying the connection (seconds)	—
Last Keep Alive Sent	Time the last KeepAlive message was sent (hour:minute:second)	—
Last Keep Alive Received	Time the last KeepAlive message was received (hour:minute:second)	—
Graceful Restart[#3]	Running mode of the graceful restart function	Restart: Runs as a restart router.
		Receive: Runs as the receiving router.
		Both: Runs as the restart router and receiving router.
Restart Status[#3]	Operating status and execution results as a restart router (the latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		—: Not executed.

Display Items	Meaning	Displayed detailed information
	Time the router went into operating status as a restart router	Date and time when the router went into operating status as a restart router (Date and time are not displayed if the operating status is "Not executed".)
Receive Status[#3]	Operating status and execution results as a receiving router (the latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		—: Not executed.
	Time the router went into operating status as a receiving router	Date and time when the router went into operating status as a restart router (Date and time are not displayed if the operating status is "Not executed".)
Stalepath-Time[#3]	Time until the remote router reaches route convergence since the router performs a graceful restart	—
NLRI of End-of-RIB Marker[#3]	Whether the End-of-RIB marker, which reports completion of route distribution, is sent/received	• Advertised and Received: The End-of-RIB marker is sent and received. • Advertised: The End-of-RIB marker is sent. • Received: The End-of-RIB marker is received. • None: The End-of-RIB marker is not sent or received.
BGP Message	Number of BGP4 messages exchanged by BGP4	—
UpdateIn	Number of UPDATE messages received from the peer	—
UpdateOut	Number of UPDATE messages sent to the peer	—
TotalIn	Total number of messages received from the peer	—
TotalOut	Total number of messages sent to the peer	—
BGP Peer Last Error	The latest detected error	The error code and sub-code are displayed by their names. • Message Header Error • Open Message Error • Update Message Error • Hold Timer Expired Error • Finite State Machine Error • Cease • Cease(Over prefix limit) • unspecified error • lost connection synchronization

Display Items	Meaning	Displayed detailed information
		• bad length • bad message type • unspecified error • unsupported version • bad AS number • bad BGP ID • unsupported authentication code • authentication failure • unspecified error • invalid attribute list • unknown well known attribute • missing well known attribute • attribute flags error • bad attribute length • bad ORIGIN attribute • AS loop detected • invalid NEXT_HOP • error with optional attribute • bad address/prefix field • AS path attribute problem
BGP Routes[#4]	Information related to maximum number of learned routes	—
Accepted[#4]	Number of routes learned from peers	Sum of the number of active routes and the number of inactive routes
MaximumPrefix[#4]	Upper limit value specifiable for the number of routes learned from peers	1 to 4294967295
RestartTime[#4]	Time from when peer is disconnected until reconnection is attempted	• time: The time is specified (in minutes). • none: The time is not specified (the peer will not be reconnected).
Threshold[#4]	Threshold value for outputting operation messages	—
(Warning-only)[#4]	Setting that the peer is not to be disconnected even if the number of learned routes exceeds the upper limit	—
BGP Capability	Capability information	—
negotiation	Negotiated Capability information	• IPv4-Uni: IPv4 unicast is supported. • Refresh: Route refresh is supported. • Refresh(v): Route refresh that uses the vender code (128) is supported. • GracefulRestart: The graceful restart function is supported.[#3]

Display Items	Meaning	Displayed detailed information
Send	Sent Capability information	• IPv4-Uni: IPv4 unicast is supported. • Refresh: Route refresh is supported. • Refresh(v): Route refresh that uses the vender code (128) is supported. • GracefulRestart(Restart Time): Time until a reconnection timeout occurs from when the router performs a graceful restart[3] • GracefulRestart(IPv4-Uni): AddressFamily for the graceful restart function is output.[3]
Receive	Received Capability information	• IPv4-Uni: IPv4 unicast is supported. • Refresh: Route refresh is supported. • Refresh(v): Route refresh that uses the vender code (128) is supported. • GracefulRestart(Restart Time): Restart time reported by the remote router[3] • GracefulRestart(IPv4-Uni): AddressFamily for the graceful restart function is output.[3]
Password	MD5 authentication	• Configured: MD5 authentication has been configured. • UnConfigure: MD5 authentication has not been configured.
BFD Name	Linked BFD setting name	If not linked to BFD, "-" is displayed.
BFD ID	Linked BFD ID	If not linked to BFD, "-" is displayed.
BFD State	Status of being notified by the BFD program about the linked BFD session	• Up: Up • Down: Down • Down (AdminDown): Administrative down (displayed when BFD is linked) • —: does not work with BFD If the BFD session status is Init, it is displayed as Down.

#1: This item is displayed only in a confederation configuration.

#2: If the connections to peers are direct connections, information is displayed when the following conditions are satisfied:

• The interface used for peering is not up and running (for both external and internal peers).

• No TCP session has been established (for only internal peers).

#3: This item is displayed only when the graceful restart function is being used.

#4: This item is displayed only when the function of restricting the number of learned routes is being used.

Example 4: show ip bgp [vpnv4 vrf {<vrf id> | all}] peer-group <Peer Group>

Displays peering information about the peers belonging to the specified peer group.

Figure 7-53: Displaying peering information for the policy group

```
>show ip bgp peer-group office
Date 20XX/01/26 12:00:00 UTC
Local AS: 100, Local Router ID: 10.10.10.20
BGP Peer       AS      Received    Sent      Up/Down              Status
```

```
192.168.10.21  65500 32645      2973        20XX/07/07 01:27:11  Established
192.168.25.172 65510 0          0           -                    Active
192.168.50.21  65530 2091       913         20XX/08/11 12:24:39  Established
>
```

Display items in Example 4

Table 7-38: Displayed peering information for the policy group

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation ID	—
Member AS[#2]	Member AS number (sub AS number)	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
AS	AS number for the peer	—
Received	Number of received messages	—
Sent	Number of sent messages	—
Up/Down	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 5: show ip bgp [vpnv4 vrf {<vrf id> | all}] [<Address> longer-prefixes]

Figure 7-54: Displaying routing information known by BGP4

```
>show ip bgp
Date 20XX/12/20 12:00:00 UTC
Local AS: 2735, Local Router ID: 192.168.32.1
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network           Next Hop       MED    LocalPref Weight Path
*> 172.16/16         192.168.16.1   0      100       0      1800 1239 i
```

```
*> 172.17/16          192.168.16.1    0     100      0      1800 1239 i
    :
*> 172.18.178/24      192.168.22.1    0     100      255    1810 690 i
*> 172.18.180/24      192.168.22.1    0     100      255    1810 690 i
    :
*> 192.168.88/24      192.168.25.1    0     100      200    1802 701 ?
*> 192.168.90.64/26   192.168.25.1    0     100      200    1802 701 ?
:
>
```

Note: If <Address> longer-prefixes is specified, the routing information contained in the specified network is displayed.

Display items in Example 5

Table 7-39: Displayed routing information known by BGP4

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCAL_PREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.

Display Items	Meaning	Displayed detailed information
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 6: show ip bgp [vpnv4 vrf {<vrf id> | all}] [-Faco] [<Address>]

Figure 7-55: Displaying the attribute of all routing information known by BGP4 in full format

```
> show ip bgp -F
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 192.168.212/24
*> Next Hop 192.168.30.172
    MED: 0, LocalPref: 100, Weight: 0, Type: Internal route
    Origin: IGP, IGP Metric: 3
    Path: 1800 600 300 1400 {700 900 1000}
    Aggregator: 400, 192.168.170.122
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
    Originator ID: 192.168.41.121
    Cluster List : 192.168.21.219 192.168.21.220
>
```

Display items in Example 6

Table 7-40: Displayed BGP4 route attribute (full format)

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS	Local AS number	—
Confederation ID[#]	Confederation AS number	—
Member AS[#]	Member AS number	—
Local Router ID[#]	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Route	Destination network of the route	Destination address/network mask

Display Items	Meaning	Displayed detailed information
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	The Local_Pref attribute of the route	—
Weight	Priority for the route	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
IGP Metric	Metric value for the IGP route	Metric value for the IGP route used for determining the next hop for the BGP route
Path	The ASPath attribute for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.

Display Items	Meaning	Displayed detailed information
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#: This item is displayed only in a confederation configuration.

Example 7: show ip bgp [vpnv4 vrf {<vrf id> | all}] <Address>

Figure 7-56: Displaying detailed information about the specific route known by BGP4

```
>show ip bgp 192.168.212.0/24
Date 20XX/12/20 12:00:00 UTC
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 192.168.212/24
*> Next Hop 192.168.30.172
    MED: 0, LocalPref: 100, Weight: 0, Type: Internal route
    Origin: IGP, IGP Metric: 3
    Path: 1800 600 300 1400 {700 900 1000}
    Aggregator: 400, 192.168.170.122
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
    Originator ID: 192.168.41.121
    Cluster List : 192.168.21.219
                   192.168.21.220
>
```

Display items in Example 7

Table 7-41: Displayed detailed information about a specific BGP4 route

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Confederation ID[#]	Confederation AS number	—
Member AS[#]	Member AS number	—
Local Router ID[#]	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Route	Destination network of the route	Destination address/network mask
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—

Display Items	Meaning	Displayed detailed information
LocalPref	The Local_Pref attribute of the route	—
Weight	Priority for the route	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
IGP Metric	Metric value for the IGP route	Metric value for the IGP route used for determining the next hop for the BGP route
Path	The ASPath attribute for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute.
		Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#: This item is displayed only in a confederation configuration.

Example 8: show ip bgp [vpnv4 vrf {<vrf id> | all}] received-routes summary

Figure 7-57: Displaying the number of BGP4 routes received from each peer

```
>show ip bgp received-routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP Peer         Active Dampened  Stale  Received   Peer AS Type
172.18.109.21    8       0        0       8          200    External
192.168.25.172   7       0        0       10         300    External
192.168.50.152   3       0        0       4          800    External
>
```

Display items in Example 8

Table 7-42: Displayed information about the number of BGP4 routes received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
Active	Number of received active routes	"-" is displayed if no peer has been established.
Dampened	Suppressed reachable routing information	—
Stale	Routes for which the source router is restarting (this item can be displayed on the receiving router only)	—
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 9: show ip bgp [vpnv4 vrf {<vrf id> | all}] [neighbors {<Peer Address> | <Host name>}] received-routes [-Faco] [<Address> [longer-prefixes]]

Figure 7-58: Displaying BGP4 route information received from a specific peer

```
>show ip bgp neighbors 192.168.50.152 received-routes
Date 20XX/12/20 12:00:00 UTC
BGP Peer: 192.168.50.152, Remote AS: 1800
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop         MED       LocalPref Path
*> 192.168.64/24    192.168.50.152   3         100       1800 100 200 i
*> 192.168.102/24   192.168.50.152   4         100       1800 100 600 500 i
*> 192.168.170/24   192.168.50.152   5         100       1800 100 {300 700} i
*> 192.168.210/24   192.168.50.152   3         100       1800 400 300 ?
>
```

Figure 7-59: Displaying detailed BGP4 routing information received from a specific peer

```
>show ip bgp neighbors 192.168.50.152 received-routes -F 192.168.64/24
Date 20XX/12/20 12:00:00 UTC
BGP Peer: 192.168.50.152, Remote AS: 1800
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 192.168.64/24
*> Next Hop 192.168.50.152
     MED: 2, LocalPref: 100, Type: Internal route
     Origin: IGP
     Path: 1800 100 200
     Next Hop Attribute: 192.168.60.150
     Aggregator: 400, 192.168.170.122
     <Atomic Aggregate>
     Communities: 600:30 1300:10 6600:1500 no-advertise
     Originator ID: 192.168.41.121
     Cluster List : 192.168.21.219 192.168.21.220
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Address> longer-prefixes is specified, the route information contained in the specified network is displayed.

Note 3: If the attribute of the route information in [-Faco], detailed information is displayed.

Display items in Example 9

Table 7-43: Displaying BGP4 routing information received from a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP Peer	IP address for the peer	—
Remote AS	AS number for the peer	—
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected

Display Items	Meaning	Displayed detailed information
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the \<limit\> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the received route	—
MED	The MED attribute for the received route[3]	—
LocalPref	The LOCALPREF attribute for the received route[3]	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the received route[3]	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the received route[3]	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the received route[3]	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.
Next Hop Attribute	The NextHop attribute value for the received route[3]	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
\<...\>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route[3]	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export

Display Items	Meaning	Displayed detailed information
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route[3]	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route[3]	This item is not displayed if there is no Cluster List attribute.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

#3: Information changed by route filtering is displayed.

Example 10: show ip bgp [vpnv4 vrf {<vrf id> | all}] routes summary

Figure 7-60: Displaying the number of valid BGP4 routes received from each peer

```
>show ip bgp routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP Peer        Active  Dampened  Stale  Received  Peer AS Type
172.18.109.21   8       0         0      8         200     External
192.168.25.172  7       0         0      10        300     External
192.168.50.152  3       0         0      4         800     External
>
```

Display items in Example 10

Table 7-44: Displayed information about the number of valid BGP4 routes received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[1]	Local AS number	—
Confederation ID[2]	Confederation AS number	—
Member AS[2]	Member AS number	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
Active	Number of received active routes	"-" is displayed if no peer has been established.
Dampened	Number of suppressed routes that were received	Suppressed reachable routing information
Stale	Number of stale routes that were received	Routes for which the source router is restarting (this item can be displayed on the receiving router only)

Display Items	Meaning	Displayed detailed information
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 11: show ip bgp [vpnv4 vrf {<vrf id> | all}] [{neighbors <Peer Address> | <Host name>}] routes [-Faco] [<Address> [longer-prefixes]]

Figure 7-61: Displaying valid BGP4 routing information received from a specific peer

```
>show ip bgp neighbors 192.168.50.152 routes
Date 20XX/12/20 12:00:00 UTC
BGP Peer: 192.168.50.152, Remote AS: 1800
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop        MED       LocalPref Weight Path
*> 192.168.64/24    192.168.50.152  0         -         0      1800 100 200 i
*> 192.168.102/24   192.168.50.152  0         -         0      1800 100 600 i
*> 192.168.170/24   192.168.50.152  0         -         0      1800 100 {700} i
*> 192.168.210/24   192.168.50.152  0         -         0      1800 400 300 ?
>
```

Figure 7-62: Displaying detailed information about valid BGP4 routing information received from a specific peer

```
>show ip bgp neighbors 192.168.50.152 routes -F 192.168.64/24
Date 20XX/12/20 12:00:00 UTC
BGP Peer: 192.168.50.152, Remote AS: 1800
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 192.168.64/24
*> Next Hop 192.168.50.152
    MED: 2, LocalPref: 100, Weight: 0, Type: Internal route
    Origin: IGP
    Path: 1800 100 200
    Next Hop Attribute: 192.168.60.150
    Aggregator: 400, 192.168.170.122
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
    Originator ID: 192.168.41.121
    Cluster List : 192.168.21.219 192.168.21.220
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Address> longer-prefixes is specified, the route information contained in the specified network is displayed.

Note 3: If the attribute of the route information in [-Faco], detailed information is displayed.

Display items in Example 11

Table 7-45: Displayed valid BGP4 route information received from a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP Peer	IP address for the peer	—
Remote AS	AS number for the peer	—
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router is restarting (this item can be displayed on the receiving router only)
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the sent route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE

Display Items	Meaning	Displayed detailed information
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.
Next Hop Attribute	The NextHop attribute value for the route	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 12: show ip bgp [vpnv4 vrf {<vrf id> | all}] advertised-routes summary

Figure 7-63: Displaying the number of BGP4 routes sent to each peer

```
>show ip bgp advertised-routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP Peer        Sent Route Peer AS Type
172.18.109.21   14         200    External
192.168.25.172  12         300    External
192.168.50.152  18         1800   External
>
```

Display items in Example 12

Table 7-46: Displayed information about the number of BGP4 routes sent to each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
Sent Route	Number of sent routes	"-" is displayed if no peer has been established
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 13: show ip bgp [vpnv4 vrf {<vrf id> | all}] [{neighbors <Peer Address> | <Host name>}] advertised-routes [-Faco] [<Address> [longer-prefixes]]

Figure 7-64: Displaying BGP4 route information sent to a specific peer

```
>show ip bgp neighbors 172.18.109.21 advertised-routes
Date 20XX/07/14 12:00:00 UTC
BGP Peer: 172.18.109.21, Remote AS: 200
Local AS: 17, Local Router ID: 10.10.10.20
Origin Codes: i - IGP, e - EGP, ? - incomplete
Network          Next Hop        MED     LocalPref Path
172.16.124/24    192.168.30.172  0       150       1800 1200 i
172.18.102/24    192.168.30.172  0       150       1800 600 500 i
:
>
```

Figure 7-65: Displaying detailed BGP4 route information sent to a specific peer

```
>show ip bgp neighbors 192.168.50.152 advertised-routes -F 192.168.64/24
Date 20XX/12/20 12:00:00 UTC
BGP Peer: 192.168.50.152, Remote AS: 1800
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 192.168.64/24
*> Next Hop 192.168.50.152
    MED: 0, LocalPref: 150, Type: Internal route
    Origin: IGP
    Path: 1800 100 200
    Next Hop Attribute: 192.168.50.152
    Aggregator: 400, 192.168.170.122
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
```

```
        Originator ID: 192.168.41.121
        Cluster List : 192.168.21.219 192.168.21.220
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Address> longer-prefixes is specified, the route information contained in the specified network is displayed.

Note 3: If the attribute of the route information in [-Faco], detailed information is displayed.

Display items in Example 13

Table 7-47: Displayed BGP4 routing information sent to a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP Peer	IP address for the peer	—
Remote AS[#1]	AS number for the peer	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local AS	Local AS number	—
Local Router ID	Local router ID	—
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	If routes other than BGP routes are advertised, "----" is displayed.
MED	The MED attribute for the sent route[#3]	—
LocalPref	LOCALPREF for the sent route[#3]	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the sent route[#3]	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the sent route[#3]	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the sent route[#3]	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

Display Items	Meaning	Displayed detailed information
Next Hop Attribute	The Next Hop attribute value for the sent route[3]	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route[3]	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route[3]	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route[3]	This item is not displayed if there is no Cluster List attribute.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

#3: Information changed by route filtering is displayed.

Example 14: show ip bgp [vpnv4 vrf {<vrf id> | all}] regexp <Aspath> [unmatch],show ip bgp [vpnv4 vrf {<vrf id> | all}] aspath-regexp <Extended Regular Expression>

Figure 7-66: Displaying BGP4 routing information that matches AS_PATH specified by an extended regular expression (^1800_ .*)

```
>show ip bgp aspath-regexp "^1800_.*"
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop          MED      LocalPref Weight Path
*> 192.168.74/24    192.168.60.152    0        -         0      1800 100 i
*> 192.168.102/24   192.168.60.152    0        -         0      1800 100 ?
*> 192.168.170/24   192.168.60.152    0        -         0      1800 100 i
*> 192.168.210/24   192.168.60.152    0        -         0      1800 100 30 i
>
```

Figure 7-67: Displaying BGP4 routing information that matches AS_PATH specified by an extended regular expression (^$: no AS_PATH)

```
>show ip bgp aspath-regexp "^$"
```

```
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network           Next Hop        MED       LocalPref Weight Path
*> 158.214.160/20    192.168.60.152  0         100       0      i
>
```

Display items in Example 14

Table 7-48: Displayed BGP4 routing information that matches AS_PATH specified by an extended regular expression

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 15: show ip bgp [vpnv4 vrf {<vrf id> | all}] community [none]

Figure 7-68: Displaying BGP4 routing information by using community filter

```
>show ip bgp community
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop        MED     LocalPref Weight Path
*> 192.168.122/24   192.168.50.152  0       -         0      100 200 i
*> 192.168.123/24   192.168.50.152  0       -         0      100 600 500 i
*> 192.168.124/24   192.168.50.152  0       -         0      100 700 300 i
>
```

Figure 7-69: Displaying BGP4 routing information by using communication filter (without community attributes)

```
>show ip bgp community none
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop        MED     LocalPref Weight Path
*> 192.168.122/24   192.168.50.152  0       100       0      (65200) 100 i
*> 192.168.123/24   192.168.50.152  0       100       0      (65200) 100 i
*> 192.168.124/24   192.168.50.152  0       100       0      (65200) 100 i
>
```

Display items in Example 15

Table 7-49: Displayed BGP4 routing information with community filter used

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length

Display Items	Meaning	Displayed detailed information
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 16: show ip bgp [vpnv4 vrf {<vrf id> | all}] community <Community>... [exact], show ip bgp [vpnv4 vrf {<vrf id> | all}] community-regexp <Extended Regular Expression>

Figure 7-70: Displaying BGP4 routing information when using an extended regular expression community filter

```
>show ip bgp community-regexp "_(100:15|no-export)_"
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network            Next Hop         MED     LocalPref Weight Path
*> 192.168.74/24      192.168.60.152  0        -          0      180 100 200 i
*> 192.168.102/24     192.168.60.152  0        -          0      180 100 500 i
*> 192.168.170/24     192.168.60.152  0        -          0      180 100 300 i
>
```

Note: If exact is specified in the "show ip bgp community <Community>" command, information for only the routes that have all specified communities is displayed.

Display items in Example 16

Table 7-50: Displayed BGP4 routing information when using an extended regular expression community filter

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[1]	Local AS number	—
Confederation ID[2]	Confederation AS number	—

Display Items	Meaning	Displayed detailed information
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the \<limit\> parameter of the "maximum routes" configuration command.
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 17: show ip bgp [neighbors {<Peer Address>|<Host name>}] dampened-routes [<Address> [longer-prefixes]], show ip bgp dampened-paths [<Address> [longer-prefixes]]

Figure 7-71: Displaying suppressed BGP4 route information

```
>show ip bgp neighbor 192.168.209.29 dampened-routes
Date 20XX/02/14 12:00:00 UTC
Status Codes: d dampened, h history, * valid, > active
  Network           Peer Address      ReUse
 d 172.21.211/24    192.168.209.29    00:07:11
 h 172.21.212/24    192.168.209.29    00:19:10
>
```

Note 1: If neighbor <Peer Address> is omitted, information about all peers is displayed.

Note 2: If longer-prefixes is specified, the route information contained in the specified network is displayed.

Note 3: If <Address> is specified, the route information that matches the specified network is displayed.

Display items in Example 17

Table 7-51: Displayed suppressed BGP4 routing information

Display Items	Meaning	Displayed detailed information
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		h history: Suppressed unreachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
Network	Destination network of the route	Destination address/network mask length
Peer Address	Address of the peer advertising the route	—
Reuse	Time to wait until the route can be reused (hour:minute:second)	—

Example 18: show ip bgp [neighbors {<Peer Address> | <Host name>}] flap-statistics [<Address> [longer-prefixes]]

Figure 7-72: Displaying flap information

```
>show ip bgp flap-statistics
Date 20XX/02/14 12:00:00 UTC
Status Codes: d dampened, h history, * valid, > active
  Network            Peer Address    Flaps     Duration ReUse    Penalty
 d 172.21.211/24     192.168.209.29  114       00:12:30 00:07:11 5.0
 h 172.21.212/24     192.168.209.29  108       00:12:30 00:19:10 4.0
 h 172.27.119/24     192.168.109.122 2         00:11:20          1.7
 h 172.27.191/24     192.168.109.122 2         00:11:20          1.7
*> 172.30.189/24     192.168.79.188  1         00:05:10          0.6
 h 172.30.192/24     192.168.79.188  3         00:05:10          0.6
>
```

Note 1: If neighbor <Peer Address> is omitted, information about all peers is displayed.

Note 2: If longer-prefixes is specified, the route information contained in the specified network is displayed.

Note 3: If <Address> is specified, the route information that matches the specified network is displayed.

Display items in Example 18

Table 7-52: Displayed flap information

Display Items	Meaning	Displayed detailed information
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		h history: Suppressed unreachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected

Display Items	Meaning	Displayed detailed information
Network	Destination network of the route	Destination address/network mask length
Peer Address	Address of the peer advertising the route	—
Flaps	Number of flaps that occurred	—
Duration	Time elapsed since the first flap occurred (hour:minute:second)	"*" is displayed for 100 hours or more.
Reuse	Time to wait until the route can be reused (hour:minute:second)	—
Penalty	Penalty value for the route	—

Example 19: show ip bgp [vpnv4 vrf {<vrf id> | all}] inconsistent-as

Figure 7-73: Displaying information about BGP4 routes on which AS path conflict has occurred

```
>show ip bgp inconsistent-as
Date 20XX/12/20 12:00:00 UTC
Local AS: 300, Local Router ID: 1.1.2.2
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network           Next Hop        MED     LocalPref Weight Path
*  192.168.124/24    172.18.115.201  0       100       0      1200 100 i
*> 192.168.124/24    192.168.50.112  0       150       255    1100 1300 i
*  192.168.102/24    172.18.115.201  0       100       0      1200 100 i
*> 192.168.102/24    192.168.50.112  0       150       255    1100 1300 i
>
```

Display items in Example 19

Table 7-53: Displayed information about the BGP4 routes on which AS path conflict has occurred

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command.

Display Items	Meaning	Displayed detailed information
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 20: show ip bgp paths [<Aspath> [unmatch]], show ip bgp paths-regexp <Extended Regular Expression>

This example shows how to display AS path information for the specific BGP4 paths that match using an extended regular expression.

Figure 7-74: Displaying information about the paths that match using an AS extended regular expression

```
>show ip bgp paths-regexp "^1800_600"
Date 20XX/07/14 12:00:00 UTC
Origin codes: i - IGP, e - EGP, ? - incomplete
ID     AS Path
8      1800 600 500 i
10     1800 600 500 e
12     1800 600 200 i
14     1800 600 500 ?
>
```

Note 1: If "Aspath" is omitted in the "show ip bgp paths" command, information about all AS paths is displayed.

Note 2: If unmatch is specified in the "show ip bgp paths" command, AS path information that does not match with the specified AS path is displayed.

Display items in Example 20

Table 7-54: Displayed information about the paths that match when using an AS extended regular expression

Display Items	Meaning	Displayed detailed information
ID	ID for managing AS path information	—

Display Items	Meaning	Displayed detailed information
AS Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

Example 21: show ip bgp [vpnv4 vrf {<vrf id> | all}] notification-factor

Figure 7-75: Displaying the message that caused disconnection of BGP4

```
> show ip bgp notification-factor
Date 20XX/07/14 12:00:00 UTC
Collection Time: 20XX/07/09 13:21:18
BGP Peer: 158.214.1.2 -> 158.214.1.1
Errors  : peer 158.214.1.1 (AS 400) UPDATE no nexthop found
Received Data:
  (0000)  ffff ffff  ffff ffff  ffff ffff  ffff ffff
  (0010)  002c 0200  0000 1140  0101 0040  020a 0402
  (0020)  0190 00c8  0301 00c8  13d3 0a00
  BGP Length: 44

Collection Time: 20XX/07/10 22:10:49
BGP Peer: 158.215.1.2 -> 158.215.1.1
Errors  : peer 158.215.1.1 (AS 500) strange message header length 16
Received Date   :
  (0000)  ffff ffff  ffff ffff  ffff ffff  ffff ffff
  (0010)  0010 0200  0000 1140  0101 0040  020a 0402
  (0020)  0190 00c8  0301 00c8  13d3 0a00
  BGP Length: 44
>
```

Display items in Example 21

Table 7-55: Displayed message that caused disconnection of BGP4

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Collection Time	Time the message was collected	—
BGP Peer	Remote device	—
Errors	Cause of disconnection	—
Received Data	Packet data that caused disconnection	The data is displayed starting with the beginning of the BGP header.
BGP Length	BGP data packet length	—

Example 22: show ip bgp [vpnv4 vrf {<vrf id> | all}] stale

Figure 7-76: Displaying information about stale routes known by BGP4

```
> show ip bgp stale
Date 20XX/02/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: > active, S Stale
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network            Next Hop        MED     LocalPref Weight Path
S> 192.168.64/24      192.168.50.152  0       -         0      1800 100 i
S> 192.168.102/24     192.168.50.152  0       -         0      1800 100 i
S> 192.168.170/24     192.168.50.152  0       -         0      1800 300 i
S> 192.168.210/24     192.168.50.152  0       -         0      1800 300 ?
>
```

Display items in Example 22

Table 7-56: Displayed information about stale routes known by BGP4

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
Network	Destination network of the route	Destination address/network mask length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCAL_PREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 23: show ip bgp [vpnv4 vrf {<vrf id> | all}] stale summary

Figure 7-77: Displaying the number of stale routes received from each peer

```
> show ip bgp stale summary
Date 20XX/02/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP Peer        Stale      Received    Peer AS Type
172.18.109.21   8          8           200     External
192.168.25.172  7          10          300     External
192.168.50.152  3          4           800     External
>
```

Display items in Example 23

Table 7-57: Displayed information about the number of stale routes received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
Stale	Number of stale routes that were received	Routes for which the source router, with graceful restart function, is restarting
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Impact on communication

None

Response messages

Table 7-58: List of response messages for the show ip bgp command

No.	Message	Description
1	BGP not active in vrf <vrf id>	BGP is not running in the specified VRF. <vrf id>: Specified VRF ID

No.	Message	Description
2	BGP not active.	BGP is not running.
3	BGP peer is not established(<Peer>)	The applicable peer has not been established. <Peer>: Peer address
4	BGP peer is not established(<Peer>) in vrf <vrf id>	The target peer has not been established in the specified VRF. <Peer>: Peer address <vrf id>: Specified VRF ID
5	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	illegal address	The specified character string for the address is invalid.
7	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid, or a host name and VRF were specified at the same time.
8	illegal extended regular expression parameter "<Parameter>"	The specified extended regular expression parameter is invalid. <Parameter>: Specified extended regular expression
9	illegal regexp parameter"<Parameter>"	The specified regexp parameter is invalid. <Parameter>: Specified regexp
10	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
11	no path attributes in database	The specified path attribute was not found.
12	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
13	no route	No route was found.
14	no route <IP Address>	The specified route was not found. <IP Address>: Specified network address
15	no route <IP Address> mask <Mask>	The specified route was not found. <IP Address>: Specified network address <Mask>: Specified network mask
16	no such peer address <Peer>	The specified peer was not found. <Peer>: Peer address
17	no such peer address <Peer> in vrf <vrf id>	The specified peer was not found in the specified VRF. <Peer>: Peer address <vrf id>: Specified VRF ID
18	no such peer group	The specified peer group was not found.

No.	Message	Description
19	no such peer group in vrf <vrf id>	The specified peer group was not found in the specified VRF. <vrf id>: Specified VRF ID
20	no such peers	No peer was found.
21	no such peers in vrf <vrf id>	No peer was found in the specified VRF. <vrf id>: Specified VRF ID
22	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
23	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

When you execute any of the following commands, the routes that are redistributed to BGP from other protocols are not included in the displayed routing information.

- show ip bgp [vpnv4 vrf {<vrf id> | all}]
- show ip bgp [vpnv4 vrf {<vrf id> | all}] received-routes
- show ip bgp [vpnv4 vrf {<vrf id> | all}] routes
- show ip bgp [vpnv4 vrf {<vrf id> | all}] {regexp|quote-regexp}
- show ip bgp [vpnv4 vrf {<vrf id> | all}] aspath-regexp
- show ip bgp [vpnv4 vrf {<vrf id> | all}] community
- show ip bgp [vpnv4 vrf {<vrf id> | all}] community-regexp
- show ip bgp [vpnv4 vrf {<vrf id> | all}] inconsistent-as

clear ip bgp [SL-L3A]

Disconnects BGP4 sessions. Also, the BGP4 sessions disconnected by the function of restricting the number of learned BGP4 routes are reconnected.

BGP4 routes are relearned and re-advertised. In addition, new BGP4 filter information is used to filter receiving and sending routes.

This command clears information about the BGP4 protocol.

Syntax

```
clear ip bgp [vrf {<vrf id> | all}]
                    { * | <Peer Group> | <Peer Address> | <Host name> }
clear ip bgp [vrf {<vrf id> | all}] * {in | out | both}
clear ip bgp [{<Peer Address> | <Host name>}]
                    dampening [<Address> [longer-prefixes]]
clear ip bgp [{<Peer Address> | <Host name>}]
                    flap-statistics [<Address> [longer-prefixes]]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all}

> Clears the BGP4 sessions and BGP4 information in VRFs. If <vrf id> is specified, this command applies to BGP4 for only the specified VRF. If all is specified, this command applies to BGP4 for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
>> The BGP4 sessions and BGP4 information in the global network are cleared.

{* | <Peer Group> | <Peer Address> | <Host name>}

> Disconnects BGP4 sessions temporarily. Note that the disconnected BGP4 sessions are automatically reconnected.
>
> The command also reconnects the BGP4 sessions disconnected by the function of restricting the number of learned BGP4 routes.
>
> *
>
>> This command applies to all peers.
>
> <Peer Group>
>
>> Specify a peer group name.
>>
>> You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".
>
> <Peer Address>
>
>> Specify the IP address of the peer in IPv4 format.
>
> <Host name>
>
>> Specify the host name. Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

* {in | out | both}

> Specify whether to relearn and/or re-advertise BGP4 routes for all peers.

in

Filters learn routes by using a new learning filter.

If the following conditions are met, the Route Refresh function is used to request the specified peer for redistributing routes.

- The "neighbor soft-reconfiguration" configuration command has not been set.
- The Route Refresh function is available.

out

- Uses a new advertisement filter and re-advertises BGP4 routes.
- The setting made by the "neighbor remove-private-as" configuration command is applied to operation.

both

Executes both in and out operations.

dampening

Clears route flap information including statistics. Note that executing the command with this parameter forcibly clears the suppressed state of routes.

flap-statistics

Clears route flap statistics (number of flaps occurred, time the flaps started to occur).

{<Peer Address>|<Host name>}

Clears only the route flap information for the route from the specified peer.

<Peer Address>

Specify the IP address of the peer. Specify this in IPv4 format.

<Host name>

Specify a host name. Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

Behavior when this parameter is omitted:

The route flap information for the routes from all peers is cleared.

<Address> [longer-prefixes]

Specifying the destination network for this parameter filters the routing information to be cleared.

<Address>

You can specify a value in any of the following formats:

- <IP Address>
- <IP Address> <Mask>
- <IP Address>/<Masklen>

For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

longer-prefixes

This command applies to the routing information included in the specified destination network. If no network mask has been specified for <Address>, the natural mask for <IP Address> is used as the network mask for filtering.

Behavior when this parameter is omitted:

This command applies to only the routing information that matches the specified destination network. If no network mask has been specified for <Address>, this command applies to the longest-match routing information for the specified <IP Address>.

Operation when a stack configuration is used

- The command can disconnect BGP4 sessions only for the master switch.
- The BGP4 sessions disconnected by the function of restricting the number of learned BGP4 routes can be reconnected only for the maser switch.
- The command can relearn and re-advertise BGP4 routes only for the master switch.
- The command can filter the receiving and sending routes by using new BGP4 filter information only for the master switch.
- The command can clear valid information only on the master switch.

Example

Figure 7-78: Disconnecting sessions for all peers
```
>clear ip bgp *
>
```
Figure 7-79: Re-advertisement for all peers
```
>clear ip bgp * out
>
```
Figure 7-80: Clearing flap information
```
>clear ip bgp dampening
>
```
Figure 7-81: Clearing flap statistics
```
>clear ip bgp flap-statistics
>
```

Display Items

None

Impact on communication

- If the {in | out | both} parameters are omitted, the sessions with the peers are temporarily disconnected, and the routes learned from those peers are deleted. Therefore, communications to those destinations are stopped while relearning is being performed. Also, the BGP4 sessions disconnected by the function of restricting the number of learned BGP4 routes are reconnected.
- If the {in | out | both} parameters are specified, routes are reselected in accordance with the newly set route filter. Therefore, communications might be stopped or communication paths might be changed, depending on the setting of the route filter. Also, because routes are reselected by relearning and re-advertisement of BGP4 routes, communication paths might be changed.
- If the dampening parameter is specified, routes are reselected after the suppressed state of the suppressed routes is released. Therefore, communication paths might be changed.

Response messages

Table 7-59: List of response messages for the clear ip bgp command

No.	Message	Description
1	BGP not active in vrf <vrf id>	BGP4 is not running in the specified VRF. <vrf id>: Specified VRF ID
2	BGP not active.	BGP4 is not running.
3	BGP peer is not established(<Peer>)	The applicable peer could not be cleared because it had not been established.

No.	Message	Description
		\<Peer\>: Applicable peer address
4	can't clear BGP session	A BGP4 session could not be cleared.
5	can't clear dampened routes.	Suppressed dampened routes could not be cleared.
6	can't clear flap-statistics	BGP flap statistics could not be cleared.
7	can't refresh BGP route	Re-advertisement or relearning of BGP4 routes failed. Check the peer status or the advertised result of peer performance.
8	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
9	illegal address	The specified character string for the address is invalid.
10	illegal parameter or cannot specify hostname with VRF	The specified character string for the address is invalid, or a host name and VRF were specified at the same time.
11	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
12	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
13	no route \<IP Address\>	The specified route was not found. \<IP Address\>: Specified network address
14	no such peer	The specified peer was not found.
15	no such peers	No peer was found in the specified AS.
16	no such peers in vrf \<vrf id\>	No peer was found in the specified VRF. \<vrf id\>: Specified VRF ID
17	no such VRF \<vrf id\>	The specified VRF was not found. \<vrf id\>: Specified VRF ID
18	program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error
19	The command cannot be executed because the configuration command being applied. Wait a while, and then try again.	The command cannot be executed because the configuration related to the unicast routing program is being applied. Wait a while, and then retry the operation.
20	unspecified peer address or parameter	No peer address or parameter is specified.

Notes

None

230

show ip static

Displays information about the static setting.

Syntax

```
show ip static [vrf {<vrf id> | all}] { route [<Address>] |
                            gateway [{ <Gateway-Address> | <Host name> }] }
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays static information for VRFs. If <vrf id> is specified, static information for only the specified VRF is displayed. If all is specified, static information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Static information about the global network is displayed.

route

> Displays the statically learned routing information.

<Address>

> Specify the destination network to display routing information only for the specified destination network.

> You can specify a value in <Address> in either of the following formats:

> • <IP Address> <Mask>

> • <IP Address> / <Masklen>

> For <IP Address>, specify the destination address. For <Mask> and <Masklen>, specify the network mask. For <IP Address> and <Mask>, use an IPv4 address. For <Masklen>, specify a value in the range from 0 to 32.

> Behavior when this parameter is omitted:

>> All routing information is displayed.

gateway

> Displays the statically learned routing information for each gateway.

{<Gateway-Address> | <Host name>}

> Displays routing information only for the specified gateway or host.

> <Gateway-Address>

>> Specify the gateway address in IPv4 format.

> <Host name>

>> Specify the host name.

>> Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

> Behavior when this parameter is omitted:

>> Routing information for all gateways is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ip static [vrf {<vrf id> | all}] route <Address>

Figure 7-82: Displaying static routes

```
>show ip static route
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination        Next Hop        Distance Weight Status     Flag
*> 101/8              158.214.17.100  2        10     -          NoResolve
                      158.214.17.102  2        0      Act Reach  Poll NoResolve
                      158.214.17.101  2        0      IFdown     Poll NoResolve
*> 102/8              112.214.7.22    10       0      Act UnReach Poll NoResolve
   104/8              134.22.4.10     255      0      UnReach    Poll Disable
*> 105/8              192.168.5.101   2        0      Act Reach  Poll
*> 172.16.20/24       210.1.1.22      2        255    Act        -
>

>show ip static route 102/8
Date 20XX/07/14 12:00:00 UTC
Status Codes: * valid, > active
   Destination        Next Hop        Distance Weight Status     Flag
*> 102/8              112.214.7.22    10       0      Act UnReach Poll NoResolve
>
```

Note: For a multipath route, only NextHop and Interface are displayed for the second and subsequent paths.

Display items in Example 1

Table 7-60: Displayed static route information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "maximum routes" configuration command. [SL-L3A]
Destination	Destination network	Destination address/network mask length
Next Hop	Next hop address	Static route gateway address (next hop address or interface set in configuration mode)
Weight	Next hop priority	—
Distance	Route distance value	—
Status	Route status	• Act (Route that is currently selected)
		• Reach (The route is reachable by dynamic monitoring.) • UnReach (The route is not reachable by dynamic monitoring.)

Display Items	Meaning	Displayed detailed information
		• IFdown (The interface has gone down.)
		• — (Route that is not currently selected)
Flag	Static route attribute	• Poll (Polling for checking reachability is enabled.)
		• NotInstall (Route information is not registered in the kernel.)
		• Disable (The route is disabled by configuration.)
		• Reject (The route is rejected.)
		• — (Polling is not enabled.)
		• NoResolve (Only direct routes are used to resolve the next hop.)

Example 2: show ip static [vrf {<vrf id> | all}] gateway [{<Gateway-Address> | <Host name>}]

Figure 7-83: Displaying static routes for each gateway

```
>show ip static gateway
Date 20XX/07/14 12:00:00 UTC
Gateway         Status  Success     Failure     Transition
112.21.1.2      -       -           -           -
112.21.1.5      IFdown  -           -           -
162.24.1.13     UnReach 2/6         -           13m 39s
172.167.202.22  Reach   -           0/10        12h 24m
172.167.202.23  Reach   -           2/10        48m 53s
183.15.210.4    UnReach 0/6         -            9h 46m
192.168.5.101   Reach   -           5/10        23h 32m
192.168.6.101   UnReach 5/6         -            9m  3s
>
>show ip static gateway 192.168.6.101
Date 20XX/07/14 12:00:00 UTC
Gateway         Status  Success     Failure     Transition
192.168.6.101   UnReach 5/6         -            9m  3s
>
```

Display items in Example 2

Table 7-61: Displayed static route information for each gateway

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Gateway	Destination network	Gateway address for the static route
Status	Route status	• Reach (The route is reachable by dynamic monitoring.) • UnReach (The route is not reachable by dynamic monitoring.)
		• IFdown (The interface has gone down.)
Success	Number of successive successful pollings	Number of successive successful pollings/set recover-count value

Display Items	Meaning	Displayed detailed information
Failure	Number of successive polling failures	Number of successive polling failures/set pollcount value
Transition	Elapsed time	Time elapsed since the NextHop status last changed

Impact on communication

None

Response messages

Table 7-62: List of response messages for the show ip static command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address	The specified address is invalid.
3	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid, or a host name and VRF were specified at the same time.
4	IP routing is not configured	The routing protocol has not been set. Check the configuration.
5	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	no such gateway	The specified gateway was not found.
7	no such gateway in vrf <vrf id>	The specified gateway was not found in the specified VRF. <vrf id>: Specified VRF ID
8	no such route	The specified route was not found.
9	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
10	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
11	static entry not found	No static route was found.

Notes

None

clear ip static-gateway

Performs polling for the gateways on the routes that were disabled by dynamic monitoring of static routes, and generates routes if the gateway responded.

Syntax

```
clear ip static-gateway [vrf {<vrf id> | all}]
                { * | <Gateway-address> | <Host name>}
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Performs polling for gateways in VRFs, and generates routes. If <vrf id> is specified, this command applies to the gateways for only the specified VRF. If all is specified, this command applies to the gateways for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Polling is performed for gateways in the global network, and routes are generated.

*

> Performs polling for all gateways, and generates routes.

<Gateway-Address>

> Performs polling for the specified gateway, and generates the route. Specify the gateway address in IPv4 format.

<Host name>

> Performs polling for the specified host, and generates the route. Specify the host name.

> Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

Operation when a stack configuration is used

The command can perform polling only on the master switch.

Example

Figure 7-84: Polling for all static gateways
```
>clear ip static-gateway *
>
```
Figure 7-85: Polling for the specified static gateway
```
>clear ip static-gateway 192.168.79.188
>
```

Display Items

None

Impact on communication

If a static route is generated, communication paths might be changed.

Response messages

Table 7-63: List of response messages for the clear ip static-gateway command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid, or a host name and VRF were specified at the same time.
3	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
5	no such gateway	The specified gateway was not found.
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ip vrf [SL-L3A]

Displays IPv4 information (such as the number of routes and interface status) in VRFs.

Syntax

```
show ip vrf {<vrf id> | global | all} [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | global | all}

Displays IPv4 information for VRFs. If <vrf id> is specified, this command applies to the specified VRF only. If global is specified, this command applies to the global network only. If all is specified, this command applies to all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

detail

Displays detailed IPv4 information in VRFs.

Behavior when this parameter is omitted:

A summary of VRF IPv4 information is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1

Figure 7-86: Displaying summary information for all VRF information

```
>show ip vrf all
Date 20XX/12/20 12:00:00 UTC
VRF             Routes        ARP
global          12/100        12/100
10              7/30          7/50
>
```

Display items in Example 1

Table 7-64: Displayed summary information about all VRF information

Display Items	Meaning	Displayed detailed information
VRF	VRD ID	—
Routes	Number of routes in the VRF	Number of routes in the VRF/Upper limit of the number of routes set in the configuration "-" is displayed if the upper limit is not set in the configuration.
ARP	Number of ARPs in a VRF	Number of ARPs in a VRF/Upper limit of the number of ARPs set in the configuration "-" is displayed if the upper limit is not set in the configuration.

Example 2

Figure 7-87: Displaying detailed information about all VRF information

```
>show ip vrf all detail
Date 20XX/12/20 12:00:00 UTC
VRF: global
  Maximum routes: 100, Warn threshold: 70%, Current routes: 12
  Maximum ARP entries: 100, Current ARP entries: 12
  Import inter-vrf: Match_Ext
Interface
Name            Local              Remote          Status
VLAN0009        128.1.1.1/24       128.1.1.255     Up
localhost       127.0.0.1/8        127.0.0.1       Up

VRF: 10
  Maximum routes: 50, Warn threshold: 70%, Current routes: 10
  Maximum ARP entries: 30, Current ARP entries: 10
  Import inter-vrf: FLT_SET
Interface
Name            Local              Remote          Status
VLAN0010        192.168.10.1/24    192.168.10.255  Up
localhost       127.0.0.1/8        127.0.0.1       Up

VRF: 20
  Maximum routes: 10, Warning only, Current routes: 5
  Maximum ARP entries: 10, Current ARP entries: 5
  Import inter-vrf: FLT_EXT1
Interface
Name            Local              Remote          Status
VLAN0015        172.16.1.100/16    172.16.255.255  Up
localhost       127.0.0.1/8        127.0.0.1       Up
>
```

Display items in Example 2

Table 7-65: Displayed detailed information about a specific VRF

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	—
Maximum routes	Upper limit of the number of VRF routes set in the configuration	The value specified by the <limit> parameter of the "maximum routes" configuration command "-" is displayed if the upper limit is not set in the configuration.
Warn threshold	Threshold value for outputting operation messages	Displayed when the <warn threshold> parameter of the "maximum routes" configuration command is set.
Warning only	Specifying not to discard routes when the number of routes exceeds the upper limit	Displayed when the warn-only parameter of the "maximum routes" configuration command is set.
Current routes	Number of routes in the VRF	—
Maximum ARP entries	Upper limit of the number of VRF ARPs set in the configuration	"-" is displayed if the upper limit is not set in the configuration.
Current ARP entries	Number of ARPs in a VRF	—
Import inter-vrf	Filter name	—
Name	Interface name	—

Display Items	Meaning	Displayed detailed information
Local	Interface address and mask length	—
Remote	Remote address	For broadcast: Broadcast address
Status	Interface status	Up
		Down

Impact on communication

None

Response messages

Table 7-66: List of response messages for the show ip vrf command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
5	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ip interface ipv4-unicast

Displays information about the interfaces, on the Switch, recognized by the unicast routing program.

Syntax

```
show ip interface ipv4-unicast [{<interface type> <interface number> | <index>}]
```

Input mode

User mode and administrator mode

Parameters

{<interface type> <interface number> | <index>}

<interface type> <interface number>

Displays detailed information about the applicable interface.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface
- Null interface
- Management port

<index>

If this parameter is specified, detailed information about the applicable interface is displayed.

For <index>, specify the index number assigned to the interface.

The index number can be displayed in the list of interfaces (with no parameter specified).

Behavior when this parameter is omitted:

Summary information about all interfaces is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1

Figure 7-88: Displaying summary information about all interfaces

```
>show ip interface ipv4-unicast
Date 20XX/07/14 12:00:00 UTC
#Index Name            Local             Remote          Flags
#1     VLAN0010        158.214.2.64/24   158.214.2.255   Up Broadcast
#3     VLAN0012        192.168.214.22/24 170.32.21.34    Up Broadcast
#2564  localhost       127.0.0.1/8       127.0.0.1       Up Loopback
>
```

Display items in Example 1

Table 7-67: Displayed summary information about all interfaces

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Index	Index number	—
Name	Interface name	—
Local	Interface address and mask length	—
Remote	Remote address	For broadcast: Broadcast address
Flags	Interface flag	Up
		PointToPoint
		Broadcast
		Loopback
		Allmulti
		NoRoute
		NoAge
		Delete
		Null

Example 2

Figure 7-89: Displaying detailed information about the specific interface

```
>show ip interface ipv4-unicast vlan 10
Date 20XX/07/14 12:00:00 UTC
VLAN0010 Index: 1
Change: <>      State: <Up Broadcast>
Refcount: 2     Up-down Transitions: 0
INET 192.168.0.64 Metric: 0      MTU: 1500
   Refcount: 3  Distance: 0  Down: 120
   Change: <>   State: <Up Broadcast>
   Broadcast Address: 192.168.0.255   Local Address: 192.168.0.64
   Subnet Number: 192.168             Subnet Mask: 255.255.255
   Route: 192.168/24
   Autonomous System: 0
   Routing Protocol Active:  RIP
     Protocol: RIP    Metric In: 1   Metric Out: 0   State: <>
>
```

Display items in Example 2

Table 7-68: Displayed detailed information about a specific interface

Display Items	Meaning	Displayed detailed information
—	Interface name	—
Index	Index number	—
Change	Status of the interface change	Refresh: No change Add: Addition of the interface Delete: Deletion of the interface

Display Items	Meaning	Displayed detailed information
		UpDown: Change to the interface status
		Netmask: Change in the network mask
		Metric: Change in the metric
		Broadcast: Change in the broadcast address or the address of the remote device
		MTU: Change in the MTU length
		Address: Change in the local or link-level address
State	Status of the interface	Up
		PointToPoint
		Broadcast
		Loopback
		Allmulti
		NoRoute
		NoAge
		Delete
		Null
Refcount	Reference counter	—
Up-down Transitions	Number of interface status changes	Number of times the interface changed from up status to down status
Interface address	Interface type and address	UNSPEC: Not specified. INET: IPv4 address LINK: Link layer

The following items are displayed for each address:

Display Items	Meaning	Displayed detailed information
Metric	Interface metric	—
MTU	Maximum send data length (bytes)	"-" is displayed when the interface is in the down status.
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Refcount	Reference counter	—
Distance	Distance of the routing information when the interface is in the up status	—
Down	Distance of the routing information when the interface is in the down status	—
Change	Status of the address change	See the above item Change.
State	Status of the address	See the above item State.

Display Items	Meaning	Displayed detailed information
Broadcast Address	Broadcast address	—
Local Address	Local address	—
Subnet Number	Subnet address	—
Subnet Mask	Subnet mask	—
Route	Routing information	Destination address/mask length
Autonomous System	AS number	—
Routing Protocols Active	Running routing protocol	OSPF
		RIP This is not displayed for the RIP interface for which passive-interface has been set by the configuration command.
		Any

The following items are displayed for each routing protocol:

Protocol	Protocol name	—
Metric In	Metric added to the routing information received from RIP	—
Metric Out	Metric added to the routing information sent by RIP	—
State	RIP protocol information flag	MetricIn: The MetricIn field is enabled. MetricOut: The MetricOut field is enabled. NoOut: Does not send RIP packets. V2Multicast: Handles RIP-2 packets with a multicast address. V2Broadcast: Handles RIP-2 packets with the broadcast address.
	OSPF protocol information flag	AllSPF: Handles OSPF packets with the AllSPF multicast address. AllDR: Handles OSPF packets with the AllDR multicast address.

Impact on communication

None

Response messages

Table 7-69: List of response messages for the show ip interface ipv4-unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such interface"<interface name>"	The specified interface has not been set. <interface name>: Name assigned to the specified interface
5	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

debug ip

Displays, in real time for each protocol, the routing packets that the unicast routing program sends and receives. Pressing Ctrl + C ends the display, and you are returned to the command prompt. This command cannot be used concurrently by multiple users.

Syntax

```
debug ip { all | <Protocol> } [summary]
```

Input mode

User mode and administrator mode

Parameters

all

Displays sent and received packets for all protocols (RIP, OSPF, and BGP4).

<Protocol>

Displays sent and received packets for the specified protocol.

For <Protocol>, specify rip, bgp, or ospf.

You can specify multiple protocols at the same time.

summary

Specifies to display summary information (header information) about sent and received packets.

Behavior when this parameter is omitted:

Detailed information about packets is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 7-90: Displaying summary information about routing packets

```
>debug ip ospf summary
OSPF SENT 192.1.1.1(-) -> 224.0.0.5  Hello  Vers: 2  Len: 48
OSPF SENT 192.1.1.1(-) -> 224.0.0.5  Hello  Vers: 2  Len: 48
^C
>
```

Figure 7-91: Displaying detailed information about routing packets

```
>debug ip ospf
OSPF SENT 192.1.1.1(-) -> 224.0.0.5  Hello  Vers: 2  Len: 48
OSPF SENT RouterID: 1.1.1.1  Area: 0.0.0.0  Checksum: 0x748e
OSPF SENT Auth: Type: 0 Key: 00000000.00000000
OSPF SENT Netmask: 255.255.255  Hello Int: 10   Options: <Externals>
OSPF SENT Pri: 1    DeadInt: 40   DR: 192.1.1.2       BDR: 192.1.1.1

OSPF SENT Attached routers:     2.2.2.2
OSPF RECV 192.1.1.2(-) -> 224.0.0.5  Hello  Vers: 2  Len: 48
OSPF RECV RouterID: 2.2.2.2  Area: 0.0.0.0  Checksum: 0x748e
OSPF RECV Auth: Type: 0 Key: 00000000.00000000
OSPF RECV Netmask: 255.255.255  Hello Int: 10   Options: <Externals>
OSPF RECV Pri: 1    DeadInt: 40   DR: 192.1.1.2       BDR: 192.1.1.1
OSPF RECV Attached routers:     1.1.1.1
^C
>
```

Display Items

If the following message is displayed on the screen, then this probably indicates that routing packets for each protocol could not be displayed because the send and reception buffer for the "debug ip" command was full:

```
An illegal PACKET-MONITOR packet has been received
```

Impact on communication

Because load on the unicast routing program increases, handling a lot of routes might adversely affect route control. Do not use this command in normal operation.

Response messages

Table 7-70: List of response messages for the debug ip command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
5	Sorry, there is another packet-monitor command	This command has already been executed.

Notes

A message is output every time a routing packet for the specified routing protocol is sent or received. Do not output such messages to a file by using redirection.

8

IPv4 Multicast Routing Protocols

show ip mcache

Displays a list of multicast forwarding entries.

Syntax

```
show ip mcache [vrf {<vrf id> | all}] [source <ip address>[/<length>]]
               [group <ip address>[/<length>]] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the VRF multicast forwarding entry information.
>
> If <vrf id> is specified, multicast forwarding entry information only for the specified VRF is displayed. If all is specified, multicast forwarding entry information for all VRFs including the global network and for the total number of VRFs are displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Displays the multicast forwarding entry information for the global network.

source <ip address>[/<length>]

> Displays addresses that match the specified source address.
>
> If source <ip address>[/<length>] is specified, all the entries that match the specified address for the mask length specified for <length> are displayed.
>
> The default value when <length> is omitted is 32.
>
> If this parameter and the group parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

group <ip address>[/<length>]

> Displays addresses that match the specified group address.
>
> If group <ip address>[/<length>] is specified, all the entries that match the specified address for the mask length specified for <length> are displayed.
>
> The default value when <length> is omitted is 32.
>
> If this parameter and the source parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

> Displays multicast forwarding entries in summary format.
>
> Behavior when this parameter is omitted:
>
> > Displays multicast forwarding entries in standard format.

Behavior when each parameter is omitted:

> This command can display only information relevant to the condition applied by a parameter that has been set.
>
> If the parameter has not been set, information is displayed with no condition applied.
>
> If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays all multicast forwarding entries for the global network in standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 8-1: Displaying multicast forwarding entries

```
> show ip mcache
Date 20XX/04/10 16:40:59 UTC
Total: 2 routes
- Forwarding entry -------------------------------------------------------
Group Address    Source Address  Flags  Uptime    Expires
226.0.0.1        10.8.0.100             00:34     00:26
     incoming:
         VLAN0012(10.6.0.10)
     outgoing:
         register
         VLAN0021(10.3.0.100)
- Negative cache --------------------------------------------------------
Group Address    Source Address  Flags  Uptime    Expires
226.0.0.2        10.8.0.100             00:57     02:30
     incoming:
         VLAN0012(10.6.0.10)
>

> show ip mcache vrf 20
Date 20XX/04/10 16:41:03 UTC
VRF: 20  Total: 1 route
- Forwarding entry -------------------------------------------------------
Group Address    Source Address  Flags  Uptime    Expires
226.0.0.1        10.8.0.100             00:32     09:28
     incoming:
         VLAN0011(10.6.0.11)
     outgoing:
         register
         VLAN0021(10.3.0.100)
>

> show ip mcache brief
Date 20XX/04/10 16:41:10 UTC
Total: 2 routes
- Forwarding entry -------------------------------------------------------
Group Address    Source Address  Incoming                Outgoing Count
226.0.0.1        10.8.0.100      VLAN0012(10.6.0.10)                   2
- Negative cache --------------------------------------------------------
Group Address    Source Address  Incoming
226.0.0.2        10.8.0.100      VLAN0012(10.6.0.10)
>
```

Display Items

Table 8-1: Displayed multicast forwarding entries information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Number of entries	—
Warning [SL-L3A]	Warning display	"Multicast forwarding entry is discarded for limit" is displayed when an entry is being discarded due to a restriction on the number of IPv4 multicast forwarding entries.

Display Items	Meaning	Displayed detailed information
		If "ip pim nonstop-forwarding" and "ip pim multiple-negative-cache" configuration commands are set at the same time, the message "Multiple-negative-cache is invalid because the nonstop-forwarding is setting" is displayed as a warning that ip pim multiple-negative-cache is not running.
Notice	Warning	In a stack configuration with "ip pim nonstop-forwarding" configuration command set, the message "Learning of IPv4 multicast forwarding entries is in progress because a master switch switchover occurred. (remaining time = <time> seconds)" is displayed while learning the IPv4 multicast forwarding entry after switching the master switch. <time>: Time until learning ends (seconds)
Group Address	Destination group address	—
Source Address	Source address	—
Flags [SL-L3A]	Flag information	U: Upstream VRF of the extranet D: Destination VRF of the extranet
Uptime	Time elapsed since the multicast forwarding entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. However, "1day", "2days", ... are displayed if the time is 24 hours or more. The timer is automatically updated every 30 seconds.
Expires	Multicast forwarding entry aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. The timer is automatically updated every 30 seconds. The multicast forwarding entry might be deleted before the aging time becomes zero. "--:--" is displayed if a timeout will not occur.
Incoming	Upstream interface	Interface name (address) "register" is displayed for an interface for decapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.
outgoing	Downstream interface	Interface name (address) "register" is displayed for an interface for encapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "<snooping>" is displayed if IGMP snooping is running.
Outgoing Count	Number of downstream interfaces	—

Impact on communication

None

Response messages

Table 8-2: List of response messages for the show ip mcache command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address	The specified address is invalid. Check the specified address.
3	illegal vrf number \<vrf id>	The specified VRF is invalid. \<vrf id>: VRF ID
4	no such VRF \<vrf id>	PIM is not running on the specified VRF. \<vrf id>: VRF ID
5	program error occurred: \<error message>	A program error occurred. Re-execute the command. \<error message>: Location of the error
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
7	Unknown command "\<command>"	The specified command is invalid. \<command>: Specified command name

Notes

None

show ip mroute

Displays PIM-SM or PIM-SSM multicast route information.

Syntax

```
show ip mroute [vrf {<vrf id> | all}] [source <ip address>[/<length>]]
               [group <ip address>[/<length>]] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays VRF multicast route information.

If <vrf id> is specified, multicast route information only for the specified VRF is displayed. If all is specified, multicast route information for all VRFs including the global network, and for the total number of VRFs multicast routes, are displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays multicast route information for the global network.

source <ip address>[/<length>]

Displays addresses that match the specified source address.

If source <ip address>[/<length>] is specified, all the entries that match the specified address for the mask length specified for <length> are displayed.

The default value when <length> is omitted is 32.

If this parameter and the group parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

group <ip address>[/<length>]

Displays addresses that match the specified group address.

If group <ip address>[/<length>] is specified, all the entries that match the specified address for the mask length specified for <length> are displayed.

The default value when <length> is omitted is 32.

If this parameter and the source parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

Displays PIM-SM or PIM-SSM multicast route information in summary format.

Behavior when this parameter is omitted:

Displays PIM-SM or PIM-SSM multicast route information in standard format.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied.

If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays all PIM-SM or PIM-SSM multicast route information for the global network in standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 8-2: Displaying PIM-SM multicast route information

```
> show ip mroute
Date 20XX/12/10 16:40:10 UTC
Total: 5 routes, 2 groups, 4 sources

(S,G) 4 routes  ------------------------------------------------------------
Group Address    Source Address    Protocol Flags  Uptime  Expires  Assert
224.1.1.1        200.1.1.100       SM       F       02:32   03:30    00:00
    incoming: VLAN0010(200.1.1.1)  upstream: Direct  reg-sup: 30s
    outgoing: register  uptime 02:32  expires --:--

230.10.10.10     190.10.10.10      SSM      L       01:10   --:--    00:00
    incoming: VLAN0016(210.1.1.1)  upstream: 210.1.1.10
    outgoing: VLAN0010(200.1.1.1)  uptime 01:10  expires  --:--

230.10.10.10     190.20.20.20      SSM      L       01:10   --:--    00:00
    incoming: VLAN0016(210.1.1.1)  upstream: 210.1.1.10
    outgoing: VLAN0010(200.1.1.1)  uptime 01:10  expires  --:--

230.10.10.10     190.30.30.30      SSM      L       01:10   --:--    00:00
    incoming: VLAN0016(210.1.1.1)  upstream: 210.1.1.10
    outgoing: VLAN0010(200.1.1.1)  uptime 01:10  expires  --:--

(*,G) 1 route   ------------------------------------------------------------
Group Address    RP Address        Protocol Flags  Uptime  Expires  Assert
224.1.1.1        1.1.1.1           SM       LR      03:20   03:26    00:00
    incoming: register  upstream: This System
    outgoing: VLAN0010(200.1.1.1)  uptime 03:20  expires --:--
              VLAN0016(210.1.1.1)  uptime 01:04  expires 03:26
>
> show ip mroute vrf 20
Date 20XX/12/10 16:40:25 UTC
VRF: 20 Total: 1 route , 1 group , 1 source

(S,G) 1 route ------------------------------------------------------------
Group Address    Source Address    Protocol Flags  Uptime  Expires  Assert
226.0.0.1        10.8.0.100        SM       FV      00:17   03:13    00:00
    incoming: global                   upstream: Extra  reg-sup: 0s
    outgoing: register                 uptime 00:17  expires --:--
              VLAN0021(10.3.0.100)     uptime 00:10  expires 09:58
>
> show ip mroute brief
Date 20XX/12/10 16:40:50 UTC
Total: 5 routes, 2 groups, 4 sources

(S,G) 4 routes  ------------------------------------------------
Group Address    Source Address   Incoming        Outgoing Count
224.1.1.1        200.1.1.100      VLAN0010                     1
230.10.10.10     190.10.10.10     VLAN0016                     1
230.10.10.10     190.20.20.20     VLAN0016                     1
230.10.10.10     190.30.30.30     VLAN0016                     1

(*,G) 1 route   ------------------------------------------------
Group Address    RP Address       Incoming        Outgoing Count
224.1.1.1        1.1.1.1          register                     2
>
```

Display Items

Table 8-3: Items displayed by the show ip mroute command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Number of entries	—
Warning	Warning display	"Multicast routing entry is discarded for limit" is displayed when an entry is being discarded due to a restriction on the number of IPv4 multicast route information entries.
Notice	Warning	In a stack configuration with "ip pim nonstop-forwarding" configuration command set, the message "Learning of IPv4 multicast routing entries is in progress because a master switch switchover occurred. (remaining time = <time> seconds)" is displayed while learning the IPv4 multicast route information after switching the master switch. <time>: Time until learning ends (seconds)
Group Address	Group address	—
Source Address	Source address	—
RP Address	Rendezvous point address	—
Protocol	Multicast protocol	SM: PIM-SM SSM: PIM-SSM
Flags	Entry flag	F: First-hop-router (the sender is directly connected) L: Last-hop-router (the receiver is directly connected) R: RPT-bit (trimming status) T: SPT-bit (communication via the rendezvous point was switched to communication via the shortest path) V: VRF Gateway (PIM-SM VRF Gateway is running) -: There is no information to be displayed.
Uptime	Time elapsed since multicast route information or oif (out of interface) was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. However, "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for multicast route information or oif	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "--:--" is displayed in the following cases: • There is no join message from downstream, and there is an IGMP group • For an encapsulated interface • The timer is not running.

Display Items	Meaning	Displayed detailed information
Assert	Upstream address aging time using Assert messages	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. See "Configuration Guide Vol. 3, 15.4.2 (4) Determining the forwarder" for more information on Assert.
Incoming/incoming	Upstream interface	Interface name (address) "register" is displayed for a non-encapsulated interface. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.
upstream	Upstream neighboring router address	"Direct" is displayed for the first-hop-router. "Extra" is displayed for the extranet. "This System" is displayed if the rendezvous point and the upstream interface have the same address in the (*,G) information.
outgoing	Downstream interface	Interface name (address) "register" is displayed for an encapsulated interface. For an (S,G) entry, the VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. If PIM-SM VRF Gateway is used, the (*,G) entry indicates the destination VRF ID.
reg-sup	Register encapsulation suppression time	The display is valid for the first-hop-router only.
Outgoing Count	Number of downstream interfaces	—

Impact on communication

None

Response messages

Table 8-4: List of response messages for the show ip mroute command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address	The specified address is invalid. Check the specified address.

No.	Message	Description
3	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
4	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip pim interface

Displays the status of a PIM-SM or PIM-SSM interface.

Syntax

```
show ip pim [vrf {<vrf id> | all}] interface [vlan <vlan id>] [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the PIM interface information for the VRF.

> If <vrf id> is specified, the PIM interface information for only the specified VRF is displayed. If all is specified, the PIM interface information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays PIM interface information for the global network.

vlan <vlan id>

> Displays interface information for the specified interface.

> Behavior when this parameter is omitted:

>> Displays all PIM-SM or PIM-SSM interface information.

detail

> Displays the PIM-SM or PIM-SSM interface information in detailed format.

> Behavior when this parameter is omitted:

>> Displays the PIM-SM or PIM-SSM interface information in standard format.

Behavior when all parameters are omitted:

> Displays all PIM-SM or PIM-SSM interface information for the global network in standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 8-3: Displaying the status of a PIM-SM or PIM-SSM interface

```
> show ip pim interface
Date 20XX/12/10 15:08:10 UTC
Address         Interface   Component  Vif    Nbr     Hello   DR            Notice
                                              Count   Intvl   Address
192.10.10.1     VLAN0011    PIM-SM      1      4        30     This system  B
192.10.20.1     VLAN0012    PIM-SM      9      10       30     192.10.20.2  B
192.10.30.1     VLAN0014    PIM-SM      10     11       30     This system
>
> show ip pim interface detail
Date 20XX/12/10 15:09:10 UTC
Address       Interface Component Vif Nbr   Hello  GenID      DR            Notice
                                      Count Intvl                          Address
192.10.10.1   VLAN0011  PIM-SM     1   4     30    3503c645   This system  B
192.10.20.1   VLAN0012  PIM-SM     9   10    30    42278152   192.10.20.2  B
```

```
192.10.30.1  VLAN0014  PIM-SM    10   11   30  29ba460b  This system
>
> show ip pim vrf 2 interface detail
Date 20XX/12/10 15:10:10 UTC
VRF: 2
Address      Interface Component Vif Nbr   Hello GenID      DR          Notice
                                    Count Intvl            Address
192.10.50.1  VLAN0015  PIM-SM    12   4    30  3503c645  This system B
192.10.60.1  VLAN0016  PIM-SM    13   10   30  42278152  192.10.60.2 B
192.10.70.1  VLAN0017  PIM-SM    14   11   30  29ba460b  This system
>
```

Display Items

Table 8-5: Items displayed by the show ip pim interface command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global net-work.
Address	Interface IP address	Local IP address
Interface	Interface name	—
Component	Protocol type	PIM-SM (fixed)
Vif	Virtual interface number	Local information
Nbr Count	Number of neighboring routers	—
Hello Intvl	Hello sending interval	—
GenID	GenerationID	Generation ID of the interface specified for the Switch
DR Address	DR address	If the specified interface is down, "-" is displayed. If the Switch is the DR, "This system" is displayed.
Notice	Warning information	B: The PIM-Bootstrap message was discarded because the "no ip pim accept-bootstrap" configuration command was specified. From the time an event occurred until PIM-Bootstrap message retention time (Bootstrap-Timeout) passes, this item is displayed when the command is executed.

Impact on communication

None

Response messages

Table 8-6: List of response messages for the show ip pim interface command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.

No.	Message text	Meaning
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such interface "<interface name>"	PIM is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip pim neighbor

Displays the neighboring information for a PIM-SM or PIM-SSM interface.

Syntax

```
show ip pim [vrf {<vrf id> | all}] neighbor [interface vlan <vlan id>] [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays the PIM interface neighboring information for the VRF.

If <vrf id> is specified, the PIM interface neighboring information for only the specified VRF is displayed. If all is specified, the PIM interface neighboring information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays PIM interface neighboring information for the global network.

interface vlan <vlan id>

Displays neighboring information for the specified interface.

Behavior when this parameter is omitted:

Displays neighboring information for all PIM-SM or PIM-SSM interfaces.

detail

Displays neighboring information for a PIM-SM or PIM-SSM interface in a detailed format.

Behavior when this parameter is omitted:

Displays the neighboring information for a PIM-SM or PIM-SSM interface in standard format.

Behavior when all parameters are omitted:

Displays neighboring information for all PIM-SM or PIM-SSM interfaces for the global network in standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 8-4: Displaying the neighboring information for a PIM-SM or PIM-SSM interface

```
> show ip pim neighbor
Date 20XX/12/10 15:08:10 UTC
Address         Interface       Neighbor Address  Uptime   Expires
192.0.2.1       VLAN0011        192.0.2.100        20:25    01:33
                                192.0.2.10         20:25    01:33
                                192.0.2.5          20:26    01:32
                                192.0.2.3          20:25    01:33
192.0.2.129     VLAN0012        192.0.2.228        10:27    01:33
                                192.0.2.138        10:27    01:33
                                192.0.2.133        10:26    01:32
                                192.0.2.131        10:27    01:33
```

```
198.0.113.1     VLAN0013        198.0.113.100    10:27    01:33
                                198.0.113.10     10:27    01:32
>
> show ip pim neighbor detail
Date 20XX/12/10 15:09:10 UTC
Address          Interface       Neighbor Address  Uptime   Expires  GenID     Addr List
192.0.2.1        VLAN0011        192.0.2.100       00:36    01:24    18277af5 192.0.3.100
                                 192.0.2.10        00:35    01:25    227a181f 192.0.3.10
                                 192.0.2.5         00:36    01:24    3dc505ef 192.0.3.5
                                 192.0.2.3         00:36    01:24    3a5e92b2 192.0.3.3
192.0.2.250      VLAN0012        192.0.2.228       00:36    01:24    2c5526a9 192.0.3.228
                                 192.0.2.138       00:36    01:24      -  -
                                 192.0.2.133       00:35    01:25    1c2dab3e 192.0.3.133
                                 192.0.2.131       00:36    01:24    4f7eb0a1 192.0.3.131
198.0.113.1      VLAN0013        198.0.113.100     00:36    01:24      -  -
192.168.10.10    VLAN0100        192.168.10.1      20:25    01:33    18277af5 192.168.20.1
                                                                             192.168.30.1
                                                                             192.168.40.1
                                 192.168.10.100    25:32    01:05    145ca112 192.168.20.100
                                                                             192.168.30.100
                                                                             192.168.40.100
192.100.10.10 VLAN0200           192.100.10.111    46:15    00:31    5418291f 192.100.20.111
                                 192.100.10.200    12:51    01:20    612eda11 -
                                 192.100.10.222    51:22    01:55    328f1aac 192.100.20.222
>
> show ip pim vrf 2 neighbor detail
Date 20XX/12/10 15:10:10 UTC
VRF: 2
Address          Interface       Neighbor Address  Uptime   Expires  GenID     Addr List
192.0.3.1        VLAN0015        192.0.3.100       00:31    01:29    18277af5 192.0.4.100
                                 192.0.3.10        00:31    01:29    227a181f 192.0.4.10
                                 192.0.3.5         00:31    01:29    3dc505ef 192.0.4.5
                                 192.0.3.3         00:32    01:28    3a5e92b2 192.0.4.3
192.0.3.250      VLAN0016        192.0.3.228       00:31    01:29    2c5526a9 192.0.4.228
                                 192.0.3.138       00:31    01:29      -  -
                                 192.0.3.133       00:31    01:29    1c2dab3e 192.0.4.133
                                 192.0.3.131       00:32    01:28    4f7eb0a1 192.0.4.131
>
```

Display Items

Table 8-7: Items displayed by the show ip pim neighbor command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Address	Local IP address	Local IP address
Interface	Interface name	—
Neighbor Address	IP address of the neighboring router	—
Uptime	Time elapsed since the neighboring information was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the neighboring information	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "--:--" is displayed if a timeout will not occur.

Display Items	Meaning	Displayed detailed information
GenID	Neighboring routers Generation ID (Generation ID of PIM Hello message)	Generation ID of the specified neighboring router "-" is displayed if the neighboring router does not support Generation IDs.
Addr List	A secondary IP address of the neighboring router (Address List of PIM Hello message)	Displays up to 5 networks from the top among the secondary IP addresses set in the Address List. "-" is displayed if the secondary IP address is not set for the neighboring router.

Impact on communication

None

Response messages

Table 8-8: List of response messages for the show ip pim neighbor command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such interface "<interface name>"	PIM is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip pim mcache

Displays PIM-SM or PIM-SSM multicast forwarding entry information.

Syntax

```
show ip pim [vrf {<vrf id> | all}] mcache
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays PIM multicast forwarding entry information for the VRF.

If <vrf id> is specified, PIM multicast forwarding entry information for only the specified VRF is displayed. If all is specified, PIM multicast forwarding entry information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays the PIM multicast forwarding entry information for the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 8-5: Displaying PIM-SM or PIM-SSM multicast forwarding entry information

```
> show ip pim mcache
Date 20XX/12/10 16:42:30 UTC
Group Address    Source Address   Uptime   Expires   Incoming              Component
225.10.10.1      172.10.10.1      01:00    02:00     VLAN0010(192.10.10.1)  PIM-SM
     outgoing:
          VLAN0011(192.20.10.1) protos 103
          VLAN0014(192.20.40.1) protos 103
226.10.10.1      172.10.20.1      00:20    02:40     VLAN0020(192.10.20.1)  PIM-SM
     outgoing:
          VLAN0011(192.20.10.1) protos 103
          VLAN0012(192.20.20.1) protos 103
          VLAN0015(192.20.50.1) protos 103
>
> show ip pim vrf 2 mcache
Date 20XX/12/10 16:44:30 UTC
VRF: 2
Group Address    Source Address   Uptime   Expires   Incoming              Component
226.0.0.1        10.8.0.100       00:00    10:00     global                PIM-SM
     outgoing:
          register             protos 103
          VLAN0021(10.3.0.100)  protos 103
>
```

Display Items

Table 8-9: Items displayed by the show ip pim mcache command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Warning	Warning display	If "ip pim nonstop-forwarding" and "ip pim multiple-negative-cache" configuration commands are set at the same time, the message "Multiple-negative-cache is invalid because the nonstop-forwarding is setting" is displayed as a warning that ip pim multiple-negative-cache is not running.
Notice	Warning	In a stack configuration with "ip pim nonstop-forwarding" configuration command set, the message "Learning of IPv4 multicast forwarding entries is in progress because a master switch switchover occurred. (remaining time = <time> seconds)" is displayed while learning the IPv4 multicast forwarding entry after switching the master switch. <time>: Time until learning ends (seconds)
Group Address	Destination group address	—
Source Address	Source address	—
Uptime	Time elapsed since the multicast forwarding entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. The timer is automatically updated every 30 seconds.
Expires	Multicast forwarding entry aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. The timer is automatically updated every 30 seconds. The multicast forwarding entry might be deleted before the aging time becomes zero. "--:--" is displayed if a timeout will not occur.
Incoming	Upstream interface	Interface name (IP address) "register" is displayed for an interface for decapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.
Component	Protocol type	PIM-SM
outgoing	Downstream interface	Interface name (IP address) "register" is displayed for an interface for encapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network.
protos	Protocol number	Local information

Impact on communication

None

Response messages

Table 8-10: List of response messages for the show ip pim mcache command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip pim bsr

Shows the PIM-SM BSR information.

Syntax

```
show ip pim [vrf {<vrf id> | all}] bsr
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Shows VRF BSR information.

If <vrf id> is specified, the BSR information for only the specified VRF is displayed. If all is specified, the BSR information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The BSR information for the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

- The Switch is neither a BSR candidate nor has BSR information

Figure 8-6: Displaying the PIM-SM BSR information (1)

```
> show ip pim bsr
Date 20XX/04/20 12:10:10  UTC
Status : Not Candidate Bootstrap Router
BSR Address : ----
>
```

- The Switch is not a BSR candidate but has BSR information

Figure 8-7: Displaying the PIM-SM BSR information (2)

```
> show ip pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Bootstrap Router
BSR Address : 192.10.10.10
    Priority: 100    Hash mask length: 30
    Uptime  : 03:00
    Bootstrap Timeout : 130 seconds
>
```

- The Switch is a BSR candidate but has no BSR information

Figure 8-8: Displaying the PIM-SM BSR information (3)

```
> show ip pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Bootstrap Router
BSR Address : ----
    Bootstrap Timeout : 20 seconds
Local BSR Address : 192.20.20.20
    Priority : 110    Hash mask length : 30
>
```

- The Switch is a BSR candidate and another device is BSR

  Figure 8-9: Displaying the PIM-SM BSR information (4)

  ```
  > show ip pim bsr
  Date 20XX/04/20 12:10:10 UTC
  Status : Candidate Bootstrap Router
  BSR Address  : 192.10.10.10
      Priority : 100    Hash mask length : 30
      Uptime   : 03:00
      Bootstrap Timeout : 130 seconds
  Local BSR Address : 192.20.20.20
      Priority : 110    Hash mask length : 30
  >
  ```

- The Switch is a BSR candidate and is BSR

  Figure 8-10: Displaying the PIM-SM BSR information (5)

  ```
  > show ip pim bsr
  Date 20XX/04/20 12:10:10 UTC
  Status : Elected Bootstrap Router
  BSR Address  : 192.20.20.20 (This System)
      Priority : 110    Hash mask length : 30
      Uptime   : 03:00
      Bootstrap Timeout  : 130 seconds
      Bootstrap Interval : 60 seconds
  >
  ```

Display Items

Table 8-11: Items displayed by the show ip pim bsr command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status	BSR state	Not Candidate Bootstrap Router: The Switch is not a BSR candidate.
		Candidate Bootstrap Router: The Switch is a BSR candidate.
		Elected Bootstrap Router: The Switch is the selected BSR.
BSR Address	BSR address	"(This System)" is displayed if the Switch is the BSR.
Priority	BSR priority	—
Hash mask length	BSR hash mask length	—
Uptime	Time elapsed since the BSR was recognized	xx:yy xx (minutes), yy (seconds)
		"1hour", "2hours", ... are displayed if the time is 60 minutes or more.
		"1day", "2days", ... are displayed if the time is 24 hours or more.
Bootstrap Timeout	BSR timer value	The BSR information retention time is displayed if the Switch is not the BSR.
		If the Switch is a BSR candidate and the BSR information is not recognized, the time that can elapse before the Switch changes to the BSR is displayed.
		If the Switch is the BSR, the time that can elapse before a Bootstrap message is sent is displayed.
Local BSR Address	BSR candidate address	This item is displayed only when the Switch is a BSR candidate.
Bootstrap Interval	BSR message send interval	This item is displayed only when the Switch is the BSR.

Impact on communication

None

Response messages

Table 8-12: List of response messages for the show ip pim bsr command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed.
		If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid.
		<vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF.
		<vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred.
		Re-execute the command.
		<error message>: Location of the error
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal.
		Try re-executing the command after the command that is executing on the operation terminal terminates.
6	Unknown command "<command>"	The specified command is invalid.
		<command>: Specified command name

Notes

None

show ip pim rp-mapping

Shows the PIM-SM rendezvous point information.

Syntax

```
show ip pim [vrf {<vrf id> | all}] rp-mapping
            [rp-address <ip address>[/<length>]] [<ip address>[/<length>]]
            [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the VRF rendezvous point information.
>
> If <vrf id> is specified, the rendezvous point information for only the specified VRF is displayed. If all is specified, the rendezvous point information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Displays rendezvous point information for the global network.

rp-address <ip address>[/<length>]

> Displays rendezvous point information that matches the rendezvous point candidate address.
>
> If rp-address <ip address>[/<length>] is specified, all rendezvous point information corresponding to the rendezvous point candidate address that matches the mask length specified by <length> is displayed.
>
> The default value when <length> is omitted is 32.
>
> Behavior when this parameter is omitted:
>
> > Shows all the PIM-SM rendezvous point information.

<ip address>[/<length>]

> Displays rendezvous point information that matches the group address.
>
> If <ip address>[/<length>] is specified, all rendezvous point information corresponding to the group address that matches the mask length specified by <length> is displayed.
>
> The default value when <length> is omitted is 32.
>
> Behavior when this parameter is omitted:
>
> > Shows all the PIM-SM rendezvous point information.

brief

> Displays the PIM-SM rendezvous point information in summary format.
>
> Behavior when this parameter is omitted:
>
> > Displays the PIM-SM rendezvous point information in standard format.

Behavior when all parameters are omitted:

> Displays all PIM-SM rendezvous point information for the global network in standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

- When the Switch is not a rendezvous point candidate:

Figure 8-11: Displaying the PIM-SM rendezvous point information (1) (standard format)

```
> show ip pim rp-mapping
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Rendezvous Point
Total: 3 routes, 2 groups, 2 RPs
Group/Masklen       C-RP Address       Priority Uptime   Expires  Flags
225.100.100.0/24    1.1.1.2                 255 03:53    02:15    -
224.100.100.0/24    1.1.1.3                 255 03:53    02:15    U
224.100.100.0/24    1.1.1.2                 255 03:53    02:15    -
>
```

Figure 8-12: Displaying the PIM-SM rendezvous point information (2) (summary format)

```
> show ip pim rp-mapping brief
Date 20XX/12/20 12:10:10 UTC
Status : Not Candidate Rendezvous Point
Total: 3 routes, 2 groups, 2 RPs
Group/Masklen       C-RP Address
225.100.100.0/24    1.1.1.2
224.100.100.0/24    1.1.1.3
224.100.100.0/24    1.1.1.2
>
```

- When the Switch is a rendezvous point candidate:

Figure 8-13: Displaying the PIM-SM rendezvous point information (3) (standard format)

```
> show ip pim rp-mapping
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Rendezvous Point
        Local RP Address: 1.1.1.1    Priority: 255
Total: 4 routes, 2 groups, 3 RPs
Group/Masklen       C-RP Address       Priority Uptime   Expires  Flags
225.100.100.0/24    1.1.1.2                 255 1hour    01:55    -
224.100.100.0/24    1.1.1.3                 255 1hour    01:55    U
224.100.100.0/24    1.1.1.2                 255 1hour    01:55    -
224.100.100.0/24    1.1.1.1                 255 1hour    01:55    -
>
```

Figure 8-14: Displaying the PIM-SM rendezvous point information (4) (summary format)

```
> show ip pim rp-mapping brief
Date 20XX/12/20 12:10:10 UTC
Status : Candidate Rendezvous Point
        Local RP Address: 1.1.1.1    Priority: 255
Total: 4 routes, 2 groups, 3 RPs
Group/Masklen       C-RP Address
225.100.100.0/24    1.1.1.2
224.100.100.0/24    1.1.1.3
224.100.100.0/24    1.1.1.2
224.100.100.0/24    1.1.1.1
>
```

Display Items

Table 8-13: Items displayed by the show ip pim rp-mapping command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status	Rendezvous point candidate status	"Candidate Rendezvous Point" is displayed if the Switch is a rendezvous point candidate. "Not Candidate Rendezvous Point" is displayed if the Switch is not a rendezvous point candidate.

Display Items	Meaning	Displayed detailed information
Local RP Address	Rendezvous point candidate address	This information is displayed only when the Switch is a rendezvous point candidate.
Priority	Rendezvous point candidate priority	—
Total	Number of items of group information	routes: Total number of groups managed by each rendezvous point candidate groups: Number of group addresses RPs: Number of rendezvous point candidates
Group/Masklen	Group address/mask length	—
C-RP Address	Rendezvous point candidate address	—
Uptime	Time elapsed since the entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the entry	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. For a static rendezvous point, "--:--" is displayed.
Flags	Flag information	U: When there is no unicast route to the rendezvous point "-" is displayed if there is no information to display.

Impact on communication

None

Response messages

Table 8-14: List of response messages for the show ip pim rp-mapping command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

No.	Message text	Meaning
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip pim rp-hash

Shows the rendezvous point information for each PIM-SM group.

Syntax

```
show ip pim [vrf <vrf id>] rp-hash <ip address>
```

Input mode

User mode and administrator mode

Parameters

vrf <vrf id>[SL-L3A]

Displays the VRF rendezvous point information.

The rendezvous point information for the VRF specified for <vrf id> is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays rendezvous point information for the global network.

<ip address>

Specify the IPv4 group address.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display the rendezvous point for the group address (225.10.10.10).

- When the rendezvous point for the group address (225.10.10.10) does not exist:

  Figure 8-15: Displaying the target rendezvous point information (1)

  ```
  > show ip pim rp-hash 225.10.10.10
  Date 20XX/04/20 12:10:10 UTC
  Group-RP mapping information for the group (225.10.10.10) does not exists.
  >
  ```

- When the rendezvous point for the group address (225.10.10.10) exists:

  Figure 8-16: Displaying the target rendezvous point information (2)

  ```
  > show ip pim rp-hash 225.10.10.10
  Date 20XX/04/20 12:10:10 UTC
  Group Address    RP Address       Uptime    Expires
  225.10.10.10     192.1.1.1         02:00     02:30
  >
  ```

Display Items

Table 8-15: Items displayed by the show ip pim rp-hash command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Group Address	Group address	—
RP Address	Rendezvous point address	—
Uptime	Time elapsed since the entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the entry	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. For a static rendezvous point, "--:--" is displayed.

Impact on communication

None

Response messages

Table 8-16: List of response messages for the show ip pim rp-hash command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip igmp interface

Shows the status of the IGMP interface.

Syntax

```
show ip igmp [vrf {<vrf id> | all}] interface [vlan <vlan id>]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays the IGMP interface information for the VRF.

If <vrf id> is specified, the IGMP interface information for only the specified VRF is displayed. If all is specified, the IGMP interface information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays IGMP interface information for the global network.

vlan <vlan id>

Displays interface information for the specified interface.

Behavior when this parameter is omitted:

Displays all the IGMP interface information.

Behavior when all parameters are omitted:

Displays all the IGMP interface information for the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display the IGMP interface information.

Figure 8-17: Displaying the IGMP interface information

```
> show ip igmp interface
Date 20XX/04/21 12:10:10 UTC
Total: 6 Interfaces
Address         Interface  Version  Flags  Querier       Expires  Group Count  Notice
192.10.20.10   VLAN0011      2       S     192.10.20.5   02:30               2  L R
192.10.30.10   VLAN0013      2             192.10.30.6   02:14               1  L
192.10.40.10   VLAN0015      3       S     192.10.40.7   01:43               2
192.10.50.10   VLAN0017     (3)            192.10.50.8   01:20               1
192.168.10.10  VLAN0100      2       S     192.168.10.10 -                   2
192.168.20.10  VLAN0100      3       S     192.168.20.5  01:30               -
192.168.30.10  VLAN0100      2       S     192.168.30.10 -                   -
192.168.40.10  VLAN0100      2       S     192.168.40.5  00:32               -
192.100.10.10  VLAN0200      2             192.100.10.10 -                   5
192.100.20.10  VLAN0200      3             192.100.20.5  01:30               -
>
```

Display Items

Table 8-17: Items displayed by the show ip igmp interface command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Total number of interfaces	Number of interface names
Address	Interface IP address	—
Interface	Interface name	If the interface names are the same, the first line of the address displays the primary IP address, and subsequent lines display the secondary IP addresses.
Version	IGMP version information	2: IGMP version 2 3: IGMP version 3 (3): IGMP version 3 only
Flags	Interface flag	S is displayed when IGMP snooping is running.
Querier	Querier IP address	If the specified interface is down, "-" is displayed.
Expires	Querier aging timer (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "-" is displayed if the Switch is the querier.
Group Count	Number of subscription groups	Number of groups. "-" is displayed for the secondary IP address.

Notice	Warning information	• L: A Report message and the contained record information were discarded because the Group-limit value was exceeded.
		  A Report message and the contained record information were discarded because the Source-limit value was exceeded.
		• Q: A query message was discarded due to inconsistent versions.
		• R: A Report message was discarded due to inconsistent versions.
		• S: Some information was discarded because the maximum number of resources that can be processed in one Report message was exceeded.
		  Information was discarded because the number of items of record information in one Report message exceeded the maximum, or because the number of sources in one item of record information exceeded the maximum.
		From the time an event occurred until General Query is sent or received twice, this item is displayed when the command is executed.

Impact on communication

None

Response messages

Table 8-18: List of response messages for the show ip igmp interface command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such interface "<interface name>"	IGMP is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip igmp group

Displays IGMP group information.

Syntax

```
show ip igmp [vrf {<vrf id> | all}] group [<ip address>[/<length>]]
                [interface vlan <vlan id>] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays the IGMP group information for the VRF.

If <vrf id> is specified, the IGMP group information for only the specified VRF is displayed. If all is specified, the IGMP group information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays the IGMP group information for the global network.

<ip address>[/<length>]

Displays addresses that match the specified group address.

If <ip address>[/<length>] is specified, all the IGMP group information that matches the specified address for the mask length specified for <length> is displayed.

The default value when <length> is omitted is 32.

If this parameter and the interface parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

interface vlan <vlan id>

Displays group information for the specified interface.

If interface vlan <vlan id> is specified, all the group information matching the specified interface is displayed.

If this parameter and the <ip address>[/<length>] parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

Displays IGMP group information in summary format.

Behavior when this parameter is omitted:

Displays IGMP group information in the standard format.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied.

If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays all IGMP group information for the global network in the standard format.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Displays IGMP group information.

Figure 8-18: Displaying the IGMP group information

```
> show ip igmp group
Date 20XX/04/20 12:10:10 UTC
Total: 4 groups
Group Address/Source Address  Interface  Version  Mode     Last Reporter
                        Uptime  Expires IGMPv1Time IGMPv2Time IGMPv3Time
225.10.10.1                   VLAN0011     1     EXCLUDE  192.20.20.1
                        05:50   00:55    00:55     00:30      00:25
10.10.10.10                   -            -     -        192.20.20.1
                        03:55   01:55    -         -          00:10
225.10.20.1                   VLAN0013     2     EXCLUDE  192.30.30.1
                        05:30   01:40   --:--      01:40      00:30
10.10.10.30                   -            -     -        192.30.30.1
                        04:00   00:50    -         -          00:25
10.10.10.40                   -            -     -        192.30.30.1
                        04:00   00:35    -         -          00:25
226.10.30.1                   VLAN0015     3     INCLUDE  192.30.40.1
                        05:15   01:20   --:--     --:--       01:20
10.10.10.50                   -            -     -        192.30.40.1
                        04:20   00:22    -         -          00:22
226.10.40.1                   VLAN0017     3     EXCLUDE  192.30.50.1
                        05:02   01:13   --:--     --:--       01:13
10.10.10.50                   -            -     -        192.30.50.1
                        04:25   00:10    -         -          00:43
>
> show ip igmp group brief
Date 20XX/04/20 12:10:10 UTC
Total: 4 groups
Group Address     Interface      Version Mode    Source Count
225.10.10.1       VLAN0011          1    EXCLUDE          1
225.10.20.1       VLAN0013          2    EXCLUDE          2
226.10.30.1       VLAN0015          3    INCLUDE          1
226.10.40.1       VLAN0017          3    EXCLUDE          1
>
```

Display Items

Table 8-19: Items displayed by the show ip igmp group command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Total number of groups	—
Group Address	Group address	—
Source Address	Source address	The source address added to the multicast group by configuring PIM-SSM link behavior in IGMPv2 or IGMPv3 (EXCLUDE mode) is displayed.
Interface	Interface name	—
Version	IGMP version information	1: IGMP version 1 2: IGMP version 2 3: IGMP version 3

Display Items	Meaning	Displayed detailed information
Mode	Group mode	INCLUDE: INCLUDE mode EXCLUDE: EXCLUDE mode "EXCLUDE" is displayed if the IGMP version information is 1 or 2.
Last Reporter	IP address that last subscribed to the group	For static group joining, "static" is displayed. If the Reporter is not defined, "unknown" is displayed.
Uptime	Time elapsed since the group information was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed in the following cases: • The static group has joined. • The group timer is not running.
IGMPv1Time	IGMPv1-compatible information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed if the IGMPv1-compatible information aging timer is not running. "-" is displayed if the timer is displayed for the source information.
IGMPv2Time	IGMPv2-compatible information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed if the IGMPv2-compatible information aging timer is not running. "-" is displayed if the timer is displayed for the source information.
IGMPv3Time	IGMPv3-compatible information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed if the IGMPv3-compatible information aging timer is not running.
Source Count	Number of source addresses	—

Impact on communication

None

Response messages

Table 8-20: List of response messages for the show ip igmp group command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address	The specified address is invalid. Check the specified address.
3	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
4	no such interface "<interface name>"	IGMP is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
5	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
6	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
7	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.
8	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ip rpf

Displays the reverse path forwarding (RPF) information for PIM.

The RPF information displays the next hop for the source (sender) in multicast communication.

Syntax

```
show ip rpf [vrf <vrf id>] <ip address>
```

Input mode

User mode and administrator mode

Parameters

vrf <vrf id>[SL-L3A]

Shows VRF RPF information.

The RPF information for the VRF specified for <vrf id> is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The RPF information for the global network is displayed.

<ip address>

Source IP address of the multicast data

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Shows RPF information.

192.20.20.1 is the IP address of the target (source to be investigated).

- When the target is not connected to the Switch:

  Figure 8-19: Displaying the RPF information (1)

  ```
  > show ip rpf 192.20.20.1
  Date 20XX/04/10 15:10:10 UTC
  Incoming: VLAN0021(192.20.20.200) Upstream: 192.1.1.3
  >
  ```

- When the target is connected to the Switch:

  Figure 8-20: Displaying the RPF information (2)

  ```
  > show ip rpf 192.20.20.1
  Date 20XX/04/10 15:15:10 UTC
  Incoming: VLAN0020(192.20.20.100) Upstream: Direct
  >
  ```

- When the target is in a different VRF direction within the Switch

  Figure 8-21: Displaying the RPF information (3)

  ```
  > show ip rpf 192.20.20.1
  Date 20XX/04/10 15:20:10 UTC
  Incoming: VRF 20  Upstream: Extra
  >
  ```

Display Items

Table 8-21: Items displayed by the show ip rpf command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Incoming	Upstream interface name and inter-face address	The VRF ID is displayed for other VRFs connected to the extranet. However, "global" is displayed for the global network.
Upstream	Upstream neighboring router address	"Direct" is displayed for the first-hop-router. "Extra" is displayed for the extranet.

Impact on communication

None

Response messages

Table 8-22: List of response messages for the show ip rpf command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing pro-gram failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	RPF information for ? (<ip address>) failed, no route exists	A route to the specified <ip address> does not exist. Check the route to the specified <ip address>, and then re-execute the command.
6	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation termi-nal. Try re-executing the command after the command that is executing on the operation terminal terminates.

Notes

None

show ip multicast statistics

Displays IPv4 multicast statistics.

Syntax

```
show ip multicast [vrf {<vrf id> | all}] statistics [{igmp | event}]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays VRF multicast statistics.
>
> If <vrf id> is specified, multicast statistics for only the specified VRF is displayed. If all is specified, multicast statistics for all VRFs including the global network and for the entire device are displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Displays multicast statistics for the global network.

{igmp | event}

> igmp
>
> > Displays IGMP statistics.
>
> event
>
> > Displays statistics for events generated by receiving multicast packets.
>
> Behavior when all parameters are omitted:
>
> > Displays all IPv4 multicast statistics for the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Displays IPv4 multicast statistics.

Figure 8-22: Displaying - IPv4 multicast statistics

```
> show ip multicast statistics
Date 20XX/12/10 15:05:10 UTC
  Rx                                 Tx
  -------------------------------------------------------------------------
igmp
  query(v2)                :      10  query(v2)                 :       26
  query(v3)                :       0  query(v3)                 :        0
  report(v1)               :       0
  report(v2)               :       0
  report(v3)               :       0
  leave                    :       0
event
  cache-misshit            :      21
  wrong-incoming-interface :      20
  register-request         :      14
  register-receive         :      34
>
> show ip multicast vrf all statistics
```

```
Date 20XX/12/10 15:10:10 UTC
System:
  Rx                                   Tx
---------------------------------------------------------------------------
igmp
  query(v2)             :        180   query(v2)            :        199
  query(v3)             :          0   query(v3)            :          0
  report(v1)            :          0
  report(v2)            :          0
  report(v3)            :          0
  leave                 :          0
event
  cache-misshit         :         50
  wrong-incoming-interface :       45
  register-request      :         35
  register-receive      :         90

VRF: global
  Rx                                   Tx
---------------------------------------------------------------------------
igmp
  query(v2)             :         10   query(v2)            :         26
  query(v3)             :          0   query(v3)            :          0
  report(v1)            :          0
  report(v2)            :          0
  report(v3)            :          0
  leave                 :          0
event
  cache-misshit         :         21
  wrong-incoming-interface :       20
  register-request      :         14
  register-receive      :         34

VRF: 2
  Rx                                   Tx
---------------------------------------------------------------------------
igmp
  query(v2)             :        115   query(v2)            :        135
  query(v3)             :          0   query(v3)            :          0
  report(v1)            :          0
  report(v2)            :          0
  report(v3)            :          0
  leave                 :          0
event
  cache-misshit         :         13
  wrong-incoming-interface :       16
  register-request      :          7
  register-receive      :         29
>
```

Display Items

Table 8-23: Items displayed by the show ip multicast statistics command

Display Items	Meaning	Displayed detailed information
System	Multicast statistics for the entire device	Displayed only when vrf all is specified.
VRF [SL-L3A]	VRF multicast statistics	Displays the VRF ID. "global" is displayed for the global network.
Rx	Number of receive packets	—
Tx	Number of send packets	—

Display Items	Meaning	Displayed detailed information
igmp	IGMP packet information	—
query(v2)	Number of IGMP version 2 query packets	—
query(v3)	Number of IGMP version 3 query packets	—
report(v1)	Number of IGMP version 1 report packets	—
report(v2)	Number of IGMP version 2 report packets	—
report(v3)	Number of IGMP version 3 report packets	—
leave	Number of leave packets	—
event	Event information generated by receiving multicast packets	—
cache-misshit	Number of cache-misshit packets	—
wrong-incoming-interface	Number of wrong-incoming-interface packets	—
register-request	Number of register-request packets	—
register-receive	Number of register-receive packets	—

Impact on communication

None

Response messages

Table 8-24: List of response messages for the show ip multicast statistics command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

No.	Message text	Meaning
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.

Notes

None

clear ip multicast statistics

Clears IPv4 multicast statistics.

Syntax

```
clear ip multicast [vrf {<vrf id> | all}] statistics {all | igmp | event}
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Clears VRF multicast statistics.

If <vrf id> is specified, multicast statistics for only the specified VRF is cleared. If all is specified, multicast statistics for all VRFs including the global network and for the entire device are cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Clears multicast statistics for the global network.

all

Clears all IPv4 multicast statistics.

igmp

Clears the IGMP statistics.

event

Clears statistics for events generated by receiving multicast packets.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Clears IPv4 multicast statistics.

Figure 8-23: Clearing IPv4 multicast statistics

```
>clear ip multicast statistics all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 8-25: List of response messages for the clear ip multicast statistics command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number \<vrf id>	The specified VRF is invalid. \<vrf id>: VRF ID
3	no such VRF \<vrf id>	PIM is not running on the specified VRF. \<vrf id>: VRF ID
4	program error occurred: \<error message>	A program error occurred. Re-execute the command. \<error message>: Location of the error
5	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.

Notes

None

show ip multicast resources

Displays the number of entries used in IPv4 multicast.

Syntax

```
show ip multicast [vrf {<vrf id> | all}] resources
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays the number of entries used in VRF multicast.

If <vrf id> is specified, the number of multicast entries for only the specified VRF is displayed. If all is specified, the number of multicast entries for all VRFs including the global network and for the entire device is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays the information for the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display the number of entries for IPv4 multicast.

Figure 8-24: Displaying the number of IPv4 multicast entries

```
> show ip multicast resources
Date 20XX/12/10 15:10:10 UTC
mcache                    :          20
interface                 :           1
extranet filter           :          20
vrf gateway               :          15
>
> show ip multicast vrf all resources
Date 20XX/12/10 15:15:10 UTC
Total_VRF                 :           2
mcache                    :          30
interface                 :           5
extranet filter           :          30
vrf gateway               :          45

VRF: global
mcache                    :          20
interface                 :           1
extranet filter           :          20
vrf gateway               :          15

VRF: 2
mcache                    :          10
interface                 :           4
extranet filter           :          10
vrf gateway               :          30
>
```

Display Items

Table 8-26: Items displayed by the show ip multicast resources command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total_VRF [SL-L3A]	Number of VRFs running in IPv4 multicast mode	—
mcache	Number of multicast route entries	—
interface	Number of interfaces on which multicast runs	—
extranet filter	Number of filters	—
vrf gateway	Number of VRF gateways	—

Impact on communication

None

Response messages

Table 8-27: List of response messages for the show ip multicast resources command

No.	Message text	Meaning
1	connection failed to mrp	Communication with the multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.
2	no such VRF <vrf id>	PIM is not running on the specified VRF. <vrf id>: VRF ID
3	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
4	This command cannot be executed now.	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after the command that is executing on the operation terminal terminates.

Notes

None

restart ipv4-multicast

Restarts the IPv4 multicast routing program.

Syntax

```
restart ipv4-multicast [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the IPv4 multicast routing program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file (pimd.core) for the IPv4 multicast routing program during restart.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Restarts the IPv4 multicast routing program.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all}
restart ipv4-multicast [-f] [core-file]
```

Example

Figure 8-25: Restart of IPv4 multicast routing program

```
> restart ipv4-multicast
Multicast routing program restart OK? (y/n): y
>
```

Display Items

None

Impact on communication

IPv4 multicast forwarding stops temporarily.

Response messages

Table 8-28: List of response messages for the restart ipv4-multicast command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing program failed. Re-execute the command.
		If this message is frequently displayed, use the command to restart the IPv4 multicast routing program.
2	IP routing is not configured.	The routing protocol has not been set.
		Check the configuration.
3	mrp appears to be running as pid <pid>, but pid <pid> doesn't exist!	The process defined in the PID file for the IPv4 multicast routing program does not exist.
		The IPv4 multicast routing program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
		<pid>: Process ID
4	mrp doesn't seem to be running.	The command failed because the IPv4 multicast routing program was not running.
		Wait until the IPv4 multicast routing program is restarted, and then re-execute the command.
5	mrp failed to terminate.	An attempt to restart the IPv4 multicast routing program by using the command failed.
		Re-execute the command.
6	mrp has already stopped.	The command failed because the IPv4 multicast routing program has already stopped.
		The IPv4 multicast routing program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
7	mrp is not response.	No response was sent from the IPv4 multicast routing program. Re-execute the command.
		If this message is frequently displayed, use the command to restart the IPv4 multicast routing program.
8	mrp restarted after termination: old pid <pid>, new pid <pid>	The command failed because the PID was changed during command execution.
		The IPv4 multicast routing program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
		<pid>: Process ID
9	mrp signaled but still running, waiting 6 seconds more.	The command is restarting the IPv4 multicast routing program.
		Wait a while.
10	mrp still running, sending a kill signal.	This command is sending a Kill signal to the IPv4 multicast routing program, to restart it.
		Wait a while.
11	mrp still running, sending another terminate signal.	This command is sending a terminate signal to the IPv4 multicast routing program, to restart it.
		Wait a while.

No.	Message	Description
12	mrp terminated.	The IPv4 multicast routing program was stopped by the command. The program will restart automatically. Wait a while.
13	pid file <file name> mangled!	The PID for the IPv4 multicast routing program The file is invalid. <file name>: PID file name
14	pid in file <file name> unreasonably small (<pid>)	The PID for the IPv4 multicast routing program The file is invalid. <file name>: PID file name <pid>: Process ID in the PID file
15	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

The following shows the directory to which the core file for the IPv4 multicast routing program is output.

Directory: /usr/var/core/

Core file: pimd.core

For details about how to delete the core file for the IPv4 multicast routing program, see "erase protocol-dump ipv4-multicast".

dump protocols ipv4-multicast

Outputs PIM-SM event trace information and control table information to a file.

Syntax

```
dump protocols ipv4-multicast { all | trace | table }
```

Input mode

User mode and administrator mode

Parameters

all

Compresses and outputs PIM-SM event trace information and control table information to a file.

trace

Compresses and outputs event trace information to a file.

table

Outputs control table information, converted to text format and compressed, to a file.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all}
dump protocols ipv4-multicast { all | trace | table }
```

Example

Figure 8-26: Example of the dump protocols ipv4-multicast command

```
> dump protocols ipv4-multicast trace
>
> dump protocols ipv4-multicast table
>
> dump protocols ipv4-multicast all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 8-29: List of response messages for the dump protocols ipv4-multicast command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.

No.	Message	Description
2	mrp appears to be running as pid <pid>,but pid <pid> doesn't exist!	The IPv4 multicast routing program appears to be running with the process ID (<pid>), but process ID (<pid>) does not exist. <pid>: Process ID
3	mrp doesn't seem to be running	The IPv4 multicast routing program is not running.
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

The following shows the output files for the Switch and the directory to which the files are output.

Directory: /usr/var/mrp/

Event trace information file: mrp_trace.gz

Control table information file: mrp_dump.gz

If a file with this name already exists, the file is overwritten unconditionally. Therefore, back up the file in advance, if necessary.

erase protocol-dump ipv4-multicast

Deletes the event trace information and control table information, and core file for PIM-SM.

Syntax

```
erase protocol-dump ipv4-multicast { trace | table | core-file }
```

Input mode

User mode and administrator mode

Parameters

table

    Deletes the control table information file.

trace

    Deletes the event trace information file.

core-file

    Deletes the core file.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all}
erase protocol-dump ipv4-multicast { trace | table | core-file }
```

Example

Figure 8-27: Example of the erase protocol-dump ipv4-multicast command

```
> erase protocol-dump ipv4-multicast trace
>
> erase protocol-dump ipv4-multicast table
>
```

Display Items

None

Impact on communication

None

Response messages

Table 8-30: List of response messages for the erase protocol-dump ipv4-multicast command

No.	Message	Description
1	connection failed to mrp	Communication with the IPv4 multicast routing program failed. If this message is output, even though IPv4 multicast routing is enabled, re-execute the command or check the configuration.

No.	Message	Description
2	mrp appears to be running as pid \<pid\>,but pid \<pid\> doesn't exist!	The IPv4 multicast routing program appears to be running with the process ID (\<pid\>), but process ID (\<pid\>) does not exist. \<pid\>: Process ID
3	mrp doesn't seem to be running	The IPv4 multicast routing program is not running.
4	program error occurred: \<error message\>	A program error occurred. Re-execute the command. \<error message\>: Location of the error

Notes

The following shows the files and directories to be deleted from the Switch.

- Directory: /usr/var/mrp/

    Event trace information file: mrp_trace.gz

    Control table information file: mrp_dump.gz

- Directory: /usr/var/core/

    Core file: pimd.core

9

Routing Protocols Common to IPv4 and IPv6

show graceful-restart unicast [SL-L3A]

Displays the running status of restart routers that perform graceful restarts in the unicast routing protocol.

Syntax

```
show graceful-restart unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 9-1: Displaying the running status of graceful restart

```
>show graceful-restart unicast
Date 20XX/12/14 12:00:00 UTC
Status: Completed
Graceful Restart Time Limit: 180s
Start Time: 20XX/12/08 17:01:23
End Time  : 20XX/12/08 17:03:19
OSPF  : Restart State <Finished>
        Total of Domain: 2 (Succeeded: 2)
BGP   : Restart State <Finished>
        Total of Peer  : 25 (Succeeded: 25)
OSPFv3: Restart State <Finished>
        Total of Domain: 2 (Succeeded: 2)
BGP4+ : Restart State <Finished>
        Total of Peer  : 20 (Succeeded: 20)
>
```

Display Items

Table 9-1: Displayed running status of graceful restart

Display Items	Meaning	Displayed detailed information
Status	Execution status of graceful restart	Executing: Graceful restart in progress Completed: Graceful restart completed Terminated: Graceful restart aborted[#] Backup: Backup switch -: Graceful restart not executed
Graceful Restart Time Limit	Upper limit of the time (in seconds) for the restarted router to hold route selection after a graceful restart	—

Display Items	Meaning	Displayed detailed information
Start Time	Date and time the graceful restart started	yyyy/mm/dd hh:mm:ss year/month/day hour:minute:second A hyphen (-) is displayed when monitoring is not performed.
End Time	Date and time the graceful restart ended	yyyy/mm/dd hh:mm:ss year/month/day hour:minute:second A hyphen (-) is displayed when monitoring is not performed or when it is being executed.
OSPF		
Restart State	Execution status of restart router (The latest information is displayed.)	Receiving: Learning routes. Advertising: Advertising routes. Finished: Restart ended. -: Not executed.
Total of Domain	Total number of domains for which a graceful restart was executed	—
(Succeeded: <N>)	Number of domains in which a graceful restart was successful	A hyphen (-) is displayed for N when the execution status of the restart router is not executed.
BGP		
Restart State	Execution status of restart router (The latest information is displayed.)	Receiving: Learning routes. Advertising: Advertising routes. Finished: Restart ended. -: Not executed.
Total of Peer	Total number of peers for which a graceful restart was executed	—
(Succeeded: <N>)	Number of peers in which a graceful restart was successful	A hyphen (-) is displayed for N when the execution status of the restart router is not executed.
OSPFv3		
Restart State	Execution status of restart router (The latest information is displayed.)	Receiving: Learning routes. Advertising: Advertising routes. Finished: Restart ended. -: Not executed.
Total of Domain	Total number of domains for which a graceful restart was executed	—
(Succeeded: <N>)	Number of domains in which a graceful restart was successful	A hyphen (-) is displayed for N when the execution status of the restart router is not executed.
BGP4+		
Restart State	Execution status of restart router (The latest information is displayed.)	Receiving: Learning routes. Advertising: Advertising routes. Finished: Restart ended. -: Not executed.

Display Items	Meaning	Displayed detailed information
Total of Peer	Total number of peers for which a graceful restart was executed	—
(Succeeded: n)	Number of peers in which a graceful restart was successful	A hyphen (-) is displayed for n when the execution status of the restart router is not executed.

#

After the execution status of the restart router (Restart State) for each protocol becomes "Finished" or "-", the graceful restart will be available again. The following are some of the factors that cause the execution to stop.

- The unicast route could not be retained.

- The existing configuration was changed while a graceful restart process was in progress.

- The master switch was switched or the unicast routing program was restarted while a graceful restart process was in progress.

Impact on communication

None

Response messages

Table 9-2: List of response messages for the show graceful-restart unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.
3	Not active as a Restart Router.	It is not running as a restart router. Check the configuration.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

1. The information for each protocol will only be displayed when the graceful restart of each protocol is configured with the "graceful-restart mode" configuration command set to "both" or "restart".

2. The displayed contents are retained until the next graceful restart is started.

show processes memory unicast

Displays the memory allocation state and usage in a unicast routing program.

Syntax

```
show processes memory unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 9-2: Displaying memory usage in the unicast routing program

```
> show processes memory unicast
Date 20XX/07/14 12:00:00 UTC
Allocation Size: 4096
Size   Free   Block Name       Init   Max       Alloc     Free        InUse
8      478    runt             1      0         0         0           0
8      478    krt_remnant_rt   1      2         2         2           0
  :
11120  0      ospf_AREA        1      0         0         0           0
Total Memory: 57336    Total Free: 42200    Total Allocated: 15136
>
```

Display Items

Table 9-3: Items displayed for memory usage in the unicast routing program

Display Items	Meaning	Displayed detailed information
Allocation Size	Page size (bytes)	—
Size	Block size (bytes)	—
Free	Number of unused blocks having the same size	—
Block Name	Block name	—
Init	Block initialization count	—
Max	Maximum allocation number for the block	—
Alloc	Block allocation count	—
Free	Block release count	—
InUse	Number of blocks in use	—

Display Items	Meaning	Displayed detailed information
Total Memory	Total amount of allocated memory (bytes)	—
Total Free	Total amount of unused memory (bytes)	—
Total Allocated	Total amount of memory in use (bytes)	—

Impact on communication

None

Response messages

Table 9-4: List of response messages for the show processes memory unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show processes cpu unicast

Shows the CPU usage of a unicast routing program.

Syntax

```
show processes cpu [{ days | hours | minutes | seconds }] unicast
```

Input mode

User mode and administrator mode

Parameters

days

Displays the CPU usage per day for the past 30 days.

hours

Displays the CPU usage per hour for the past 24 hours.

minutes

Displays the CPU usage per minute for the past 60 minutes.

seconds

Displays the CPU usage per second for the past 60 seconds.

Behavior when this parameter is omitted:

Displays the CPU usage per second for the past 60 seconds.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 9-3: Displaying the CPU usage (per day)

```
>show processes cpu days unicast
Date 20XX/07/14 12:00:00 UTC
Collection Time          Peak Average RIP OSPF BGP RIPng OSPFv3 BGP4+ RA
07/10 00:00:00-23:59:59  30   7       0   2    3   0     0      0     0
07/11 00:00:00-23:59:59  24   8       0   2    3   0     0      0     0
:
07/13 00:00:00-23:59:59  10   7       0   2    3   0     0      0     0
>
```

Figure 9-4: Displaying the CPU usage (per hour)

```
>show processes cpu hours unicast
Date 20XX/07/14 12:00:00 UTC
Collection Time          Peak Average RIP OSPF BGP RIPng OSPFv3 BGP4+ RA
07/14 08:00:00-08:59:59  10   7       0   2    2   0     0      0     0
07/14 09:00:00-09:59:59  7    7       0   2    2   0     0      0     0
:
07/14 11:00:00-11:59:59  7    7       0   2    2   0     0      0     0
>
```

Figure 9-5: Display of CPU usage (per minute)

```
>show processes cpu minutes unicast
Date 20XX/07/14 12:00:00 UTC
Collection Time          Peak Average RIP OSPF BGP RIPng OSPFv3 BGP4+ RA
07/14 11:53:00-11:53:59  5    5       0   1    1   0     0      0     0
07/14 11:54:00-11:54:59  5    5       0   1    1   0     0      0     0
```

```
:
07/14 11:59:00-11:59:59 5    5      0  1   1  0    0    0    0
>
```

Figure 9-6: Display of CPU usage (per second)

```
>show processes cpu seconds unicast
Date 20XX/07/14 12:00:00 UTC
Collection Time    Average RIP OSPF BGP RIPng OSPFv3 BGP4+ RA
07/14 11:59:01     3        0   0    0   0     0      0     0
07/14 11:59:02     3        0   1    0   0     0      0     0
:
07/14 12:00:00     3        0   0    1   0     0      0     0
>
```

Display Items

Table 9-5: Items displayed for the CPU usage of the unicast routing program

Display Items	Meaning	Displayed detailed information
Collection Time	Collection date and time	—
Peak	Maximum CPU usage (%)	Maximum CPU usage per second in the collection date and time
Average	Average CPU utilization (%)	Total CPU usage for the common processing and each protocol process
RIP	RIP CPU usage (%)	—
OSPF	OSPF CPU usage (%)	—
BGP	BGP4 CPU usage (%)	—
RIPng	RIPng CPU usage (%)	—
OSPFv3	OSPFv3 CPU usage (%)	—
BGP4+	BGP4+ CPU usage (%)	—
RA	RA CPU usage (%)	—

Impact on communication

None

Response messages

Table 9-6: List of response messages for the show processes cpu unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.

No.	Message	Description
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show processes task unicast

Displays information about tasks running on a unicast routing program.

Syntax

```
show processes task unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 9-7: Displaying the task information for the unicast routing program

```
>show processes task unicast
Date 20XX/07/14 12:00:00 UTC
* = UnUsed
Name                Priority Use Address      Port   Socket <Proto - Flag>
IF                  10       ----             *      *      <Direct - >
INET                15       ----             *      7      <INET - >
Aggregate           20       ----             *      *      <Any - >
GIM_SESSION         70       127.0.0.1        1028   11     <Any - >
GIM_LISTEN          70       0.0.0.0          6116   10     <Any - Accept>
>
```

Display Items

Table 9-7: Items displayed for the task information for the unicast routing program

Display Items	Meaning	Displayed detailed information
Name	Task name	—
Priority	Task priority	—
Use Address	IP address used by the task	—
Port	Port number used by the task	—
Socket	Descriptor number for the socket used by the task	—
Proto	Routing protocol controlled by the task	Any: Other
		Connected: Directly-connected interface processing
		Kernel: Kernel interface processing
		OSPF: OSPF processing
		OSPFv3: OSPFv3 processing

Display Items	Meaning	Displayed detailed information
		RIP: RIP processing
		RIPng: RIPng processing
		BGP: BGP4 processing
		BGP4+: BGP4+ processing
		INET: Multicast address processing
		INET6: IPv6 multicast address processing
		RA: RA processing
		DHCP: Internal route processing
		MIB: MIB processing
Flag	Task status	Accept
		Connect
		Delete
		LowPrio

Note: An asterisk (*) is displayed if a port or socket is not used.

Impact on communication

None

Response messages

Table 9-8: List of response messages for the show processes task unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

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show processes timer unicast

Displays information about each timer used by a unicast routing program.

Syntax

```
show processes timer unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 9-8: Displaying the timer information for the unicast routing program

```
>show processes timer unicast
Date 20XX/07/14 12:00:00 UTC
Name            Task          Last   Next   Interval Flags
AGE             IF            0s     0s     0s       <OneShot>
Age             RIP           0s     2m24s  0s       <OneShot>
Timeout         KRT           0s     0s     0s       <OneShot Inactive>
>
```

Display Items

Table 9-9: Items displayed for the timer information for the unicast routing program

Display Items	Meaning	Displayed detailed information
Name	Timer name	—
Task	Task name	—
Last	Time elapsed since the last timeout processing was started	Time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Next	Time elapsed before the next timeout processing starts	
Interval	Interval for starting the timer	
Flags	Timer flag	HiPrio
		OneShot
		Processing
		Inactive

Display Items	Meaning	Displayed detailed information
		Delete
		Set
		Reset

Impact on communication

None

Response messages

Table 9-10: List of response messages for the show processes timer unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

restart unicast

Restarts the unicast routing program.

Syntax

```
restart unicast [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the unicast routing program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file (rtm.core) for the unicast routing program during restart.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Displays a restart confirmation message and then restarts the unicast routing program (rtm).

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} restart unicast [-f] [core-file]
```

Example

```
>restart unicast
IP routing program restart OK? (y/n): y
>
```

Display Items

None

Impact on communication

Because routing protocol adjacencies are lost, communication stops until the adjacencies are restored. However, this does not affect the communication of routing protocols running as a restart router for graceful restart.

Response messages

Table 9-11: List of response messages for the restart unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this message is frequently displayed, use the command to restart the unicast routing program.
2	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this message is frequently displayed, use the command to restart the unicast routing program.
3	pid file <File Name> mangled!	The PID file for the unicast routing program is invalid. <File Name>: PID file name
4	pid in file <File Name> unreasonably small(<PID>)	The PID file for the unicast routing program is invalid. <File_Name>: PID file name <PID>: Process ID in the PID file
5	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
6	rtm appears to be running as pid <PID>, but pid <PID> doesn't exist!	The process listed in the PID file for the unicast routing program was not found. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <PID>: Process ID
7	rtm doesn't seem to be running.	The command failed because the unicast routing program was not running. Wait until the unicast routing program has been restarted, and then re-execute the command.
8	rtm failed to terminate.	An attempt to restart the unicast routing program by using this command failed. Re-execute the command. <PID>: Process ID
9	rtm has already stopped.	The command failed because the unicast routing program has already stopped. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
10	rtm restarted after termination: old pid <PID>, new pid <PID>	The command failed because the PID was changed during command execution. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <PID>: Process ID
11	rtm signaled but still running, waiting 6 seconds more.	The command is restarting the unicast routing program. Wait a while.

No.	Message	Description
12	rtm still running, sending a kill signal.	This command is sending a Kill signal to the unicast routing program, to restart it. Wait a while.
13	rtm still running, sending another terminate signal.	This command is sending a terminate signal to the unicast routing program, to restart it. Wait a while.
14	rtm terminated.	The unicast routing program was stopped by the command. The program will restart automatically. Wait a while.

Notes

1. If necessary, back up any existing file in advance because the specified file is unconditionally overwritten if it already exists when a core file is output.

2. The core file for the unicast routing program is output to the following directory.

   Core file storage directory: /usr/var/core

   Core file: rtm.core

3. For details about how to delete the core file for the unicast routing program, see the "erase protocol-dump unicast" command ("erase protocol-dump unicast").

debug protocols unicast

Starts the operation message display for event log information output by a unicast routing program.

Syntax

```
debug protocols unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} debug protocols unicast
```

Example

```
>debug protocols unicast
monitor: start IP event-log monitor
>
(Displays event log information.)
```

Display Items

None

Impact on communication

None

Response messages

Table 9-12: List of response messages for the debug protocols unicast command

No.	Message	Description
1	already printed for event-log	Event log output has already started.
2	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
3	IP routing is not configured	The routing protocol has not been set. Check the configuration.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.

No.	Message	Description
5	program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error
6	start IP event-log monitor	Event log output is started.

Notes

None

no debug protocols unicast

Stops the operation message display for event log information output by a unicast routing program.

Syntax

```
no debug protocols unicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} no debug protocols unicast
```

Example

```
>no debug protocols unicast
monitor: stop IP event-log monitor
>
(Does not display event log information.)
```

Display Items

None

Impact on communication

None

Response messages

Table 9-13: Response messages for the no debug protocols unicast command

No.	Message	Description
1	already does not printed for event-log	Event log output has already stopped.
2	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
3	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.

No.	Message	Description
5	program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error
6	stop IP event-log monitor	Event log output is stopped.

Notes

None

dump protocols unicast

Outputs to a file event trace information and control table information collected by a unicast routing program.

Syntax

```
dump protocols unicast { all | trace | table }
```

Input mode

User mode and administrator mode

Parameters

all

Outputs event trace information and control table information to a file.

trace

Outputs the event trace information collected by the unicast routing program to a file.

table

Converts the control table information used by the unicast routing program to text format, and outputs the compressed information to a file.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} dump protocols unicast {all | trace | table}
```

Example

Figure 9-9: Example of outputting detailed event trace information and control table information

```
> dump protocols unicast all
>
```

Figure 9-10: Outputting the event trace information

```
> dump protocols unicast trace
>
```

Display Items

None

Impact on communication

None

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Response messages

Table 9-14: List of response messages for the dump protocols unicast command

No.	Message	Description
1	pid file <File Name> mangled!	The PID file for the unicast routing program is invalid. <File Name>: PID file name
2	pid in file <File Name> unreasonably small(<PID>)	The PID file for the unicast routing program is invalid. <File_Name>: PID file name <PID>: Process ID in the PID file
3	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
4	rtm appears to be running as pid <PID>, but pid <PID> doesn't exist!	The process listed in the PID file for the unicast routing program was not found. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <PID>: Process ID
5	rtm doesn't seem to be running.	The command failed because the unicast routing program was not running. Wait until the unicast routing program has been restarted, and then re-execute the command.

Notes

The output files and directories for the Switch are as follows:

Directory storing the unicast routing program information: /usr/var/rtm/

Event trace information file: rt_trace

Control table information file: rt_dump.gz

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

erase protocol-dump unicast

Deletes the files containing the event trace information and control table information generated by a unicast routing program.

Syntax

```
erase protocol-dump unicast { all | trace | table | core-file }
```

Input mode

User mode and administrator mode

Parameters

all

Deletes the event trace information file, control table information file, and core file created by the unicast routing program.

trace

Deletes the event trace information file created by the unicast routing program.

table

Deletes the control table information file created by the unicast routing program.

core-file

Deletes the core file created by the unicast routing program.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all}
erase protocol-dump unicast {all | trace | table | core-file}
```

Example

Figure 9-11: Deleting the event trace information and control table information

```
> erase protocol-dump unicast all
>
```

Figure 9-12: Deleting the event trace information file

```
> erase protocol-dump unicast trace
>
```

Display Items

None

Impact on communication

None

Response messages

Table 9-15: List of response messages for the erase protocol-dump unicast command

No.	Message	Description
1	pid file <File Name> mangled!	The PID file for the unicast routing program is invalid. <File Name>: PID file name
2	pid in file <File Name> unreasonably small(<PID>)	The PID file for the unicast routing program is invalid. <File_Name>: PID file name <PID>: Process ID in the PID file
3	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
4	rtm appears to be running as pid <PID>, but pid <PID> doesn't exist!	The process listed in the PID file for the unicast routing program was not found. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <PID>: Process ID
5	rtm doesn't seem to be running.	The command failed because the unicast routing program was not running. Wait until the unicast routing program has been restarted, and then re-execute the command.

Notes

The files and directories to be deleted from the Switch are as follows:

- Directory storing the unicast routing program information (/usr/var/rtm/)

  Event trace information file: rt_trace

  Control table information file: rt_dump.gz

- Unicast routing program core storage directory (/usr/var/core)

  Core file: rtm.core

10 IPv6, NDP, ICMPv6

show ip-dual interface

Displays the status of IPv4 and IPv6 interfaces.

Syntax

```
show ip-dual interface [vrf [<vrf id>]]
show ip-dual interface summary
show ip-dual interface up [vrf [<vrf id>]]
show ip-dual interface down [vrf [<vrf id>]]
show ip-dual interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf [<vrf id>][SL-L3A]

Displays detailed information about interfaces for which a VRF is configured.

If <vrf id> is omitted, all interfaces for which a VRF is configured are displayed.

If <vrf id> is specified, only the interface with the specified <vrf id> is displayed.

For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays all interfaces, including the global network.

summary

Displays a summary of the status of all interfaces.

up

Displays detailed information about interfaces in the UP status.

down

Displays detailed information about interfaces in the DOWN status.

<interface type> <interface number>

Displays detailed information about the applicable interface.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface
- Management port

Behavior when all parameters are omitted:

Displays the detailed status of all interfaces, including the global network.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example 1

Displays a summary of the status of all interfaces.

```
>show ip-dual interface summary
```

Figure 10-1: Example of displaying a summary of all interfaces

```
> show ip-dual interface summary
Date 20XX/12/10 12:00:00 UTC
VLAN0002: UP 3ffe::1:1/64
          fe80::200:87ff:fe98:a21c%VLAN0002/64
VLAN0003: UP 192.171.0.64/24 VRF: 10
VLAN0004: UP 3ffe:1234::1/64
>
```

Display format

```
Interface name: Status IP-address Subnet-mask VRF

Interface name: Status IPv6-address Prefix-len VRF
```

Display items in Example 1

Table 10-1: Information displayed for a summary of all interfaces

Display Items	Meaning	Displayed information
Interface name	Interface name	—
Status	Status of the interface	UP/DOWN
IP-address	IPv4 address	—
Subnet-mask	Subnet mask	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
IPv6-address	IPv6 address	—
Prefix-len	Prefix length	—

Example 2

- This example shows how to display detailed information about interfaces in the UP status.

  ```
  >show ip-dual interface up
  ```

- Display the detailed status of an interface.

  ```
  > show ip-dual interface vlan 10
  ```

The following figure shows an example of executing the command with an interface specified.

Figure 10-2: Example of executing the command with an interface specified

```
>show ip-dual interface vlan 10
Date 20XX/12/10 12:00:00 UTC
VLAN0010: flags=80e3<UP,BROADCAST,NOTRAILERS,RUNNING,NOARP,MULTICAST>
  mtu 1500
  inet 158.214.178.30/25 broadcast 158.214.178.127
  inet 158.214.178.33/32 (virtual router ip address)        <--------------1
  inet6 3ffe::1:1/64
  inet6 fe80::60:972e:1d4c%VLAN0010/64
  Switch01/NIF00/Port01: UP media 100BASE-TX full(auto) 0012.e22e.1d4c
  Switch02/NIF00/Port02: UP media ----- 0012.e22f.1d4f ChGr:5 (-)   <--------2
  Time-since-last-status-change: 30,00:10:00
  Last down at: 11/10 11:45:00              <-------------------------------3
  VLAN: 10          <--------------------------------------------------4
>show ip-dual interface vlan 100
Date 20XX/12/10 12:00:00 UTC
```

```
VLAN0100: flags=8863<UP,BROADCAST,NOTRAILERS,RUNNING,SIMPLEX,MULTICAST>
  mtu 1500
  inet 192.182.0.67/24 broadcast 192.182.0.255
  Switch01/NIF00/Port03: UP media 100BASE-TX full(auto) 0012.e220.5200
  Time-since-last-status-change: 00:22:10
  Last down at: -----
  VLAN : 100    VRF: 10                <--------------------------------4
>
```

1. Indicates that the IPv4 address is the address for the VRRP virtual router.

2. Displayed for a link aggregation line.

3. The reason that the interface is down is a line failure or a change in the configuration of the IP information or the line.

   If the configuration is changed during a line failure, the time the line failure occurred is displayed instead of the time the information was updated because the status when the configuration was changed was the Down status.

4. The VLAN ID is displayed for a VLAN. The VRF ID is displayed for a VRF.

Display items in Example 2

Table 10-2: Contents of the displayed detailed information (common display items)

Display Items	Meaning	Displayed information
flags	Status of the target interface, and the configuration items	—
mtu	MTU for the interface	See "Configuration Guide Vol. 3, 1.4.3 MTU and fragmentation".
inet	IPv4 address	—
inet6	IPv6 address	duplicated: The address is duplicated. tentative: The address is being checked for duplication.
broadcast	Broadcast address	Displayed when the IP interface type is broadcast.
virtual router ip address	IPv4 address of the VRRP virtual router	This information is displayed when a VRRP that was set up in accept mode becomes the master.
UP/DOWN	Status of the interface	UP: In operation (Normal running state) DOWN: In operation (line has failed), or not in operation
media	Line type	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command".
Time-since-last-status-change	Time elapsed since the status changed to UP or DOWN.	Time elapsed since the status of the interface last changed. The display format is hour:minute:second or number-of-days,hour:minute:second. "Over 100 days" is displayed if the number of days exceeds 100. "-----" is displayed if there has never been an UP or DOWN status.
Last down at	Time the interface went down	Time the interface last went down. The display format is month/day hour:minute:second. "-----" is displayed if the interface has never gone down.

Display Items	Meaning	Displayed information
VLAN	VLAN ID	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Table 10-3: Contents of the displayed detailed information (Ethernet interface display items)

Display Items	Meaning	Displayed information
Switch<switch no.>	Switch number	—
NIF<nif no.>	NIF number	—
Port<port no.>	Port number	—
media	Line type/line speed	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet,<line type> in the display items of the show interfaces command". In a stack configuration, "-----" is displayed for any switch other than the member switch on which the command was executed.
xxxx.xxxx.xxxx	MAC address	The MAC address used by packets sent from the interface. For a VLAN interface, a MAC address of all zeros might be displayed if the line cannot communicate.
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	In a stack configuration, "-" is displayed for the channel group status of any switch other than the member switch on which the command was executed.

Impact on communication

None

Response messages

Table 10-4: Response messages for the show ip-dual interface command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such interface -- <interface name>.	The specified interface has not been set. <interface name>: Name assigned to the specified interface

Notes

None

show ipv6 interface

Shows the status of the IPv6 interface.

Syntax

```
show ipv6 interface [vrf [<vrf id>]]
show ipv6 interface summary
show ipv6 interface up [vrf [<vrf id>]]
show ipv6 interface down [vrf [<vrf id>]]
show ipv6 interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf [<vrf id>][SL-L3A]

    Displays detailed information about interfaces for which a VRF is configured.

    If <vrf id> is omitted, all interfaces for which a VRF is configured are displayed.

    If <vrf id> is specified, only the interface with the specified <vrf id> is displayed. For <vrf id>, specify a VRF ID that was set by using the configuration command.

    Behavior when this parameter is omitted:

        Displays all interfaces, including the global network.

summary

    Displays a summary of the status of all interfaces.

up

    Displays detailed information about interfaces in the UP status.

down

    Displays detailed information about interfaces in the DOWN status.

<interface type> <interface number>

    Displays detailed information about the applicable interface.

    For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

    • VLAN interface
    • Loopback interface
    • Management port

Behavior when all parameters are omitted:

    Displays detailed status of all interfaces, including the global network.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example 1

Displays a summary of the status of all interfaces.

```
>show ipv6 interface summary
```

Figure 10-3: Example of displaying a summary of all interfaces

```
> show ipv6 interface summary
Date 20XX/12/10 12:00:00 UTC
VLAN0010: UP  3ffe::1:1/64 VRF: 10
             fe80::200:87ff:fe98:a21c%VLAN0010/64 VRF: 10
>
```

Display format

```
Interface name: Status IPv6-address prefix-len VRF
```

Display items in Example 1

Table 10-5: Information displayed for a summary of all interfaces

Display Items	Meaning	Displayed information
Interface name	Interface name	—
Status	Status of the interface	UP/DOWN
IPv6-address	IPv6 address	—
Prefix-len	Prefix length	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Example 2

- This example shows how to display detailed information about interfaces in the UP status.

```
>show ipv6 interface up
```

- Display the detailed status of an interface.

```
> show ipv6 interface vlan 10
```

The following figure shows an example of executing the command with an interface specified.

Figure 10-4: Example of executing the command with an interface specified

```
>show ipv6 interface vlan 10
Date 20XX/12/10 12:00:00 UTC
VLAN0010: flags=80e3<UP,BROADCAST,NOTRAILERS,RUNNING,NOARP,MULTICAST>
  mtu 1500
  inet6 3ffe::1:1/64
  inet6 fe80::60:972e:1d4c%VLAN0010/64
  inet6 3ffe::1:2/128 (virtual router ip address)        <----------------1
  Switch01/NIF00/Port01: UP media 100BASE-TX full(auto) 0012.e22e.1d4c
  Switch02/NIF00/Port02: UP media ----- 0012.e22f.1d4f ChGr:5 (-)  <-------2
  Time-since-last-status-change: 30,00:10:00
  Last down at: 11/10 11:45:00        <----------------------------------3
  VLAN: 10   VRF: 10        <-----------------------------------------4
```

1. Indicates that the IPv6 address is the address for the VRRP virtual router.

2. Displayed for a link aggregation line.

3. The reason that the interface is down is a line failure or a change in the configuration of the IP information or the line. If the configuration is changed during a line failure, the time the line failure occurred is displayed instead of the time the information was updated because the status when the configuration was changed was the Down status.

4. The VLAN ID is displayed for a VLAN. The VRF ID is also displayed for a VRF.

Display items in Example 2

The following describes the detailed information items.

Table 10-6: Contents of the displayed detailed information (common display items)

Display Items	Meaning	Displayed information
flags	Status of the target interface, and the configuration items	—
mtu	MTU for the interface	See "Configuration Guide Vol. 3, 1.4.3 MTU and fragmentation".
inet6	IPv6 address	duplicated: The address is duplicated. tentative: The address is being checked for duplication.
broadcast	Broadcast address	Displayed when the IP interface type is broadcast.
virtual router ip address	IPv6 address of the VRRP virtual router	This information is displayed when a VRRP that was set up in accept mode becomes the master.
UP/DOWN	Status of the interface	UP: In operation (Normal running state) DOWN: In operation (line has failed), or not in operation
media	Line type	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command".
Time-since-last-status-change	Time elapsed since the status changed to UP or DOWN.	Time elapsed since the status of the interface last changed. The display format is hour:minute:second or number-of-days,hour:minute:second. "Over 100 days" is displayed if the number of days exceeds 100. "-----" is displayed if there has never been an UP or DOWN status.
Last down at	Time the interface went down	Time the interface last went down. The display format is month/day hour:minute:second. "-----" is displayed if the interface has never gone down.
VLAN	VLAN ID	—
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Table 10-7: Contents of the displayed detailed information (Ethernet interface display items)

Display Items	Meaning	Displayed information
Switch<switch no.>	Switch number	—
NIF<nif no.>	NIF number	—
Port<port no.>	Port number	—

Display Items	Meaning	Displayed information
media	Line type/line speed	For details about line types, see "Operation Command Reference Vol. 1, 21. Ethernet, <line type> in the display items of the show interfaces command".
		In a stack configuration, "-----" is displayed for any switch other than the member switch on which the command was executed.
xxxx.xxxx.xxxx	MAC address	The MAC address used by packets sent from the interface.
		For a VLAN interface, a MAC address of all zeros might be displayed if the line cannot communicate.
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	In a stack configuration, "-" is displayed for the channel group status of any switch other than the member switch on which the command was executed.

Impact on communication

None

Response messages

Table 10-8: Response messages for the show ipv6 interface command

Message	Description
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
Can't execute.	The command could not be executed. Re-execute the command.
No such interface -- <interface name>.	The specified interface has not been set.
	<interface name>: Name assigned to the specified interface

Notes

None

show ipv6 neighbors

Shows NDP information.

Syntax

```
show ipv6 neighbors [vrf {<vrf id> | all}][detail]
show ipv6 neighbors interface <interface type> <interface number>
show ipv6 neighbors summary
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the NDP information for the specified VRF. If <vrf id> is specified, the NDP information for only the specified VRF is displayed. If all is specified, the NDP information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays the NDP information for the global network.

detail

> Displays the IPv6 address and interface name without omission.

> As a result, information exceeding the display width might be displayed.

> Behavior when this parameter is omitted:

>> For IPv6 addresses, only the first 31 characters are displayed. For interface names, only the first 10 characters are displayed.

interface <interface type> <interface number>

> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".
> - VLAN interface
> - Management port

summary [SL-L3A]

> Provides an overview of the NDP information for all VRFs including the global network.

Behavior when all parameters are omitted:

> Displays the NDP information registered on all interfaces of the global network.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 10-5: Execution result when a VLAN interface is specified

```
>show ipv6 neighbors interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 4 entries
```

```
Neighbor                       Linklayer Address Netif    Expire    S Flgs P
2001:501:811:10:260:1dff:fe22:f 0012.e222.f298   VLAN0100  permanent R
2001:501:811:10:2a0:c9ff:fe6b:8 0012.e26b.8e1b   VLAN0100  9m24s     R R
fe80::260:1dff:fe22:f298%VLAN01 0012.e222.f298   VLAN0100  permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN01 0012.e26b.8e1b   VLAN0100  expired   S R
>
>show ipv6 neighbors interface vlan 100 detail
Date 20XX/07/14 12:00:00 UTC
Total: 4 entries
Neighbor                         Linklayer Address Netif    Expire    S Flgs P
2001:501:811:10:260:1dff:fe22:f298 0012.e222.f298   VLAN0100 permanent R
2001:501:811:10:2a0:c9ff:fe6b:8e1b 0012.e26b.8e1b   VLAN0100 7s        R R
fe80::260:1dff:fe22:f298%VLAN0100  0012.e222.f298   VLAN0100 permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN0100  0012.e26b.8e1b   VLAN0100 2s        R R
>
```

Figure 10-6: Execution result when VRF is specified [SL-L3A]

```
>show ipv6 neighbors vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 5 entries
Neighbor                       Linklayer Address Netif    Expire    S Flgs P
2001:501:811:10:260:1dff:fe22:f 0012.e222.f298   VLAN0100  permanent R
2001:501:811:10:2a0:c9ff:fe6b:8 0012.e26b.8e1b   VLAN0400  9m24s     R R
2001:501:811:20:3a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0200  Extra-VRF
fe80::260:1dff:fe22:f298%VLAN01 0012.e222.f298   VLAN0100  permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN04 0012.e26b.8e1b   VLAN0400  expired   S R

VRF: 2  Total: 3 entries
Neighbor                       Linklayer Address Netif    Expire    S Flgs P
2001:501:811:20:3a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0200  7m22s     R R
2001:501:811:30:4a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0300  Extra-VRF
fe80::260:1dff:fe23:f301%VLAN02 0022.e277.f223   VLAN0200  expired   S R

VRF: 3  Total: 2 entries
Neighbor                       Linklayer Address Netif    Expire    S Flgs P
2001:501:811:30:4a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0300  7m22s     R R
fe80::260:1dff:fe24:f401%VLAN03 0033.e269.f245   VLAN0300  expired   S R
>
```

Figure 10-7: Execution result when summary is specified [SL-L3A]

```
>show ipv6 neighbors summary
Date 20XX/12/10 12:00:00 UTC
Total : 15
VRF           Limit    Entries  Extra-VRF
global        unlimit  10       5
2             1000     5        5
3             unlimit  0        0
```

Display Items

The following shows the format of information displayed by the "show ipv6 neighbors" command:

If summary is not specified:
```
VRF: <vrf id>  Total: <entry> entries
<Neighbor> <Linklayer Address> <interface name> <Expire> <Status> <Flags> <Probes>
```

Table 10-9: Displaying the interface information (If summary is not specified)

Display Items	Displayed information	
	Detailed information	Meaning
VRF: <vrf id> [SL-L3A]	VRF ID	—
	global	Global network
Total: <entry> entries	Number of entries	Number of used NDP table entries
<Neighbor>	Next hop IP address	—

Display Items	Displayed information	
	Detailed information	**Meaning**
<Linklayer Address>	MAC address of a neighboring device	(incomplete) is displayed when <status> shows I.
<interface name>	Interface name	Interface name for the device
<Expire>	XXmXXs permanent expired Extra-VRF [SL-L3A]	Remaining time before the entry expires (minute and second) Permanent entry Expired entry Entry imported from another VRF
<Status>	I, R, S, D, P	Status information I: Incomplete R: Reachable S: Stale D: Delay P: Probe
<Flags>	R, P, S	Entry information R: Router P: Proxy S: Static
<Probes>	1/2/3	Probe count

If summary is specified: [SL-L3A]

```
Total : <entry> entries
VRF    Limit      Entries  Extra-VRF
<vrf id> <limit>  <entry>  <import entry>
```

Table 10-10: Contents of the displayed NDP information (If summary is specified)

Display Items	Displayed information	
	Detailed information	**Meaning**
Total: <entry> entries	Number of entries	Number of used NDP table entries for all VRFs
<vrf id>	VRF ID global	— Global network
<limit>	Upper limit for NDP unlimit	Upper limit for NDP for a VRF No upper limit is set.
<entry>	Number of entries	Number of NDP table entries used for a VRF (including the <import entry> value)
<import entry>	Number of entries	Number of NDP entries imported from another VRF

Impact on communication

None

Response messages

Table 10-11: List of response messages for the show ipv6 neighbors command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No ndp entry.	There is no NDP information.
No such Interface.	The specified interface has not been configured. Make sure the specified parameter is correct, and then try again.
No such VRF.	The specified VRF does not exist. Make sure the specified parameter is correct, and then try again.
Socket open error.	An attempt to generate a socket failed. Wait a while, and then retry the operation.

Notes

- If a route is imported from another VRF, the NDP information for that VRF might be imported. Like regular NDP information, the imported NDP information consumes the resources of one entry. In this case, this command displays Extra-VRF in the Expire field. [SL-L3A]

clear ipv6 neighbors

Clears dynamic NDP information.

Syntax

```
clear ipv6 neighbors [vrf {<vrf id> | all}]
clear ipv6 neighbors interface <interface type> <interface number>
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Clears the NDP information for the specified VRF. If <vrf id> is specified, only the NDP information for the specified VRF is cleared. If all is specified, the NDP information for all VRFs including the global network is cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Clears the NDP information registered on the global network.

interface <interface type> <interface number>

> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

> • VLAN interface
> • Management port

Behavior when all parameters are omitted:

> Clears the NDP information registered on the global network.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Figure 10-8: Execution result of clearing the NDP information (deleting the NDP information for a specific VLAN interface)

```
> show ipv6 neighbors interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 6 entries
Neighbor                          Linklayer Address Netif      Expire    S Flgs P
2001:501:811:10:260:8ff:fe8e:30   0012.e28e.3090    VLAN0100   permanent R
2001:501:811:10:2a0:c9ff:fe6b:8   0012.e26b.8e1b    VLAN0100   expired   S R
fe80::200:87ff:fec0:3655%VLAN01   0012.e2c0.3655    VLAN0100   expired   S R
fe80::200:e2ff:fe16:7d9a%VLAN01   0012.e216.7d9a    VLAN0100   expired   S
fe80::260:8ff:fe8e:3090%VLAN010   0012.e28e.3090    VLAN0100   permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN01   0012.e26b.8e1b    VLAN0100   expired   S R
> clear ipv6 neighbors interface vlan 100
> show ipv6 neighbors interface vlan 100
Date 20XX/07/14 12:00:00 UTC
Total: 2 entries
Neighbor                          Linklayer Address Netif      Expire    S Flgs P
2001:501:811:10:260:8ff:fe8e:30   0012.e28e.3090    VLAN0100   permanent R
```

```
fe80::260:8ff:fe8e:3090%VLAN010  0012.e28e.3090    VLAN0100   permanent R
>
```

Figure 10-9: Execution result of clearing the NDP information (deleting the NDP information for a specific VRF)

```
>show ipv6 neighbors vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 5 entries
Neighbor                       Linklayer Address Netif       Expire    S Flgs P
2001:501:811:10:260:1dff:fe22:f 0012.e222.f298   VLAN0100    permanent R
2001:501:811:10:2a0:c9ff:fe6b:8 0012.e26b.8e1b   VLAN0400    9m24s       R R
2001:501:811:20:3a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0200    Extra-VRF
fe80::260:1dff:fe22:f298%VLAN01 0012.e222.f298   VLAN0100    permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN04 0012.e26b.8e1b   VLAN0400    expired   S R

VRF: 2  Total: 3 entries
Neighbor                       Linklayer Address Netif       Expire    S Flgs P
2001:501:811:20:3a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0200    7m22s       R R
2001:501:811:30:4a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0300    Extra-VRF
fe80::260:1dff:fe23:f301%VLAN02 0022.e277.f223   VLAN0200    expired   S R

VRF: 3  Total: 2 entries
Neighbor                       Linklayer Address Netif       Expire    S Flgs P
2001:501:811:30:4a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0300    7m22s       R R
fe80::260:1dff:fe24:f401%VLAN03 0033.e269.f245   VLAN0300    expired   S R
>clear ipv6 neighbors vrf 2
>show ipv6 neighbors vrf all
Date 20XX/12/10 12:00:00 UTC
VRF: global  Total: 4 entries
Neighbor                       Linklayer Address Netif       Expire    S Flgs P
2001:501:811:10:260:1dff:fe22:f 0012.e222.f298   VLAN0100    permanent R
2001:501:811:10:2a0:c9ff:fe6b:8 0012.e26b.8e1b   VLAN0400    9m24s       R R
fe80::260:1dff:fe22:f298%VLAN01 0012.e222.f298   VLAN0100    permanent R
fe80::2a0:c9ff:fe6b:8e1b%VLAN04 0012.e26b.8e1b   VLAN0400    expired   S R

VRF: 3  Total: 2 entries
Neighbor                       Linklayer Address Netif       Expire    S Flgs P
2001:501:811:30:4a0:c9ff:fe6b:8 0022.e277.8e23   VLAN0300    7m22s       R R
fe80::260:1dff:fe24:f401%VLAN03 0033.e269.f245   VLAN0300    expired   S R
>
```

Display Items

None

Impact on communication

Communication might stop temporarily until the NDP entry is created again.

Response messages

Table 10-12: List of response messages for the clear ipv6 neighbors command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No ndp entry.	There is no NDP information.
No such Interface.	The specified interface has not been configured. Make sure the specified parameter is correct, and then try again.

Message	Description
No such VRF.	The specified VRF does not exist. Make sure the specified parameter is correct, and then try again.
Socket open error.	An attempt to generate a socket failed. Wait a while, and then retry the operation.

Notes

- If you delete the NDP information for a specific VRF by using the command with the vrf parameter specified, the NDP information for other VRFs created by importing that NDP information is also deleted. [SL-L3A]

show netstat(netstat)

Shows the network status and statistics.

Syntax

```
[show] netstat [detail][numeric][addressfamily <address family>]
[show] netstat all-protocol-address [detail][numeric]
               [addressfamily <address family>]
[show] netstat interface [<interface type> <interface number> [wait <time>]]
[show] netstat {memory | protocol <protocol> | system}
[show] netstat statistics [addressfamily <address family>]
[show] netstat routing-table[{[detail][numeric]
               [addressfamily <address family>][vrf {<vrf id> | all}]
               | statistics [addressfamily <address family>]}]
[show] netstat multicast [{[detail][numeric]
               [addressfamily <address family>][vrf {<vrf id> | all}]
               | [statistics] [addressfamily <address family>]}]
```

Input mode

User mode and administrator mode

Parameters

detail

> Displays detailed information about the routing table and full IP addresses.
>
> Behavior when this parameter is omitted:
>
>> Detailed information for the routing table is not displayed. IP addresses are displayed in abbreviated form.

numeric

> Displays network addresses by their address numbers, not by their host names, and displays ports by their port numbers, not by their service names. This option can be used in any display format.
>
> Behavior when this parameter is omitted:
>
>> Displays network addresses by host names, and ports by service names.

addressfamily <address family>

> Reports statistics or address control blocks for the specified address family only.
>
> For <address family>, you can specify inet, local, inet6, unix, or arp. The specifiable address families vary depending on the combination with other parameters.
>
> Behavior when this parameter is omitted:
>
>> Displays information for all address families.

all-protocol-address

> Displays all protocol control block addresses related to the socket. This parameter is used for debugging.

interface <interface type> <interface number>

> Displays the status of the target interface.
>
> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".
>
> - VLAN interface
> - Loopback interface
> - Management port

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Behavior when this parameter is omitted:

Displays the status of all interfaces.

wait <time>

Displays the network interface statistics at intervals of seconds specified in <time>. You can specify a decimal number in the range from 1 to 2^{64} - 1.

Behavior when this parameter is omitted:

Statistics are not displayed at regular intervals.

{ memory | protocol <protocol> | system }

memory

Displays the statistics used for managing memory.

protocol <protocol>

Displays statistics for the specified protocol. The specifiable protocols are tcp, ip6, udp6, icmp6, and rip6. If you specify tcp, statistics for IPv4 and IPv6 are displayed.

system

Displays statistics such as the total number of packets received by the Switch.

statistics

Displays statistics for each protocol. If the routing-table option is specified at the same time, routing statistics will be displayed.

routing-table

Displays the routing table (if the statistics option is specified at the same time, routing statistics will be displayed instead).

vrf {<vrf id> | all} [SL-L3A]

Specifies the VRF to be displayed. If <vrf id> is specified, only the specified VRF is displayed. If all is specified, all VRFs including the global network are displayed. For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays the global network.

multicast

Displays the multicast virtual interface and routing information.

By default, information for both IPv4 and IPv6 is displayed.

(You can display only the IPv6 information by specifying an address family at the same time. To display this information, specify inet6 as the address family).

(If the statistics option is specified at the same time, multicast statistics will be displayed.)

Behavior when all parameters are omitted:

Displays information about all sockets including the global network. Normally, sockets used by server processes are not displayed.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} [show] netstat [detail][numeric][addressfamily <address fam
ily>]
remote command {<switch no.> | all} [show] netstat all-protocol-address [detail][numeric][addre
ssfamily <address family>]
remote command {<switch no.> | all} [show] netstat interface [<interface type> <interface numbe
r> [wait <time>]]
remote command {<switch no.> | all} [show] netstat {memory | protocol <protocol> | system}
```

```
remote command {<switch no.> | all} [show] netstat statistics [addressfamily <address family>]
remote command {<switch no.> | all} [show] netstat routing-table[{[detail][numeric][addressfami
ly <address family>][vrf {<vrf id> | all}] | statistics [addressfamily <address family>]}]
remote command {<switch no.> | all} [show] netstat multicast [{[detail][numeric][addressfamily
<address family>][vrf {<vrf id> | all}] | [statistics] [addressfamily <address family>]}]
```

Example and display items

The following figure shows an example displayed after execution of the "show netstat" command.

Figure 10-10: Socket interface usage

```
> show netstat addressfamily inet6
Date 20XX/04/01 12:00:00 UTC
Active Internet6 connections
Proto Recv-Q Send-Q Local Address      Foreign Address   (state)
tcp6      0       0 192:169:11::129.65513 192:169:11::71.23 ESTABLISHED
tcp6      0       0 192:169:12::129.65512 192:169:12::71.23 ESTABLISHED  VRF:10
tcp6      0       0 localhost.56165       *.*               LISTEN
tcp6      0       0 localhost.56161       *.*               LISTEN
```

Table 10-13: Information displayed for the socket interface usage

Display Items	Description
Proto	Protocol type of the socket
Recv-Q	Number of data bytes in the input queue
Send-Q	Number of data bytes in the output queue
Local Address	Local address and port number of the socket
Foreign Address	Remote address and port number of the socket
State, (state)	TCP status transition
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.
Address	Internal memory address of the UNIX domain control block
Type	Data communication type of the UNIX socket
Inode	Internal memory address of the i-node information control table
Conn	Internal memory address of the remote control block for the UNIX Stream socket
Refs	Internal memory address of the remote control block received at the end of a UNIX Datagram socket
Nextref Addr	Internal memory address of the remote control block sent at the end of a UNIX Datagram socket

Figure 10-11: Status of each interface

```
>show netstat interface
Date 20XX/04/01 12:00:00 UTC
Name      Mtu    Network      Address        Ipkts Ierrs   Opkts Oerrs Colls
VLAN0002  1500   192.168/24   192.168.0.60    3896     2    2602     0     0
VLAN0002  1500   1234::       1234::60        3896     2    2602     0     0
VLAN0002  1500   fe80::       fe80::4036:30ff 3896     2    2602     0     0
VLAN0005  1500   192:169:11:  192:169:11::99 159712    0  204354     0     0
VLAN0012  1500   192:168:12:  192:168:12::99    12     0    2328     0     0
 VRF:20
VLAN0013  1500   192:168:13:  192:168:13::99     0     0    2317     0     0
 VRF:30
```

```
loopback0   33180 loopback/8   127.0.0.1          4083   0    4083   0    0
loopback0   33180 localhost     ::1                4083   0    4083   0    0
loopback0   33180 fe80::        fe80::1            4083   0    4083   0    0
localhost   33180 127/8         127.0.0.1          1391   0    1391   0    0
 VRF:10
localhost   33180 ::1/128       ::1                1391   0    1391   0    0
 VRF:10
localhost   33180 fe80::        fe80::1            1391   0    1391   0    0
 VRF:10
loopback20  33180 127/8         127.0.0.1          3756   0    3756   0    0
 VRF:20
loopback20  33180 192:169:111 192:169:111::99      3756   0    3756   0    0
 VRF:20
loopback20  33180 ::1/128       ::1                3756   0    3756   0    0
 VRF:20
loopback20  33180 fe80::        fe80::1            3756   0    3756   0    0
 VRF:20
null0       33180 -----         -----               -    -     -     -    -

> show netstat interface vlan 2
Date 20XX/04/01 12:00:00 UTC
Name      Mtu   Network       Address         Ipkts Ierrs  Opkts Oerrs Colls
VLAN0002  1500  192.168/24    192.168.0.60    3896   2     2602   0    0
VLAN0002  1500  1234::        1234::60        3896   2     2602   0    0
VLAN0002  1500  fe80::        fe80::4036:30ff 3896   2     2602   0    0
>
```

Table 10-14: Information displayed for the status of each interface

Display Items	Description
Name	Interface name
Mtu	MTU length
Network	IP network address "- - -" is displayed for an interface other than an IP interface.
Address	Host name (if not set, the IP address is displayed). "- - -" is displayed for an interface other than an IP interface.
Ipkts	Number of receive packets (total number of IPv4 packets and IPv6 packets for an IP interface)
Ierrs	Number of received errors (total number of IPv4 packets and IPv6 packets for an IP interface)
Opkts	Number of sent packets (total number of IPv4 packets and IPv6 packets for an IP interface)
Oerrs	Number of send errors (total number of IPv4 packets and IPv6 packets for an IP interface)
Colls	Number of times collisions occurred (total number of IPv4 packets and IPv6 packets for an IP interface)
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.

Figure 10-12: Total statistics of the interface

```
> show netstat interface vlan 2 wait 5
Date 20XX/04/01 12:00:00 UTC
Name : VLAN0002  VRF:10
     in           out            total in      total out
 packets errs packets errs colls  packets errs packets  errs colls
    3905    2    2603    0     0      3905   40    2603     0     0
```

```
           0       0           0      0      0          0      0          0      0      0
           0       0           0      0      0          0      0          0      0      0
^C>
```

Table 10-15: Information displayed for total statistics of the interface

Display Items	Description
Name	Interface name
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.
in/packets	Number of receive packets for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of receive packets.
in/errs	Number of received errors for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of received errors.
out/packets	Number of packets sent for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of sent packets.
out/errs	Number of send errors for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of sent errors.
colls	Number of times collisions occurred for the specified interval (total number of IPv4 packets and IPv6 packets). The first expression is the total number of times collisions occurred.

Figure 10-13: Routing table status

```
>show netstat routing-table addressfamily inet6
Date 20XX/04/01 12:00:00 UTC
Routing tables

Internet6:
Destination        Gateway            Flags         Refs    Use   Interface
localhost          link#4099          UHC/DfA          0       0   loopback0
192:169:11::       link#8             UC/DA            0       0   VLAN0005
192:169:11::99     localhost          UHC/DA           0       0   loopback0
192:169:111::99    link#4099          UHC/DA           0       0   loopback0
fe80::%VLAN0005    link#8             UC/DfA           0       0   VLAN0005
fe80::212:e2ff:fe0 localhost          UH/DfA           1       0   loopback0
fe80::%loopback0   fe80::1%loopback0  U/Df             0       0   loopback0
fe80::1%loopback0  localhost          UH/Df            0       0   loopback0
ff01::             localhost          UC/Df            0       0   loopback0
ff02::%VLAN0005    link#8             UC/Df            0       0   VLAN0005
ff02::%loopback0   fe80::1%loopback0  UC/Df            0       0   loopback0
>
>show netstat routing-table addressfamily inet6 vrf all
Date 20XX/12/10 12:00:00 UTC
Routing tables

Internet6:
VRF: global
Destination        Gateway            Flags         Refs    Use   Interface
localhost          link#4099          UHC/DfA          0       0   loopback0
192:169:11::       link#8             UC/DA            0       0   VLAN0005
192:169:11::99     localhost          UHC/DA           0       0   loopback0
192:169:111::99    link#4099          UHC/DA           0       0   loopback0
fe80::%VLAN0005    link#8             UC/DfA           0       0   VLAN0005
fe80::212:e2ff:fe0 localhost          UH/DfA           1       0   loopback0
```

```
fe80::%loopback0    fe80::1%loopback0   U/Df            0      0  loopback0
fe80::1%loopback0   localhost           UH/Df           0      0  loopback0
ff01::              localhost           UC/Df           0      0  loopback0
ff02::%VLAN0005     link#8              UC/Df           0      0  VLAN0005
ff02::%loopback0    fe80::1%loopback0   UC/Df           0      0  loopback0

VRF: 10
Destination         Gateway             Flags        Refs   Use  Interface
::1                 link#4100           UHC/DfA         0      0  localhost
fe80::%localhost    fe80::1%localhost   U/Df            0      0  localhost
fe80::1%localhost   localhost           UH/Df           0      0  localhost
ff01::              localhost           UC/Df           0      0  localhost
ff02::%localhost    fe80::1%localhost   UC/Df           0      0  localhost

VRF: 20
Destination         Gateway             Flags        Refs   Use  Interface
::1                 link#4101           UHC/DfA         0      0  localhost
192:169:12::        link#15             UC/DA           0      0  VLAN0012
192:169:12::99      ::1                 UHC/DA          0      0  loopback20
192:169:112::99     link#4101           UHC/DA          0      0  loopback20
fe80::%VLAN0012     link#15             UC/DfA          0      0  VLAN0012
fe80::212:e2ff:fe0  ::1                 UH/DfA          1      0  loopback20
fe80::%loopback20   fe80::1%loopback20  U/Df            0      0  loopback20
fe80::1%loopback20  ::1                 UH/Df           0      0  loopback20
ff01::              ::1                 UC/Df           0      0  loopback20
ff02::%VLAN0012     link#15             UC/Df           0      0  VLAN0012
ff02::%loopback20   fe80::1%loopback20  UC/Df           0      0  loopback20
```

Table 10-16: Information displayed for the routing table status

Display Items	Description
VRF [SL-L3A]	VRF ID
Destination	Destination host name (if not set, the IPv6 address is displayed)
Gateway	Gateway address (MAC address for an NDP entry)
Flags	Route status flag
Refs	Total number of sockets that are currently referencing the target route
Use	Total number of sockets that have been referencing the target route
Interface	Sending interface

Figure 10-14: Statistics for the icmp6 protocol

```
>show netstat protocol icmp6
Date 20XX/07/14 12:00:00 UTC
icmp6:
      284 calls to icmp_error
      0 errors not generated because old message was icmp
        0utput histogram:
                destination unreachable: 284
        3 messages with bad code fields
        0 messages < minimum length
        0 bad checksums
        0 messages with bad length
        lnput histogram:
                destination unreachable: 293
        0 message responses generated
>
```

Table 10-17: Information displayed for icmp6 protocol statistics

Display Items	Description
calls to icmp_error	Number of attempts to issue ICMPv6 error messages

Display Items	Description
errors not generated because old message was icmp	Number of times an ICMPv6 error message was not issued because the packet that caused the issuance of ICMPv6 message was an ICMPv6 message
errors not generated because rate limitation	Number of ICMPv6 error messages that could not be issued due to the rate limit.
Output histogram:	Histogram of number of ICMPv6 messages sent vs. message type
messages with bad code fields	Number of received ICMPv6 messages with undefined codes
messages < minimum length	Number of the following types of ICMPv6 messages received: 1. The message is smaller than the ICMPv6 header. 2. The ICMPv6 header does not exist. 3. The message size is smaller than the sum of the length of the ICMPv6 header and the IPv6 header (of the packet that caused the message). 4. No data exists after the ICMPv6 header. 5. A higher-level header of the packet causing the message is not found.
bad checksums	Number of received packets for which the value of the ICMPv6 message checksum field was invalid
messages with bad length	The message size is smaller than the size of each ICMPv6 message header.
Input histogram:	Histogram of number of ICMPv6 messages received vs. message type
message responses generated	Number of received ICMPv6 messages (Echo, Timestamp, or Address Mask) that returned responses

Figure 10-15: show netstat system statistics

```
>show netstat system
Date 20XX/12/10 12:00:00 UTC
SYSTEM:
        1039 packets received
                0 ip
                0 ip6
                0 arp
                1039 control
        0 input packets discarded
                0 no memory
                0 bad length
        0 times ip queue full
        0 times ip6 queue full
        0 times arp queue full
        0 times control queue full
        1 times receiver disabled
        1 times receiver restarted
        1016 packets sent
                0 ip
                0 ip6
                0 arp
                1016 control
>
```

Table 10-18: Information displayed for the show netstat system statistics command

Display Items	Description
packets received	Total number of packets received by the Switch
ip	Number of IPv4 packets received by the Switch

Display Items	Description
ip6	Number of IPv6 packets received by the Switch
arp	Number of ARP packets received by the Switch
control	Number of control packets received by the Switch (including L2 control)
input packets discarded	Total number of packets discarded by the Switch during reception
no memory	Number of packets discarded by the Switch due to insufficient buffers during reception
bad length	Number of packets discarded by the Switch due to invalid packet length during reception
times ip queue full	Number of times the Switch detected IPv4 queue full during reception
times ip6 queue full	Number of times the Switch detected IPv6 queue full during reception
times arp queue full	Number of times the Switch detected ARP queue full during reception
times control queue full	Number of times the Switch detected control queue full during reception
times receiver disabled	Number of times the Switch stopped receiving packets (excessive load control)
times receiver restarted	Number of times the Switch resumed receiving packets (excessive load control)
packets sent	Total number of packets sent by the Switch
ip	Number of IPv4 packets sent by the Switch
ip6	Number of IPv6 packets sent by the Switch
arp	Number of ARP packets sent by the Switch
control	Number of control packets sent by the Switch (including L2 control)

Figure 10-16: Displaying the IPv6 information (address family specified)

```
> show netstat routing-table addressfamily inet6
Date 20XX/07/14 12:00:00 UTC
Routing tables

Internet6:
Destination        Gateway           Flags          Refs    Use  Interface
1234::             link#2            UC/DA             0      0  VLAN0002
                                        :
>
```

Table 10-19: Items displayed for the IPv6 information (address family specified)

Display Items	Description
Destination	Destination address
Gateway	Gateway address
Flags	Route status flag
Refs	Total number of sockets that are currently referencing the target route

Display Items	Description
Use	Total number of sockets that have been referencing the target route
Interface	Sending interface

Figure 10-17: Displaying the IPv6 multicast routing status

```
>show netstat multicast addressfamily inet6 vrf 10
Date 20XX/04/01 12:00:00 UTC
IPv6 Virtual Interface Table
 Mif    Rate      PhyIF    Pkts-In   Pkts-Out
  0      0         reg0        0          0
  1      0       VLAN0010      21         0
  2      0       VLAN0020      14         0   VRF:10
  3      0       VLAN0030      35         0   VRF:20
  4      0       VLAN0040       0         0
  5      0       VLAN0050      35         0   VRF:10
  6      0       VLAN0060       0         0   VRF:20

IPv6 Multicast Forwarding Cache
VRF: 10
 Origin                         Group         Packets Waits In-Mif  Out-Mifs
 3ffe:ffff:1234:5678:1200:2425 ff15:1::1            2     0     2     5
Total no. of entries in cache: 1

>show netstat multicast addressfamily inet6 vrf all
Date 20XX/10/22 12:00:00 UTC
IPv6 Virtual Interface Table
 Mif    Rate      PhyIF    Pkts-In   Pkts-Out
  0      0         reg0        0          0
  1      0       VLAN0010      21         0
  2      0       VLAN0020      14         0   VRF:10
  3      0       VLAN0030      35         0   VRF:20
  4      0       VLAN0040       0         0
  5      0       VLAN0050      35         0   VRF:10
  6      0       VLAN0060       0         0   VRF:20

IPv6 Multicast Forwarding Cache
VRF: global
 Origin                         Group         Packets Waits In-Mif  Out-Mifs
 3ffe:ffff:1234:5678:1200:87fe ff15:1::1            3     0     1     4
Total no. of entries in cache: 1

VRF: 10
 Origin                         Group         Packets Waits In-Mif  Out-Mifs
 3ffe:ffff:1234:5678:1200:2425 ff15:1::1            2     0     1     5
Total no. of entries in cache: 1

VRF: 20
 Origin                         Group         Packets Waits In-Mif  Out-Mifs
 3ffe:ffff:1234:5678:1200:87fe ff15:1::1            1     0     3     6
Total no. of entries in cache: 1

>
```

Table 10-20: Items displayed for the statistics of the IPv6 multicast routing status (IPv6 Virtual Interface Table)

Display Items	Description
Mif	Internal number for the multicast interface
Rate	Fixed to 0 (not supported)
PhyIF	Multicast interface name
Pkts-In	Number of packets received by the target interface.

Display Items	Description
Pkts-Out	Number of packets sent from the target interface.
VRF [SL-L3A]	VRF ID This item is not displayed when the target is a global network.

Table 10-21: Items displayed for the statistics of the IPv6 multicast routing status (IPv6 Multicast Forwarding Cache)

Display Items	Description
VRF [SL-L3A]	VRF ID global (global network)
Origin	Source address
Group	Destination group address
Packets	Number of packets forwarded by software via the target route
Waits	Number of packets addressed to a cache route and waiting to be forwarded in the kernel
In-Mif	Receiving interface number
Out-Mifs	Sending interface number
Total no. of entries in cache	Number of multicast forwarding entries

Figure 10-18: Displaying the IPv6 multicast routing statistics

```
>show netstat multicast statistics addressfamily inet6
Date 20XX/07/14 12:00:00 UTC
IPv6 Multicast forwarding:
        0 multicast forwarding cache lookups
        0 multicast forwarding cache misses
        0 upcalls to mrouted
        0 upcall queue overflows
        0 upcalls dropped due to full socket buffer
        0 cache cleanups
        0 datagrams with no route for origin
        0 datagrams arrived with bad tunneling
        0 datagrams could not be tunneled
        0 datagrams arrived on wrong interface
        0 datagrams selectively dropped
        0 datagrams dropped due to queue overflow
        0 datagrams dropped for being too large
>
```

Table 10-22: Items displayed for the IPv6 multicast routing statistics

Display Items	Description
multicast forwarding cache lookups	Number of searches performed on the forwarding route table
multicast forwarding cache misses	Number of times that no match was found by searching through the forwarding route table
upcalls to mrouted	Number of receive packets that were reported to the routing information controller
upcall queue overflows	Number of packets discarded due to queue overflow while the receive packets were waiting for forwarding routing information to be created

Display Items	Description
upcalls dropped due to full socket buffer	Number of packets that were to be reported to the routing information controller, but were discarded due to insufficient socket buffer
cache cleanups	Number of packets that were queued to wait for forwarding routing information to be created, but were discarded due to timeout.
datagrams with no route for origin	Number of receive packets that had no forwarding routes.
datagrams arrived with bad tunneling	Number of packets discarded due to an invalid tunnel option
datagrams could not be tunneled	Number of packets that were discarded due to an interface with invalid tunnel option.
datagrams arrived on wrong interface	Number of packets received from a wrong interface
datagrams selectively dropped	Fixed to 0 (not supported)
datagrams dropped due to queue overflow	Fixed to 0 (not supported)
datagrams dropped for being too large	Fixed to 0 (not supported)

Impact on communication

None

Response messages

Table 10-23: List of response messages for the show netstat (netstat) command

Message	Description
IPv6 Multicast Interface Table is empty	There are no IPv6 multicast interfaces.
IPv6 Multicast Routing Table is empty	There are no IPv6 multicast forwarding entries.
Since cache changed, please try again.	Information was changed during command execution. Re-execute the command.
Socket open error.	An attempt to generate a socket failed.

Notes

- To terminate the command that was started with the wait parameter specified, press Ctrl+C.
- If this command terminates abnormally, a core file might be output. If this occurs, re-execute the command.

clear netstat

Clears protocol statistics.

Syntax

```
clear netstat statistics [{ protocol <protocol> | system }]
```

Input mode

User mode and administrator mode

Parameters

statistics

    Clears the statistics.

    Behavior when this parameter is omitted:

        Clears all protocol statistics.

{ protocol <protocol> | system }

    protocol <protocol>

        Clears the statistics for the specified protocol. The specifiable protocols are tcp, ip6, udp6, icmp6, and rip6. If you specify tcp, statistics for IPv4 and IPv6 are displayed.

    system

        Clears statistics such as the total number of packets received by the Switch.

    Behavior when this parameter is omitted:

        Clears all protocol statistics.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} clear netstat statistics [{ protocol <protocol> | system }]
```

Example and display items

None

Impact on communication

None

Response messages

Table 10-24: List of messages for the clear netstat command

Message	Description
Socket open error.	An attempt to generate a socket failed.

Notes

None

clear tcp

Forcibly disconnects the specified TCP connection.

Syntax

```
clear tcp [-f] {pcb <pcb address> |
               local <ipv6 address> <port> remote <ipv6 address> <port> |
               local <hostname> <port> remote <hostname> <port> }
               [reset-flag]
```

Input mode

User mode and administrator mode

Parameters

-f

Forcibly releases the resources of the device.

pcb <pcb address>

Specifies the connection by the PCB address displayed by the "show netstat all-protocol-address" command (see "show netstat(netstat)").

local <ipv6 address> <port> remote <ipv6 address> <port>

Specifies the connection by the local IPv6 address, local port, remote IPv6 address, and remote port.

For the local IPv6 address and remote IPv6 address, an IPv6 address, or an IPv6 address with an interface name (for a link-local address) can be specified.

local <hostname> <port> remote <hostname> <port>

Specifies the connection by the local host name, local port, remote host name, and remote port.

reset-flag

Forces disconnection by sending RST flag.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} clear tcp [-f] {pcb <pcb address> | local <ipv6 address> <p
ort> remote <ipv6 address> <port> | local <hostname> <port> remote <hostname> <port> } [reset-f
lag]
```

Example

Figure 10-19: Example of executing the clear tcp command

```
> clear tcp local fe80::1234%VLAN0100 1027 remote fe80::1233%VLAN0100 23
>
```

Display Items

None

Impact on communication

Communication stops because the TCP connection is disconnected.

Response messages

Table 10-25: List of response messages for the clear tcp command

Message	Description
<hostname>: Unknown host	The host name specified by <hostname> is invalid.
connection not found	The specified connection does not exist.
missing pcb address	The PCB address is not specified.
missing remote address	The remote address or port is not specified.
pcb not found	The specified PCB does not exist.

Notes

Disconnection using this command might adversely affect system operation. This command must be used with care and used only when unavoidable.

ping ipv6

The "ping ipv6" command is used to determine whether communication is possible with the device with the specified IPv6 address. This command is used with IPv6 only.

Syntax

```
ping ipv6 <host> [numeric] [summary] [verbose] [hostname] [count <count>]
    [interval <wait>] [preload <preload>] [pad-byte <pattern>]
    [interface <interface type> <interface number>]
    [[specific-route] source <source address>] [packetsize <size>]
    [hoplimit <hops>] [<gateway address>…] [vrf <vrf id>]
ping ipv6 <host> compact [numeric] [hostname] [count <count>] [interval <wait>]
    [pad-byte <pattern>] [interface <interface type> <interface number>]
    [[specific-route] source <source address>] [packetsize <size>]
    [hoplimit <hops>] [<gateway address>…] [vrf <vrf id>]
ping ipv6 <host> simple [numeric] [hostname] [count <count>] [interval <wait>]
    [pad-byte <pattern>] [interface <interface type> <interface number>]
    [[specific-route] source <source address>] [packetsize <size>]
    [hoplimit <hops>] [<gateway address>…] [vrf <vrf id>]
```

Input mode

User mode and administrator mode

Parameters

\<host\>

Specifies the destination host name, an IPv6 address, or an IPv6 address with an interface name (for a link-local address only).

If vrf \<vrf id\> is specified, either an IPv6 address or an IPv6 address with an interface name (for a link-local address only) can be specified for \<host\>. When /vrf \<vrf id\> is specified, the destination host name cannot be specified to \<host\>. [SL-L3A]

compact

Displays the execution results in a simplified format using the following symbols. If this parameter is specified, the initial value of the ping ipv6 transmission count is set to 5.

!: Response received (ICMPv6 Echo Reply)

.: No response

U: No route (ICMPv6 Destination Unreachable: No route to destination)

A: Access denied

(ICMPv6 Destination Unreachable:

Communication with destination administratively prohibited)

N: Beyond the scope of addresses

(ICMPv6 Destination Unreachable: Beyond scope of source address

H: Address unreachable

(ICMPv6 Destination Unreachable: Address unreachable

S: Port unreachable (ICMPv6 Destination Unreachable: Port unreachable)

@: Unreachable destinations other than above (ICMPv6 Destination Unreachable: Undefined code)

B: Packet too big (ICMPv6 Packet too big)

T: Time exceeded (ICMPv6 Time exceeded)

P: Parameter problem (ICMPv6 Parameter problem)

?: Unidentified ICMPv6 packet type

If no response is sent within the sending interval, it is determined that no response (a timeout) occurred. This parameter cannot be specified together with the simple, summary, verbose, or preload parameter.

simple

Displays the execution results in a simplified format using the following symbols. If this parameter is specified, the initial value of the transmission count is set to 5.

!: Response received (ICMP Echo Reply)

.: No response

Note that "no response" symbols are displayed together with a "response received" symbol when a response is received after the time that no response was received (echo reply was missing). Therefore, no-response symbols are displayed real-time while no response is received.

This parameter cannot be specified together with the compact, summary, verbose, or preload parameter.

numeric

Displays the host IPv6 address without converting it to a name. If a standard host name is registered on the host, the standard host name is displayed at the end of the command.

Behavior when this parameter is omitted:

If the hostname parameter is specified, the name converted from the IPv6 address of the host is displayed.

If the hostname parameter is not specified, the IPv6 address of the host is displayed without being converted to a name.

summary

Restricts the output. Only the summary lines of the first and last lines are displayed.

Behavior when this parameter is omitted:

Displays one line for one response as regular display mode.

verbose

Enables verbose output. Received ICMPv6 packets other than ECHO_RESPONSE and this command are also displayed.

Behavior when this parameter is omitted:

Displays ECHO_RESPONSE and other errors only.

hostname

Displays the output results as a host name.

Behavior when this parameter is omitted:

Displays the host IPv6 address without converting it to a name.

count <count>

Sends packets for the number of times specified for <count>, and then finishes the processing. To interrupt the processing, press Ctrl+C. The specifiable values are from 1 to 2147483647. Note that if the simple parameter is specified, packets are sent a maximum of 65536 times.

Behavior when this parameter is omitted:

Sends packets indefinitely. However, if the compact or simple parameter is specified, packets are sent five times.

interval <wait>

Sets the packet sending interval to the number of seconds specified for <wait>. The specifiable values are from 0.1 to 0.9, and from 1 to 2147483647. Values smaller than one second can be specified in units of 0.1 seconds. Values from 1 to 2147483647 seconds can be specified in seconds.

Behavior when this parameter is omitted:

The sending interval defaults to 1 second.

preload <preload>

Sends the number of packets specified in <preload> as fast as possible, and then returns to normal behavior. The specifiable values are from 1 to 2147483647. Do not use this parameter for normal operations. When using this parameter, the CPU usage rises and the send bandwidth is significantly consumed, which might affect other processes, services, and communications.

Behavior when this parameter is omitted:

Preload sending is not performed.

pad-byte <pattern>

Specifies the pad bytes for packets to be sent. The maximum size of the pad is 16 bytes. This is effective for diagnosing data-dependent problems on the network. For example, specify pad-byte ff to generate an all-ones packet to be sent. You can specify a hexadecimal number consisting of 1 to 32 digits.

Behavior when this parameter is omitted:

Generates pad characters by incrementing from 00 to ff.

interface <interface type> <interface number>

If the destination IPv6 address specified for <host>is a multicast address or link-local address, specify the source interface.

If the destination IPv6 address specified for <host>is a unicast address, packets will be sent only when active routes to the interface specified by <interface type> and <interface number> are retained.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface
- Management port

Behavior when this parameter is omitted:

Packets are sent from the interface selected by the Switch.

specific-route

Sends packets only to a specific route when the destination has multipath routes. Packets are sent by the interface for which the IPv6 address specified for <source address> of the source option is set.

Behavior when this parameter is omitted:

A specific route is not specified.

source <source address>

Uses the IPv6 address specified for <source address> as the source address of an output packet. Only the IPv6 addresses set on the Switch can be specified.

Behavior when this parameter is omitted:

The source IPv6 address selected by the Switch is used.

packetsize <size>

Specifies how many bytes of data are to be sent. The size of a packet to be sent is the sum of this value, 40 bytes of the IPv6 header, and 8 bytes of the ICMPv6 header. The specifiable values are from 1 to 65527.

Behavior when this parameter is omitted:

The number of bytes of data to be sent is 8.

hoplimit <hops>

> Sets the value specified for <hops> to the hops field of the IPv6 header. The specifiable values are from 1 to 255.
>
> Behavior when this parameter is omitted:
>
>> 64 is set.

<gateway address>

> Specifies source route gateways. You can specify a maximum of eight gateways.
>
> Behavior when this parameter is omitted:
>
>> A source route gateway is not specified.

vrf <vrf id>[SL-L3A]

> Specifies the VRF. For <vrf id>, specify a VRF ID that was set by using the configuration command.
>
> Behavior when this parameter is omitted:
>
>> Displays the information for the global network.

Behavior when all parameters are omitted:

> Displays information in the usual "one line for one response" display mode for the global network.

Operation when a stack configuration is used

The command can be used in the same way as for a standalone configuration.

Example

- This example shows how to execute an echo test by specifying the default values (unlimited attempts, data size of 56 bytes, and sending interval of 1 second).

  Figure 10-20: Result of executing the ping ipv6 command with default values

  ```
  >ping ipv6 3ffe:1:100::120
  PING6(56=40+8+8 bytes) 3ffe:1:100::1 --> 3ffe:1:100::120
  16 bytes from 3ffe:1:100::120, icmp_seq=0 hlim=64 time=0.301 ms
  16 bytes from 3ffe:1:100::120, icmp_seq=1 hlim=64 time=0.468 ms
  16 bytes from 3ffe:1:100::120, icmp_seq=2 hlim=64 time=0.45 ms
  ^C
  --- 3ffe:1:100::120 ping6 statistics ---
  3 packets transmitted, 3 packets received, 0.0% packet loss
  round-trip min/avg/max = 0.301/0.406/0.468 ms
  >
  ```

- This examples shows how to execute an echo test by specifying 3 attempts, data size of 120 bytes, and sending interval of 2 seconds.

  Figure 10-21: Example of executing the ping ipv6 command by specifying 3 attempts, data size of 120 bytes, and sending interval of 2 seconds

  ```
  >ping ipv6 3ffe:1:100::120 count 3 packetsize 120 interval 2
  ```

- This example shows how to execute an echo test by specifying the compact parameter and 10 attempts.

  Figure 10-22: Example of executing the ping ipv6 command by specifying the compact parameter and 10 attempts

  ```
  > ping ipv6 3ffe:1:100::120 compact count 10
  PING6(56=40+8+8 bytes) 3ffe:1:100::1 --> 3ffe:1:100::120
  !!!!!!!!!!
  10 packets transmitted, 10 packets received, 0.0% packet loss
  round-trip min/avg/max = 0.301/0.406/0.468 ms
  >
  ```

- This example shows how to execute an echo test by specifying the simple parameter, 100 attempts, and a sending interval of 0.5 seconds.

Figure 10-23: Example of executing the ping ipv6 command by specifying the simple parameter, 100 attempts, and a sending interval of 0.5 seconds

```
> ping ipv6 3ffe:1:100::120 simple count 100 interval 0.5
PING6(56=40+8+8 bytes) 3ffe:1:100::1 --> 3ffe:1:100::120
!!!!!!!!!!!!!!!!!!!!!!!!!!!........................!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!
100 packets transmitted, 75 packets received, 25.0% packet loss
round-trip min/avg/max = 0.301/0.406/0.468 ms
>
```

Impact on communication

When using the preload parameter, the CPU usage rises and the send bandwidth is significantly consumed, which might affect communications.

Response messages

Table 10-26: List of messages for the ping ipv6 command

Message	Description
<interface name>: invalid interface name	The specified interface has not been set. <interface name>: Name assigned to the specified interface
Bad/invalid number of packets	The sending count specified for count is too large. Reduce the sending count.
bind: Can't assign requested address	The specified IPv6 address has not been set on the Switch (when the source option is specified).
Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
failed to get receiving hop limit	The hop limit could not be acquired from the receive packet.
failed to get receiving packet information	The packet information could not be acquired from the receive packet.
invalid peername	An invalid partner was set in the receive packet.
invalid source address: <error message>	An invalid source address is specified. <error message>: Error message
No address associated with hostname	An address corresponding to the host name was not found.
packet too short (<receive> bytes) from <host>	The packet length from the specified host is too short. <receive>: Length of the data received <host>: Host name or IPv6 address
patterns must be specified as hex digits	Pattern characters must be specified in hexadecimal (when the pad-byte is specified).
recvmsg: <error message>	An attempt to receive data from a socket failed. <error message>: Error message
sendmsg: <error message>	An attempt to send data to a socket failed. <error message>: Error message

Message	Description
sendmsg: Message too long	Data cannot be sent because the number of data bytes specified for packetsize is too large. Reduce the number of data bytes.
sendmsg: No buffer space available	Data cannot be sent because the number of data bytes specified for packetsize is too large. Reduce the number of data bytes.
socket: \<error message\>	An attempt to open a socket failed. \<error message\>: Error message
unknown host \<hostname\>	The host name is not correct. Specify the correct host name.
unknown protocol icmp	An attempt to obtain the icmp protocol information failed.
wrote \<host\> \<send\> chars, ret=\<sent\>	Packets cannot be sent to the specified host. \<host\>: Host name or IPv6 address \<send\>: Length of the data to be sent \<sent\>: Length of the data sent

Notes

- To halt execution of the "ping ipv6" command, press Ctrl+C. If you interrupt the command with the simple parameter specified, "no response" symbols (.) corresponding to echo replies which have not been received are displayed after the command is interrupted. As a result, the number of "no response" symbols might not be exactly correct.

- In IPv6, unlike IPv4, the address defined for the sending interface might not be a starting point address.

  To use the "ping ipv6" command to perform continuity confirmation, make sure that which address is selected for the starting point address. If a connection cannot be established, use the source parameter to specify another IPv6 address set on the interface for the device, and then perform continuity confirmation again.

- If the "ping ipv6" command is executed for an IPv6 address that is also used by another device, an IPv6 address that is different from the specified IPv6 address might return response messages.

  In addition, if the command is executed for the IPv6 address of an interface that has just started, response messages might be sent from a different IPv6 address for several seconds after the command is executed.

- When the compact or simple parameter is specified, the summary, verbose, or preload parameter cannot be specified.

- When the compact or simple parameter is specified, you cannot specify the sending of unlimited numbers of ping transmissions.

- If a small value is specified for interval, "no response" might be displayed and no data is sent or received. Therefore, adjust the value according to the usage environment.

- If a small value is specified for interval and the command is executed on a terminal with a slow communication data rate, such as a console, "no response" might be displayed because the display takes time. In such a case, execute the command on a remote operation terminal with a fast communication data rate or execute the command with the simple or summary parameter specified.

- If a small value is specified for interval, the actual sending of interval for packets depends on the load on the device. Therefore, the sending interval is not exactly the same as the time specified for interval. Packets are sent at the sending interval specified for interval when viewed as the average time for the entire ping test.

- Unlike the compact parameter, the simple parameter does not have timeout for each sending interval. Therefore, "no response" symbols are displayed together with a "response received" symbol when a response is received after the time that no response was received (echo reply was missing). No response symbols are displayed in real-time while no response is received.

traceroute ipv6

Displays the route (route of the passed gateways and response time between the gateways) over which UDP6 messages are sent to the destination host. This command is used with IPv6 only.

Syntax

```
traceroute ipv6 <host> [numeric] [direct] [verbose]
[gateway <gateway address>…] [hoplimit <hops>] [port <port>]
[probes <nqueries>] [[specific-route] source <source address>]
[waittime <time>] [packetsize <size>] [/vrf <vrf id>]
```

Input mode

User mode and administrator mode

Parameters

<host>

Specifies the destination host name, a host IPv6 address, or an IPv6 address with an interface name (for a link-local address only) for the test target (IP destination).

If vrf <vrf id> is specified, either an IPv6 address or an IPv6 address with an interface name (for a link-local address only) can be specified for <host>. When /vrf <vrf id> is specified, the destination host name cannot be specified to <host>. [SL-L3A]

numeric

Displays the gateway address by the IPv6 address, not by the host name.

Behavior when this parameter is omitted:

Displays the name converted from the host IPv6 address.

direct

Directly sends the probe packet to the host on the connected network. The normal routing table is not used. You can use this option when using an interface without routes to execute the "traceroute ipv6" command on the host.

Behavior when this parameter is omitted:

Uses the normal routing table to send data.

verbose

Enables verbose output.

Behavior when this parameter is omitted:

Displays only TIME_EXCEEDED and UNREACHABLE.

gateway <gateway address>

Specifies source route gateways.

Behavior when this parameter is omitted:

A source route gateway is not specified.

hoplimit <hops>

Sets the maximum number of hops for the probe packets to be sent. The specifiable values are from 1 to 255.

Behavior when this parameter is omitted:

The maximum number of hops is 30.

port <port>

Specifies the port number of the UDP6 packet to be used. The port number for a probe packet starts with the <port> value plus 1, and is incremented by one for a probe packet.

Behavior when this parameter is omitted:

The port number is set to 33434 (the port number for probe packets starts from 33435).

probes <nqueries>

Specify the number of times a search is performed for each hop in <nqueries>. The specifiable values are from 1 to 4294967295.

Behavior when this parameter is omitted:

A search is performed 3 times.

source <source address>

Uses the IPv6 address of an argument (specified by number, not by host name) as the source address of the probe packet to be sent (address to be sent). For a host with multiple IPv6 addresses, this parameter can be used to assign another source address to the probe packet. If the specified IPv6 address is not one of the interface addresses of that host, an error is returned and not data is sent.

Behavior when this parameter is omitted:

The source IPv6 address selected by the Switch is used.

specific-route

Sends packets only to a single route when the destination has multipath routes. Packets are sent by the interface for which the IPv6 address specified for <source address> of the source option is set.

Behavior when this parameter is omitted:

A specific route is not set.

waittime <time>

Specify the time (in seconds) to wait for a probe packet. The specifiable values are from 2 to 2147483647.

Behavior when this parameter is omitted:

The wait time for a response is 5 seconds.

packetsize <size>

Specify, in bytes, the data size of a probe packet. The specifiable values are from 12 to 65534. If a value from 0 to 11 is specified, 12 is assumed.

Behavior when this parameter is omitted:

The data size is set to 12 bytes.

vrf <vrf id>[SL-L3A]

Specifies the VRF and displays the route. For <vrf id>, specify a VRF ID that was set by using the configuration command.

Behavior when this parameter is omitted:

Displays the information for the global network route.

Behavior when all parameters are omitted:

Displays the route to the <host> specified for the global network.

Operation when a stack configuration is used

The command can be executed only on the master switch.

Example

Figure 10-24: Execution result of the traceroute ipv6 command

```
>traceroute ipv6 3ffe:1:120::100 numeric
traceroute to 3ffe:1:120::100 (3ffe:1:120::100), 30 hops max, 40 byte packets
 1  3ffe:22::100  0.612 ms *  0.532 ms
 2  3ffe:1:120::100 0.905 ms  0.816 ms  0.807 ms
```

Impact on communication

None

Response messages

Table 10-27: List of response messages for the traceroute ipv6 command

Message	Description
bind: Can't assign requested address	The specified IP address has not been set on the Switch (when the source option is specified).
Can't execute this command in backup switch or transit switch.	The command cannot be executed on a backup switch or a transit switch.
connect: No route to host	There was no route to the specified destination.
packet too short (\<receive> bytes) from \<host>	The packet length from the specified host is too short. \<receive>: Length of the data received \<host>: Host name or IP address
sendto: \<error message>	An attempt to send data to a socket failed. \<error message>: Error message
traceroute6: Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
traceroute6: No address associated with hostname	The host name is not correct. Specify the correct host name.
traceroute6: socket(ICMPv6): \<error message>	An attempt to open an icmp socket failed. \<error message>: Error message
traceroute6: Warning: \<host> has multiple addresses; using \<address>	The specified \<host> had multiple addresses, but \<address> was used. \<host>: Host name \<address>: IP address
traceroute6: wrote \<host> \<send> chars, ret=\<sent>	Packets cannot be sent to the specified host. \<host>: Host name or IP address \<send>: Length of the data to be sent \<sent>: Length of the data sent

Notes

- In IPv6, unlike IPv4, the address defined for the sending interface might not be a starting point address. To use the "traceroute ipv6" command to perform forwarding route confirmation, check which address is selected for the starting point address. If a connection cannot be established, use the source parameter to specify another IPv6 address set on the interface for the device, and then confirm everything again.

- If there is a global host route for the destination host, the direct parameter does not take effect for that host.

- If the "traceroute ipv6" command is executed for an IPv6 address that is also used by another device, an IPv6 address that is different from the specified IPv6 address might return response messages.

  In addition, if the command is executed for the IPv6 address of an interface that has just started, response messages might be sent from a different IPv6 address.

- If ICMPv6 messages are continuously issued to the Switch during execution of the "traceroute ipv6" command from the Switch, the command might appear to send no response. In such a case, you can check the ICMPv6 messages continuously issued to the Switch by specifying and executing the verbose option.

11 RA

show ipv6 routers

Displays the RA information recognized by a unicast routing program.

Syntax

```
show ipv6 routers [vrf {<vrf id> | all}] global
show ipv6 routers interface {<interface type> <interface number> | <Index>}
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Shows VRF RA information. If <vrf id> is specified, the RA information for only the specified VRF is displayed. If all is specified, the RA information for all VRFs including the global network is displayed. The range of specifiable values for <vrf id> is all the VRF IDs set by configuration commands.

> Behavior when this parameter is omitted:

> > Displays the RA for the global network.

global

> Displays a summary of the interfaces for which the RA is enabled, and the prefixes advertised by the RA.

interface <interface type> <interface number>

> Displays detailed information about the specified interface.

> For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

> - VLAN interface
> - Management port

interface<Index>

> Displays detailed information about the interface if the index number assigned to the interface is specified.

> The index numbers can be displayed by using the "show ipv6 routers global" command.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 11-1: Displaying RA information

```
>show ipv6 routers global
Date 20XX/07/14 12:00:00 UTC
#Index Name          Prefix
#2     VLAN0010      3ffe:2::/64
#2     VLAN0010      3ffe:1111:2222:3333::/64
#3     VLAN0020 (VRRP ID:10, Status:MASTER) 3ffe:501:811:ff04::/64

>show ipv6 routers interface vlan 10
Date 20XX/07/14 12:00:00 UTC
Index: 2, Name: VLAN0010
Statistics:
```

```
    RSin(wait): 0(0), RAout: 0, RAin(invalid): 4(0)
Intervals:
  RA Interval: 200-600s (next=219s later), RA Lifetime: 1800s
  Reachable Time: ---, NS Interval: ---
Managed Config Flag: off, Other Config Flag: off, Hop Limit: 64,
No Advertised Link Address: on, Link MTU: 1500
DNS Server Address(lifetime):
  fe80::1(1800s)

Domain Name List(lifetime):
  router.example.com(1800s)

Prefix                  ValidLife[s] PrefLife[s] OnLink Autoconfig
3ffe:2::/64              2592000      604800       on     on
3ffe:1111:2222:3333::/64 2592000     604800       on     on
>
>show ipv6 routers interface vlan 20
Date 20XX/07/14 12:00:00 UTC
Index: 3, Name: VLAN0020 (VRRP ID:10 ,Status:MASTER)
Statistics:
  RSin(wait): 0(0), RAout: 0, RAin(invalid): 2(0)
Intervals:
  RA Interval: 200-600s (next=103s later), RA Lifetime: 1800s
  Reachable Time: ---, NS Interval: ---
Managed Config Flag: off, Other Config Flag: off, Hop Limit: 64,
Advertised Link Address: on, Link MTU: 1500

Prefix                  ValidLife[s] PrefLife[s] OnLink Autoconfig
3ffe:501:811:ff04::/64   2592000      604800       on     on
>
```

Display Items

Table 11-1: Items displayed for RA information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Index	Index number	—
Name	Interface name	Name of the interface for which RA information is set. If the interface uses VRRP, the following information is also displayed: (VRRP ID:<Num>, Status:<Status>) <Status>=INIT, BACKUP, MASTER <Num>=1 to 4095
Statistics	RA-related statistics	
RSin(wait)	Number of input RS packets The value in parentheses indicates the number of invalid RS packets.	—
RAout	Number of output RA packets	—
RAin(invalid)	Number of input RA packets The value in parentheses indicates the number of invalid RA packets.	—
Intervals		

Display Items	Meaning	Displayed detailed information
RA Interval	Advertisement interval (minimum to maximum)	next: Time before the next advertisement
RA Lifetime	Lifetime of the advertised device	—
ReachableTime	Reachable time of the advertised device	—
NS Interval	Retransmission period for the advertised device	—
Managed Config Flag:	Setting of the address management flag	on/off
Other Config Flag:	Flag to indicate that the autonomous settings other than for addresses are enabled	on/off
Hop Limit:	Hop limit that the terminals advertised by the RA must use	—
No Advertised Link Address:	Setting for whether to advertise the link layer address of the RA source	on/off
Link MTU:	—	MTU value
DNS Server Address(lifetime)	DNS server address Validity period in parentheses	If RDNSS information is not advertised, it will not be displayed.
Domain Name List(lifetime)	Domain name Validity period in parentheses	If DNSSL information is not advertised, it will not be displayed.
Prefix	Prefix being advertised by the RA	—
ValidLife[s]	Valid lifetime of the advertised prefix	Unit: Seconds
PrefLife[s]	Preferred lifetime of the advertised prefix	Unit: Seconds
OnLink	Setting for whether the advertised prefix exists in the same link	on/off
Autoconfig	Setting for whether to allow terminals to use the advertised prefix	on/off

Impact on communication

None

Response messages

Table 11-2: List of response messages for the show ipv6 routers command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.

No.	Message	Description
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such interface "<Interface-Type> <Interface-Number>"	The specified interface name is invalid. <Interface-Type> <Interface-Number>: Specified interface
5	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
6	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

12 IPv6 DHCP Relays

show ipv6 dhcp traffic

Displays IPv6 DHCP relay statistics.

Syntax

```
show ipv6 dhcp traffic [interface vlan <vlan id>]
```

Input mode

User mode and administrator mode

Parameters

interface vlan <vlan id>

> Displays IPv6 DHCP relay statistics related to the specified interface.
>
> For <vlan id>, specify the VLAN ID set by the "interface vlan" command.
>
> Behavior when this parameter is omitted:
>
>> Displays statistics for IPv6 DHCP relays.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example

Figure 12-1: Result of executing the command for displaying IPv6 DHCP relay statistics

```
>show ipv6 dhcp traffic
Date 20XX/04/09 12:00:00 UTC
<<IPv6 DHCP Request Packets Count>>
<Interface>        <Receive Packets>
    <Forward To>                          <Send Packets>     <Send Error>
vlan 10                       113
    vlan 20                                        103                2
vlan 40                        20
    3ffe:1200:1344:12::1223:1                        5                0
    3ffe:1200:1344:12::1223:2                        3                2
    3ffe:1200:1344:12::1223:3                        2                3
    3ffe:1200:1344:12::1223:4                        3                2
TOTAL:                        133              116                9

<<IPv6 DHCP Reply Packets Count>>
                   <Receive Packets>     <Send Packets>     <Send Error>
ALL:                      116                116                0

<<IPv6 DHCP Error Packets Count>>
not ipv6 dhcp packet :         3
packet error         :         5
other error          :         0
send error           :         9
lease prefix over    :         0
>

>show ipv6 dhcp traffic interface vlan 10
Date 20XX/04/09 12:00:00 UTC
<<IPv6 DHCP Request Packets Count>>
<Interface>        <Receive Packets>
    <Forward To>                          <Send Packets>     <Send Error>
vlan 10                       113
    vlan 20                                        103                2

TOTAL:                        113              103                2
>
```

Display Items

Table 12-1: Items displayed by the show ipv6 dhcp traffic command

Display Items	Meaning	Displayed detailed information
IPv6 DHCP Request Packets Count	Interface	vlan <vlan id>: VLAN ID of the VLAN for which the "ipv6 dhcp relay destination" configuration command is set
	Receive Packets	Number of packets received at the receiving interface associated by the "ipv6 dhcp relay destination" configuration command
	Forward To	Destination interface name or destination IPv6 address specified for the "ipv6 dhcp relay destination" configuration command
	Send Packets	Number of normal IPv6 DHCP relay packets sent
	Send Error	Number of packets that were not sent due to a send processing failure
	TOTAL	Total number of packets for each of <Receive Packets>, <Send Packets>, and <Send Error> processed on the IPv6 DHCP relay program
IPv6 DHCP Reply Packets Count	Receive Packets	Number of packets received by the IPv6 DHCP relay program
	Send Packets	Number of normal IPv6 DHCP relay packets sent
	Send Error	Number of packets that were not sent due to a send processing failure
IPv6 DHCP Error Packets Count	not ipv6 dhcp packet	Number of packets that should not be processed by the IPv6 DHCP relay program
	packet error	Number of packets from which the message header or other options could not be read.
	other error	Number of error packets in other protocol processing
	send error	Number of packets that were not sent due to a send processing failure
	lease prefix over	Number of packets that were discarded because the number of prefix entries exceeded the maximum

Impact on communication

None

Response messages

Table 12-2: List of response messages for the show ipv6 dhcp traffic command

Message	Description
Failed to show ipv6 dhcp traffic command : <error message>.	The command for displaying statistics failed. <error message> 1: Temporary file creation error 2: Socket descriptor creation error 3: Bind error

Message	Description
	4: Send error
	5: Selection error
	6: Response message timeout
	7: Reception error
	8: Socket option error
	9: Other errors
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.
No enough memory.	There is not enough memory for executing the command.
No such interface.	IPv6 DHCP relay is not configured for the specified interface.

Notes

1. In a stack configuration, statistics is cleared when the master switch is switched.

clear ipv6 dhcp traffic

Deletes IPv6 DHCP relay statistics.

Syntax

```
clear ipv6 dhcp traffic
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

The command can clear information only from the master switch.

Example

Figure 12-2: Result of executing the command for deleting IPv6 DHCP relay statistics

```
>clear ipv6 dhcp traffic
>
```

Display Items

None

Impact on communication

None

Response messages

Table 12-3: List of response messages for the clear ipv6 dhcp traffic command

Message	Description
Failed to clear ipv6 dhcp traffic command : <error message>.	The command for clearing statistics failed. <error message> 1: Temporary file creation error 2: Socket descriptor creation error 3: Bind error 4: Send error 5: Selection error 6: Response message timeout 7: Reception error 9: Other errors
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.

Message	Description
No enough memory.	There is not enough memory for executing the command.

Notes

1. If the configuration is deleted or added, the target statistics are cleared.

show ipv6 dhcp relay binding

Shows lease information for the IPv6 DHCP relay.

Syntax

```
show ipv6 dhcp relay binding
            [{<ipv6 prefix>/<prefixlen> | interface vlan <vlan id>}] [detail]
```

Input mode

User mode and administrator mode

Parameters

{<ipv6 prefix>/<prefixlen> | interface vlan <vlan id>}

    Displays lease information for the specified prefix or interface.

    <ipv6 prefix>/<prefixlen>

        Displays lease information for the specified prefix and prefix length.

    interface vlan <vlan id>

        Displays lease information for the specified interface.

        For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

    Behavior when this parameter is omitted:

        Displays all lease information for the IPv6 DHCP relay.

detail

    Displays lease information, including client DUID information, for the IPv6 DHCP relay.

    Behavior when this parameter is omitted:

        Displays lease information, excluding client DUID information, for the IPv6 DHCP relay.

Behavior when all parameters are omitted:

    Displays all lease information, excluding client DUID information, for the IPv6 DHCP relay.

Operation when a stack configuration is used

The command can display information only for the master switch.

Example

Figure 12-3: Result of executing the command for displaying IPv6 DHCP relay lease information

```
> show ipv6 dhcp relay binding
Date 20XX/04/09 12:00:00 UTC
Total : 2 prefixes
<Interface>      <Prefix>                             <Lease expires>
vlan 10          3ffe:1234:5678::/48                  XX/04/10 11:11:11
vlan 20          3ffe:aaaa:1234::/48                  XX/04/10 12:12:12
>
> show ipv6 dhcp relay binding detail
Date 20XX/04/09 12:00:00 UTC
Total : 2 prefixes
<Interface>      <Prefix>                             <Lease expires>
 <DUID>
vlan 10          3ffe:1234:5678::/48                  XX/04/10 11:11:11
 00:01:00:01:3e:00:2e:5b:11:22:33:44:55:66
vlan 20          3ffe:aaaa:1234::/48                  XX/04/10 12:12:12
 00:01:00:01:3e:00:2e:41:11:22:33:44:55:77
>
```

Display Items

Table 12-4: Items displayed by the show ipv6 dhcp relay binding command

Display Items	Meaning	Displayed detailed information
Interface	vlan \<vlan id\>	—
Prefix	Relayed prefix and prefix length, separated by a slash	—
Lease expires	Lease expiration date and time for the prefix (year/month/day hour:minute:second)	"infinity" is displayed when an infinite lease period is set. "-" is displayed for lease information waiting for release.
DUID	ID of the client to which the prefix is allocated	—

Impact on communication

None

Response messages

Table 12-5: List of response messages for the show ipv6 dhcp relay binding command

Message	Description
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.
No enough memory.	There is not enough memory for executing the command.
No such Prefix or interface.	There is no information for the specified prefix or interface.

Notes

1. This command can display lease information only when IPv6 DHCP-PD clients are directly contained.

2. The precision of the lease expiration date and time for the prefix is 1 second.

clear ipv6 dhcp relay binding

Deletes lease information from the IPv6 DHCP relay database.

Syntax

```
clear ipv6 dhcp relay binding [{<ipv6 prefix>/<prefixlen> | interface vlan <vlan id>}]
```

Input mode

User mode and administrator mode

Parameters

{<ipv6 prefix>/<prefixlen> | interface vlan <vlan id>}

    Deletes lease information for the specified prefix or interface.

    <ipv6 prefix>/<prefixlen>

        Deletes lease information for the specified prefix and prefix length.

    interface vlan <vlan id>

        Deletes lease information for the specified interface.

        For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

    Behavior when this parameter is omitted:

        Deletes all lease information for IPv6 DHCP relays.

Operation when a stack configuration is used

The command can clear information only from the master switch.

Example

Figure 12-4: Result of executing the command for deleting IPv6 DHCP relay lease information

```
>clear ipv6 dhcp relay binding
>
```

Display Items

None

Impact on communication

If automatic route assignment function is used for assigned prefixes, communication via the target route is no longer possible due to the deletion of binding information.

Response messages

Table 12-6: List of response messages for the clear ipv6 dhcp relay binding command

Message	Description
Failed to clear ipv6 dhcp relay binding command : <error message>.	The command for deleting lease information failed. <error message> 1: Temporary file creation error

Message	Description
	2: Socket descriptor creation error
	3: Bind error
	4: Send error
	5: Selection error
	6: Response message timeout
	7: Reception error
	9: Other errors
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.
No enough memory.	There is not enough memory for executing the command.
No such interface.	IPv6 DHCP relay is not configured for the specified interface.
No such Prefix.	There is no lease information for the specified prefix.

Notes

None

restart ipv6-dhcp relay

Restarts the IPv6 DHCP relay program.

Syntax

```
restart ipv6-dhcp relay [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

    Restarts the IPv6 DHCP relay program without displaying a restart confirmation message.

    Behavior when this parameter is omitted:

        A restart restart confirmation message is displayed.

core-file

    Outputs the core file (dhcp6_relay.core) for the IPv6 DHCP relay program during restart.

    Behavior when this parameter is omitted:

        A core file is not output.

Behavior when all parameters are omitted:

    Displays a restart confirmation message and then restarts the IPv6 DHCP relay program.

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} restart ipv6-dhcp relay [-f] [core-file]
```

Example

Figure 12-5: Result of executing the command for restarting the IPv6 DHCP relay program

```
>restart ipv6-dhcp relay
DHCPv6 Relay program restart OK? (y/n):y
>
```

Display Items

None

Impact on communication

None

Response messages

Table 12-7: List of response messages for the restart ipv6-dhcp relay command

Message	Description
dhcp6_relay failed to restart.	An attempt to restart the IPv6 DHCP relay program by using the command failed. Re-execute the command.
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.
restarting dhcp6_relay, wait awhile.	The command is restarting the IPv6 DHCP relay program. Wait a while.

Notes

1. Core output file: /usr/var/core/dhcp6_relay.core

2. Do not use the "ipv6 dhcp relay destination" command to add or delete configuration information while the IPv6 DHCP relay program is being restarted. Not doing so might cause lease information to be invalid. Similarly, do not use the "copy" command to copy the configuration.

dump protocols ipv6-dhcp relay

Outputs relay log data collected by the IPv6 DHCP relay program to a file.

Syntax

```
dump protocols ipv6-dhcp relay
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

To execute this command for member switches other than the master switch, use the "remote command" command.

```
remote command {<switch no.> | all} dump protocols ipv6-dhcp relay
```

Example

Figure 12-6: Execution result of outputting IPv6 DHCP relay log data

```
>dump protocols ipv6-dhcp relay
>
```

Display Items

None

Impact on communication

None

Response messages

Table 12-8: List of response messages for the dump protocols ipv6-dhcp relay command

Message	Description
Failed to dump protocols ipv6-dhcp relay command : <error message>.	The command for outputting log data to a file failed. <error message> 1: Temporary file creation error 2: Socket descriptor creation error 3: Bind error 4: Send error 5: Selection error 6: Response message timeout 7: Reception error 9: Other errors

Message	Description
IPv6 DHCP relay doesn't seem to be running.	This command cannot be used because the IPv6 DHCP relay program is not running.
No enough memory.	There is not enough memory for executing the command.

Notes

The output files are as follows:

/usr/var/dhcp6/dhcp6_relay.trc

/usr/var/dhcp6/dhcp6_relay_ldb.dmp

/usr/var/dhcp6/dhcp6_relay_dup.dmp

13 IPv6 DHCP Server Function

show ipv6 dhcp binding

Displays the binding information on the IPv6 DHCP server.

Syntax

```
show ipv6 dhcp binding [{<Prefix> | pool <Pool Name> | interface vlan <vlan id>}] [detail]
```

Input mode

User mode and administrator mode

Parameters

{<Prefix> | pool <Pool Name> | interface vlan <vlan id>}

> < Prefix >
>
>> Displays binding information for the specified prefix.
>
> pool < Pool Name >
>
>> Displays binding information for the prefix that is bound to the specified <Pool Name>. For <Pool Name>, specify the name of the IPv6 DHCP address pool configuration information specified in the configuration.
>
> interface vlan <vlan id>
>
>> Displays binding information for the prefix that is bound to the specified <vlan id>.
>>
>> For <vlan id>, specify the VLAN ID set by the "interface vlan" command.
>
> Behavior when this parameter is omitted:
>
>> Displays all binding information on the IPv6 DHCP server.

detail

> Displays binding information, including client DUID information, on the IPv6 DHCP server.
>
> Behavior when this parameter is omitted:
>
>> Displays binding information, excluding client DUID information, on the IPv6 DHCP server.

Behavior when all parameters are omitted:

> Displays binding information, excluding DUID information, on the IPv6 DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-1: Execution result of displaying binding information on the IPv6 DHCP server

```
> show ipv6 dhcp binding
Date 20XX/10/15 12:00:00 UTC
Total: 2 prefixes
<Prefix>                <Lease expiration>    <Type>
3ffe:1234:5678::/48     infinity              Automatic
3ffe:aaaa:1234::/48     XX/11/01 11:29:00     Automatic
>
> show ipv6 dhcp binding detail
Date 20XX/10/15 12:00:00 UTC
Total: 2 prefixes
<Prefix>                <Lease expiration>    <Type>
  <DUID>
```

```
3ffe:1234:5678::/48      infinity            Automatic
  00:01:00:01:3e:00:2e:5b:11:22:33:44:55:66
3ffe:aaaa:1234::/48      XX/11/01 11:29:00   Automatic
  00:01:00:01:3e:00:2e:41:11:22:33:44:55:77
>
```

Display Items

Table 13-1: Items displayed by the show ipv6 dhcp binding command

Display Items	Meaning	Displayed detailed information
Prefix	Prefix bound by the IPv6 DHCP server	—
Lease expiration	Lease expiration date and time (year/month/day hour:minute:second). However, infinity is displayed if an infinite lease period is set.	—
Type	Connection type (Manual or Automatic)	Manual: Binding information assigned based on DUID settings Automatic: Binding information assigned by the server from the specified range when any is specified for the DUID
DUID	Client ID bound to the prefix	—

Impact on communication

None

Response messages

Table 13-2: List of response messages for the show ipv6 dhcp binding command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
No such interface.	The specified IPv6 DHCP server interface information does not exist.
No such pool.	The specified IPv6 DHCP address pool information does not exist.
No such Prefix.	There is no binding information for the specified prefix.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.
Pool check error <Pool Name>.	The format of the name of the specified IPv6 DHCP address pool configuration information is not correct.
Prefix check error <Prefix>.	The format of the specified prefix is not correct.

Note: The "ipv6 dhcp" command described in "Table 13-2: List of response messages for the show ipv6 dhcp binding command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics
- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

None

clear ipv6 dhcp binding

Deletes the binding information on the IPv6 DHCP server.

Syntax

```
clear ipv6 dhcp binding [{<Prefix> | pool <Pool Name> | interface vlan <vlan id>}]
clear ipv6 dhcp binding all
```

Input mode

User mode and administrator mode

Parameters

{<Prefix> | pool <Pool Name> | interface vlan <vlan id>}

    < Prefix >

        Deletes binding information for the specified prefix.

    pool < Pool Name >

        Deletes binding information for the prefix that is bound to the specified <Pool Name>. For <Pool Name>, specify the name of the IPv6 DHCP address pool configuration information specified in the configuration.

    interface vlan <vlan id>

        Deletes binding information for the prefix that is bound to the specified <vlan id>.

        For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

all

    Explicitly specifies that all binding information on the IPv6 DHCP server will be deleted. Deletes all binding information on the IPv6 DHCP server.

Behavior when all parameters are omitted:

    Deletes all binding information on the IPv6 DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-2: Execution result of deleting binding information on the IPv6 DHCP server

```
> clear ipv6 dhcp binding
>
```

Display Items

None

Impact on communication

If automatic route assignment function is used for assigned prefixes, communication via the target route is no longer possible due to the deletion of binding information.

Response messages

Table 13-3: List of response messages for the clear ipv6 dhcp binding command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
No such interface.	The specified IPv6 DHCP server interface information does not exist.
No such pool.	The specified IPv6 DHCP address pool configuration information does not exist.
No such Prefix.	There is no binding information for the specified prefix.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.
Pool check error <Pool Name>.	The format of the name of the specified host IPv6 DHCP address pool configuration information is not correct.
Prefix check error <Prefix>.	The format of the specified prefix is not correct.

Note: The "ipv6 dhcp" command described in "Table 13-3: List of response messages for the clear ipv6 dhcp binding command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics
- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

If ipv6 dhcp server static-route-setting is specified in the configuration, the automatically configured routing information corresponding to the binding information deleted by this command will also be deleted.

show ipv6 dhcp server statistics

Shows statistics about the IPv6 DHCP server.

Syntax

```
show ipv6 dhcp server statistics [{interface vlan <vlan id> | all}]
```

Input mode

User mode and administrator mode

Parameters

{interface vlan <vlan id> | all}

    interface vlan <vlan id>

        Displays statistics on the IPv6 DHCP server for the specified <vlan id>.

        For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

    all

        Displays statistics for all IPv6 DHCP servers on the interface.

    Behavior when this parameter is omitted:

        Displays statistics only on the IPv6 DHCP server.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-3: Execution result of displaying IPv6 DHCP server statistics

```
> show ipv6 dhcp server statistics
Date 20XX/10/15 12:00:00 UTC
   < DHCP Server use statistics >
     prefix pools         :20
     automatic prefixes    :50
     manual prefixes       :4
     expired prefixes      :3
     over pools requests   :0
     discard packets       :0
   < Receive Packets >
     SOLICIT               :54
     REQUEST               :54
     RENEW                 :54
     REBIND                :0
     INFORMATION-REQUEST   :0
     CONFIRM               :0
     RELEASE               :0
     DECLINE               :0
     RELAY-FORW            :0
   < Send Packets >
     ADVERTISE             :54
     REPLY                 :108
     RELAY-REPL            :0
   < Server DUID >
     00:01:00:01:3e:00:2e:22:11:22:33:44:55:01
>

> show ipv6 dhcp server statistics all
```

```
Date 20XX/10/15 12:00:00 UTC
   < DHCP Server use statistics >
     prefix pools           :20
     automatic prefixes     :50
     manual prefixes        :4
     expired prefixes       :3
     over pools requests    :0
     discard packets        :0
   < Receive Packets >
     SOLICIT                :54
     REQUEST                :54
     RENEW                  :54
     REBIND                 :0
     INFORMATION-REQUEST    :0
     CONFIRM                :0
     RELEASE                :0
     DECLINE                :0
     RELAY-FORW             :0
   < Send Packets >
     ADVERTISE              :54
     REPLY                  :108
     RELAY-REPL             :0
   < Server DUID >
     00:01:00:01:3e:00:2e:22:11:22:33:44:55:01

< Interface >
 DISCARD     SOLICIT     REQUEST     RENEW       REBIND      INFO-REQ    CONFIRM
 RELEASE     DECLINE     RELAY-FORW  ADVERTISE   REPLY       RELAY-REPL
vlan 10:
 0           2           2           4           0           0           0
 1           0           0           2           6           0
vlan 20:
 0           2           2           4           0           0           0
 1           0           0           2           6           0
>

> show ipv6 dhcp server statistics interface vlan 10
Date 20XX/10/15 12:00:00 UTC
< Interface >
 DISCARD     SOLICIT     REQUEST     RENEW       REBIND      INFO-REQ    CONFIRM
 RELEASE     DECLINE     RELAY-FORW  ADVERTISE   REPLY       RELAY-REPL
vlan 10:
 0           2           2           4           0           0           0
 1           0           0           2           6           0
>
```

Display Items

Table 13-4: Items displayed by the show ipv6 dhcp server statistics command

Category	Item	Meaning
DHCP Server use statistics	prefix pools	Number of prefixes available for distribution
	automatic prefixes	Number of automatically assigned prefixes
	manual prefixes	Number of manually assigned prefixes
	expired prefixes	Number of expired prefixes
	over pools requests	Number of insufficient prefixes that have been detected
	discard packets	Number of discarded messages
Receive Packets	SOLICIT	Number of SOLICIT messages received

Category	Item	Meaning
	REQUEST	Number of REQUEST messages received
	RENEW	Number of RENEW messages received
	REBIND	Number of REBIND messages received
	INFORMATION-REQUEST	Number of INFORMATION-REQUEST messages received
	CONFIRM	Number of CONFIRM messages received
	RELEASE	Number of RELEASE messages received
	DECLINE	Number of DECLINE messages received
	RELAY-FORW	Number of RELAY-FORW messages received
Send Packets	ADVERTISE	Number of ADVERTISE messages sent
	REPLY	Number of REPLY messages sent
	RELAY-REPL	Number of RELAY-REPL messages sent
Server DUID	—	DUID of the device
Interface	DISCARD	Number of discarded messages per interface
	SOLICIT	Number of SOLICIT messages received per interface
	REQUEST	Number of REQUEST messages received per interface
	RENEW	Number of RENEW messages received per interface
	REBIND	Number of REBIND messages received per interface
	INFO-REQ	Number of INFORMATION-REQUEST messages received per interface
	CONFIRM	Number of CONFIRM messages received per interface
	RELEASE	Number of RELEASE messages received per interface
	DECLINE	Number of DECLINE messages received per interface
	RELAY-FORW	Number of RELAY-FORW messages received per interface
	ADVERTISE	Number of ADVERTISE messages sent per interface
	REPLY	Number of REPLY messages sent per interface

Category	Item	Meaning
	RELAY-REPL	Number of RELAY-REPL messages sent per interface

Impact on communication

None

Response messages

Table 13-5: List of response messages for the show ipv6 dhcp server statistics command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
No such interface.	The specified IPv6 DHCP server interface information does not exist.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.

Note: The "ipv6 dhcp" command described in "Table 13-5: List of response messages for the show ipv6 dhcp server statistics command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics
- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

- If you change the configuration of IPv6 DHCP server information, per-interface statistics will be reset.
- The number of prefixes available for distribution displayed for prefix pools is determined based on the prefix information for the IPv6 DHCP address local pool name specified in prefix-delegation information in the IPv6 DHCP server configuration.

clear ipv6 dhcp server statistics

Resets statistics on the IPv6 DHCP server.

Syntax

```
clear ipv6 dhcp server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-4: Execution result of resetting statistics on the IPv6 DHCP server

```
> clear ipv6 dhcp server statistics
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-6: List of response messages for the clear ipv6 dhcp server statistics command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.

Note: The "ipv6 dhcp" command described in "Table 13-6: List of response messages for the clear ipv6 dhcp server statistics command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics
- restart ipv6-dhcp server

- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

None

restart ipv6-dhcp server

Restarts the IPv6 DHCP server daemon process.

Syntax

```
restart ipv6-dhcp server [ -f ][ core-file ]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the IPv6 DHCP server program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file (dhcp6_server.core) for the IPv6 DHCP server program during restart.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Displays a restart confirmation message and then restarts the IPv6 DHCP server program.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-5: Execution result of restarting the IPv6 DHCP server program

```
> restart ipv6-dhcp server
DHCPv6 Server program restart OK? (y/n):y
>
```

Display Items

None

Impact on communication

Distribution, update, and release of prefixes cannot be performed, because the sending and receiving of IPv6 DHCP packets temporarily stops.

Response messages

Table 13-7: List of response messages for the restart ipv6-dhcp server command

Message	Description
Canceled dhcp6_server restart command.	The command on the IPv6 DHCP server was canceled by the user.
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server program was not running. Wait until the IPv6 DHCP server program is restarted, and then re-execute the command.
dhcp6_server failed to terminate.	An attempt to restart the IPv6 DHCP server by using the command failed. Re-execute the command.
dhcp6_server has already stopped.	The command failed because the IPv6 DHCP server program has already stopped. The IPv6 DHCP server program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
dhcp6_server restarted after termination: old pid <PID>, new pid <PID>	The command failed because the PID was changed during command execution. The IPv6 DHCP server program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <PID>: Process ID
dhcp6_server signaled but still running, waiting 6 seconds more.	The command is restarting the IPv6 DHCP server. Wait a while.
dhcp6_server still running, sending a kill signal.	This command is sending a Kill signal to the IPv6 DHCP server program, to restart it. Wait a while.
dhcp6_server still running, sending another terminate signal.	This command is sending a terminate signal to the IPv6 DHCP server program, to restart it. Wait a while.
Input data error.	The input data is not correct. Enter y or n.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.
pid file <File Name> mangled!	The PID file for the IPv6 DHCP server program is corrupted. <File Name>: PID file name
pid in file <File Name> unreasonably small (<PID>)	The PID file for the IPv6 DHCP server program is corrupted. <File_Name>: PID file name <PID>: Process ID in the PID file
program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Note: The "ipv6 dhcp" command described in "Table 13-7: List of response messages for the restart ipv6-

dhcp server command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics
- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

1. Core output file: /usr/var/core/dhcp6_server.core

2. If the server is restarted by the restart "ipv6-dhcp server" command, binding information entries are retained. Use the clear "ipv6 dhcp binding" command to clear the binding information.

   However, if the server is restarted due to any other cause (for example, the software was aborted), the entries are not retained.

dump protocols ipv6-dhcp server

Outputs the server log data and the packet sending and receiving log data collected by the IPv6 DHCP server program to a file.

Syntax

```
dump protocols ipv6-dhcp server
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-6: Execution result of outputting IPv6 DHCP server log data

```
> dump protocols ipv6-dhcp server
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-8: List of response messages for the dump protocols ipv6-dhcp server command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.

Note: The "ipv6 dhcp" command described in "Table 13-8: List of response messages for the dump protocols ipv6-dhcp server command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics

- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

Server log data is always collected. Packet sending and receiving log data is collected only when requested.

Output file: /usr/var/dhcp6/dhcp6_server.trc

ipv6-dhcp server monitor

Starts collection of sending and receiving log data for packets which are sent and received by the IPv6 DHCP server.

Syntax

```
ipv6-dhcp server monitor
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-7: Execution result of starting the collection of sending and receiving packet log data on the IPv6 DHCP server

```
> ipv6-dhcp server monitor
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-9: List of response messages for the ipv6-dhcp server monitor command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6 dhcp" command. Wait a while, and then retry the operation.

Note: The "ipv6 dhcp" command described in "Table 13-9: List of response messages for the ipv6-dhcp server monitor command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics

- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

To collect packet log data, execute the "dump protocols ipv6-dhcp server" command after execution of this command.

no ipv6-dhcp server monitor

Stops collection of the sending and receiving log data for packets on the IPv6 DHCP server program.

Syntax

```
no ipv6-dhcp server monitor
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-8: Execution result of stopping the collection of sending and receiving packet log data on the IPv6 DHCP server

```
> no ipv6-dhcp server monitor
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-10: List of response messages for the no ipv6-dhcp server monitor command

Message	Description
dhcp6_server doesn't seem to be running.	The command failed because the IPv6 DHCP server was not running.
Now another user is using ipv6 dhcp command, please try again.	Another user is using an "ipv6-dhcp" command. Wait a while, and then retry the operation.

Note: The "ipv6 dhcp" command described in "Table 13-10: List of response messages for the no ipv6-dhcp server monitor command" is one of the following commands:

- show ipv6 dhcp binding
- clear ipv6 dhcp binding
- show ipv6 dhcp server statistics
- clear ipv6 dhcp server statistics

- restart ipv6-dhcp server
- dump protocols ipv6-dhcp server
- ipv6-dhcp server monitor
- no ipv6-dhcp server monitor

Notes

None

set ipv6-dhcp server duid

Configures an IPv6 DHCP server DUID file in the internal memory of the device.

Syntax

```
set ipv6-dhcp server duid <DUID>
```

Input mode

User mode and administrator mode

Parameters

<DUID>

Specify the server DUID to be set in the device.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-9: Execution result of configuring the IPv6 DHCP server DUID file

```
> set ipv6-dhcp server duid 00:01:00:01:ff:00:10:00:11:22:33:44:55:01
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-11: List of response messages for the set ipv6-dhcp server duid command

Message	Description
Access failure to the active DUID file.	Access to the active DUID file failed.
Invalid DUID.	The DUID value is invalid. Check the DUID, and then re-execute the command.

Notes

- The device automatically creates DUIDs. Do not use this command unless you need to use an arbitrary DUID, such as the case that you want to replace another IPv6 DHCP server and inherit the previously used server DUID.

- The DUID set by this command is applied when one of the events listed below occurs. Because changing the DUID has the same effect as changing the IPv6 DHCP server, we recommend that you explicitly restart the IPv6 DHCP server.

- The IPv6 DHCP server configuration is changed.
- The IPv6 DHCP server is restarted by the "restart ipv6-dhcp server" command.
- Restarting the device

- When you use the command to set a DUID, confirm that the DUID value you set will be unique in the network in the future.

show ipv6-dhcp server duid

Displays the IPv6 DHCP server DUID file from the internal memory of the device.

Syntax

```
show ipv6-dhcp server duid
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-10: Execution result of displaying the IPv6 DHCP server DUID file

```
> show ipv6-dhcp server duid
Date 20XX/10/15 12:00:00 UTC
   < Server DUID file(Active) >
     00:01:00:01:ff:00:10:00:11:22:33:44:55:01
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-12: List of response messages for the show ipv6-dhcp server duid command

Message	Description
Access failure to the active DUID file.	Access to the active DUID file failed.
Active DUID file doesn't exist.	The active DUID file does not exist. The DUID for the IPv6 DHCP server has not been set in the Switch.

Notes

None

erase ipv6-dhcp server duid

Deletes the IPv6 DHCP server DUID file from the internal memory of the device.

Syntax

```
erase ipv6-dhcp server duid
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 13-11: Execution result of deleting the IPv6 DHCP server DUID file

```
> erase ipv6-dhcp server duid
>
```

Display Items

None

Impact on communication

None

Response messages

Table 13-13: List of response messages for the erase ipv6-dhcp server duid command

Message	Description
Access failure to the active DUID file.	Access to the active DUID file failed.
Active DUID file doesn't exist.	The active DUID file does not exist. The DUID for the IPv6 DHCP server has not been set in the Switch.

Notes

When you use this command to delete a DUID, the IPv6 DHCP server creates a new DUID when one of the following occurs:

- The IPv6 DHCP server configuration is changed.
- The IPv6 DHCP server is restarted by the "restart ipv6-dhcp server" command.
- Restarting the device

14 IPv6 Routing Protocols

show ipv6 route

Displays routing information stored in the routing table.

The routing table stores routing information learned by using unicast routing protocols.

Syntax

```
show ipv6 route {[all-routes] [-FSimpaPTAscB] | [brief]} [vrf {<vrf id> | all}]
                [<Protocol>] [<Prefix>[/<Prefixlen>] longer-prefixes]
show ipv6 route [all-routes] [vrf {<vrf id> | all}] [<Prefix>[/<Prefixlen>]]
show ipv6 route [vrf {<vrf id> | all}] [<Protocol>] [<Prefix>[/<Prefixlen>]]
                summary
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays routing information for VRFs. If <vrf id> is specified, routing information for only the specified VRF is displayed. If all is specified, routing information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays routing information for the global network.

all-routes

Displays all routing information, including alternate routes, in a standard format (equivalent to specifying -Smpai).

You can change the display format by specifying the -FSimpaPTAscB options.

-F

Displays routing information in full format. (The same information is displayed when -PTAscB is specified.)

-S

Displays routing information in summary format (only the destination network and next hop address).

-i

Displays the name of the sending interface.

-m

Displays the metrics (Metric and Metric2) of the routing information.

-p

Displays the protocol that was used to learn the routing information.

-a

Displays the aging information for the routing information.

-P

Displays the distance values (Distance, Distance2, and Distance3) of the routing information.

-T

Displays tag information of the routing information.

-A

Displays the AS path information of the routing information.

-s

Displays the status of the routing information.

-c

Displays Community attributes of the routing information.

-B

Displays the Local_Pref attributes of the routing information.

brief

Displays summary routing information.

<Protocol>

Displays routing information for each of the protocol types below.

The following types can be specified for <Protocol>:

- connected: Directly connected route
- kernel: A route learned from the kernel
- default: BGP4+ default route
- ospf: Displays all routes for OSPFv3

  If ospf is specified, you can specify any of the protocol types below. Note that, however, if summary is specified after specifying a type, summary information for the entire OSPF is displayed.

  (Input example: ospf inter-area)

  - intra-area: Intra-area route

  - inter-area: Inter-area route

  - external: External AS route

- ospf_ase: External AS route for OSPFv3
- rip: RIPng route
- bgp: BGP4+ route
- static: Static route
- summary_routes: Summarized route
- extra-vrf: A route imported from another VRF or global network [SL-L3A]

<Prefix>[/<Prefixlen>]

Displays detailed information about the routes that match specified <Prefix>[/<Prefixlen>].

<Prefix>

Specify the destination address in colon notation.

<Prefixlen>

Specify the prefix length in the range from 0 to 128.

Behavior when this parameter is omitted:

Detailed information about the longest-match routes for the specified <Prefix> is displayed.

longer-prefixes

If the destination network is specified for <Prefix>[/<Prefixlen>], information about all routes for the specified destination network is displayed.

If <Prefixlen> is omitted, the specified <Prefix> is considered as the filtering address, and routing information is displayed.

(Example) If 3ffe:811:: is entered, route information about 3ffe:811::/32 is displayed.

summary

Displays the number of active routes and inactive routes that are known by each protocol.

The number of active routes shows the number of routes that are registered in the forwarding table.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays information in standard format about active routes (routes that are registered in the forwarding table) of the global network. (The same information is displayed when -Smpai is specified.)

You can change the display format by specifying the -FSimpaPTAscB options.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ipv6 route {[all-routes] [-FSimpaPTAscB] | [brief]} [vrf {<vrf id> | all}] [<Protocol>][<Prefix>[/<Prefixlen>] longer-prefixes]

Figure 14-1: Displaying active route information in standard format

```
>show ipv6 route
Date 20XX/07/14 12:00:00 UTC
Total: 13 routes
Destination                                  Next Hop                              Interface
    Metric    Protocol     Age
::1/128                                       ::1                                  loopback0
    0/0      Connected    59d 20h
3ffe:501:811:ff01::/64                        3ffe:501:811:ff01::1                 VLAN0010
    0/0      Connected     2h  0m
 :
>
```

Note: For a multipath route, only NextHop and Interface are displayed for the second and subsequent paths.

Figure 14-2: Displaying active route information in summary format

```
>show ipv6 route brief
Date 20XX/07/14 12:00:00 UTC
Total: 13 routes
Destination                Next Hop                         Protocol
::1/128                    ::1                              Connected
3ffe:501:811:ff01::/64     3ffe:501:811:ff01::1             Connected
3ffe:501:811:ff01::1/128   ::1                              Connected
4fde:3a11:ffff:1032::/64   fe80::260:97ff:feba:19cf%VLAN0010  BGP4+
4fde:3ea0:30fa:9b01:5041::/80  fe80::280:bcff:fe02:563d%VLAN0010  BGP4+
4ffe:327b:4502:bc00::/64   4ffe:327b:4502:bc00:2403:1020:2100:3241 Connected
:
>
```

Figure 14-3: Displaying active route information in full format

```
> show ipv6 route -F
Date 20XX/07/14 12:00:00 UTC
Total: 15 routes
Destination                                  Next Hop                                  Interface
    Metric    Protocol     Age
::1/128                                       ::1                                      loopback0
    0/0      Connected    59d 20h , Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities
: -, LocalPref: -, <NoAdvise Active Retain>
3ffe:501:811:ff01::/64                        3ffe:501:811:ff01::1                     VLAN0010
    0/0      Connected     2h  1m , Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities
```

```
: -, LocalPref: -, <Int Active Retain>
3ffe:501:811:ff01::1/128                      ::1                              loopback0
     0/0     Connected    2h 25m , Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities
: -, LocalPref: -, <NoAdvise Int Active Retain>
3ffe:501:811:ff02::/64                   3ffe:501:811:ff02::1                  VLAN0010
     0/0     Connected    2h  1m , Distance: 0/0/0, Tag: 0, AS-Path: IGP (Id 1), Communities
: -, LocalPref: -, <Int Active Retain>
    :
3ffe:501:811:ff08::/64                   fe80::200:87ff:fed0:e792%VLAN0001     VLAN0010
    3/0     RIPng       10s    , Distance: 100/0/0, Tag: 0, AS-Path: IGP (Id 1), Communiti
es: -, LocalPref: -, <Int Active Gateway>
3ffe:501:811:ff40::/64                   fe80::200:87ff:fed0:e792%VLAN0001     VLAN0010
    -/-     BGP4+       10s    , Distance: 200/0/0, Tag: 0, AS-Path: 100 IGP (Id 2), Commu
nities: 100:200 1200:300, LocalPref: 100, <Int Active Gateway>
>
```

Figure 14-4: Displaying route information for all VRF [SL-L3A]

```
>show ipv6 route vrf all
Date 20XX/12/20 12:00:00 UTC
VRF: global  Total: 3 routes
Destination                              Next Hop                         Interface
     Metric   Protocol    Age
::1/128                                  ::1                              loopback0
     0/0     Connected   59d 20h
2001:db8:1::/64                          2001:db8:1::1                    VLAN0010
     0/0     Connected    2h  0m
2001:db8:1::1/128                        ::1                              loopback0
     0/0     Connected   12s

VRF: 5 Total: 2 routes
Destination                              Next Hop                         Interface
     Metric   Protocol    Age
2001:db8:10::/64                         2001:db8:10::1                   VLAN0011
     0/0     Connected    2h  0m
2001:db8:10::1/128                       ::1                              loopback5
     0/0     Connected   12s

VRF: 100 Total: 2 routes
Destination                              Next Hop                         Interface
     Metric   Protocol    Age
2001:db8:100::/64                        2001:db8:100::1                  VLAN0012
     0/0     Connected    2h  0m
2001:db8:100::1/128                      ::1                              loopback1
00   0/0     Connected    2h  3m
>
```

Figure 14-5: Displaying active route information learned by RIPng

```
>show ipv6 route rip
Date 20XX/07/14 12:00:00 UTC
Total: 1 routes
Destination                              Next Hop                         Interface
     Metric   Protocol    Age
3ffe:501:811:ff05::/64                   fe80::200:87ff:fed0:e792%VLAN0010 VLAN0010
     3/0     RIPng      12s
>
```

Figure 14-6: Displaying information about active routes included in the specific network
               3ffe:501:811:ff05::/64

```
>show ipv6 route 3ffe:501:811:ff05::/64 longer-prefixes
Date 20XX/07/14 12:00:00 UTC
Total: 1 routes
Destination                              Next Hop                         Interface
     Metric   Protocol    Age
3ffe:501:811:ff05::/64                   fe80::200:87ff:fed0:e792%VLAN0010 VLAN0010
     3/0     RIPng      24s
>
```

Figure 14-7: Displaying information about all routes including alternate routes

```
>show ipv6 route all-routes
Date 20XX/12/20 12:00:00 UTC
```

```
Status Codes: * valid, > active, r RIB failure
Total: 13 routes
  Destination                              Next Hop                            Interface
Metric    Protocol    Age
*> ::1/128                                 ::1                                 loopback0
0/0     Connected    59d 20h
*> 3ffe:501:811:ff01::/64                  3ffe:501:811:ff01::1                VLAN0010
0/0     Connected    2h  3m
*> 3ffe:501:811:ff01::1/128                ::1                                 loopback0
0/0     Connected    2h 27m
*> 3ffe:501:811:ff02::/64                  3ffe:501:811:ff02::1                VLAN0010
0/0     Connected    2h  3m
    :
>
```

Display items in Example 1

Table 14-1: Displayed routing information stored in the routing table

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global net-work.
Total xxx routes [SL-L3A]	Number of routes in the VRF	xxx: The number of routes in the VRF
Status Codes	Routing information status	* valid: Valid routing information
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
		> active: Information about routes that are currently selected
Total	Number of routes	—
Destination	Destination network	destination address/prefix length
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—

Metric	Route metric	• xxx/yyy:
		    xxx: The first metric value
		    yyy: The second metric value
		• If Protocol is OSPFv3 ext1 or OSPFv3 ext2, the fol-lowing is displayed for each OSPF type:
		    For TYPE1 series switches:
		      First-metric value = metric value + cost value
		      Second-metric value = "-"
		    For TYPE2 series switches:
		      First-metric value = metric value
		      Second-metric value = cost value
		• If Protocol is OSPFv3 intra or OSPFv3 inter, the fol-lowing is displayed:
		    First-metric value = cost value
		    Second-metric value= "-"

Display Items	Meaning	Displayed detailed information
Protocol	The protocol that was used to learn the routing information	Connected: Directly connected route
		Kernel: A route learned from the kernel (a route temporarily created due to restarting of the unicast routing program)
		Default: BGP4+ default route
		RIPng: RIPng route
		BGP4+: BGP4+ route
		OSPFv3 intra: Intra-area route for OSPFv3
		OSPFv3 inter: Inter-area route for OSPFv3
		OSPFv3 ext1: External AS route for OSPFv3 (TYPE 1)
		OSPFv3 ext2: External AS route for OSPFv3 (TYPE 2)
		Static: Static route
		Summary: Summarized route
		Extra-VRF: A route imported from another VRF or global network [SL-L3A]
		Any: Other
Age	Route aging time	The elapsed number of days and time:
		xxxxd: Days (from 100 days to 49708 days)
		xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours)
		xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes)
		xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds)
		xxs: Seconds (from 0 to 59 seconds)
Distance	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Tag	Route tag	—
AS Path	The AS path for the route	xxx(Id yyy): • xxx: IGP/EGP/Incomplete • yyy: The ID number of the AS path displayed by using show ipv6 bgp paths
Communities	The Community attributes of the route	Displays the Community attributes. no-advertise no-export local-AS xx:yy

Display Items	Meaning	Displayed detailed information
		• xx: AS number • yy: Community ID Other: Hexadecimal notation "-" is displayed if there is no information.
LocalPref	The Local_Pref attribute of the route	"-" is displayed if there is no information.
<...>	Route status	NotInstall (A route not to be registered in the forwarding table)
		NoAdvise (A route that is not advertised)
		Int (Internal route)
		Ext (External route)
		Pending (A route for which route advertisements are temporarily suppressed due to a RIPng hold-down processing)
		Delete (Deleted route)
		Hidden (A route that was assumed to be invalid)
		OnList (A route change is being reported to routing protocols.)
		Retain (A route that is always retained as active while the interface is up)
		Gateway (A route used for forwarding)
		Reject (A route that rejects forwarding due to unreachable state)
		Active (Valid route)
		Suppressed (A route that is being suppressed by the route flap dampening function)
		Remote (Remote gateway route)
		Dhcp (A route corresponding to the prefix the IPv6 DHCP server assigned to the terminal)
		Stale (A stale route in the graceful restart function)
		Delay (A route for which deletion is suspended by the route deletion delay function)

Example 2: show ipv6 route [all-routes] [vrf {<vrf id> | all}] <Prefix>[/<Prefixlen>]

• This example shows how to display detailed information about the active routes to the specific network 3ffe:200:1024::/64.

Figure 14-8: Displaying detailed information about a specific route (1)

```
>show ipv6 route 3ffe:200:1024::/64
Date 20XX/12/20 12:00:00 UTC
```

```
Route codes: *  = active,   + = changed to active recently
             ' ' = inactive, - = changed to inactive recently
              r  = RIB failure


Route 3ffe:200:1024::/64
Entries 1 Announced 1 Depth 0 <>

* NextHop 3ffe:200:1024:0:1122:33ff:fe44:5566, Interface: VLAN0010
      Protocol <Static>
      Source Gateway ----
      Metric/2    : 0/0
      Distance/2/3: 0/0/0
      Tag : 0, Age :  2h 34m
      AS Path : IGP (Id 1)
      Communities: -
      LocalPref : -
      RT State: <Int Active Retain>
>
```

Note: For a multipath route, only NextHop and Interface are displayed for the second and subsequent paths.

- This example shows how to display detailed information about the active, longest-match routes for the specific destination 3ffe:501:811:100::1.

Figure 14-9: Displaying detailed information about a specific route (2)

```
>show ipv6 route 3ffe:501:811:100::1
Date 20XX/12/20 12:00:00 UTC
Route codes: *  = active,   + = changed to active recently
             ' ' = inactive, - = changed to inactive recently
              r = RIB failure


Route 3ffe:501:811:100::/64
Entries 1 Announced 1 Depth 0 <>

* NextHop 3ffe:501:811:100:0:33ff:fe44:5566, Interface: VLAN0010
         Protocol <Static>
         Source Gateway ----
         Metric/2    : 0/0
         Distance/2/3: 0/0/0
         Tag : 0, Age :  2h 34m
         AS Path : IGP (Id 1)
         Communities: -
         LocalPref : -
         RT State: <Int Active Retain>
>
```

Display items in Example 2

Table 14-2: Displayed specific route information

Display Items	Meaning	Displayed detailed information
Route	Destination network	destination address/prefix length
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Entries	Number of entries registered for the route	—
Announced	Whether route advertisement is performed	0: The route is neither advertised nor registered in the forwarding table.
		1: The route is either advertised or registered in the forwarding table.
Depth	Number of layers for summarized routes	—

Display Items	Meaning	Displayed detailed information
<...>	Route status	See the <...> item in the previous table for show ipv6 route.
Route codes	Routing information status	*: Active route
		+: A route that has been changed to active recently
		-: A route that has been changed to inactive recently
		' ': Inactive route
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—
Source Gateway	Gateway address	—
Protocol	The protocol that was used to learn the routing information	See the protocol item in the previous table for show ipv6 route.
Distance/2/3	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Metric/2	Route metric	See the Metric item in the previous table for show ipv6 route.
Tag	Route tag	—
Age	Route aging time	See the Age item in the previous table for show ipv6 route.
AS Path	The AS path for the route	See the ASPath item in the previous table for show ipv6 route.
Communities	The Community attributes of the route	See the Communities item in the previous table for show ipv6 route.
LocalPref	The Local_Pref attribute of the route	See the LocalPref item in the previous table for show ipv6 route.
RT State	Route status	See the above <...> item.

Example 3: show ipv6 route [vrf {<vrf id> | all}] [<Protocol>] [<Prefix>[/<Prefixlen>]] summary

Figure 14-10: Displaying, for each protocol, the number of routes learned by the protocol

```
>show ipv6 route summary
Date 20XX/12/20 12:00:00 UTC
Protocol      Active Routes  InActive Routes
Connected   13              0
Kernel      0               0
Default     0               0
OSPFv3      20              0
  intra-area        8                  0
```

```
 inter-area        0                 0
 external-1        12                0
 external-2        0                 0
RIPng        1            0
BGP4+        100          0
Static       0            0
Summary      0            0
Extra-VRF    0            0
Total        134          0
>
```

Figure 14-11: Displaying the number of routes learned by RIPng

```
>show ipv6 route rip summary
Date 20XX/07/14 12:00:00 UTC
Protocol     Active Routes  InActive Routes
RIPng        4              0
>
```

Figure 14-12: Displaying information about the routes included in the specific network
               3ffe:501:811:ff05::/64

```
>show ipv6 route 3ffe:501:811:ff05::/64 summary
Date 20XX/12/20 12:00:00 UTC
Protocol     Active Routes  InActive Routes
Connected    3              0
Kernel       0              0
Default      0              0
OSPFv3       0              0
  intra-area        0                 0
  inter-area        0                 0
  external-1        0                 0
  external-2        0                 0
RIPng        0            0
BGP4+        0            0
Static       0            0
Summary      0            0
Extra-VRF    0            0
Total        3            0
>
```

Display items in Example 3

Table 14-3: Displayed information about the number of routes learned by each protocol

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Protocol	The protocol that was used to learn the routing information	Connected: Directly connected route
		Kernel: A route learned from the kernel (a route temporarily created due to restarting of the unicast routing program)
		Default: BGP4+ default route
		OSPFv3: Number of all OSPFv3 routes • intra-area: Number of intra-area routes • inter-area: Number of inter-area routes • external-1: Number of external AS routes (TYPE 1) • external-2: Number of external AS routes (TYPE 2)
		RIPng: RIPng route

Display Items	Meaning	Displayed detailed information
		BGP4+: BGP4+ route
		Static: Static route
		Summary: Summarized route
		Extra-VRF: A route imported from another VRF or global network [SL-L3A]
		Total: Total number of routes (the total value of the routes for all protocols)
Active Routes	Number of active routes	The number of routes that are registered in the forwarding table
InActive Routes	Number of inactive routes	A number of routes that cannot be registered in the forwarding table (including alternate routes)

Impact on communication

None

Response messages

Table 14-4: List of response messages for the show ipv6 route command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	linklocal address is not displayed	A link-local address is not displayed.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
5	no route <Prefix>	The specified network was not found. <Prefix>: Prefix
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

clear ipv6 route

Temporarily clears the hardware forwarding entries, and re-registers routing entries stored by the unicast routing program.

Syntax

```
clear ipv6 route [vrf {<vrf id> | all}] { * | <Prefix>[/<Prefixlen>] }
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> This command applies to the routes for VRFs. If <vrf id> is specified, this command applies to the routes for only the specified VRF. If all is specified, this command applies to the routes for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> This command applies to global network routes.

*

> Updates all routing information.

<Prefix>[/<Prefixlen>]

> If the destination network is specified for <Prefix>/<Prefixlen>, information about the routes for the specified destination network is displayed. For <Prefix>, specify the destination address in colon notation.

> <Prefixlen>

>> Specify the prefix length in the range from 0 to 128.

>> Behavior when this parameter is omitted:

>>> Detailed information about the longest-match routes for the specified <Prefix> is updated.

> Note that you cannot specify a loopback address for the network.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Figure 14-13: Updating all routing information

```
>clear ipv6 route *
>
```

Figure 14-14: Updating information about the routes to a specific network

```
>clear ipv6 route 3ffe:811:172::10/64
>
```

Display Items

None

Impact on communication

Because hardware forwarding entries are cleared and routing entries stored by the unicast routing program are re-registered, communication might stop temporarily.

Response messages

Table 14-5: List of response messages for the clear ipv6 route command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal parameter class -- \<Parameter\>	The route for the specified address could not be cleared. \<Parameter\>: Specified parameter name
3	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
4	linklocal address is not cleared	A link-local address cannot be cleared.
5	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	no route \<IPv6 Address\>	The specified route was not found. \<IPv6 Address\>: IPv6 address
7	no such VRF \<vrf id\>	The specified VRF was not found. \<vrf id\>: Specified VRF ID
8	pid file \<File Name\> mangled!	The PID file for the unicast routing program is invalid. \<File Name\>: PID file name
9	pid in file \<File Name\> unreasonably small(\<PID\>)	The PID file for the unicast routing program is invalid. \<File_Name\>: PID file name \<PID\>: Process ID in the PID file
10	program error occurred: \<Error Message\>	A program error occurred. Re-execute the command. \<Error Message\>: Location of the error
11	rtm appears to be running as pid \<PID\>, but pid \<PID\> doesn't exist!	The process listed in the PID file for the unicast routing program was not found. The unicast routing program might have restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. \<PID\>: Process ID
12	rtm doesn't seem to be running.	The command failed because the unicast routing program was not running. Wait until the unicast routing program has been restarted, and then re-execute the command.

Notes

Executing clear ipv6 route * deletes NDP entries that were registered dynamically.

show ipv6 entry

Displays detailed information about specific routes.

Syntax

```
show ipv6 entry [vrf {<vrf id> | all}] <Prefix>[/<Prefixlen>]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays routing information for VRFs. If <vrf id> is specified, routing information for only the specified VRF is displayed. If all is specified, routing information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays routing information for the global network.

<Prefix>[/<Prefixlen>]

> If the destination network is specified for <Prefix>/<Prefixlen>, detailed information about the routes that match the specified destination network is displayed. For <Prefix>, specify the destination address in colon notation.

> <Prefixlen>

>> Specify the prefix length in the range from 0 to 128.

>> Behavior when this parameter is omitted:

>>> Detailed information about the longest-match routes for the specified <Prefix> is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

This example shows how to display information about the routes that have the destination network specified by the destination address 3ffe:501:811:ff02:: and 64 bits of prefix length.

Figure 14-15: Displaying detailed information about specific routes

```
>show ipv6 entry 3ffe:501:811:ff02::/64
Date 20XX/12/20 12:00:00 UTC
Route codes: *  = active,   + = changed to active recently
             ' ' = inactive, - = changed to inactive recently
             r = RIB failure

Route 3ffe:501:811:ff02::/64
Entries 1 Announced 1 Depth 0 <>

* NextHop 3ffe:501:811:ff02::1, Interface   : VLAN0012
      Protocol <Static>
      Source Gateway ----
      Metric/2    : 0/0
      Distance/2/3: 0/0/0
      Tag : 0, Age :  2h 10m
      AS Path : IGP (Id 1)
      Communities: -
```

```
        LocalPref : -
        RT State: <Int Active Retain>
>
```

Note: For a multipath route, only NextHop and Interface are displayed for the second and subsequent paths.

Display Items

Table 14-6: Displayed detailed information about specific routes

Display Items	Meaning	Displayed detailed information
Route	Destination network	destination address/prefix length
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Entries	Number of entries registered for the route	—
Announced	Whether route advertisement is performed	0: The route is neither advertised nor registered in the forwarding table.
		1: The route is either advertised or registered in the forwarding table.
Depth	Number of layers for summarized routes	—
<...>	Route status	See the <...> item in the previous table for show ipv6 route.
Route codes	Routing information status	*: Active route
		+: A route that has been changed to active recently
		-: A route that has been changed to inactive recently
		' ': Inactive route
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—
Source Gateway	Gateway address	—
Protocol	The protocol that was used to learn the routing information	See the protocol item in the previous table for show ipv6 route.
Distance/2/3	Route distance	xxx/yyy/zzz: • xxx: The first distance value • yyy: The second distance value • zzz: The third distance value
Metric/2	Route metric	See the Metric item in the previous table for show ipv6 route.

Display Items	Meaning	Displayed detailed information
Tag	Route tag	—
Age	Route aging time	See the Age item in the previous table for show ipv6 route.
AS Path	The AS path for the route	See the ASPath item in the previous table for show ipv6 route.
Communities	The Community attributes of the route	See the Communities item in the previous table for show ipv6 route.
LocalPref	The Local_Pref attribute of the route	See the LocalPref item in the previous table for show ipv6 route.
RT State	Route status	See the above <...> item.

Impact on communication

None

Response messages

Table 14-7: List of response messages for the show ipv6 entry command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	linklocal address is not displayed	A link-local address cannot be specified.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
5	no route <IPv6 Address>	The specified route was not found. <IPv6 Address>: IPv6 address
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ipv6 rip

Shows information about the RIPng protocol.

Syntax

```
show ipv6 rip [vrf {<vrf id> | all}] [{ target | neighbor }]
show ipv6 rip [vrf {<vrf id> | all}] route [brief] [{ [<Prefix>[/<Prefixlen>]]
            | summary }]| summary }]
show ipv6 rip [vrf {<vrf id> | all}] received-routes [brief]
            [{ <Neighbor-Address> | <Host name> }][<Prefix>/<Prefixlen>]
show ipv6 rip [vrf {<vrf id> | all}] received-routes summary
show ipv6 rip [vrf {<vrf id> | all}] advertised-routes  [brief]
            [interface vlan <vlan id>] [<Prefix>/<Prefixlen>]
show ipv6 rip [vrf {<vrf id> | all}] advertised-routes summary
show ipv6 rip [vrf {<vrf id> | all}] statistics
            [{ neighbor {<Neighbor-Address>|<Host name>} |
            target interface vlan <vlan id>}]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays RIPng information for VRFs. If <vrf id> is specified, RIPng information for only the specified VRF is displayed. If all is specified, RIPng information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

RIPng information for the global network is displayed.

target

Displays information about the RIPng target (the destination of the RIPng packets).

neighbor

Displays information about the RIPng neighboring router (the source of the RIPng packets).

brief

Displays summary routing information.

<Prefix>[/<Prefixlen>]

Displays only the routing information for the specified destination network.

If /<Prefixlen> is omitted, the specified <Prefix> is considered as the filtering address, and routing information is displayed.

Example: If 3ffe:811:: is entered, routing information about 3ffe:811::/32 is displayed.

For <Prefix>, specify the destination address in colon notation.

For <Prefixlen>, specify the prefix length in the range from 0 to 128.

<Neighbor -Address>

Specify the neighboring router in an IPv6 address or in an IPv6 address with the interface name (for a link-local address only).

<Host name>

Specify the host name.

Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

summary

    Displays the number of routes.

route

    Displays the routing information that is learned by RIPng and stored in the routing table.

received-routes

    Displays for each neighboring router the routing information that is learned by RIPng and stored in the routing table.

advertised-routes

    Displays for each neighboring router the routing information advertised by RIPng.

    interface vlan <vlan id>

        Displays information about only the routes advertised to the specified interface. For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

statistics

    Displays RIPng statistics.

    neighbor {<Neighbor-Address>|<Host name>}

        Displays detailed statistics about the status of received RIPng routes for the specified neighboring router.

        For <Neighbor-Address>, specify an IPv6 address or an IPv6 address with the interface name (for a link-local address only).

        For <Host name>, specify the host name. Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

    target interface vlan <vlan id>

        Displays detailed statistics about the status of sent RIPng routes for the specified target. For <vlan id>, specify the VLAN ID set by the "interface vlan" command.

Behavior when each parameter is omitted:

    This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

    Global RIPng information for the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ipv6 rip [vrf {<vrf id> | all}]

Figure 14-16: Displaying global information

```
>show ipv6 rip
Date 20XX/07/14 12:00:00 UTC
RIPng Flags: <ON>
Default Metric: 16, Distance: 100
Timers (seconds)
  Update             : 30
  Aging              : 180
  Garbage-Collection : 120
>
```

Display items in Example 1

Table 14-8: Displayed global information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
RIPng Flags	RIPng flag	ON: RIPng is running.
		Inherit-metric: Inherits metrics when advertising routes
		SecondaryRoute: creates priority 2 route.
Default Metric	The default metric added to the route to be advertised	—
Distance	Route distance that is learned by RIPng and stored in the routing table	—
Timer information		
Update	Periodic advertisement time (seconds)	—
Aging	Aging time (seconds)	—
Garbage-Collection	Hold-down time (seconds)	—

Example 2: show ipv6 rip [vrf {<vrf id> | all}] target

Figure 14-17: Displaying target information

```
>show ipv6 rip target
Date 20XX/07/14 12:00:00 UTC
Source Address                   Destination     Flags
fe80::200:fed0:e792%VLAN0010     VLAN0010        <Multicast>
>
```

Display items in Example 2

Table 14-9: Displayed target information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Source Address	Source address	—
Destination	Sending interface	—
Flags	Target flag	Multicast: A multicast address is used for the destination address for the packets sent to this target.
		Passive: Transmission of the packets to this target is being suppressed.

Example 3: show ipv6 rip [vrf {<vrf id> | all}] neighbor

Figure 14-18: Displaying neighboring router information

```
>show ipv6 rip neighbor
Date 20XX/07/14 12:00:00 UTC
Neighbor Address                     Age        Flags
fe80::%VLAN0013                      2m 12s     < >
fe80::200:fed0:e792%VLAN0010         30s        <ImportRestrict>
>
```

Display items in Example 3

Table 14-10: Displayed neighboring router information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Neighbor Address	Neighboring router address	—
Age	Time elapsed since the last UPDATE packet was received	—
Flags[#]	Neighboring router flag	Query: A request packet was received.
		ImportRestrict: Packet reception is restricted by the import policy.
		Format: A packet with a format error was received.
		AuthFail: A packet with an authentication error was received.

#: This flag indicates that the applicable event occurred one or more times up to now, since the neighboring router was recognized.

Example 4: show ipv6 rip [vrf {<vrf id> | all}] route [brief] <Prefix>/<Prefixlen>

Figure 14-19: Displaying, in standard format, the routes learned by RIPng and stored in the routing table

```
>show ipv6 rip route 3ffe:501:811:ff05::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination                              Next Hop
     Interface      Metric   Tag   Timer
*> 3ffe:501:811:ff05::/64                   fe80::200:fed0:e792%VLAN0010
     VLAN0010       3        0     14s
*  3ffe:501:811:ff05::/64                   fe80::200:3fd0:4792%VLAN0013
     VLAN0013       4        0     14s
>
```

Figure 14-20: Displaying, in summary format, the routes learned by RIPng and stored in the routing table

```
>show ipv6 rip route brief 3ffe:501:811:ff05::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination                         Interface      Metric Tag   Timer
*> 3ffe:501:811:ff05::/64              VLAN0010       3      0     26s
*  3ffe:501:811:ff05::/64              VLAN0010       4      0     26s
>
```

Display items in Example 4

Table 14-11: Displayed routing information learned by RIPng and stored in the routing table

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
Destination	Destination network	destination address/prefix length
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—
Metric	Metric after route calculation	—
Tag	Route tag	—
Timer	Time elapsed since the last route update	—

Example 5: show ipv6 rip route summary

Figure 14-21: Displaying the number of routes learned by RIPng and stored in the routing table

```
>show ipv6 rip route summary
Date 20XX/07/14 12:00:00 UTC
RIPng: 4  active route
>
```

Display items in Example 5

None

Example 6: show ipv6 rip [vrf {<vrf id> | all}] received-routes [brief] [{<Neighbor-Address>|<Host name>}] [<Prefix>/<Prefixlen>]

- This example shows how to display, in standard format, routing information learned by RIPng and stored in the routing table, based on the specified neighboring router and destination network.

  Figure 14-22: Displaying, in standard format, RIPng routes for each neighboring router

```
>show ipv6 rip received-routes 3ffe:501:811:ff05::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure

Neighbor Address: fe80::200:fed0:e792%VLAN0010
   Destination                              Next Hop
     Interface      Metric   Tag    Timer
*> 3ffe:501:811:ff05::/64                   fe80::200:fed0:e792%VLAN0010
     VLAN0010        3        0      2s
*> 3ffe:501:811:ff06::/64                   fe80::200:fed0:e792%VLAN0010
     VLAN0010        3        0      2s
*> 3ffe:501:811:ffe0::/64                   fe80::200:fed0:e792%VLAN0010
     VLAN0010        3        0      2s
```

```
Neighbor Address: fe80::%VLAN0013
    Destination                              Next Hop
    Interface      Metric   Tag   Timer
*   3ffe:501:811:ff05::/64                   fe80::200:3fd0:4792%VLAN0013
    VLAN0013       3        0     20s
*>  3ffe:801:fe01::/64                       fe80::200:3fd0:4792%VLAN0013
    VLAN0013       3        0     20s
>
```

- This example shows how to display, in summary format, routing information learned by RIPng and stored in the routing table, based on the specified neighboring router and destination network.

Figure 14-23: Displaying, in summary format, RIPng routes for each neighboring router

```
>show ipv6 rip received-routes brief 3ffe:501:811:ff05::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
Neighbor Address: fe80::200:fed0:e792%VLAN0010
    Destination                     Interface     Metric Tag   Timer
*>  3ffe:501:811:ff05::/64          VLAN0010      3      0     2s
*>  3ffe:501:811:ff06::/64          VLAN0010      3      0     2s
*>  3ffe:501:811:ffe0::/64          VLAN0010      3      0     2s
Neighbor Address: fe80::%VLAN0013
    Destination                     Interface     Metric Tag   Timer
*   3ffe:501:811:ff05::/64          VLAN0013      3      0     20s
*>  3ffe:501:801:fe01::/64          VLAN0013      3      0     20s
>
```

Display items in Example 6

Table 14-12: Displayed RIPng routes for each neighboring router

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected
		r: The number of routes exceeded the maximum number of routes specified by the \<limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
Neighbor Address	Neighboring router address	—
Destination	Destination network	destination address/prefix length
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—
Metric	Metric for the received route	—
Tag	Received route tag	—
Timer	Time elapsed since the last route update	—

Example 7: show ipv6 rip [vrf {\<vrf id> | all}] received-routes summary

Figure 14-24: Displaying for each neighboring router the number of routes learned by RIPng and stored in the routing table

```
>show ipv6 rip received-routes summary
Date 20XX/07/14 12:00:00 UTC
Neighbor Address: fe80::%VLAN0013                   0 routes received
Neighbor Address: fe80::%VLAN0015                   0 routes received
Neighbor Address: fe80::200:fed0:e792%VLAN0010      4 routes received
>
```

Display items in Example 7

None

Example 8: show ipv6 rip [vrf {<vrf id> | all}] advertised-routes [brief] [interface <interface type> <interface number>] [<Prefix>/ <Prefixlen>]

- This example shows how to display, in standard format, routing information advertised by RIPng, based on the specified target and destination network.

  Figure 14-25: Displaying, in standard format, RIPng advertised routes for each target

```
>show ipv6 rip advertised-routes
Date 20XX/07/14 12:00:00 UTC
Target Interface: VLAN0012
Destination                             Next Hop
    Interface      Metric    Tag   Age
3ffe:501:811:ff04::/64                  3ffe:501:811:ff04::1
    VLAN0012       0         0     2h 39m

Target Interface: VLAN0010
Destination                             Next Hop
    Interface      Metric    Tag   Age
3ffe:501:811:ff01::/64                  3ffe:501:811:ff01::1
    VLAN0010       0         0     1m 12s
3ffe:501:811:ff02::/64                  3ffe:501:811:ff02::1
    VLAN0010       0         0     1m 12s
3ffe:501:811:ff03::/64                  3ffe:501:811:ff03::1
    VLAN0010       0         0     1m 12s
3ffe:501:811:ff05::/64                  fe80::200: fed0:e792%VLAN0010
    VLAN0010       3         0     13s
3ffe:501:811:ff06::/64                  fe80::200: fed0:e792%VLAN0010
    VLAN0010       2         0     13s
3ffe:501:811:ff07::/64                  fe80::200: fed0:e792%VLAN0010
    VLAN0010       2         0     13s
3ffe:501:811:ff08::/64                  fe80::200: fed0:e792%VLAN0010
    VLAN0010       2         0     13s
>
```

- This example shows how to display, in summary format, routing information advertised by RIPng, based on the specified target and destination network.

  Figure 14-26: Displaying, in summary format, RIPng advertised routes for each target

```
>show ipv6 rip advertised-routes brief vlan 10
Date 20XX/07/14 12:00:00 UTC
Target Interface:VLAN0010
Destination                             Interface    Metric Tag  Age
3ffe:501:811:ff01::/64                  VLAN0010     0      0    2m 2s
3ffe:501:811:ff02::/64                  VLAN0010     0      0    2m 2s
3ffe:501:811:ff03::/64                  VLAN0010     0      0    2m 2s
3ffe:501:811:ff05::/64                  VLAN0010     3      0    29s
3ffe:501:811:ff06::/64                  VLAN0010     2      0    29s
3ffe:501:811:ff07::/64                  VLAN0010     2      0    29s
3ffe:501:811:ff08::/64                  VLAN0010     3      0    29s
>
```

Display items in Example 8

Table 14-13: Displayed RIPng advertised routes for each target

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Target Interface	Interface name	—
Destination	Destination network	destination address/prefix length
Next Hop	Next hop address	Reject routes are displayed as "- - - -".
Interface	Sending interface name	—
Metric	Advertised route metric	—
Tag	Advertised route tag	—
Age	Route aging time	Time elapsed since the route was generated

Example 9: show ipv6 rip [vrf {<vrf id> | all}] advertised-routes summary

Figure 14-27: Displaying the number of RIPng advertised routes for each target

```
>show ipv6 rip advertised-routes summary
Date 20XX/07/14 12:00:00 UTC
Target Interface:VLAN0010          1 routes sent
Target Interface:VLAN0010          7 routes sent
>
```

Display items in Example 9

None

Example 10: show ipv6 rip [vrf {<vrf id> | all}] statistics

This example shows how to display, in summary format, statistics about the status of sent and received RIPng routes for each neighboring router or target.

Figure 14-28: Displaying summary statistics for sent and received RIPng packets

```
>show ipv6 rip statistics
Date 20XX/07/14 12:00:00 UTC
Collection Time: 19:02:31 and 4day
Received
Neighbor                              Request    Response   Entries
fe80::200:fe39:c3b3%VLAN0015          134201     142952     214290
fe80::200:fed0:e792%VLAN0010          132582     142532     59219
Total                                 266783     285484     273509

Advertised
Target                                Request    Response   Entries
VLAN0010                              42         214923     432910
VLAN0015                              102        194320     328112
Total                                 144        409243     771022
>
```

Display items in Example 10

Table 14-14: Displayed summary statistics for sent and received RIPng packets

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Collection time	Time elapsed for collecting statistics	—

Display Items	Meaning	Displayed detailed information
Received information		
Neighbor	Neighboring router address	—
Request	Total number of received Request messages	—
Response	Total number of received Response messages	—
Entries	Total number of received RIPng routes	—
Total	Total of Request, Response, and Entries	—
Advertised information		
Target	Gateway address	—
Request	Total number of sent Request messages	—
Response	Total number of sent Response messages	—
Entries	Total number of sent RIPng routes	—
Total	Total of Request, Response, and Entries	—

Example 11: show ipv6 rip [vrf {<vrf id> | all}] statistics neighbor {<Neighbor-Address>|<Host name>}

Figure 14-29: Displaying statistics for received RIPng packets from the specified neighboring router

```
>show ipv6 rip statistics neighbor fe80::200:fe39:c3b3%VLAN0010
Date 20XX/07/14 12:00:00 UTC
Neighbor fe80::200:fe39:c3b3%VLAN0010
 Request
   Total Messages          134201
     Invalid               0
 Response
   Total Messages          142952
     Invalid               0
   Total Entries           214290
     Import Restrict       10
     Unreachable           4
     Invalid               0
 Invalid or Not Supported
   Total Messages          0
 Added                     20
 Changed                   25
 Deleted                   10
>
```

Display items in Example 11

Table 14-15: Displayed statistics for RIPng packets received from the specified neighboring router

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Neighbor	Neighboring router address	—

Display Items	Meaning	Displayed detailed information
Received Request message information (Request)		
Total Messages	Total number of received messages	—
Invalid	Total number of received error messages	—
Received Response message information (Response)		
Total Messages	Total number of received messages	—
Invalid	Total number of received error messages	—
Total Entries	Total number of received RIPng routes	—
Import Restrict	Total number of the RIPng routes for which reception is restricted	—
Unreachable	Total number of the RIPng routes that have the metric of 16	—
Invalid	Total number of the RIPng routes on which errors occur	—
Received error message information (Invalid or Not Supported)		
Total Messages	Total number of received error messages	—
Added	Number of times RIPng routes were added to the routing table	—
Changed	Number of times RIPng routes on the routing table were changed	—
Deleted	Number of times RIPng routes on the routing table were deleted	—

Example 12: show ipv6 rip [vrf {<vrf id> | all}] statistics target interface vlan <vlan id>

Figure 14-30: Displaying statistics for sent RIPng packets to the specified target

```
>show ipv6 rip statistics target interface vlan 10
Date 20XX/07/14 12:00:00 UTC
Target VLAN0010
 Request
   Total Messages        1
 Response
   Total Messages        5
   Total Entries         13
   Triggered Updates     1
   Responses to Request  1
>
```

Display items in Example 12

Table 14-16: Displayed statistics for RIPng packets sent to the specified target

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Target	Target address	—
Sent Request message information (Request)		
Total Messages	Total number of sent Request messages	—
Sent Response message information (Response)		
Total Messages	Total number of sent Response messages	—
Total Entries	Total number of sent RIPng routes	—
Triggered Updates	Number of triggered updates	—
Responses to Request	Number of updates in response to Request messages	—

Impact on communication

None

Response messages

Table 14-17: List of response messages for the show ipv6 rip command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address	The specified host name is invalid.
3	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid. Alternatively, a host name and VRF were specified at the same time.
4	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
5	linklocal address is not displayed	A link-local address is not displayed.
6	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
7	no route	No route was found.
8	no such neighbor	The specified neighbor was not found. Check the correct neighbor by executing the "show ipv6 rip neighbor" command.

No.	Message	Description
9	no such neighbor in vrf <vrf id>	The specified neighbor was not found in the specified VRF. Check the correct neighbor by executing the "show ipv6 rip neighbor" command. <vrf id>: Specified VRF ID
10	no such neighbor or statistics "<Neighbor Address>"	The specified neighbor was not found. Check the correct neighbor by executing the "show ipv6 rip neighbor" command. <Neighbor Address>: Neighboring router address
11	no such neighbor or statistics "<Neighbor Address>" in vrf <vrf id>	The specified neighbor was not found in the specified VRF. Check the correct neighbor by executing the "show ipv6 rip neighbor" command. <Neighbor Address>: Neighboring router address <vrf id>: Specified VRF ID
12	no such target	The specified target was not found. Check the correct interface by executing the "show ipv6 rip target" command.
13	no such target in vrf <vrf id>	The specified target was not found in the specified VRF. <vrf id>: Specified VRF ID
14	no such target or statistics "<target interface name>"	The specified interface has not been set. Check the correct interface by executing the "show ipv6 rip target" command. <target interface name>: Name assigned to the specified interface
15	no such target or statistics "<target interface name>" in vrf <vrf id>	The specified interface has not been set in the specified VRF. Check the correct interface by executing the "show ipv6 rip target" command. <target interface name>: Name assigned to the specified interface <vrf id>: Specified VRF ID
16	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
17	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
18	RIPng not active in vrf <vrf id>	RIPng is not running in the specified VRF. <vrf id>: Specified VRF ID
19	RIPng not active.	RIPng is not running.

Notes

None

clear counters rip ipv6-unicast

Clears information about the RIPng protocol.

Syntax

```
clear counters rip [vrf {<vrf id> | all}] ipv6-unicast all
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Clears RIPng statistics for VRFs. If <vrf id> is specified, this command clears the RIPng statistics for only the specified VRF. If all is specified, this command clears the RIPng statistics for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by the configuration command.

> Behavior when this parameter is omitted:

>> RIPng statistics for the global network are cleared.

all

> Clears RIPng statistics.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Figure 14-31: Clearing RIPng statistics

```
>clear counters rip ipv6-unicast all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 14-18: List of response messages for the clear counters rip ipv6-unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.

No.	Message	Description
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
5	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
6	RIPng not active in vrf <vrf id>	RIPng is not running in the specified VRF. <vrf id>: Specified VRF ID
7	RIPng not active.	RIPng is not running.

Notes

None

show ipv6 ospf [SL-L3A]

Displays information about the OSPFv3 protocol.

Syntax

```
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] interface
                [{<interface type> <interface number> | detail }]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] neighbor
                [{ interface <interface type>
                <interface number> | <Router-id> | detail }]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] area
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] [area <Area-id>]
                database database-summary
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] [area <Area-id>] database
                [{ adv-router <Router-id> | self-originate }]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] [area <Area-id> ] database
                <LS-Type> [[<LSA-information>]
                [{ adv-router <Router-id> | self-originate }] [lsid <LSID>]]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] virtual-links
                [{ area<Area-id> [neighbor <Router-id>] | detail }]
show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] border-routers
show ipv6 ospf [vrf {<vrf id>|all}] statistics
show ipv6 ospf discard-packets
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id>|all}

Displays OSPFv3 information for VRFs. If <vrf id> is specified, OSPFv3 information for only the specified VRF is displayed. If all is specified, OSPFv3 information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The OSPFv3 information for the global network is displayed.

<Domain>

Specify an OSPFv3 domain number to display information about the domain.

For <Domain>, specify a value in the range from 1 to 65535.

Behavior when this parameter is omitted:

Information about all domains is displayed.

interface

Displays information about OSPFv3 interfaces.

If only interface is specified, summary information about all interfaces is displayed.

{<interface type> <interface number> | detail}

<interface type> <interface number>

Displays detailed information about the specified interface.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface

detail

Displays detailed information about all interfaces.

neighbor

Displays the status of neighboring routers.

If only neighbor is specified, summary information about all neighboring routers is displayed.

{interface <interface type> <interface number> | <Router-id> | detail}

interface <interface type> <interface number>

Displays summary information about the neighboring routers for the specified interface.

For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface
- Loopback interface

<Router-id>

Displays detailed information about the specified router. For <Router-id>, specify the router ID for the neighboring router in IPv4 format.

detail

Displays detailed information about all neighboring routers.

area

Displays summary information for all areas.

database database-summary

Displays the number of LS-Databases for each LS type.

area <Area-id>

Displays information for all areas. For <Area-id>, enter the backbone or area ID in IPv4 format or in decimal number format.

database

Displays all LS-Databases in summary format.

{adv-router <Router-id>| self-originate}

adv-router <Router-id>

Displays the LS-Databases that were advertised by the router with the specified router ID. For <Router-id>, specify an address in IPv4 format.

self-originate

Displays the LS-Database generated by this router.

database <LS-Type>

Displays the detailed information about the LS-Databases with the specified LS type. For <LS-Type>, you can specify any of the following LS types:

- router: Router LSA
- network: Network LSA
- inter-area-prefix: Inter-area prefix LSA
- inter-area-router: Inter-area router LSA
- external: External AS route LSA

- link: Link LSA
- intra-area-prefix: Intra-area prefix LSA
- opaque-link: Opaque link
- grace: Graceful restart LSA

<LSA-information>

Displays detailed information about the LS-Databases that have the specified <LSA-information>.

For <LSA-information>, specify any of the following:

<LS-Type>: <LSA-information>

- router: LSID (specified in hexadecimal format)
- network: LSID (specified in hexadecimal format)
- inter-area-prefix: Inter-area prefix (specified as an IPv6 global address)
- inter-area-router: ID for an inter-area router (specified as an IPv4 address)
- external: Address prefix for the external AS route (specified as an IPv6 global address)
- link: Interface name (specified as an interface name)
- intra-area-prefix: Intra-area address prefix (specified as an IPv6 global address)
- opaque-link: Opaque link interface address (specified as an interface name)
- grace: Interface name (specified as an interface name)

lsid<LSID>

Displays information about the LS-Database that has the specified LSID. For <LSID>, specify a hexadecimal value in the range from 0 to ffffffff.

virtual-links

Displays information about OSPFv3 virtual links.

If only virtual-links is specified, summary information about all virtual links is displayed.

{ area<Area-id> [neighbor <Router-id>] | detail }

area<Area-id> [neighbor <Router-id>]

Displays summary information about the virtual links passing through the specified area. If neighbor <Router-id> is specified, more detailed information about the virtual links for the specified router is displayed. For <Area-id>, specify an area ID in IPv4 format or in decimal number format. For <Router-id>, specify an address in IPv4 format.

detail

Displays detailed information about all virtual links.

border-routers

Displays information about OSPFv3 area boundary routers and AS boundary routers.

statistics

Displays statistics about the packets collected by OSPFv3.

discard-packets

Displays information about discarded OSPFv3 packets.

The contents of the packet are displayed, starting with the beginning of the OSPFv3 header.

Only information about the single last-discarded packet can be displayed for each cause in an entire OSPFv3 environment.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multi-

ple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

The global OSPFv3 information for the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>]

Figure 14-32: Displaying global information

```
>show ipv6 ospf
Date 20XX/02/14 12:00:00 UTC
OSPFv3 protocol: ON

Domain: 1
Router ID: 172.16.1.1
Distance:
  Intra Area: 10, Inter Area: 10, External: 150
Flags: <AreaBorder ASBoundary>
SPF Interval: 7s, SPF Delay: 3s
Graceful Restart: Both
  Restart Time  : 60s
  Restart Status: Finished  20XX/12/10 18:11:23
  Helper Status : Finished  20XX/02/08 14:12:22
Stub Router     : On-Startup 25s
  Status        : Active 20XX/01/10 14:30:34
Area: 0, Interfaces: 2
   Network Range                          State
   3ffe:501:ffff:100::/64                 DoNotAdvertise
   3ffe:501:ffff:200::/64                 Advertise
Area: 1, Interfaces: 1
   Network Range                          State
   -                                      -
>
```

Display items in Example 1

Table 14-19: Displayed global information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
OSPFv3 protocol	OSPFv3 behavior flag	ON: OSPFv3 is running.
Domain	Domain number	—
Router ID	Router ID	—
Distance:		
Intra area	Distance for the OSPFv3 intra-area route	—
Inter area	Distance for the OSPFv3 inter-area route	—
External	Distance for the OSPFv3 external AS route	—
SPF Interval	Value set for the interval timer for SPF calculation (seconds)	—
SPF Delay	Value set for delay time for SPF calculation (seconds)	—

Display Items	Meaning	Displayed detailed information
Graceful Restart:[#1]	Running mode of the graceful restart function	Restart: Runs as a restart router
		Helper: Runs as the helper router
		Both: Runs as a restart router and helper router
Restart Time[#1]	Time allowed for reconnection after restart (seconds)	—
Restart Status[#1]	Operating status and execution results as a restart router (The latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		-: Not executed.
	Time the router went into operating status as a restart router	Date and time when the router went into operating status as a restart router (Date and time are not displayed if the operating status is "Not executed".)
Helper Status[#1]	Operating status and execution results as a helper router (The latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		-: Not executed.
	Time the router went into operating status as a helper router	Date and time when the router went into the operating status as the helper router. (Date and time are not displayed if the operating status is "Not executed".)
Stub Router[#2]	Stub router behavior	Always: Continuously running.
		On-Startup <Time>: Running during the set time (in seconds) after the device has started.
Status[#2]	Stub router status	Active: Running.
		InActive: Not running.
	Date and time the stub router started	Date and time the stub router started behavior (This is not displayed if Stub Router status is Always or Status is Inactive.)
Flags	Router type	AreaBorder: Area boundary router
		ASBoundary: AS boundary router
		VLink: There is a virtual link.

Display Items	Meaning	Displayed detailed information
Area	Area ID for the area to which the router belongs	—
Interfaces	Number of interfaces belonging to the area	—
Network Range	Summary network range	—
State	Whether the summary network is advertised	Advertise: The summary network is advertised.
		DoNotAdvertise: The summary network is not advertised.

#1: This item is displayed only when the graceful restart function is being used.

#2: This item is displayed only when the stub router function is being used.

The stub router behavior displays the settings in configuration. Also, the stub router status displays its running status. If configuration is changed while the stub router is running, the behavior and status might become different.

Example 2: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] interface

Figure 14-33: Displaying summary information about all interfaces

```
>show ipv6 ospf interface
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
  Interface         State        Priority  Cost   Neighbor
  VLAN0010          DR                 1       1        1

Area: 1
  Interface         State        Priority  Cost   Neighbor
  VLAN0011          BackupDR          10      20       10
>
```

Display items in Example 2

Table 14-20: Displayed summary information about all interfaces

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Interface	Interface name	—
State	Status of the interface	Loopback: Loopback
		Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router

Display Items	Meaning	Displayed detailed information
		Backup DR: Backup designated router
		DR: Designated router
Priority	Priority for determining the designated router	—
Cost	Interface cost	—
Neighbor	Number of neighboring routers	—

Example 3: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] interface [{<interface type> <interface number> | detail }]

Figure 14-34: Displaying detailed information about the specific interface (vlan 10)

```
>show ipv6 ospf interface vlan 10
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
Interface ID: 2,Link Local Address : fe80::1000:00ff:fe00:0001%VLAN0010
    IPv6 Address: 3ffe:501:ffff::1/64
    MTU: 1460, DDinPacket: 70, LSRinPacket: 117, ACKinPacket:70
    Router ID: 172.16.1.1, Network Type: Broadcast, State: Backup DR
    DR: 172.17.1.1, Backup DR: 172.16.1.1
    Priority: 1, Cost: 1, Instance: 0
    Transmit Delay: 1s
    Intervals:
        Hello: 10s, Dead: 40s, Retransmit: 5s

 Neighbor List (1):
    Address                 State      Router ID        Priority
    fe80::1000:00ff:fe00:2002  Full       172.17.1.1        1
>
```

Display items in Example 3

Table 14-21: Displayed detailed information about a specific interface

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Interface ID	Interface ID	—
Link Local Address	IPv6 link-local address on the interface	—
IPv6 Address	IPv6 address on the interface	—
MTU	Maximum send data length for OSPFv3 packets	The length of the IPv6 header is not included.
DDinPacket	Number of entries that can be sent in a database exchange packet	—
LSRinPacket	Number of entries that can be sent in an LS request packet	—
ACKinPacket	Number of entries that can be sent in an ACK packet	—

Display Items	Meaning	Displayed detailed information
Router ID	ID of the router	—
Network Type	Network type	Loopback: Loopback interface
		Broadcast: Broadcast type interface
		P to P: Point-to-point interface
State	Status of the interface	Loopback: Loopback
		Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
DR	ID of the designated router for the interface	none: The designated router does not exist or has been selected.
Backup DR	ID of the backup designated router for the interface	none: The backup designated router does not exist or has been selected.
Priority	Priority for determining the designated router	—
Cost	Interface cost	—
Instance	The group to which the interface belongs	—
Transmit Delay	Necessary period of time to send the link state update packet (seconds)	—
Intervals:		
Hello	Sending interval for hello packets (seconds)	—
Dead	The maximum permissible receiving interval of hello packets (seconds)	—
Retransmit	The interval for retransmitting OSPFv3 packets (seconds)	—
Neighbor List(n):	Number of neighboring routers	—
Address	IPv6 link-local address of the neighboring router	none: The router is not connected to neighboring routers.
State	Status of connection with the neighboring router	Down
		Attempt
		Init
		Two Ways
		Exch Start

Display Items	Meaning	Displayed detailed information
		Exchange
		Loading
		Full
Router ID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Priority	Priority of the neighboring router	—

Example 4: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] neighbor [interface <interface type> <interface number>]

This example shows how to display summary information about the neighboring routers for all interfaces on which the OSPFv3 protocol is running.

Figure 14-35: Displaying summary information about neighboring routers

```
>show ipv6 ospf neighbor
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
Neighbor Address        State              Router ID    Priority Interface
fe80::1000:00ff:fe00:2002 Full/BackupDR      172.16.10.12      1 VLAN0010
fe80::1000:00ff:fe00:2003 Full/DR Other      172.16.10.13      1 VLAN0010
fe80::1000:00ff:fe00:2004 Exch Start/DR Other 172.126.10.14    1 VLAN0010

Area: 1
Neighbor Address        State              Router ID    Priority Interface
fe80::1000:20ff:fe00:2002 Full/DR            172.116.120.131  1 VLAN0015

Area: 2
Neighbor Address        State              Router ID    Priority Interface
fe80::1000:00ff:fe00:3003 Full/DR            172.18.10.10     1 VLAN0060

Virtual Neighbor
Transit Area     State       Router ID       Interface      Cost
1                Full        192.168.10.1    VLAN0010           5
1                Full        192.168.11.1    VLAN0020           6
2                Full        192.168.1.1     VLAN0030           5
>
```

Note: If interface vlan <vlan id> is specified, summary information about the neighboring routers for the specified interface is displayed.

Display items in Example 4

Table 14-22: Displayed summary information about all neighboring routers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Neighbor Address	IPv6 link-local address of the neighboring router	none: The router is not connected to neighboring routers.
State	Status of connection with the neighboring router	Down

Display Items	Meaning	Displayed detailed information
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full
	DR for the neighboring router	DR Other: Other than the designated router or backup designated router
		BackupDR: Backup designated router
		DR: Designated router
		Blank: The designated router does not exist or has been selected.
Router ID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Priority	Priority of the neighboring router	—
Interface	Interface name	none: The router is not connected to neighboring routers.
Virtual Neighbor		
Transit Area	Area through which the virtual link passes	—
State	Status of connection with the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full
Router ID	ID of the neighboring router	—
Interface	Interface name	—
Cost	Interface cost	—

Example 5: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] neighbor [{ <Router-id> | detail }]

Figure 14-36: Displaying detailed information about the specific neighboring router (172.17.1.1)

```
>show ipv6 ospf neighbor 172.17.1.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Area: 0
Interface: VLAN0010, Interface State: Backup DR
    Neighbor Address: fe80::1000:00ff:fe00:2002, State: Full/DR
    Neighbor Router ID: 172.17.1.1, Priority: 1
    Neighbor Interface ID: 2
    DR: 172.16.10.11, Backup DR: 172.16.10.10
    Last Hello: 6s, Last Exchange: 45d 12h
    DS: 0, LSR: 0, Retrans: 0, <Master>
>
```

Note: If detail is specified, detailed information about all neighboring routers is displayed.

Display items in Example 5

Table 14-23: Displayed detailed information about a specific neighboring router

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Area	Area ID for the area to which the interface belongs	—
Interface	Interface name	none: The router is not connected to neighboring routers.
Interface State	Status of the interface	Waiting: Waiting for the designated router to be determined.
		P to P: Point-to-point interface
		DR Other: Other than the designated router or backup designated router
		Backup DR: Backup designated router
		DR: Designated router
Neighbor Address	IPv6 link-local address of the neighboring router	none: The router is not connected to neighboring routers.
State	Status of connection with the neighboring router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full

Display Items	Meaning	Displayed detailed information
	DR for the neighboring router	DR Other: Other than the designated router or backup designated router
		BackupDR: Backup designated router
		DR: Designated router
		Blank: The designated router does not exist or has been selected.
Neighbor Router ID	ID of the neighboring router	none: The router is not connected to neighboring routers.
Priority	Priority of the neighboring router	—
DR	ID of the designated router as per the neighboring router	none: The designated router does not exist or has been selected.
Backup DR	ID of the backup designated router as per the neighboring router	none: The backup designated router does not exist or has been selected.
Last Hello	Time elapsed since the last hello packet was received	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Last Exchange	Time elapsed since the last database exchange finished	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
DS	Total number of database summary queues	—
LSR	Total number of link state request queues	—
Retrans	Total number of retrans queues	—
<...>	Option for the neighboring router	Initialize
		More
		Master

Example 6: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] area

Figure 14-37: Displaying summary information for all areas

```
>show ipv6 ospf area
Date 20XX/07/14 12:00:00 UTC
Domain: 1
ID               Neighbor  SPFcount  Flags
```

```
0               3       14      <ASBoundary>
10              2       8       <ASBoundary>
>
```

Display items in Example 6

Table 14-24: Displayed summary information for all areas

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
ID	Area ID for the area to which the interface belongs	—
Neighbor	Number of neighboring routers	—
SPFcount	Number of executed SPF calculations (routing table registration processing)	—
Flags	Flag	Stub: The area is a stub area.
		ASBoundary: There is an AS boundary router in the area.

Example 7: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] [{ area <Area-id> | backbone }] database database-summary

Figure 14-38: Displaying the number of link-states for the specific area (backbone)

```
>show ipv6 ospf area backbone database database-summary
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
  [Linklocal scope]
    Link            :    1
    Opaque-Link     :    1
    Grace           :    1
    ------------------------
    Total                3
  [Area scope]
    Router          :    2
    Network         :    0
    Inter-Area-Prefix:   0
    Inter-Area-Router:   1
    Intra-Area-Prefix:   1
    -----------------------
    Total                4

[AS scope]
    External:    1
>
```

Note: If area<Area-id> is omitted, the number of link-states for all areas is displayed.

Display items in Example 7

Table 14-25: Displayed information about the number of link-states for a specified area

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Domain	Domain number	—
Local Router ID	ID of the router	—
Area	Area ID	—
Linklocal-scope		
Link	Number of Link LSAs	—
Opaque-Link	Number of Opaque-Links	—
Grace	Number of Grace-LSAs	—
Total	Total number of link-local scope LSAs	—
Area-scope		
Router	Number of router links	—
Network	Number of network links	—
Inter-Area-Prefix	Number of inter-area prefix links	—
Inter-Area-Router	Number of inter-area router links	—
Intra-Area-Prefix	Number of intra-area prefix links	—
Total	Total number of area scope LSAs	—
AS-scope		
External	Number of external links	—

Example 8: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] area [{ <Area-id> | backbone }] database [{ adv-router <Router-id> | self-originate }]

- This example shows how to display summary information about link-states in the specific area (backbone) in which OSPFv3 protocol is running.

Figure 14-39: Displaying summary area information (link-state)

```
>show ipv6 ospf area backbone database
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
  LS Database: Router-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000000  221   8000000b  0dad      40
    172.16.251.141      00000000  275   80000002  6d7a      24
  LS Database: Network-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000000  221   8000000b  0dad      40
    172.16.251.141      00000002  226   80000002  94f6      32
  LS Database: Inter-Area-Prefix-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000001  210   80000002  7d89      32
    255.255.255.255     00000001  210   80000003  7d89      32
  LS Database: Inter-Area-Router-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    172.16.251.141      0301000a  262   80000002  4e74      32
    172.16.251.143      0301000a  262   80000002  4e74      32
  LS Database: Link-LSA
  Interface: VLAN0010
```

```
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000001  336   80000001  87f0      44
    172.16.251.141      00000001  399   80000002  7e8d      44
  Interface: VLAN0020
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    172.16.251.141      00000002  399   80000002  7e8d      44
  LS Database: Intra-Area-Prefix-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    172.16.251.141      00000001  275   80000002  0d9a      52
  LS Database: Opaque-Link
  Interface: VLAN0030
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            03000000  336   80000001  87f0      44
  LS Database: Grace-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    172.16.251.141      00000002  226   80000002  94f6      32

AS:
  LS Database: AS-external-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    172.16.251.141      00000001  275   80000002  0d9a      52
>
```

Note 1: If area<Area-id> is omitted, link-states for all areas are displayed in summary format.

Note 2: If adv-router is specified, LSAs advertised by the router that has the designated router ID is displayed.

Note 3: If self-originate is specified, LSAs generated by the router are displayed.

- This example shows how to display summary information about link-states advertised by the router that has the designated router ID for the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-40: Displaying summary area information (designated router ID link-state)

```
>show ipv6 ospf area backbone database adv-router 10.0.1.3
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
  LS Database: Router-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000000  221   8000000b  0dad      40
  LS Database: Network-LSA
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000000  221   8000000b  0dad      40
  LS Database: Link-LSA
  Interface: VLAN0010
    Advertising Router  LSID      Age   Sequence  Checksum  Length
    10.0.1.3            00000001  336   80000001  87f0      44
>
```

Display items in Example 8

Table 14-26: Summary display of area information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Local Router ID	ID of the router	—
Area	Area ID	—
LS Database	Link-state name	Router-LSA

Display Items	Meaning	Displayed detailed information
		Network-LSA
		Inter-Area-Prefix-LSA
		Inter-Area-Router-LSA
		AS-external-LSA
		Link-LSA
		Intra-Area-Prefix-LSA
		Opaque-Link
		Grace-LSA
Advertising Router	ID of the LSA advertising router	—
LSID	Link-state ID	—
Age	Aging time for the LSA (seconds)	-1 is displayed for MaxAge.
Sequence	Sequence number of the LSA	—
Checksum	Checksums of the LSA	—
Length	LSA size (bytes)	—
Interface	Interface name	—

Example 9: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] [{ area <Area-id> | backbone }] database <LS-Type> [<LSA-information>][{ adv-router <Router-id> | self-originate][lsid<LSID> }]

- This example shows how to display the router link information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-41: Displaying detailed area information (router link)

```
>show ipv6 ospf area backbone database router
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.251.141
Area: 0
LS Database: Router-LSA
Advertising Router: 10.0.1.3
    LSID: 00000000, Age: 221, Length: 40
    Sequence: 8000000b, Checksum: 0dad
    Flags: <AreaBorder ASBoundary>
    Options: <IPv6 External Router>
    -> Type: Router, Metric: 1, Interface ID: 2
       Neighbor Interface ID: 2, Neighbor Router ID: 172.16.251.141
Advertising Router: 172.16.251.141
    LSID: 00000000, Age: 211, Length: 40
    Sequence: 80000005, Checksum: c7bf
    Flags: <AreaBorder ASBoundary>
    Options: <IPv6 External Router>
>
```

Note 1: If area<Area-id> is omitted, router link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display the network link information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-42: Displaying detailed area information (network link)

```
>show ipv6 ospf area backbone database network
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
LS Database: Network-LSA
Advertising Router: 172.16.251.141
    LSID: 00000002, Age: 226, Length: 32
    Sequence: 80000002, Checksum: 94f6
    Options: <IPv6 External Router>
    -> Attached Router: 172.16.251.139
                        172.16.251.141
Advertising Router: 100.0.0.1
    LSID: 00000003, Age: 233, Length: 32
    Sequence: 80000003, Checksum: 94f3
    Options: <IPv6 External Router>
    -> Attached Router: 100.0.0.1
                        172.16.251.141
>
```

Note 1: If area<Area-id> is omitted, network link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display inter-area prefix information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-43: Displaying detailed area information (inter-area prefix)

```
>show ipv6 ospf area backbone database inter-area-prefix
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.1.1
Area: 0
LS Database: Inter-Area-Prefix-LSA
Advertising Router: 255.255.255.255
    LSID: 00000002, Age: 350, Length: 32,
    Sequence: 80000002, Checksum: 7d89
    -> Prefix: 3ffe:501:ffff:100::/64, Metric: 1
        Prefix Options: <>
Advertising Router: 10.1.1.1
    LSID: 00000001, Age: 210, Length: 32,
    Sequence: 80000003, Checksum: 7d89
    -> Prefix: 3ffe:501:ffff:101::/64, Metric: 1
        Prefix Options: <>
>
```

Note 1: If area<Area-id> is omitted, inter-area prefix information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display inter-area router information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-44: Displaying detailed area information (inter-area router)

```
>show ipv6 ospf area backbone database inter-area-router
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
LS Database: Inter-Area-Router-LSA
Advertising Router: 172.16.251.141
    LSID: 0301000a, Age: 262, Length: 32
    Sequence: 80000002, Checksum: 4e74
    Options: <IPv6 External Router>
    -> Destination Router ID: 10.0.1.3, Metric: 1
Advertising Router: 172.16.251.143
    LSID: 0301000a, Age: 262, Length: 32
```

```
        Sequence: 80000002, Checksum: 4e74
        Options: <IPv6 External Router>
        -> Destination Router ID: 100.0.0.101, Metric: 1
>
```

Note 1: If area<Area-id> is omitted, inter-area router information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display external AS routing information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-45: Displaying detailed area information (external AS route)

```
>show ipv6 ospf area backbone database external
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
LS Database: AS-external-LSA
Advertising Router: 10.0.1.3
    LSID: 00000001, Age: 1020, Length: 44
    Sequence: 80000006, Checksum: 36f2
    Prefix: 3ffe:501:ffff:2ff::2/128
      Prefix Options:<>
      Type: 2, Metric: 1, Tag: ----
      Forwarding Address: ----
      Referenced LS Type: ----, Referenced LS ID: ----
      <Int Ext Active Gateway>
      NextHop: fe80::260:8ff:fe8e:2c0a%VLAN0010
Advertising Router: 172.16.251.141
    LSID: 00000001, Age: 1020, Length: 44
    Sequence: 80000006, Checksum: 36f2
    Prefix: 3ffe:501:eeee:2::3/128
      Prefix Options:<>
      Type: 1, Metric: 1, Tag: ----
      Forwarding Address: ----
      Referenced LS Type: ----, Referenced LS ID: ----
>
```

Note 1: If area<Area-id> is omitted, external AS route information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display link information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-46: Displaying detailed area information (link)

```
>show ipv6 ospf area backbone database link
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
LS Database: Link-LSA
Interface: VLAN0010
Advertising Router: 172.16.251.141
    LSID: 00000002, Age: 399, Length: 44
    Sequence: 80000002, Checksum: 7e8d
    Options: <IPv6 External Router>
    -> Priority: 1
      Link-local Address: fe80::210:4bff:fed6:46e7
      Prefix List (1):
          3ffe:501:ffff:1ff::/64
              Prefix Options:<>

Interface: VLAN0020
Advertising Router: 172.16.251.141
    LSID: 00000002, Age: 399, Length: 44
    Sequence: 80000002, Checksum: 7e8d
    Options: <IPv6 External Router>
    -> Priority: 1
```

```
         Link-local Address: fe80::1000:00ff:fe00:0002
         Prefix List (1):
             3ffe:501:ffff:1::/64
                  Prefix Options:<>
>
```

Note 1: If area<Area-id> is omitted, link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display intra-area prefix information in the specific area (backbone) in which the OSPFv3 protocol is running.

Figure 14-47: Displaying detailed area information (intra-area prefix)

```
>show ipv6 ospf area backbone database intra-area-prefix
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID: 172.16.251.141
Area: 0
LS Database: Intra-Area-Prefix-LSA
Advertising Router: 172.16.251.141
    LSID: 00000001, Age: 420, Length: 52
    Sequence: 80000002, Checksum: 0d9a
    -> Referenced LS Type: Router-LSA, Referenced LS ID: 00000000
       Referenced Advertising Router: 172.16.251.141
       Prefix List (1):
           3ffe:501:ffff:1ff::1/128, Metric: 0
                Prefix Options:<>
>
```

Note 1: If area<Area-id> is omitted, intra-area prefix information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display area information (Opaque-Link).

Figure 14-48: Displaying summary area information (Opaque-Link)

```
>show ipv6 ospf area 0 database opaque-link
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 0
LS Database: Opaque-Link
  Interface: VLAN0010
  Advertising Router: 10.0.1.3
    LSID: 03000000, Opaque Type: 3, Opaque ID: 000000
    Age: 336, Length: 44, Sequence: 80000001, Checksum: 87f0
    Type: Grace Period, Length: 4
    -> 1800
    Type: Graceful Restart Reason, Length: 1
    -> Software Restart
    Type: 10, Length: 4, Value: 0x3f

  Transit Area: 1, Virtual Neighbor Router ID: 192.168.10.1
  Advertising Router: 125.16.1.1
    LSID: 03000000, Opaque Type: 3, Opaque ID: 000000
    Age: 336, Length: 44, Sequence: 80000001, Checksum: 87f0
    Type: Grace Period, Length: 4
    -> 1800
    Type: Graceful Restart Reason, Length: 1
    -> Software Restart
>
```

Note 1: If area<Area-id> is omitted, network link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

- This example shows how to display area information (Grace).

Figure 14-49: Displaying summary area information (Grace)

```
>show ipv6 ospf area 0 database grace
Date 20XX/10/14 12:00:00 UTC
Domain: 1
Local Router ID : 172.16.1.1
Area: 0
LS Database: Grace-LSA
  Interface: VLAN0010
  Advertising Router: 10.0.1.3
    LSID: 00000002, Age: 336, Length: 44,
    Sequence: 80000001, Checksum: 87f0
    Type: Grace Period, Length: 4
    -> 1800
    Type: Graceful Restart Reason, Length: 1
    -> Software Restart
    Type: 10, Length: 4, Value: 0x3f

  Transit Area: 1, Virtual Neighbor Router ID: 192.168.10.1
  Advertising Router: 125.16.1.1
    LSID: 00000002, Age: 336, Length: 44,
    Sequence: 80000001, Checksum: 87f0
    Type: Grace Period, Length: 4
    -> 1800
    Type: Graceful Restart Reason, Length: 1
    -> Software Restart
>
```

Note 1: If area<Area-id> is omitted, network link information for all areas is displayed.

Note 2: Same as Note 2 and Note 3 for "Figure 14-39: Displaying summary area information (link-state)".

Display items in Example 9

Table 14-27: Displayed detailed area information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Local Router ID	ID of the router	—
Area	Area ID	—
LS Database	Specified <LS Type>	Router-LSA
		Network-LSA
		Inter-Area-Prefix-LSA
		Inter-Area-Router-LSA
		AS-external-LSA
		Link-LSA
		Intra-Area-Prefix-LSA
		Opaque-Link
		Grace-LSA
Advertising Router	ID of the LSA advertising router	—

Display Items	Meaning	Displayed detailed information
LSID	Link-state ID	—
Age	Aging time for the LSA (seconds)	"3600" is displayed for MaxAge.
Length	LSA size (bytes)	—
Sequence	Sequence number of the LSA	—
Checksum	Checksums of the LSA	—
Items when LS Database = Router-LSA		
Flags	Router type	AreaBorder
		ASBoundary
		VLink
Options	Capacity of the advertising router	IPv6: IPv6 is supported.
		External: External AS routes can be advertised.
		Router: Only packets that have local addresses are forwarded.
Type	Link type	Router: Connection to the neighboring router
		TransNet: Connection to the designated router
		Virtual: Connection to the virtual link
Metric	Cost	—
Interface ID	Interface ID	—
Neighbor Interface ID	ID of the interface on the remote device	If the link type is Router or Virtual, this item shows the ID of the interface on the neighboring router. If the link type is TransNet, this item shows the ID of the interface on the DR.
Neighbor Router ID	ID of the neighboring router to connect	If the link type is Router or Virtual, this item shows the router ID of the neighboring router. If the link type is TransNet, this item shows the router ID of the DR.
Items when LS Database = Network-LSA		
Options	Capacity of the advertising router	IPv6: IPv6 is supported.
		External: External AS routes can be advertised.
		Router: Only packets that have local addresses are forwarded.
Attached Router	ID of the router connected to the network	—
Items when LS Database = Inter-Area-Prefix-LSA		
Prefix	IPv6 address prefix	—
Metric	Cost	—

Display Items	Meaning	Displayed detailed information
Prefix Options	Prefix option	LocalAddress: This prefix is the IPv6 interface address for the advertising router.
Items when LS Database = Inter-Area-Router-LSA		
Destination Router ID	ID of the AS boundary router	—
Metric	Cost to the AS boundary router	—
Items when LS Database = AS-external-LSA		
Prefix	Prefix	—
Prefix Options	Prefix option	LocalAddress: This prefix is the IPv6 interface address for the advertising router.
Type	Cost type	1 or 2
Metric	Cost	—
Tag	Cost type	—
Forwarding Address	Next hop address	"----" is displayed, indicating that this is not supported because the specification in RFC is unclear.
Referenced LS Type	Type of the referenced LSA	Router-LSA
		Network-LSA
		Inter-Area-Prefix-LSA
		Inter-Area-Router-LSA
		AS-external-LSA
		Link-LSA
		Intra-Area-Prefix-LSA
		"----" is displayed, indicating that this is not supported because the specification in RFC is unclear.
Referenced LS ID	LSID of the referenced LSA	"----" is displayed, indicating that this is not supported because the specification in RFC is unclear.
<...>	Route status	NotInstall
		NoAdvise
		Int
		Ext
		Pending
		Delete
		Hidden
		Initial
		Release

Display Items	Meaning	Displayed detailed information
		Flash
		OnList
		Retain
		Static
		Gateway
		Reject
		Blackhole
		IfSubnetPrefix
		Active
		• This item is displayed only when routes have been imported. • If Active is not included in this item, it indicates that import was suppressed for the LSA. • For an LSA generated by the Switch, NextHop and Flags are not displayed.
NextHop	Next hop address	—

Items when LS Database = Link-LSA

Display Items	Meaning	Displayed detailed information
Interface	Interface name	—
Options	Capacity of the advertising router	IPv6: IPv6 is supported.
		External: External AS routes can be advertised.
		Router: Only packets that have local addresses are forwarded.
Priority	Router priority of the advertising router	—
Link-local-Address	Link-local address of the interface on the advertising router	—
Prefix List	IPv6 address prefix	—
Prefix Options	Prefix option	LocalAddress: This prefix is the IPv6 interface address for the advertising router.

Items when LS Database = Intra-Area-Prefix-LSA

Display Items	Meaning	Displayed detailed information
Referenced LS Type	Type of the referenced LSA	Router-LSA
		Network-LSA
		Inter-Area-Prefix-LSA
		Inter-Area-Router-LSA
		AS-external-LSA
		Link-LSA

Display Items	Meaning	Displayed detailed information
		Intra-Area-Prefix-LSA
Referenced LS ID	LSID of the referenced LSA	—
Referenced Advertising Router	ID of the router advertising the referenced LSA	—
Prefix List	IPv6 address prefix	—
Metric	Cost	—
Prefix Options	Prefix option	LocalAddress: This prefix is the IPv6 interface address for the advertising router.
Items when LS Database = Opaque-Link		
Interface	Address on the interface that received an Opaque-Link	—
Transit Area	Area through which the virtual link passes	—
Virtual Neighbor Router ID	ID of the remote router on the virtual link	—
Advertising Router	ID of the LSA advertising router	—
LSID	Link-state ID	—
Opaque-Link Type	Opaque-Link type	—
Opaque-Link ID	Opaque-Link ID	—
Age	LSA age (seconds)	—
Length	LSA size (bytes)	—
Sequence	Sequence number of the LSA	—
Checksum	Checksums of the LSA	—
Items in the TLV display section when LS Database = Opaque-Link		
Type	Opaque-Link TLV type	Grace Period: Time period in which adjacency with the restart router must be established on the helper router while the restart router is restarting.
		Graceful Restart Reason: Reason why the router restarted
		For other types, the value is displayed in decimal number format.
Length	Opaque-Link TLV length	—
Items that explain the Value field in the TLV display section when LS Database = Opaque-Link		
Reason	The reason why the graceful restart was executed.	Unknown (Code=0): Unknown
		Software restart (Code=1): Software restart
		Software reload/upgrade (Code=2): Software reload or software upgrade

Display Items	Meaning	Displayed detailed information
		Switch to redundant control processor (Code=3): Switching of redundant control processors
		For other codes, the code value is displayed in decimal number format.
Value	The reason why the graceful restart was executed.	For values other than the above Reason values, the value for the Value field is displayed in hexadecimal format.

Items when LS Database = Grace-LSA

Display Items	Meaning	Displayed detailed information
Interface	Address on the interface that received a Grace-LSA	—
Transit Area	Area through which the virtual link passes	—
Virtual Neighbor Router ID	ID of the remote router on the virtual link	—
Advertising Router	ID of the LSA advertising router	—
LSID	Link-state ID	—
Age	LSA age (seconds)	—
Length	LSA size (bytes)	—
Sequence	Sequence number of the LSA	—
Checksum	Checksums of the LSA	—

Items in the TLV display section when LS Database = Grace-LSA

Display Items	Meaning	Displayed detailed information
Type	Grace-LSA TLV type	Grace Period: Time period in which adjacency with the restart router must be established on the helper router while the restart router is restarting.
		Graceful Restart Reason: Reason why the router restarted
		For other types, the value is displayed in decimal number format.
Length	Grace-LSA TLV length	—

Items that explain the Value field in the TLV display section when LS Database = Grace-LSA

Display Items	Meaning	Displayed detailed information
Reason	The reason why the graceful restart was executed.	Unknown (Code=0): Unknown
		Software restart (Code=1): Software restart
		Software reload/upgrade (Code=2): Software reload or software upgrade
		Switch to redundant control processor (Code=3): Switching of redundant control processors
		For other codes, the code value is displayed in decimal number format.

Display Items	Meaning	Displayed detailed information
Value	The reason why the graceful restart was executed.	For values other than the above Reason values, the value for the Value field is displayed in hexadecimal format.

Example 10: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] virtual-links [area <Area-id>]

Figure 14-50: Displaying virtual link information

```
>show ipv6 ospf virtual-links
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area      State          Router ID         Interface      Cost
1                 Full           192.168.10.1       VLAN0010       5
1                 Init           192.168.11.1       ----           6
2                 Full           192.168.1.1        VLAN0010       5
>
>show ipv6 ospf virtual-links area 1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area      State          Router ID         Interface      Cost
1                 Full           192.168.10.1       VLAN0010       5
1                 Init           192.168.11.1       ----           6
>
```

Display items in Example 10

Table 14-28: Displayed virtual link information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Transit Area	Area through which the virtual link passes	—
State	Status of connection with the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full
Router ID	ID of the remote router on the virtual link	—
Interface	Name of the interface	—
Cost	Interface cost	—

Example 11: show ipv6 ospf [vrf {<vrf id> | all}] [<Domain>] virtual-links {area <Area-id> neighbor <Router-id> | detail}

Figure 14-51: Displaying detailed virtual link information

```
>show ipv6 ospf virtual-links area 1 neighbor 192.168.10.1
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Transit Area: 1, Virtual Neighbor Router ID: 192.168.10.1
    Virtual Link State: UP
    Interface Name: VLAN0010
    Local Address        : 3ffe:501:ffff:100::1
    Virtual Neighbor Address: 3ffe:501:ffff:300::3
    Cost: 5, State: Full
    Transmit Delay: 4S
    Intervals:
        Hello: 10s, Dead: 40s, Retransmit: 5s
    Last Hello: 6s, Last Exchange: 20m 13s
    DS: 0, LSR: 0, Retrans: 0, <Master>
>
```

Display items in Example 11

Table 14-29: Displayed detailed virtual link information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Transit Area	Area through which the virtual link passes	—
Virtual Neighbor Router ID	ID of the remote router on the virtual link	—
Virtual Link State	Virtual link status	UP
		DOWN
Interface Name	Name of the interface	—
Local Address	IPv6 address on the interface	—
Virtual Neighbor Address	IPv6 address on the partner interface	—
Cost	Interface cost	—
State	Status of connection with the remote router	Down
		Attempt
		Init
		Two Ways
		Exch Start
		Exchange
		Loading
		Full
Transmit Delay	Necessary period of time to send the link state update packet (seconds)	—

Display Items	Meaning	Displayed detailed information
Intervals		
Hello	Sending interval for hello packets (seconds)	—
Dead	The maximum permissible receiving interval of hello packets (seconds)	—
Retransmit	The interval for retransmitting OSPFv3 packets (seconds)	—
Last Hello	Time elapsed since the last hello packet was received	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
Last Exchange	Time elapsed since the last database exchange finished	The elapsed number of days and time: xxxxd: Days (from 100 days to 49708 days) xxd xxh: Number of days and hours (from 1 day and 0 hours to 99 days and 23 hours) xxh xxm: hours and minutes (from 1 hour and 0 minutes to 23 hours and 59 minutes) xxm xxs: minutes and seconds (1 minute and 0 seconds to 59 minutes and 59 seconds) xxs: Seconds (from 0 to 59 seconds)
DS	Total number of database summary queues	—
LSR	Total number of link state request queues	—
Retrans	Total number of retrans queues	—
<...>	Option for the neighboring router	Initialize
		More
		Master

Example 12: show ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] border-routers

Figure 14-52: Displaying information about area boundary routers and AS boundary routers

```
>show ipv6 ospf border-routers
Date 20XX/07/14 12:00:00 UTC
Domain: 1
Router ID: 172.20.3.1, Area: 3
    Cost: 22, Type: Intra-Area, Flags: <ASBoundary>
    Next Hop: fe80::1000:00ff:fe00:3003%VLAN0010
Router ID: 172.16.1.1, Area: 2
    Cost: 10, Type: Inter-Area, Flags: <AreaBorder>
    Next Hop: fe80::1000:00ff:fe00:1001%VLAN0010
Router ID: 172.17.1.1, Area: 0
    Cost: 20, Type: Inter-Area, Flags: <ASBoundary>
    Next Hop: fe80::1000:00ff:fe00:2002%VLAN0010
>
```

Display items in Example 12

Table 14-30: Displayed information about area boundary routers and AS boundary routers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Domain	Domain number	—
Router ID	ID of the area boundary router or AS boundary router	—
Area	ID of the area that has the area boundary router or AS boundary router	—
Cost	Cost for the area boundary router or AS boundary router	—
Type	Route type	Inter-Area
		Intra-Area
Flags	Router type	AreaBorder: Area boundary router
		ASBoundary: AS boundary router
Next Hop	Next hop for the area boundary router or AS boundary router	—

Example 13: show ipv6 ospf [vrf {<vrf id>|all}] statistics

Figure 14-53: Displaying statistics about sent and received packets collected by OSPF

```
> show ipv6 ospf statistics
Date 20XX/07/14 12:00:00 UTC
Packets:
Received                        Sent
Hello             : 145801      Hello             : 140932
DB description    : 145         DB description    : 31
Link-State request: 49          Link-State request: 34
Link-State update : 5231        Link-State update : 5126
Link-State ack    : 5214        Link-State ack    : 5104
Errors:
IP: bad destination             : 0
IP: bad protocol                : 0
IP: received my own packet      : 0
OSPFv3: bad packet type         : 0
OSPFv3: bad version             : 0
OSPFv3: bad checksum            : 0
OSPFv3: bad instance id         : 0
OSPFv3: area mismatch           : 0
OSPFv3: bad virtual link        : 0
OSPFv3: packet too small        : 0
OSPFv3: packet size < ip length: 0
OSPFv3: transmit error          : 0
OSPFv3: interface down          : 0
OSPFv3: unknown neighbor        : 0
HELLO: hello timer mismatch     : 0
HELLO: dead timer mismatch      : 0
HELLO: extern option mismatch   : 0
HELLO: router id confusion      : 0
HELLO: unknown virtual neighbor: 0
HELLO: unknown NBMA neighbor    : 0
DD: neighbor state low          : 0
```

```
DD: router id confusion      : 0
DD: extern option mismatch   : 0
DD: MTU mismatch             : 0
LS ACK: neighbor state low   : 0
LS ACK: bad ack              : 0
LS ACK: duplicate ack        : 0
LS ACK: unknown LSA type     : 0
LS REQ: neighbor state low   : 0
LS REQ: empty request        : 0
LS REQ: bad request          : 0
LS UPDATE: neighbor state low  : 0
LS UPDATE: bad LSA checksum    : 0
LS UPDATE: received less recent LSA: 0
LS UPDATE: unknown LSA type   : 0
>
```

Display items in Example 13

Table 14-31: Displayed statistics about sent and received packets

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Packets	Total number of received packets	—
Received	Number of receive packets	—
Sent	Number of send packets	—
Hello	Number of hello packets	—
DB description	Number of database description packets	—
Link-State request	Number of link-state request packets	—
Link-State update	Number of link-state update packets	—
Link-State ack	Number of link-state ACK packets	—
Errors	Total number of received error packets	—
IP: bad destination	Number of invalid-destination packets	—
IP: bad protocol	Number of invalid-protocol packets	—
IP: received my own packet	Number of packets originating from the device	—
OSPFv3: bad packet type	Number of packets whose packet type is invalid	—
OSPFv3: bad version	Number of invalid-version packets	—
OSPFv3: bad checksum	Number of packets whose checksum is invalid	—
OSPFv3: bad instance id	Number of packets whose area ID is invalid	—
OSPFv3: area mismatch	Number of packets whose area is mismatched	—
OSPFv3: bad virtual link	Number of packets whose virtual link is invalid	—
OSPFv3: packet too small	Number of packets whose OSPFv3 packet length is invalid	—

Display Items	Meaning	Displayed detailed information
OSPFv3: packet size > ip Length	Number of packets whose OSPFv3 packet length is invalid	—
OSPFv3: transmit error	Number of packets that failed to be transmitted	—
OSPFv3: interface down	Number of receive packets from down interfaces	—
OSPFv3: unknown neighbor	Number of unknown OSPFv3 neighbor packets	—
HELLO: hello timer mismatch	Number of packets whose hello timer is mismatched	—
HELLO: dead timer mismatch	Number of packets whose dead timer is mismatched	—
HELLO: extern option mismatch	Number of packets whose stub area settings are mismatched	—
HELLO: router id confusion	Number of received packets that have duplicate router-id	—
HELLO: unknown virtual neighbor	Number of unknown OSPFv3 virtual neighbor packets	—
HELLO: unknown NBMA neighbor	Number of unknown OSPFv3 NBMA neighbor packets	—
DD: neighbor state low	Number of received packets that were discarded due to mismatch of the neighbor state	—
DD: router id confusion	Number of received packets that have duplicate router-id	—
DD: extern option mismatch	Number of packets whose stub area settings are mismatched	—
DD: MTU mismatch	Number of packets whose MTU is mismatched	—
LS ACK: neighbor state low	Number of received packets that were discarded due to mismatch of the neighbor state	—
LS ACK: bad ack	Number of invalid-ACK packets	—
LS ACK: duplicate ack	Number of duplicate-ACK packets	—
LS ACK: unknown LSA type	Unknown LSA type	—
LS REQ: neighbor state low	Number of received packets that were discarded due to mismatch of the neighbor state	—
LS REQ: empty request	Number of empty request packets	—
LS REQ: bad request	Number of invalid request packets	—
LS UPDATE: neighbor state low	Number of received packets that were discarded due to mismatch of the neighbor state	—
LS UPDATE: bad LSA checksum	Number of LSAs discarded due to invalid checksum	—
LS UPDATE: received less recent LSA	Number of LSAs discarded due to invalid sequence number	—

Display Items	Meaning	Displayed detailed information
LS UPDATE: unknown LSA type	Number of LSAs discarded due to invalid type	—

Example 14: show ipv6 ospf discard-packets

Figure 14-54: Displaying OSPFv3 discarded packets

```
> show ipv6 ospf discard-packets
Date 20XX/12/20 12:00:00 UTC
Collection Time : 20XX/10/08 10:40:03
OSPFv3 RECV: fe80::1%VLAN0020 -> ff02::5 (VRF:10, Router ID: 192.168.30.212)
Errors     : OSPFv3: bad packet type
Received Data:
  (0000)   0300 0024  0200 0000  0000 0001  8fad 0000
  (0010)   0001 0002  0100 0013  000a 0028  0000 0000
  (0020)   0000 0000
  OSPFv3 Length: 36

Collection Time : 20XX/10/07 11:12:11
OSPFv3 RECV: fe80::1%VLAN0020 -> ff02::5 (VRF:20, Router ID: 192.168.33.95)
Errors     : LS UPDATE: neighbor state low
Received Data:
  (0000)   0304 003c  0000 0002  0000 0000  226e 0000
  (0010)   0000 0001  0002 2001  0000 0000  0100 0008
  (0020)   8000 000e  8877 0028  0300 0013  0200 0001
  (0030)   0000 0002  0000 0002  0000 0002
  OSPFv3 Length: 60
>
```

Display items in Example 14

Table 14-32: Displayed OSPFv3 discarded packets

Display Items	Meaning	Displayed detailed information
Collection Time	Time the message was collected	—
OSPFv3 RECV	Remote device	In a case other than a transmit error
OSPFv3 SEND	Remote device	In the case of a transmit error
VRF	VRF ID	This item is not displayed when the target is a global network.
Router ID	ID of the connection target router	If the router ID cannot be identified, unspecified is displayed.
error code	Error code for transmit error	—
Errors	Cause of why the packet was discarded	—
Received Data	Discarded IP packet data	—
OSPFv3 Length	OSPFv3 packet length	—

Impact on communication

None

Response messages

Table 14-33: List of response messages for the show ipv6 ospf command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	no Area Border Router or AS Boundary Router exist	There is no area boundary router or AS boundary router.
4	no domain exists	There is no domain.
5	no interface exists	There is no interface.
6	no neighbor exists	There is no neighboring router.
7	no OSPFv3 Virtual Link is configured	There is no virtual link configured.
8	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
9	no such area	The specified area was not found.
10	no such domain"<Domain>"	The specified domain was not found.
11	no such interface"<interface name>"	The specified interface has not been set. <interface name>: Name assigned to the specified interface
12	no such LSA	The specified LSA was not found.
13	no such neighbor"<RouterID>"	The specified neighboring router was not found.
14	no such transit area"<AreaID>"	The specified transit area was not found.
15	no such virtual neighbor"<RouterID>"	The specified neighboring router was not found.
16	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
17	OSPFv3 not active in vrf <vrf id>	OSPFv3 is not running in the specified VRF. <vrf id>: Specified VRF ID
18	OSPFv3 not active.	OSPFv3 is not running.
19	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

clear ipv6 ospf [SL-L3A]

Clears information about the OSPFv3 protocol.

Syntax

```
clear ipv6 ospf [vrf {<vrf id>|all}] [<Domain>] stub-router
clear ipv6 ospf discard-packets
clear ipv6 ospf [vrf {<vrf id>|all}] statistics
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id>|all}

> This command applies to OSPFv3 for VRFs. If <vrf id> is specified, this command applies to OSPFv3 for only the specified VRF. If all is specified, this command applies to OSPFv3 for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by the configuration command.
>
> Behavior when this parameter is omitted:
>
>> This command applies to OSPFv3 for the global network.

<Domain>

> Specify the OSPFv3 domain number.
>
> For <Domain>, specify a value in the range from 1 to 65535.
>
> Behavior when this parameter is omitted:
>
>> This command applies to all domains.

stub-router

> Stops any stub router running in OSPFv3.
>
> This operation cannot be performed in the following situations:
>
> * The stub router function is not set in configuration commands.
> * The stub router function is in InActive status.
> * The stub router function runs in Always mode.

discard-packets

> Clears any discarded packets collected by OSPFv3.

statistics

> Clears statistics about the send or receive packets collected by OSPFv3.

Operation when a stack configuration is used

The command can clear valid information only from the master switch.

Example

Figure 14-55: Stopping an running stub router

```
> clear ipv6 ospf stub-router
>
```

Figure 14-56: Clearing OSPFv3 discarded packets

```
> clear ipv6 ospf discard-packets
>
```

Figure 14-57: Clearing the OSPFv3 statistics

```
> clear ipv6 ospf statistics
>
```

Display Items

None

Impact on communication

When the stub router function is running (except for when it runs "Always"), executing the command with the stub-router parameter specified changes the Cost value of the OSPFv3 interface.

Response messages

Table 14-34: List of response messages for the clear ipv6 ospf command

No.	Message	Description
1	can't reset stub-router	The stub router function is not running, or stub-router has not been set. Alternatively, the stub router function runs all the time and could not be ended. (The target of the command is the specified domains. If the target of the command is all domains, an error occurs if the command cannot be executed in all domains.)
2	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
3	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
4	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
5	no such domain "<id>"	The specified domain was not found. <id>: Domain number
6	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
7	OSPFv3 not active in vrf <vrf id>	OSPFv3 is not running in the specified VRF. <vrf id>: Specified VRF ID
8	OSPFv3 not active.	OSPFv3 is not running.
9	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ipv6 bgp [SL-L3A]

Shows information about the BGP4+ protocol.

Syntax

```
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] summary [brief]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbors [brief]
        [{ <As> | <Peer Group> | <Peer Address> | <Host name> | detail }]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] peer-group <Peer Group>
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [brief] [-Faco]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbors [brief]
        {<Peer Address> | <Host name>} received-routes [-Faco]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] received-routes
        [{ summary | [brief ] [-Faco] [<Prefix>[/<Prefixlen>]
        [longer-prefixes]] }]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbors [brief]
        {<Peer Address> | <Host name>} routes [-Faco]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] routes
        [{ summary | [brief] [-Faco] [<Prefix>[/<Prefixlen>]
        [longer-prefixes]] }]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbors [brief]
        {<Peer Address> | <Host name>} advertised-routes [-Faco]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] advertised-routes
        [{ summary | [brief] [-Faco]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]] }]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] {regexp | quote-regexp}
        <Aspath> [unmatch] [brief]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] aspath-regexp
        <Extended Regular Expression> [brief]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] inconsistent-as [brief]
show ipv6 bgp paths [<Aspath> [unmatch]]
show ipv6 bgp paths-regexp <Extended Regular Expression>
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community [brief] [none]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community [brief]
        <community>... [exact]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community-regexp
        <Extended Regular Expression> [brief]
show ipv6 bgp neighbors {<Peer Address> | <Host name>}
        dampened-routes [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp dampened-paths [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [neighbors [brief]{<Peer Address> | <Host name>}]
        flap-statistics [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp flap-statistics [brief]
        [<Prefix>[/<Prefixlen>] [longer-prefixes]]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] notification-factor
        [{<Peer-address> | <Host Name>}]
show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] stale [{summary | brief}]
```

Input mode

User mode and administrator mode

Parameters

vpnv6 vrf {<vrf id> | all}

Displays BGP4 information for VRFs. If <vrf id> is specified, BGP4+ information for only the specified VRF is displayed. If all is specified, BGP4+ information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

The BGP4+ information for the global network is displayed.

summary

Displays the peering status of all peers.

brief

Displays information in summary format.

neighbors

Displays a summary of all peering information.

{ <As> | <Peer Group> | <Peer Address> | <Host name> | detail }

<As>

Displays summary information about peers in the specified AS. Specify an AS number.

<Peer Group>

Displays summary information about the specified peer group. Specify a peer group name.

You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".

<Peer Address>

Displays information about the specified peer in detail. For the peer, specify an IPv6 address or an IPv6 address with the interface name (for a link-local address only).

<Host name>

Displays information about the specified peer in detail. For <Host name>, specify the host name.

Note that you cannot specify this parameter if vpnv6 vrf {<vrf id> | all} is specified.

detail

Displays information about all peers in detail.

peer-group <Peer Group>

Displays peering information about the peers belonging to the specified peer group.

<Peer Group>

Specify a peer group name.

You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".

-F

Displays attributes of the routing information in full format (equivalent to specifying -aco).

-a

Displays the atomic_aggregate and aggregator attributes in the routing information.

-c

Displays Community attributes of the routing information.

-o

Displays the originator_id and cluster_list attributes in the routing information.

<Prefix>[/<Prefixlen>] [longer-prefixes]

Displays routing information known by BGP4+.

Specifying the destination network for <Prefix>/<Prefixlen> filters the routing information to be displayed. For <Prefix>, specify the destination address in colon notation.

<Prefixlen>

Specifies the prefix length. You can specify from 0 to 128.

Behavior when this parameter is omitted:

The specified <Prefix> is considered as the filtering address, and routing information is displayed.

Example: If 3ffe:811:: is entered, routing information about 3ffe:811::/32 is displayed.

longer-prefixes

This command applies to the routing information included in the specified destination network.

Behavior when this parameter is omitted:

This command applies to only the routing information that matches the specified destination network. If <Prefixlen> is omitted, this command applies to the longest-match routing information for the specified <Prefix>.

neighbors [brief] {<Peer Address>|<Host name>}

Displays routing information about only the specified peer.

<Peer Address>

For the peer, specify an IPv6 address or an IPv6 address with the interface name (for a link-local address only).

<Host name>

Specify the host name.

Note that you cannot specify this parameter if vpnv6 vrf {<vrf id> | all} is specified.

received-routes

Displays routing information received from the peers.

If only received-routes is specified, all routing information for all peers is displayed.

received-routes summary

Displays the number of routing information entries received from each peer.

routes

Displays information about the valid routes (which are not suppressed by filters) received from the peers.

If only routes is specified, all routing information about all peers is displayed.

routes summary

Displays information about the valid routes (which are not suppressed by filters) received from the peers for each peer.

advertised-routes

Displays routing information advertised to the peers.

If only advertised-routes is specified, all routing information about all peers is displayed.

advertised-routes summary

Displays the number of routing information entries advertised to each peer.

{regexp | quote-regexp} <Aspath> [unmatch]

Displays routing information for the ASPATH attribute that matches the specified AS path regular expression. Note that path comparison applies to only AS_SEQUENCE of the ASPATH attribute.

<Aspath>

When regexp is specified, specify the ASPATH attribute.

When quote-regexp is specified, specify <Aspath> enclosed in double quotation marks (") and the AS path regular expression in the following format:

```
<Aspath>      := <Aspath_Term>...
<Aspath_Term> := <Aspath_Symbol>[{ {m,n} | {m} | {m,} | * | + | ? }]
<Aspath_Symbol> := { <As> | . }
```

{m,n}: Indicates that Aspath_Symbol is repeated m to n times.

(Valid setting range for m and n: 0 to 255)

{m}: Indicates that Aspath_Symbol is repeated m times.

(Valid setting range for m: 0 to 255)

{m,}: Indicates that Aspath_Symbol is repeated m times or more.

(Valid setting range for m: 0 to 255)

*: Indicates that Aspath_Symbol is repeated 0 times or more.

+: Indicates that Aspath_Symbol is repeated 1 time or more.

?: Indicates that Aspath_Symbol is repeated 0-1 times.

(Press Ctrl + V, and then ?.)

<AS>: Indicates the specified AS number.

.: Indicates any AS number.

unmatch

Displays routing information for the ASPATH attribute that does not match the specified AS path regular expression.

aspath-regexp

Displays routing information for the AS_PATH attribute that matches the specified extended regular expression. Note that path comparison applies to AS_SEQ, AS_SET, and AS_CONFED_SEQUENCE of the AS_PATH attribute.

<Extended Regular Expression>

For <Extended Regular Expression>, specify an extended regular expression. Enclose <Extended Regular Expression> in double quotations (").

For details about how to specify the extended regular expression, see "Configuration Guide Vol.3, 30.1.2 (3) (e) Regular expressions".

paths

Displays the ASPATH attribute of all the known routing information.

paths-regexp

Displays the AS_PATH attribute that matches the specified extended regular expression. Note that path comparison applies to AS_SEQ, AS_SET, and AS_CONFED_SEQUENCE of the AS_PATH attribute.

inconsistent-as

Displays information about the routes on which AS path conflict has occurred (the routes whose destination network is the same, but whose source ASs are different).

community

Displays routing information with the Community attribute (when none has not been set).

Displays routing information with no Community attribute.

community <Community>... [exact]

Displays routing information with the specified Community attribute.

<Community>

Multiple communities can be specified.

Specify <Community> in the following format:

```
<Community> := { <Community-Number> | <Well-Known-Community> }
<Community-Number> := { AS number format (AS:Communti_id: AS is in the range from 0 to
65,535. Communti_id is in the range from 0 to 65,535.) | Hexadecimal format (0xhhhhhhhh:
h = 0-9 or a-f) }
<Well-Known-Community> := { no-export | no-advertise | local-AS }
```

exact

Displays only routing information that contains all the specified communities.

Behavior when this parameter is omitted:

Displays routing information that contains some of the specified communities.

community-regexp

Displays routing information with the Community attribute that matches the specified extended regular expression.

dampened-routes

Displays suppressed-routing information.

dampened-paths

Displays suppressed-routing information.

flap-statistics

Displays information about the routes on which flapping has occurred.

notification-factor[{<Peer Address> | <Host Name>}]

Displays the packet that caused disconnection of the BGP4+ connection.

The contents of the packet are displayed, starting with the beginning of the BGP4+ header.

<Peer Address>

Displays the message, which was received from the specified peer, that caused disconnection. For the peer, specify an IPv6 address or an IPv6 address with the interface name (for a link-local address only).

<Host name>

Displays the message, which was received from the specified host, that caused disconnection. Note that you cannot specify this parameter if vpnv6 vrf {<vrf id> | all} is specified.

stale

Displays stale routing information received from the peers.

The stale information is displayed on the receiving router only.

Behavior when each parameter is omitted:

This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

The routing information known by BGP4+ in the global network is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] summary [brief]

Figure 14-58: Displaying peering status for all peers in standard format

```
>show ipv6 bgp summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
BGP4+ Peer          AS   Received  Sent   Up/Down           Status
3ffe:501:811:ff06::2  100  241       245    20XX/07/12 00:59:01 Established
>
```

Figure 14-59: Displaying peering status for all peers in summary format

```
>show ipv6 bgp summary brief
Date 20XX/07/14 12:00:00 UTC
Local AS: 500, Local Router ID: 1.2.3.5
BGP4+ Peer                          AS    Up/Down             Status
3ffe:501:ffff:3::2                  100   20XX/07/12 15:44:12 Established
3ffe:501:ffff:5::2                  300   20XX/07/12 19:41:01 Established
3ffe:502:ffee:1022:3204:0:2102:1112 500   -                   Active
:
>
```

Display items in Example 1

Table 14-35: Displayed peering status for all peers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	AS number of the router	—
Local Router ID	ID of the router	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
BGP4+ Peer	IPv6 address for the peer	—
AS	AS number for the peer	—
Received	Number of received messages	—
Sent	Number of sent messages	—
Up/Down	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 2: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbor [brief] [<As> | <Peer Group>]

Figure 14-60: Displaying summary information about all peers in standard format

```
>show ipv6 bgp neighbor
Date 20XX/01/26 12:00:00 UTC
Peer Address                          Peer AS      Local Address    Local AS
    Type      Status
3ffe:501:811:ff06::2                  100          3ffe:501:811:ff06::3 200
    External  Established to NSPIX1
>
```

Note: If <As> or <Peer Group> is specified, summary information about the peers that have the specified AS number or the specified peer group name is displayed.

Figure 14-61: Displaying summary information about all peers in summary format

```
>show ipv6 bgp neighbor brief
Date 20XX/07/14 12:00:00 UTC
Peer Address                          AS     Type      Status
3ffe:501:ffff:3::2                    100    External  Established
3ffe:501:ffff:5::2                    300    External  Established
3ffe:502:ffee:1022:3204:0:2102:1112   500    Internal  Active
:
>
```

Note: If <As> or <Peer Group> is specified, summary information about the peers that have the specified AS number or the specified peer group name is displayed.

Display items in Example 2

Table 14-36: Displayed summary information about all peers

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Confederation ID[#1]	Confederation AS number	—
Member AS[#1]	Member AS number	—
Peer Address	IPv6 address for the peer	—
Peer AS	AS number for the peer	—
Local Address	Local IPv6 address	If the local IPv6 address cannot be identified, unspecified is displayed.[#2]
Local AS	Local AS number	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect

Display Items	Meaning	Displayed detailed information
		Active
		OpenSent
		OpenConfirm
		Established
…	Peer name	Displayed only when the peer name has been set in the configuration file.

#1: This item is displayed only in a confederation configuration.

#2: If the connections to peers are direct connections, information is displayed when the following conditions are satisfied:

- The interface used for peering is not up and running (for both external and internal peers).
- No TCP session has been established (for only internal peers).

Example 3: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] neighbors [{ <Peer Address> | <Host name> | detail }]

Figure 14-62: Displaying detailed information about a specific peer

```
>show ipv6 bgp neighbor 3ffe:501:ffff:5::2
Date 20XX/01/26 10:40:21 UTC
BGP4+ Peer: 3ffe:501:ffff:5::2, Remote AS: 300
Remote Router ID: 192.168.22.10, Peer Group: office10
Description: to NSPIX1
BGP4+ Status: Established          HoldTime: 90, Keepalive: 30
    Established Transitions: 1     Established Date: 20XX/07/13 12:00:00
    BGP4+ Version: 4               Type: External
    Local Address: 3ffe:501:ffff:5::1
    Local AS: 500                  Local Router ID: 192.168.22.80
    Next Connect Retry: -          Connect Retry Timer: -
    Last Keep Alive Sent: 10:39:30  Last Keep Alive Received: 10:40:01
    Graceful Restart: Both
     Restart Status : Finished    20XX/12/07 10:11:12
     Receive Status : Finished    20XX/07/13 12:00:02
      Stalepath Time: 300
    NLRI of End-of-RIB Marker: Advertised and Received
    BGP4+ Message  UpdateIn   UpdateOut   TotalIn    TotalOut
                     1          7          61          68
    BGP4+ Peer Last Error: Cease
    BGP4+ Routes  Accepted     MaximumPrefix RestartTime Threshold
               9429          10000         none        75%
    BGP4+ Capability Negotiation: <GracefulRestart>
        Send : <Refresh Refresh(v) IPv6-Uni, GracefulRestart(RestartTime:120s)>
        Receive: <GracefulRestart(RestartTime:300s, IPv6-uni)>
    Password : Configured
>
Note: If detail is specified, detailed information about all peers is displayed.
```

Display items in Example 3

Table 14-37: Displayed detailed information about a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Confederation ID[#1]	Confederation AS number	—
Member AS[#1]	Member AS number	—
BGP4+ Peer	IPv6 address for the peer	—
Remote AS	AS number for the peer	—
Remote Router ID	Router ID for the peer	Displays the ID for the connection-destination router. "-" is displayed when no connection has been made.
Peer Group	Peer group name	—
Description	Peer name	Displayed only when the peer name has been set in the configuration file.
BGP4+ Status	Status of the peer	Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established
HoldTime	Hold time (seconds)	—
Keepalive	Sending interval (seconds)	—
Established Transitions	Number of transitions to the Established status	—
Established Date	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
BGP4+ Version	BGP4+ version	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		Internal RRclient: Internal peer and route reflector client
		Internal RRclient no-client-reflect: Internal peer and route reflector non-client
		ConfedExt: Member AS peer
Local Address	Local IPv6 address	If the local IPv6 address cannot be identified, unspecified is displayed.[#2]
Local AS	Local AS number	—

Display Items	Meaning	Displayed detailed information
Local Router ID	Local router ID	Displays the ID of the router.
Next Connect Retry	Time until the next retry for re-establishing the BGP4+ connection (minute:second)	—
Connect Retry Timer	Current interval for retrying the connection (seconds)	—
Last Keep Alive Sent	Time the last KeepAlive message was sent (hour:minute:second)	—
Last Keep Alive Received	Time the last KeepAlive message was received (hour:minute:second)	—
Graceful Restart[#3]	Running mode of the graceful restart function	Restart: Runs as a restart router
		Receive: Runs as a receiving router
		Both: Runs as a restart router and receiving router
Restart Status[#3]	Operating status and execution results as a restart router (The latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		-: Not executed.
	Time the router went into operating status as a restart router	Date and time when the router went into operating status as a restart router (Date and time are not displayed if the operating status is "Not executed".)
Receive Status[#3]	Operating status and execution results as a receive router (The latest information is displayed.)	Receiving: Learning routes.
		Advertising: Advertising routes.
		Finished: Ended normally.
		Failed: Failed.
		-: Not executed.
	Time the router went into operating status as a restart router	Date and time when the router went into the operating status as the helper router. (Date and time are not displayed if the operating status is "Not executed".)
Stalepath Time[#3]	Time from when the router performed a graceful restart until the remote router reaches route convergence	—

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Display Items	Meaning	Displayed detailed information
NLRI of End-of-RIB Marker[#3]	Whether the End-of-RIB marker, which reports completion of route distribution, is sent/received	• Advertised and Received: The End-of-RIB marker is sent and received. • Advertised: The End-of-RIB marker is sent. • Received: The End-of-RIB marker is received. • None: The End-of-RIB marker is not sent or received.
BGP4+ Messages	Number of BGP4+ messages exchanged by BGP4+	—
UpdateIn	Number of UPDATE messages received from the peer	—
UpdateOut	Number of UPDATE messages sent to the peer	—
TotalIn	Total number of messages received from the peer	—
TotalOut	Total number of messages sent to the peer	—
BGP4+ Peer Last Error	The latest detected error	The error code and sub-code are displayed by their names. • Message Header Error • Open Message Error • Update Message Error • Hold Timer Expired Error • Finite State Machine Error • Cease • Cease(Over prefix limit) • unspecified error • lost connection synchronization • bad length • bad message type • unspecified error • unsupported version • bad AS number • bad BGP ID • unsupported authentication code • authentication failure • unspecified error • invalid attribute list • unknown well known attribute • missing well known attribute • attribute flags error • bad attribute length • bad ORIGIN attribute • AS loop detected

Display Items	Meaning	Displayed detailed information
		• invalid NEXT_HOP • error with optional attribute • bad address/prefix field • AS path attribute problem
BGP4+ Routes[#4]	Information related to maximum number of learned BGP4+ routes	—
Accepted[#4]	Number of routes learned from peers	Sum of the number of active routes and the number of inactive routes
MaximumPrefix[#4]	Upper limit value specifiable for the number of routes learned from peers	1 to 4294967295
RestartTime[#4]	Time from when peer is disconnected until reconnection is attempted	time: The time is specified (in minutes). none: The time is not specified (the peer will not be reconnected).
Threshold[#4]	Threshold value for outputting operation messages	—
(Warning-only)[#4]	Setting that the peer is not to be disconnected even if the number of learned routes exceeds the upper limit	—
BGP4 Capability	Capability information	—
negotiation	Negotiated Capability information	IPv6-Uni: IPv6 unicast is supported. Refresh: Route refresh is supported. Refresh(v): Route refresh that uses the vender code (128) is supported. GracefulRestart: The graceful restart function is supported.
Send	Sent Capability information	IPv6-Uni: IPv6 unicast is supported. Refresh: Route refresh is supported. Refresh(v): Route refresh that uses the vender code (128) is supported. GracefulRestart(Restart Time): Time until a reconnection timeout occurs from when the router performs a graceful restart[#3] GracefulRestart(IPv6-Uni): AddressFamily for the graceful restart function is output.[#3]
Receive	Received Capability information	IPv6-Uni: IPv6 unicast is supported. IPv6-Multi: IPv6 multicast is supported. IPv6-Uni&Multi: Support for simultaneous IPv6 unicast and IPv6 multicast Refresh: Route refresh is supported. Refresh(v): Route refresh that uses the vender code (128) is supported. GracefulRestart(Restart Time): Restart time reported by the remote router[#3]

Display Items	Meaning	Displayed detailed information
		GracefulRestart(IPv6-Uni): AddressFamily for the graceful restart function is output.[3]
Password	MD5 authentication	Configured: MD5 authentication has been configured. UnConfigured: MD5 authentication has not been configured.

#1: This item is displayed only in a confederation configuration.

#2: If the connections to peers are direct connections, information is displayed when the following conditions are satisfied:

- The interface used for peering is not up and running (for both external and internal peers).
- No TCP session has been established (for only internal peers).

#3: These items are displayed only when the graceful restart function is being used.

#4: This item is displayed only when the function of maximum number of learned routes is being used.

Example 4: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] peer-group <Peer Group>

Displays peering information about the peers belonging to the specified peer group.

Figure 14-63: Displaying peering information for the policy group

```
>show ipv6 bgp peer-group office
Date 20XX/01/26 12:00:00 UTC
Local AS: 100, Local Router ID: 10.10.10.20
BGP4+ Peer          AS   Received   Sent   Up/Down             Status
3ffe:501:811:ff06::2  100  241        245    20XX/11/10 00:59:01 Established
>
```

Display items in Example 4

Table 14-38: Displayed peering information for the policy group

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[1]	Local AS number	—
Confederation ID[2]	Confederation ID	—
Member AS[2]	Member AS number (sub AS number)	—
Local Router ID	Local router ID	—
BGP Peer	IP address for the peer	—
AS	AS number for the peer	—
Received	Number of received messages	—
Sent	Number of sent messages	—

Display Items	Meaning	Displayed detailed information
Up/Down	Time of the last transition to or from the Established status (year/month/day hour:minute:second)	—
Status	Status of the peer	Shutdown (when the peer option shutdown is specified)
		Idle
		Connect
		Active
		OpenSent
		OpenConfirm
		Established

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 5: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [brief] [<Prefix>/<Prefixlen> longer-prefixes]

Figure 14-64: Displaying information about all routes known by BGP4+ in standard format

```
>show ipv6 bgp
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                              Next Hop
     MED    LocalPref Weight Path
*> 3ffe:501:811:ff01::/64               3ffe:501:811:ff06::2
     -        100      100    100 i
*> 3ffe:501:811:ff02::/64               3ffe:501:811:ff06::2
     -        100      255    100 i
*> 3ffe:501:811:ff03::/64               3ffe:501:811:ff06::2
     -        100       0     100 i
*> 3ffe:501:811:ff04::/64               3ffe:501:811:ff06::2
     -        100       0     100 i
*> 3ffe:501:811:4411::/64               3ffe:501:811:ff12::12
     -        100       0     100 ?
 :
>
```

Note: If <Prefix>/<Prefixlen> longer-prefixes is specified, the routing information contained in the specified network is displayed.

Figure 14-65: Displaying information about all routes known by BGP4+ in summary format

```
>show ipv6 bgp brief
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                  Next Hop                Path
*> 3ffe:501:811:ff01::/64   3ffe:501:811:ff06::2    100 i
*> 3ffe:501:811:ff02::/64   3ffe:501:811:ff06::2    100 i
*> 3ffe:501:811:ff03::/64   3ffe:501:811:ff06::2    100 i
*> 3ffe:501:811:ff04::/64   3ffe:501:811:ff06::2    100 i
S> 3ffe:501:811:4411::/64   3ffe:501:811:ff12::12   100 ?
 :
```

>

Note: If <Prefix>/<Prefixlen> longer-prefixes is specified, the routing information contained in the specified network is displayed.

Display items in Example 5

Table 14-39: Displayed routing information known by BGP4

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Local Router ID	Local router ID	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCAL_PREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 6: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [-Faco] [<Prefix>/<Prefixlen>]

Figure 14-66: Displaying the attribute of all routing information known by BGP4+ in full format

```
> show ipv6 bgp -F
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 3ffe:501:811:ff07::/64
*> Next Hop 3ffe:501:811:ff07::10
    MED: 0,  LocalPref: 100, Weight: 100, Type: External route
    Origin: IGP, IGP Metric: 3
    Path: 1000 400 1000 { 600 500 }
    Aggregator: 400, 3ffe:501:811:ff07::120
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
    Originator ID: 192.168.41.121
    Cluster List : 192.168.21.219
                   192.168.21.220
>
```

Display items in Example 6

Table 14-40: Displayed BGP4+ route attribute (full format)

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS	Local AS number	—
Local Router ID	Local router ID	—
Confederation ID[#]	Confederation AS number	—
Member AS[#]	Member AS number	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Route	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	The Local_Pref attribute of the route	—

Display Items	Meaning	Displayed detailed information
Weight	Priority for the route	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
IGP Metric	Metric value for the IGP route	Metric value for the IGP route used for determining the next hop for the BGP route
Path	The ASPath attribute for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#: This item is displayed only in a confederation configuration.

Example 7: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] <Prefix>/<Prefixlen>

Figure 14-67: Displaying detailed information about the specific route known by BGP4+

```
>show ipv6 bgp 3ffe:501:811:ff07::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
Route 3ffe:501:811:ff07::/64
*> Next Hop 3ffe:501:811:ff07::10
     MED: 0,  LocalPref: 100, Weight: 100, Type: External route
     Origin: IGP, IGP Metric: 3
     Path: 1000 400 1000 { 600 500 }
     Aggregator: 400, 190.168.10.10
     <Atomic Aggregate>
     Communities: 600:30 1300:10 6600:1500 no-advertise
     Originator ID: 192.168.41.121
     Cluster List : 192.168.21.219
                    192.168.21.220
>
```

Display items in Example 7

Table 14-41: Displayed detailed information about a specific BGP4+ route

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Confederation ID[#]	Confederation AS number	—
Member AS[#]	Member AS number	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Route	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	The Local_Pref attribute of the route	—
Weight	Priority for the route	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.

Display Items	Meaning	Displayed detailed information
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
IGP Metric	Metric value for the IGP route	Metric value for the IGP route used for determining the next hop for the BGP route
Path	The ASPath attribute for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#: This item is displayed only in a confederation configuration.

Example 8: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] received-routes summary

Figure 14-68: Displaying the number of BGP4+ routes received from each peer

```
>show ipv6 bgp received-routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
BGP4+ Peer          Active  Dampened  Stale  Received   Peer AS Type
3ffe:501:811:ff06::2  2        0         0       3        100    External
>
```

Display items in Example 8

Table 14-42: Displayed information about the number of BGP4+ routes received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP4+ Peer	IPv6 address for the peer	—
Active	Number of received active routes	"-" is displayed if no peer has been established.
Dampened	Number of suppressed routes that were received	Suppressed reachable routing information
Stale	Number of stale routes that were received	Routes for which the source router is restarting (this item can be displayed on the receiving router only)
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 9: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [{neighbors [brief] <Peer Address> | <Host name>}] recieved-routes [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]], show ipv6 bgp recieved-routes [brief] [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]]

• This example shows how to display, in standard format, BGP4+ routing information received from a specific peer.

Figure 14-69: Displaying, in standard format, BGP4+ routing information received from a specific peer

```
>show ipv6 bgp neighbors 3ffe:501:811:ff06::2 received-routes
Date 20XX/12/20 12:00:00 UTC
BGP4+ Peer: 3ffe:501:811:ff06::2, Remote AS: 100
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
    Network                            Next Hop
        MED    LocalPref Path
    3ffe:501:811:ff06::/64              3ffe:501:811:ff06::2
        -        100       100 i
*> 3ffe:501:811:ff07::/64              3ffe:501:811:ff06::2
```

```
           -      100       100 i
*> 3ffe:501:811:ff08::/64                    3ffe:501:811:ff06::2
           -      100       100 i
    :
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- This example shows how to display, in summary format, BGP4+ routing information received from a specific peer.

Figure 14-70: Displaying, in summary format, BGP4+ routing information received from a specific peer

```
>show ipv6 bgp neighbors brief 3ffe:501:811:ff06::2 received-routes
Date 20XX/12/20 12:00:00 UTC
BGP4+ Peer: 3ffe:501:811:ff06::2, Remote AS: 100
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
    Network                        Next Hop                     Path
    3ffe:501:811:ff06::/64         3ffe:501:811:ff06::2         100 i
*> 3ffe:501:811:ff07::/64          3ffe:501:811:ff06::2         100 i
*> 3ffe:501:811:ff08::/64          3ffe:501:811:ff06::2         100 i
    :
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- This example shows how to display, in detailed format, BGP4+ routing information received from a specific peer.

Figure 14-71: Displaying the attribute of the route information known by BGP4+ (full format)

```
> show ipv6 bgp neighbors 3ffe:501:811:ff06::2 received-routes -F 3ffe:501:811:ff08::/64
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 3ffe:501:811:ff07::/64
*> Next Hop 3ffe:501:811:ff07::10
    MED: 0,  LocalPref: 100, Type: External route
    Origin: IGP
    Path: 1000 400 1000 { 600 500 }
    Next Hop Attribute: 3ffe:501:811:f007:10
    Aggregator: 400, 3ffe:501:811:ff07::120
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
    Originator ID: 192.168.41.121
    Cluster List : 192.168.21.219
                   192.168.21.220
>
```

Note 1: If <Peer Address> is specified, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> is specified, routing information for the specified network is displayed.

Note 3: If the route information attributes are specified in -Faco, route information is displayed.

Display items in Example 9

Table 14-43: Displaying BGP4 + routing information received from a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP4+ Peer	IPv6 address for the peer	—

Display Items	Meaning	Displayed detailed information
Remote AS	AS number for the peer	—
Confederation ID[#1]	Confederation AS number	—
Member AS[#1]	Member AS number	—
Local AS[#2]	Local AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the received route	—
MED	The MED attribute for the received route[#3]	—
LocalPref	The LOCALPREF for the received route[#3]	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the received route[#3]	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the received route[#3]	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the received route[#3]	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

Display Items	Meaning	Displayed detailed information
Next Hop Attribute	The NextHop attribute value for the received route[#3]	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the received route[#3]	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route[#3]	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route[#3]	This item is not displayed if there is no Cluster List attribute.

#1: This item is displayed only in a confederation configuration.

#2: This item is not displayed in a confederation configuration.

#3: Information before being changed by route filtering is displayed.

Example 10: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] routes summary

Figure 14-72: Displaying the number of valid BGP4 + routes received from each peer

```
>show ipv6 bgp routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS: 500, Local Router ID: 1.2.3.5
BGP4+ Peer          Active  Dampened  Stale  Received   Peer AS Type
3ffe:501:ffff:3::2    65      0         0      65         100     External
3ffe:501:ffff:5::2    50      0         0      50         300     External
3ffe:501:ffff:8::2    40      0         0      40         500     Internal
:
>
```

Display items in Example 10

Table 14-44: Displayed information about the number of valid BGP4+ routes received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Local AS[#1]	Local AS number	—
Local Router ID	Local router ID	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
BGP4+ Peer	IPv6 address for the peer	—
Active	Number of received active routes	"-" is displayed if no peer has been established.
Dampened	Number of suppressed routes that were received	Suppressed reachable routing information
Stale	Number of stale routes that were received	Routes for which the source router is restarting (this item can be displayed on the receiving router only)
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 11: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [{neighbors [brief] <Peer Address> | <Host name>}] routes [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]], show ipv6 bgp routes [brief] [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]]

- This example shows how to display, in standard format, valid BGP4+ routing information received from a specific peer.

    Figure 14-73: Displaying, in standard format, valid BGP4+ routing information received from a specific peer

```
>show ipv6 bgp neighbors 3ffe:501:ffff:13::2 routes
Date 20XX/12/20 12:00:00 UTC
BGP4+ Peer: 3ffe:501:ffff:13::2, Remote AS: 600
Local AS: 500, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                                   Next Hop
        MED    LocalPref Weight Path
*> 10:1:1::/64                               3ffe:501:ffff:13::2
        -      100       255    600 200 e
*> 3ffe:501:811:ff0b::/64                    3ffe:501:ffff:13::2
        -      100       255    600 700 800 i
:
>
```

    Note 1: If <Peer Address> is omitted, information about all peers is displayed.

    Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- This example shows how to display, in summary format, valid BGP4+ routing information received from a specific peer.

    Figure 14-74: Displaying, in summary format, valid BGP4+ route information received from a specific peer

```
>show ipv6 bgp neighbors brief 3ffe:501:ffff:13::2 routes
```

```
Date 20XX/12/20 12:00:00 UTC
BGP4+ Peer: 3ffe:501:ffff:13::2, Remote AS: 600
Local AS: 500, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                    Next Hop                  Path
*> 10:1:1::/64                3ffe:501:ffff:13::2       600 200 e
*> 3ffe:501:811:ff0b::/64     3ffe:501:ffff:13::2       600 700 800 i
*> 3ffe:402:3210:4222::/64    3ffe:501:ffff:13:1032::2  600 100 800 i
:
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- Displaying the attribute of the routing information known by BGP4 (full format)

  Figure 14-75: Displaying the attribute of the route information known by BGP4+ (full format)

```
> show ipv6 bgp neighbors 3ffe:501:ffff:13::2 routes -F 3ffe:501:811:ff0b::/64
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 3ffe:501:811:ff0b::/64
*> Next Hop 3ffe:501:ffff:22::10
     MED: 0,  LocalPref: 100, Weight: 255, Type: External route
     Origin: IGP
     Path: 600 700 800
     Next Hop Attribute: 3ffe:501:811:f007:10
     Aggregator: 400, 3ffe:501:811:ff07::120
     <Atomic Aggregate>
     Communities: 600:30 1300:10 6600:1500 no-advertise
     Originator ID: 192.168.41.121
     Cluster List : 192.168.21.219
                    192.168.21.220
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> is specified, routing information for the specified network is displayed.

Note 3: If the attribute of the route information is specified for [-Faco], route information is displayed.

Display items in Example 11

Table 14-45: Displayed valid BGP4+ route information received from a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP4+ Peer	IP address for the peer	—
Remote AS	AS number for the peer	—
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information

Display Items	Meaning	Displayed detailed information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the \<limit\> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Origin	The Origin attribute for the sent route	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.
Next Hop Attribute	The NextHop attribute value for the route	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
\<...\>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the route	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export

Display Items	Meaning	Displayed detailed information
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the route	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the route	This item is not displayed if there is no Cluster List attribute.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 12: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] advertised-routes summary

Figure 14-76: Displaying the number of BGP4+ routes sent to each peer

```
>show ipv6 bgp advertised-routes summary
Date 20XX/07/14 12:00:00 UTC
Local AS:10, Local Router ID: 1.2.3.5
BGP4+ Peer                       Sent Route Peer AS Type
3ffe:501:811:ff06::2             2          100     External
3ffe:501:811:ff0a::2             1          100     External
>
```

Display items in Example 12

Table 14-46: Displayed information about the number of BGP4 + routes sent to each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP4+ Peer	IPv6 address for the peer	—
Sent Route	Number of sent routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 13: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] [{neighbors [brief] <Peer Address> | <Host name>}] advertised-routes [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]], show ipv6 bgp advertised-routes [brief] [-Faco] [<Prefix>[/<Prefixlen>] [longer-prefixes]]

- This example shows how to display, in standard format, BGP4+ routing information sent to a specific peer.

Figure 14-77: Displaying, in standard format, BGP4+ routing information sent to a specific peer

```
>show ipv6 bgp neighbors 3ffe:501:811:ff06::2 advertised-routes
Date 20XX/07/14 12:00:00 UTC
BGP4+ Peer: 3ffe:501:811:ff06::2, Remote AS: 100
Local AS: 200, Local Router ID: 1.2.3.5
Origin Codes: i - IGP, e - EGP, ? - incomplete
Network                                    Next Hop
      MED    LocalPref Path
3ffe:501:811:ff05::/64                     ----
        0      0        i
3ffe:501:811:ff06::/64                     ----
        0      0        i
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- This example shows how to display, in summary format, BGP4+ routing information sent to a specific peer.

Figure 14-78: Displaying, in summary format, BGP4+ routing information sent to a specific peer

```
>show ipv6 bgp neighbors brief 3ffe:501:811:ff06::2 advertised-routes
Date 20XX/07/14 12:00:00 UTC
BGP4+ Peer: 3ffe:501:811:ff06::2, Remote AS: 100
Local AS: 200, Local Router ID: 1.2.3.5
Origin Codes: i - IGP, e - EGP, ? - incomplete
Network                      Next Hop                  Path
3ffe:501:811:ff05::/64       ----                      i
3ffe:501:811:ff06::/64       ----                      i
>
```

Note 1: If <Peer Address> is omitted, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> longer-prefixes is specified, routing information contained in the specified network is displayed.

- This example shows how to display, in detailed format, BGP4+ routing information sent to a specific peer.

Figure 14-79: Displaying the attribute of the route information known by BGP4+ (full format)

```
> show ipv6 bgp neighbors 3ffe:501:811:ff06::2 advertised-routes -F
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Route 3ffe:501:811:ff07::/64
*> Next Hop 3ffe:501:811:ff07::10
    MED: 0,  LocalPref: 100, Type: External route
    Origin: IGP
    Path: 1000 400 200 { 600 500 }
    Next Hop Attribute: 3ffe:501:811:f007:10
    Aggregator: 400, 3ffe:501:811:ff07::120
    <Atomic Aggregate>
    Communities: 600:30 1300:10 6600:1500 no-advertise
```

```
        Originator ID: 192.168.41.121
        Cluster List : 192.168.21.219
                       192.168.21.220
  >
```

Note 1: If <Peer Address> is specified, information about all peers is displayed.

Note 2: If <Prefix>/<Prefixlen> is specified, routing information for the specified network is displayed.

Note 3: If the attribute of the route information is specified for [-Faco], route information is displayed.

Display items in Example 13

Table 14-47: Displayed BGP4+ routing information sent to a specific peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
BGP4+ Peer	IPv6 address for the peer	—
Remote AS	AS number for the peer	—
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the sent route	If routes other than BGP4+ routes are advertised, "----" is displayed.
MED	The MED attribute for the sent route[#3]	—
LocalPref	Local_Pref for the sent route[#3]	—
Type	Route type	Internal route: Received at an internal peer.
		External route: Received at an external peer.
		ConfedExt route: Received at a member AS peer.
Origin	The Origin attribute for the sent and received route[#3]	IGP: The source is IGP.
		EGP: The source is EGP.
		incomplete: The source is other than above.
Path	The AS path for the sent route[#3]	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE

Display Items	Meaning	Displayed detailed information
	Source of the sent route[#3]	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.
Next Hop Attribute	The NextHop attribute value for the sent route[#3]	—
Aggregator	The Aggregator attribute for the route	This item is not displayed if there is no Aggregator attribute.
<...>	The Atomic Aggregate attribute and state of the route	This item is not displayed if there is no Atomic Aggregate attribute. Atomic Aggregate: Indicates that the route has the Atomic Aggregate attribute.
		AS Loop: A loop has occurred in ASPATH.
Communities	The Community attributes of the sent route[#3]	This item is not displayed if there is no Community attribute.
		no-advertise
		no-export
		local-AS
		xx:yy • xx: AS number • yy: Community ID
		Other: Hexadecimal notation
Originator ID	The Originator ID attribute for the sent route[#3]	This item is not displayed if there is no Originator ID attribute.
Cluster List	The Cluster List attribute for the sent route[#3]	This item is not displayed if there is no Cluster List attribute.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

#3: Information changed by route filtering is displayed.

Example 14: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] {regexp | quote-regexp} <Aspath> [unmatch] [brief] ,show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] aspath-regexp <Extended Regular Expression> [brief]

Figure 14-80: Displaying information about BGP4+ routes that match the specified AS path condition (100 only) in standard format

```
>show ipv6 bgp aspath-regexp "^100$"
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
```

```
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                                   Next Hop
MED    LocalPref Weight Path
   3ffe:501:811:ff06::/64                    3ffe:501:811:ff06::2
-      100        0      100 i
*> 3ffe:501:811:ff07::/64                    3ffe:501:811:ff06::2
-      100        0      100 i
 :
>
```

Figure 14-81: Displaying information about BGP4+ routes that match the specified AS path condition (100 only) in summary format

```
>show ipv6 bgp aspath-regexp "^100$" brief
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                    Next Hop                  Path
   3ffe:501:811:ff06::/64     3ffe:501:811:ff06::2      100 i
*> 3ffe:501:811:ff07::/64     3ffe:501:811:ff06::2      100 i
 :
>
```

Display items in Example 14

Table 14-48: Displayed BGP4+ routing information that matches the specified AS path condition

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	Local_Pref for the route	—
Weight	Priority for the route	—

Display Items	Meaning	Displayed detailed information
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SE-QUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 15: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] inconsistent-as [brief]

Figure 14-82: Displaying, in standard format, information about BGP4+ routes on which AS path conflict has occurred

```
>show ipv6 bgp inconsistent-as
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                                Next Hop
      MED    LocalPref Weight Path
*> 3ffe:501:811:ff06::/64                3ffe:501:811:ff04::2
       -      100      100    100 110 i
*  3ffe:501:811:ff06::/64                3ffe:501:811:ff07::4
       -      100      30     500 510 i
>
```

Figure 14-83: Displaying, in summary format, information about BGP4+ routes on which AS path conflict has occurred

```
>show ipv6 bgp inconsistent-as brief
Date 20XX/12/20 12:00:00 UTC
Local AS: 200, Local Router ID: 1.2.3.5
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                   Next Hop                  Path
*> 3ffe:501:811:ff06::/64   3ffe:501:811:ff04::2      100 110 i
*  3ffe:501:811:ff06::/64   3ffe:501:811:ff07::4      500 510 i
>
```

Display items in Example 15

Table 14-49: Displayed information about the BGP4+ routes on which AS path conflict has occurred

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—

Display Items	Meaning	Displayed detailed information
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 16: show ipv6 bgp paths [<Aspath>] [unmatch], show ipv6 bgp paths-regexp <Extended Regular Expression>

This example shows how to display AS path information for the specific BGP4+ paths that match using an extended regular expression.

Figure 14-84: Displaying information about the paths that match using an AS extended regular expression

```
>show ipv6 bgp paths-regexp "^1800_600"
Date 20XX/07/14 12:00:00 UTC
Origin codes: i - IGP, e - EGP, ? - incomplete
ID    AS Path
8     1800 600 500 i
10    1800 600 500 e
12    1800 600 200 i
14    1800 600 500 ?
>
```

Note 1: If "Aspath" is omitted in the "show ipv6 bgp paths" command, information about all AS paths is displayed.

Note 2: If unmatch is specified in the "show ipv6 bgp paths" command, AS path information that does not match with the specified AS path is displayed.

Display items in Example 16

Table 14-50: Displayed information about the paths that match when using an AS extended regular expression

Display Items	Meaning	Displayed detailed information
ID	ID for managing AS path information	—
AS Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED-_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

Example 17: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community [brief] [none]

This example shows how to display BGP4+ routing information that has the Community attribute.

Figure 14-85: Displaying, in standard format, BGP4+ routing information when using a community filter

```
>show ipv6 bgp community
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                             Next Hop
       MED     LocalPref Weight Path
*> 3ffe:ff01::/64                     3ffe:501:811::3
       0         -       100    1800 100 200 i
*> 3ffe:ff02::/64                     3ffe:511:fe49::3
       0         -       170    1800 100 600 500 i
*> 3ffe:ff03::/64                     3ffe:152:4ef9::5
       0         -       0      1800 100 700 300 i
>
```

Figure 14-86: Displaying, in summary format, BGP4+ routing information when using a community filter

```
>show ipv6 bgp community brief
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                 Next Hop           Path
*> 3ffe:ff01::/64         3ffe:501:811::3    1800 100 200 i
*> 3ffe:ff02::/64         3ffe:511:fe49::3   1800 100 600 500 i
*> 3ffe:ff03::/64         3ffe:152:4ef9::5   1800 100 700 300 i
>
```

Figure 14-87: Displaying, in standard format, information about BGP4+ routes that do not have the Community attribute

```
>show ipv6 bgp community none
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                                    Next Hop
        MED      LocalPref Weight Path
*> 3ffe:3801::/64                             3ffe:501:811::3
        0         -        255    (1800) 100 200 i
*> 3ffe:8302::/64                             3ffe:511:fe49::3
        0         -        0      (1800) 100 600 500 i
*> 3ffe:8803::/64                             3ffe:152:4ef9::5
        0         -        0      (1800) 100 700 300 i
>
```

Figure 14-88: Displaying, in summary format, information about BGP4+ routes that do not have the Community attribute

```
>show ipv6 bgp community brief none
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
   Network                 Next Hop            Path
*> 3ffe:3801::/64          3ffe:501:811::3     (1800) 100 200 i
*> 3ffe:8302::/64          3ffe:511:fe49::3    (1800) 100 600 500 i
*> 3ffe:8803::/64          3ffe:152:4ef9::5    (1800) 100 700 300 i
>
```

Display items in Example 17

Table 14-51: Displayed BGP4 route information with community filter used

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—

Display Items	Meaning	Displayed detailed information
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 18: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community <Community>... [exact] [brief], show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community-regexp <Extended Regular Expression> [brief]

This example shows how to display information about BGP4+ routes that have the Community attribute specified by using an extended regular expression.

Figure 14-89: Displaying, in standard format, BGP4+ routing information when using an extended regular expression community filter

```
>show ipv6 bgp community-regexp "_(100:121|no-export)_"
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                                 Next Hop
      MED     LocalPref Weight Path
*> 3ffe:ff01::/64                         3ffe:501:811::3
      0         -       255    1800 100 200 i
*> 3ffe:ff02::/64                         3ffe:511:fe49::3
      0         -       0      1800 100 600 500 i
*> 3ffe:ff03::/64                         3ffe:152:4ef9::5
      0         -       0      1800 100 700 300 i
>
```

Note: If exact is specified in the "show ipv6 bgp community" command, information for only the routes that have all specified communities.

Figure 14-90: Displaying, in summary format, BGP4+ routing information when using an extended regular expression community filter

```
>show ipv6 bgp community-regexp "_(100:121|no-export)_" brief
Date 20XX/12/20 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: d dampened, * valid, > active, S Stale, r RIB failure
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                 Next Hop           Path
*> 3ffe:ff01::/64         3ffe:501:811::3    1800 100 200 i
*> 3ffe:ff02::/64         3ffe:511:fe49::3   1800 100 600 500 i
*> 3ffe:ff03::/64         3ffe:152:4ef9::5   1800 100 700 300 i
>
```

Note: If exact is specified in the "show ipv6 bgp community" command, information for only the routes that have all specified communities.

Display items in Example 18

Table 14-52: Displayed BGP4+ route information when using an extended regular expression community filter

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command.
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCALPREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 19: show ipv6 bgp [neighbors {<Peer Address> | <Host name>}]dampened-routes [<Prefix>[/<Prefixlen>] [longer-prefixes]] ,show ipv6 bgp dampened-paths [<Prefix>[/<Prefixlen>] [longer-prefixes]]

Figure 14-91: Displaying suppressed BGP4+ route information

```
>show ipv6 bgp neighbor 3ffe:811:ff01::10 dampened-routes
Date 20XX/02/14 12:00:00 UTC
Status Codes: d dampened, h history, * valid, > active
   Network                                   Peer Address
         ReUse
d  3300:391:10::/64                          3ffe:811:ff01::10
       00:07:11
h  3301:366:8::/64                           3ffe:811:ff01::10
       00:19:10
>
```

Note 1: If neighbor <Peer Address> is omitted, information about all peers is displayed.

Note 2: If longer-prefixes is specified, the routing information contained in the specified network is displayed.

Note 3: If <Prefix> is specified, the routing information that matches the specified network is displayed.

Display items in Example 19

Table 14-53: Displayed suppressed BGP4+ routing information

Display Items	Meaning	Displayed detailed information
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		h history: Suppressed unreachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
Network	Destination network of the route	destination address/prefix length
Peer Address	Address of the peer advertising the route	—
Reuse	Time to wait until the route can be reused (hour:minute:second)	—

Example 20: show ipv6 bgp [neighbors [brief] {<Peer Address> | <Host name>}] flap-statistics [<Prefix>[/<Prefixlen>] [longer-prefixes]] , show ipv6 bgp flap-statistics [brief] [<Prefix>[/<Prefixlen>] [longer-prefixes]]

This example shows how to display information about all flaps.

Figure 14-92: Displaying flap information in standard format

```
>show ipv6 bgp flap-statistics
Date 20XX/02/14 12:00:00 UTC
Status Codes: d dampened, h history, * valid, > active
   Network                                   Peer Address
         Flaps     Duration ReUse    Penalty
d  3300:391:10::/64                          3ffe:811:ff01::10
       114         00:12:30 00:07:11 5.0
```

```
h  3300:391:11::/64                                  3ffe:811:ff01::10
          108        00:12:30 00:19:10 4.0
h  3301:366:8::/64                                   3ffe:501:ff05::8
          4          00:11:20          1.8
h  3301:366:128::/64                                 3ffe:501:ff05::8
          4          00:11:20          1.8
d  330f:172:30::/64                                  3ffe:1022:ff50::16
          5          00:09:20          3.6
*> 330f:172:189::/64                                 3ffe:1022:ff50::16
          1          00:05:10          0.6
h  330f:172:192::/64                                 3ffe:1022:ff50::16
          5          00:05:10          3.1
>
```

Note 1: If neighbor <Peer Address> is specified, information about the specified peer is displayed.

Note 2: If <Prefix> is specified, the routing information contained in the specified network is displayed.

Note 3: If longer-prefixes is specified, only the routing information that matches the specified network is displayed.

Figure 14-93: Displaying flap information in summary format

```
>show ipv6 bgp flap-statistics brief
Date 20XX/02/14 12:00:00 UTC
Status Codes: d dampened, h history, * valid, > active
   Network                     Peer Address          Flaps      Penalty
d  3300:391:10::/64            3ffe:811:ff01::10     114        5.0
h  3300:391:11::/64            3ffe:811:ff01::10     108        4.0
h  3301:366:8::/64             3ffe:501:ff05::8      4          1.8
h  3301:366:128::/64           3ffe:501:ff05::8      4          1.8
d  330f:172:30::/64            3ffe:1022:ff50::16    5          3.6
*> 330f:172:189::/64           3ffe:1022:ff50::16    1          0.6
h  330f:172:192::/64           3ffe:1022:ff50::16    5          3.1
>
```

Note 1: If neighbor <Peer Address> is specified, information about the specified peer is displayed.

Note 2: If <Prefix> is specified, the routing information contained in the specified network is displayed.

Note 3: If longer-prefixes is specified, only the routing information that matches the specified network is displayed.

Display items in Example 20

Table 14-54: Displayed flap information

Display Items	Meaning	Displayed detailed information
Status Codes	Routing information status	d dampened: Suppressed reachable route information
		h history: Suppressed unreachable route information
		* valid: Valid routing information
		> active: Information about routes that are currently selected
Network	Destination network of the route	destination address/prefix length
Peer Address	Address of the peer advertising the route	—
Flaps	Number of flaps that occurred	—
Duration	Time elapsed since the first flap occurred (hour:minute:second)	"*" is displayed for 100 hours or more.
Reuse	Time to wait until the route can be reused (hour:minute:second)	—

Display Items	Meaning	Displayed detailed information
Penalty	Penalty value for the route	—

Example 21: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] notification-factor

Displays the message that caused disconnection of the BGP4+ connection.

Figure 14-94: Displaying the message that caused disconnection of BGP4+

```
> show ipv6 bgp notification-factor
Date 20XX/07/14 12:00:00 UTC
Collection Time: 20XX/07/13 13:20:05
BGP4+ Peer: 3ffe:158:214:1::2 (AS 200) -> 3ffe:158:214:1::1
Errors    : peer 3ffe:158:214:1::1 (External AS 400) UPDATE no localpref attribute found
Received Data:
  (0000)   ffff ffff  ffff ffff  ffff ffff  ffff ffff
  (0010)   0053 0200  0000 3c40  0101 0140  0206 0202
  (0020)   0190 03e7  4003 0404  0404 0480  0404 0000
  (0030)   008b 800e  1e00 0201  103f fe01  5802 1400
  (0040)   0100 0000  0000 0000  0100 403f  fe04 0001
  (0050)   0000 00
  BGP4+ Length: 83
>
```

Display items in Example 21

Table 14-55: Displayed message that caused disconnection of BGP4+

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Collection Time	Time the message was collected	—
BGP4+ Peer	Remote device	—
Errors	Cause of disconnection	—
Received Data	Packet data that caused disconnection	The data is displayed starting with the beginning of the BGP4+ header.
BGP4+ Length	BGP4+ data packet length	—

Example 22: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] stale [brief]

Figure 14-95: Displaying information about stale routes known by BGP4+

```
>show ipv6 bgp stale
Date 20XX/02/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
Status Codes: > active, S Stale
Origin Codes: i - IGP, e - EGP, ? - incomplete
  Network                                    Next Hop
       MED     LocalPref Weight Path
S> 3ffe:ff01::/64                            3ffe:501:811::3
       0       -         0     1800 100 200 i
S> 3ffe:ff02::/64                            3ffe:511:fe49::3
       0       -         0     1800 100 600 500 i
S> 3ffe:ff03::/64                            3ffe:152:4ef9::5
       0       -         0     1800 100 700 300 i
>
```

Display items in Example 22

Table 14-56: Displayed information about stale routes known by BGP4+

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
Status Codes	Routing information status	> active: Information about routes that are currently selected
		S Stale: Routes for which the source router, with graceful restart function, is restarting
Network	Destination network of the route	destination address/prefix length
Next Hop	The NextHop attribute value for the route	—
MED	The MED attribute for the route	—
LocalPref	LOCAL_PREF for the route	—
Weight	Priority for the route	—
Path	The AS path for the route	AS sequential number: AS_SEQ
		{AS sequential number}: AS_SET
		(AS sequential number): AS_CONFED_SEQUENCE
	Source of the route	i: The source is IGP.
		e: The source is EGP.
		?: The source is other than above.

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Example 23: show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] stale summary

Figure 14-96: Displaying stale routing information received from each peer

```
>show ipv6 bgp stale summary
Date 20XX/02/14 12:00:00 UTC
Local AS: 17, Local Router ID: 10.10.10.20
BGP4+ Peer                Stale     Received   Peer AS Type
3ffe:501:ffff:5::2         8         8          200    External
3ffe:501:ffff:10::2        7         10         300    External
3ffe:501:ffff:100::2       3         4          800    External
>
```

Display items in Example 23

Table 14-57: Displayed stale routing information received from each peer

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	This item is not displayed when the target is a global network.
Local AS[#1]	Local AS number	—
Confederation ID[#2]	Confederation AS number	—
Member AS[#2]	Member AS number	—
Local Router ID	Local router ID	—
BGP4+ Peer	IP address for the peer	—
Stale	Number of stale routes that were received	Routes for which the source router is restarting (this item can be displayed on the receiving router only)
Received	Number of received routes	"-" is displayed if no peer has been established.
Peer AS	AS number for the peer	—
Type	Connection type of the peer	Internal: Internal peer
		External: External peer
		ConfedExt: Member AS peer

#1: This item is not displayed in a confederation configuration.

#2: This item is displayed only in a confederation configuration.

Impact on communication

None

Response messages

Table 14-58: List of response messages for the show ipv6 bgp command

No.	Message	Description
1	BGP4+ not active in vrf <vrf id>	BGP4+ is not running in the specified VRF. <vrf id>: Specified VRF ID
2	BGP4+ not active.	BGP4+ is not running.
3	BGP4+ peer is not estab-lished(<Peer>)	The applicable peer has not been established. <Peer>: Peer address
4	BGP4+ peer is not estab-lished(<Peer>) in vrf <vrf id>	The target peer has not been established in the specified VRF. <Peer>: Peer address <vrf id>: Specified VRF ID
5	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.

No.	Message	Description
6	illegal address	The specified character string for the address is invalid.
7	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid. Alternatively, a host name and VRF were specified at the same time.
8	illegal extended regular expression parameter "<Parameter>"	The specified extended regular expression parameter is invalid. <Parameter>: Specified extended regular expression
9	illegal regexp parameter "<Parameter>"	The specified regexp parameter is invalid. <Parameter>: Specified regexp
10	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
11	linklocal address is not displayed	A link-local address is not displayed.
12	no path attributes in database	The specified path attribute was not found.
13	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
14	no route	No route was found.
15	no route <Prefix>	The specified route was not found. <Prefix>: Specified network
16	no such peer address <Peer>	The specified peer was not found. <Peer>: Peer address
17	no such peer address <Peer> in vrf <vrf id>	The specified peer was not found in the specified VRF. <vrf id>: Specified VRF ID <Peer>: Peer address
18	no such peer group	The specified peer group was not found.
19	no such peer group in vrf <vrf id>	The specified peer group was not found in the specified VRF. <vrf id>: Specified VRF ID
20	no such peers	No peer was found.
21	no such peers in vrf <vrf id>	No peer was found in the specified VRF. <vrf id>: Specified VRF ID
22	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
23	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

When you execute any of the following commands, the routes that are redistributed to BGP from other protocols are not included in the displayed routing information.

- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}]

- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] received-routes
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] routes
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] {regexp|quote-regexp}
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] aspath-regexp
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] community-regexp
- show ipv6 bgp [vpnv6 vrf {<vrf id> | all}] inconsistent-as

clear ipv6 bgp [SL-L3A]

Disconnects BGP4+ sessions. Also, the BGP4+ sessions disconnected by the function that restricts the number of learned BGP4+ routes are reconnected.

BGP4+ routes are relearned and re-advertised. In addition, new BGP4+ filter information is used to filter receiving and sending routes.

This command clears information about the BGP4+ protocol.

Syntax

```
clear ipv6 bgp [vrf {<vrf id> | all}]
                    { * | <Peer Group> | <Peer Address> | <Host name> }
clear ipv6 bgp [vrf {<vrf id> | all}] * {in | out | both}
clear ipv6 bgp [{<Peer Address> | <Host name>}] dampening
                    [<Prefix>[/<Prefixlen>] [longer-prefixes]]
clear ipv6 bgp [{<Peer Address> | <Host name>}] flap-statistics
                    [<Prefix>[/<Prefixlen>] [longer-prefixes]]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all}

> Disconnects BGP4+ sessions in VRFs, and clears BGP4+ information. If <vrf id> is specified, this command applies to BGP4+ for only the specified VRF. If all is specified, this command applies to BGP4+ for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > BGP4+ sessions in the global network are disconnected, and BGP4+ information is cleared.

{ * | <Peer Group> | <Peer Address> | <Host name> }

> Disconnects BGP4+ sessions temporarily. Note that the disconnected BGP4+ sessions are automatically reconnected.
>
> The command also reconnects the BGP4+ sessions disconnected by the function of maximum number of learned BGP4+ routes.
>
> *
>
> > This command applies to all peers.
>
> <Peer Group>
>
> > Specify a peer group name.
> >
> > You can enter a name of no more than 31 characters. For details, see "Specifiable values for parameters".
>
> <Peer Address>
>
> > For the peer, specify an IPv6 address or an IPv6 address with the interface name (for a link-local address only).
>
> <Host name>
>
> > Specify the host name.
> >
> > Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

* {in | out | both}

> Specify whether to relearn and/or re-advertise BGP4+ routes for all peers.
>
> in
>
>> Filters learn routes by using a new learning filter. If the following conditions are met, the Route Refresh function is used to request the specified peer for redistributing routes.
>> - The "neighbor soft-reconfiguration" configuration command has not been set.
>> - The Route Refresh function is available.
>
> out
>
>> - Uses a new advertisement filter and re-advertises BGP4+ routes.
>> - The setting made by the "neighbor remove-private-as" configuration command is applied to operation.
>
> both
>
>> Executes both in and out operations.

dampening

> Clears route flap information including statistics. Note that executing the command with this parameter forcibly clears the suppressed state of routes.

flap-statistics

> Clears route flap statistics (number of flaps occurred, time the flaps started to occur).

{<Peer Address>|<Host name>}

> If you specify this parameter, only the route flap information for the route from the specified peer is cleared.
>
> <Peer Address>
>
>> Specify the IP address of the peer.
>
> <Host name>
>
>> Specify a host name.
>
> Behavior when this parameter is omitted:
>
>> The route flap information for the routes from all peers is cleared.

<Prefix>[/<Prefixlen>] [longer-prefixes]

> Specifying the destination network for <Prefix>[/<Prefixlen>] filters the routing information to be cleared. Specify <Prefix> in colon notation, and <Prefixlen> in the range from 0 to 128.
>
> longer-prefixes
>
>> This command applies to the routing information included in the specified destination network. For <Prefix>[/<Prefixlen>], if <Prefixlen> is not specified, <Prefix> is used as the filtering address.
>>
>> Example: If 3ffe:811:: is entered, routing information about 3ffe:811::/32 is displayed.
>>
>> Behavior when this parameter is omitted:
>>
>>> This command applies to only the routing information that matches the specified destination network. For <Prefix>[/<Prefixlen>], if <Prefixlen> is not specified, this command applies to the longest-match routing information for the specified <Prefix>.

Operation when a stack configuration is used

- The command can disconnect BGP4+ sessions only on the master switch.

- The command can reconnect the BGP4+ sessions disconnected by restricting the number of learned BGP4+ routes only on the master switch.

- The command can relearn and re-advertise BGP4+ routes only on the master switch.

- The command can filter the receiving and sending routes by using new BGP4+ filter information only on the master switch.

- The command can clear valid information only on the master switch.

Example

Figure 14-97: Disconnecting all sessions

```
>clear ipv6 bgp *
>
```

Figure 14-98: Re-advertisement for all peers

```
>clear ipv6 bgp * out
>
```

Figure 14-99: Relearning from all peers

```
>clear ipv6 bgp * in
>
```

Figure 14-100: Clearing flap information

```
>clear ipv6 bgp dampening
>
```

Figure 14-101: Clearing flap statistics

```
>clear ipv6 bgp flap-statistics
>
```

Display Items

None

Impact on communication

- If the {in | out | both} parameters are omitted, the sessions with the peers are temporarily disconnected, and the routes learned from those peers are deleted. Therefore, communications to those destinations are stopped while relearning is being performed. Also, the BGP4+ sessions disconnected by the function that restricts the number of learned BGP4+ routes are reconnected.

- If the {in | out | both} parameters are specified, routes are reselected in accordance with the newly set route filter. Therefore, communications might be stopped or communication paths might be changed, depending on the setting of the route filter. Also, because routes are reselected by relearning and re-advertisement of BGP4+ routes, communication paths might be changed.

- If the dampening parameter is specified, routes are reselected after the suppressed state of the suppressed routes is released. Therefore, communication paths might be changed.

Response messages

Table 14-59: List of response messages for the clear ipv6 bgp command

No.	Message	Description
1	BGP4+ not active in vrf <vrf id>	BGP4+ is not running in the specified VRF. <vrf id>: Specified VRF ID
2	BGP4+ not active.	BGP4+ is not running.
3	BGP4+ peer is not estab-lished(<Peer>)	The applicable peer could not be cleared because it had not been established. <Peer>: Applicable peer address

No.	Message	Description
4	can't clear BGP4+ session	A BGP4+ session could not be cleared.
5	can't refresh BGP4+ route	Re-advertisement or relearning of BGP4+ routes failed. Check the peer status or the advertised result of peer performance.
6	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
7	illegal parameter	The specified host name is invalid.
8	illegal parameter or cannot specify hostname with VRF	The specified character string for the address is invalid. Alternatively, a host name and VRF were specified at the same time.
9	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
10	linklocal address is not cleared	A link-local address cannot be cleared.
11	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
12	no route <Prefix>	The specified route was not found. <Prefix>: Specified network
13	no such peer	The specified peer was not found.
14	no such peers	No peer was found in the specified AS.
15	no such peers in vrf <vrf id>	No peer was found in the specified VRF. <vrf id>: Specified VRF ID
16	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
17	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
18	The command cannot be executed because the configuration command being applied. Wait a while, and then try again.	The command cannot be executed because the configuration related to the unicast routing program is being applied. Wait a while, and then retry the operation.
19	unspecified peer address or parameter	No peer address or parameter is specified.

Notes

None

show ipv6 static

Displays information about the static setting.

Syntax

```
show ipv6 static [vrf {<vrf id> | all}] route [brief] [<Prefix>[/<Prefixlen>]]
show ipv6 static [vrf {<vrf id> | all}] gateway [brief]
                 [{ <Gateway-Address> | <Host name> }]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays static information for VRFs. If <vrf id> is specified, static information for only the specified VRF is displayed. If all is specified, static information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Static information about the global network is displayed.

route

Displays the statically learned routing information.

brief

Displays information in summary format.

<Prefix>[/<Prefixlen>]

If the destination network is specified for <Prefix>, only information about the routes for the specified destination network is displayed.

If <Prefixlen> is omitted, the specified <Prefix> is considered as the filtering address, and routing information is displayed.

Example: If 3ffe:811:: is entered, routing information about 3ffe:811::/32 is displayed.

For <Prefix>, specify the destination address. For <Prefixlen>, specify the prefix length. Specify <Prefix> in colon notation, and <Prefixlen> in the range from 0 to 128.

Behavior when this parameter is omitted:

All routing information is displayed.

gateway

Displays the statically learned routing information for each gateway.

{<Gateway-Address> | <Host name>}

Displays routing information only for the specified gateway or host.

<Gateway-Address>

Specify the gateway address in an IPv6 address or in an IPv6 address with the interface name (for a link-local address only).

<Host name>

Specify the host name.

Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

Behavior when this parameter is omitted:

Routing information for all gateways is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1: show ipv6 static [vrf {<vrf id> | all}] route [brief] <Prefix>/<Prefixlen>

Figure 14-102: Displaying statically learned routes

```
>show ipv6 static route
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination                                Next Hop                     Distan
ce Weight Status      Flag
*> 2001:db8:1:1::/64                          2001:db8:1:100::             2
   10     Act          NoResolve
*> 2001:db8:2:2::/64                          2001:db8:2:200::22           2
   0      Act Reach    Poll NoResolve
                                              2001:db8:7:700::77           2
   10     IFdown       NoResolve
*> 2001:db8:3:3::/64                          2001:db8:3:300::11           2
   0      Act Reach    Poll
*> 2001:db8:4:4::/64                          2001:db8:4:400::1            255
   0      Act Reach    Poll
>
>show ipv6 static route brief
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination                 Next Hop                     Flag
*> 2001:db8:1:1::/64           2001:db8:1:100::1            NoResolve
*> 2001:db8:2:2::/64           2001:db8:2:200::22           Poll NoResolve
                               2001:db8:7:700::77           NoResolve
*> 2001:db8:4:4::/64           2001:db8:4:400::1            Poll
>
>show ipv6 static route 3ffe:50cd:4460::/64
Date 20XX/12/20 12:00:00 UTC
Status Codes: * valid, > active, r RIB failure
   Destination                                Next Hop                     Distan
ce Weight Status      Flag
*> 3ffe:50cd:4460::/64                        2001:db8:4:400::1            2
   0      Act Reach    Poll
>
```

Note: For a multipath route, only NextHop, Status, and Flag are displayed for the second and subsequent paths.

Display items in Example 1

Table 14-60: Displayed static route information

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status Codes	Routing information status	* valid: Valid routing information
		> active: Information about routes that are currently selected

Display Items	Meaning	Displayed detailed information
		r: The number of routes exceeded the maximum number of routes specified by the <limit> parameter of the "ipv6 maximum routes" configuration command. [SL-L3A]
Destination	Destination network	destination address/prefix length
Next Hop	Next hop address	Static route gateway address (next hop address or interface set in configuration mode)
Weight	Next hop priority	—
Distance	Route distance	—
Status	Route status	• Act (Route that is currently selected)
		• Reach (The route is reachable by dynamic monitoring.) • UnReach (The route is not reachable by dynamic monitoring.)
		• IFdown (The interface has gone down.)
		• - (Route that is not currently selected)
Flag	Static route attribute	• Poll (Polling for checking reachability is enabled.) • NotInstall (Routing information is not registered in the kernel.) • Disable (The route is disabled by configuration.) • Reject (The route is rejected.) • - (Polling is not enabled.) • NoResolve (Only direct routes are used to resolve the next hop.)

Example 2: show ipv6 static [vrf {<vrf id> | all}] gateway [brief] [{<Gateway-Address> | <Host name>}]

Figure 14-103: Displaying static routes for each gateway

```
>show ipv6 static gateway
Date 20XX/07/14 12:00:00 UTC
Gateway                                 Status  Success    Failure    Transition
3ffe:210:67ee::65                       Reach   -          0/3        -
3ffe:40:e23b:c4::7                      -       -          -          -
3ffe:816:ee57::30                       UnReach 1/3        -           7m 31s
3ffe:4fe3:10ef::a7                      Reach   -          8/10        6s
>
>show ipv6 static gateway brief
Date 20XX/07/14 12:00:00 UTC
Gateway                                 Status
3ffe:210:67ee::65                       Reach
3ffe:e23b:c4::7                         -
3ffe:816:ee57::30                       UnReach
3ffe:4fe3:10ef::a7                      Reach
>
>show ipv6 static gateway 3ffe:210:67ee::65
Date 20XX/07/14 12:00:00 UTC
Gateway                                 Status  Success    Failure    Transition
3ffe:210:67ee::65                       Reach   -          0/3        -
>
```

Display items in Example 2

Table 14-61: Displayed static route information for each gateway

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Gateway	Destination network	Gateway address for the static route
Status	Route status	• Reach (The route is reachable by dynamic monitoring.) • UnReach (The route is not reachable by dynamic monitoring.) • IFdown (The interface has gone down.)
Success	Number of successive successful pollings	Number of successive successful pollings/set recover-count value
Failure	Number of successive polling failures	Number of successive polling failures/set pollcount value
Transition	Elapsed time	Time elapsed since the gateway status last changed

Impact on communication

None

Response messages

Table 14-62: List of response messages for the show ipv6 static command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address	The specified address is invalid.
3	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid. Alternatively, a host name and VRF were specified at the same time.
4	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
5	linklocal address is not displayed	A link-local address is not displayed.
6	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
7	no such gateway	The specified gateway was not found.

No.	Message	Description
8	no such gateway in vrf <vrf id>	The specified gateway was not found in the specified VRF. <vrf id>: Specified VRF ID
9	no such route	The specified route was not found
10	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
11	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error
12	static entry not found	No static route was found.

Notes

None

clear ipv6 static-gateway

Performs polling for the gateways on the routes that were disabled by dynamic monitoring of static routes, and generates routes if the gateway responded.

Syntax

```
clear ipv6 static-gateway [vrf {<vrf id> | all}]
                 { * | <Gateway-address> | <Host name>}
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Performs polling for gateways in VRFs, and generates routes. If <vrf id> is specified, this command applies to the gateways for only the specified VRF. If all is specified, this command applies to the gateways for all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Polling is performed for gateways in the global network, and routes are generated.

*

Performs polling for all gateways, and generates routes.

<Gateway-Address>

Performs polling for the specified gateway, and generates the route. Specify the gateway address in an IPv6 address or in an IPv6 address with the interface name (for a link-local address only).

<Host name>

Performs polling for the specified gateway, and generates the route. Specify the host name.

Note that you cannot specify this parameter if vrf {<vrf id> | all} is specified.

Operation when a stack configuration is used

The command can perform polling only on the master switch.

Example

Figure 14-104: Polling for all static gateways

```
>clear ipv6 static-gateway *
>
```

Figure 14-105: Polling for the specified static gateway

```
>clear ipv6 static-gateway 3ffe:501:888::188
>
```

Display Items

None

Impact on communication

If a static route is generated, communication paths might be changed.

Response messages

Table 14-63: List of response messages for the clear ipv6 static-gateway command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	illegal address or cannot specify hostname with VRF	The specified character string for the address is invalid. Alternatively, a host name and VRF were specified at the same time.
3	Illegal parameter -- <Parameter>	The specified parameter is invalid. Use the "usage" or "help" command to check the correct parameter. <Parameter>: Specified parameter name
4	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
5	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
6	no such gateway	The specified gateway was not found.
7	no such gateway in vrf <vrf id>	The specified gateway was not found in the specified VRF. <vrf id>: Specified VRF ID
8	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
9	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ipv6 vrf [SL-L3A]

Displays IPv6 information (such as the number of routing information entries and interface status) in VRFs.

Syntax

```
show ipv6 vrf {<vrf id> | global | all} [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | global | all}

Displays IPv6 information for VRFs. If <vrf id> is specified, this command applies to the specified VRF only. If global is specified, this command applies to the global network only. If all is specified, this command applies to all VRFs including the global network. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

detail

Displays detailed IPv6 information in VRFs.

Behavior when this parameter is omitted:

A summary of VRF IPv6 information is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1

Figure 14-106: Displaying summary information for all VRF information

```
>show ipv6 vrf all
Date 20XX/12/20 12:00:00 UTC
VRF            Routes          Neighbor
global         12/100          12/100
10             7/30            7/50
>
```

Display items in Example 1

Table 14-64: Displayed summary information about all VRF information

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	—
Routes	Number of routes in the VRF	Number of routes in the VRF/Upper limit of the number of routes set in the configuration "-" is displayed if the upper limit is not set in the configuration.
Neighbor	Number of NDP entries in the VRF	Number of NDP entries in the VRF/Upper limit of the number of NDP entries set in the configuration "-" is displayed if the upper limit is not set in the configuration.

Example 2

Figure 14-107: Displaying detailed information about all VRF information

```
>show ipv6 vrf all detail
Date 20XX/12/20 12:00:00 UTC
VRF: global
  Maximum routes: 100, Warn threshold: 70%, Current routes: 12
  Maximum Neighbor entries: 100, Current Neighbor entries: 12
  Import inter-vrf: Match_Ext
Interface
Name           Address                         Status
VLAN0009       3ffe:501:ffff:2::200/64         Up
VLAN0009       fe80::1001:201a:1%VLAN0009/64   Up
localhost      ::1/128                         Up
localhost      fe80::1%localhost/64            Up

VRF: 10
  Maximum routes: 50, Warn threshold: 70%, Current routes: 10
  Maximum Neighbor entries: 30, Current Neighbor entries: 10
  Import inter-vrf: FLT_SET
Interface
Name           Address                         Status
VLAN0010       3ffe:501:1002:2::200/64         Up
VLAN0010       fe80::1001:2019:1%VLAN0010/64   Up
localhost      ::1/128                         Up
localhost      fe80::1%localhost/64            Up

VRF: 20
  Maximum routes: 10, Warning only, Current routes: 5
  Maximum Neighbor entries: 10, Current Neighbor entries: 5
  Import inter-vrf: FLT_EXT1
Interface
Name           Address                         Status
VLAN0011       3ffe:501:2100:2::200/64         Up
VLAN0011       fe80::1001:10a:1%VLAN0011/64    Up
localhost      ::1/128                         Up
localhost      fe80::1%localhost/64            Up
>
```

Display items in Example 2

Table 14-65: Displayed detailed information about a specific VRF

Display Items	Meaning	Displayed detailed information
VRF	VRF ID	—
Maximum routes	Upper limit of the number of VRF routes set in the configuration	The value specified by the <limit> parameter of the "ipv6 maximum routes" configuration command "-" is displayed if the upper limit is not set in the configuration.
Warn threshold	Threshold value for outputting operation messages	Displayed when the <warn threshold> parameter of the "ipv6 maximum routes" configuration command is set.
Warning only	Specifying not to discard routes when the number of routes exceeds the upper limit	Displayed when the warn-only parameter of the "ipv6 maximum routes" configuration command is set.
Current routes	Number of routes in the VRF	—

Display Items	Meaning	Displayed detailed information
Maximum Neighbor entries	Upper limit of the number of NDP entries for the VRF set in the configuration	"-" is displayed if the upper limit is not set in the configuration.
Current Neighbor entries	Number of NDP entries in the VRF	—
Import inter-vrf	Filter name	—
Name	Interface name	—
Address	Interface address and prefix length	—
Status	Interface status	Up
		Down

Impact on communication

None

Response messages

Table 14-66: List of response messages for the show ipv6 vrf command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	no such VRF <vrf id>	The specified VRF was not found. <vrf id>: Specified VRF ID
5	program error occurred: <Error Message>	A program error occurred. Re-execute the command. <Error Message>: Location of the error

Notes

None

show ipv6 interface ipv6-unicast

Displays information about the interfaces, on the Switch, recognized by the unicast routing program.

Syntax

```
show ipv6 interface ipv6-unicast [{<interface type> <interface number> | <index>}]
```

Input mode

User mode and administrator mode

Parameters

{<interface type> <interface number> | <index>}

    <interface type> <interface number>

        Displays detailed information about the applicable interface.

        For <interface type> <interface number>, you can specify the interface name and interface number corresponding to the following interface type groups. For details, see "How to specify an interface" in "Specifiable values for parameters".

- VLAN interface

- Loopback interface

- Null interface

- Management port

    <index>

        If <index> is specified, detailed information about the applicable interface is displayed.

        For <index>, specify the index number assigned to the interface.

        The index number can be displayed in the list of interfaces (with no parameter specified).

    Behavior when this parameter is omitted:

        Summary information about all interfaces is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example 1

Figure 14-108: Displaying summary information about all interfaces

```
>show ipv6 interface ipv6-unicast
Date 20XX/07/14 12:00:00 UTC
Index Name           Address                            Flag
3     VLAN0010       3ffe:501:ffff:5::1/64              Up
3     VLAN0010       fe80::200:87ff:fed0:67a9%VLAN0010/64   Up
4     VLAN0012       3ffe:501:ffff:2::1/64              Up
4     VLAN0012       fe80::200:87ff:fed0:67a8%VLAN0012/64   Up
4097  localhost      ::1/128                            Up Loopback
4097  localhost      fe80::1%localhost/64               Up Loopback
>
```

Display items in Example 1

Table 14-67: Displayed summary information about all interfaces

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Index	Index number	—
Name	Interface name	—
Address	Interface address and prefix length	—
Flags	Interface flag	Up
		Down
		Loopback
		Allmulti
		NoRoute
		NoAge
		Delete
		Null

Example 2

Figure 14-109: Displaying detailed information about the specific interface

```
>show ipv6 interface ipv6-unicast vlan 10
Date 20XX/07/14 12:00:00 UTC
VLAN0010 Index: 2
Change: <>       State: <Up>
Refcount: 6     Up-down Transitions: 1
INET6 3ffe:500:811:ff00::1  Metric: 0      MTU: 1500
    Refcount: 2  Distance: 0   Down: 120
    Change: <>    State: <>
    Remote Address:
    Address: 3ffe:500:811:ff00::1
    Route: 3ffe:500:811:ff00::/64
    Autonomous System: 0
    Routing Protocol Active:
INET6 fe80::212:e2ff:fe20:2200%VLAN0010 Metric: 0      MTU: 1500
    Refcount: 3  Distance: 0   Down: 120
    Change: <>    State: <Up>
    Remote Address:
    Address: fe80::212:e2ff:fe20:2200%VLAN0010
    Route: fe80::%VLAN0010/64
    Autonomous System: 0
    Routing Protocol Active:
>
```

Display items in Example 2

Table 14-68: Displayed detailed information about a specific interface

Display Items	Meaning	Displayed detailed information
—	Interface name	—
Index	Index number	—
Change	Status of the interface change	Refresh: No change
		Add: Addition of the interface
		Delete: Deletion of the interface
		UpDown: Change to the interface status
		NetPrefix: Change in the prefix length
		Metric: Change in the metric
		MTU: Change in the MTU length
		Address: Change in the local or link-level address
State	Status of the interface	Up
		Down
		Loopback
		Allmulti
		NoRoute
		NoAge
		Delete
		Null
Refcount	Reference counter	—
Up-down Transitions	Number of interface status changes	Number of times the interface changed from up status to down status
Interface address	Interface type and address	INET6: IPv6 address
The following items are displayed for each address:		
Metric	Interface metric	—
MTU	Maximum send data length (bytes)	"-" is displayed when the interface is in the down status.
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Refcount	Reference counter	—
Distance	Distance of the routing information when the interface is in the up status	—

Display Items	Meaning	Displayed detailed information
Down	Distance of the routing information when the interface is in the down status	—
Change	Status of the address change	See the above item Change.
State	Status of the address	See the above item State.
Remote Address	Remote address	The value is not displayed.
Address	Local address	—
Route	Routing information	destination address/prefix length
Autonomous System	AS number	—
Routing Protocols Active	Running routing protocol	RIPng This is not displayed for the RIPng interface for which passive-interface has been set by the configuration command.
		OSPFv3
		Any

The following items are displayed for each routing protocol:

Protocol	Protocol name	—
Metric In	Metric added to the routing information received from RIPng	—
Metric Out	Metric added to the routing information sent by RIPng	—
State	RIPng protocol information flag	MetricIn: The MetricIn field is enabled.
		MetricOut: The MetricOut field is enabled.
	OSPFv3 protocol information flag	AllSPF: Handles OSPFv3 packets with the AllSPF multicast address.
		AllDR: Handles OSPFv3 packets with the AllDR multicast address.

Impact on communication

None

Response messages

Table 14-69: List of response messages for the show ipv6 interface ipv6-unicast command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: \<Error Message>	A program error occurred. Re-execute the command. \<Error Message>: Location of the error

Notes

None

debug ipv6

Controls the display of message packets sent and received by each protocol.

Syntax

```
debug ipv6 { all | <Protocol> } [summary]
```

Input mode

User mode and administrator mode

Parameters

all

    Displays sent and received packets for all protocols (RIPng, OSPFv3, and BGP4+).

<Protocol>

    Displays sent and received packets for the specified protocol.

    For <Protocol>, specify rip, bgp, or ospf.

    You can specify multiple protocols at the same time.

summary

    Specifies to display summary information (header information only) about sent and received packets.

    Behavior when this parameter is omitted:

        Detailed information about packets is displayed.

Operation when a stack configuration is used

The command can acquire valid information only from the master switch.

Example

Figure 14-110: Displaying summary information about routing packets

```
>debug ipv6 rip summary
RIPng SENT fe80::200:87ff:fed0:c748%VLAN0010        cmd Response length   24
RIPng SENT fe80::200:87ff:fed0:c748%VLAN0010        cmd Response length   24,
^C
>
```

Figure 14-111: Displaying detailed information about routing packets

```
>debug ipv6 rip
RIPng SENT fe80::200:87ff:fed0:c748%VLAN0010        cmd Response length   24
RIPng SENT       routing table request
RIPng SENT end of packet
RIPng SENT fe80::200:87ff:fed0:c748%VLAN0010        cmd Response length   24
RIPng SENT                              3ffe:1022::/64  metric   1 tag    0
RIPng SENT end of packet
^C
>
```

Display Items

If the following message is displayed on the screen, then this probably indicates that routing packets for each protocol could not be displayed because the send and reception buffer for this command was full:

```
An illegal PACKET-MONITOR packet has been received
```

Impact on communication

Because load on the unicast routing program increases, handling a lot of routes might adversely affect route control. Do not use this command in normal operation.

Response messages

Table 14-70: List of response messages for the debug ipv6 command

No.	Message	Description
1	connection failed to rtm	Communication with the unicast routing program failed. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
2	IP routing is not configured.	The routing protocol has not been set. Check the configuration.
3	No response from rtm.	There was no response from the unicast routing program. Re-execute the command. If this problem occurs frequently, execute the "restart unicast" command to restart the unicast routing program.
4	program error occurred: \<Error Message>	A program error occurred. Re-execute the command. \<Error Message>: Location of the error
5	Sorry, there is another packet-monitor command	The "debug ipv6" command has already been executed.

Notes

A message is output every time a routing packet for the specified routing protocol is sent or received. Do not output such messages to a file by using redirection.

15 **IPv6 Multicast Routing Protocol**

show ipv6 mcache

Displays a list of IPv6 multicast forwarding entries.

Syntax

```
show ipv6 mcache [vrf {<vrf id> | all}]
        [source <ipv6 address>[/<prefix length>]]
        [group <ipv6 address>[/<prefix length>]] [brief]
show ipv6 mcache [vrf {<vrf id> | all}]
        [<ipv6 address>[/<prefix length>]] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

   Displays the VRF IPv6 multicast forwarding entry information.

   If <vrf id> is specified, IPv6 multicast forwarding entry information only for the specified VRF is displayed. If all is specified, IPv6 multicast forwarding entry information for all VRFs including the global network, and for the total number of VRFs, are displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

   Behavior when this parameter is omitted:

      Displays the IPv6 multicast forwarding entry information for the global network.

source <ipv6 address>[/<prefix length>]

   Displays addresses that match the specified source address.

   If source <ipv6 address>[/<prefix length>] is specified, all the entries for the source information that matches the specified prefix are displayed.

   The default value when <prefix length> is omitted is 128.

   If this parameter and the group parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

group <ipv6 address>[/<prefix length>]

   Displays addresses that match the specified group address.

   If group <ipv6 address>[/<prefix length>] is specified, all the entries for the group that matches the specified prefix are displayed.

   The default value when <prefix length> is omitted is 128.

   If this parameter and the source parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

   Displays IPv6 multicast forwarding entries in summary format.

   Behavior when this parameter is omitted:

      Displays IPv6 multicast forwarding entry information in standard format.

<ipv6 address>[/<prefix length>]

   Displays addresses that match the specified group address.

   If <ipv6 address>[/<prefix length>] is specified, all the entries for the group that matches the specified prefix are displayed.

The default value when <prefix length> is omitted is 128.

Behavior when each parameter is omitted:

This command can display only information relevant to conditions applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied.

If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays all IPv6 multicast forwarding entries for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display IPv6 multicast forwarding entries.

Figure 15-1: Displaying IPv6 multicast forwarding entries

```
> show ipv6 mcache
Date 20XX/04/10 12:40:10 UTC
Total: 2 routes
- Forwarding entry  --------------------------------------------------------
Group Address                            Source Address
ff1e:1234:5678::a                        2001:db8:1::1
    uptime: 00:20    expires: 02:40    flags:
    incoming:
        VLAN0001
    outgoing:
        VLAN0002
        VLAN0003
ff1e:1234:5678::b                        2001:db8:2::1
    uptime: 00:20    expires: 02:40    flags:
    incoming:
        VLAN0004
    outgoing:
        VLAN0005
        VLAN0006
        VLAN0007
>
> show ipv6 mcache vrf 2
Date 20XX/04/10 12:40:20 UTC
VRF: 2  Total: 4 routes
- Forwarding entry  --------------------------------------------------------
Group Address                            Source Address
ff1e:1234:5678::c                        2001:db8:3::1
    uptime: 00:20    expires: 02:40    flags:
    incoming:
        VLAN0011
    outgoing:
        VLAN0012
        VLAN0013
ff1e:1234:5678::d                        2001:db8:4::1
    uptime: 00:20    expires: 02:40    flags:
    incoming:
        VLAN0014
    outgoing:
        VLAN0015
        VLAN0016
        VLAN0017
- Negative cache -----------------------------------------------------------
Group Address                            Source Address
ff1e:1234:1000::1                        2001:db8:5::1
    uptime: 00:20    expires: 02:50    flags:
    incoming:
        VLAN0018
```

```
ff1e:1234:1000::2                          2001:db8:6::1
    uptime: 00:20    expires: 02:50    flags:
    incoming:
        VLAN0018
>
> show ipv6 mcache brief
Date 20XX/04/10 12:40:40 UTC
Total: 2 routes
- Forwarding entry  -----------------------------------------------------------
Group Address              Source Address          Incoming   Outgoing Count
ff1e:1234:5678::a          2001:db8:1::1           VLAN0001           2
ff1e:1234:5678::b          2001:db8:2::1           VLAN0002           3
>
```

Display Items

Table 15-1: Items displayed by the show ipv6 mcache command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Number of entries	—
Warning [SL-L3A]	Warning display	"Multicast forwarding entry is discarded for limit" is displayed when an entry is being discarded due to a restriction on the number of IPv6 multicast forwarding entries.
Group Address	Destination group address	—
Source Address	Source address	—
uptime	Time elapsed since the IPv6 multicast forwarding entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. The timer is automatically updated every 30 seconds.
expires	IPv6 multicast forwarding entry aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "--:--" is displayed if a timeout will not occur. The timer is automatically updated every 30 seconds. The IPv6 multicast forwarding entry might be deleted before the aging time becomes zero.
flags [SL-L3A]	Flag information	U: Upstream VRF of the extranet D: Destination VRF of the extranet
Incoming/incoming	Upstream interface	Interface name "register" is displayed for an interface for decapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network.

Display Items	Meaning	Displayed detailed information
		"(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.
outgoing	Downstream interface	Interface name "register" is displayed for an interface for encapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "<snooping>" is displayed if MLD snooping is running.
Outgoing Count	Number of downstream interfaces	—

Impact on communication

None

Response messages

Table 15-2: Response messages for the show ipv6 mcache command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address <ipv6 address>	The specified IPv6 address is invalid. Check the address, and then re-execute the command. <ipv6 address>: Specified IPv6 address
3	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
4	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 mroute

Displays a list of IPv6 PIM-SM or IPv6 PIM-SSM multicast route information.

Syntax

```
show ipv6 mroute [vrf {<vrf id> | all}]
        [source <ipv6 address>[/<prefix length>]]
        [group <ipv6 address>[/<prefix length>]] [brief]
show ipv6 mroute [vrf {<vrf id> | all}]
        [<ipv6 address>[/<prefix length>]] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast route information for the VRF.

If <vrf id> is specified, IPv6 PIM-SM or IPv6 PIM-SSM multicast route information only for the specified VRF is displayed. If all is specified, IPv6 PIM-SM or IPv6 PIM-SSM multicast route information for all VRFs including the global network, and for the total number of VRFs, are displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast route information for the global network.

source <ipv6 address>[/<prefix length>]

Displays addresses that match the specified source address.

If source <ipv6 address>[/<prefix length>] is specified, all the entries for the source information that matches the specified prefix are displayed.

The default value when <prefix length> is omitted is 128.

If this parameter and the group parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

group <ipv6 address>[/<prefix length>]

Displays addresses that match the specified group address.

If group <ipv6 address>[/<prefix length>] is specified, all the entries for the group that matches the specified prefix are displayed.

The default value when <prefix length> is omitted is 128.

If this parameter and the source parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast route information in summary format.

Behavior when this parameter is omitted:

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast route information in standard format.

<ipv6 address>[/<prefix length>]

Displays addresses that match the specified group address.

If <ipv6 address>[/<prefix length>] is specified, all the entries for the group that matches the specified prefix are displayed.

The default value when <prefix length> is omitted is 128.

Behavior when each parameter is omitted:

This command can display only information relevant to conditions applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

Displays all IPv6 PIM-SM or IPv6 PIM-SSM multicast route information for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-2: Displaying IPv6 PIM-SM multicast route information

```
> show ipv6 mroute
Date 20XX/12/10 12:42:00 UTC
Total: 4 routes, 3 groups, 2 sources

(S,G) 2 routes  -------------------------------------------------
Group Address                     Source Address
ff1e:ffff:1234:aaaa::1            2001:db8:1::1
    uptime 02:00    expires 02:30    assert 00:00    flags F  protocol SM
    incoming: VLAN0008       upstream: Direct  reg-sup: 30s
    outgoing: VLAN0012  uptime 02:30    expires --:--

ff1e:ffff:1234:bbbb::1            2001:db8:2::1
    uptime 02:00    expires 02:30    assert 00:00    flags F  protocol SM
    incoming: VLAN0011       upstream: Direct  reg-sup: 30s
    outgoing: VLAN0012  uptime 02:30    expires --:--

(*,G) 2 routes  -------------------------------------------------
Group Address                     RP Address
ff1e:ffff:1234:aaaa::1            3ffe:ffff:ffff::3
    uptime 02:00    expires --:--    assert 00:00    flags LR  protocol SM
    incoming: register    upstream: This System
    outgoing: VLAN0012  uptime 02:30    expires --:--

ff1e::1                           3ffe:ffff:ffff::4
    uptime 02:00    expires --:--    assert 00:00    flags LR  protocol SM
    incoming: register    upstream: This System
    outgoing: VLAN0012  uptime 02:30    expires --:--
             VLAN0013  uptime 02:30    expires --:--
>
> show ipv6 mroute vrf 2
Date 20XX/12/10 12:42:10 UTC
VRF: 2 Total: 3 routes, 2 groups, 2 sources

(S,G) 2 routes -------------------------------------------------
Group Address                     Source Address
ff1e:ffff:1234:aaaa::2            2001:db8:3::1
    uptime 02:00    expires 02:30    assert 00:00    flags F  protocol SM
    incoming: VLAN0018       upstream: Direct  reg-sup: 30s
    outgoing: VLAN0022  uptime 02:30    expires --:--

ff1e:ffff:1234:bbbb::2            2001:db8:4::1
    uptime 02:00    expires 02:30    assert 00:00    flags F  protocol SM
    incoming: VLAN0021       upstream: Direct  reg-sup: 30s
    outgoing: VLAN0022  uptime 02:30    expires --:--

(*,G) 1 routes -------------------------------------------------
Group Address                     RP Address
ff1e:ffff:1234:aaaa::2            3ffe:ffff:ffff::5
```

```
        uptime 02:00    expires --:--    assert 00:00    flags LR  protocol SM
        incoming: register        upstream: This System
        outgoing: VLAN0022  uptime 02:30    expires --:--
>
> show ipv6 mroute brief
Date 20XX/12/10 12:42:20 UTC
Total: 4 routes, 3 groups, 2 sources

(S,G) 2 routes -------------------------------------------------
Group Address                     Source Address    Incoming  Outgoing Count
ff1e:ffff:1234:aaaa::1            2001:db8:1::1     VLAN0008                 1
ff1e:ffff:1234:bbbb::1            2001:db8:2::1     VLAN0011                 1

(*,G) 2 routes -------------------------------------------------
Group Address                     RP Address        Incoming  Outgoing Count
ff1e:ffff:1234:aaaa::1            3ffe:ffff:ffff::3 register                 1
ff1e::1                           3ffe:ffff:ffff::4 register                 2
>
```

Display Items

Table 15-3: Items displayed by the show ipv6 mroute command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Number of entries	—
Warning	Warning display	"Multicast routing entry is discarded for limit" is displayed when an entry is being discarded due to a restriction on the number of IPv6 multicast route information entries.
Group Address	Group address	—
Source Address	Source address	—
RP Address	Rendezvous point address	—
uptime	Time elapsed since IPv6 multicast route information or oif (out of interface) was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
expires	Aging timer (remaining time) for IPv6 multicast route information or oif	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "--:--" is displayed in the following cases: • There is no join message from downstream, and there is an MLD group • For an encapsulated interface • The timer is not running.
assert	Upstream address aging timer using Assert messages	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. See "Configuration Guide Vol. 3, 15.4.2 (4) Determining the forwarder" for more information on Assert.

Display Items	Meaning	Displayed detailed information
flags	Entry flag	F: First-hop-router (the sender is directly connected) L: Last-hop-router (the receiver is directly connected) R: RPT-bit (trimming status) T: SPT-bit (communication via the rendezvous point was switched to communication via the shortest path) V: VRF Gateway (PIM-SM VRF Gateway is running) -: There is no information to be displayed.
protocol	Multicast protocol	SM: PIM-SM SSM: PIM-SSM
Incoming/incoming	Upstream interface	Interface name "register" is displayed for an encapsulated interface. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.
upstream	Upstream neighboring router address	"Direct" is displayed for the first-hop-router. "Direct(configured)" is displayed if the first-hop-router is configured based on the specification of the "ipv6 pim direct" configuration command. "Extra" is displayed for the extranet. "This System" is displayed if the rendezvous point and the upstream interface have the same address in the (*,G) information.
outgoing	Downstream interface	Interface name "register" is displayed for an encapsulated interface. For an (S,G) entry, the VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. If PIM-SM VRF Gateway is used, the (*,G) entry indicates the destination VRF ID.
reg-sup	Register encapsulation suppression time	The display is valid for the first-hop-router only.
Outgoing Count	Number of downstream interfaces	—

Impact on communication

None

Response messages

Table 15-4: Response messages for the show ipv6 mroute command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address <ipv6 address>	The specified IPv6 address is invalid. Check the address, and then re-execute the command. <ipv6 address>: Specified IPv6 address
3	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
4	invalid group address '<ipv6 address>'	The group address specified for <ipv6 address> is invalid. Check the address, and then re-execute the command. <ipv6 address>: Specified IPv6 address
5	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
6	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
7	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
8	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim interface

Displays the status of an IPv6 PIM-SM or IPv6 PIM-SSM interface.

Syntax

```
show ipv6 pim [vrf {<vrf id> | all}] interface [vlan <vlan id>] [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays IPv6 PIM-SM or IPv6 PIM-SSM interface information for the VRF.

If <vrf id> is specified, IPv6 PIM-SM or IPv6 PIM-SSM interface information only for the specified VRF is displayed. If all is specified, IPv6 PIM-SM or IPv6 PIM-SSM interface information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays IPv6 PIM-SM or IPv6 PIM-SSM interface information for the global network.

vlan <vlan id>

Displays interface information for the specified interface.

Behavior when this parameter is omitted:

Displays all IPv6 PIM-SM or IPv6 PIM-SSM interface information.

detail

Displays detailed information about the IPv6 PIM-SM or IPv6 PIM-SSM interface.

Behavior when this parameter is omitted:

Displays the IPv6 PIM-SM or IPv6 PIM-SSM interface information in standard format.

Behavior when all parameters are omitted:

Displays all IPv6 PIM-SM or IPv6 PIM-SSM interface information for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display the status of the IPv6 PIM-SM interface.

Figure 15-3: Displaying the status of the IPv6 PIM-SM interface

```
> show ipv6 pim interface
Date 20XX/12/10 16:10:21 UTC
Interface Component Vif Nbr   Hello DR                       This
                        Count Intvl Address                  System
VLAN0001  PIM-SM      1    4     30 fe80::1200:87ff:fe10:a123 Y
VLAN0003  PIM-SM      9   10     30 fe80::1200:87ff:fe10:a124 N
VLAN0005  PIM-SM     10   11     30 fe80::1200:87ff:fe10:a125 N
>
> show ipv6 pim interface detail
Date 20XX/12/10 16:12:21 UTC
```

```
Interface Component Vif Nbr    Hello GenID    DR                         This
                        Count  Intvl          Address                    System
VLAN0001  PIM-SM      1    4      30 3503c645  fe80::1200:87ff:fe10:a123 Y
VLAN0003  PIM-SM      9   10      30 42278152  fe80::1200:87ff:fe10:a124 N
VLAN0005  PIM-SM     10   11      30 29ba460b  fe80::1200:87ff:fe10:a125 N
>
> show ipv6 pim vrf 2 interface detail
Date 20XX/12/10 16:14:21 UTC
VRF: 2
Interface Component Vif Nbr    Hello GenID    DR                         This
                        Count  Intvl          Address                    System
VLAN0015  PIM-SM     12    4      30 3503c645  fe80::1200:87ff:fe10:a130 Y
VLAN0016  PIM-SM     13   10      30 42278152  fe80::1200:87ff:fe10:a131 N
VLAN0017  PIM-SM     14   11      30 29ba460b  fe80::1200:87ff:fe10:a132 N
>
```

Display Items

Table 15-5: Items displayed by the show ipv6 pim interface command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Interface	Interface name	—
Component	Protocol type	PIM-SM (fixed)
Vif	Virtual interface number	Local information
Nbr Count	Number of neighboring routers	—
Hello Intvl	Hello send interval	—
GenID	GenerationID	Generation ID of the interface specified for the Switch
DR Address	DR address	If the specified interface is down, "-" is displayed.
This System	Whether the DR is the Switch	Y: The DR is the Switch. N: The DR is not the Switch. If the specified interface is down, "-" is displayed.

Impact on communication

None

Response messages

Table 15-6: Response messages for the show ipv6 pim interface command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID

No.	Message text	Meaning
3	no such interface "<interface name>"	IPv6 PIM is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim neighbor

Displays neighboring information for an IPv6 PIM-SM or IPv6 PIM-SSM interface.

Syntax

```
show ipv6 pim [vrf {<vrf id> | all}] neighbor [interface vlan <vlan id>] [detail]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays IPv6 PIM-SM or IPv6 PIM-SSM interface neighboring information for the VRF.

> If <vrf id> is specified, IPv6 PIM-SM or IPv6 PIM-SSM interface neighboring information only for the specified VRF is displayed. If all is specified, IPv6 PIM-SM or IPv6 PIM-SSM interface neighboring information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays the IPv6 PIM-SM or IPv6 PIM-SSM interface neighboring information for the global network.

interface vlan <vlan id>

> Displays neighboring information for the specified interface.

> Behavior when this parameter is omitted:

>> Displays neighboring information for all IPv6 PIM-SM or IPv6 PIM-SSM interfaces.

detail

> Displays neighboring information for an IPv6 PIM-SM or IPv6 PIM-SSM interface in a detailed format.

> Behavior when this parameter is omitted:

>> Displays neighboring information for an IPv6 PIM-SM or IPv6 PIM-SSM interface in standard format.

Behavior when all parameters are omitted:

> Displays neighboring information for all IPv6 PIM-SM or IPv6 PIM-SSM interfaces for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display IPv6 PIM interface neighboring information.

Figure 15-4: Displaying IPv6 PIM interface neighboring information

```
> show ipv6 pim neighbor
Date 20XX/12/10 17:16:12 UTC
Neighbor Address        Interface       Uptime    Expires
fe80::100:200           VLAN0011         49:07     01:33
fe80::100:10            VLAN0011         49:07     01:34
fe80::100:5             VLAN0011         49:07     01:33
fe80::100:3             VLAN0011         49:07     01:33
fe80::100:20            VLAN0012         49:07     01:33
```

```
fe80::100:10              VLAN0012          49:07     01:33
fe80::100:5               VLAN0012          49:07     01:33
fe80::100:3               VLAN0012          49:07     01:33
fe80::100:20              VLAN0013          49:07     01:33
fe80::100:10              VLAN0013          49:07     01:33
>
> show ipv6 pim neighbor detail
Date 20XX/12/10 17:17:12 UTC
Neighbor Address          Interface         Uptime    Expires   GenID
fe80::100:200             VLAN0011          06:58     01:47     -
fe80::100:10              VLAN0011          06:57     01:47     18277af5
fe80::100:5               VLAN0011          06:58     01:47     227a181f
fe80::100:3               VLAN0011          06:57     01:48     3a5e92b2
fe80::100:20              VLAN0012          06:57     01:47     3d5526b8
fe80::100:10              VLAN0012          06:57     01:47     -
fe80::100:5               VLAN0012          06:58     01:47     337a182e
fe80::100:3               VLAN0012          06:57     01:47     4b5e92c3
fe80::100:20              VLAN0013          06:57     01:47     -
fe80::100:10              VLAN0013          06:58     01:48     -
>
> show ipv6 pim vrf 2 neighbor detail
Date 20XX/12/10 17:18:12 UTC
VRF: 2
Neighbor Address          Interface         Uptime    Expires   GenID
fe80::200:200             VLAN0015          00:11     01:34     -
fe80::200:10              VLAN0015          00:10     01:35     18277af5
fe80::200:5               VLAN0015          00:11     01:34     227a181f
fe80::200:3               VLAN0015          00:11     01:34     3a5e92b2
fe80::300:20              VLAN0016          00:11     01:34     3d5526b8
fe80::300:10              VLAN0016          00:11     01:34     -
fe80::300:5               VLAN0016          00:11     01:34     337a182e
fe80::300:3               VLAN0016          00:11     01:34     4b5e92c3
>
```

Display Items

Table 15-7: Items displayed by the show ipv6 pim neighbor command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Neighbor Address	IPv6 address of the neighboring router	—
Interface	Interface name	—
Uptime	Time elapsed since the neighboring information was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the neighboring information	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "--:--" is displayed if a timeout will not occur.
GenID	Neighboring router Generation ID	Generation ID of the specified neighboring router "--" is displayed if the neighboring router does not support Generation IDs.

Impact on communication

None

Response messages

Table 15-8: Response messages for the show ipv6 pim neighbor command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such interface "<interface name>"	IPv6 PIM is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim mcache

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information.

Syntax

```
show ipv6 pim [vrf {<vrf id> | all}] mcache [<ipv6 address>[/<prefix length>]]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information for the VRF.

If <vrf id> is specified, IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information for only the specified VRF is displayed. If all is specified, IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information for the global network.

<ipv6 address>[/<prefix length>]

Displays addresses that match the specified group address.

If <ipv6 address>[/<prefix length>] is specified, all the forwarded entries for the group that matches the specified prefix are displayed.

The default value when <prefix length> is omitted is 128.

Behavior when all parameters are omitted:

Displays all IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information for the global network.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-5: Displaying IPv6 PIM-SM or IPv6 PIM-SSM multicast forwarding entry information

```
> show ipv6 pim mcache
Date 20XX/12/10 12:43:10 UTC
Group Address                        Source Address
ff1e:1234:5678::1                    2001:db8:1::1
    uptime 01:00    expires 02:00    component: PIM-SM
    incoming:
        VLAN0010
    outgoing:
        VLAN0011
        VLAN0014
ff1e:1234:7280::3                    2001:db8:2::1
    uptime 00:40    expires 02:40    component: PIM-SM
    incoming:
        VLAN0010
    outgoing:
        VLAN0011
>
```

```
> show ipv6 pim vrf 2 mcache
Date 20XX/12/10 12:43:20 UTC
VRF: 2
Group Address                          Source Address
ff1e:1234:5678::9                      2001:db8:3::1
    uptime 01:00   expires 01:50    component: PIM-SM
    incoming:
        VLAN0030
    outgoing:
        VLAN0031
        VLAN0034
ff1e:1234:7280::7                      2001:db8:4::1
    uptime 00:40   expires 02:30    component: PIM-SM
    incoming:
        VLAN0030
    outgoing:
        VLAN0031
>
```

Display Items

Table 15-9: Items displayed by the show ipv6 pim mcache command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Group Address	Destination group address	—
Source Address	Source address	—
uptime	Time elapsed since the IPv6 multicast forwarding entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. The timer is automatically updated every 30 seconds.
expires	IPv6 multicast forwarding entry aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. The timer is automatically updated every 30 seconds. The IPv6 multicast forwarding entry might be deleted before the aging time becomes zero. "--:--" is displayed if a timeout will not occur.
component	Protocol type	PIM-SM (fixed)
incoming	Upstream interface	Interface name "register" is displayed for an interface for decapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network. "(denied)" is displayed if the VRF is not permitted by upstream VRF filtering.

Display Items	Meaning	Displayed detailed information
outgoing	Downstream interface	Interface name "register" is displayed for an interface for encapsulation. The VRF ID is displayed for other VRFs connected to the extranet. "global" is displayed for the global network.

Impact on communication

None

Response messages

Table 15-10: Response messages for the show ipv6 pim mcache command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim bsr

Shows the IPv6 PIM-SM BSR information.

Syntax

```
show ipv6 pim [vrf {<vrf id> | all}] bsr
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the IPv6 PIM-SM BSR information for the VRF.

> If <vrf id> is specified, the IPv6 PIM-SM BSR information for only the specified VRF is displayed. If all is specified, the IPv6 PIM-SM BSR information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays the IPv6 PIM-SM BSR information for the global network.

Operation when a stack configuration is used

This command is not supported.

Example

- The Switch is neither a BSR candidate nor has BSR information

  Figure 15-6: Displaying the IPv6 PIM-SM BSR information (1)

```
> show ipv6 pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Bootstrap Router
BSR Address : ----
>
```

- The Switch is not a BSR candidate but has BSR information

  Figure 15-7: Displaying the IPv6 PIM-SM BSR information (2)

```
> show ipv6 pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Bootstrap Router
BSR Address : 3ffe:ffff:1234:4568:1200:87ff:fe10:1234
    Priority: 100    Hash mask length: 126
    Uptime  : 03:00
    Bootstrap Timeout : 130 seconds
>
```

- The Switch is a BSR candidate but has no BSR information

  Figure 15-8: Displaying the IPv6 PIM-SM BSR information (3)

```
> show ipv6 pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Bootstrap Router
BSR Address : ----
    Bootstrap Timeout : 20 seconds
Local BSR Address : 3ffe:ffff:1234:4568:1200:87ff:fe10:1234
    Priority : 110    Hash mask length : 126
>
```

- The Switch is a BSR candidate and another device is BSR

Figure 15-9: Displaying the IPv6 PIM-SM BSR information (4)

```
> show ipv6 pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Bootstrap Router
BSR Address  : 3ffe:ffff:1234:4568:1200:87ff:fe10:1234
    Priority : 100    Hash mask length : 126
    Uptime   : 03:00
    Bootstrap Timeout : 130 seconds
Local BSR Address : 3ffe:ffff::1
    Priority : 110    Hash mask length : 126
>
```

- The Switch is a BSR candidate and is BSR

Figure 15-10: Displaying the IPv6 PIM-SM BSR information (5)

```
> show ipv6 pim bsr
Date 20XX/04/20 12:10:10 UTC
Status : Elected Bootstrap Router
BSR Address  : 3ffe:ffff:1234:4568:1200:87ff:fe10:1234 (This System)
    Priority : 110    Hash mask length : 126
    Uptime   : 03:00
    Bootstrap Timeout  : 130 seconds
    Bootstrap Interval : 60 seconds
>
```

Display Items

Table 15-11: Items displayed by the show ipv6 pim bsr command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status	BSR status	Not Candidate Bootstrap Router: The Switch is not a BSR candidate. Candidate Bootstrap Router: The Switch is a BSR candidate. Elected Bootstrap Router: The Switch is the selected BSR.
BSR Address	BSR address	"(This System)" is displayed if the Switch is the BSR.
Uptime	Time elapsed since the BSR was recognized	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Priority	BSR priority	—
Hash mask length	BSR hash mask length	—
Bootstrap Timeout	BSR timer value	The BSR information retention time is displayed if the Switch is not the BSR. If the Switch is a BSR candidate and the BSR information is not recognized, the time that can elapse before the Switch changes to the BSR is displayed. If the Switch is the BSR, the time that can elapse before a Bootstrap message is sent is displayed.

Display Items	Meaning	Displayed detailed information
Bootstrap Interval	BSR message send interval	This item is displayed only when the Switch is the BSR.
Local BSR Address	BSR candidate address	This item is displayed only when the Switch is a BSR candidate.

Impact on communication

None

Response messages

Table 15-12: Response messages for the show ipv6 pim bsr command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim rp-mapping

Shows the IPv6 PIM-SM rendezvous point information.

Syntax

```
show ipv6 pim [vrf {<vrf id> | all}] rp-mapping
              [<ipv6 address>[/<prefix length>]] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the VRF rendezvous point information.
>
> If <vrf id> is specified, the rendezvous point information for only the specified VRF is displayed. If all is specified, the rendezvous point information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
>> Displays rendezvous point information for the global network.

<ipv6 address>[/<prefix length>]

> Displays rendezvous point information that matches the group address.
>
> If <ipv6 address>[/<prefix length>] is specified, all rendezvous point information corresponding to the group address that matches the specified prefix is displayed.
>
> The default value when <prefix length> is omitted is 128.
>
> Behavior when this parameter is omitted:
>
>> Shows the IPv6 PIM-SM rendezvous point information.

brief

> Displays the IPv6 PIM-SM rendezvous point information in summary format.
>
> Behavior when this parameter is omitted:
>
>> Displays the IPv6 PIM-SM rendezvous point information in standard format.

Behavior when all parameters are omitted:

> Displays all IPv6 PIM-SM rendezvous point information for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

- When the Switch is not a rendezvous point candidate:

  Figure 15-11: Displaying the IPv6 PIM-SM rendezvous point information (1) (standard format)

```
> show ipv6 pim rp-mapping
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Rendezvous Point
Total: 3 routes, 2 groups, 2 RPs
Group/Masklen          C-RP Address              Priority Uptime   Expires
ff65::/16              2001:db8::ffff:2               255  07:41    01:35
```

```
ff55::/16                 2001:db8::ffff:3         255  07:41    01:35
ff55::/16                 2001:db8::ffff:2         255  07:41    01:35
>
```

Figure 15-12: Displaying the IPv6 PIM-SM rendezvous point information (2) (summary
format)

```
> show ipv6 pim rp-mapping brief
Date 20XX/04/20 12:10:10 UTC
Status : Not Candidate Rendezvous Point
Total: 3 routes, 2 groups, 2 RPs
Group/Masklen           C-RP Address
ff65::/16               2001:db8::ffff:2
ff55::/16               2001:db8::ffff:3
ff55::/16               2001:db8::ffff:2
>
```

• When the Switch is a rendezvous point candidate:

Figure 15-13: Displaying the IPv6 PIM-SM rendezvous point information (3) (standard format)

```
> show ipv6 pim rp-mapping
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Rendezvous Point
        Local RP Address: 2001:db8::ffff:1    Priority: 255
Total: 4 routes, 2 groups, 3 RPs
Group/Masklen           C-RP Address             Priority Uptime   Expires
ff65::/16               2001:db8::ffff:2             255  11:36    01:45
ff55::/16               2001:db8::ffff:3             255  11:36    01:45
ff55::/16               2001:db8::ffff:2             255  11:36    01:45
ff55::/16               2001:db8::ffff:1             255  01:43    01:45
>
```

Figure 15-14: Displaying the IPv6 PIM-SM rendezvous point information (4) (summary
format)

```
> show ipv6 pim rp-mapping brief
Date 20XX/04/20 12:10:10 UTC
Status : Candidate Rendezvous Point
        Local RP Address: 2001:db8::ffff:1    Priority: 255
Total: 4 routes, 2 groups, 3 RPs
Group/Masklen           C-RP Address
ff65::/16               2001:db8::ffff:2
ff55::/16               2001:db8::ffff:3
ff55::/16               2001:db8::ffff:2
ff55::/16               2001:db8::ffff:1
>
```

Display Items

Table 15-13: Items displayed by the show ipv6 pim rp-mapping command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Status	Rendezvous point candidate status	"Candidate Rendezvous Point" is displayed if the Switch is a rendezvous point candidate. "Not Candidate Rendezvous Point" is displayed if the Switch is not a rendezvous point candidate.
Local RP Address	Rendezvous point candidate address	This information is displayed only when the Switch is a rendezvous point candidate.
Priority	Rendezvous point candidate priority	—
Total	Number of items of group information	routes: Total number of groups managed by each rendezvous point candidate groups: Number of group addresses RPs: Number of rendezvous point candidates

Display Items	Meaning	Displayed detailed information
Group/Masklen	Group address/mask length	—
C-RP Address	Rendezvous point candidate address	—
Uptime	Time elapsed since the entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the entry	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. For a static rendezvous point, "--:--" is displayed.

Impact on communication

None

Response messages

Table 15-14: Response messages for the show ipv6 pim rp-mapping command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 pim rp-hash

Shows the rendezvous point information for each IPv6 PIM-SM group.

Syntax

```
show ipv6 pim [vrf <vrf id>] rp-hash <ipv6 address>
```

Input mode

User mode and administrator mode

Parameters

vrf <vrf id>[SL-L3A]

Displays the rendezvous point information for each IPv6 PIM-SM group for the VRF.

The rendezvous point information for each IPv6 PIM-SM group for the VRF specified for <vrf id> is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays the rendezvous point information for each IPv6 PIM-SM group for the global network.

<ipv6 address>

Specify the IPv6 group address.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display the rendezvous point information for the group address (ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa).

- When the rendezvous point for the group address (ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa) does not exist:

  Figure 15-15: Displaying the target rendezvous point information (1)

  ```
  > show ipv6 pim rp-hash ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa
  Date 20XX/04/20 12:10:10 UTC
  Group-RP mapping information for the group (ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa) does not
  exist.
  >
  ```

- When the rendezvous point for the group address (ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa) exists:

  Figure 15-16: Displaying the target rendezvous point information (2)

  ```
  > show ipv6 pim rp-hash ff1e:ffff:1234:abcd:1234:ffff:1234:aaaa
  Date 20XX/04/20 12:10:10 UTC
  RP Address                             Uptime  Expires
  3ffe:ffff:1234:3456:ffff:2234:2349:aaaa  02:00   02:30
  >
  ```

Display Items

Table 15-15: Items displayed by the show ipv6 pim rp-hash command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
RP Address	Rendezvous point address	—
Uptime	Time elapsed since the entry was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Aging (remaining time) for the entry	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. For a static rendezvous point, "--:--" is displayed.

Impact on communication

None

Response messages

Table 15-16: Response messages for the show ipv6 pim rp-hash command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
6	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 mld interface

Shows the status of the MLD interface.

Syntax

```
show ipv6 mld [vrf {<vrf id> | all}] interface [vlan <vlan id>]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Displays the MLD interface information for the VRF.

If <vrf id> is specified, the MLD interface information for only the specified VRF is displayed. If all is specified, the MLD interface information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Displays MLD interface information for the global network.

vlan <vlan id>

Displays interface information for the specified interface.

Behavior when this parameter is omitted:

Displays all the MLD interface information.

Behavior when all parameters are omitted:

Displays all MLD interface information for the global network.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display the MLD interface information.

Figure 15-17: Displaying the MLD interface information

```
> show ipv6 mld interface
Date 20XX/04/21 12:10:10 UTC
Total: 2 Interfaces
Interface     Version  Flags  Querier              Expires  Group Count  Notice
VLAN0011        2        S     fe80::10             02:30              2  LQ S
VLAN0012        1              fe80::20             -                  1  R
>
```

Display Items

Table 15-17: Items displayed by the show ipv6 mld interface command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

Display Items	Meaning	Displayed detailed information
Total	Total number of interfaces	—
Interface	Interface name	—
Version	MLD version information	1: MLD version 1 2: MLD version 2 (2): MLD version 2 only
Flags	Interface flag	S is displayed when MLD snooping is running.
Querier	Querier IPv6 address	If the specified interface is down, "-" is displayed.
Expires	Querier aging timer (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "-" is displayed if the Switch is the querier.
Group Count	Number of subscription groups	—
Notice	Warning information	• L: A Report message and the contained record information were discarded because the Group-limit value was exceeded. A Report message and the contained record information were discarded because the Source-limit value was exceeded. • Q: A query message was discarded due to inconsistent versions. • R: A Report message was discarded due to inconsistent versions. • S: Some information was discarded because the maximum number of resources that can be processed in one Report message was exceeded. Information was discarded because the number of items of record information in one Report message exceeded the maximum, or because the number of sources in one item of record information exceeded the maximum. From the time an event occurred until General Query is sent or received twice, this item is displayed when the command is executed.

Impact on communication

None

Response messages

Table 15-18: Response messages for the show ipv6 mld interface command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such interface "<interface name>"	MLD is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
4	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
7	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 mld group

Displays MLD group information.

Syntax

```
show ipv6 mld [vrf {<vrf id> | all}] group [<ipv6 address>[/<prefix length>]]
              [interface vlan <vlan id>] [brief]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the MLD group information for the VRF.
>
> If <vrf id> is specified, the MLD group information for only the specified VRF is displayed. If all is specified, the MLD group information for all VRFs including the global network is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
>> Displays the MLD group information for the global network.

<ipv6 address>[/<prefix length>]

> Displays addresses that match the specified group address.
>
> If <ipv6 address>[/<prefix length>] is specified, all the entries for the group that matches the specified prefix are displayed.
>
> The default value when <prefix length> is omitted is 128.
>
> If this parameter and the interface parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

interface vlan <vlan id>

> Displays interface information for the specified interface.
>
> If interface vlan <vlan id> is specified, all the group information matching the specified interface is displayed.
>
> If this parameter and the <ipv6 address>[/<prefix length>] parameter are specified at the same time, all entries that match the conditions of both parameters are displayed.

brief

> Displays MLD group information in summary format.
>
> Behavior when this parameter is omitted:
>
>> Displays MLD group information in standard format.

Behavior when each parameter is omitted:

> This command can display only information relevant to conditions applied by a parameter that has been set.
>
> If the parameter has not been set, information is displayed with no condition applied.
>
> If multiple parameters are specified, the information conforming to the conditions will be displayed.

Behavior when all parameters are omitted:

> Displays all MLD group information for the global network in standard format.

Operation when a stack configuration is used

This command is not supported.

Example

Displays MLD group information.

Figure 15-18: Displaying the MLD group information

```
> show ipv6 mld group
Date 20XX/04/20 12:10:10 UTC
Total: 3 groups
Group Address/Source Address   Interface      Version Mode    Last Reporter
                                            Uptime  Expires MLDv1Time MLDv2Time
ff15::1                        VLAN0011         2    INCLUDE fe80::1
                                            00:10   02:10   00:10     00:30
  2001:db8::1                  -                -      -     fe80::1
                                            00:10   02:10     -       00:10
ff15::2                        VLAN0011         2    EXCLUDE fe80::1
                                            00:10   02:20   00:10     00:10
  2001:db8::2                  -                -      -     fe80::1
                                            00:10   02:20     -       00:10
  2001:db8::3                  -                -      -     fe80::3
                                            00:10   02:20     -       00:15
ff3e::1                        VLAN0012         1      -     fe80::2
                                            00:15   04:10   00:35     00:10
  2001:db8::4                  -                -      -     fe80::2
                                            00:10   02:20     -       00:10
>

> show ipv6 mld group brief
Date 20XX/04/20 12:10:10 UTC
Total: 3 groups
Group Address                  Interface    Version Mode    Source Count
ff15::1                        VLAN0011         2    INCLUDE             1
ff15::2                        VLAN0011         2    EXCLUDE             2
ff3e::1                        VLAN0012         1      -                 1
>
```

Display Items

Table 15-19: Items displayed by the show ipv6 mld group command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total	Total number of groups	—
Group Address	Group address	—
Last Reporter	IPv6 address that last subscribed to the group	For static group joining, "static" is displayed. If the Reporter is not defined, "unknown" is displayed.
Interface	Interface name	—
Version	MLD version information	1: MLD version 1 2: MLD version 2
Mode	Group mode	INCLUDE: INCLUDE mode EXCLUDE: EXCLUDE mode "-" is displayed if the MLD version information of the interface is 1.

Display Items	Meaning	Displayed detailed information
Uptime	Time elapsed since the group information was generated	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. However, "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed in the following cases: • The static group has joined. • The group timer is not running.
MLDv1Time	MLDv1-compatible information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. However, "1day", "2days", ... are displayed if the time is 24 hours or more. "-" is displayed if the source information is displayed. "--:--" is displayed if the MLDv1-compatible information aging timer is not running.
MLDv2Time	MLDv2 information aging (remaining time)	xx:yy xx (minutes), yy (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more. "--:--" is displayed if the MLDv2 information aging timer is not running.
Source Address	Source address	The source address added to the multicast group by configuring PIM-SSM link operation in MLDv1 or MLDv2 (EXCLUDE mode), or in MLDv2 (INCLUDE mode) is displayed.
Source Count	Number of source addresses	—

Impact on communication

None

Response messages

Table 15-20: Response messages for the show ipv6 mld group command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal address <ipv6 address>	The specified IPv6 address is invalid. Check the address, and then re-enter the command. <ipv6 address>: Specified IPv6 address
3	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
4	no such interface "<interface name>"	MLD is not running on the specified interface. Check the indicated interface. <interface name>: Name assigned to the specified interface
5	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
6	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
7	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.
8	Unknown command "<command>"	The specified command is invalid. <command>: Specified command name

Notes

None

show ipv6 rpf

Displays the IPv6 reverse path forwarding (RPF) information for IPv6 PIM-SM.

The IPv6 RPF information displays the link-local next hop for the source (sender) in multicast communication.

Syntax

```
show ipv6 rpf [vrf <vrf id>] <ipv6 address>
```

Input mode

User mode and administrator mode

Parameters

vrf <vrf id> [SL-L3A]

> Shows VRF RPF information.

> The RPF information for the VRF specified for <vrf id> is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

> Behavior when this parameter is omitted:

>> Displays the RPF information for the global network.

<ipv6 address>

> Source IPv6 address of the multicast data

Operation when a stack configuration is used

This command is not supported.

Example

Shows RPF information.

3ffe:ffff:ffff:1234:200:87ff:fe10:5929 is the IPv6 address of the target (source to be investigated).

- When the target is not connected to the Switch:

  ### Figure 15-19: Displaying the RPF information (1)

  ```
  > show ipv6 rpf 3ffe:ffff:ffff:1234:200:87ff:fe10:5929
  Date 20XX/04/10 18:13:13 UTC
  Incoming: VLAN0003 Upstream: fe80::200:87ff:fe91:1292
  >
  ```

- When the target is connected to the Switch:

  ### Figure 15-20: Displaying the RPF information (2)

  ```
  > show ipv6 rpf 3ffe:ffff:ffff:1234:200:87ff:fe10:5929
  Date 20XX/04/10 18:13:56 UTC
  Incoming: VLAN0003 Upstream: Direct
  >
  ```

- When the target is in a different VRF direction within the Switch

  ### Figure 15-21: Displaying the RPF information (3)

  ```
  > show ipv6 rpf 3ffe:ffff:ffff:1234:200:87ff:fe10:5929
  Date 20XX/04/10 18:13:59 UTC
  Incoming: VRF 20  Upstream: Extra
  >
  ```

Display Items

Table 15-21: Items displayed by the show ipv6 rpf command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Incoming	Upstream interface name	The VRF ID is displayed for other VRFs connected to the extranet. However, "global" is displayed for the global network.
Upstream	Upstream neighboring router address	"Direct" is displayed for the first-hop-router. "Direct(configured)" is displayed if the first-hop-router is configured based on the specification of the "ipv6 pim direct" configuration command. "Extra" is displayed for the extranet.

Impact on communication

None

Response messages

Table 15-22: Response messages for the show ipv6 rpf command

No.	Message	Description
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	invalid source address <ipv6 address>	The specified IPv6 address is invalid. Check the address, and then re-execute the command. <ipv6 address>: Specified IPv6 address
4	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
5	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
6	RPF information for ? (<ipv6 address>) failed, no route exists	A route to the specified <ipv6 address> does not exist. Check the route to the specified <ipv6 address>, and then re-execute the command. <ipv6 address>: Specified IPv6 address
7	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.

No.	Message	Description
8	unspecified source address	No address is specified for the parameter. Specify the address, and then re-execute the command.

Notes

None

show ipv6 multicast statistics

Shows IPv6 multicast statistics.

Syntax

```
show ipv6 multicast [vrf {<vrf id> | all}] statistics [{mld | event}]
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

　　Displays VRF IPv6 multicast statistics.

　　If <vrf id> is specified, IPv6 multicast statistics for only the specified VRF is displayed. If all is speci-
　　fied, IPv6 multicast statistics for all VRFs including the global network and for the entire device are dis-
　　played. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

　　Behavior when this parameter is omitted:

　　　　Displays IPv6 multicast statistics for the global network.

{mld | event}

　　mld

　　　　Displays MLD statistics.

　　event

　　　　Displays statistics for events generated by receiving multicast packets.

　　Behavior when all parameters are omitted:

　　　　Displays all IPv6 multicast statistics for the global network.

Operation when a stack configuration is used

This command is not supported.

Example

Shows IPv6 multicast statistics.

Figure 15-22: Displaying the IPv6 multicast statistics

```
> show ipv6 multicast statistics
Date 20XX/12/10 18:20:00 UTC
  Rx                                    Tx
------------------------------------------------------------------------
mld
  query(v1)              :        0   query(v1)              :        26
  query(v2)              :       10   query(v2)              :        41
  report(v1)            :        0
  report(v2)            :        0
  done                  :        0
event:
  cache-misshit          :       21
  wrong-incoming-interface :     20
  register-request       :       14
  register-receive       :       34

> show ipv6 multicast vrf all statistics
```

```
Date 20XX/12/10 18:22:28 UTC
System:
  Rx                                Tx
-------------------------------------------------------------------------
mld
  query(v1)              :      0    query(v1)             :       26
  query(v2)              :     10    query(v2)             :       41
  report(v1)            :      0
  report(v2)            :      0
  done                  :      0
event
  cache-misshit          :     21
  wrong-incoming-interface :    20
  register-request      :     14
  register-receive      :     34

VRF: global
  Rx                                Tx
-------------------------------------------------------------------------
mld
  query(v1)              :      0    query(v1)             :       12
  query(v2)              :      7    query(v2)             :       26
  report(v1)            :      0
  report(v2)            :      0
  done                  :      0
event
  cache-misshit          :     11
  wrong-incoming-interface :    10
  register-request      :      8
  register-receive      :      4

VRF: 2
  Rx                                Tx
-------------------------------------------------------------------------
mld
  query(v1)              :      0    query(v1)             :       14
  query(v2)              :      3    query(v2)             :       15
  report(v1)            :      0
  report(v2)            :      0
  done                  :      0
event
  cache-misshit          :     10
  wrong-incoming-interface :    10
  register-request      :      6
  register-receive      :     30
```

Display Items

Table 15-23: Items displayed by the show ipv6 multicast statistics command

Display Items	Meaning	Displayed detailed information
System	Multicast statistics for the entire device	Displayed only when vrf all is specified.
VRF [SL-L3A]	VRF ID	"global" is displayed for the global network.
Rx	Number of receive packets	—
Tx	Number of send packets	—
mld	MLD packet information	—
query(v1)	Number of MLD version 1 query packets	—
query(v2)	Number of MLD version 2 query packets	—

Display Items	Meaning	Displayed detailed information
report(v1)	Number of MLD version 1 report packets	—
report(v2)	Number of MLD version 2 report packets	—
done	Number of done packets	—
event	Event information generated by receiving multicast packets	—
cache-misshit	Number of cache-misshit packets	—
wrong-incoming-interface	Number of wrong-incoming-interface packets	—
register-request	Number of register-request packets	—
register-receive	Number of register-receive packets	—

Impact on communication

None

Response messages

Table 15-24: Response messages for the show ipv6 multicast statistics command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.

Notes

None

clear ipv6 multicast statistics

Clears IPv6 multicast statistics.

Syntax

```
clear ipv6 multicast [vrf {<vrf id> | all}] statistics {all | mld | event}
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

Clears VRF IPv6 multicast statistics.

If <vrf id> is specified, IPv6 multicast statistics for only the specified VRF is cleared. If all is specified, IPv6 multicast statistics for all VRFs including the global network and for the entire device are cleared. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.

Behavior when this parameter is omitted:

Clears IPv6 multicast statistics for the global network.

all

Clears all IPv6 multicast statistics.

mld

Clears MLD statistics.

event

Clears statistics for events generated by receiving multicast packets.

Operation when a stack configuration is used

This command is not supported.

Example

Clears IPv6 multicast statistics.

Figure 15-23: Clearing IPv6 multicast statistics

```
>clear ipv6 multicast statistics all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 15-25: Response messages for the clear ipv6 multicast statistics command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.

Notes

None

show ipv6 multicast resources

Displays the number of entries used in IPv6 multicast.

Syntax

```
show ipv6 multicast [vrf {<vrf id> | all}] resources
```

Input mode

User mode and administrator mode

Parameters

vrf {<vrf id> | all} [SL-L3A]

> Displays the number of entries used in VRF IPv6 multicast. If <vrf id> is specified, the number of IPv6 multicast entries for only the specified VRF is displayed. If all is specified, the number of IPv6 multicast entries for all VRFs including the global network and for the entire device is displayed. For <vrf id>, you can specify any VRF ID in the range set by configuration commands.
>
> Behavior when this parameter is omitted:
>
> > Displays the information for the global network.

Operation when a stack configuration is used

This command is not supported.

Example

This example shows how to display the number of entries for IPv6 multicast.

Figure 15-24: Displayed number of IPv6 multicast entries

```
> show ipv6 multicast resources
Date 20XX/12/10 15:10:10 UTC
mcache                    :          20
interface                 :           1
extranet filter           :          20
vrf gateway               :          15
>
> show ipv6 multicast vrf all resources
Date 20XX/12/10 15:12:10 UTC
Total_VRF                 :           2
mcache                    :          30
interface                 :           5
extranet filter           :          30
vrf gateway               :          45

VRF: global
mcache                    :          20
interface                 :           1
extranet filter           :          20
vrf gateway               :          15

VRF: 2
mcache                    :          10
interface                 :           4
extranet filter           :          10
vrf gateway               :          30
>
```

Display Items

Table 15-26: Items displayed by the show ipv6 multicast resources command

Display Items	Meaning	Displayed detailed information
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
Total_VRF [SL-L3A]	Number of VRFs running in IPv6 multicast mode	—
mcache	Number of multicast route entries	—
interface	Number of interfaces on which multicast runs	—
extranet filter	Number of filters	—
vrf gateway	Number of VRF gateways	—

Impact on communication

None

Response messages

Table 15-27: Response messages for the show ipv6 multicast resources command

No.	Message text	Meaning
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. If this message is output, even though IPv6 multicast routing is enabled, re-execute the command or check the configuration.
2	illegal vrf number <vrf id>	The specified VRF is invalid. <vrf id>: VRF ID
3	no such VRF <vrf id>	IPv6 multicast is not running on the specified VRF. <vrf id>: VRF ID
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error
5	This command cannot be executed now	The command cannot be executed because a multicast command is being executed on the operation terminal. Try re-executing the command after executing the multicast command on the operation terminal.

Notes

None

restart ipv6-multicast

Restarts the IPv6 multicast routing program.

Syntax

```
restart ipv6-multicast [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

    Restarts the IPv6 multicast routing program without displaying a restart confirmation message.

    Behavior when this parameter is omitted:

        A confirmation message is displayed.

core-file

    Outputs the core file (pim6sd.core) for the IPv6 multicast routing program during restart.

    Behavior when this parameter is omitted:

        A core file is not output.

Operation when a stack configuration is used

This command is not supported.

Example

Restarts the IPv6 multicast routing program.

Figure 15-25: Restart of IPv6 multicast routing program

```
> restart ipv6-multicast
IPv6 Multicast routing program restart OK? (y/n): y
>
```

Display Items

None

Impact on communication

IPv6 multicast forwarding stops temporarily.

Response messages

Table 15-28: Response messages for the restart ipv6-multicast command

No.	Message	Description
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed.

No.	Message	Description
		If this message is output, even though IPv6 multicast routing is enabled, re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.
2	IPv6 routing is not configured.	IPv6 routing protocol is not configured. Check the configuration.
3	mr6 appears to be running as pid \<pid\>, but pid \<pid\> doesn't exist!	The process defined in the PID file for the IPv6 multicast routing program does not exist. IPv6 multicast routing might be disabled, or the IPv6 multicast routing program might have been restarted automatically. If the program was restarted automatically, wait until the program is restarted, and then re-execute the command. \<pid\>: Process ID
4	mr6 does not respond.	No response was sent from the IPv6 multicast routing program. Re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.
5	mr6 doesn't seem to be running.	The command failed because the IPv6 multicast routing program was not running. If this message is output, even though IPv6 multicast routing is enabled, wait until the IPv6 multicast routing program is restarted, and then re-execute the command.
6	mr6 failed to terminate.	An attempt to restart the IPv6 multicast routing program by using the "restart ipv6-multicast" command failed. Re-execute the command.
7	mr6 has already stopped.	The "restart ipv6-multicast" command failed because the IPv6 multicast routing program has already stopped. The IPv6 multicast routing program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command.
8	mr6 restarted after termination: old pid \<pid\>, new pid \<pid\>	The "restart ipv6-multicast" command failed because the PID was changed during command execution. The IPv6 multicast routing program might have been restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. \<pid\>: Process ID
9	mr6 signaled but still running, waiting 6 seconds more.	The "restart ipv6-multicast" command is restarting the IPv6 multicast routing program. Wait a while.
10	mr6 still running, sending a kill signal.	The "restart ipv6-multicast" command is sending a Kill signal to the IPv6 multicast routing program, to restart it. Wait a while.
11	mr6 still running, sending another terminate signal.	The "restart ipv6-multicast" command is sending a terminate signal to the IPv6 multicast routing program, to restart it. Wait a while.

No.	Message	Description
12	mr6 terminated.	The IPv6 multicast routing program was stopped by the "restart ipv6-multicast" command. The program will restart automatically. Wait a while.
13	pid file <file name> mangled!	The PID file for the IPv6 multicast routing program is corrupted. <file name>: PID file name
14	pid in file <file name> unreasonably small (<pid>)	The PID file for the IPv6 multicast routing program is corrupted. <file name>: PID file name <pid>: Process ID in the PID file
15	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

The following shows the directory to which the core file for the IPv6 multicast routing program is output.

Directory: /usr/var/core/

Core file: pim6sd.core

For details about how to delete the core file for the IPv6 multicast routing program, see "erase protocol-dump ipv6-multicast".

debug protocols ipv6-multicast

Enables the output of event information specific to syslog by the IPv6 multicast routing program.

The types of event information specific to syslog are as follows:

- Addition of an MLD or PIM output interface
- Deletion of an MLD or PIM output interface

Event information specific to syslog is output only to the syslog interface, and not output to the operation log.

Syntax

```
debug protocols ipv6-multicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-26: Example of the debug protocols ipv6-multicast command

```
> debug protocols ipv6-multicast
>
(syslog-specific event information is output to the syslog interface.)
```

Impact on communication

None

Response messages

Table 15-29: Response messages for the debug protocols ipv6-multicast command

No.	Message	Description
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. Re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.
2	IPv6 multicast routing is not configured	IPv6 multicast routing protocol is not configured. Check the configuration.
3	mr6 is no response.	No response was sent from the IPv6 multicast routing program. Re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.

No.	Message	Description
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

To enable the output to syslog, specify mr6 for the event level parameter of the "logging event-kind" configuration command.

no debug protocols ipv6-multicast

Disables the output of event information specific to syslog by the IPv6 multicast routing program.

The types of event information specific to syslog are as follows:

- Addition of an MLD or PIM output interface
- Deletion of an MLD or PIM output interface

Event information specific to syslog is output only to the syslog interface, and not output to the operation log.

Syntax

```
no debug protocols ipv6-multicast
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-27: Example of the no debug protocols ipv6-multicast command

```
>no debug protocols ipv6-multicast
>
(syslog-specific event information is not output to the syslog interface.)
```

Impact on communication

None

Response messages

Table 15-30: Response messages for the no debug protocols ipv6-multicast command

No.	Message	Description
1	connection failed to mr6	Communication with the IPv6 multicast routing program failed. Re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.
2	IPv6 multicast routing is not configured.	IPv6 multicast routing protocol is not configured. Check the configuration.
3	mr6 is not response.	No response was sent from the IPv6 multicast routing program. Re-execute the command. If this message is frequently displayed, use the "restart ipv6-multicast" command to restart the IPv6 multicast routing program.

No.	Message	Description
4	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

None

dump protocols ipv6-multicast

Converts the control table information collected by the IPv6 multicast routing program to text format, and outputs the compressed information to a file.

Converts the event trace information collected by the IPv6 multicast routing program to text format, and outputs it to a file.

Syntax

```
dump protocols ipv6-multicast { all | trace | table }
```

Input mode

User mode and administrator mode

Parameters

all

Outputs event trace information and control table information to a file.

trace

Outputs event trace information to a file.

table

Outputs control table information, converted to text format and compressed, to a file.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-28: Example of the dump protocols ipv6-multicast command

```
> dump protocols ipv6-multicast trace
>

or

> dump protocols ipv6-multicast table
>

or

> dump protocols ipv6-multicast all
>
```

Display Items

None

Impact on communication

None

Response messages

Table 15-31: Response messages for the dump protocols ipv6-multicast command

No.	Message	Description
1	mr6 doesn't seem to be running.	The command failed because the IPv6 multicast routing program was not running. If this message is output, even though IPv6 multicast routing is enabled, wait until the IPv6 multicast routing program is restarted, and then re-execute the command.
2	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

The following shows the output files for the Switch and the directory to which the files are output.

Directory: /usr/var/mrp/

Control table information file: mr6_dump.gz

Event trace information file: mr6_trace

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists when event trace information or control table information is collected.

erase protocol-dump ipv6-multicast

Deletes the event trace information file, control table information file, and core file created by the IPv6 multicast routing program.

Syntax

```
erase protocol-dump ipv6-multicast { trace | table | core-file }
```

Input mode

User mode and administrator mode

Parameters

trace

> Deletes the event trace information file.

table

> Deletes the control table information file.

core-file

> Deletes the core file.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 15-29: Example of the erase protocol-dump ipv6-multicast command

```
> erase protocol-dump ipv6-multicast trace
>
> erase protocol-dump ipv6-multicast table
>
> erase protocol-dump ipv6-multicast core-file
>
```

Display Items

None

Impact on communication

None

Response messages

Table 15-32: Response messages for the erase protocol-dump ipv6-multicast command

No.	Message	Description
1	mr6 doesn't seem to be running.	The command failed because the IPv6 multicast routing program was not running. If this message is output, even though IPv6 multicast routing is enabled, wait until the IPv6 multicast routing program is restarted, and then re-execute the command.

No.	Message	Description
2	program error occurred: <error message>	A program error occurred. Re-execute the command. <error message>: Location of the error

Notes

The following shows the files and directories to be deleted from the Switch.

- Directory: /usr/var/mrp/

  Control table information file: mr6_dump.gz

  Event trace information file: mr6_trace

- Directory: /usr/var/core/

  Core file: pim6sd.core

After collecting the core file, use the command to delete the core file.

16 **BFD**

show bfd session

Displays the status and statistics of the BFD session.

Syntax

```
show bfd session [name <bfd name>] [detail]
show bfd session [vrf <vrf id>] ip <ipv4 address>
```

Input mode

User mode and administrator mode

Parameters

name <bfd name>

    Displays a BFD session for the specified BFD configuration.

    Behavior when this parameter is omitted:

        Displays all BFD sessions.

detail

    Displays detailed information of a BFD session.

    Behavior when this parameter is omitted:

        Displays a summary of a BFD session.

vrf <vrf id>[SL-L3A]

    Specifies the VRF of a BFD session.

    For <vrf id>, specify a VRF ID that was set by using the configuration command.

    Behavior when this parameter is omitted:

        Displays the BFD session for the global network.

ip <ipv4 address>

    Displays detailed information about the BFD session for the specified destination address.

    For <ipv4 address>, specify an IPv4 address of the remote system.

Behavior when all parameters are omitted:

    Displays a summary of all BFD sessions.

Operation when a stack configuration is used

This command is not supported.

Example 1

Figure 16-1: Displaying a summary of all BFD sessions

```
> show bfd session
Date 20XX/07/10 18:37:50 UTC
Total: 3 sessions
RemoteAddress                   VRF Index State    DetectTime BFDName
172.16.10.11                     -    2 Down            - Network2
192.168.16.5                     2    1 Up            440 Network1
192.168.22.1                     2    3 AdminDown       - BGP0100
>
```

Display Items 1

Table 16-1: Displayed summary of BFD sessions

Display Items	Meaning	Displayed detailed information
Total	Number of BFD sessions	—
RemoteAddress	Remote system address	—
VRF	VRF ID	-: Global network
Index	BFD session number	An arbitrary sequence number assigned by the system.
State	Session status	Down: Down Init: Establishment being requested Up: Up AdminDown: Administrative down
DetectTime	Failure detection time	Shows the information in milliseconds. -: No session has been established.
BFDName	BFD setting name	—

Example 2

Figure 16-2: Displaying detailed information about the specified BFD session

```
> show bfd session vrf 2 ip 192.168.16.5
Date 20XX/05/22 15:55:33 UTC
Session Index 1
 State : Up
   Remote System    : 192.168.16.5  VRF:2
   Local System     : 192.168.16.1  VRF:2
   Discriminator    : Hex                    Decimal
     Remote         : 0xbce20002             3168927746
     Local          : 0xe0430001             3762487297
   Detection Time   : 440
   Diagnostic       : -
   Operating Mode   : Asynchronous (Echo off)
 BFD Name : Network1
   Path             : Singlehop
   Parameter        :    TxInterval      RxInterval     Multiplier
   Remote System    :           150             200              2
   Local System     :           160             220              3
   Current          :           200             220              2
 Follower : BGP4 (BFD ID: 1)
 Statistics
   Packets Counter  :                    Tx                  Rx
     Since Last Up  :                   265                 133
     Since Boot     :                   280                 144
   Up Count         : 1
   Last Up Time     : 20XX/05/22 15:37:20 UTC
   Last Down Time   : -
     Diagnostic     : -
>
```

Display Items 2

Table 16-2: Displayed detailed information about a BFD session

Display Items	Meaning	Displayed detailed information
Session Index	BFD session number	An arbitrary sequence number assigned by the system.
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.
State	Session status	Down: Down Init: Establishment being requested Up: Up AdminDown: Administrative down
Remote System	Remote system address	—
Local System	Local system address	—
Discriminator	Session identifier	0 is displayed if the value is unknown before the session is established.
Detection Time	Failure detection time	—
Diagnostic	Down factor	Control Detection Time Expired: Failure detection time timeout Neighbor Signaled Session Down: Down state received from the remote system Forwarding Plane Reset: Forwarding plane resetting Path Down: Path down Administratively Down: Administrative down -: If downing is not present[#]
Operating Mode	Running mode	Asynchronous: Asynchronous mode
Echo	Echo function	off: Disabled
BFD Name	BFD setting name	—
Path	Monitoring route	Value set in the configuration Singlehop: Single-hop Multihops: Multi-hop
Parameter	Monitoring interval	TxInterval: Sending interval RxInterval: Receiving interval Multiplier: Detection multiplier The sending and receiving intervals are displayed in milliseconds.
Remote System	Remote system monitoring interval	Value stored in the BFD packet "-" is displayed if the value is unknown before the session is established.
Local System	Monitoring interval requested by the local system	Value set in the configuration

Display Items	Meaning	Displayed detailed information
Current	Monitoring interval applied in the session	"-" is displayed if the value is unknown before the session is established.
Follower	Linkage function	BGP4: BGP4 linkage
BFD ID	System-assigned BFD linkage identifier	—
Statistics	Statistics	—
Packets Counter	Number of send and receive packets	Tx: Number of send packets Rx: Number of receive packets
Since Last Up	Number of packets since last up	—
Since Boot	Number of packets since device startup	—
Up Count	Number of up times	—
Last Up Time	Last up time	-: If up operation has never been performed
Last Down Time	Last down time	-: If downing has never occurred[#]
Diagnostic	Last down factor	Control Detection Time Expired: Failure detection time timeout Neighbor Signaled Session Down: Down state received from the remote system Forwarding Plane Reset: Forwarding plane resetting Path Down: Path down Administratively Down: Administrative down -: If downing has never occurred[#]

#: If the BFD session downed in its initial state, it is not treated as being downed.

Impact on communication

None

Response messages

Table 16-3: List of response messages for the show bfd session command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed because another user is executing a BFD command. Wait a while, and then try again.	The command cannot be executed because another user is executing the "BFD" command. Wait a while, and then retry the operation.
The command cannot be executed because the connection to the BFD program failed.	Communication with the BFD program failed. Re-execute the command. If the failure occurs frequently, use the "restart bfd" command to restart the BFD program.

Message	Description
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.
The specified session does not exist.	The specified session was not found. Check the specified IP address or VRF.
There is no BFD session information.	BFD session information does not exist.

Notes

None

show bfd discard-packets

Displays information about discarded BFD packets. Only the information about the single last-discarded packet can be displayed for each discard cause in an entire BFD environment.

Syntax

```
show bfd discard-packets
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 16-3: Displaying the information on packets discarded by BFD

```
> show bfd discard-packets
Date 20XX/07/10 18:37:50 UTC
15 packets discard
    10 packets: Unknown Session (Discriminator=0xd1ef0023)
        Remote Address: 172.16.10.11 VRF:2
    1 packet: Authentication Failure
        Remote Address: 192.168.22.1
        Local Address: 192.168.22.4
    4 packets: Invalid Desired Min TX Interval (Interval=0)
        Remote Address: 192.168.22.1
        Local Address: 192.168.22.4
>
```

Display Items

Table 16-4: Displayed information on packets discarded by BFD

Display Items	Meaning	Displayed detailed information
packets discard	Total number of discarded packets	—
packets	Discard factor of received BFD packet[#]	Displayed for each discard factor. If the value that caused the packets to be discarded can be obtained, it is displayed in parentheses.
Remote Address	Remote address for BFD session	Not displayed if it cannot be obtained from the discarded packet information.
Local Address	BFD session local address	Not displayed if it cannot be obtained from the discarded packet information.
VRF [SL-L3A]	VRF ID	This item is not displayed when the target is a global network.

#: The following table shows the reasons why a received packet was discarded. This table is listed in order of priority of display order.

Table 16-5: Reasons why a received BFD packet was discarded

Discard factor	Meaning	Description
Invalid Packet	Discarded due to the packet being invalid	The packet is invalid. Check the settings of the partner device.
Invalid Version	Discarded due to the BFD version being invalid	The value in the version field is not 1. Check the settings of the partner device.
Too Short Packet	Discarded due to the packet length being invalid (short)	The Length field is less than 24 bytes. Check the settings of the partner device.
Too Long Packet	Discarded due to the packet length being invalid (long)	The value in the Length field is larger than the size of the received packet. Check the settings of the partner device.
Invalid Multiplier	Discarded due to Multiplier being invalid	The value in the Detect Mult field is 0. Check the settings of the partner device.
Invalid Multipoint	Discarded due to Multipoint being invalid	The M bit value is not 0. Check the settings of the partner device.
Invalid My Discriminator	Discarded due to My Discriminator being invalid	The value in the My Discriminator field is 0. Check the settings of the partner device.
Unknown Session	Discarded due to the session being unknown	The corresponding BFD session is not set on the Switch. Review the setting on the Switch.
Invalid Your Discriminator	Discarded due to Your Discriminator being invalid	The value in the Your Discriminator field is 0, and the State field is Init or Up Check the settings of the partner device.
Invalid TTL/HopLimit	Discarded due to TTL/HopLimit being invalid	Single hop communication is used but the value in the TTL field or HopLimnit field is not 255. Check the network status.
Received Interface Mismatch	Discarded due to interface mismatch	Single hop communication is used but the receiving interface and the sending interface are different. Check the network status.
Authentication Failure	Discarded due to authentication failure	Authentication failed, or the use of an authentication method not supported by the Switch was requested. Check the settings of the Switch and the partner device.
Invalid Desired Min TX Interval	Discarded due to Desired Min TX Interval being invalid	The value in the Desired Min TX Interval field is not in the range of 1 to 255000000. Check the partner device and set the value within the range.

Discard factor	Meaning	Description
Invalid Required Min RX Interval	Discarded due to Required Min RX Interval being invalid	The value in the Required Min RX Interval field is not in the range of 0 to 255000000 Check the partner device and set the value within the range.
Other Errors	Discarded due to other factors	The packet was discarded due to other conditions.

Impact on communication

None

Response messages

Table 16-6: List of response messages for the show bfd discard-packets command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed because another user is executing a BFD command. Wait a while, and then try again.	The command cannot be executed because another user is executing the "BFD" command. Wait a while, and then retry the operation.
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.

Notes

When target is applied to multiple discard causes, only the discard cause with the highest priority is counted. For example, the packets corresponding to both Invalid Version and Authentication Failure are added as Invalid Packet.

clear bfd session

Re-establishes or re-generates a BFD session.

Syntax

```
clear bfd session {<session index> | all}
```

Input mode

User mode and administrator mode

Parameters

<session index>

Specifies the BFD session number for which you want to reestablish the session. The specified BFD session is deleted and then re-established. Statistics and other information will not be carried over.

all

For all BFD sessions, the destination IP address of the BFD session is re-registered from the linked protocol. For any BFD sessions that have already been monitored, their session state and statistics are inherited.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 16-4: BFD session re-establishment

```
> clear bfd session 3
>
```

Display Items

None

Impact on communication

Communication may temporarily stop on routes being monitored using BFD.

Response messages

Table 16-7: List of response messages for the clear bfd session command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed because another user is executing a BFD command. Wait a while, and then try again.	The command cannot be executed because another user is executing the "BFD" command. Wait a while, and then retry the operation.

Message	Description
The command cannot be executed because the connection to the BFD program failed.	Communication with the BFD program failed. Re-execute the command. If the failure occurs frequently, use the "restart bfd" command to restart the BFD program.
The command cannot be executed in the current state. Wait a while, and then try again.	The session is already trying to establish itself. Wait a while, and then retry the operation. If the failure occurs frequently, use the "restart bfd" command to restart the BFD program.
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.
The specified session does not exist.	The specified session does not exist or is being deleted. Check the specified BFD session number.

Notes

None

clear bfd statistics

Clears the following statistics managed by BFD.

- Number of sent and received BFD packets (Packets Counter)

- Session up count (Up count)

- Last up time (Last Up Time)

- Last down time (Last Down Time)

- Last down factor (Diagnostic)

Syntax

```
clear bfd statistics
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 16-5: Clearing the BFD statistics
```
> clear bfd statistics
>
```

Display Items

None

Impact on communication

None

Response messages

Table 16-8: List of response messages for the clear bfd statistics command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed because another user is executing a BFD command. Wait a while, and then try again.	The command cannot be executed because another user is executing the "BFD" command. Wait a while, and then retry the operation.

Message	Description
The command cannot be executed because the connection to the BFD program failed.	Communication with the BFD program failed. Re-execute the command. If the failure occurs frequently, use the "restart bfd" command to restart the BFD program.
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.

Notes

None

restart bfd

Restarts the BFD program.

Syntax

```
restart bfd [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the BFD program without displaying a restart confirmation message.

Behavior when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file (bfdd.core) for the BFD program during restart.

Behavior when this parameter is omitted:

A core file is not output.

Behavior when all parameters are omitted:

Restarts the BFD program after displaying a restart confirmation message.

Operation when a stack configuration is used

This command is not supported.

Example

Figure 16-6: Restarting the BFD program

```
> restart bfd
Are you sure you want to restart the BFD program? (y/n): y
>
```

Display Items

None

Impact on communication

When the BFD program is restarted, the Switch stops sending BFD packets. As a result, the partner device may detect a failure.

Response messages

Table 16-9: List of response messages for the restart bfd command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.

Notes

1. If the core file already exists, it is overwritten unconditionally. Therefore, back up the file in advance, if necessary. The output destination and file name are as follows.

   - Directory: /usr/var/core/

   - File name: bfdd.core

2. Since the sending and receiving of BFD packets is stopped while the BFD program is restarting, any failure in the route to the partner device cannot be detected.

dump protocols bfd

Outputs the control information logged by the BFD program to a file.

Syntax

```
dump protocols bfd
```

Input mode

User mode and administrator mode

Parameters

None

Operation when a stack configuration is used

This command is not supported.

Example

Figure 16-7: Executing BFD dump
```
> dump protocols bfd
>
```

Display Items

None

Impact on communication

None

Response messages

Table 16-10: List of response messages for the dump protocols bfd command

Message	Description
Command execution failed because the BFD program is not running.	This command cannot be executed because the BFD program is not running.
The command cannot be executed because another user is executing a BFD command. Wait a while, and then try again.	The command cannot be executed because another user is executing the "BFD" command. Wait a while, and then retry the operation.
The command cannot be executed because the connection to the BFD program failed.	Communication with the BFD program failed. Re-execute the command. If the failure occurs frequently, use the "restart bfd" command to restart the BFD program.
The command cannot be executed. Try again.	The command could not be executed. Re-execute the command.
The dump command failed. The amount of free disk space on the device might be insufficient. Delete unnecessary files, and then try again.	There might not be enough free space on the disk of the Switch. Delete unnecessary files and then re-execute the command.

Message	Description
The dump file could not be opened.	An attempt to open or access a dump file failed.

Notes

If the file with this name already exists, it is overwritten unconditionally. Therefore, back up the file in advance, if necessary. The output destination and file name are as follows.

Directory: /usr/var/bfd

File name: bfdd_trace.tar.gz

File name: bfdd_dump.gz