AX6700S/AX6600S/AX6300S Software Manual

Operation Command Reference Vol. 1

For Version 11.7

AX63S-S006X-C0

AlaxalA

■ Relevant products

This manual applies to the models in the AX6700S, AX6600S, and AX6300S series of switches. It also describes the functionality of version 11.7 of the software for the AX6700S, AX6600S, and AX6300S series switches. The described functionality is that supported by the OS-S/ OS-SE basic software and optional licenses.

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■ Reading and storing this manual

Before you use the equipment, 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.

■ Notes

Information in this document is subject to change without notice.

■ Editions history

January 2012 (Edition 13) AX63S-S006X-C0

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History of Amendments

[For version 11.7]

Summary of amendments

Location and title	Changes
3 Terminals and Remote Operations	• A parameter was added to the `tftp` command.
23 Policy-based Switching	• This chapter was added.

In addition to the above changes, minor editorial corrections were made.

[For version 11.5]

Summary of amendments

Item	Changes
Checking Software Versions and Device Statuses	• The `temperature-logging` parameter was added to the `show environment` command. • A description about Mode (fan operation mode) was added to the display items for the `show environment` command.
Log	• The notes on the `show logging` command were changed.
Ring Protocol	• A description about Flush Request Transmit VLAN ID was added to the display items for the `show axrp` command.

[For version 11.4]

Summary of amendments

Item	Changes
Terminals and Remote Operations	• A parameter related to VRF was added to the `ftp` command.
BSU/NIF Management	• The following commands were added: show redundancy nif-group
Power Saving Functionality	• The following commands were added: show engine-traffic statistics clear engine-traffic statistics show power clear power

[For version 11.3]

The chapter Filters and all subsequent chapters were moved to *Operation Command Reference Vol. 2 For Version 11.7*.

[For version 11.2]

Summary of amendments

Item	Changes
Time Settings and NTP	• A parameter related to VRF was added to the `show ntp associations` command.
Ethernet	• The `detail` parameter was added to the `show port` command. • A description of SFP for 10BASE-T/100BASE-TX/1000BASE-T was added.
Ring Protocol	• The execution example and display items of the `show axrp` command were changed. • The `clear axrp preempt-delay` command was added.

[For version 11.1]

Summary of amendments

Item	Changes
Checking Software Versions and Device Statuses	• The execution example and display items of the following commands were added: show version show system show environment • The explanation about the functionality of the `clear control-counter` command was changed. • The explanations about the functionality and parameters of the `reload` command were changed.
Power Saving Functionality	• This chapter was added.
Checking Internal Memory and Memory Cards	• The notes on the `show flash` command were changed.
Log	• The execution example of the `show logging` command was changed.
Software Management	• Notes on the `set license` command were added.
Dump Information	• The descriptions about the parameters of the `erase dumpfile` command were changed. • The execution example of the `show dumpfile` command was changed.
IEEE 802.1X	• The output format and messages of the operation log displayed by the `show dot1x logging` command were changed.
Redundancy of BCUs, CSUs, and MSUs	• The explanation about the functionality of the `inactivate standby` command was changed.
CFM	• This chapter was added.

[For version 11.0]

Summary of amendments

Item	Changes
Terminals and Remote Operations	• A parameter related to VRF was added to the `telnet` command.
Checking Software Versions and Device Statuses	• The display items of the `show version` command were changed.
BSU/NIF Management	• The display items of the `show nif` command were changed.
Software Management	• Notes on the `ppupdate` command were added.
Ethernet	• The display items of the following commands were changed: show interfaces show port • Notes on the `test interfaces` command were added. • The explanation about the `transceiver` parameter of the `show port` command was changed.
VLANs	• The execution example and display items of the `show vlan` command were changed.
IGMP/MLD Snooping	• The execution example and display items of the `show igmp-snooping` command were changed.

Item	Changes
QoS	• For the `show qos queueing` command, a figure of the queues to be displayed was added for when NK1GS-8M or NH1GS-6M is used. • The displayed statistics information of the following commands was changed: show qos queueing show qos queueing interface • The following commands were added: show shaper clear shaper show shaper <*port list*> clear shaper <*port list*>
GSRP	• The execution example and display items of the `show gsrp` command were changed. • The `clear gsrp forced-shift` command was added.
VRRP	• The `group` parameter and the `name` parameter were added to the `show vrrpstatus (IPv4)` command. • The `name` parameter was added to the following commands: clear vrrpstatus (IPv4) swap vrrp (IPv4) show vrrpstatus (IPv6) clear vrrpstatus (IPv6) swap vrrp (IPv6)
SNMP	• The execution example and display items of the `snmp getforward` command were changed.

[For version 10.7]

Summary of amendments

Item	Changes
Checking Software Versions and Device Statuses	• The notes on the following commands were changed: backup restore
Ethernet	• The display items of the following commands were changed: show interfaces show port test interfaces no test interfaces
Spanning Tree Protocols	• The display items of the following commands were changed: show spanning-tree show spanning-tree statistics show spanning-tree port-count
Web Authentication	• The list of operation log messages of the `show web-authentication logging` command was modified.
MAC-based Authentication	• The list of operation log messages of the `show mac-authentication logging` command was modified.
GSRP	• The display items of the `show gsrp` command were changed.
L2 Loop Detection	• This chapter was added.

[For version 10.6]

Summary of amendments

Item	Changes
Ethernet	• A description of the 10GBASE-ZR interface was added. • A description of the `vlan` parameter was added to the `show port` command.
VLANs	• A description of the `configuration` parameter was added to the `show vlan` command.
Web Authentication	• The display items of the following commands were changed: show web-authentication login show web-authentication logging show web-authentication
MAC-based Authentication	• This chapter was added.

[For version 10.5]

Summary of amendments

Item	Changes
Login Security and RADIUS or TACACS+	• The `no-flash` parameter was added to the `adduser` command.
BSU/NIF Management	• 1000BASE-BX and 1000BASE-SX2 were added to the line types of the `show nif` command.
Dump Information	• The output directories of the following commands were changed: dump psp dump bsu dump nif
Ethernet	• 1000BASE-BX and 1000BASE-SX2 were added to the line type, speed, and Interface type of the following commands: show interfaces show port no test interfaces • A note on the loop connector loopback test that uses 1000BASE-BX was added to the `test interfaces` command.
Spanning Tree Protocols	• The `clear spanning-tree detected-protocol` command was added.
Web Authentication	• The description of the `clear web-authentication auth-state` command was changed. • The following commands were added: set web-authentication html-files clear web-authentication html-files show web-authentication html-files

[For version 10.4]

Summary of amendments

Item	Changes
VLANs	• A description about Ring Protocol was added to the `show vlan` command.
Spanning Tree Protocols	• The `active` parameter was added to the `show spanning-tree` command. • The `show spanning-tree port-count` command was added.
Ring Protocol	• This chapter was added.

Item	Changes
Authentication VLAN	• The description of the `show fense server` command was changed.

[For version 10.3]

Summary of amendments

Item	Changes
BSU/NIF Management	• The following commands were added: activate bsu inactivate bsu
Dump Information	• The `dump bsu` command was added.
VLANs	• The `show vlan rate` command was added.
IGMP/MLD Snooping	• This chapter was added.
Web Authentication	• This chapter was added.
IEEE 802.3ah/UDLD	• This chapter was added.
sFlow	• This chapter was added.

Preface

Applicable products and software versions

This manual applies to the models in the AX6700S, AX6600S, and AX6300S series of switches. It also describes the functionality of version 11.7 of the software for the AX6700S, AX6600S, and AX6300S series switches. The described functionality is that supported by the OS-S/OS-SE basic software and optional licenses.

Before you operate the equipment, 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 functionality applicable to AX6700S, AX6600S, and AX6300S series switches. Functionality specific to a model is indicated as follows:

[AX6700S]:

The description applies to AX6700S switches.

[AX6600S]:

The description applies to AX6600S switches.

[AX6300S]:

The description applies to AX6300S switches.

Unless otherwise noted, this manual describes functionality applicable to the basic software OS-S/OS-SE. Functionality specific to an optional license is indicated as follows:

[OP-BGP]:

The description applies to the OP-BGP optional license.

[OP-DH6R]:

The description applies to the OP-DH6R optional license.

[OP-MBSE]:

The description applies to the OP-MBSE optional license.

[OP-NPAR]:

The description applies to the OP-NPAR optional license.

[OP-VAA]:

The description applies to the OP-VAA optional 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

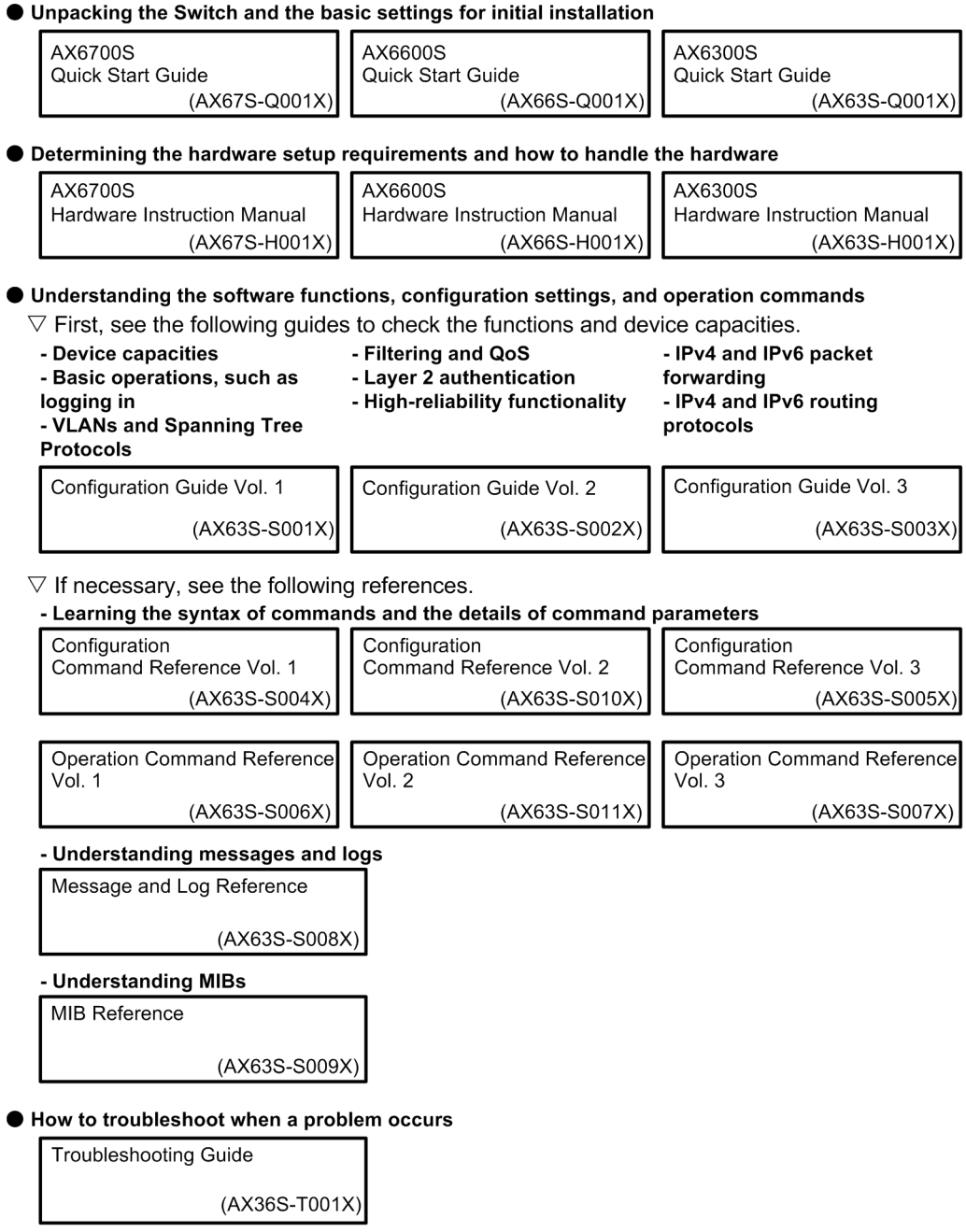
Manual URL

You can view this manual on our website at:

http://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.



Conventions: The terms "Switch" and "switch"

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

AX6700S series switch

AX6600S series switch

AX6300S 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
ALG	Application Level Gateway
ANSI	American National Standards Institute
ARP	Address Resolution Protocol
AS	Autonomous System
AUX	Auxiliary
BCU	Basic Control Unit
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
BSU	Basic Switching Unit
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
CSU	Control and Switching Unit
DA	Destination Address
DC	Direct Current
DCE	Data Circuit terminating Equipment
DHCP	Dynamic Host Configuration Protocol
DIS	Draft International Standard/Designated Intermediate System
DNS	Domain Name System
DR	Designated Router
DSAP	Destination Service Access Point
DSCP	Differentiated Services Code Point
DTE	Data Terminal Equipment
DVMRP	Distance Vector Multicast Routing Protocol
E-Mail	Electronic Mail
EAP	Extensible Authentication Protocol
EAPOL	EAP Over LAN
EFM	Ethernet in the First Mile
ES	End System
FAN	Fan Unit
FCS	Frame Check Sequence
FDB	Filtering DataBase
FTTH	Fiber To The Home
GBIC	GigaBit Interface Converter
GSRP	Gigabit Switch Redundancy Protocol
HMAC	Keyed-Hashing for Message Authentication
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
LLPQ	Low Latency Priority Queueing
LLQ+3WFQ	Low Latency Queueing + 3 Weighted Fair Queueing
LLRLQ	Low Latency Rate Limited 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
MRU	Maximum Receive Unit
MSTI	Multiple Spanning Tree Instance
MSTP	Multiple Spanning Tree Protocol
MSU	Management and Switching Unit
MTU	Maximum Transfer Unit
NAK	Not AcKnowledge
NAS	Network Access Server
NAT	Network Address Translation
NCP	Network Control Protocol
NDP	Neighbor Discovery Protocol
NET	Network Entity Title
NIF	Network Interface
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
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
PRI	Primary Rate Interface

PS	Power Supply
PSNP	Partial Sequence Numbers PDU
PSP	Packet Switching Processor
QoS	Quality of Service
RA	Router Advertisement
RADIUS	Remote Authentication Dial In User Service
RDI	Remote Defect Indication
REJ	REJect
RFC	Request For Comments
RGQ	Rate Guaranteed Queueing
RIP	Routing Information Protocol
RIPng	Routing Information Protocol next generation
RMON	Remote Network Monitoring MIB
RPF	Reverse Path Forwarding
RQ	ReQuest
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
SMTP	Simple Mail Transfer Protocol
SNAP	Sub-Network Access Protocol
SNMP	Simple Network Management Protocol
SNP	Sequence Numbers PDU
SNPA	Subnetwork Point of Attachment
SOP	System Operational Panel
SPF	Shortest Path First
SSAP	Source Service Access Point
STP	Spanning Tree Protocol
TA	Terminal Adapter
TACACS+	Terminal Access Controller Access Control System Plus
TCP/IP	Transmission Control Protocol/Internet Protocol
TLA ID	Top-Level Aggregation Identifier
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
uRPF	unicast Reverse Path Forwarding
VAA	VLAN Access Agent
VLAN	Virtual LAN
VPN	Virtual Private Network
VRF	Virtual Routing and Forwarding/Virtual Routing and Forwarding Instance
VRRP	Virtual Router Redundancy Protocol
WAN	Wide Area Network
WDM	Wavelength Division Multiplexing
WFQ	Weighted Fair Queueing
WGQ	Weighted Guaranteed Queueing
WRED	Weighted Random Early Detection
WS	Work Station
WWW	World-Wide Web
XFP	10 gigabit small Form factor Pluggable

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.

Contents

PART 5: Layer 2 Switching

Chapter

1. Reading the Manual

Command description format
Specifiable values for parameters
List of character codes
Error messages displayed by the entry-error location detection functionality

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 *Operation when all parameters are omitted*.

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

Example

Provides examples of appropriate command usage.

Display items

Describes the display items generated by the example.

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

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

Item	Displayed information
Date	*yyyy/mm/dd hh:mm:ss timezone* year/month/day hour:minute:second time zone The time the command was accepted is displayed.

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 1-2: List of interface names assigned for input format

Input format	Interface name <*interface name*>
interface gigabitethernet	geth1/1 The numeric values represent <*nif no.*>/<*port no.*>.

Input format	Interface name <*interface name*>
interface tengigabitethernet	tengeth1/1 The numeric values represent <*nif no.*>/<*port no.*>.
interface vlan <*vlan id*>	VLAN0002 The last four digits represent <*vlan id*>.
interface loopback	loopback0 The numeric value represents <*loopback id*>.
interface null 0	null0
interface mgmt 0	MGMT0
interface async 1	ASYNC1

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 execution of the command.

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

The Switch assigns names to corresponding interfaces set by configuration. If <*interface name*> is shown in Response messages, the Switch displays any of the interface names listed in *Table 1-2: 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 1-3: Specifiable values for parameters

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 inbound1
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, IPv4 subnet mask	Specify these items in decimal format, separating 1-byte decimal values by periods (.).	192.168.0.14 255.255.255.0
Wildcard mask	The same input format as IPv4 addresses. The set bits in an IPv4 address represent an arbitrary value.	255.255.0.0
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 <nif no.> and <port no.> values

The following tables list the range of parameter <*nif no.*> and <*port no.*> values.

Table 1-4: Range of <nif no.> values

#	Model	Range of <*nif no.*> values
1	AX6708S	1 to 8
2	AX6604S	1 to 4
3	AX6608S	1 to 8
4	AX6304S	1 to 4
5	AX6308S	1 to 8

Table 1-5: Range of <port no.> values [AX6700S] [AX6600S]

#	NIF type name abbreviation	Range of <*port no.*> values
1	NK1G-24T	1 to 24
2	NK1G-24S	1 to 24

#	NIF type name abbreviation	Range of <*port no.*> values
3	NK1GS-8M	1 to 8
4	NK10G-4RX	1 to 4
5	NK10G-8RX	1 to 8

Table 1-6: Range of <port no.> values [AX6300S]

#	NIF type name abbreviation	Range of <*port no.*> values
1	NH1G-16S	1 to 16
2	NH1G-24T	1 to 24
3	NH1G-24S	1 to 24
4	NH1G-48T	1 to 48
5	NH1GS-6M	1 to 6
6	NH10G-1RX	1
7	NH10G-4RX	1 to 4
8	NH10G-8RX	1 to 8

How to specify <port list> and the range of the specifiable values

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

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

1/1-3,5

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

`*/*`: Specify all ports on a switch

`1/*`: Specify all ports on a switch whose NIF number is 1.

How to specify <vlan id list>

If <*vlan id list*> is written in the parameter input format, use a hyphen (-) or comma (,) to specify multiple VLAN IDs. You can also specify one VLAN ID, as when <*vlan id*> is written as the parameter input format. 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 <channel group list>

If <*channel group list*> is written in parameter input format, use a hyphen (-) or comma (,) to specify multiple channel group numbers. You can also specify one channel group number. The range of permitted values for the channel group number 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

List of character codes

Character codes are listed in the following table.

Table 1-7: List of character codes

Character	Code	Character	Code	Character	Code	Character	Code	Character	Code	Character	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	---	---

Note

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 functionality

The following table describes error messages output by the entry-error location detection functionality (see *5.2.3 Entry-error location detection functionality* in the manual *Configuration Guide Vol. 1 For Version 11.7*.)

Table 1-8: List of error messages output by the entry-error location detection functionality

#	Message	Description	Occurrence condition
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	The parameter entered at '^' has 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
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

Chapter 2. Switching the Command Input Mode

enable
disable
quit
exit
logout
configure (configure terminal)

enable

Changes the command input mode from user mode to administrator mode. In administrator mode, you can execute commands, such as the `configure` command, which cannot be input from user mode.

Syntax

```
enable
```

Input mode

User mode

Parameters

None

Example

Changes the command input mode from user mode to administrator mode.

```
> enable    Press the Enter key.
Password:******
#
```

If password authentication is successful, the administrator mode prompt (#) is displayed.

Display items

None

Impact on communication

None

Response messages

Table 2-1: List of response messages for the enable command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Login timed out after 60 seconds.	A timeout occurred because there was no password input within 60 seconds.
Sorry	The mode cannot be changed to administrator mode because a password entry error occurred.

Notes

- Initially, no password is set. To ensure better security, we recommend that you use the `password` command to set the password.
- This command cannot be executed on a standby system.

disable

Changes the command input mode from administrator mode to user mode.

Syntax

```
disable
```

Input mode

Administrator mode

Parameters

None

Example

Changes the command input mode from administrator mode to user mode.

```
#  disable    Press the Enter key.
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

quit

Ends the current command input mode as follows:

1. If you are in user mode, you are logged out.
2. If you are in administrator mode, the current mode ends, and you are returned to user mode. (The disable command can also be used.)

For details about operations in configuration command mode, see the manual *Configuration Command Reference*.

Syntax

```
quit
```

Input mode

User mode, administrator mode, and configuration command mode

Parameters

None

Example

Ends administrator mode and returns to user mode.

```
# quit    Press the Enter key.
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

exit

Ends user mode or administrator mode and logs out from the device.

For details about operations in configuration command mode, see the manual *Configuration Command Reference*.

Syntax

```
exit
```

Input mode

User mode, administrator mode, and configuration command mode

Parameters

None

Example

Ends administrator mode and logs out from the device.

```
# exit    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

Use the `disable` command to return the command input mode from administrator mode to user mode.

logout

Logs out from the device.

Syntax

```
logout
```

Input mode

User mode and administrator mode

Parameters

None

Example

In administrator mode, logs out from the command input mode.

```
# logout    Press the Enter key.
login:
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

configure (configure terminal)

Changes the command input mode from administrator mode to configuration command mode, and starts configuration editing.

Syntax

```
configure [terminal]
```

Input mode

Administrator mode

Parameters

terminal

Enables editing of the running configuration stored in memory.

Example

Changes the command input mode to configuration command mode.

```
# configure    Press the Enter key.
(config)#
```

Display items

None

Impact on communication

None

Response messages

For details about error messages displayed during configuration editing, see *21.1.2 Editing configurations and operation information* in the manual *Configuration Command Reference Vol. 1 For Version 11.7*.

Notes

1. The device starts operation based on the settings in the startup configuration file that is read into memory at power up. The running configuration stored in memory is the file subject to editing. Note that if you do not save the settings to the startup configuration file after editing the running configuration stored in memory, the configuration settings will be lost when the device is restarted. We recommend that you execute the `save` configuration command to save the settings to the startup configuration file after editing.
2. By using the `status` configuration command, you can check the status of the configuration being edited.
3. Do not interrupt the `configure` command by pressing **Ctrl** + **C** before the command processing finishes. If you do so, the `copy`, `erase configuration`, `synchronize`, and `redundancy force-switchover` commands might result in an error.

   If an error occurs, use this command to switch to configuration command mode, and then use the `end` configuration command to end the configuration command mode. If the user who interrupted the processing has logged out, use the `show logging` command to check the user's tty name, and then log in with that tty name. After that, use this command to switch to configuration command mode, and then use the `end` configuration command to end the configuration command mode.

Chapter

3. Terminals and Remote Operations

set exec-timeout
set terminal help
set terminal pager
show history
telnet
ftp
tftp

set exec-timeout

Sets the idle time (in minutes) for auto-logout (see *4.3(3) Auto-logout* in the manual *Configuration Guide Vol. 1 For Version 11.7*). This setting can be configured for each user.

Syntax

```
set exec-timeout <minutes>
```

Input mode

User mode and administrator mode

Parameters

<minutes>

This parameter specifies the idle time for auto-logout in minutes. The specifiable values are from 0 to 60.

If 0 is specified, auto-logout does not apply. The default for an initial installation is 60 minutes.

Example

Sets the auto-logout value to 30 minutes.

```
> set exec-timeout 30    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

1. To synchronize the settings for auto-logout configured using this command on a standby system, execute the `synchronize` command with the `userfile` or `account` parameter specified.
2. If an account added by the `adduser` command with the `no-flash` parameter specified configures the settings using this command, they revert to the default (60 minutes) when the device is restarted.
3. If any of `exec-timeout`, `terminal-pager`, or `terminal-help` is set for the `username` configuration command, the corresponding user operates with the `exec-timeout` setting value (specified value, or default value when the parameter is omitted) in the configuration.
4. A user operating with the settings of the `username` configuration command can also temporarily change operations only in the target session by executing this command after login.

set terminal help

Selects the type of command help messages to be displayed. This setting can be configured for each user.

Syntax

```
set terminal help { all | no-utility }
```

Input mode

User mode and administrator mode

Parameters

all

Enables help messages for all permissible operation commands to be displayed. This setting is the default for initial installation.

no-utility

Enables help messages for all operation commands except for utility commands and file operation commands to be displayed.

Example

- Enables help messages for all permissible operation commands to be displayed.
  ```
  > set terminal help all    Press the Enter key.
  ```

- Enables help messages for all permissible operation commands except for utility commands and file operation commands to be displayed.
  ```
  > set terminal help no-utility    Press the Enter key.
  ```

Display items

None

Impact on communication

None

Response messages

None

Notes

1. To synchronize the settings for help message display configured using this command on a standby system, execute the `synchronize` command with the `userfile` or `account` parameter specified.
2. If an account added by the `adduser` command with the `no-flash` parameter specified configures the settings using this command, they revert to the default (all) when the device is restarted.
3. If any of `exec-timeout`, `terminal-pager`, or `terminal-help` is set for the `username` configuration command, the corresponding user operates with the `terminal-help` setting value (specified value, or default value when the parameter is omitted) in the configuration.
4. A user operating with the settings of the `username` configuration command can also temporarily change operations only in the target session by executing this command after login.

set terminal pager

Specifies whether to perform paging (see *5.2.8 Paging* in the manual *Configuration Guide Vol. 1 For Version 11.7*). This setting can be configured for each user.

Syntax

```
set terminal pager [{ enable | disable }]
```

Input mode

User mode and administrator mode

Parameters

{ enable | disable }

enable

Paging is performed. This setting is the default for initial installation.

disable

Paging is not performed.

Operation when this parameter is omitted:

Paging is performed.

Example

- Paging is not performed.
```
> set terminal pager disable    Press the Enter key.
```

- Paging is performed.
```
> set terminal pager enable    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

1. To synchronize the settings for paging configured using this command on a standby system, execute the `synchronize` command with the `userfile` or `account` parameter specified.
2. If an account added by the `adduser` command with the `no-flash` parameter specified configures the settings using this command, they revert to the default (enable) when the device is restarted.
3. If any of `exec-timeout`, `terminal-pager`, or `terminal-help` is set for the `username` configuration command, the corresponding user operates with the `terminal-pager` setting value (specified value, or default value when the parameter is omitted) in the configuration.
4. A user operating with the settings of the `username` configuration command can also temporarily change operations only in the target session by executing this command after login.

show history

Displays a log of operation commands executed in the past. When this command is executed in user mode or administrator mode, logs of configuration commands are not displayed.

When this command is prefixed with a dollar sign ($) and executed in configuration command mode, logs of configuration commands are displayed.

Syntax

```
show history
```

Input mode

User mode and administrator mode

Parameters

None

Example

The following is an example of executing the `show history` command:

```
>  show history    Press the Enter key.
    1 show system
    2 show interfaces
    3 show logging
    4 show history
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

telnet

Connects a virtual terminal to the remote operation terminal that has the specified IP address.

Syntax

`telnet <`*host*`> [{/ipv4 | /ipv6}][/source-interface <`*source address*`>][/vrf <`*vrf id*`>][<`*port*`>]`

Input mode

User mode and administrator mode

Parameters

<*host*>

Specifies the destination host name or IP address. An IPv4 address, IPv6 address, or IPv6 address with an interface name (only a link-local address) can be specified as the IP address.

When `/vrf <`*vrf id*`>` is specified, the destination host name cannot be specified to <*host*>.

{/ipv4 | /ipv6}

/ipv4

Establishes a connection via IPv4 only.

/ipv6

Establishes a connection via IPv6 only.

/source-interface <*source address*>

Configures a source IP address connected via Telnet. An IPv4 or IPv6 address can be specified as an IP address.

Operation when this parameter is omitted:

The source IP address selected by the Switch is used.

/vrf <*vrf id*> [OP-NPAR]

Connects to the specified VRF. For <*vrf id*>, specify the VRF ID set by a configuration command.

Operation when this parameter is omitted:

Connects to global network.

<*port*>

Specifies a port number.

Operation when this parameter is omitted:

23 is used for the port number.

Operation when all parameters are omitted:

Connects to specified <*host*> in global networks.

Example

1. Accesses the remote operation terminal whose IP address is 192.168.0.1 via Telnet.
   `> telnet 192.168.0.1    Press the` **`Enter`** `key.`

   After the `telnet` command is executed, the following message indicating that you will need to wait for the connection with the remote operation terminal to be established is displayed.

```
Trying 192.168.0.1 ...
```

When the connection is established, the following messages are displayed. If the connection is not established within 30 seconds, it reverts to command input mode.

```
Connected to 192.168.0.1
Escape character is '^]'.
```

2. After the connection is established, you can enter the login name and password.

```
login: username    Press the Enter key.
Password: ********    Press the Enter key.
```

3. Accesses the remote operation terminal whose IPv6 address is 3ffe:1:100::250 via Telnet.

```
> telnet 3ffe:1:100::250
Trying 3ffe:1:100::250...
```

Display items

None

Impact on communication

None

Response messages

Table 3-1: List of response messages for the telnet command

Message	Description
<*host*>: hostname nor servname provided, or not known	The address specified for the host or the connection method specified by option are invalid or inconsistent. <*host*>: Remote host
<*host*>: No address associated with hostname	The connection to the host could not be established because the address could not be resolved. <*host*>: Remote host
bind: Can't assign requested address	An invalid source IP address has been set.
bind: Invalid argument	An invalid source IP address has been set.
Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
connect to address <*host*>: Connection refused	The host rejected the connection. <*host*>: Remote host
connect to address <*host*>: No route to host	The connection to the host cannot be established because no route exists. <*host*>: Remote host
connect to address <*host*>: Operation timed out	The connection timed out. <*host*>: Remote host
Connected to <*host*>.	A connection to <*host*> was established. <*host*>: Remote host
Connection closed by foreign host.	The connection was closed from the host.
Trying <*host*>...	Trying to connect to <*host*>. <*host*>: Remote host
Unable to connect to remote host	The connection to the host could not be established.
Unable to connect to remote host: Connection refused	The host rejected the connection.

Message	Description
Unable to connect to remote host: Operation timed out	The connection timed out.

Notes

- To interrupt the processing while `Trying...` is displayed, press the **Ctrl** + **C** keys.
- After a connection is established, to halt execution of this command while the login prompt is displayed, press the **Ctrl** + **D** keys.
- This command sends the input key codes to the login destination remote device without making any modifications. Therefore, the key code output by the terminal on which this command is entered must be the same as the key code required by the destination terminal. If they are different, the command will not operate correctly. For example, as the input key code for the carriage return control code (the **Enter** key), some terminals generate 0x0D or 0x0D0A, whereas other terminals need to receive 0x0D or 0x0A to recognize a carriage return control code from the login destination terminal. Check key code compatibility beforehand.
- When the escape character ^] (**Ctrl** +**]** keys) is entered while a connection is being established, the mode switches to telnet> mode. In this mode, inputting `quit` ends the `telnet` command (If a connection is established, it is closed). To exit from telnet> mode, enter just a line feed without any other character.

ftp

Transfers files between the Switch and a remote operation terminal connected via TCP/IP.

Syntax

```
ftp [<host> [{/ipv4 | /ipv6}][/source-interface <source address>]][/vrf <vrf id>]
```

Input mode

User mode and administrator mode

Parameters

<host>

Specifies the IP address of the remote operation terminal. An IPv4 address, IPv6 address, or IPv6 address with an interface name (only a link-local address) can be specified as the IP address.

Operation when this parameter is omitted:

Displays the `ftp` prompt. In this state, a connection to the remote operation terminal has not been established. Use the `open` command to establish the connection.

{/ipv4 | /ipv6}

/ipv4

Establishes a connection via IPv4 only.

/ipv6

Establishes a connection via IPv6 only.

Operation when this parameter is omitted:

Establishes a connection via IPv4 or IPv6.

/source-interface *<source address>*

Configures the source IP address used for connection via FTP. An IPv4 or IPv6 address can be specified as an IP address.

Operation when this parameter is omitted:

The source IP address selected by the Switch is used.

/vrf *<vrf id>* [OP-NPAR]

Connects to the specified VRF. For *<vrf id>*, specify the VRF ID set by a configuration command.

Operation when this parameter is omitted:

Connects to global network.

Operation when all parameters are omitted:

Displays the `ftp` prompt. In this state, a connection to the remote operation terminal has not been established. Use the `open` command to establish the connection.

Example

Logs in to the remote operation terminal whose IP address is 192.168.0.1.

```
> ftp 192.168.0.1    Press the Enter key.
```

After the `ftp` command is executed, wait for the connection to the remote operation terminal to be established. When the connection is established, the input prompt (see steps 1 and 2 below) is

displayed. If a connection is not established, the state is changed to ready for command input.

1. Entering the login name:

   The following prompt is displayed on the command line. Enter the login name for the remote operation terminal, and then press the **Enter** key.
   ```
   Name:
   ```

2. Entering the password:

   The following prompt is displayed on the command line. Enter the password for the specified login name, and then press the **Enter** key.
   ```
   Password:
   ```

3. Entering a file transfer command:

   The following prompt is displayed on the command line.
   ```
   ftp>
   ```

   Enter a file transfer command according to the transfer direction, and then press the **Enter** key.

   The input format of the file transfer commands is as follows:

   get <*remote-file*> [<*local-file*>]

   Transfers a file from the remote operation terminal to the Switch. If <*local-file*> is omitted, the file name becomes the name of the file on the remote operation terminal.

   mget <*remote-files*>

   Use this command to receive multiple files. Enter the command in the format `mget *.txt`.

   put <*local-file*> [<*remote-file*>]

   Transfers a file from the Switch to the remote operation terminal. If <*remote-file*> is omitted, the file name becomes the name of the file on the Switch.

   mput <*local-files*>

   Use this command to send multiple files. Enter the command in the format `mput *.txt`.

4. Entering a command other than a file transfer command:

   If the prompt `ftp>` is displayed, the following commands can be executed in addition to the `get` and `put` commands:

   ascii

   Sets ASCII as the transfer format of the file.

   binary

   Sets binary as the transfer format of the file.

   [bye | quit | exit]

   Ends the FTP session, and then the `ftp` command.

   cd <*remote-directory*>

   Changes the current directory on the remote operation terminal to <*remote-directory*>.

   cdup

   Changes the current directory on the remote operation terminal to the next higher level.

   chmod <*mode*> <*remote-file*>

Changes the attribute of the file specified by <*remote-file*> on the remote operation terminal to the attribute specified for <*mode*>.

close

Ends the FTP session, and then displays the prompt `ftp>` waiting for command input.

debug

Enables (on) or disables (off) the use of debug output mode. The default is off.

delete <*remote-file*>

Deletes <*remote-file*> on the remote operation terminal.

hash

Enables (on) or disables (off) the use of hash display (# is displayed every 1024 `bytes`) during data transfer. The default is off.

help [<*command*> | ? <*command*>]

Displays Help for the command specified by the argument <*command*>. If no argument is specified, a list of available commands is displayed.

lcd [<*directory*>]

Changes the current directory on the Switch. If <*directory*> is omitted, the current directory moves to the home directory for the user.

lols [<*local-directory*>]

Lists the contents of <*local-directory*> (current directory if <*local-directory*> is not specified) of the Switch.

[lopwd | lpwd]

Displays the current directory of the Switch.

lpage <*local-file*>

Displays the contents of <*local-file*> on the Switch.

ls [<*remote-directory*>] [<*local-file*>]

Lists the contents of <*remote-directory*> (current directory if <*remote-directory*> is not specified) on the remote operation terminal. If <*local-file*> is specified, the contents to be displayed are stored in the file.

mdelete [<*remote-files*>]

Deletes <*remote-files*> on the remote operation terminal.

mkdir <*directory-name*>

Creates a directory on the remote operation terminal.

more [<*remote-file*> | page <*remote-file*>]

Displays the contents of <*remote-files*> on the remote operation terminal.

open <*host*> [<*port*>]

Establishes a connection to the FTP server with the specified address. When a port number (option) is specified, the `ftp` command tries to connect to the FTP server on the specified port.

passive

Enables (on) or disables (off) the use of passive transfer mode. The default is off.

progress

Enables (on) or disables (off) the use of a transmission progress display bar. The default is on.

prompt

Enables (on) or disables (off) the use of interactive mode prompt. When you transfer multiple files, if this prompt is enabled (on), the files can be selected separately. If the prompt is off, the specified files are transferred unconditionally by the `mget` or `mput` command, and they are deleted unconditionally by the `mdelete` command. The default is on.

pwd

Displays the current directory on the remote operation terminal.

rename <*from-name*> <*to-name*>

Changes the name of a file on the remote operation terminal from <*from-name*> to <*to-name*>.

rmdir <*directory-name*>

Deletes a directory on the remote operation terminal.

status

Displays the current FTP status.

verbose

Enables (on) or disables (off) the use of redundant output mode. If redundant output mode is on, all responses from the FTP server are displayed for the user. In addition, when file transfer is completed, the statistics of the data transfer are displayed. The default is on.

Display items

None

Impact on communication

None

Response messages

Table 3-2: List of response messages for the ftp command

Message	Description
?Ambiguous command	Multiple commands contain the specified characters.
?Ambiguous help command <*command*>	Multiple help commands correspond to the specified characters. <*command*>: Command name
?Invalid command	The specified command could not be found.
<*file name*>: No such file OR directory	The specified file or directory could not be found. <*file name*>: The specified file name or directory name
<*host*>: bad port number -- <*port*>usage: open host-name [port]	An invalid port number was input. <*port*>: Port number
<*host*>: Host name lookup failure	An unknown host name was input. <*host*>: Remote host
<*host*>: hostname nor servname provided, or not known	The address specified for the host or the connection method specified by option are invalid or inconsistent. <*host*>: Remote host

Message	Description
<*host*>: Unknown host	An unknown host name was input. <*host*>: Remote host IP address
Already connected to <*host*>, use close first.	Communication with the remote device has already been established. To connect to another host, use the (ftp) `close` command or (ftp) `quit` command to stop the communication. <*host*>: Remote host IP address
bind: Can't assign requested address	An invalid source IP address has been set.
bind: Invalid argument	An invalid source IP address has been set.
Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
connect to address <*host*>: Connection refused	The host rejected the connection. <*host*>: Remote host
connect to address <*host*>: No route to host	The connection to the host cannot be established because no route exists. <*host*>: Remote host
connect to address <*host*>: Operation timed out	The connection timed out. <*host*>: Remote host
connect: Connection refused	Connection has failed.
connect: No route to host	A connection cannot be established because the routing table to the remote host does not exist.
connect: Operation timed out	The connection timed out.
Connected to <*host*>.	A connection to <*host*> was established. <*host*>: Remote host
Login failed.	A login attempt has failed.
No address associated with hostname	The connection to the host could not be established because the address could not be resolved.
No control connection for command: Bad file descriptor	The command could not be executed because the control connection with the remote host was lost.
Not connected.	No remote communication.
quit for Ctrl+Z pushed.	The `ftp` command was ended by pressing the **Ctrl** + **Z** keys.
Service not available, remote server has closed connection	The command could not be executed because the connection was closed on the remote host.
Trying <*host*>...	Trying to connect to <*host*>. <*host*>: Remote host

Notes

1. A user ID whose password is not set on the destination terminal might not be able to log in via FTP. If this occurs, set the password on the destination terminal, and then execute the `ftp` command again.
2. If commands cannot be input, enter the **Ctrl** + **Z** keys to exit.
3. When commands are executed from the Switch to an IPv4 host after login through FTP, a message `500 'EPRT |1|`*xx.xx.xx.xx*`|xxxx|':command not found` (*xx.xx.xx.xx*`|xxxx` represents IPv4 address`|` port number of the Switch) might be displayed. It does not affect operations.

tftp

Transfers files between the Switch and a connected remote operation terminal by using UDP. This functionality is used for transferring update files to TFTP servers that support TFTP Option Extension (RFC2347, 2348, 2349).

Syntax

`tftp [<`*host*`> [{/ipv4 | /ipv6}][/source-interface <`*source address*`>] [/vrf <`*vrf id*`>] [<`*port*`>]]`

Input mode

User mode and administrator mode

Parameters

<host>

Specifies a remote operation terminal. A host name, IPv4 address, IPv6 address, or IPv6 address with an interface name (only a link-local address) can be specified.

Operation when this parameter is omitted:

Displays the `tftp` prompt. In this state, a remote operation terminal has not been specified. Use the `connect` command to specify a remote operation terminal.

{/ipv4 | /ipv6}

/ipv4

Establishes a connection via IPv4 only.

/ipv6

Establishes a connection via IPv6 only.

Operation when this parameter is omitted:

Establishes a connection via IPv4 or IPv6.

/source-interface *<source address>*

Configures the source IP address used for connection via TFTP. IPv4 or IPv6 address can be specified.

Operation when this parameter is omitted:

The source IP address selected by the Switch is used.

/vrf *<vrf id>* [OP-NPAR]

Connects to the specified VRF. For *<vrf id>*, specify the VRF ID set by a configuration command.

If you specify a host name for *<host>*, this parameter cannot be specified.

Operation when this parameter is omitted:

Connects to global network.

<port>

Specifies the port number of the connection destination.

Operation when this parameter is omitted:

69 is used for the port number.

Operation when all parameters are omitted:

Displays the `tftp` prompt. In this state, a connection to the remote operation terminal has not been established. Use the `connect` command to establish the connection.

Example

Files are sent to and received from the remote operation terminal whose IP address is 192.168.0.1.

```
> tftp 192.168.0.1    Press the Enter key.
```

After executing the `tftp` command, communication with the remote operation terminal is not actually started, and the `tftp` prompt is displayed. Even if the specified connection destination has a problem, an error is output, and then the `tftp` prompt is displayed. In this case, use the `connect` command to reset the connection destination, or use the `quit` command to end the `tftp` command.

1. Entering a file transfer command:

   The following prompt is displayed on the command line.
   `tftp>`

   Enter a file transfer command according to the transfer direction, and then press the **Enter** key.

   The input format of the file transfer commands is as follows:

   get <*remote-file*> [<*local-file*>]

   Transfers a file from the remote operation terminal to the Switch. If <*local-file*> is omitted, the file name becomes the name of the file on the remote operation terminal.

   put <*local-file*> [<*remote-file*>]

   Transfers a file from the Switch to the remote operation terminal. If <*remote-file*> is omitted, the file name becomes the name of the file on the Switch.

2. Entering a command other than a file transfer command:

   If the prompt `tftp>` is displayed, the following commands can be executed in addition to the `get` and `put` commands:

   connect <*host*> [port]

   Connects to the TFTP server with the specified address. The port number of the connection destination can also be specified.

   mode

   Checks the current file transfer format.

   quit

   Ends the `tftp` command.

   trace

   Enables (on) or disables (off) the use of trace output mode. If the trace output mode is on, traces of packets transferred to the TFTP server are displayed. The default is off.

   status

   Displays statuses such as file transfer format, connection destination, and timeout.

   binary

   Sets binary (octet) as the file transfer format (default).

   ascii

   Sets ascii (netascii) as the file transfer format.

   ? [<*command*>]

Displays Help for the command specified by the argument <*command*>. If no argument is specified, a list of available commands is displayed.

Display items

None

Impact on communication

None

Response messages

Table 3-3: List of response messages for the tftp command

Message	Description
?Invalid command	The specified command could not be found.
?Invalid help command <*command*>	The help command applicable to the specified characters could not be found. <*command*>: Command name
Cannot specify hostname with VRF	VRF and a host name cannot be specified at the same time.
Error code <*number*>: <*message*>	Displaying other TFTP error messages: <*number*>: Error code <*message*>: Error description
Error code 1: File not found	The specified file could not be found.
Error code 2: Access violation	The specified file could not be accessed.
Error code 3: Disk full or allocation exceeded	The disk is full or allocation exceeds the limit.
Error code 6: File already exists	The file already exists.
getting from <*host*>:<*remote file*> to <*local file*> [<*mode*>]	Receiving <*remote file*> on <*host*> as <*local file*> (the transfer mode is <*mode*>). <*host*>: Remote host <*remote file*>: Remote file name <*local file*>: Local file name <*mode*>: File transfer mode
No target machine specified, Use connect command.	The connection destination has not been set. Use the `connect` command to set it.
putting <*local file*> to <*host*>:<*remote file*> [<*mode*>]	Sending <*local file*> to <*host*> as <*remote file*> (the transfer mode is <*mode*>). <*local file*>: Local file name <*host*>: Remote host <*remote file*>: Remote file name <*mode*>: File transfer mode
quit for Ctrl+Z pushed.	The `tftp` command was ended by pressing the **Ctrl** + **Z** keys.
tftp: <*file name*>: Is a directory	The specified file is a directory. <*file name*>: File name
tftp: <*file name*>: Permission denied	Access permission for the specified file does not exist. <*file name*>: File name
tftp: bind: Can't assign requested address	An invalid source IP address has been set.
tftp: bind: Invalid argument	An invalid source IP address has been set.
tftp: No address associated with hostname	The connection to the host could not be established because the address could not be resolved.

Message	Description
tftp: sendto: No route to host	The connection to the remote host cannot be established because no route exists.
tftp: servname not supported for ai_socktype	An invalid port number was input.
Transfer timed out.	Transfer timed out. Check the route to the server or the server settings.

Notes

- Immediately after executing the `tftp` command or specifying the connection destination by using the `connect` command in tftp> mode, no communication is actually performed except that the address of the connection destination server is obtained. When the `get` or `put` command is specified in tftp> mode, communication is started. Communication errors such as no route are also output at this time.
- If proper permissions for accessing or writing data are not configured on the TFTP server, errors such as Access violation are output, and transfer fails.
- If commands cannot be input, enter the **Ctrl** + **Z** keys to exit.
- Use TFTP servers that support TFTP Option Extension (RFC2347, 2348, 2349) for a connection destination. TFTP (RFC1350) servers that do not support TFTP Option Extension cannot accept large files such as an update file, resulting in an error (Transfer timed out.) normally.

Chapter

4. Configurations and File Operations

show running-config (show configuration)
show startup-config
copy
erase configuration
show file
cd
pwd
ls
dir
cat
cp
mkdir
mv
rm
rmdir
delete
undelete
squeeze

show running-config (show configuration)

Displays the running configuration.

Syntax

```
show running-config
show configuration
```

Input mode

Administrator mode

Parameters

None

Example and display items

None

Impact on communication

None

Response messages

For details about error messages displayed during configuration editing, see *21.1.2 Editing configurations and operation information* in the manual *Configuration Command Reference Vol. 1 For Version 11.7*.

Notes

1. If there are many items in the running configuration, command execution might take some time.
2. If the configuration is edited, the `copy` command is executed, or NIF insertion is performed while this command is being executed, this command might be aborted.
3. When software is updated, the last-modified time displayed on the first line before and after the switch is restarted might be slightly inaccurate.

   If you restart the switch after software is updated without saving the startup configuration, the time at which the switch was restarted is displayed as the last-modified time on the first line.

show startup-config

Displays the startup configuration used at device startup.

Syntax

```
show startup-config
```

Input mode

Administrator mode

Parameters

None

Example and display items

None

Impact on communication

None

Response messages

For details about error messages displayed during configuration editing, see *21.1.2 Editing configurations and operation information* in the manual *Configuration Command Reference Vol. 1 For Version 11.7*.

Notes

If the configuration is edited, the `copy` command is executed, or NIF insertion is performed while this command is being executed, this command might be aborted.

copy

Copies a configuration.

Syntax

`copy` <*source file*> <*target file*> `[debug]`

Input mode

Administrator mode

Parameters

<*source file*>

Specifies the copy-source configuration file or configuration.

<*source file*> can be specified in the following formats:

<*file name*>

- Specify a local configuration file

  Specify the name of the file in the switch.

- Specify a remotely-stored configuration file.

  The following URL formats can be specified:

  FTP

  ftp://[<*user name*>[:<*password*>]@]<*host*>[:<*port*>]/<*file path*>

  TFTP

  tftp://<*host*>[:<*port*>]/<*file path*>

  HTTP

  http://[<*user name*>[:<*password*>]@]<*host*>[:<*port*>]/[<*file path*>]

  <*user name*>: User name on the remote server

  <*password*>: Password for the remote server

  <*host*>: Specifies the name or IP address of the remote server.

  To use an IPv6 address, it needs to be enclosed in [ ] parentheses.

  (Example) [2001:240:400::101]

  <*port*>: Specifies a port number.

  <*file path*>: Specifies the path to the file on the remote server.

  If <*user name*> and <*password*> are omitted when ftp or http is specified, anonymous login is performed. If <*password*> is omitted, a prompt is displayed requesting the password.

`running-config`: Running configuration

`startup-config`: Startup configuration file

<*target file*>

Specifies the copy-destination configuration file or configuration.

As was the case for <*source file*> (above), <*file name*>, `running-config`, and `startup-config` can be specified. However, the same format as that specified for <*source file*> cannot be specified for <*target file*> (For example, for a file-to-file copy, `copy` <*file name*> <*file name*> cannot be specified).

Also, HTTP specification for <*target file*> is not supported.

debug

Displays details on the communication status when a remote file is specified.

When the error `Data transfer failed.` occurs when accessing a remote file, if you re-execute the command with this debug parameter specified, then you can see details about the error such as server responses.

Operation when this parameter is omitted:

Details about communication status are not displayed.

Example

- Copy the running configuration to the startup configuration.

```
# copy running-config startup-config
  Configuration file copy to startup-config?(y/n):y
```

- Save the running configuration to a file on a remote server.

```
# copy running-config ftp://staff@[2001:240:400::101]/backup.cnf
  Configuration file copy to ftp://staff@[2001:240:400::101]/backup.cnf?
  (y/n): y

  Authentication for 2001:240:400::101.
  User: staff
  Password: xxx  (Enter the password stored on the remote server for the user
account "staff".)
  transferring

  Data transfer succeeded.
#
```

Display items

None

Impact on communication

If you do a copy that changes the running configuration, the operating port restarts.

Response messages

Table 4-1: List of response messages for the copy command

Message	Description
Configuration file already exist. Configuration file copy to <*target file*>? (y/n):	That copy-destination file name already exists. This message asks for confirmation on whether or not to overwrite the file. Entering y performs the copy. Entering n aborts the copy.
Configuration file copy to <*target file*>? (y/n):.	This message asks for confirmation on whether or not to copy a file to the copy-destination file name. Entering y performs the copy. Entering n aborts the copy.

For details about error messages displayed during configuration editing, see *21.1.2 Editing configurations and operation information* in the manual *Configuration Command Reference Vol. 1 For Version 11.7*.

Notes

1. You cannot copy to a running configuration while the running configuration is being edited. Execute the copy command after the edit is completed.
2. When the running configuration is updated, the edited contents of the configuration are also updated.
3. Editing the startup configuration has no effect on the running configuration or communication.
4. If you do not have writing permission for the save destination file, your edits cannot be saved to the file. To save edits to a file on a remote server, change the settings to allow you to write on the remote server.
5. If you copy a configuration to the running configuration, the specified configuration becomes the running configuration. Note that if you were logged in via the network, the operating port is restarted.
6. If you copy a configuration file created using a different editor, or created for a device whose device configuration is different, operation might be unstable even if the copy command completes normally. Before copying, confirm that the configuration file contents and interface definitions to be applied are appropriate for the capacity limit of the device and that there is sufficient space for the new configuration file. If you perform a copy by mistake, use the `erase configuration` command to reset the configuration, and then edit it again.
7. If there is insufficient free space for storing files, a configuration cannot be copied. Use the `show mc` command to check the free space in the user area. The necessary space required for copying a configuration is the total size of the new configuration in the copy source and the existing configuration in the copy destination. About 2 MB of free capacity is required for a maximum-size configuration file.
8. When specifying the URL format, we recommend that you omit <*password*> when executing the command. The executed command is recorded in operation logs, and might be referenced by other users. To ensure security, we recommend that you omit <*password*> and input the password by using the inquiry prompt.
9. In the URL notation, a single `/` located between the <*host*> specification and the <*filepath*> specification is not included as a path component. For example, to specify `/usr/home/staff/a.cnf` on the FTP remote server, specify `ftp://`<*host*>`//usr/home/staff/a.cnf`.
10. When the copy source is a running configuration, and the copy destination is a startup configuration, the same processing as that for the `save` command is performed.
11. When the command is executed with `startup-config` specified as the copy source and with `running-config` specified as the copy destination, the interface configuration is changed depending on the interface ports equipped.
12. When the command is executed with a parameter other than `startup-config` specified as the copy source and with `running-config` specified as the copy destination, if an interface configuration that specifies not-equipped ports is designated as the copy source, execution of the `copy` command fails.

erase configuration

Resets startup configuration and running configuration to the defaults.

Syntax

```
erase configuration
```

Input mode

Administrator mode

Parameters

None

Example

```
#erase configuration
Do you wish to erase both running-config and startup-config? (y/n):
#
```

Display items

None

Impact on communication

When this command is executed, all operating ports stop all operations.

Response messages

Table 4-2: List of response messages for the erase configuration command

Message	Description
Do you wish to erase both running-config and startup-config? (y/n):	This message asks you to confirm whether you want to reset the current startup configuration file and running configuration file to the defaults. Entering `y` resets those files to the default. Entering `n` aborts the `erase` command.

For details about error messages displayed during configuration editing, see *21.1.2 Editing configurations and operation information* in the manual *Configuration Command Reference Vol. 1 For Version 11.7*.

Notes

1. This command cannot be used while the configuration is being edited. Use this command to reset the configuration file to the default, after the configuration edit is completed.
2. When this command is executed, the operating ports stop all operations. You need to be careful if you logged in via a network because the session is terminated by executing this command.

show file

Shows the contents and line numbers of a local or remote server file. For connection via FTP, specify a directory with / specified at the end of the file path to get and display the directory list.

Syntax

`show file <file name> [debug]`

Input mode

User mode and administrator mode

Parameters

<file name>

Specifies the following items as file names to be displayed.

- Local file specification

  Specify the name of the file in the switch.

- Remote file specification

  Specifies the following types of URLs:

  FTP

  ftp://[<*user name*>[:<*password*>]@]<*host*>[:<*port*>]/<*filepath*>

  TFTP

  tftp://<*host*>[:<*port*>]/<*filepath*>

  HTTP

  http://[<*user name*>[:<*password*>]@]<*host*>[:<*port*>]/[<*filepath*>]

  <*user name*>: User name on the remote server

  <*password*>: Password for the remote server

  <*host*>: Specifies the name or IP address of the remote server.

  To use an IPv6 address, it needs to be enclosed in [ ] parentheses.

  (Example) [2001:240:400::101]

  <*port*>: Specifies a port number.

  <*filepath*>: Specifies the path to the file on the remote server.

  If <*user name*> and <*password*> are omitted when ftp or http is specified, anonymous login is performed. If <*password*> is omitted, a prompt is displayed requesting the password.

debug

Displays details on the communication status when a remote file is specified.

When the error `Data transfer failed.` occurs when accessing a remote file, if you re-execute the command with this debug parameter specified then you can see details about the error such as server responses.

Operation when this parameter is omitted:

Details about communication status are not displayed.

Example

- Show the information of a file on the remote server.

```
> show file ftp://staff@[2001:240:400::101]/backup.cnf
Date 2009/01/20 12:00:00 UTC

Authentication for 2001:240:400::101.
User: staff
Password: xxx (Enter the password stored on the remote server for the user
account "staff".)
transferring

interface gigabitethernet 0/1
  switchport mode access
!

### Total 3 lines.
>
```

- Show the information of a directory on a remote server.

```
> show file ftp://staff@[2001:240:400::101]//usr/home/staff/
Date 2009/01/20 12:00:00 UTC

Authentication for 2001:240:400::101.
User: staff
Password: xxx (Enter the password stored on the remote server for the user
account "staff".)
transferring

### List of remote directory.
total 9
-rw-------  1 staff user   34 Dec  8 11:31 .clihihistory
-rw-------  1 staff user  408 Dec  8 12:32 .clihistory
-rw-------  1 staff user    0 Dec  8 12:32 .history
-rw-r--r--  1 staff user  109 Dec  8 10:02 .login
-rw-r--r--  1 staff user  268 Dec  8 10:02 .tcshrc
-rw-r--r--  1 staff user   34 Dec 12 12:62 backup.cnf
>
```

Display items

None

Impact on communication

None

Response messages

Table 4-3: List of response messages for the show file command

Message	Description
### List of remote directory.	Gets and displays the list of the specified directory.
### Total <*number*> lines.	The number of lines of the displayed file is <*number*> lines.
Data transfer failed. (<*reason*>)	File transfer from the remote server failed. <*reason*>: Additional information Re-execute the command with the `debug` parameter specified for checking.

Notes

1. Specify ASCII text files as the files to be displayed. Do not specify files that cannot be

displayed by terminals, such as binary-format files. If such files are specified, the display might be distorted or display invalid characters. In this case, log in to the Switch again, or reset the terminal.

For HTTP transfers, such files might be discarded partway through the transfer, the transfer might result in the error `Data transfer failed.`, and download might not be performed.

2. When specifying the URL format with <*file name*>, we recommend that you omit the <*password*> when executing the command. The executed command is recorded in operation logs, and they might be checked by other users. To ensure security, we recommend that you omit <*password*> and input the password by using the inquiry prompt.
3. For access via FTP, specify a directory with `/` specified at the end of the file path to get and display the directory list.
4. In the URL notation, a single `/` located between the <*host*> specification and the <*filepath*> specification is not included as a path component. For example, to specify `/usr/home/staff/a.cnf` on the FTP remote server, specify `ftp://`<*host*>`//usr/home/staff/a.cnf`.

cd

Changes the directory.

Syntax

`cd [<directory>]`

Input mode

User mode and administrator mode

Parameters

<directory>

Specifies the name of the destination directory.

Operation when this parameter is omitted:

Moves to the home directory of the current logged-in user.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

pwd

Shows the path to the current directory.

Syntax

```
pwd
```

Input mode

User mode and administrator mode

Parameters

None

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

ls

Shows the files and directories that exist in the current directory.

Syntax

```
ls [<option>] [<names>]
ls mc-dir
```

Input mode

User mode and administrator mode

Parameters

<option>

`-a`: Shows all contents of the current directory including hidden files.

`-l`: Shows detailed information related to files and directories.

Operation when this parameter is omitted:

Hidden files and detailed information are not displayed.

<names>

Specifies a file name or directory name.

Operation when this parameter is omitted:

Shows a list of the contents of the current directory.

mc-dir

Show the list of files on a memory card.

Example

Show the list of files on a memory card.

```
>ls mc-dir    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-4: List of response messages for the ls command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC not found.	A memory card was not inserted. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Notes

1. The `mc-dir` parameter cannot be used when a memory card is not inserted.
2. When the `mc-dir` parameter is specified, the ACC LED is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.

dir

Lists deleted files that are recoverable on the internal flash memory of the Switch. If the `/all`, `summary`, or `/deleted` parameters are not specified, this command has almost the same functionality as the `ls` command.

Syntax

```
dir  /all [summary]
dir  /deleted
```

Input mode

User mode and administrator mode

Parameters

/all

Shows a list of files on the current directory including detailed information. Files that have been deleted by the `delete` command are displayed with an index added. The file names of deleted files are displayed in parentheses [ ].

summary

Shows a list of files on the current directory. Files that have been deleted by the `delete` command are displayed with an index added. The file names of deleted files are displayed in parentheses [ ].

Operation when this parameter is omitted:

Shows a list of files including detailed information.

/deleted

Shows all the deleted files on the specified internal flash memory with an index added to each. Deleted files are displayed with a full pathname. That full pathname is displayed in parentheses [ ].

Example

- Shows files in the current directory on the internal flash memory including deleted files.

Figure 4-1: Displayed files when /all and summary are specified

```
> dir /all summary    Press the Enter key.
Directory of ./:
userfile1               userfile2               userfile3
[userfile4]
>
```

- Shows files in the current directory on internal flash memory with detailed information. An index number is added to each deleted file.

Figure 4-2: Displayed file when only /all is specified

```
> dir /all    Press the Enter key.
Directory of ./:
 - -rw-r--r-- user     user       123117 Jan 27 14:18 userfile1
 - -rw-r--r-- user     user          344 Jan 27 14:55 userfile2
 6 -rw-r--r-- user     user           16 Jan 27 17:57 [userfile3]
>
```

- Shows deleted files in the current root on internal flash memory with detailed information and index number.

Figure 4-3: Displayed deleted files

```
> dir /deleted    Press the Enter key.
Directory of /mc0:
 4 user2    user         5555 Jan 27 11:10 [/usr/home/user2/testfile]
 6 user1    user           16 Jan 27 17:57 [/usr/home/user1/usefile4]
>
```

Display items

Table 4-5: Display contents when the /all option is specified

Location (digit)	Item	Description
1 to 2	Index number	Indicates the index number of each deleted file (1 to 64).
4 to 13	File attribute	Each symbol has the following meaning: d: Directory attribute r: Read permission exists. w: Write permission exists. x: Execute permission exists. Each display location has the following meanings: +0th digit: Directory attribute +1st digit: Read permission for the owner +2nd digit: Write permission for the owner +3rd digit: Execute permission for the owner +4th digit: Read permission for the group +5th digit: Write permission for the group +6th digit: Execute permission for the group +7th digit: Other read permission +8th digit: Other write permission +9th digit: Other execute permission
15 to 22	Owner name	Indicates the owner name of a file.
24 to 31	Group name	Indicates the group name of a file.
33 to 40	File size	Indicates the file size in bytes.
42 to 51	File modification date	Indicates the file modification date.
53 and higher digits	File name	Indicates the file name.

Table 4-6: Display contents when the /deleted option is specified

Location (digit)	Item	Description
1 to 2	Index number	Indicates the index number of each deleted file (1 to 64).
4 to 9	Owner name	Indicates the owner name of a file.
11 to 16	Group name	Indicates the group name of a file.
18 to 25	File size	Indicates the file size in `bytes`.
27 to 38	File modification date	Indicates the file modification date.
40 and higher digits	Deleted file name	Indicates the deleted file name.

Impact on communication

None

Response messages

Table 4-7: List of response messages for the dir command

Message	Description
dir: Current directory is not flash.	The current directory is not the internal flash memory. Move to an appropriate directory.

Notes

None

cat

Shows the contents of a specified file.

Syntax

`cat [<option>] <file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-n`: Shows the contents of a file with line numbers added.

Operation when this parameter is omitted:

Shows the contents of a specified file without any modification.

<file name>

Specifies a file name to be displayed.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

cp

Copies a file.

Syntax

```
cp [<option>] <file name1> <file name2>
cp <file name1> mc-file <mc file name2>   (Copies a file on the internal flash
memory to a memory card.)
cp mc-file <mc file name1> <file name2>   (Copies a file on a memory card to the
internal flash memory.)
```

Input mode

User mode and administrator mode

Parameters

<option>

`-r`: Copies a directory.

`-i`: Displays confirmation prompts asking whether to permit overwriting if a file or directory exists in the copy destination.

Operation when this parameter is omitted:

Copies the specified file without asking for confirmation of overwriting.

<file name1>

Specifies the copy-source file. Or, specifies the name of a file on the copy-source internal flash memory.

<file name2>

Specifies the copy destination file. Or, specifies the name of a file on the copy-destination internal flash memory.

mc-file *<mc file name2>*

Specifies the name of a file on the copy-destination memory card.

Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for a file name on a memory card. Note that names ending in a period (.) cannot be used.

mc-file *<mc file name1>*

Specifies the name of a file on the copy-source memory card.

Wildcards cannot be used to specify file names on a memory card.

Example

- Copy file1 from the internal flash memory to the memory card and name as file2.
  ```
  >cp file1 mc-file file2   Press the Enter key.
  ```

- Copy file1 from the memory card to the internal flash memory and name as file2.
  ```
  >cp mc-file file1 file2    Press the Enter key.
  ```

Display items

None

Impact on communication

When mc-file is specified, if the monitoring time or sending interval of the Layer 2 or Layer 3

protocol is set shorter than the initial value on neighboring devices, communication might be disconnected when the Layer 2 or Layer 3 protocol is disconnected.

Response messages

Table 4-8: List of response messages for the cp command

Message	Description
Can't create file.	The file could not be copied to the memory card. Check the state of the memory card such as free capacity, and then re-execute the command.
Can't execute.	The command could not be executed. Re-execute the command.
copy error	The file could not be read from or written to the memory card. Check the state of the destination such as the free capacity of the memory card and internal flash memory, and then re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC is write protected.	Make sure the memory card's protect switch is not set to ▼ Lock. If the switch is set to ▼ Lock, slide the switch, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC not found.	A memory card was not inserted. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Notes

1. The `mc-file` parameter cannot be used when a memory card is not inserted. In addition, the parameter cannot be used with the `-i` option and `-p` option.
2. When the `mc-file` parameter is specified, the ACC LED is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.
3. Accessing a memory card increases load on the device. Before specifying `mc-file`, if monitoring time and sending interval of the Layer 2 or Layer 3 protocol, which are settings for maintaining connection with neighboring devices, are set shorter than the initial value, reset the monitoring time and sending interval to longer values.

mkdir

Creates a new directory.

Syntax

```
mkdir [<option>] <directory>
mkdir mc-dir <directory>
```

Input mode

User mode and administrator mode

Parameters

<option>

`-p`: Creates a directory as necessary when no parent directory exists.

Operation when this parameter is omitted:

An error occurs when the parent directory does not exist (The parent directory is not created).

<directory>

Specifies the name of the directory to be created.

mc-dir *<directory>*

Creates a directory on a memory card.

Alphanumeric characters, hyphens (`-`), underscores (_), and periods (`.`) can be used for a directory name on a memory card. Note that names ending in a period (`.`) cannot be used.

Example

Creates a directory `newdir` on a memory card.

```
>mkdir mc-dir newdir    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-9: List of response messages for the mkdir command

Message	Description
Can't create directory.	A directory could not be created on the memory card. Check the state of the memory card such as free capacity, and then re-execute the command.
Can't execute.	The command could not be executed. Re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.

Message	Description
MC is write protected.	Make sure the memory card's protect switch is not set to ▼ Lock. If the switch is set to ▼ Lock, slide the switch, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC not found.	A memory card was not inserted. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Notes

1. The `mc-dir` parameter cannot be used when a memory card is not inserted. In addition, the parameter cannot be used with the `-p` option.
2. When the `mc-dir` parameter is specified, the ACC LED is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.

mv

Moves or renames a file.

Syntax

```
mv [<option>] <file name1> <file name2>
mv [<option>] <directory1> <directory2>
mv [<option>] <names> <dir>
```

Input mode

User mode and administrator mode

Parameters

<option>

-f

Forcibly performs a move without requesting confirmation.

Operation when this parameter is omitted:

Displays a confirmation message, and then moves or renames a file.

<file name1>

Specifies the name of a file to be moved (renamed).

<file name2>

Specifies the name of the file after moving or renaming.

<directory1>

Specifies the name of a directory to be moved (renamed).

<directory2>

Specifies the name of a directory after moving (renaming).

<names>

Indicates the names of one or more source files or directories.

<dir>

Indicates the name of the destination directory.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

rm

Deletes a specified file.

Syntax

`rm [<option>] <file name>`
`rm mc-file <mc file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-r`

Recursively deletes all files in the specified directory and the directories below it.

Operation when this parameter is omitted:

Deletes only the specified file.

<file name>

Specifies a file name or directory name to be deleted.

mc-file *<mc file name>*

Specifies the name of a file to be deleted from a memory card.

Wildcards cannot be used to specify file names on a memory card.

Example

Delete a file called `file1` on the memory card.

```
>rm mc-file file1    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-10: List of response messages for the rm command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC is write protected.	Make sure the memory card's protect switch is not set to ▼ Lock. If the switch is set to ▼ Lock, slide the switch, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Message	Description
MC not found.	A memory card was not inserted. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Notes

1. The `mc-file` parameter cannot be used when a memory card is not inserted. In addition, the parameter cannot be used with the `-r` option.
2. When the `mc-file` parameter is specified, the ACC LED is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.
3. If file names or directory names include special characters, an error such as a command invalid error might occur. In this case, specify an asterisk wildcard (`*`) for <*file name*>, and individually confirm target files, to delete files named with special characters. Special characters are characters other than alphanumeric characters listed in *List of character codes* in *1. Reading the Manual*.

rmdir

Deletes a specified directory.

Syntax

`rmdir` <*directory*>
`rmdir mc-dir` <*directory*>

Input mode

User mode and administrator mode

Parameters

<*directory*>

Specifies the name of the directory to be deleted.

mc-dir <*directory*>

Deletes a directory on the memory card.

Wildcards cannot be used to specify directory names on a memory card.

Example

Delete a directory `deldir` on the memory card.

```
>rmdir mc-dir deldir    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-11: List of response messages for the rmdir command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC is write protected.	Make sure the memory card's protect switch is not set to ▼ Lock. If the switch is set to ▼ Lock, slide the switch, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC not found.	A memory card was not inserted. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.

Notes

1. The `mc-dir` parameter cannot be used when a memory card is not inserted.

2. When the `mc-dir` parameter is specified, the ACC LED is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.

delete

Recoverably deletes files on the internal flash memory used by the Switch. Note that the maximum number of files that may be deleted is 64 files.

Syntax

`delete` <*file name*>

Input mode

User mode and administrator mode

Parameters

<*file name*>

Specifies the name of a file to be deleted.

Example

Recoverably deletes a file.

Figure 4-4: Executing delete for a file

```
> delete  userfile    Press the Enter key.
>
```

Display items

None

Impact on communication

None

Response messages

Table 4-12: List of response messages for the delete command

Message	Description
delete: Delete command can not be used this flash. (<*code*>)	This command cannot be used for internal flash memory (<*internal code*>).
delete: Directory is specified.	A directory has been specified.
delete: No flash file is specified.	The specified file does not exist.
delete: No such file or directory.	The specified file does not exist. or the current directory is not valid.
delete: Not enough flash space.	There is not enough free space on the internal flash memory to execute this command.
delete: Permission denied.	No deletion permission for the specified file exists.
delete: Specify file name.	Specify a file name.

Notes

1. This command can operate only on files in internal flash memory. Files on RAM disk (memory) cannot be deleted.
2. If there is not enough free space on internal flash memory to recoverably store files, this command cannot be used for deletion.
3. To recover files deleted by this command, use the `undelete` command.

4. To completely erase files deleted by this command, use the `squeeze` command.
5. To list files deleted by this command, use the `dir` command.

undelete

Recovers recoverably deleted files on the internal flash memory used by the Switch.

Syntax

`undelete <index>`

Input mode

User mode and administrator mode

Parameters

<index>

Specifies the index number of a file to be recovered. Index numbers are unique numbers assigned to each deleted file and displayed when file lists are displayed using the `dir/all` command or `dir/deleted` command.

Example

Recover files deleted by the `delete` command.

Figure 4-5: File recovery

```
> dir /all    Press the Enter key.

Directory of ./:
 - -rw-r--r-- user     user       123117 Jan 27 14:18 userfile1
 - -rw-r--r-- user     user          344 Jan 27 14:55 userfile2
 - -rw-r--r-- user     user        22310 Jan 27 17:38 userfile3
 6 -rw-r--r-- user     user           16 Jan 27 17:57 [userfile4]
> undelete  6
>
```

Display items

None

Impact on communication

None

Response messages

Table 4-13: List of response messages for the undelete command

Message	Description
undelete: Current directory is not flash.	The current directory is not the internal flash memory. Move to an appropriate directory.
undelete: Directory is not found for undelete file.	No directory was found for restoring undeleted files to. Create a directory for storing the file.
undelete: Exist same name file or directory.	A file or directory that has the same name as that of the specified file already exists in the directory for executing the `undelete` command.
undelete: Invalid index value.	Specify decimal values for the index value.
undelete: No such file or directory.	The current directory is not valid.
undelete: Not found undelete file.	The specified file does not exist.
undelete: Permission denied.	You do not have access permission for the current directory or specified file.

Message	Description
undelete: Permission denied of directory for undelete file.	You do not have write permission for the directory where the specified file is to be stored.
undelete: Specify correct deleted index number.	Specify a proper index number for the deleted file.
undelete: Specify correct index number [1-64].	Specify a numeric value between 1 and 64 for the index value.
undelete: Specify index number.	Specify an index number.
undelete: Undelete command can not be used this flash. (<*code*>)	This command cannot be used for internal flash memory (<*internal code*>).

Notes

1. This command can operate only on internal flash memory files that have been deleted by the `delete` command. Files deleted by the `rm` command or other commands cannot be recovered.
2. If there is no directory in internal flash memory to store a file to be recovered, the file cannot be recovered.
3. To check the indexes of deleted files to be recovered by this command, use the `dir` command.
4. If files are completely erased by the `squeeze` command, they cannot be recovered by this command.
5. If the current root directory is not internal flash memory, this command will fail.

squeeze

Completely erases files on internal flash memory used by the Switch that have been recoverably deleted by the `delete` command.

Syntax

```
squeeze
```

Input mode

User mode and administrator mode

Parameters

None

Example

Completely erase files deleted by the `delete` command.

Figure 4-6: Executing squeeze for a file

```
> squeeze    Press the Enter key.
All deleted files will be erased.
 (y/n)?:y
Squeezing...
Done
>
```

Display items

None

Impact on communication

None

Response messages

Table 4-14: List of response messages for the squeeze command

Message	Description
Canceled	The squeeze command has been canceled.
Deleted files will be erased. OK ? (y/n):	Erases deleted files. Enter y to erase, otherwise n to abort.
Done	The erasure has been completed.
squeeze: Current directory is not flash.	The current directory is not internal flash memory.
squeeze: No such file or directory.	The current directory is not valid. Move to an appropriate directory.
squeeze: Permission denied.	You do not have access permission for the current directory. Move to an appropriate directory.
squeeze: Squeeze command can not be used this flash.(<*code*>)	This command cannot be used for internal flash memory (<*internal code*>).
Squeezing	Erasing the file.

Notes

1. This command can operate only on files in internal flash memory.
2. Files completely erased by this command cannot be recovered by the `undelete` command.

Chapter

5. Management Port

inactivate mgmt 0
activate mgmt 0
test interfaces mgmt 0
no test interfaces mgmt 0

inactivate mgmt 0

Changes the management port from the `active` state to the `inactive` state.

Syntax

```
inactivate mgmt 0
```

Input mode

User mode and administrator mode

Parameters

None

Example

Deactivate the management port.

```
> inactivate mgmt 0
>
```

Display items

None

Impact on communication

Communication using the management port becomes unavailable.

Response messages

Table 5-1: List of response messages for the inactivate mgmt 0 command

Message	Description
Can't accept command (system is busy).	The command cannot be accepted (because the system is busy). Re-execute the command later.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Line test executing.	A line test is being conducted.
Management port is disabled.	The management port is in the `inactive` state.
No such interface -- management port.	The management port could not be found.
Not operational interface management port.	The management port is not operational.

Notes

1. Executing this command does not change the configuration.
2. If the device is restarted after the management port is inactivated by executing this command, the `inactive` status of the management port is canceled.
3. To revert the status of a management port that has been changed to `inactive` status by this command to `active` status, use the `activate mgmt 0` command.

activate mgmt 0

Reverts the `inactive` state of a management port that has been set by the `inactivate mgmt 0` command to the `active` state.

Syntax

```
activate mgmt 0
```

Input mode

User mode and administrator mode

Parameters

None

Example

Activate the management port.

```
> activate mgmt 0
>
```

Display items

None

Impact on communication

Communication using the management port resumes.

Response messages

Table 5-2: List of response messages for the activate mgmt 0 command

Message	Description
Can't accept command (system is busy).	The command cannot be accepted (because the system is busy). Re-execute the command later.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Management port is already active.	The management port is already in the `active` state.
Management port is disabled.	The management port is in the `inactive` state.
No such interface -- management port.	The management port could not be found.
Not operational interface management port.	The management port is not operational.

Notes

Executing this command does not change the configuration.

test interfaces mgmt 0

Starts a line test for the management port.

Before performing a line test, set the applicable line by the configuration.

Syntax

```
test interfaces mgmt 0 internal [pattern <TestPatternNo>]
```

Input mode

User mode and administrator mode

Parameters

internal

Specifies that an internal loopback test will be conducted.

pattern <*TestPatternNo*>

Specifies the number of the test pattern. You can specify a value from 0 to 4.

`0`: Repeats test patterns 1 to 4 in ascending order.

`1`: all 0xff

`2`: all 0x00

`3`: "** THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG.0123456789 **" pattern repeat

`4`: Send a data corruption detection pattern.

Operation when this parameter is omitted:

Test pattern `3` is used.

Example and display items

None

Impact on communication

Communication using the management port becomes unavailable.

Response messages

Table 5-3: List of response messages for the test interfaces mgmt 0 command

Message	Description
Can't accept command (system is busy).	The command cannot be accepted (because the system is busy). Re-execute the command later.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal test pattern -- <*TestpatternNo*>.	The test pattern number is outside the valid range. <*TestpatternNo*> Test pattern number
Management port is disabled.	The management port is in the `inactive` state.
No configuration Management Port.	The management port is not set for the configuration.
Not operational interface management port.	The management port is not operational.

Message	Description
Not start condition.	A test cannot be started now.
Test already executing.	A line test is being performed.

Notes

1. If the applicable line is operating at the start of a line test, operation is stopped, and then the line test is performed. After the line test ends, operation resumes automatically. Note that the applicable line cannot operate while a line test is being performed.
2. After a line test has started, the test processing is repeated until a request to stop the test is issued. If the line is switched during execution of a management port line test, the line test is terminated. In such cases, the execution result of the line test is not displayed.

no test interfaces mgmt 0

Stops a line test for the management port, and displays the test results.

Syntax

```
no test interfaces mgmt 0
```

Input mode

User mode and administrator mode

Parameters

None

Example

Start a loopback test in the module of the management port. The following figure shows the result of executing a line test for the management port.

Figure 5-1: Result of executing line tests

```
>test interfaces mgmt 0 internal
>no test interfaces mgmt 0
Date 2006/10/18 18:36:40 UTC
Test count               :1
Send-OK                  :1         Send-NG                :0
Receive-OK               :1         Receive-NG             :0
Data compare error       :0          Out buffer error      :0
Out underflow error      :0          Out late collision    :0
Out loss of carrier      :0          Out retry error       :0
In framing error         :0          In overflow error     :0
In CRC error             :0          In buffer error       :0
In monitor time out      :0
>
```

Display items

Table 5-4: Items displayed as line test results

Item	Meaning	Presumed cause	Measures
Test count	Number of times a test was conducted	--	--
Send-OK	Number of times data was sent normally	--	--
Send-NG	Number of times data was sent abnormally	--	See the applicable item.
Receive-OK	Number of times data was received normally	--	--
Receive-NG	Number of times data was received abnormally	--	See the applicable item.
Data compare error	Data check error	#1	#2
Out buffer error	Number of times a send buffer could not be secured	#1	#2
Out underflow error	Number of out underflows	#1	#2
Out late collision	Number of out collisions	#1	#2

Item	Meaning	Presumed cause	Measures
Out loss of carrier	The number of times CRSs were not detected.	#1	#2
Out retry error	Number of out retries	#1	#2
In framing error	In framing error	#1	#2
In overflow error	Number of in overflows	#1	#2
In CRC error	Number of CRC errors	#1	#2
In buffer error	Failure to read in buffers	#1	#2
In monitor time out	Timeout for the reception monitoring timer	#1	#2

#1: The probable cause is a BCU failure in AX6700S series switches, a CSU failure in AX6600S series switches, or an MSU failure in AX6300S series switches.

#2: Replace the BCU for AX6700S series switches, the CSU for AX6600S series switches, or the MSU for AX6300S series switches.

Impact on communication

Communication using the management port resumes.

Response messages

Table 5-5: List of response messages for the no test interfaces mgmt 0 command

Message	Description
Can't accept command (system is busy).	The command cannot be accepted (because the system is busy). Re-execute the command later.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Management port is disabled.	The management port is in the `inactive` state.
No configuration management port.	The management port is not set for the configuration.
Not operational interface management port.	The management port is not operational.
Test not executing.	A line test is not being performed.

Notes

When a line test is stopped, depending on the timing, the test might stop while the command is waiting for the response to a test frame that was sent. Therefore, in the displayed test results, the total of `Receive-OK` and `Receive-NG` values could be one smaller than the `Send-OK` value.

Chapter

6. Login Security and RADIUS or TACACS+

adduser
rmuser
password
clear password
show sessions (who)
show whoami (who am i)
killuser
show accounting
clear accounting
restart accounting
dump protocols accounting

adduser

Adds an account for a new login user.

If the Switch is operating in a duplex configuration, the account is automatically synchronized on a standby system.

Syntax

```
adduser <user name> [no-flash]
```

Input mode

Administrator mode

Parameters

<user name>

Specifies a user name for a new account. Set 1 to 16 characters for the user name. For the user name, alphabetic characters can be used for the first character, and alphanumeric characters can be used for the second and subsequent characters.

no-flash

Creates the home directory of a new account in memory, rather than internal flash memory.

Operation when this parameter is omitted:

Creates the home directory of a new account in internal flash memory.

Example

1. Add a new login user `user1`.

```
# adduser user1    Press the Enter key.
```

A new login user account with no password is added, and then the following message is output:

```
User(empty password) add done. Please setting password.
```

2. Next, enter a password.

```
Changing local password for newuser.
New password:********    Press the Enter key.
```

If the password configuration is interrupted (press the **Ctrl** + **D** keys or press only the **Enter** key) at this time, a new login user with no password is created.

3. Re-type the password for confirmation.

```
Retype new password:********    Press the Enter key.
# quit
>
```

Display items

None

Impact on communication

None

Response messages

Table 6-1: List of response messages for the adduser command

Message	Description
<*user name*> is not a valid login name	This user name cannot be used.
already a '<*user name*>' user	The specified user has already been registered. <*user name*>: User name
Can't access to standby system.	The standby system could not be accessed.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
can't lock <*file name*> : <*reason*>	The addition of a user was canceled because the password file was locked. Re-execute the command. <*file name*>: Password file name <*reason*>: Detailed information
Can't synchronize accounts to standby system.	Synchronization with the standby system has failed.
Can't synchronize for accounts mismatch.	Synchronization could not be performed because the account of the standby system was different.
Can't synchronize for software version mismatch.	The command cannot be executed because the versions of software do not match.
Mismatch; try again.	The new password and the re-entered password are not the same. Re-enter the password.
no changes made	The registration of the specified user was canceled. Re-execute the command.
Now another user is executing user account command, please try again.	Another user is executing a user account related command. Re-execute the command after the related command completes.
Password unchanged. /etc/master.passwd: unchanged	The password change was canceled.
Permission denied	The password change is not allowed.
Please don't use an all-lower case password. Unusual capitalization, control characters or digits are suggested.	We recommend that upper-case alphabetic characters, symbols, or numbers be used in addition to lower-case alphabetic characters.
Please enter a longer password.	Enter at least six characters for a password.
synchronize accounts to standby system.	The synchronization with the standby system has started now.

Notes

1. To abort password configuration, press the **Ctrl** + **D** keys. If the **Ctrl** + **D** keys are pressed while retyping, the input prompt (`Mismatch; try again.`) is displayed. If this happens, press the **Ctrl** + **D** keys again. If password configuration is aborted, a new login user with no password is created.
2. A login user name that has already been registered cannot be added. In addition, names such as `root` or `admin` cannot be used as a login user name because they are used inside the Switch.
3. We recommend that you use at least six characters for a password. If fewer than six characters are entered, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted. Also, the maximum number of characters that can be used for a password is 128. If you enter 129 or more characters, only the first 128 characters are registered for the password. We recommend that you use upper-case alphabetic characters, numbers, and symbols in addition to lower-case alphabetic characters. If a password consists of only

lower-case alphabetic characters, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted.

4. If the Switch is operating in a duplex configuration, it takes a while to synchronize an account on the standby system.
5. If an account is added with the `no-flash` parameter specified, do not create any files under the home directory of the added account.
6. If you create an account with the `adduser` command and specify the `no-flash` parameter then configure settings using the `set exec-timeout`, `set terminal help`, or `set terminal pager` commands, they revert to the default settings, and logs of commands of the history functionality are cleared when the device is restarted.

rmuser

Deletes a user login account registered by the `adduser` command.

If the Switch is operating in a duplex configuration, the account is automatically synchronized on a standby system.

Syntax

`rmuser` <*user name*>

Input mode

Administrator mode

Parameters

<*user name*>

Specifies a logged-in user name registered in the password file.

Example

1. Delete the user registration of the login user named `operator`.
   `# rmuser operator  Press the` **Enter** `key.`
2. If the specified login user name has been registered, a confirmation message is displayed as follows:
   `Delete user 'operator'? (y/n): _`

   If `y` is entered, the account is deleted.

   If `n` is entered, the user is returned to the command prompt without deleting the account.

Display items

None

Impact on communication

None

Response messages

Table 6-2: List of response messages for the rmuser command

Message	Description
Can't access to standby system.	The standby system could not be accessed.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
can't lock <*file name*> : <*reason*>	The deletion of a user was canceled because the password file was locked. Re-execute the command. <*file name*>: Password file name <*reason*>: Detailed information
Can't synchronize accounts to standby system.	Synchronization with the standby system has failed.
Can't synchronize for accounts mismatch.	Synchronization could not be performed because the account of the standby system was different.
Can't synchronize for software version mismatch.	The command cannot be executed because the versions of software do not match.
Last user.	The last user cannot be deleted.

Message	Description
no changes made	The deletion of the specified user was canceled. Re-execute the command.
No such user '<*user name*>'.	The specified user has not been registered. <*user name*>: User name
Now another user is executing user account command, please try again.	Another use is executing a user account related command. Re-execute the command after the related command completes.
Permission denied	The specified user could not be deleted.
Remove myself?	The account of the user executing this command cannot be deleted.
synchronize accounts to standby system.	The synchronization with the standby system has started now.

Notes

1. The account of the user executing this command cannot be deleted. For example, the account `operator` cannot be deleted by this command while the account user `operator` is logged in.
2. The default user (operator) provided during the initial installation can be deleted.
3. If a user is deleted, the home directory of the user is also deleted. Therefore, before deleting a user, back up user files that need to be saved.
4. If the Switch is operating in a duplex configuration, it takes a while to synchronize an account on the standby system.
5. If the specified user is logged in, the user is forcibly logged out. Therefore, the user to be deleted should be logged out by the `logout` command or `exit` command beforehand.

password

Only the password of the login user can be changed. The operation differs depending on the command input mode as follows:

1. In user mode, only the password of the current login user can be changed.
2. In administrator mode, the password of all users and the password for enable mode can be changed.

In addition, if the Switch is operating in a duplex configuration, the password is automatically synchronized on a standby system.

Syntax

```
password [<user name>]
password enable-mode
```

Input mode

User mode and administrator mode

Parameters

<user name>

Specifies the login user name. In administrator mode, other users can also be specified for the user name.

Operation when this parameter is omitted:

Changes the password of the current login user.

enable-mode

In administrator mode, a password for enable mode can be set.

Example

- Change the password of the login user name `operator`.

```
# password operator
Changing local password for operator
New password:******** ... Enter a new password.
Retype new password:******** ... Re-enter the new password.
#
```

- Change the password of the current login user (with no parameters).

```
> password
Changing local password for xxxxxxx ... The login user name is displayed.
Old password:******** ... Enter the current password.
New password:******** ... Enter a new password.
Retype new password:******** ... Re-enter the new password.
>
```

Display items

None

Impact on communication

None

Response messages

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

Message	Description
Can't access to standby system.	The standby system could not be accessed.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't synchronize accounts to standby system.	Synchronization with the standby system has failed.
Can't synchronize for accounts mismatch.	Synchronization could not be performed because the account of the standby system was different.
Can't synchronize for software version mismatch.	The command cannot be executed because the versions of software do not match.
Mismatch; try again.	The new password and the re-entered password are not the same. Re-enter both passwords.
Now another user is executing user account command, please try again.	Another use is executing a user account related command. Re-execute the command after the related command completes.
Password unchanged./etc/master.passwd: unchanged	The password change was canceled.
Permission denied.	The password change is not allowed.
Please don't use an all-lower case password.Unusual capitalization, control characters or digits are suggested.	We recommend that upper-case alphabetic characters, symbols, or numbers be used in addition to lower-case alphabetic characters.
Please enter a longer password.	Enter at least six characters for a password.
synchronize accounts to standby system.	The synchronization with the standby system has started now.
unknown user <*user name*>	The specified user has not been registered. <*user name*>: User name

Notes

1. The password of other login users cannot be changed in modes other than administrator mode. When the password of other login users is changed, the prompt (`Old password:`) is not displayed. Start the procedure by entering the new password at the prompt (`New password:`).
2. To abort password configuration, press the **Ctrl** + **D** keys. If the **Ctrl** + **D** keys are pressed while retyping, the input prompt (`Mismatch; try again.`) is displayed. If this happens, press the **Ctrl** + **D** keys again.
3. We recommend that you use at least six characters for a password. If fewer than six characters are entered, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted. Also, the maximum number of characters that can be used for a password is 128. If you enter 129 or more characters, only the first 128 characters are registered for the password. We recommend that you use upper-case alphabetic characters, numbers, and symbols in addition to lower-case alphabetic characters. If a password consists of only lower-case alphabetic characters, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted.
4. If the Switch is operating in a duplex configuration, it takes a while to synchronize the password on the standby system.

clear password

Clears the user login password. The operation differs depending on the command input mode as follows:

1. In user mode, only the password of the current login user can be deleted.
2. In administrator mode, the password of any users and the password for enable mode can be deleted.

In addition, if the Switch is operating in a duplex configuration, the password is automatically synchronized on a standby system.

Syntax

```
clear password [<user name>]
clear password enable-mode
```

Input mode

User mode and administrator mode

Parameters

<user name>

Specifies the login user name. In administrator mode, other users can also be specified for the user name.

Operation when this parameter is omitted:

Clears the password of the current login user.

enable-mode

In administrator mode, a password for enable mode can be deleted.

Example

Clear the password of the current logged-in user.

```
> clear password
Changing local password for xxxxxxx ... The login user name is displayed.
Old password:******** ... Enter the current password.
Password cleared.
>
```

Display items

None

Impact on communication

None

Response messages

Table 6-4: List of response messages for the clear password command

Message	Description
Can't access to standby system.	The standby system could not be accessed.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't synchronize accounts to standby system.	Synchronization with the standby system has failed.
Can't synchronize for accounts mismatch.	Synchronization could not be performed because the account of the standby system was different.

Message	Description
Can't synchronize for software version mismatch.	The command cannot be executed because the versions of software do not match.
Now another user is executing user account command, please try again.	Another use is executing a user account related command. Re-execute the command after the related command completes.
Permission denied	The password of the specified user could not be changed.
synchronize accounts to standby system.	The synchronization with the standby system has started now.
unknown user <*user name*>	The specified user has not been registered. <*user name*>: User name

Notes

The password of other login users cannot be deleted in modes other than administrator mode.

If the Switch is operating in a duplex configuration, it takes a while to synchronize the password on the standby system.

show sessions (who)

Display the users currently logged in to the Switch.

Syntax

```
show sessions
who
```

Input mode

User mode and administrator mode

Parameters

None

Example

Display the users currently logged in to the Switch.

```
> show sessions
Date 2011/09/07 12:00:00 UTC
kikuchi console  -----  0   Sep  6 14:16                      <--1
shimizu aux      -----  1   Sep  6 14:15 (ppp0:10.1.1.100)   <--2
shimizu ttyp0    admin  2   Sep  6 14:16 (192.168.0.1)       <--3
shimizu ttyp1    -----  3   Sep  6 14:17 (192.168.0.1)       <--4
tanaka  ttyp2    -----  4   Sep  6 15:52 (192.168.0.1 VRF:2) <--5
>
```

1. Login from CONSOLE
2. AUX dial-up IP connection
3. Login from a remote operation terminal (administrator mode)
4. Login from a remote operation terminal
5. Login from a remote operation terminal (VRF 2) [OP-NPAR]

Display items

The following information is displayed:

- Login user name
- tty name
- Command input mode: `admin` (administrator mode) or `-----` (user mode)
- Login number
- Date and time
- Terminal IP address (displayed only when the user has logged in from a remote operation terminal)
- VRF ID (displayed only when the user has logged in from a VRF) [OP-NPAR]

Impact on communication

None

Response messages

None

Notes

The login number might be used to forcibly log out a login user.

show whoami (who am i)

Displays only the user, logged in to the Switch, who executed this command. If the command is restricted, the contents of the command list, class, and situation authenticated by TACACS+, RADIUS, and local password authentication are displayed on an extended display.

Syntax

```
show whoami
who am i
```

Input mode

User mode and administrator mode

Parameters

None

Example

Displays the login name of the current login user.

```
> show whoami
Date 2011/09/07 12:00:00 UTC
shimizu ttyp0    -----  2   Sep  6 14:17 (192.168.0.1)
>
```

Displays the login name of the current logged-in user when the user has logged in from VRF 2. [OP-NPAR]

```
> show whoami
Date 2011/09/07 12:00:00 UTC
tanaka  ttyp2    -----  4   Sep  6 15:52 (192.168.0.1 VRF:2)
>
```

If command authentication is set by the TACACS+ server, RADIUS server, or local (configuration), an extended display appears, as follows.

- When staff1 is authenticated by a TACACS+ server

  The following result is displayed when nothing is set for the class, `show` is set in the "allow" command list, and `enable`, `inactivate`, `reload`, `config`, and `show ip` are set in the "deny" command list:

```
> show whoami
Date 2009/01/07 12:00:00 UTC
staff1 ttyp0    -----  2   Jan  6 14:17 (192.168.0.1)

Home-directory: /usr/home/staff1
Authentication: TACACS+ (Server 10.10.10.10)
Class: -----
Command-list:
    Allow: "show"
    Deny : "enable,inactivate,reload,config,show ip"
>
```

- When staff2 is authenticated by the RADIUS server

  The following result is displayed when nomanage is set for the class, and `reload` is set in the "deny" command list:

```
> show whoami
Date 2009/01/07 12:00:00 UTC
staff2 ttyp0    -----  2   Jan  6 14:17 (192.168.0.1)

Home-directory: /usr/home/remote_user
Authentication: RADIUS (Server 10.10.10.10)
Class: nomanage
```

```
    Allow: -----
    Deny : "adduser,rmuser,clear password,password,killuser"
Command-list:
    Allow: -----
    Deny : "reload"
>
```

- When staff3 is authenticated by local password authentication

  The following result is displayed when allcommand is set for the class, and no command list is set:

```
> show whoami
Date 2009/01/07 12:00:00 UTC
staff3 ttyp0    -----  2   Jan  6 14:17 (192.168.0.1)

Home-directory: /usr/home/staff3
Authentication: LOCAL
Class: allcommand
    Allow: "all"
    Deny : -----
Command-list: -----
>
```

Display items

Table 6-5: Information displayed by the show whoami command

Item		Displayed information
User information		Displays information about the user who executed the command. • Login user name • tty name • Command input mode: `admin` (administrator mode) or `-----` (user mode) • Login number • Date and time • Terminal IP address (displayed only when the user has logged in from a remote operation terminal) • VRF ID (displayed only when the user has logged in from a VRF) [OP-NPAR]
Home-directory		Displays the home directory.
Authentication		Displays the authentication type (`RADIUS`, `TACACS+`, or `LOCAL`). Displays the address authentication information of the remote authentication server only when the user is authenticated by RADIUS or TACACS+.
Class	Class	Displays a class name. If no class is set, `-----` is displayed. If an invalid class name is set, a comment (`Invalid Class`) is displayed next to the class name. If the invalid class name includes characters that cannot be displayed such as non-ASCII characters, they are replaced by "`.`" in the display.
	Allow	If a class is set, the contents of the "allow" command list of the class are displayed. If the class is root, a command "deny" list is not possible. The message (`Command unlimited`) is displayed. If an "allow" command list is not specified for the applicable class, `-----` is displayed.
	Deny	If a class is set, the contents of the "deny" command list of the class are displayed. If the class is root, a command "deny" list is not possible. The message (`Command unlimited`) is displayed. If a "deny" command list is not specified for the applicable class, `-----` is displayed.
Command list	Command-list	If a command list is not specified, or the class is root, `-----` is displayed.

Item		Displayed information
	Allow	If an "allow" command list is set, the contents of the list are displayed. If the "allow" command list is not set, - - - - - is displayed. If the command list includes characters that cannot be displayed such as non-ASCII characters, they are replaced by "." in the display.
	Deny	If a "deny" command list is set, the contents of the list are displayed. If the "deny" command list is not set, - - - - - is displayed. If the command list includes characters that cannot be displayed such as non-ASCII characters, they are replaced by "." in the display.

Impact on communication

None

Response messages

None

Notes

1. The login number might be used to forcibly log out a logged-in user.
2. If the class name or command list includes characters that cannot be displayed such as non-ASCII characters, they are replaced by "." in the display.

killuser

Forcibly logs out a logged-in user.

Syntax

`killuser` <*login no.*>

Input mode

User mode and administrator mode

Parameters

<*login no.*>

Specifies the login number of the forced logout target. The login number might be checked by the `show sessions` command.

Example

Use the `show sessions` command to check the login number of a user to be logged out. Execute the `killuser` command with the login number specified.

```
> show sessions
Date 2009/01/07 12:00:00 UTC
kikuchi console  -----  0#   Jan  6 14:16
shimizu aux      -----  1#   Jan  6 14:16 (ppp0:10.1.1.100) <--(Note 1)
shimizu ttyp0    admin  2#   Jan  6 14:17 (192.168.0.1)
kikuchi ttyp1    -----  3#   Jan  6 14:20 (localhost)
>
> killuser 1

#: Login number
Note 1: To force this user to log out, specify login number 1.
```

Display items

None

Impact on communication

When a logged-in user is forcibly logged out from the remote operation terminal, the remote access communication is disconnected.

Response messages

Table 6-6: List of response messages for the killuser command

Message	Description
different user.	Users other than that of the same account cannot be forcibly logged out. For details, see item 3 in Notes. Alternatively, the previously login user is currently logging out, and cannot be forced to log out. Wait for 10 or more seconds, and then try again.
invalid Login-No: <*login no.*>	The specified login number is invalid. <*login no.*>: Specified login number
kill myself?	The user who is executing this command cannot forcibly log themselves out.
no user(UserName)	The user does not exist.

Notes

1. This command is prepared for forcibly logging out a login user who remains logged in due to a network failure or terminal failure occurring while the user is logged in. Use the `logout` command or `exit` command for normal logout. Do not use this command except in an emergency. Even if a user remains logged in, the user will eventually be logged out by the auto-logout functionality.
2. The user who is executing this command cannot specify himself as the forced logout target. If such a user is specified as described above, an error occurs. However, a user can specify himself as logout target when logged in from the console.
3. Only users who have the same account as the user who is executing this command can be forcibly logged out by using this command and specifying the applicable login number. In the above example, shimizu with login number 2 can forcibly log out shimizu with login number 1, but not kikuchi with login number 3. However, when this command is executed from the console, users with different accounts can be forcibly logged out.
4. If a failure occurs, such as a cable disconnection when the command execution results are being displayed, a forced logout might not be able to be performed. In this case, a forced logout is performed after the recovery from the failure. If the failure recovery is not successful, a forced logout is performed after the TCP protocol times out. Although the timeout period of the TCP protocol varies depending on the line speed or line quality, the protocol usually times out after 10 minutes.

show accounting

Displays accounting information.

Syntax

```
show accounting
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 6-1: Display of accounting information

```
>show accounting
Date 2006/09/26 10:52:49 UTC
Since 2006/09/26 10:45:00 UTC

Event
    Login  :         15          Logout :         10
    Command:          -          Config :          -
    Total  :         25

    InQueue:         10
    Discard:          5

[RADIUS]
    Host: RADIUS111
      Event Counts:         10               (Timeout: 30  Retransmit: 15)
      Request Information                 Response Information
        Send             :          0       Success          :          0
        Communicate Error:          0       Failure          :          0
        Timeout          :         10       Invalid          :          0

    Host: 192.168.111.111
      Event Counts:         10               (Timeout: 30  Retransmit: 15)
      Request Information                  Response Information
        Send             :          4       Success          :          4
        Communicate Error:          5       Failure          :          0
        Timeout          :          1       Invalid          :          0


>show accounting
Date 2006/09/26 10:52:49 UTC
Since 2006/09/26 10:45:00 UTC

Event
    Login  :          6          Logout :          6
    Command:          0          Config :      60000
    Total  :      60012

    InQueue:        512 (Congestion)
    Discard:      55000

[TACACS+]
    Host: 192.168.111.112
      Event Counts:        500                              (Timeout:  0)
      Request Information                  Response Information
        Send             :        500       Success          :        400
        Communicate Error:          0       Failure          :        100
        Timeout          :          0       Invalid          :          0
```

Display items

Table 6-7: Display contents of accounting information

Item	Meaning	Displayed information
Since	Statistics start time	*yyyy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second
Event	Displays the status of accounting events.	
Login	Number of login events	Displays - when target event accounting is not set in the system configuration.
Logout	Number of logout events	Displays - when target event accounting is not set in the system configuration.
Command	Number of execution events for operation commands	Displays - when target event accounting is not set in the system configuration.
Config	Number of execution events for configuration commands	Displays - when target event accounting is not set in the system configuration.
Total	Total number of accounting events	Indicates the total number of the above events.
InQueue	Number of transmission queue events	• Displays the number of transmission queue accounting events when a large volume of accounting events to be transmitted occurs. • Displays (`Congestion`) when a device log is output and a congested state occurs.
Discard	Number of discarded events	When the congesting of an accounting event transmission occurs, the number of discarded events is counted.
[RADIUS]	• This item is displayed when a RADIUS server is set to be used by the system accounting configuration. • The following accounting statistics are displayed for each RADIUS server. (`Not configured`) is displayed in the following items when the RADIUS server configuration is not set or all RADIUS servers are for logon authentication only, not accounting.	
Timeout	Reply timeout time	1 to 30 (seconds)
Retransmit	Number of re-transmissions	0 to 15 (times)
Host	Target host name or IP address	It is displayed in order of server priority.
Event Counts	Number of accounting events	Displays the number of events to be reported to the target RADIUS server.
Request Information	Displays accounting request information.	
Send	Number of accounting request transmissions	• The number of times the Switch sent accounting requests to servers. • It is counted as a response timeout (`Timeout`), but not as a transmission error (`Communicate Error`).
Communicate Error	Number of accounting request transmission errors	This item is counted when communication to servers is not successful, such as when the address corresponding to the host name is not found, or a route to the server does not exist.
Timeout	Number of accounting response timeouts	This item is counted when a response from a server times out.
Response Information	Displays accounting response information.	

Item	Meaning	Displayed information
Success	Number of successful accounting responses	This item is counted when an accounting response is received from a server.
Failure	Number of failed accounting responses	This item is counted when a response other than an accounting response is received from a server.
Invalid	Number of invalid message responses	This item is counted when an invalid message is received from a server.
[TACACS+]	• This item is displayed when a TACACS+ server is set to be used by the system accounting configuration. • The following accounting statistics are displayed for each TACACS+ server. A term (`Not configured`) is displayed in the following items when the TACACS+ server configuration is not set or all TACACS+ servers are for logon authentication only, not accounting.	
Timeout	Reply timeout time	1 to 30 (seconds)
Host	Target host name or IP address	It is displayed in order of server priority.
Event Counts	Number of accounting events	Displays the number of events to be reported to the target TACACS+ server.
Request Information	Displays accounting request information.	
Send	Number of accounting request transmissions	• The number of times the Switch sent accounting requests to servers. • It is not counted as a response timeout (`Timeout`) or as a transmission error (`Communicate Error`).
Communicate Error	Number of connection errors	This item is counted when communication to servers is not successful, such as when the address corresponding to the host name is not found, or a route to the server does not exist.
Timeout	Number of timeouts of accounting connections and responses	This item is counted when a connection or communication to a server times out.
Response Information	Displays accounting response information.	
Success	Number of successful accounting responses	This item is counted when an accounting success is received from a server.
Failure	Number of failed accounting responses	This item is counted when an accounting failure is received from a server.
Invalid	Number of invalid message responses	This item is counted when an invalid message is received from a server.

Impact on communication

None

Response messages

Table 6-8: List of response messages for the show accounting command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
Connection failed to accounting program.	Communication with the accounting program failed. Make sure the accounting settings have been set. If this error occurs frequently, use the `restart accounting` command to restart the accounting program.

Notes

None

clear accounting

Clears accounting statistics information.

After accounting events that were being sent to or received from each server when this command was executed have been successfully transmitted, the service will start recording statistics about the accounting events.

Syntax

```
clear accounting
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 6-2: Clearing accounting information

```
>clear accounting
Date 2006/03/26 10:52:49 UTC
>
```

Display items

None

Impact on communication

None

Response messages

Table 6-9: List of response messages for the clear accounting command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to accounting program.	Communication with the accounting program failed. Re-execute the command. If this error occurs frequently, use the `restart accounting` command to restart the accounting program.

Notes

After accounting events that were being sent to or received from each server when this command was executed have been successfully transmitted, the service will start recording statistics about the accounting events.

restart accounting

Restarts the accounting program.

Syntax

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

Input mode

User mode and administrator mode

Parameters

-f

Restarts the accounting program without outputting a restart confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file when the program is restarted.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

Restarts the accounting program after outputting a restart confirmation message.

Example

Figure 6-3: Example of the restart of the accounting program

```
> restart accounting
accounting program restart OK? (y/n):y
Date 2006/03/26 11:02:42 UTC
>

> restart accounting -f
Date 2006/03/26 11:12:42 UTC
>
```

Display items

None

Impact on communication

None

Response messages

Table 6-10: List of response messages for the restart accounting command

Message	Description
accounting program failed to be restarted.	An attempt to restart the accounting program by this command failed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
Connection failed to accounting program.	Communication with the accounting program failed. Re-execute the command. If this error occurs frequently, use the `restart accounting` command to restart the accounting program.

Notes

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

Storage directory: `/usr/var/core/`

Core file name: `acctd.core`

If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

dump protocols accounting

Outputs to a file detailed event trace information and control table information collected for the accounting program.

Syntax

```
dump protocols accounting
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 6-4: Example of executing accounting dump

```
> dump protocols accounting
Date 2006/03/26 11:03:19 UTC
>
```

Display items

None

Impact on communication

None

Response messages

Table 6-11: List of response messages for the dump protocols accounting command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to accounting program.	Communication with the accounting program failed. Re-execute the command. If this error occurs frequently, use the `restart accounting` command to restart the accounting program.
File open error.	An attempt to open or access a dump file failed.

Notes

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

Storage directory: `/usr/var/accounting/`

File name: `accounting_dump.gz`

If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

Chapter

7. Time Settings and NTP

show clock
set clock
show ntp associations
restart ntp

show clock

Displays the current date and time.

Syntax

```
show clock
```

Input mode

User mode and administrator mode

Parameters

None

Displays the current time.

Example

Enter the following command to display the current time.

```
> show clock    Press the Enter key.
Wed Mar 22 15:30:00 UTC 2006
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

set clock

Displays and sets the date and time.

Syntax

```
set clock <[[[[yy]mm]dd]hh]mm[.ss]>
```

Input mode

User mode and administrator mode

Parameters

yy

Specifies the last two digits of the year. The specifiable values are from 69 to 99 (for the 1900s) and from 00 to 38 (for the 2000s). (For example, 00 means the year 2000.)

mm

Specifies the month in the range from 1 to 12.

dd

Specifies the day of the month in the range from 1 to 31.

hh

Specifies the hour in the range from 0 to 23.

mm

Specifies the minute in the range from 0 to 59.

ss

Specifies the second in the range from 0 to 59.

Operation when all parameters are omitted:

You can omit the year, month, day, hour, and seconds, but cannot omit the minutes. These elements must be specified in sequence without skipping any. For example, you cannot specify just the day of the month and the minutes (but skip the hour).

Example

To set the date and time as March 22, 2006 at 15:30, enter the following command:

```
> set clock 0603221530
Wed Mar 22 15:30:00 UTC 2006
>
```

Impact on communication

Use of Web authentication or MAC authentication might affect communication. For details, see *7.4.1 Notes on changing the Switch configuration and status* in the manual *Configuration Guide Vol. 2 For Version 11.7*.

Response messages

Table 7-1: List of response messages for the set clock command

Message	Description
illegal time format.	The input format of the time is incorrect.

Notes

1. If you change the time, statistics on CPU usage collected by the Switch will be cleared to zero.
2. Do not specify an invalid date or time that does not actually exist. If an invalid date or time is specified, it is automatically changed to a valid date. For example, if `0431` (April 31) is specified for mmdd, the value is changed to `0501` (May 1).
3. If you adjust the Switch's clock when scheduled power saving is in use, the adjustment might not be reflected in the schedule until the length of the time that has been adjusted (or up to 30 minutes) lapses. [AX6700S] [AX6600S]

show ntp associations

Displays the activity status of the connected NTP server.

Syntax

```
show ntp associations [{vrf <vrf id> | global}]
```

Input mode

User mode and administrator mode

Parameters

{vrf <*vrf id*> | global} [OP-NPAR]

Displays the activity status of the NTP server of the specified VRF. Only the activity status of the NTP server of the specified VRF is displayed when <*vrf id*> is specified, and only the activity status of the NTP server of the global network is displayed when global is specified. The range of the specifiable values for <*vrf id*> is all the VRF IDs specified by the configuration command.

Operation when this parameter is omitted:

Displays the activity status of the NTP server of all VRFs including the global network.

Example 1

Figure 7-1: Display of the activity status of an NTP server

```
> show ntp associations    Press the Enter key.
Date 2009/01/23 12:00:00 UTC
  remote         refid      st t when poll reach   delay   offset    disp
==============================================================================
*timesvr    192.168.1.100    3 u    1   64  377     0.89   -2.827    0.27
>
```

Example 2

Figure 7-2: Display of the activity status of the NTP servers of all VRFs [OP-NPAR]

```
> show ntp associations    Press the Enter key.
Date 2009/10/08 11:01:35 UTC
VRF: global
  remote         refid      st t when poll reach   delay   offset    disp
==============================================================================
*10.10.10.10    10.10.10.20  4 u  968 1024  177     1.16    0.085    76.46
VRF: 10
  remote         refid      st t when poll reach   delay   offset    disp
==============================================================================
+10.10.10.10    10.10.10.20  4 u  981 1024  377     1.21   -4.727    14.82
>
```

Figure 7-3: Display of the activity status of the NTP server of the specified VRF [OP-NPAR]

```
> show ntp associations vrf 10    Press the Enter key.
Date 2009/10/08 11:01:35 UTC
VRF: 10
  remote         refid      st t when poll reach   delay   offset    disp
==============================================================================
+10.10.10.10    10.10.10.20  4 u  981 1024  377     1.21   -4.727    14.82
>
```

Display items

Table 7-2: Information displayed by the show ntp associations command

Item	Meaning
VRF [OP-NPAR]	VRF ID
remote	Indicates the name of the time server host. If a local time server is set, `LOCAL(1)` is displayed. [Meaning of the code at the beginning of the host name] " ": A host that is treated as invalid because the activity cannot be checked, or the stratum value is high. `+`: A host remaining as an available choice. `#`: A selected synchronized host. However, the upper limit of the distance is exceeded. `*`: A selected synchronized host. Other symbols: Hosts that are found to be invalid by test results.
refid	The destination host to which the time server is synchronized.
st	The stratum value of the host
t	Indicates a server type. [Meaning of displayed server types] `u`: Unicast server `b`: Broadcast server `l`: Local server
when	Indicates the time elapsed since the last packet was received from the host. `-` is displayed when the elapsed time is 0 seconds or less. [Meaning of the symbol at the end of a displayed number] `m`: In minutes (for 2049 seconds or more) `h`: In hours (for 301 minutes or more) `d`: In days (for 97 hours or more) If only a number is displayed with no symbol, the displayed value is in seconds.
poll	Indicates the host polling interval (in seconds).
reach	Indicates reachability in octal notation.
delay	Indicates the total both-way delay time from the reference source to the synchronized subnet (in milliseconds).
offset	Indicates the offset value (in milliseconds).
disp	Indicates the latency (variation) in the time from the reference source to the synchronized subnet (in milliseconds).

Impact on communication

None

Response messages

Table 7-3: List of response messages for the show ntp associations command

Message	Description
Connection refused	A connection with the NTP server could not be established.
No association ID's returned	The time server could not be found.
no such VRF *<vrf id>*	The specified VRF was not found. *<vrf id>*: Specified VRF ID
ntp is not running	NTP is not running.

Notes

None

restart ntp

Restarts the local NTP server.

Syntax

```
restart ntp
```

Input mode

Administrator mode

Parameters

None

Example

Figure 7-4: Restarting the NTP server

```
# restart ntp    Press the Enter key.
#
```

Display items

None

Impact on communication

None

Response messages

Table 7-4: List of response messages for the restart ntp command

Message	Description
Connection refused	A connection with the NTP server could not be established.
No association ID's returned	The time server could not be found.

Notes

None

Chapter

8. Utilities

diff
grep
more
less
tail
hexdump

diff

Compares two specified files and displays their differences.

Syntax

```
diff [<option>] <file name1> <file name2>
diff [<option>] <directory1> <directory2>
```

Input mode

User mode and administrator mode

Parameters

<option>

`-i`: Ignores the difference between upper-case and lower-case letters.

`-r`: Applies the command to common subdirectories recursively (when directories are specified).

Operation when this parameter is omitted:

Compares specified files, distinguishing between upper-case and lower-case letters.

<file name1> <file name2>

Specifies the names of files to be compared.

<directory1> <directory2>

Specifies the names of directories to be compared.

Example and display items

```
# diff aaa.txt bbb.txt
3d2           <---------------1
< Test 3
6c5           <---------------2
< Test 6
---
> Test 66
7a7           <---------------3
> Test 8
#
```

1. Indicates that `Test3` on the third line of aaa.txt is deleted in bbb.txt.
2. Indicates that `Test6` on the sixth line of aaa.txt is different from Test66 on the fifth line of bbb.txt.
3. Indicates that `Test8` was added to the seventh line of bbb.txt.

Impact on communication

None

Response messages

None

Notes

If a text file that is 4 MB or larger is specified using this command, a message (/usr/bin/diff: memory exhausted) is displayed and command execution might be aborted.

grep

Retrieves a specified file and outputs lines containing a specified pattern.

Syntax

`grep[<option>] <pattern> [<file name>]`

Input mode

User mode and administrator mode

Parameters

<option>

`-n`: Inserts the line number at the beginning of each line in the retrieved result.

`-i`: Retrieves a file without distinguishing between upper-case and lower-case letters.

Operation when this parameter is omitted:

Retrieves the specified file while distinguishing between upper-case and lower-case letters and outputs the result with no line numbers.

<pattern>

Specifies the search string.

<file name>

Specifies the file name.

Operation when this parameter is omitted:

Searches for specified *<pattern>* from the standard input.

Operation when all parameters are omitted:

Searches for specified *<pattern>* from the standard input.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

more

Displays one page of the contents of a specified file.

Syntax

`more [<option>] <file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-N`: Displays the line number at the beginning of each line.

Operation when this parameter is omitted:

Line numbers are not displayed.

<file name>

Specifies the file name.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

less

Displays one page of the contents of a specified file.

Syntax

`less [<option>] <file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-m`: Always displays a percentage representing the current line in the prompt.

`-N`: Displays the line number at the beginning of each line.

Operation when this parameter is omitted:

The percentage and line number of the current line are not displayed.

<file name>

Specifies the file name.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

tail

Outputs the contents of a specified file from a specified point.

Syntax

`tail [<option>] <file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-n`: Outputs n lines from the end.

Operation when this parameter is omitted:

Outputs 10 lines from the end.

<file name>

Specifies the file name.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

hexdump

Displays a hexadecimal dump.

Syntax

`hexdump [<option>] <file name>`

Input mode

User mode and administrator mode

Parameters

<option>

`-b`: Displays a dump in octal notation for every byte.

`-c`: Displays a dump in characters for every byte.

Operation when this parameter is omitted:

Displays a dump in hexadecimal notation for every byte.

<file name>

Specifies the file name.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

Chapter 9. Checking Software Versions and Device Statuses

show version
show system
clear control-counter
show environment
reload
show tech-support
show tcpdump (tcpdump)
backup
restore

show version

Displays information about the Switch software and the board installed.

Syntax

```
show version [software]
```

Input mode

User mode and administrator mode

Parameters

software

Only the software information is displayed.

Operation when this parameter is omitted:

Displays information about the Switch software and the boards installed.

Example 1

The following examples show how to display only the switch software version.

Figure 9-1: Example of displaying only the software version [AX6700S]

```
> show version software
Date 2009/04/10 18:36:40 UTC
S/W: AX-P6300-S2 OS-SE Ver. 11.1
>
```

Figure 9-2: Example of displaying only the software version [AX6600S]

```
> show version software
Date 2009/04/10 18:36:40 UTC
S/W: AX-P6300-S2 OS-SE Ver. 11.1
>
```

Figure 9-3: Example of displaying only the software version [AX6300S]

```
> show version software
Date 2009/04/10 18:36:40 UTC
S/W: AX-P6300-S2 OS-SE Ver. 11.1
>
```

Example 2

The following examples show how information is displayed about the Switch software and the boards installed when this command is executed from the active system.

Figure 9-4: Example of displaying information about the Switch software and the boards installed (when the command is executed from the active system) [AX6700S]

```
> show version
Date 2009/04/10 18:37:50 UTC
Model: AX6708S [AA1AX6708S00S000164J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: BCU1 AX-F6700-2S1 [BCU-S1, AB1BCUS1000004401659102]
          AX-P6300-S2 OS-SE Ver. 11.1
     BCU2 AX-F6700-2S1 [BCU-S1, AB1BCUS1000004401659104]
          AX-P6300-S2 OS-SE Ver. 11.1
     BSU1 AX-F6700-3LA [BSU-LA, AB1BSULA0000S010657M111]
     BSU2 AX-F6700-3LA [BSU-LA, AB1BSULA0000S010657M114]
     BSU3 AX-F6700-3LA [BSU-LA, AB1BSULA0000S010657M113]
     NIF1 AX-F6700-713T [NK1G-24T, AB1K1G24T000S010657M089]
     NIF2 AX-F6700-713S [NK1G-24S, AB1K1G24S000S010657M089]
     NIF3 AX-F6700-722F [NK10G-4RX, AB1K10G4RX00S010657M020]
     NIF4 AX-F6700-723F [NK10G-8RX, AB1K10G8RX00S010657M777]
```

```
     NIF5 notconnect
     NIF6 notconnect
     NIF7 notconnect
     NIF8 notconnect
     PS1 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G119]
     PS2 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G116]
     PS3 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G117]
     PS4 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G118]
     PS5 notconnect
     PS6 notconnect
     PS7 notconnect
     PS8 notconnect
     FAN1 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J207]
     FAN2 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J206]
     FAN3 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J205]
     FAN4 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J204]
>
```

Figure 9-5: Example of displaying information about the Switch software and the boards installed (when the command is executed from the active system) [AX6600S]

```
> show version
Date 2009/04/10 18:37:50 UTC
Model: AX6608S [A10HBX87A000S000364J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: CSU1 AX-F6600-41A [CSU-1A, AE0CSU1A0000045318AE071]
          AX-P6300-S2 OS-SE Ver. 11.1
     CSU2 AX-F6600-41A [CSU-1A, AE0CSU1A0000045318AH071]
          AX-P6300-S2 OS-SE Ver. 11.1
     NIF1 AX-F6700-713T [NK1G-24T, AB1K1G24T000S010657M089]
     NIF2 AX-F6700-713S [NK1G-24S, AB1K1G24S000S010657M089]
     NIF3 AX-F6700-722F [NK10G-4RX, AB1K10G4RX00S010657M020]
     NIF4 AX-F6700-723F [NK10G-8RX, AB1K10G8RX00S010657M777]
     NIF5 notconnect
     NIF6 notconnect
     NIF7 notconnect
     NIF8 notconnect
     PS1 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G119]
     PS2 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G116]
     PS3 notconnect
     PS4 notconnect
     PS5 notconnect
     PS6 notconnect
     FAN1 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J207]
     FAN2 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J206]
     FAN3 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J205]
>
```

Figure 9-6: Example of displaying information about the Switch software and the boards installed (when the command is executed from the active system) [AX6300S]

```
> show version
Date 2009/04/10 18:37:50 UTC
Model: AX6308S [AA1AX6304S00S000164J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: MSU1 AX-F6300-51A [MSU-1A, AB1MSU1A000004401659102]
          AX-P6300-S2 OS-SE Ver. 11.1
     MSU2 AX-F6300-51A [MSU-1A, AB1MSU1A000004401659104]
          AX-P6300-S2 OS-SE Ver. 11.1
     NIF1 AX-F6300-711T [NH1G-48T, AB1NH1G48T00S010657M089]
     NIF2 AX-F6300-711T [NH1G-48T, AB1NH1G48T00S010657M090]
     NIF3 AX-F6300-712S [NH1G-16S, AB1NH1G16S00S010657M020]
     NIF4 AX-F6300-721XF [NH10G-1RX, AB1NH10G1RX0S010657M777]
     NIF5 notconnect
     NIF6 notconnect
     NIF7 notconnect
     NIF8 notconnect
     PS1 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G119]
```

```
     PS2 AX-F6300-1A11 [PS-A11, AB1PSA110000C000065G116]
     PS3 notconnect
     PS4 notconnect
     PS5 notconnect
     PS6 notconnect
     FAN1 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J207]
     FAN2 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J206]
     FAN3 AX-F6300-CFAN11 [FAN-11, AB1FAN110000C000064J205]
>
```

Example 3

The following examples show how to display information about the Switch software and the boards installed when the command is executed from the standby system.

Figure 9-7: Example of displaying information about the Switch software and the boards installed (when the command is executed from the standby system) [AX6700S]

```
SBY:> show version
Date 2009/04/10 15:11:20 UTC
Model: AX6708S [AA1AX6708S00S000164J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: BCU1 AX-F6700-2S1 [BCU-S1, AB1BCUS1000004401659102]
          AX-P6300-S2 OS-SE Ver. 11.1
     BCU2 AX-F6700-2S1 [BCU-S1, AB1BCUS1000004401659104]
          AX-P6300-S2 OS-SE Ver. 11.1
SBY:>
```

Figure 9-8: Example of displaying information about the Switch software and the boards installed (when the command is executed from the standby system) [AX6600S]

```
SBY:> show version
Date 2009/04/10 13:45:35 UTC
Model: AX6608S [A10HBX87A000S000364J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: CSU1 AX-F6600-41A [CSU-1A, AE0CSU1A0000045318AE071]
          AX-P6300-S2 OS-SE Ver. 11.1
     CSU2 AX-F6600-41A [CSU-1A, AE0CSU1A0000045318AH071]
          AX-P6300-S2 OS-SE Ver. 11.1
SBY:>
```

Figure 9-9: Example of displaying information about the Switch software and the boards installed (when the command is executed from the standby system) [AX6300S]

```
SBY:> show version
Date 2009/04/10 18:38:52 UTC
Model: AX6308S [AA1AX6304S00S000164J117]
S/W: AX-P6300-S2 OS-SE Ver. 11.1
H/W: MSU1 AX-F6300-51A [MSU-1A, AB1MSU1A000004401659102]
          AX-P6300-S2 OS-SE Ver. 11.1
     MSU2 AX-F6300-51A [MSU-1A, AB1MSU1A000004401659104]
          AX-P6300-S2 OS-SE Ver. 11.1
SBY:>
```

Display items in Examples 1 to 3

Table 9-1: Information displayed by the show version command [AX6700S]

Item		Display format	Meaning
Model#1, #2, #3		AX6708S [*ssss...ssss*]	AX6708S model
S/W#1, #6		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software
H/W#2, #3	BCU#1	AX-F6700-2S1 [BCU-S1, *ssss...ssss*]	Basic control unit

Item		Display format	Meaning
		AX-F6700-2S11 [BCU-S11, *ssss...ssss*]	Basic control unit
		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software#7
	BSU#4	AX-F6700-3LA [BSU-LA, *ssss...ssss*]	Basic switching unit
		AX-F6700-3LB [BSU-LB, *ssss...ssss*]	Basic switching unit
	NIF#4	AX-F6700-713T [NK1G-24T, *ssss...ssss*]	24 10BASE-T, 100BASE-TX, or 1000BASE-T lines
		AX-F6700-713S [NK1G-24S, *ssss...ssss*]	24 1000BASE-X (SFP) lines
		AX-F6700-715M [NK1GS-8M, *ssss...ssss*]	Four 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X SFP lines (user selectable) with hierarchical shaper, and four 1000BASE-X SFP lines with hierarchical shaper
		AX-F6700-722F [NK10G-4RX, *ssss...ssss*]	Four 10GBASE-R (XFP) lines
		AX-F6700-723F [NK10G-8RX, *ssss...ssss*]	Eight 10GBASE-R (XFP) lines
	PS#5	AX-F6300-1A11 [PS-A11, *ssss...ssss*]	AC power supply unit
		AX-F6300-1D11 [PS-D11, *ssss...ssss*]	DC power supply unit
	FAN	AX-F6300-CFAN11 [FAN-11, *ssss...ssss*]	Fan unit

#1: This item is also displayed when this command is executed on the standby system.

#2: The format *ssss...ssss* displayed in the items `Model` and `H/W` indicates the management information of the chassis or board.

#3: When a hardware board is not mounted, `notconnect` is displayed in the item H/W for the applicable hardware board. In addition, *ssss...ssss* is not displayed.

#4: When an unsupported hardware board is mounted, `--------` `[--------,`*ssss...ssss*`]` is displayed in the item `H/W` for the applicable hardware board. In this case, *ssss...ssss* is displayed.

#5: When PS is equipped, if power is not supplied or voltage is in an abnormal state, `--------` is displayed in the item `H/W` for the applicable PS. In addition, *ssss...ssss* is not displayed.

#6 When the command is executed from the active system, information about software that is operating on the active system is displayed. When the command is executed from the standby system, information about software that is operating on the standby system is displayed.

#7: Information about software installed on the target BCU board is displayed. `--------` is displayed when no information can be obtained.

Table 9-2: Information displayed by the show version command [AX6600S]

Item	Display format	Meaning
Model#1,#2,#3	AX6604S [*ssss...ssss*]	AX6604S model

Item		Display format	Meaning
		AX6608S [*ssss...ssss*]	AX6608S model
S/W[#1, #6]		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software
H/W[#2, #3]	CSU[#1]	AX-F6600-41A [CSU-1A , *ssss...ssss*]	Control and switching unit
		AX-F6600-41B [CSU-1B , *ssss...ssss*]	Control and switching unit
		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software[#7]
	NIF[#4]	AX-F6700-713T [NK1G-24T, *ssss...ssss*]	24 10BASE-T, 100BASE-TX, or 1000BASE-T lines
		AX-F6700-713S [NK1G-24S, *ssss...ssss*]	24 1000BASE-X (SFP) lines
		AX-F6700-715M [NK1GS-8M, *ssss...ssss*]	Four 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X SFP lines (user selectable) with hierarchical shaper, and four 1000BASE-X SFP lines with hierarchical shaper
		AX-F6700-722F [NK10G-4RX, *ssss...ssss*]	Four 10GBASE-R (XFP) lines
		AX-F6700-723F [NK10G-8RX, *ssss...ssss*]	Eight 10GBASE-R (XFP) lines
	PS[#5]	AX-F6300-1A11 [PS-A11, *ssss...ssss*]	AC power supply unit
		AX-F6300-1D11 [PS-D11, *ssss...ssss*]	DC power supply unit
	FAN	AX-F6300-CFAN11 [FAN-11, *ssss...ssss*]	Fan unit

#1: This item is also displayed when this command is executed on the standby system.

#2: The format *ssss...ssss* displayed in the items `Model` and `H/W` indicates the management information of the chassis or board.

#3: When a hardware board is not mounted, `notconnect` is displayed in the item H/W for the applicable hardware board. In addition, *ssss...ssss* is not displayed.

#4: When an unsupported hardware board is mounted, `--------` [`--------`,*ssss...ssss*] is displayed in the item `H/W` for the applicable hardware board. In this case, *ssss...ssss* is displayed.

#5: When PS is equipped, if power is not supplied or voltage is in an abnormal state, `--------` is displayed in the item `H/W` for the applicable PS. In addition, *ssss...ssss* is not displayed.

#6 When the command is executed from the active system, information about software that is operating on the active system is displayed. When the command is executed from the standby system, information about software that is operating on the standby system is displayed.

#7: Information about software installed on the target CSU board is displayed. `--------` is displayed when no information can be obtained.

Table 9-3: Information displayed by the show version command [AX6300S]

Item		Display format	Meaning
Model[#1,#2,#3]		AX6304S [*ssss...ssss*]	AX6304S model
		AX6308S [*ssss...ssss*]	AX6308S model
S/W[#1, #6]		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software
H/W[#2, #3]	MSU[#1]	AX-F6300-51A [MSU-1A , *ssss...ssss*]	Management and switching unit
		AX-F6300-51A1 [MSU-1A1 , *ssss...ssss*]	Management and switching unit
		AX-F6300-51B [MSU-1B , *ssss...ssss*]	Management and switching unit
		AX-F6300-51B1 [MSU-1B1 , *ssss...ssss*]	Management and switching unit
		AX-P6300-S2 OS-S/OS-SE Ver. *x.x*	The model name, abbreviated name, and version of the software[#7]
	NIF[#4]	AX-F6300-711T [NH1G-48T, *ssss...ssss*]	48 10BASE-T, 100BASE-TX, or 1000BASE-T lines
		AX-F6300-712S [NH1G-16S, *ssss...ssss*]	16 1000BASE-X (SFP) lines
		AX-F6300-721F [NH10G-1RX, *ssss...ssss*]	One 10GBASE-R (XFP) line
		AX-F6300-713T [NH1G-24T, *ssss...ssss*]	24 10BASE-T, 100BASE-TX, or 1000BASE-T lines
		AX-F6300-713S [NH1G-24S, *ssss...ssss*]	24 1000BASE-X (SFP) lines
		AX-F6300-714M [NH1GS-6M, *ssss...ssss*]	Four 10BASE-T, 100BASE-TX, or 1000BASE-T lines with the hierarchical shaper and two 1000BASE-X SFP lines with the hierarchical shaper
		AX-F6300-722F [NH10G-4RX, *ssss...ssss*]	Four 10GBASE-R (XFP) lines
		AX-F6300-723F [NH10G-8RX, *ssss...ssss*]	Eight 10GBASE-R (XFP) lines
	PS[#5]	AX-F6300-1A11 [PS-A11, *ssss...ssss*]	AC power supply unit
		AX-F6300-1D11 [PS-D11, *ssss...ssss*]	DC power supply unit
	FAN	AX-F6300-CFAN11 [FAN-11, *ssss...ssss*]	Fan unit

#1: This item is also displayed when this command is executed on the standby system.

#2: The format *ssss...ssss* displayed in the items `Model` and `H/W` indicates the management information of the chassis or board.

#3: When a hardware board is not mounted, `notconnect` is displayed in the item H/W for the applicable hardware board. In addition, *ssss...ssss* is not displayed.

#4: When an unsupported hardware board is mounted, `--------` `[--------,`*ssss...ssss*`]` is displayed in the item `H/W` for the applicable hardware board. In this case, *ssss...ssss* is displayed.

#5: When PS is equipped, if power is not supplied or voltage is in an abnormal state, `--------` is displayed in the item `H/W` for the applicable PS. In addition, *ssss...ssss* is not displayed.

#6 When the command is executed from the active system, information about software that is operating on the active system is displayed. When the command is executed from the standby system, information about software that is operating on the standby system is displayed.

#7: Information about software installed on the target MSU board is displayed. `--------` is displayed when no information can be obtained.

Impact on communication

None

Response messages

None

Notes

None

show system

Displays operating status.

Syntax

```
show system
```

Input mode

User mode and administrator mode

Parameters

None

Example 1

The following examples show the information displayed in normal operation status.

Figure 9-10: Example of displaying information in normal operation status [AX6700S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6708S, OS-SE Ver. 11.2
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5101
    Device redundancy cpu status : duplex
    Power control : normal
    Power redundancy-mode : check is executed
    PS1 = active
    PS2 = active
    PS3 = active
    PS4 = active
    PS5 = notconnect
    PS6 = notconnect
    PS7 = notconnect
    PS8 = notconnect
    Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                      FAN2(4), FAN2(5), FAN2(6),
                      FAN3(7), FAN3(8), FAN3(9),
                      FAN4(10), FAN4(11), FAN4(12)
                      Speed = normal
    BCU1 : active
        CPU: AX-F6700-2S1[BCU-S1 , 80200020]
        Boot : 2009/04/10 18:35:42 , power on , 0 times restart
        Lamp : STATUS LED=green , ACTIVE LED=green
               SYSTEM1 LED=green , SYSTEM2 LED=light off
        System operation panel : No error
        Board : CPU=PowerPC 833MHz , Memory=2,097,152kB(2048MB)
        Management port: active up
             10BASE-T half(auto) , 0012.e220.3401
        Temperature : normal(27degree)
        Flash :
                  user area   config area     dump area    area total
            used   63,470kB          91kB       6,326kB      69,887kB
            free   29,872kB      19,318kB      14,734kB      63,924kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC  : enabled
             Manufacture ID : 00000003
            19,343kB used
            103,616kB free
            122,959kB total
    BCU2 : standby
        CPU: AX-F6700-2S1[BCU-S1 , 80200020]
```

```
        Boot : 2009/04/10 18:36:25 , power on , 0 times restart
        Lamp : STATUS LED=green , ACTIVE LED=light off
               SYSTEM1 LED=green , SYSTEM2 LED=light off
        System operation panel : No error
        Board : CPU=PowerPC 833MHz , Memory=2,097,152kB(2048MB)
        Management port: unused
        Temperature : normal(25degree)
        Flash :
                  user area   config area     dump area    area total
            used   62,699kB          91kB       4,800kB      67,590kB
            free   30,643kB      19,318kB      16,260kB      66,221kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC : enabled
            Manufacture ID : 00000003
            22,863kB used
            100,096kB free
            122,959kB total
    Redundancy bsu-load-balancing : port
    Redundancy bsu-mode : fail-safe
    BSU1 : active AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =green , ACTIVE LED=green, 0 times restart
    BSU2 : fault AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =red , ACTIVE LED=light off, 0 times restart
    BSU3 : active AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =green , ACTIVE LED=green, 0 times restart
    Forwarding Database Management
        fwdm : ipv4-uni standard
            IPv4 Unicast resources    Used/Max:       0 /  65536
            IPv4 Multicast resources  Used/Max:       0 /      0
            IPv6 Unicast resources    Used/Max:       0 /      0
            IPv6 Multicast resources  Used/Max:       0 /      0
            MAC Address resources     Used/Max:       0 /  24576
                MAC Address (Learned) used                      :       0
                MAC Address (Static) used                       :       0
                MAC Address (IEEE802.1X/Web/MAC) used           :       0
                MAC Address (not Learned/ARP,NDP resolved) used :       0
                VLAN config used                                :       0
                MAC Address (IGMP/MLD Snooping) used            :       0
            Shared resources          Used/Max:       0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User:   1024/  32768
>
```

Figure 9-11: Example of displaying information in normal operation status [AX6600S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6608S, OS-SE Ver. 11.2
```

```
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5102
    Device redundancy cpu status : duplex
    Power control : normal
    Power redundancy-mode : check is executed
    PS1 = active
    PS2 = active
    PS3 = notconnect
    PS4 = notconnect
    PS5 = notconnect
    PS6 = notconnect
    Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                      FAN2(4), FAN2(5), FAN2(6),
                      FAN3(7), FAN3(8), FAN3(9)
                      Speed = normal
    CSU1 : active
        CPU : AX-F6600-41A [CSU-1A , AE0CSU1A0000045318AE071]
        Boot : 2009/04/10 13:55:35 , power on , 0 times restart
        PSP : active
        Lamp : STATUS LED=green , ACTIVE LED=green
               SYSTEM1 LED=green , SYSTEM2 LED=light off
        System operation panel : No error
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: active up
             10BASE-T half(auto) , 0012.e220.3401
        Temperature : normal(27degree)
        Flash :
                  user area   config area     dump area    area total
            used   35,645kB         111kB           0kB      35,756kB
            free  247,119kB     282,775kB     163,660kB     693,554kB
            total 282,764kB     282,886kB     163,660kB     729,310kB
        MC  : enabled
             Manufacture ID : 00000003
            19,343kB used
            103,616kB free
            122,959kB total
    CSU2 : standby
        CPU : AX-F6600-41A [CSU-1A , AE0CSU1A0000045318AH071]
        Boot : 2009/04/10 13:56:10 , power on , 0 times restart
        PSP : active
        Lamp : STATUS LED=green , ACTIVE LED=light off
               SYSTEM1 LED=green , SYSTEM2 LED=light off
        System operation panel : No error
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: unused
        Temperature : normal(25degree)
        Flash :
                  user area   config area     dump area    area total
            used   35,631kB         111kB           0kB      35,742kB
            free  247,133kB     282,775kB     163,660kB     693,568kB
            total 282,764kB     282,886kB     163,660kB     729,310kB
        MC : enabled
            Manufacture ID : 00000003
            22,863kB used
            100,096kB free
            122,959kB total
    Forwarding Database Management
        fwdm : ipv4-uni standard
            IPv4 Unicast resources    Used/Max:       0 /  65536
            IPv4 Multicast resources  Used/Max:       0 /      0
            IPv6 Unicast resources    Used/Max:       0 /      0
            IPv6 Multicast resources  Used/Max:       0 /      0
            MAC Address resources     Used/Max:       0 /  24576
                MAC Address (Learned) used                  :       0
```

```
                MAC Address (Static) used                      :       0
                MAC Address (IEEE802.1X/Web/MAC) used          :       0
                MAC Address (not Learned/ARP,NDP resolved) used :       0
                VLAN config used                               :       0
                MAC Address (IGMP/MLD Snooping) used           :       0
            Shared resources          Used/Max:       0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User: 1024/ 32768
>
```

Figure 9-12: Example of displaying information in normal operation status [AX6300S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6308S, OS-SE Ver. 11.2
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5100
    Device redundancy cpu status : duplex
    Power control : normal
    Power redundancy-mode : check is executed
    PS1 = active
    PS2 = active
    PS3 = notconnect
    PS4 = notconnect
    PS5 = notconnect
    PS6 = notconnect
    Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                      FAN2(4), FAN2(5), FAN2(6),
                      FAN3(7), FAN3(8), FAN3(9)
                      Speed = normal
    MSU1 : active
        CPU : AX-F6300-51A [MSU-1A , 80200020]
        Boot : 2008/06/24 18:35:42 , power on , 0 times restart
        PSP : active
        Lamp : STATUS LED=green , ACTIVE LED=green , SYSTEM1 LED=green
        System operation panel : No error
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: active up
             10BASE-T half(auto) , 0012.e220.3401
        Temperature : normal(27degree)
        Flash :
                  user area   config area     dump area    area total
            used   63,470kB          91kB       6,326kB      69,887kB
            free   29,872kB      19,318kB      14,734kB      63,924kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
```

```
        MC  : enabled
             Manufacture ID : 00000003
            19,343kB used
            103,616kB free
            122,959kB total
    MSU2 : standby
        CPU : AX-F6300-51A [MSU-1A , 80200020]
        Boot : 2008/06/24 18:36:25 , power on , 0 times restart
        PSP : standby
        Lamp : STATUS LED=green , ACTIVE LED=light off , SYSTEM1 LED=green
        System operation panel : No error
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: unused
        Temperature : normal(25degree)
        Flash :
                  user area   config area     dump area    area total
            used   62,699kB          91kB       4,800kB      67,590kB
            free   30,643kB      19,318kB      16,260kB      66,221kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC : enabled
            Manufacture ID : 00000003
            22,863kB used
            100,096kB free
            122,959kB total
    Forwarding Database Management
        fwdm : ipv4-uni standard
            IPv4 Unicast resources    Used/Max:       0 /  65536
            IPv4 Multicast resources  Used/Max:       0 /      0
            IPv6 Unicast resources    Used/Max:       0 /      0
            IPv6 Multicast resources  Used/Max:       0 /      0
            MAC Address resources     Used/Max:       0 /  24576
                MAC Address (Learned) used                      :       0
                MAC Address (Static) used                       :       0
                MAC Address (IEEE802.1X/Web/MAC) used           :       0
                MAC Address (not Learned/ARP,NDP resolved) used :       0
                VLAN config used                                :       0
                MAC Address (IGMP/MLD Snooping) used            :       0
            Shared resources          Used/Max:       0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User:   1024/  24576
>
```

Example 2

The following examples show the information displayed when the standby system is in an abnormal state.

Figure 9-13: Example of the information displayed when the standby system is in an abnormal state [AX6700S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6708S, OS-SE Ver. 11.2
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5101
    Device redundancy cpu status : simplex
    Power control : normal(changing suspended)
    Power redundancy-mode : check is not executed
    PS1 = active
    PS2 = active
    PS3 = active
    PS4 = active
    PS5 = notconnect
    PS6 = notconnect
    PS7 = notconnect
    PS8 = notconnect
    Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                      FAN2(4), FAN2(5), FAN2(6),
                      FAN3(7), FAN3(8), FAN3(9),
                      FAN4(10), FAN4(11), FAN4(12)
                      Speed = normal
    BCU1 : active
        CPU: AX-F6700-2S1[BCU-S1 , 80200020]
        Boot : 2009/04/10 18:35:42 , operation reboot , 0 times restart
        Lamp : STATUS LED=green , ACTIVE LED=green
               SYSTEM1 LED=orange , SYSTEM2 LED=light off
        System operation panel :
            Event level : E7
            Location of event occurrence : SOFTWARE
            Message identifier : 01600001
            Event occurrence interface identifier : none
        Board : CPU=PowerPC 833MHz , Memory=2,097,152kB(2048MB)
        Management port: active up
             10BASE-T half(auto) 0012.e220.3401
        Temperature : normal(27degree)
        Flash :
                  user area   config area     dump area    area total
            used   62,699kB          91kB       4,800kB      67,590kB
            free   30,643kB      19,318kB      16,260kB      66,221kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC : notconnect
    BCU2 : fault
        CPU: AX-F6700-2S1[BCU-S1 , 80200020]
        Boot : 2009/04/10 18:36:25, fatal , 1 times restart
        Lamp : STATUS LED=red , ACTIVE LED=light off
               SYSTEM1 LED=red , SYSTEM2 LED=light off
        System operation panel :
            Event level : E8
            Location of event occurrence : BCU
            Message identifier : 800000000
            Event occurrence interface identifier : none
        Board : CPU=PowerPC 833MHz , Memory=2,097,152kB(2048MB)
        Management port: unused
        Temperature : normal(25degree)
        Flash :
                  user area   config area     dump area    area total
            used   63,470kB          91kB       6,326kB      69,887kB
            free   29,872kB      19,318kB      14,734kB      63,924kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC  : enabled
            Manufacture ID : 00000003
            19,343kB used
```

```
        103,616kB free
        122,959kB total
    Redundancy bsu-load-balancing : port
    Redundancy bsu-mode : fail-safe
    BSU1 : active AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =green , ACTIVE LED=green, 0 times restart
    BSU2 : fault AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =red , ACTIVE LED=light off, 0 times restart
    BSU3 : active AX-F6700-3LA [BSU-LA]
        Lamp : STATUS LED =green , ACTIVE LED=green, 0 times restart
    Forwarding Database Management
        fwdm : ipv4-uni standard
            IPv4 Unicast resources    Used/Max:       0 /  65536
            IPv4 Multicast resources  Used/Max:       0 /      0
            IPv6 Unicast resources    Used/Max:       0 /      0
            IPv6 Multicast resources  Used/Max:       0 /      0
            MAC Address resources     Used/Max:       0 /  24576
                MAC Address (Learned) used                      :       0
                MAC Address (Static) used                       :       0
                MAC Address (IEEE802.1X/Web/MAC) used           :       0
                MAC Address (not Learned/ARP,NDP resolved) used :       0
                VLAN config used                                :       0
                MAC Address (IGMP/MLD Snooping) used            :       0
            Shared resources          Used/Max:       0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User:   1024/  32768
>
```

Figure 9-14: Example of the information displayed when the standby system is in an abnormal state [AX6600S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6608S, OS-SE Ver. 11.2
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5102
    Device redundancy cpu status : simplex
    Power control : normal(changing suspended)
    Power redundancy-mode : check is not executed
    PS1 = active
    PS2 = active
    PS3 = notconnect
    PS4 = notconnect
    PS5 = notconnect
    PS6 = notconnect
```

```
Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                  FAN2(4), FAN2(5), FAN2(6),
                  FAN3(7), FAN3(8), FAN3(9)
                  Speed = normal
CSU1 : active
    CPU : AX-F6600-41A [CSU-1A , AE0CSU1A0000045318AE071]
    Boot : 2009/04/10 15:40:31 , operation reboot , 1 times restart
    PSP : active
    Lamp : STATUS LED=green , ACTIVE LED=green
           SYSTEM1 LED=orange , SYSTEM2 LED=light off
    System operation panel :
        Event level : E7
        Location of event occurrence : SOFTWARE
        Message identifier : 01600001
        Event occurrence interface identifier : none
    Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
    Management port: active up
         10BASE-T half(auto) 0012.e220.3401
    Temperature : normal(27degree)
    Flash :
              user area   config area     dump area    area total
        used   35,645kB         111kB           0kB      35,756kB
        free  247,119kB     282,775kB     163,660kB     693,554kB
        total 282,764kB     282,886kB     163,660kB     729,310kB
    MC : notconnect
CSU2 : fault
    CPU : AX-F6600-41A [CSU-1A , AE0CSU1A0000045318AH071]
    Boot : 2009/04/10 15:41:43, fatal , 1 times restart
    PSP : fault
    Lamp : STATUS LED=red , ACTIVE LED=light off
           SYSTEM1 LED=orange , SYSTEM2 LED=light off
    System operation panel :
        Event level : E8
        Location of event occurrence : CSU
        Message identifier : 800000000
        Event occurrence interface identifier : none
    Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
    Management port: unused
    Temperature : normal(25degree)
    Flash :
              user area   config area     dump area    area total
        used   35,631kB         111kB           0kB      35,742kB
        free  247,133kB     282,775kB     163,660kB     693,568kB
        total 282,764kB     282,886kB     163,660kB     729,310kB
    MC  : enabled
        Manufacture ID : 00000003
        19,343kB used
        103,616kB free
        122,959kB total
Forwarding Database Management
    fwdm : ipv4-uni standard
        IPv4 Unicast resources    Used/Max:       0 /  65536
        IPv4 Multicast resources  Used/Max:       0 /      0
        IPv6 Unicast resources    Used/Max:       0 /      0
        IPv6 Multicast resources  Used/Max:       0 /      0
        MAC Address resources     Used/Max:       0 /  24576
            MAC Address (Learned) used                    :       0
            MAC Address (Static) used                     :       0
            MAC Address (IEEE802.1X/Web/MAC) used         :       0
            MAC Address (not Learned/ARP,NDP resolved) used :       0
            VLAN config used                              :       0
            MAC Address (IGMP/MLD Snooping) used          :       0
        Shared resources          Used/Max:       0B/1638400B
            IPv4 Unicast Single-path used :          0B
            IPv4 Unicast Multi-path used  :          0B
            IPv6 Unicast Single-path used :          0B
            IPv6 Unicast Multi-path used  :          0B
```

```
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User: 1024/ 32768
>
```

Figure 9-15: Example of the information displayed when the standby system is in an abnormal state [AX6300S]

```
> show system
Date 2009/07/15 12:00:00 UTC
System: AX6308S, OS-SE Ver. 11.2
Node : Name=System Name
    Contact=Contact Address
    Locate=Location
    Elapsed time : 2days 03:25:01
    Machine ID : 0012.e220.5100
    Device redundancy cpu status : simplex
    Power control : normal
    Power redundancy-mode : check is not executed
    PS1 = active
    PS2 = active
    PS3 = notconnect
    PS4 = notconnect
    PS5 = notconnect
    PS6 = notconnect
    Fan: active No =  FAN1(1), FAN1(2), FAN1(3),
                      FAN2(4), FAN2(5), FAN2(6),
                      FAN3(7), FAN3(8), FAN3(9)
                      Speed = normal
    MSU1 : active
        CPU : AX-F6300-51A [MSU-1A , 80200020]
        Boot : 2008/06/24 18:35:42 , operation reboot , 1 times restart
        PSP : active
        Lamp : STATUS LED=green , ACTIVE LED=green , SYSTEM1 LED=orange
        System operation panel :
            Event level : E7
            Location of event occurrence : SOFTWARE
            Message identifier : 01600001
            Event occurrence interface identifier : none
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: active up
             10BASE-T half(auto) 0012.e220.3401
        Temperature : normal(27degree)
        Flash :
                  user area   config area     dump area    area total
            used   62,699kB          91kB       4,800kB      67,590kB
            free   30,643kB      19,318kB      16,260kB      66,221kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC : notconnect
    MSU2 : fault
        CPU : AX-F6300-51A [MSU-1A , 80200020]
        Boot : 2008/06/24 18:36:25, fatal , 1 times restart
        PSP : fault
```

```
        Lamp : STATUS LED=red , ACTIVE LED=light off , SYSTEM1 LED=red
        System operation panel :
            Event level : E8
            Location of event occurrence : MSU
            Message identifier : 800000000
            Event occurrence interface identifier : none
        Board : CPU=PowerPC 667MHz , Memory=1,048,576kB(1024MB)
        Management port: unused
        Temperature : normal(25degree)
        Flash :
                  user area   config area     dump area    area total
            used   63,470kB          91kB       6,326kB      69,887kB
            free   29,872kB      19,318kB      14,734kB      63,924kB
            total  93,342kB      19,409kB      21,060kB     133,811kB
        MC  : enabled
            Manufacture ID : 00000003
            19,343kB used
            103,616kB free
            122,959kB total
    Forwarding Database Management
        fwdm : ipv4-uni standard
            IPv4 Unicast resources    Used/Max:       0 /  65536
            IPv4 Multicast resources  Used/Max:       0 /      0
            IPv6 Unicast resources    Used/Max:       0 /      0
            IPv6 Multicast resources  Used/Max:       0 /      0
            MAC Address resources     Used/Max:       0 /  24576
                MAC Address (Learned) used                      :       0
                MAC Address (Static) used                       :       0
                MAC Address (IEEE802.1X/Web/MAC) used           :       0
                MAC Address (not Learned/ARP,NDP resolved) used :       0
                VLAN config used                                :       0
                MAC Address (IGMP/MLD Snooping) used            :       0
            Shared resources          Used/Max:       0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
    Flow Database Management
        fldm : default standard-advance
            Filter resources     Used/Max:    1856/   4000
                MAC :    239  IPv4 :   1046  IPv6 :    571  Advance :      0
            QoS resources        Used/Max:    1206/   4000
                MAC :     18  IPv4 :    814  IPv6 :    374  Advance :      0
        upc-storm-control mode : upc-in-and-storm-control
            UPC resources        Used/Max:     145/    744
                MAC :    100  IPv4 :     30  IPv6 :     15  Advance :      0
    Hierarchical shaper Database Management
        User:   1024/  24576
>
```

Display items in Example 1 and 2

Table 9-4: Information displayed by the show system command (1/8)

Item	Displayed information	Displayed detailed information
System	Device model	Device model
	Software information	Software type, version
Node	Node information	--

Item	Displayed information	Displayed detailed information
Name	System name	Identification name set by the user
Contact	Contact information	Contact information set by the user
Locate	Installation location	Installation location set by the user
Elapsed time	Elapsed time	The time elapsed since the switch started
Machine ID	Chassis MAC address	Chassis MAC address
Device redundancy cpu status	CPU redundancy status	`duplex`: During normal duplex operation `simplex`: During normal simplex
Power control	Power control mode [AX6700S] [AX6600S]	`normal`: Operation is in normal power mode. `saving mode1`: Operation is in power saving mode 1. `saving mode2`: Operation is in power saving mode 2. `changing`: The power control mode is being changed. When the power control mode could not be changed by scheduling or traffic volume, the information is displayed with `changing suspended` added.
	Power control mode [AX6300S]	`normal`: Operation is in normal power mode. `saving`: Operation is in power saving mode.
Power redundancy-mode	Power mode	`check is executed`: A check of whether or not the power is in a redundant configuration is performed. `check is not executed`: A check of whether or not the power is in a redundant configuration is not performed.
PS	Installation status of the input power supply unit.	`active`: Supplied normally `fault`: No power is being supplied or there is an abnormal voltage. `notconnect`: Not installed
Fan#	Fan operating status	The numbers of active fans
	The rotational speed of the fan	`normal`: Normal rotation `high`: High-speed rotation `stop`: Stopped rotation

#: The location information of a fan is described in the format `FAN`*x*`(`*y*`)`. In this format, the *x* value indicates the fan unit number, and the *y* value indicates the fan number. The following table describes the correspondence between information in operation log and names specified on the chassis. Front surface, inside surface, and back surface described in Location on the chassis represent the positional relation as viewed from the back of the device.

Table 9-5: Correspondence between fan numbers, operation log data, and chassis

Device model		Correspondence of the fan unit	
Chassis	Unit	Command and operation log display	Location on the chassis
AX6708S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage upper fan unit
		FAN2(5)	Inside surface of the middle stage upper fan unit

Device model		Correspondence of the fan unit	
Chassis	**Unit**	**Command and operation log display**	**Location on the chassis**
		FAN2(6)	Back surface of the middle stage upper fan unit
	FAN3	FAN3(7)	Front surface of the middle stage lower fan unit
		FAN3(8)	Inside surface of the middle stage lower fan unit
		FAN3(9)	Back surface of the middle stage lower fan unit
	FAN4	FAN4(10)	Front surface of the bottom stage fan unit
		FAN4(11)	Inside surface of the bottom stage fan unit
		FAN4(12)	Back surface of the bottom stage fan unit
AX6604S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the bottom stage fan unit
		FAN2(5)	Inside surface of the bottom stage fan unit
		FAN2(6)	Back surface of the bottom stage fan unit
AX6608S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage fan unit
		FAN2(5)	Inside surface of the middle stage fan unit
		FAN2(6)	Back surface of the middle stage fan unit
	FAN3	FAN3(7)	Front surface of the bottom stage fan unit
		FAN3(8)	Inside surface of the bottom stage fan unit
		FAN3(9)	Back surface of the bottom stage fan unit
AX6304S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the bottom stage fan unit
		FAN2(5)	Inside surface of the bottom stage fan unit
		FAN2(6)	Back surface of the bottom stage fan unit
AX6308S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage fan unit
		FAN2(5)	Inside surface of the middle stage fan unit

Device model		Correspondence of the fan unit	
Chassis	**Unit**	**Command and operation log display**	**Location on the chassis**
		FAN2(6)	Back surface of the middle stage fan unit
	FAN3	FAN3(7)	Front surface of the bottom stage fan unit
		FAN3(8)	Inside surface of the bottom stage fan unit
		FAN3(9)	Back surface of the bottom stage fan unit

Table 9-6: Information displayed by the show system command (2/8) [AX6700S]

Item	Displayed information	Displayed detailed information
BCU	Operating status of BSU	`active`: Running as active system `standby`: Running as standby system fault: Failed[#1] `initialize`: Initializing `inactive`: Inactive status `notconnect`: Not installed `configuration discord`: Not synchronized with the active system due to a configuration mismatch[#2] `software version discord`: Not synchronized with the active system due to a software version mismatch[#2] `license key discord`: Not synchronized with the active system due to a license key mismatch[#2]
CPU	BCU information	The model name, abbreviated name, and CPU version of the BCU
Boot	Startup time of CPU	Startup time of CPU
	Cause of CPU startup	`power on`: Startup because the power switch turned on `operation reboot`: Restart because lines were switched or reboot command issued. `fatal`: Restart (a fault occurs) `default restart`: Restart due to a default restart `default restart`: Restart due to a default restart `auto restart`: Auto restart due to software
	Number of times CPU restarts due to failure	Number of times CPU restarts due to device failure[#3]
Lamp	LED indication	--
STATUS LED	LED indicating device status	`light off`: The LED is off. `green`: The LED is on and green. `orange`: The LED is on and orange. `red`: The LED is on and red.
ACTIVE LED	LED indicating BCU redundant operation status	`light off`: The LED is off. `green`: The LED is on and green.
SYSTEM1 LED	LED indicating BCU operating status	`light off`: The LED is off. `orange`: The LED is on and orange. `green blink`: The LED is green and blinking. `green`: The LED is on and green. `red`: The LED is on and red.

Item	Displayed information	Displayed detailed information
SYSTEM2 LED	LED indicating power control mode	`light off`: The LED is off. `green blink`: The LED is green and blinking. `green`: The LED is on and green.
System operation panel	Information display of system operation panel[#4]	--
Event level	Event level[#5]	Display of an event level #: When multiple failures occur, the highest failure event level is displayed.
Location of event occurrence	Event location[#5]	Display of the event location
Message identifier	Message ID[#5]	Display of the message ID
Event occurrence interface identifier	Event interface ID[#5]	Display of the event interface ID
Board	BCU information	The type, clock, and CPU version of the BCU
	Amount of installed memory of the BCU	Amount of installed memory of the BCU
Management port	Management port status[#6]	`active up`: Active (Normal operating status) `active down`: Active (During line failure) `unused`: Not used `inactive`: Inactive status `test`: During line test `disable`: Stopped by configuration
	Line speed	`10BASE-T half`: 10BASE-T half duplex `10BASE-T half(auto)`: 10BASE-T half duplex `10BASE-T full`: 10BASE-T full duplex `10BASE-T full(auto)`: 10BASE-T full duplex `100BASE-TX half`: 100BASE-TX half duplex `100BASE-TX half(auto)`: 100BASE-TX half duplex `100BASE-TX full`: 100BASE-TX full duplex `100BASE-TX full(auto)`: 100BASE-TX full duplex
	MAC address	MAC address of the management port
	Description	Contents of the Description configuration set for the corresponding management port #: This item is not displayed if the Description configuration has not been set.
Temperature	Intake temperature information	`normal`: Normal `caution`: Caution (High or low temperature) `critical`: Warning `fault`: Abnormal #: If the sensor detects temperatures over 65 degrees Celsius, the software stops.

#1: This status is displayed under the following conditions:

- A hardware failure has occurred.
- Operation stopped because the BCU board type of the active system is different from that of the standby system.
- Operation stopped because an unsupported BCU board is installed.

- Operation stopped because a configuration that cannot be used in the installed BCU board is set.
- Recovery of the BCU was aborted.

In addition, this status is temporarily displayed when this command is executed immediately after the standby BSU is started. If the standby BCU remains in this status without switching the status, it indicates that an abnormality is detected by the hardware diagnostics.

#2: When the operating status of the BCU is displayed, three statuses (`configuration discord`, `software version discord`, and `license key discord`) might occur at the same time. Therefore, the display might cover multiple lines.

Display example

```
BCU1 : configuration discord
       software version discord
       license key discord
```

#3: The value is initialized one hour after the device is restarted.

#4: `No error` is displayed if a failure has not occurred.

#5: This item is not displayed if `No error` is displayed on the system operation panel.

#6: When the configuration is being saved by the `save` configuration command, or copied by the `copy` command, `--------` is displayed, but line speed and MAC address are not displayed in this item.

Table 9-7: Information displayed by the show system command (3/8) [AX6600S]

Item	Displayed information	Displayed detailed information
CSU	Operating status of CSU	`active`: Running as active system `standby`: Running as standby system fault: Failed[#1] `initialize`: Initializing `inactive`: Inactive status `notconnect`: Not installed `configuration discord`: Not synchronized with the active system due to a configuration mismatch[#2] `software version discord`: Not synchronized with the active system due to a software version mismatch[#2] `license key discord`: Not synchronized with the active system due to a license key mismatch[#2]
CPU	CSU information	The model name, abbreviated name, and CPU version of the CSU
Boot	Startup time of CPU	Startup time of CPU
	Cause of CPU startup	`power on`: Startup because the power switch turned on `operation reboot`: Restart because ACH was switched or reboot command issued `fatal`: Restart (a fault occurs) `default restart`: Restart due to a default restart `default restart`: Restart due to a default restart `auto restart`: Auto restart due to software
	Number of times CPU restarts due to failure	Number of times CPU restarts due to device failure[#3]

Item	Displayed information	Displayed detailed information
PSP	Operating status of PSP	`active`: Running as active system `standby hot`: Running as hot standby system `standby cold2`: Running as cold standby 2 system fault: Failed[#1] `initialize`: Initializing
Lamp	LED indication	--
STATUS LED	LED indicating device status	`light off`: The LED is off. `green`: The LED is on and green. `orange`: The LED is on and orange. `red`: The LED is on and red.
ACTIVE LED	LED indicating CSU redundant operation status	`light off`: The LED is off. `green`: The LED is on and green.
SYSTEM1 LED	LED indicating CSU operating status	`light off`: The LED is off. `orange`: The LED is on and orange. `green blink`: The LED is green and blinking. `green`: The LED is on and green. `red`: The LED is on and red.
SYSTEM2 LED	LED indicating power control mode	`light off`: The LED is off. `green blink`: The LED is green and blinking. `green`: The LED is on and green.
System operation panel	Information display of system operation panel[#4]	--
Event level	Event level[#5]	Display of an event level #: When multiple failures occur, the highest failure event level is displayed.
Location of event occurrence	Event location[#5]	Display of the event location
Message identifier	Message ID[#5]	Display of the message ID
Event occurrence interface identifier	Event interface ID[#5]	Display of the event interface ID
Board	CPU information	The type and clock of the CPU
	Amount of installed memory of CSU	Amount of installed memory of CSU
Management port	Management port status[#6]	`active up`: Active (Normal operating status) `active down`: Active (During line failure) `unused`: Not used `inactive`: Inactive status `test`: During line test `disable`: Stopped by configuration
	Line speed	`10BASE-T half`: 10BASE-T half duplex `10BASE-T half(auto)`: 10BASE-T half duplex `10BASE-T full`: 10BASE-T full duplex `10BASE-T full(auto)`: 10BASE-T full duplex `100BASE-TX half`: 100BASE-TX half duplex `100BASE-TX half(auto)`: 100BASE-TX half duplex `100BASE-TX full`: 100BASE-TX full duplex `100BASE-TX full(auto)`: 100BASE-TX full duplex
	MAC address	MAC address of the management port

Item	Displayed information	Displayed detailed information
	Description	Contents of the Description configuration set for the corresponding management port #: This item is not displayed if the Description configuration has not been set.
Temperature	Intake temperature information	`normal`: Normal `caution`: Caution (High or low temperature) `critical`: Warning `fault`: Abnormal #: If the sensor detects temperatures over 65 degrees Celsius, the software stops.

#1: This status is displayed under the following conditions:

- A hardware failure has occurred.
- Operation stopped because the CSU board type of the active system is different from that of the standby system.
- Operation stopped because an unsupported CSU board is installed.
- Operation stopped because a configuration that cannot be used in the installed CSU board is set.
- Recovery of the CSU was aborted.

In addition, this status is temporarily displayed when this command is executed immediately after the standby CSU is started. If the standby CSU remains in this status without switching the status, it indicates that an abnormality is detected by the hardware diagnostics.

#2: When the operating status of the CSU is displayed, three statuses (`configuration discord`, `software version discord`, and `license key discord`) might occur at the same time. Therefore, the display might cover multiple lines.

Display example

```
CSU1 : configuration discord
       software version discord
       license key discord
```

#3: The value is initialized one hour after the device is restarted.

#4: `No error` is displayed if a failure has not occurred.

#5: This item is not displayed if `No error` is displayed on the system operation panel.

#6: When the configuration is being saved by the `save` configuration command, or copied by the `copy` command, `--------` is displayed, but line speed and MAC address are not displayed in this item.

Table 9-8: Information displayed by the show system command (4/8) [AX6300S]

Item	Displayed information	Displayed detailed information
MSU	Operating status of MSU	`active`: Running as active system `standby`: Running as standby system fault: Failed[#1] `initialize`: Initializing `inactive`: Inactive status `notconnect`: Not installed `configuration discord`: Not synchronized with the active system due to a configuration mismatch[#2] `software version discord`: Not synchronized with the active system due to a software version mismatch[#2] `license key discord`: Not synchronized with the active system due to a license key mismatch[#2]
CPU	MSU information	The model name, abbreviated name, and CPU version of the MSU
Boot	Startup time of CPU	Startup time of CPU
	Cause of CPU startup	`power on`: Startup because the power switch turned on `operation reboot`: Restart because ACH was switched or reboot command issued `fatal`: Restart (a fault occurs) `default restart`: Restart due to a default restart `default restart`: Restart due to a default restart `auto restart`: Auto restart due to software
	Number of times CPU restarts due to failure	Number of times CPU restarts due to device failure[#3]
PSP	Operating status of PSP	`active`: Running as active system `standby`: Running as standby system fault: Failed[#1] `initialize`: Initializing
Lamp	LED indication	--
STATUS LED	LED indicating device status	`light off`: The LED is off. `green`: The LED is on and green. `orange`: The LED is on and orange. `red`: The LED is on and red.
ACTIVE LED	LED indicating MSU redundant operation status	`light off`: The LED is off. `green`: The LED is on and green.
SYSTEM1 LED	LED indicating MSU operating status	`light off`: The LED is off. `orange`: The LED is on and orange. `green blink`: The LED is green and blinking. `green`: The LED is on and green. `red`: The LED is on and red.
System operation panel	Information display of system operation panel[#4]	--
Event level	Event level[#5]	Display of an event level #: When multiple failures occur, the highest failure event level is displayed.
Location of event occurrence	Event location[#5]	Display of the event location

Item	Displayed information	Displayed detailed information
Message identifier	Message ID[#5]	Display of the message ID
Event occurrence interface identifier	Event interface ID[#5]	Display of the event interface ID
Board	CPU information	The type and clock of the CPU
	Amount of installed MSU memory	Amount of installed MSU memory
Management port	Management port status[#6]	`active up`: Active (Normal operating status) `active down`: Active (During line failure) `unused`: Not used `inactive`: Inactive status `test`: During line test `disable`: Stopped by configuration
	Line speed	`10BASE-T half`: 10BASE-T half duplex `10BASE-T half(auto)`: 10BASE-T half duplex `10BASE-T full`: 10BASE-T full duplex `10BASE-T full(auto)`: 10BASE-T full duplex `100BASE-TX half`: 100BASE-TX half duplex `100BASE-TX half(auto)`: 100BASE-TX half duplex `100BASE-TX full`: 100BASE-TX full duplex `100BASE-TX full(auto)`: 100BASE-TX full duplex
	MAC address	MAC address of the management port
	Description	Contents of the Description configuration set for the corresponding management port #: This item is not displayed if the Description configuration has not been set.
Temperature	Intake temperature information	`normal`: Normal `caution`: Caution (High or low temperature) `critical`: Warning `fault`: Abnormal #: If the sensor detects temperatures over 65 degrees Celsius, the software stops.

#1: This status is displayed under the following conditions:

- A hardware failure has occurred.
- Operation stopped because the MSU board type of the active system is different from that of the standby system.
- Operation stopped because an unsupported MSU board is installed.
- Operation stopped because a configuration that cannot be used in the installed MSU board is set.
- Recovery of the MSU was aborted.

In addition, this status is temporarily displayed when this command is executed immediately after the standby MSU is started. If the standby MSU remains in this status without switching the status, it indicates that an abnormality is detected by the hardware diagnostics.

#2: When the operating status of the MSU is displayed, three statuses (`configuration discord`, `software version discord`, and `license key discord`) might occur at the same time. Therefore, the display might cover multiple lines.

Display example

```
MSU1 : configuration discord
       software version discord
       license key discord
```

#3: The value is initialized one hour after the device is restarted.

#4: `No error` is displayed if a failure has not occurred.

#5: This item is not displayed if `No error` is displayed on the system operation panel.

#6: When the configuration is being saved by the `save` configuration command, or copied by the `copy` command, `--------` is displayed, but line speed and MAC address are not displayed in this item.

Table 9-9: Information displayed by the show system command (5/8)

Item		Displayed information	Displayed detailed information
Flash	--	Flash information	Flash information
	used	Used capacity	Capacity in use by the file system in the internal flash memory[#1] `user area`: Used capacity of the user area `config area`: Used capacity of the configuration area `dump area`: Used capacity of the dump area `area total`: Total of each used capacity of the user area, configuration area, and dump area
	free	Unused capacity	Capacity not being used by the file system in the internal flash memory[#1] `user area`: Unused capacity of the user area `config area`: Unused capacity of the configuration area `dump area`: Unused capacity of the dump area `area total`: Total of each unused capacity of the user area, configuration area, and dump area
	total[#2]	Total capacity	Total of capacity in use and unused capacity of the file system in the internal flash memory[#1] `user area`: Total of used and unused capacity of the user area `config area`: Total of used and unused capacity of the configuration area `dump area`: Total of used and unused capacity of the dump area `area total`: Total capacity being used and not being used by the file system in the internal flash memory
MC	--	Memory card status	`enabled`: The memory card can be accessed. `notconnect`: The memory card is not installed. `write protect`: Writing to the memory card is not allowed. `--------`: Another process is accessing the memory card.[#3]
	Manufacture ID	Production ID number[#4]	Memory card production ID number
	used	Used capacity[#4]	Used capacity of the memory card file system
	free	Unused capacity[#4]	Unused capacity of the memory card file system
	total	Total capacity[#4]	Total of capacity in use and unused capacity of the memory card file system

#1: When used capacity exceeds 95 percent of the total capacity, unused capacity might be displayed as a negative value. If unused capacity is displayed as a negative value, delete the user files to free up sufficient unused capacity.

#2: Even if the BCU, CSU, and MSU have the same model name, the used capacity of the internal flash memories might be different.

#3: Another process is accessing the memory card. Wait a while, and then re-execute the command.

#4: Those items are displayed when the memory card status is `enabled` or `write protect`.

Table 9-10: Information displayed by the show system command (6/8) [AX6700S]

Item	Displayed information	Displayed detailed information
Redundancy bsu-load-balancing	BSU load balancing mode	`port`: Distributes the load of BSU according to the number of the port that is receiving packets. `smac`: Distributes the load of BSU according to the source MAC address of packets.
Redundancy bsu-mode	BSU operation mode	`fail-safe`: In case of BSU failure continues communication by using another normal BSU. `fixed`: Does not recover the communication of the applicable BSU in case of BSU failure.
BSU	Operating status of BSU	`active`: Running as active system `standby hot`: Running as hot standby system `standby cold`: Running as cold standby system `standby cold2`: Running as cold standby 2 system `fault`: Failed `inactive`: In any of the following states • Operation stopped by the `inactivate` command. • An unsupported board is installed. • Different types of boards are installed. • Fixed mode is set by the `redundancy bsu-mode` configuration command, and the location of the installed slot of the applicable BSU is different from the `max-bsu` value in the configuration. `notconnect`: Not installed[#1] `initialize`: Initializing `disable`: Operation stopped because `no power enable` is set by a configuration command.
	BSU information	The model name and abbreviated name of a BCU, and the number of times a BSU restarts due to failure[#2]
Lamp[#3, #4]	LED indication	--
STATUS LED	LED indicating BSU operating status	`light off`: The LED is off. `orange`: The LED is on and orange. `green blink`: The LED is green and blinking. `green`: The LED is on and green. `red`: The LED is on and red.
ACTIVE LED	LED indicating BSU redundant operation status	`light off`: The LED is off. `green`: The LED is on and green.

#1: This status is also displayed when the recovery of BCU is aborted.

#2: The number of times a BSU was restarted due to a fault is initialized every hour.

#3: When a hardware board is not mounted, or an unsupported hardware board is mounted, the item `Lamp` is not displayed for the applicable hardware board.

#4: While the active BSU is stopping operation, the STATUS LED is off, and the ACTIVE LED is on and green.

Table 9-11: Information displayed by the show system command (7/8)

Item		Displayed information	Displayed detailed information
Forwarding Database Management		--	
fwdm	--	Allocation pattern for the maximum number of path table entries specified in the configuration	`default standard`: All entries mixed standard allocation `ipv4-uni standard`: IPv4 unicast is standard; no multicast and no IPv6 standard allocation `ipv4-ipv6-uni standard`: IPv4/IPv6 unicast is standard; no multicast standard allocation `vlan standard`: L2 is standard; no multicast standard allocation `default extended`: All entries mixed extended allocation `ipv4-uni extended`: IPv4 unicast is standard; extended allocation with no multicast and no IPv6 `ipv4-ipv6-uni extended`: IPv4/IPv6 unicast is standard; extended allocation with no multicast `vlan extended`: L2 is standard; extended allocation with no multicast
IPv4 Unicast resources	Used/Max	Used capacity of IPv4 unicast path table	Displays the used capacity of IPv4 unicast path tables for the entire switch. <*Used*>: Number of used entries <*Max*>: Maximum number of available entries
IPv4 Multicast resources	Used/Max	Used capacity of IPv4 multicast path table	Displays the used capacity of IPv4 multicast path tables for the entire switch. <*Used*>: Number of used entries <*Max*>: Maximum number of available entries
IPv6 Unicast resources	Used/Max	Used capacity of IPv6 unicast path table	Displays the used capacity of IPv6 unicast path tables for the entire switch. <*Used*>: Number of used entries <*Max*>: Maximum number of available entries
IPv6 Multicast resources	Used/Max	Used capacity of IPv6 multicast path table	Displays the used capacity of IPv6 multicast path tables for the entire switch. <*Used*>: Number of used entries <*Max*>: Maximum number of available entries
MAC Address resources	Used/Max	Used capacity of MAC address database	Displays the used capacity of MAC address databases for the entire switch. <*Used*>: Number of used entries <*Max*>: Maximum number of available entries
	MAC Address (Learned) used	Displays capacity of MAC address databases used by MAC address learning.	

Item		Displayed information	Displayed detailed information
	MAC Address (Static) used	Displays capacity of MAC address databases used by the Static MAC address or Ring Protocol functionality.	
	MAC Address (IEEE802.1X/Web/MAC) used	Displays capacity of MAC address databases used by IEEE 802.1X, Web authentication, or MAC-based authentication functionality.	
	MAC Address (not Learned/ARP,NDP resolved) used	Displays capacity of MAC address databases used by unlearned MAC addresses resolved by ARP/NDP.	
	VLAN config used	Displays capacity of MAC address databases used by the configuration for MAC address learning stop.	
	MAC Address (IGMP/ MLD Snooping) used	Displays capacity of MAC address databases used by IGMP/MLD Snooping.	
Shared resources	Used/Max	Capacity of shared memory used by Layer 2 or Layer 3 forwarding.	Displays the used capacity of shared memory for the entire switch in bytes. <*Used*>: Used capacity (in bytes) <*Max*>: Maximum available capacity (in bytes)
	IPv4 Unicast Single-path used	Displays capacity of shared memory used by IPv4 unicast single path routes in bytes.	
	IPv4 Unicast Multi-path used	Displays capacity of shared memory used by IPv4 unicast multipath routes in bytes.	
	IPv6 Unicast Single-path used	Displays capacity of shared memory used by IPv6 unicast single path routes in bytes.	
	IPv6 Unicast Multi-path used	Displays capacity of shared memory used by IPv6 unicast multipath routes in bytes.	
	IPv4 Multicast used	Displays capacity of shared memory used by IPv4 multicast routes in bytes.	
	IPv6 Multicast used	Displays capacity of shared memory used by IPv6 multicast routes in bytes.	
	IPv4 Policy Based Routing used	Displays capacity of shared memory used by IPv4 policy-based routing in bytes.	
	IPv6 Policy Based Routing used	Displays capacity of shared memory used by IPv6 policy-based routing in bytes.	
	Policy Based Switching used	Displays the capacity of shared memory used by policy-based switching in bytes.	
	VLAN config used	Always 0 bytes	
	IGMP/MLD Snooping used	Displays capacity of shared memory used by IGMP/MLD Snooping in bytes.	

Table 9-12: Information displayed by the show system command (8/8)

Item	Displayed information	Displayed detailed information
Flow Database Management	Flow entry information	

Item		Displayed information	Displayed detailed information
fldm	--	Flow allocation pattern for filtering and the QoS functionality that is specified by a configuration command	`default standard`: Standard flow allocation `default standard-advance`: Standard flow allocation with flow detection extended mode specified `default extended`: Extended flow allocation with uniform allocation between filtering and QoS `default extended-advance`: Extended flow allocation with uniform allocation between filtering and QoS with flow detection extended mode specified `filter-only extended`: Filter-only extended flow allocation `filter-only extended-advance`: Filter-only extended flow allocation with flow detection extended mode specified `qos-only extended`: QoS-only extended flow allocation `qos-only extended-advance`: QoS-only extended flow allocation with flow detection extended mode specified `filter extended`: Filter-oriented extended flow allocation `filter extended-advance`: Filter-oriented extended flow allocation with flow detection extended mode specified `qos extended`: QoS-oriented extended flow allocation `qos extended-advance`: QoS-oriented extended flow allocation with flow detection extended mode specified
Filter resources	Used/Max: <*Used*>/<*Max*>	Number of filter condition entries applied to an interface whose filter functionality is enabled, and the maximum number of applicable entries	Displays the number of filter condition entries applied to an interface whose filter functionality is enabled, and the maximum number of applicable entries. The number of applied entries indicates the total of filter condition entries and implicit discard entries in the entire switch which are set during configuration. <*Used*>: Number of applied entries <*Max*>: Maximum number of entries that can be applied
	MAC :	Displays the number of filter condition entries for a MAC access list applied to an interface whose filter functionality is enabled.	
	IPv4 :	Displays the number of filter condition entries for an IPv4 access list applied to an interface whose filter functionality is enabled.	
	IPv6 :	Displays the number of filter condition entries for an IPv6 access list applied to an interface whose filter functionality is enabled.	
	Advance :	Applies only to fldm when flow detection extended mode is set for an interface; shows the number of filter condition entries in active Advance access lists.	

Item		Displayed information	Displayed detailed information
QoS resources	Used/Max: <*Used*>/<*Max*>	Number of flow detection entries and operating specification entries applied to an interface whose QoS functionality is enabled, and the maximum number of applicable entries	Displays the number of flow detection entries and operating specification entries applied to an interface whose QoS functionality is enabled, and the maximum number of applicable entries. The number of applied entries indicates the total of QoS flow detection entries and operating specification entries in the entire switch which are set during configuration. <*Used*>: Number of applied entries <*Max*>: Maximum number of entries that can be applied
	MAC :	Displays the number of flow detection entries and operating specification entries for a MAC QoS flow list applied to an interface whose QoS functionality is enabled.	
	IPv4 :	Displays the number of flow detection entries and operating specification entries for an IPv4 QoS flow list applied to an interface whose QoS functionality is enabled.	
	IPv6 :	Displays the number of flow detection entries and operating specification entries for an IPv6 QoS flow list applied to an interface whose QoS functionality is enabled.	
	Advance :	Displays the number of flow detection entries and operating specification entries for an Advance QoS flow list applied to an interface whose QoS functionality is enabled only when flow detection extended mode is set for fldm.	
upc-storm-control mode	--	Bandwidth monitoring and storm control mode of the QoS functionality that is specified by a configuration command	`upc-in-and-storm-control`: The maximum bandwidth control or minimum bandwidth control can be set for the receiving side. Storm control can be used. `upc-in-in`: The maximum bandwidth control and minimum bandwidth control can be set for the receiving side. Storm control cannot be used. `upc-in-out`: The maximum bandwidth control and minimum bandwidth control can be set for the receiving and sending sides. Storm control cannot be used.
UPC resources	Used/Max: <*Used*>/<*Max*>	Number of entries applied to an interface whose bandwidth monitoring of the QoS functionality is enabled, and the maximum number of applicable entries	Displays the number of entries applied to an interface whose bandwidth monitoring of the QoS functionality is enabled, and the maximum number of applicable entries. The number of applied entries indicates the total of entries in the entire switch whose operating specification of the QoS functionality is set as bandwidth monitoring during configuration. <*Used*>: Number of applied entries <*Max*>: Maximum number of entries that can be applied

Item		Displayed information	Displayed detailed information
	MAC :	Displays the number of flow detection entries and operating specification entries for a MAC QoS flow list applied to an interface whose bandwidth monitoring of the QoS functionality is enabled.	
	IPv4 :	Displays the number of flow detection entries and operating specification entries for an IPv4 QoS flow list applied to an interface whose bandwidth monitoring of the QoS functionality is enabled.	
	IPv6 :	Displays the number of flow detection entries and operating specification entries for an IPv6 QoS flow list applied to an interface whose bandwidth monitoring of the QoS functionality is enabled.	
	Advance :	Displays the number of flow detection entries and operating specification entries for an Advance QoS flow list applied to an interface whose bandwidth monitoring of the QoS functionality is enabled only when the flow detection extended mode is set for fldm.	
Hierarchical shaper Database Management		Hierarchical shaper user entry information	
User	<*Used*>/<*Max*>	Number of user entries applied to an interface, and the maximum number of applicable entries	Displays the number of user entries applied to an interface, and the maximum number of applicable entries. <*Used*>: Number of applied entries <*Max*>: Maximum number of entries that can be applied If the shaper auto setting functionality of the hierarchical shaper is set in the configuration, the number of applied entries are calculated from the expression below: For AX6700S/AX6600S series switches: Number of specified users Number of mountable NIFs 8 ports For AX6300S series switches: Number of specified users Number of mountable NIFs 6 ports

Impact on communication

None

Response messages

Table 9-13: List of response messages for the show system command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

clear control-counter

Resets to zero the number of the device restarts due to a failure and due to each target part failure.

In AX6700S series switches, the number of restarts due to failures of BCU, BSU, NIFs, and ports is cleared.

In AX6600S series switches, the number of restarts due to failures of CSU, NIFs, and ports is cleared.

In AX6300S series switches, the number of restarts due to failures of MSU, NIFs, and ports is cleared.

Syntax

```
clear control-counter
```

Input mode

User mode and administrator mode

Parameters

None

Example

Resets to zero the number of restarts due to a failure.

```
> clear control-counter    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 9-14: List of response messages for the clear control-counter command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

show environment

Shows the status of the chassis fan and power supply unit, the temperature, and the total operating hours.

Syntax

```
show environment [temperature-logging]
```

Input mode

User mode and administrator mode

Parameters

temperature-logging

Displays the temperature history of the active system collected by the switch.

Operation when this parameter is omitted:

The environmental status of the switch is displayed.

Example 1

The following shows an example of displaying the operating status.

Figure 9-16: Example of the information displayed for operating status [AX6700S]

```
> show environment
Date 2010/12/20 18:00:00 UTC

Fan environment
    FAN1(1) : active    FAN1(2) : active    FAN1(3) : active
    FAN2(4) : active    FAN2(5) : active    FAN2(6) : active
    FAN3(7) : active    FAN3(8) : active    FAN3(9) : active
    FAN4(10): active    FAN4(11): active    FAN4(12): active
    Speed : normal
    Mode  : 2 (cool)

Power environment
    Power supply type : AC
    PS1 : active      PS2 : active      PS3 : active      PS4 : active
    PS5 : notconnect  PS6 : notconnect  PS7 : notconnect  PS8 : notconnect

Temperature environment
    BCU1  Temperature :  36 degrees C
    BCU2  Temperature :  37 degrees C
    BSU1  Temperature :  32 degrees C
    BSU2  Temperature :  34 degrees C
    BSU3  Temperature :  31 degrees C
    NIF1  Temperature :  34 degrees C
    NIF2  Temperature :  32 degrees C
    NIF3  Temperature :  31 degrees C
    NIF4  Temperature :  30 degrees C
    NIF5  notconnect
    NIF6  notconnect
    NIF7  notconnect
    NIF8  notconnect
    Warning level : normal

Accumulated running time
           total                    caution
    BCU1 :  365 days and 18 hours :   10 days and  8 hours
    BCU2 :  365 days and 18 hours :   10 days and  8 hours
    BSU1 :  365 days and 18 hours :   10 days and  8 hours
    BSU2 :  365 days and 18 hours :   10 days and  8 hours
    BSU3 :   85 days and 18 hours :    0 days and 18 hours
```

```
    NIF1 :  365 days and 18 hours :   10 days and  8 hours
    NIF2 :  365 days and 18 hours :   10 days and  8 hours
    NIF3 :  128 days and 20 hours :    1 days and  4 hours
    NIF4 :   85 days and 11 hours :    0 days and 18 hours
    NIF5 : notconnect
    NIF6 : notconnect
    NIF7 : notconnect
    NIF8 : notconnect
    PS1  :  365 days and 18 hours :   10 days and  8 hours
    PS2  :  365 days and 18 hours :   10 days and  8 hours
    PS3  :  128 days and 20 hours :    1 days and  4 hours
    PS4  :  128 days and 20 hours :    1 days and  4 hours
    PS5  : notconnect
    PS6  : notconnect
    PS7  : notconnect
    PS8  : notconnect
    FAN1 :  365 days and 18 hours :   10 days and  8 hours
    FAN2 :  128 days and 20 hours :    1 days and  4 hours
    FAN3 :  365 days and 18 hours :   10 days and  8 hours
    FAN4 :  365 days and 18 hours :   10 days and  8 hours
>
```

Figure 9-17: Example of the information displayed for operating status [AX6600S]

```
> show environment
Date 2010/12/20 18:00:00 UTC

Fan environment
    FAN1(1) : active    FAN1(2) : active    FAN1(3) : active
    FAN2(4) : active    FAN2(5) : active    FAN2(6) : active
    FAN3(7) : active    FAN3(8) : active    FAN3(9) : active
    Speed : normal
    Mode  : 1 (silent)

Power environment
    Power supply type : AC
    PS1 : active      PS2 : active      PS3 : notconnect  PS4 : notconnect
    PS5 : notconnect  PS6 : notconnect

Temperature environment
    CSU1  Temperature :  36 degrees C
    CSU2  Temperature :  37 degrees C
    NIF1  Temperature :  34 degrees C
    NIF2  Temperature :  32 degrees C
    NIF3  Temperature :  31 degrees C
    NIF4  Temperature :  30 degrees C
    NIF5  notconnect
    NIF6  notconnect
    NIF7  notconnect
    NIF8  notconnect
    Warning level : normal

Accumulated running time
           total                    caution
    CSU1 :  365 days and 18 hours :   10 days and  8 hours
    CSU2 :  365 days and 18 hours :   10 days and  8 hours
    NIF1 :  365 days and 18 hours :   10 days and  8 hours
    NIF2 :  365 days and 18 hours :   10 days and  8 hours
    NIF3 :  128 days and 20 hours :    1 days and  4 hours
    NIF4 :   85 days and 11 hours :    0 days and 18 hours
    NIF5 : notconnect
    NIF6 : notconnect
    NIF7 : notconnect
    NIF8 : notconnect
    PS1  :  365 days and 18 hours :   10 days and  8 hours
    PS2  :  365 days and 18 hours :   10 days and  8 hours
    PS3  : notconnect
    PS4  : notconnect
```

```
    PS5  : notconnect
    PS6  : notconnect
    FAN1 :  365 days and 18 hours :   10 days and  8 hours
    FAN2 :  128 days and 20 hours :    1 days and  4 hours
    FAN3 :  365 days and 18 hours :   10 days and  8 hours
>
```

Figure 9-18: Example of the information displayed for operating status [AX6300S]

```
> show environment
Date 2010/12/20 18:00:00 UTC

Fan environment
    FAN1(1) : active    FAN1(2) : active    FAN1(3) : active
    FAN2(4) : active    FAN2(5) : active    FAN2(6) : active
    FAN3(7) : active    FAN3(8) : active    FAN3(9) : active
    Speed : normal
    Mode  : 2 (cool)

Power environment
    Power supply type : AC
    PS1 : active      PS2 : active      PS3 : notconnect  PS4 : notconnect
    PS5 : notconnect  PS6 : notconnect

Temperature environment
    MSU1  Temperature :  36 degrees C
    MSU2  Temperature :  37 degrees C
    NIF1  Temperature :  34 degrees C
    NIF2  Temperature :  32 degrees C
    NIF3  Temperature :  31 degrees C
    NIF4  Temperature :  30 degrees C
    NIF5  notconnect
    NIF6  notconnect
    NIF7  notconnect
    NIF8  notconnect
    Warning level : normal

Accumulated running time
           total                     caution
    MSU1 :  365 days and 18 hours :   10 days and  8 hours
    MSU2 :  365 days and 18 hours :   10 days and  8 hours
    NIF1 :  365 days and 18 hours :   10 days and  8 hours
    NIF2 :  365 days and 18 hours :   10 days and  8 hours
    NIF3 :  128 days and 20 hours :    1 days and  4 hours
    NIF4 :   85 days and 11 hours :    0 days and 18 hours
    NIF5 : notconnect
    NIF6 : notconnect
    NIF7 : notconnect
    NIF8 : notconnect
    PS1  :  365 days and 18 hours :   10 days and  8 hours
    PS2  :  365 days and 18 hours :   10 days and  8 hours
    PS3  : notconnect
    PS4  : notconnect
    PS5  : notconnect
    PS6  : notconnect
    FAN1 :  365 days and 18 hours :   10 days and  8 hours
    FAN2 :  128 days and 20 hours :    1 days and  4 hours
    FAN3 :  365 days and 18 hours :   10 days and  8 hours
>
```

Display items 1

Table 9-15: Information displayed by the show environment command

Item	Displayed information	Displayed detailed information
Fan environment	Fan information	--

Item	Displayed information	Displayed detailed information
FAN	Fan operating status	The number of an installed fan `active`: Running `fault`: A fault has occurred. `notconnect`: Not installed
Speed	The rotational speed of the fan	`normal`: Normal rotation `high`: High-speed rotation `stop`: Stopped rotation
Mode	Fan operation mode	`1 (silent)`: Reducing switch noise takes priority. `2 (cool)`: Keeping the switch cool takes priority.
Power Environment	Power supply unit information	--
Power supply type	Power supply unit type	`AC`: AC (alternating-current) power `DC`: DC (direct-current) power
PS	Installation status of the input power supply unit.	`active`: Supplied normally `fault`: Not supplied/Abnormal voltage `notconnect`: Not installed
Temperature Environment	Intake temperature information	--
Warning level#1	Operating condition level	`normal`: Normal `caution`: Caution (High or low temperature) `critical`: Warning `fault`: Abnormal
Accumulated running time	Cumulative operating time#2	`total`: Total device run time since startup#3 `caution`: Total time this switch ran in an environment of 40 degrees Celsius or higher#4

#1

`Warning level` is displayed as a result of evaluating the changes in intake temperature. If the sensor detects temperatures over 65 degrees Celsius, the software is stopped.

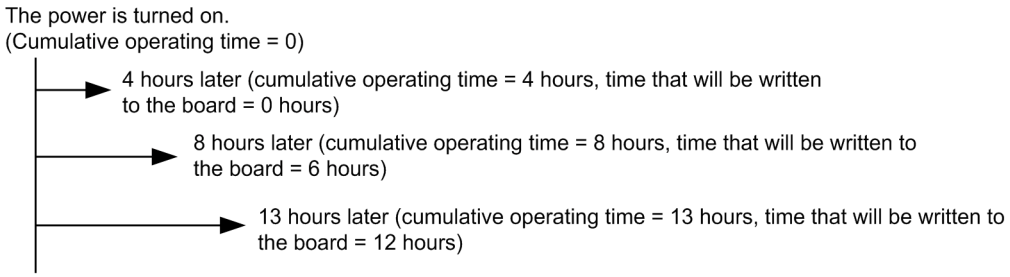
Table 9-16: Operating condition level and temperature

Measured temperature	Temperature value	Fault/recovery operation
Intake temperature	2 degrees Celsius	Caution detection (Low temperature)
	5 degrees Celsius	Caution recovery (Low temperature)
	40 degrees Celsius	Caution recovery (High temperature)
	43 degrees Celsius	Caution detection (High temperature)
	55 degrees Celsius	Warning recovery
	58 degrees Celsius	Warning detection
	65 degrees Celsius	High-temperature stop

#2

The cumulative operating time information in each board is updated every six hours.

Therefore, if the operating time is less than six hours, the information in each board is not updated and the operating time recorded in each board will not be correct.



#3

In AX6700S series switches, if the operating status of a BSU is standby cold or standby cold2, the time the BSU operates as standby cold or standby cold2 is not included in the cumulative operating time.

#4

In AX6700S series switches, this information is updated based on the BCU2 temperature information when BCU2 is on, and updated based on the BCU1 temperature information when only BCU1 is on, or BCU1 and BCU2 are mounted and BCU2 is off. Therefore, even if the temperature of the target board shows 40 degrees Celsius or higher, when the corresponding BCU is lower than 40 degrees Celsius, this information is not updated. The operating status and temperature information of each BCU can be checked by using the `show system` command.

In AX6600S series switches, this information is updated based on the temperature information of an active CSU. Therefore, even if the temperature of the target board shows 40 degrees Celsius or higher, when the corresponding CSU is lower than 40 degrees Celsius, this information is not updated. The temperature information of an active CSU can be checked by using the `show system` command.

In AX6300S series switches, this information is updated based on the temperature information of an active MSU. Therefore, even if the temperature of the target board shows 40 degrees Celsius or higher, when the corresponding MSU is lower than 40 degrees Celsius, this information is not updated. The temperature information of an active MSU can be checked by using the `show system` command.

The location information of a fan is described in the format `FAN`*x*`(`*y*`)`. In this format, the *x* value indicates the fan unit number, and *y* value indicates the fan number. The following table describes the correspondence between information in operation log and names specified on the chassis. Front surface, inside surface, and back surface described in Location on the chassis represent the positional relation as viewed from the back of the device.

Table 9-17: Correspondence between fan numbers, operation log data, and chassis

Device model		Correspondence of the fan unit	
Chassis	**Unit**	**Command and operation log display**	**Location on the chassis**
AX6708S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage upper fan unit

Device model		Correspondence of the fan unit	
Chassis	**Unit**	**Command and operation log display**	**Location on the chassis**
		FAN2(5)	Inside surface of the middle stage upper fan unit
		FAN2(6)	Back surface of the middle stage upper fan unit
	FAN3	FAN3(7)	Front surface of the middle stage lower fan unit
		FAN3(8)	Inside surface of the middle stage lower fan unit
		FAN3(9)	Back surface of the middle stage lower fan unit
	FAN4	FAN4(10)	Front surface of the bottom stage fan unit
		FAN4(11)	Inside surface of the bottom stage fan unit
		FAN4(12)	Back surface of the bottom stage fan unit
AX6604S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the bottom stage fan unit
		FAN2(5)	Inside surface of the bottom stage fan unit
		FAN2(6)	Back surface of the bottom stage fan unit
AX6608S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage fan unit
		FAN2(5)	Inside surface of the middle stage fan unit
		FAN2(6)	Back surface of the middle stage fan unit
	FAN3	FAN3(7)	Front surface of the bottom stage fan unit
		FAN3(8)	Inside surface of the bottom stage fan unit
		FAN3(9)	Back surface of the bottom stage fan unit
AX6304S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the bottom stage fan unit
		FAN2(5)	Inside surface of the bottom stage fan unit
		FAN2(6)	Back surface of the bottom stage fan unit
AX6308S	FAN1	FAN1(1)	Front surface of the top stage fan unit
		FAN1(2)	Inside surface of the top stage fan unit
		FAN1(3)	Back surface of the top stage fan unit
	FAN2	FAN2(4)	Front surface of the middle stage fan unit

Device model		Correspondence of the fan unit	
Chassis	Unit	Command and operation log display	Location on the chassis
		FAN2(5)	Inside surface of the middle stage fan unit
		FAN2(6)	Back surface of the middle stage fan unit
	FAN3	FAN3(7)	Front surface of the bottom stage fan unit
		FAN3(8)	Inside surface of the bottom stage fan unit
		FAN3(9)	Back surface of the bottom stage fan unit

Example 2

The following shows an example of displaying the temperature history.

Figure 9-19: Example of displaying the temperature history

```
> show environment temperature-logging
Date 2010/12/20 12:00:00 UTC
Date         0:00  6:00 12:00 18:00
2010/12/20   24.3  24.2  26.0
2010/12/19   21.8  25.1  26.0  24.0
2010/12/18   25.6     -  26.0  24.0
2010/12/17   21.0     -  26.0  24.0
2010/12/16   24.0  23.5  26.0  24.0
2010/12/15   22.2  24.9  26.0  24.0
2010/12/14      -     -  26.0  24.0
>
```

Display items 2

Table 9-18: Information displayed by the show environment temperature-logging command

Item	Displayed information	Displayed detailed information
Date	Date	--
0:00	Average temperature of the time period	Average temperature of the period from 18:00 (previous day) to 0:00
6:00		Average temperature of the period from 0:00 to 6:00
12:00		Average temperature of the period from 6:00 to 12:00
18:00		Average temperature of the period from 12:00 to 18:00
"-"	Hyphen (-)	The switch was not running. (Power was off or the history could not be held because the system time was changed.)
" "	Blank	Temperature aggregation not yet performed

Impact on communication

None

Response messages

Table 9-19: List of response messages for the show environment command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

- The temperature history display is refreshed at the fixed times (0:00, 6:00, 12:00, and 18:00). The times might slightly change depending on the environment of the switch.
- For the display of temperature history, if the date of the switch is changed, the change is applied at 0:00 on the next day. Because the information items are displayed in the order they are collected, they are not displayed chronologically.
- Temperature history is retained for each BCU, MSU, and CSU board. Therefore, if a board is replaced, the information about the previous board is not used by the replacement board.

reload

Restarts the device, and then collect logs. In normal operation, a memory dump of the BCU, CSU, or MSU is collected.

Syntax

```
reload [ stop ] [{no-dump-image | dump-image }] [-f] [<System>]
```

Input mode

User mode and administrator mode

Parameters

stop

Stops without restarting.

{no-dump-image | dump-image }

no-dump-image

A memory dump of the BCU, CSU, or MSU is not collected.

dump-image

A memory dump of the BCU, CSU, or MSU is collected.

Operation when this parameter is omitted:

Operation is the same as the operation when `dump-image` is selected.

-f

Executes the command without displaying a confirmation message. A memory dump is collected if it is not specified whether or not to collect a memory dump.

Operation when this parameter is omitted:

A confirmation message is displayed.

<System>

Specifies the system to be restarted in the redundant configuration.

active

Restarts the active system. At this time, if a standby system is in the `active` state, a system switchover is performed.

standby

Restarts the standby system.

Operation when this parameter is omitted:

Restarts the entire switch.

Example

Specify collection of a memory dump of the BCU, CSU, or MSU, and restart the switch.

1. Enter a command.
   ```
   > reload    Press the Enter key.
   ```
   A confirmation message appears.
   ```
   Dump information extracted? (y/n):
   ```

2. Enter `y`.

   Entering `y` collects a memory dump at the time of restart.

   The following message appears:

   ```
   act :old dump file(rmdump  08/01 11:26) delete OK? (y/n):
   ```

3. Enter `y`.

   Entering `y` overwrites a memory dump and restarts the switch.

Display items

None

Impact on communication

Communication is aborted while the active system is being restarted.

Response messages

Table 9-20: List of response messages for the reload command

Message	Description
Can't execute restarting of standby system because standby system is not ready.	An attempt to access the standby system failed. Check the status of the standby system.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Standby system is notconnect.	The standby system is not installed.

Notes

1. The Switch boots from the memory card if a memory card that contains the software image file `k.img` is mounted. When you use this method, the account and configuration information reverts to the factory defaults and you cannot save your own settings. Avoid using this method under normal circumstances.
2. If the switch operates in a duplex configuration, when the device of a standby system is restarted by executing this command, a log message `System mode changed from duplex to simplex.` is displayed. In this case, line switching is suppressed until the log message `System mode changed from simplex to duplex.` is displayed.
3. The following table describes the result of executing a restart specification command to the entire switch for each standby system status.

   Table 9-21: Execution results of restarting the entire switch

Standby system status	Result of executing the `reload` command when restart of the entire switch is specified
A board is not mounted.	Only the active system is restarted.
Failed	The command cannot be executed.#
Normal (During operation in duplex configuration)	The entire switch is restarted.
`inactive` state	Only the active system is restarted.

#: To restart the switch where the standby system is faulty, specify `active` (active system) for the parameter <*System*>. If `standby` (standby system) is specified for the parameter <*System*>, the standby system is restarted. In addition, if `stop` is specified for the parameter to stop the standby

system, the state of the standby BCU/CSU/MSU is displayed as `failed` by the `show system` command or MIB information.

4. Do not abort command execution while this command is being executed. The processing continues even if command execution is aborted.
5. When this command is executed, log information is collected.

show tech-support

Collects hardware and software status information required for technical support.

Syntax

```
show tech-support
[page][<password>][no-config][ftp][{unicast|multicast|layer-2}]
```

Input mode

User mode and administrator mode

Parameters

page

Displays a page of the collected information on the console terminal screen. Pressing the **Space** key displays the next page of information, and pressing the **Enter** key displays the next line of information. Note that, this `page` parameter has no effect when the `ftp` parameter is also specified.

<*password*>

Enters the password if the password for administrator mode is specified. If the password includes a special character, the password needs to be enclosed in " " (double quotation marks).

This parameter can be omitted if the password for administrator mode has not been set. Note that where the password for administrator mode has been set, if the password is omitted then, a prompt requesting the password appears. If an incorrect password is specified, the results of executing commands that require administrator mode such as the `show running-config` command are not collected.

no-config

The configuration is not collected.

Operation when this parameter is omitted:

The configuration is collected.

ftp

Saves a text file of collected information, and the dump file and core file from the internal memory card to a remote FTP server. The dump file and core file are combined into one binary file. When this parameter is specified, collected information is not displayed. Additionally, when this parameter is specified, enter connection setting information for the FTP server as per the prompts.

{unicast|multicast|layer-2}

unicast

Collects information required for communication failure analysis of unicast routing.

multicast

Collects information required for communication failure analysis of multicast routing.

layer-2

Collects information required for communication failure analysis of Layer 2 protocols.

Operation when this parameter is omitted:

Collects basic information about the hardware and software.

Example

- Example of executing the `show tech-support` command:

  Collect basic information that shows the hardware and software status, and display the information on the console terminal screen.

  Figure 9-20: Example of displaying the collected information on the screen

```
> show tech-support    Press the Enter key.
########## Tech-Support Log ##########
Tue Nov  8 18:54:46 UTC 2005

  :                         :
  :       (omitted)         :
  :                         :

Tue Nov  8 19:28:15 UTC 2005
########## End of Tech-Support Log ##########
```

- Example of executing the `show tech-support ftp` command:

  Collect basic information that shows the hardware and software status, and save it with a dump file and core file from the internal memory card to an FTP server. Specify the file name as `support`.

  Figure 9-21: Example of saving the collected information to the FTP server

```
> show tech-support ftp    Press the Enter key.
Specify Host Name of FTP Server.       : ftpserver.example.com    Press the Enter
key.
Specify User ID for FTP connections.   : user1                Press the Enter key.
Specify Password for FTP connections.  : <user1's password>    Press the Enter key.
Specify Path Name on FTP Server.       : /usr/home/user1       Press the Enter key.
Specify File Name of log and Dump files: support               Press the Enter key.
Check and Extract Dump Files in a Standby system?(y/n)y
Mon Mar 14 12:00:00 UTC 2011
Transferred support.txt .
Executing.
.....................................................................
.....................................................................
.....................................................
Operation normal end.
########## Dump files' Information ##########
***** ls -l /dump0 *****
total 4568
-rwxrwxrwx  1 root  wheel  4677464 Dec 18 21:16 rmdump
***** ls -l /usr/var/hardware *****
total 1368
-rwxrwxrwx  1 root  wheel  1002811 Dec 27 11:56:16 2006 nif05.000
########## End of Dump files' Information ##########
########## Core files' Information ##########
***** ls -l /usr/var/core *****
***** ls -l /standby/usr/var/core *****
No Core files
########## End of Core files' Information ##########
Transferred support.tgz .
Executing.
.....................................................................
.....................................................................
.....................................................
Operation normal end.
>
```

Display items

Table 9-22: Information displayed by the show tech-support command

Item	Displayed detailed information
########## <*Information Type*> ##########	A separator indicating the beginning of each type of collected information.<*Information Type*> indicates the type of information. The following describes the contents of <*Information Type*>: `Dump files' Information`: List of existing dump files `Core files' Information`: List of existing core files `Tech-Support Log`: Basic information that shows the hardware and software status. `Tech-Support Unicast Log`: Detailed information about unicast routing `Tech-Support Multicast Log`: Detailed information about multicast routing `Tech-Support Layer-2 Log`: Detailed information about Layer 2 protocols
########## End of <*Information Type*> ##########	A separator indicating the end of each type of collected information.<*Information Type*> indicates the type of information.
########## <*Command Name*> ##########	<*Command Name*> indicates the name of the command executed to collect the information. The execution result of the indicated command is displayed after this separator.
########## End of<*Command Name*> ##########	A separator that indicates the end of the execution result of the indicated command.<*Command Name*> indicates the name of the command executed to collect the information.

Impact on communication

None

Response messages

Table 9-23: List of response messages for the show tech-support command

Message	Description
<*File Name*>:Permission denied.	A file that has the same name as <*File Name*> in the response message already exists in the destination directory. You do not have permission to modify the file. Change the permission for the file in the destination directory, or change the name of the file to be saved.
<*Host Name*>: Unknown host	The host name (<*Host-name*>) is invalid.
<*Path*>: No such file or directory.	The directory specified for <*Path*> does not exist.
<*Path*>: Not a directory.	<*Path*> is not a directory.
<*Path*>: Permission denied.	You do not have permission to access the directory specified for <*Path*>.
Check and Extract Dump Files in a Standby system?(y/n)	When `y` is selected in response to the message `Check and Extract Dump Files in a Standby system?`, a dump file and core file of the standby system are checked and saved to the FTP server. When `n` is selected, a dump file and core file only for the active system are saved to the FTP server.

Message	Description
connection Time out.	An attempt to connect to the FTP server failed. Check communication with the FTP server.
Exec failed.	The command execution failed.
Is the Password retyped?(y/n)	When `y` is selected in response to the message `Is the Password retyped?`, the password can be re-entered. When `n` is selected, the command execution is continued assuming that an incorrect password was entered.
Login incorrect.Login failed.	You are not permitted to log in to the specified host. A login attempt has failed.
Operation normal end.	The file transfer ended normally.
Password for Administrator Mode Invalid.	The password for administrator mode entered in the <*password*> parameter is incorrect.
Sorry, already execute show tech-support	Another user is executing `show tech-support` command.
Specify File Name of log and Dump files:	Specify the name of a log file and dump file. If not specified, a 14-digit number is specified as the file name by using the command execution date and time. Note that the file name entered in response to this message is reflected in <*File Name*> in subsequent response messages.
Specify Host Name of FTP Server. :	Specify a host name. Note that the host name entered in response to this message is reflected in <*Host Name*> in subsequent response messages.
Specify Password for Administrator Mode.:	Enter the password for administrator mode.
Specify Password for FTP connections. :	Enter the password of the User ID entered for the response message `Specify User ID for FTP connections. :`.
Specify Path Name on FTP Server. :	Specify a destination directory name. Note that the destination directory name entered in response to this message is reflected in <*Path*> in subsequent response messages.
Specify User ID for FTP connections. :	Specify a logged-in user name. Note that the logged-in user name entered in response to this message is reflected in <*User ID*> in subsequent response messages.
Write failed.	An attempt to transfer the file failed. Check the free capacity of the destination and the state of the communication line.

Notes

1. If `unicast`, `multicast`, or `layer-2` parameters are specified, route information and other information are collected. Accordingly, depending on the network configuration, internal flash memory might no longer be available to users if a large amount of information is collected.

   If the information collected by the command is redirected to a file, make sure that the information is saved in compressed format.

   Example

   ```
   > show tech-support unicast | gzip > show-tech.txt.gz
   ```

2. When the collected information is displayed in the window (without the `ftp` parameter), the display interval is as follows:

   - When the information is displayed in the window of console terminals connected to

RS232C, the display interval with no parameters specified is five minutes, and the display time with the `unicast`, `multicast`, or `layer-2` parameters depends on the network configuration.

- When the information is displayed in the window of remote operation terminals, the display interval with no parameter is 30 seconds, and the display interval with the `unicast`, `multicast`, or `layer-2` parameters depends on the network configuration.

3. When a dump file, core file, and collected information are saved to an FTP server (with the `ftp` option), the time for transferring the files to the FTP server is as follows:
   - When the dump file and core file only for the active system are saved, the transfer time is one to three minutes.
4. If an IP address is set for the device itself by the `ip address(loopback)` configuration command, the IP address is used as the source IP address during communication with the FTP server.
5. Only dump files and core files in the following directories can be saved to an FTP server when the `ftp` parameter is specified:
   - Storage directory for dump files

     `/dump0` or `/usr/var/hardware`
   - Storage directory for core files

     `/usr/var/core`

show tcpdump (tcpdump)

Monitors incoming and outgoing packets.

This command can be used to check the communication status of the incoming and outgoing Layer 3 (IPv4/IPv6/ARP) traffic. For example, you can monitor packets such as remote access requests sent to the Switch or routing protocols sent from the Switch.

The following table shows a list of packets that can be monitored and analyzed.

Table 9-24: List of packets that can be monitored and analyzed

Address family	Type	Description
IPv4	TCP	Analyzes various types of TCP communication such as BGP4 or Telnet.
	UDP	Analyzes various types of UDP communication such as SNMP or RIP.
	ICMP	Analyzes ping and the like.
	OSPF	Analyzes the OSPF routing protocol.
	IGMP	Analyzes IGMP.
	PIM	Analyzes PIM multicast.
IPv6	TCP	Analyzes various types of TCP communication such as BGP4+ or Telnet.
	UDP	Analyzes various types of UDP communication such as SNMP or RIPng.
	ICMP6	Analyzes ping and the like.
	OSPF6	Analyzes the OSPFv3 routing protocol.
	PIM	Analyzes PIM multicast.
ARP	ARP	Analyzes the ARP protocol.

Syntax

<*Monitoring interface packets*>

```
show tcpdump interface <interface type> <interface number> [{no-resolv |
no-domain}] [abs-seq] [no-time] [{brief | detail | extensive | debug}] [{hex
| hex-ascii}] [count <count>] [snaplen <snaplen>] [writefile <file name>]
[<expression>]
```

<*Displaying the packet monitoring file*>

```
show tcpdump readfile <file name> [{ no-resolv | no-domain }] [abs-seq]
[no-time] [{ brief | detail | extensive | debug }] [{ hex | hex-ascii }]
[count <count>] [writefile <file name>] [<expression>]
```

#: `show tcpdump` can be abbreviated as `tcpdump`. To use `tcpdump`, enter the following parameters:

```
tcpdump -i <interface type> <interface number> [{-n | -N}] [-S] [-t] [-q] [-v[v[v]]]
[{-x | -X}] [-c <count>] [-s <snaplen>] [-w <file name>] [<expression>]
tcpdump -r <file name> [{-n | -N}] [-S] [-t] [-q] [-v[v[v]]] [{-x | -X}] [-c
<count>] [-w <file name>] [<expression>]
```

Input mode

User mode and administrator mode

Parameters

interface <*interface type*> <*interface number*> (-i <*interface type*> <*interface number*>)

For <*interface type*> and <*interface number*>, you can specify the following:

- vlan <*vlan id*>

  For <*vlan id*>, specify a VLAN ID set by the `interface vlan` configuration command.

- loopback 0
- loopback <*loopback id*> [OP-NPAR]

  For <*loopback id*>, specify a loopback interface ID set by the `interface loopback` configuration command.

- mgmt 0

readfile <*file name*> (-r <*file name*>)

Reads a packet from <*file name*> (created by the `writefile` option).

{no-resolv | no-domain}

no-resolv (-n)

Addresses (host addresses, port numbers, or others) are not converted into names.

no-domain (-N)

The domain name of the host is not displayed. For example, `server` is displayed rather than `server.example.com`.

Operation when this parameter is omitted:

Addresses (host addresses, port numbers, or others) are converted into names. A host address is displayed including the domain name.

abs-seq (-S)

Displays the TCP sequence number as an absolute value rather than a relative value.

Operation when this parameter is omitted:

Displays the TCP sequence number as a relative value.

no-time (-t)

Does not display time information on each line of a dump.

Operation when this parameter is omitted:

Displays time information on each line of a dump.

{brief | detail | extensive | debug}

brief (-q)

Partially omits the display of protocol information such as TCP or UDP to simplify the displayed information more than usual. The Layer 2 section (address family) is also not displayed.

detail (-v)

Displays the information in a little more detail than usual.

For example, the information about the time to live, identification, total length, or options of IP packets is displayed. Furthermore, a check of the integrity of packets is also added. For example, the checksum of the IP or ICMP header is checked.

extensive (-vv)

Displays the information in more detail than the `detail` parameter.

For example, the extended fields of NFS response packets are displayed.

debug (-vvv)

Displays the most detailed information.

For example, the sub option of the `telnet` protocol is also displayed.

Operation when this parameter is omitted:

Displays normal information rather than displaying the information briefly or in detail.

{hex | hex-ascii}

hex (-x)

Displays each packet in hexadecimal except for the link layer.

hex-ascii (-X)

In hexadecimal notation, ASCII characters are also displayed.

Operation when this parameter is omitted:

Only the result of analyzing each line of a dump is displayed, without hexadecimal or ASCII.

count <*count*> (-c <*count*>)

Exits after receiving <*count*> packets. The specifiable values are from 1 to 2147483647.

Operation when this parameter is omitted:

Can be exited by pressing the **Ctrl** + **C** key.

snaplen <*snaplen*> (-s <*snaplen*>)

Retrieves <*snaplen*> bytes from each packet and dumps them. The permissible values are 0, and from 4 to 65535. This value should be set at a minimum required to obtain protocol information. In the Switch, set 4 or more for <*snaplen*> because the Layer 2 section of a packet is treated as a 4-byte Null/Loopback header including the address family.

Packets truncated by the restriction set by <*snaplen*> are output in the format `[|` <*proto*>`]` (<*proto*> is the protocol name corresponding to the level where the truncation occurs).

When <*snaplen*> is specified as 0, length (65535) is used (to ensure capturing the whole packet).

Operation when this parameter is omitted:

Retrieves 96 bytes from each packet and dumps them.

writefile <*file name*> (-w <*file name*>)

Writes monitored information to <*file name*> instead of analyzing or displaying packets.

The <*file name*> can be displayed later by using the `readfile` <*file name*> option.

Operation when this parameter is omitted:

Displays the result of analyzing each dump.

<*expression*>

Selects the type of packets to be dumped. When <*expression*> is specified, only the packets that match <*expression*> are monitored.

When the Switch receives or transmits a large number of packets, specify this parameter to monitor only required packets.

The following is an example of the <*expression*> specification.

Specify one basic element or a combination of multiple basic elements for <*expression*>.

The basic element consists of four qualifiers <*protocol*> <*direction*> <*type*> <*identification*>.

The basic element is specified by placing <*type*> in front of <*identification*> and placing <*direction*>, <*protocol*>, or <*protocol*> <*direction*> qualifiers without conflict in front of <*type*> and <*identification*>.

The pattern of the basic elements is as follows:

Pattern of the basic elements:

<*type*> <*identification*>

<*direction*> <*type*> <*identification*>

<*protocol*> <*type*> <*identification*>

<*protocol*> <*direction*> <*type*> <*identification*>

<*identification*>

Indicates the name or number of addresses or port numbers.

Ex: `10.10.10.10, serverA, 23, telnet`

<*type*>

Indicates the type of target for which <*identification*> is specified. The usable <*type*> is `host`, `net`, and `port`.

Ex: `host serverA, net 192.168, port 22`

When the <*type*> qualifier is omitted depending on combination with other qualifiers, it is assumed that host is specified.

Ex: `src serverA` represents `src host serverA`.

<*direction*>

Indicates the communication direction, such as from <*identification*>, to <*identification*>, or both ways.

Usable values for <*direction*> are `src`, `dst`, `src or dst`, and `src and dst`.

Ex: `src serverA`, `dst net fe80::/64`, `src or dst port telnet`

When the <*direction*> qualifier is not specified, it is assumed that `src or dst` is specified.

Ex: `port telnet` represents `src or dst port telnet`.

<*protocol*>

This qualifier is specified to limit the use of protocols to specific protocols.

Usable values for <*protocol*> are `ip`, `ip6`, `tcp`, and `udp`.

Ex: `ip6 src fec0::1`, `ip net 192.168`, `tcp port 23`

When the <*protocol*> qualifier is not specified, it is assumed that all the protocols that are consistent with the <*type*> specification are specified.

Ex: `port 53` represents `tcp port 53` or `udp port 53`.

Example of the basic elements:

dst host <*host*>

This is true when the IPv4/IPv6 destination of packets is <*host*>.

src host <*host*>

This is true when the IPv4/IPv6 source of packets is <*host*>.

host <*host*>

This is true when the IPv4/IPv6 destination or source of packets is <*host*>.

IPv4 or IPv6 can be limited by adding **ip** or **ip6** to the front of the above conditional expression indicating each host.

Ex: **ip** host <*host*>

Ex: **ip6** src host <*host*>

dst net <*network*>/<*length*>

This is true when the IPv4/IPv6 destination address of packets is included in the specified <*length*>-bit netmask <*network*>.

src net <*network*>/<*length*>

This is true when the IPv4/IPv6 source address of packets is included in the specified <*length*>-bit netmask <*network*>.

net <*network*>/<*length*>

This is true when the IPv4/IPv6 destination address of packets is included in the specified <*length*>-bit netmask <*network*>.

dst port <*port*>

This is true when a packet is ip/tcp, ip/udp, ipv6/tcp, or ipv6/udp, if the destination port number is <*port*>.

src port <*port*>

This is true when a packet is ip/tcp, ip/udp, ipv6/tcp, or ipv6/udp, if the source port number is <*port*>.

port <*port*>

This is true when a packet is ip/tcp, ip/udp, ipv6/tcp, or ipv6/udp, if the destination or source port number is <*port*>.

tcp or udp can be limited by adding **tcp** or **udp** to the front of the above conditional expression indicating each port.

Ex: **tcp** src port <*port*>

Furthermore, basic elements for which <*identification*> or other qualifiers are not specified are as follows:

ip proto <*protocol number*>

This is true when a packet is the IPv4 packet of the <*protocol number*> protocol.

Note that, when the protocol header is chained, it is not traced.

ip6 proto <*protocol number*>

This is true when a packet is the IPv6 packet of the <*protocol number*> protocol.

Note that, when the protocol header is chained, it is not traced.

ip multicast

This is true when a packet is an IPv4 multicast packet.

ip6 multicast

This is true when a packet is an IPv6 multicast packet.

ip, ip6, arp (Specify any of them)

This is true when a packet is ip, ip6, or arp.

tcp, udp, icmp, icmp6 (Specify any of them)

This is true when a packet is tcp, udp, icmp, or icmp6.

Note that, when the protocol header is chained, it is not traced.

ip protochain <*protocol number*>

The conditional expression is the same as that of `ip proto` <*protocol number*>, but the chain of the protocol header is traced.

ip6 protochain <*protocol number*>

The conditional expression is the same as that of `ip6 proto` <*protocol number*>, but the chain of the protocol header is traced.

Combinations of basic elements

A complicated filter conditional expression is represented by combining basic elements by using **and**, **or**, **not**.

To combine conditional expressions, enclose them in parentheses ( ).

Ex: `host server1` **and not (** `port ssh` **or** `port http`**)**

The above expression filters packets for which host server1 is true, and port ssh or port http is false.

Explicit qualifiers can be omitted.

Ex: `tcp dst port ftp` **or** `ssh` **or** `domain` is

the same meaning as that of `tcp dst port ftp` **or** `tcp dst port ssh` **or** `tcp dst port domain`.

Example of <*expression*> specification

host serverA

Monitors packets communication with serverA.

tcp port telnet

Monitors Telnet communication packets.

not tcp port ssh

Monitors packets other than SSH communication.

host serverA and tcp port bgp

Monitors BGP4/BGP4+ communication (IPv4 and IPv6) packets with serverA.

ip6 and host serverA and tcp port bgp

Monitors BGP4+ communication (IPv6) packets with serverA.

ip and not net 192.168.1/24

Monitors IPv4 packets whose destination and source is not the network 192.168.1/24.

udp port 520 or 521

Monitors RIP/RIPng communication (IPv4/IPv6) packets.

ip6 proto 89

Monitors OSPFv3 communication (IPv6) packets.

Operation when this parameter is omitted:

Dumps all packets without filtering received packets.

Example 1

When IPv4/IPv6 packets are monitored

Figure 9-22: When IPv4/IPv6 packets are monitored

```
# show tcpdump interface vlan 10
Date 2009/01/20 18:36:00 UTC
tcpdump: listening on VLAN0010
18:36:53.390062 ip6 56: v6hostA.example.com > v6.hostB.example.com: icmp6: echo
request seq 20
18:36:54.220039 ip 84: hostA.example.com > hostB.example.com:
      1           2                     3
icmp 64: echo request seq 43
          4
^C
4 packets received by filter      <--5
0 packets dropped by kernel       <--6
```

Display items in Example 1

Table 9-25: Information displayed for monitoring IPv4/IPv6 packets

Displayed information	Description
1. Time stamp	Displays a time stamp when a packet is captured (not displayed when `no-time` is specified).
2. Protocol	Displays the protocol name and packet length except four bytes of the null/loopback header section (not displayed when `brief` is specified).
3. IP address pair	Displays a pair of the source address and destination address. For encapsulated packets such as tunneled packets, multiple address pairs are displayed.
4. Upper-layer protocol	Displays upper-level protocols for packet types such as ICMP or TCP.
5. Monitor statistics	Displays the number of received packets.
6. Monitor statistics	Displays the number of dropped packets.

Example 2

When ARP packets are monitored

Figure 9-23: When ARP packets are monitored

```
# show tcpdump interface vlan 10
Date 2009/01/20 16:07:00 UTC
tcpdump: listening on VLAN0010
16:07:29.683632 arp 46: arp who-has 100.100.100.1 tell 100.100.100.2
16:07:29.683758 arp 46: arp reply 100.100.100.1 is-at 0:12:e2:98:dc:1
      1           2                       3
^C
4 packets received by filter      <--4
0 packets dropped by kernel       <--5
```

Display items in Example 2

Table 9-26: Information displayed for monitoring ARP packets

Displayed information	Description
1. Time stamp	Displays a time stamp when a packet is captured (not displayed when `no-time` is specified).
2. Protocol	Displays ARP and the packet length except four bytes of the null/loopback header section (not displayed when `brief` is specified).

Displayed information	Description
3. Upper-layer protocol	Displays the information of the ARP protocol.
4. Monitor statistics	Displays the number of received packets.
5. Monitor statistics	Displays the number of dropped packets.

Example 3

When `tcpdump` is executed with another parameter specified while ping (IPv4 and IPv6) is being performed from hostA.example.com (10.10.10.10) and v6hostA.example.com (fec0::1) to the Switches myhost.example.com (20.20.20.20) and v6myhost.example.com (fec0::2)

Figure 9-24: Result of executing the command with an interface name specified

```
# show tcpdump interface vlan 10
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
20:23:10.113591 ip 84: hostA.example.com > myhost.example.com: icmp 64: echo
request seq 20
20:23:10.113692 ip 84: myhost.example.com > hostA.example.com: icmp 64: echo
reply seq 20
20:23:10.213696 ip6 56: v6hostA.example.com > v6myhost.example.com: icmp6: echo
request seq 43
20:23:10.213765 ip6 56: v6myhost.example.com > v6hostA.example.com: icmp6: echo
reply seq 43
^C
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-25: Result of executing the command with no-resolv specified not to perform reverse lookup

```
# show tcpdump interface vlan 10 no-resolv
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
20:23:10.113591 ip 84: 10.10.10.10 > 20.20.20.20: icmp 64: echo request seq 20
20:23:10.113692 ip 84: 20.20.20.20 > 10.10.10.10: icmp 64: echo reply seq 20
20:23:10.213696 ip6 56: fec0::1 > fec0::2: icmp6: echo request seq 43
20:23:10.213765 ip6 56: fec0::2 > fec0::1: icmp6: echo reply seq 43
^C
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-26: Result of executing the command with no-domain specified not to display the host name and subsequent part (domain name)

```
# show tcpdump interface vlan10 no-domain
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
20:23:10.113591 ip 84: hostA > myhost: icmp 64: echo request seq 20
20:23:10.113692 ip 84: myhost > hostA: icmp 64: echo reply seq 20
20:23:10.213696 ip6 56: v6hostA > v6myhost: icmp6: echo request seq 43
20:23:10.213765 ip6 56: v6myhost > v6hostA: icmp6: echo reply seq 43
^C
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-27: Result of executing the command with ip6 specified as <*expression*>

```
# show tcpdump interface vlan 10 ip6
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
20:23:10.213696 ip6 56: v6hostA > v6myhost: icmp6: echo request seq 43
20:23:10.213765 ip6 56: v6myhost > v6hostA: icmp6: echo reply seq 43
^C
4 packets received by filter
```

```
0 packets dropped by kernel
```

Figure 9-28: Result of executing the command with count <*count*> specified

```
# show tcpdump interface vlan 10 count 3
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
20:23:10.113591 ip 84: hostA.example.com > myhost.example.com: icmp 64: echo
request seq 20
20:23:10.113692 ip 84: myhost.example.com > hostA.example.com: icmp 64: echo
reply seq 20
20:23:10.213696 ip6 56: v6hostA.example.com > v6myhost.example.com: icmp6: echo
request seq 43
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-29: Result of executing the command with no-time specified not to display a time stamp at each line

```
# show tcpdump interface vlan 10 no-time
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
ip 84: hostA.example.com > myhost.example.com: icmp 64: echo request seq 20
ip 84: myhost.example.com > hostA.example.com: icmp 64: echo reply seq 20
ip6 56: v6hostA.example.com > v6myhost.example.com: icmp6: echo request seq 43
ip6 56: v6myhost.example.com > v6hostA.example.com: icmp6: echo reply seq 43
^C
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-30: Result of executing the command with writefile specified to specify the file name and save a dump to the file

```
# show tcpdump interface vlan 10 writefile mydump
Date 2009/01/20 20:23:00 UTC
tcpdump: listening on VLAN0010
^C
4 packets received by filter
0 packets dropped by kernel
```

Figure 9-31: Result of executing the command with readfile specified to specify the file name and read a dump from the file and display it

```
# show tcpdump readfile mydump
Date 2009/01/20 20:23:00 UTC
reading from file mydump, link-type NULL (BSD loopback)
20:23:10.113591 ip 84: hostA.example.com > myhost.example.com: icmp 64: echo
request seq 20
20:23:10.113692 ip 84: myhost.example.com > hostA.example.com: icmp 64: echo
reply seq 20
20:23:10.213696 ip6 56: v6hostA.example.com > v6myhost.example.com: icmp6: echo
request seq 43
20:23:10.213765 ip6 56: v6myhost.example.com > v6hostA.example.com: icmp6: echo
reply seq 43
```

Figure 9-32: Result of executing the command with readfile specified to read a dump from the file, and with icmp specified as <*expression*> to display only icmp

```
# show tcpdump readfile mydump icmp
Date 2009/01/20 20:23:00 UTC
reading from file mydump, link-type NULL (BSD loopback)
20:23:10.113591 ip 84: hostA.example.com > myhost.example.com: icmp 64: echo
request seq 20
20:23:10.113692 ip 84: myhost.example.com > hostA.example.com: icmp 64: echo
reply seq 20
```

Display items in Example 3

None

Impact on communication

None

Response messages

Table 9-27: List of response messages for the show tcpdump command

Message	Description
tcpdump: <*file name*>: Is a directory	<*file name*> is a directory (Specify the name of a file).
tcpdump: <*file name*>: No such file or directory	<*file name*> could not be found.
tcpdump: <*file name*>: Permission denied	Access to <*file name*> has not been permitted.
tcpdump: archaic file format	The file format is old.
tcpdump: bad dump file format	The file format is invalid.
tcpdump: BIOCSETIF: Device not configured	An invalid interface has been specified. The command execution ends now.
tcpdump: BIOCSETIF: Network is down	An invalid interface has been specified. The command execution ends now.
tcpdump: bogus savefile header	The file header is invalid.
tcpdump: ethernet addresses supported only on ethernet, FDDI or token ring	Layer 2 monitoring is not supported.
tcpdump: expression rejects all packets	The specified filter condition <*expression*> filters all packets. So, change the condition.
tcpdump: fread: Operation not permitted	The file could not be read (an invalid file might be specified).
tcpdump: fread: Undefined error: 0	The file is abnormal (an unusually short file might be specified).
tcpdump: fwrite: No space left on device	The file could not be written (the disk space might be insufficient).
tcpdump: illegal char: <*character*>	An invalid <*character*> has been specified.
tcpdump: illegal Interface name -- <*interface name*>.	The specified interface has not been set. <*interface name*>: Name assigned to the specified interface
tcpdump: illegal qualifier of 'port'	An invalid port condition has been specified.
tcpdump: illegal token: <*token*>	An invalid <*token*> has been specified.
tcpdump: inbound/outbound not supported on linktype 0	inbound/outbound specification is not supported.
tcpdump: invalid ip6 address <*address*>	The IPv6 address <*address*> is invalid.
tcpdump: invalid packet count <*count*>	The <*count*> value is invalid.
tcpdump: invalid qualifier against IPv6 address	An invalid qualifier has been specified for the IPv6 address.
tcpdump: invalid snaplen <*snaplen*>	The <*snaplen*> value is invalid.
tcpdump: link layer applied in wrong context	Layer 2 monitoring is not supported.
tcpdump: listening on <*interface name*>	The interface <*interface name*> is being monitored. <*interface name*>: Name assigned to the specified interface
tcpdump: mask length must be <= <*length*>	The mask length should be <*length*> or less.
tcpdump: Mask syntax for networks only	Masks can be specified only by the net qualifier.
tcpdump: No match.	The specified file does not exist.

Message	Description
tcpdump: no VLAN support for data link type 0	VLAN specification is not supported.
tcpdump: non-network bits set in "<*address*>"	<*address*> whose host bit is not 0 has been specified.
tcpdump: only IP multicast filters supported on ethernet/FDDI	To specify multicast, place `ip` or `ip6` in front of it.
tcpdump: parse error	The syntax of the specified filter condition <*expression*> is invalid.
tcpdump: pcap_loop: link-layer type <*type*> isn't supported in savefiles	The link layer type <*type*> of the read file is not supported.
tcpdump: pcap_loop: truncated dump file; tried to read <*bytes1*> captured bytes, only got <*bytes2*>.	The read file has been dropped on the way. <*byte1*> bytes were captured, but there are only <*bytes2*> bytes.
tcpdump: pcap_loop: truncated dump file; tried to read <*bytes1*> header bytes, only got <*bytes2*>.	The read file has been dropped on the way. The header is <*byte1*>-bytes, but there are only <*bytes2*> bytes.
tcpdump: port '<*port*>' is <*protocol*>	The port specification <*port*> is <*protocol*> protocol.
tcpdump: syntax error	The syntax of the specified filter condition <*expression*> is invalid.
tcpdump: unknown host '<*host*>'	An unknown host name <*host*> was specified. Write the network with the address.
tcpdump: unknown host '<*host*>' for specified address family	The address of the host <*host*> could not be resolved by the specified address family.
tcpdump: unknown ip proto '<*protocol*>'	The protocol name <*protocol*> of the specified filter condition <*expression*> could not be specified. Specify the protocol with the protocol number.
tcpdump: unknown network '<*network*>'	An unknown network name <*network*> was specified. Write the network with the address.
tcpdump: unknown osi proto '<*protocol*>'	An unknown osi protocol <*protocol*> was specified.
tcpdump: unknown port '<*port*>'	The port name <*port*> of the specified filter condition <*expression*> could not be specified. Specify the port with the port number.
tcpdump: unknown protocol: <*protocol*>	An unknown protocol <*protocol*> was specified.
tcpdump: WARNING: no IPv4 address assigned	This is displayed if an IPv4 address is not assigned.
tcpdump: WARNING: SIOCGIFADDR: Operation not permitted	An invalid interface has been specified. Exit by pressing the **Ctrl** + **C** key.
tcpdump: <*filter*> host filtering not implemented	The host filter of <*filter*> is not supported.
tcpdump: '<*string*>' modifier applied to host	The <*string*> qualifier has been added to the host (invalid).
tcpdump: '<*string*>' modifier applied to <*host*> host	The <*string*> qualifier has been added to the host <*host*> (invalid).
tcpdump: '<*protocol*> proto' is bogus	The protocol specification <*protocol*> is invalid.
tcpdump: <*host*> resolved to multiple address	<*host*> has resolved multiple addresses.

Notes

1. This command can monitor incoming and outgoing software processing packets such as routing protocols.
2. This command cannot monitor packets other than incoming and outgoing packets, such as an IPv4/IPv6 transfer packets, MPLS transfer packets, multicast transfer packets, or tunnel processing packets. Note that filtered packets or packets that are not processed by software

(various Layer 2 packets such as PPP), which are one type of incoming and outgoing packet, cannot be monitored.

3. This command can monitor the Layer 3 packet traffic and the lower layers. The Layer 2 traffic such as Ethernet headers cannot be monitored. The Layer 2 traffic is replaced with the null/loopback header (data link type) regardless of the type of the specified VLAN <*vlan id*>.
4. The address family (`ip`/`ip6`/`arp`) is displayed in the information of the null/loopback header section.
5. The length of the null/loopback header is four bytes. This is displayed as `[|null]` when the <*snaplen*> setting is set to less than four bytes.
6. When the `no-resolv` parameter is not specified, if the dns-resolver configuration is wrong, displaying the monitoring status takes some time.
7. When there is a large amount of traffic, there might be too many packets to be monitored and packets might be dropped (Count of `packets dropped by kernel` is displayed after the command execution ends). In such a case, specify <*expression*> to monitor only required packets.
8. The transmission of RA packets from an interface for which VRRP is set cannot be monitored.

backup

Saves switch information and information about active applications to a memory card or remote FTP server. The device information includes the password information, configuration, license information, and IPv6 DHCP server DUID file.

Syntax

```
backup { mc | ftp <ftp-server> } <filename> [ no-software ]
```

Input mode

Administrator mode

Parameters

mc

Specifies the memory card as the backup destination.

ftp <*ftp-server*>

Specifies the remote FTP server as the backup destination. Specify the IP address or host name of a server (IPv4 address or IPv6 address) for <*ftp-server*>.

<*filename*>

Specifies the path and name of the storage-destination file.

Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for a file name specified by the `backup mc` command. Note that file names which end with a period (.) cannot be used.

no-software

No software is backed up.

Operation when this parameter is omitted:

Backup, including software information, is performed.

Example 1

Save the current device information to the `MCBackup.dat` file on the memory card.

```
> enable    Press the Enter key.
# backup mc MCBackup.dat    Press the Enter key.
Backup information to MC (MCBackup.dat).
Copy file to MC...
Backup information success!
```

Example 2

Save the current device information to the `MCBackup.dat` file on the FTP server.

```
> enable    Press the Enter key.
# backup ftp ftpserver MCBackup.dat    Press the Enter key.
Backup information to MCBackup.dat in FTP(ftpserver) .
Input username: guest
Input password:
ftp transfer start.

Executing.....................................................................
.....................................................................
..................(omitted).....................................
.....................................................
Operation normal end.
ftp transfer succeeded.
Backup information success!
```

Example 3

Save the current device information (excluding software information) to the `MCBackup.dat` file on the memory card.

```
> enable    Press the Enter key.
# backup mc MCBackup.dat no-software    Press the Enter key.
Backup information to MC (MCBackup.dat).
Copy file to MC...
Backup information success!
```

Display items

None

Impact on communication

When the mc parameter is specified, if the monitoring time or sending interval of the Layer 2 or Layer 3 protocol is set shorter than the initial value on neighboring devices, communication might be disconnected when the Layer 2 or Layer 3 protocol is disconnected.

Response messages

Table 9-28: List of response messages for the backup command

Message	Description
/usr/var/update/k.img is not exist. please put k.img to /usr/var/update and retry.	The file k.img does not exist in /usr/var/update. Copy k.img to /usr/var/update and then re-execute the command.
Filename is invalid	A file with the specified name could not be created on a memory card. Specify another file name.
ftp transfer failed.	An attempt to transfer the device information by using the `backup ftp` command failed.
MC file write error.	Writing to the memory card failed. There might not be enough free space on the memory card. Delete unnecessary files and then re-execute the command.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC is write protected.	Make sure the memory card's protect switch is not set to ▼ Lock. If the switch is set to ▼ Lock, slide the switch, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC not found.	A memory card was not inserted into the slot. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
Saving file(<*file name*>) to MC failed.	Writing to the memory card failed.
This command is executable only the start-up from flash memory	The command could not be executed because the switch booted from a memory card. Start up the switch from flash memory and then re-execute the command.

Notes

- Before using the `backup ftp` command, make sure that the target FTP server has about 50 MB of free space.
- The files under /usr/home/ are not backed up.
- The device information saved by this command can be restored to the Switch by using the

`restore` command.

- Perform backup and restoration between the same models and also between the same configurations.
- When the file k.img does not exist in the directory /usr/var/update, this command cannot be executed. Before executing the command, copy the file k.img to /usr/var/update.
- Do not allow other users to log in while this command is being executed.
- Do not remove or insert the memory card while the `backup mc` command is backing up data to the memory card.
- Accessing a memory card increases load on the device. Before specifying the `mc` parameter, if the monitoring time and sending interval of the Layer 2 or Layer 3 protocol, which are settings for maintaining connection with neighboring devices, are set shorter than the initial value, reset the monitoring time and sending interval to longer values.

restore

Restores the switch information saved to a memory card or remote FTP server to the Switch.

Syntax

```
restore { mc | ftp <ftp-server> } <filename> [ no-software ]
```

Input mode

Administrator mode

Parameters

mc

Specifies the memory card as the location where the image is stored.

ftp <*ftp-server*>

Specifies the remote FTP server as the location where the image is stored. Specify the IP address or host name of a server (IPv4 address or IPv6 address) for <*ftp-server*>.

<*filename*>

Specifies the path and name of the file where the image is stored.

no-software

No software is restored.

Operation when this parameter is omitted:

Restores all the backup data.

Example 1

Restore the device information from the file `MCBackup.dat` saved on the memory card.

```
> enable    Press the Enter key.
# restore mc MCBackup.dat    Press the Enter key.
Restore information from MC (MCBackup.dat).
Copy file from MC...
Restore software.
```

Example 2

Restore the device information from the file MCBackup.dat saved on the FTP server.

```
> enable    Press the Enter key.
# restore ftp ftpserver MCBackup.dat    Press the Enter key.
Restore information from FTP(ftpserver) MCBackup.dat.
Input username: guest
Input password:
ftp transfer start.

Operation normal end.
ftp transfer succeeded.
Restore software.
```

Display items

None

Impact on communication

When the device information has been restored, the device restarts automatically. During the restart, communication is temporarily suspended. When the `mc` parameter is specified, if monitoring time or sending interval of the Layer 2 or Layer 3 protocol is set shorter than the initial value on neighboring devices, communication might be disconnected when the Layer 2 or Layer

3 protocol is disconnected.

Response messages

Table 9-29: List of response messages for the restore command

Message	Description
File is not found.	The specified file could not be found.
MC is busy.	Another process is accessing the memory card. Wait a while, and then re-execute the command.
MC not found.	A memory card was not inserted into the slot. Make sure that a memory card is inserted into the device properly. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
Restore operation failed.	An attempt to restore the device information failed. There might not be enough free space on the disk of the Switch. Delete unnecessary files and then re-execute the command.

Notes

- When the device information has been restored, the device restarts automatically. During the restart, communication is temporarily suspended.
- Do not allow other users to log in while this command is being executed.
- Do not remove or insert the memory card while the `restore mc` command is restoring data from the memory card.
- Perform backup and restoration between the same models and also between the same configurations.
- Accessing a memory card increases load on the device. Before specifying the `mc` parameter, if the monitoring time and sending interval of the Layer 2 or Layer 3 protocol, which are settings for maintaining connection with neighboring devices, are set shorter than the initial value, reset the monitoring time and sending interval to longer values.

Chapter

10. BSU/NIF Management

activate bsu [AX6700S]
inactivate bsu [AX6700S]
show nif
clear counters nif
activate nif
inactivate nif
show redundancy nif-group [AX6700S] [AX6600S]

activate bsu [AX6700S]

Restores the status of the BSU board from `inactive` to `active` when the `inactivate bsu` command has been used to set `inactive`.

Syntax

`activate bsu <bsu no.>`

Input mode

User mode and administrator mode

Parameters

<bsu no.>

Specifies the number of a BSU to be restored to `active` status. Specifiable values for the BSU number are in the range from 1 to 3.

Example

Return the BSU board whose BSU number is 1 to `active`.

```
> activate bsu 1
```

Display items

None

Impact on communication

Yes

Response messages

Table 10-1: List of response messages for the activate bsu command

Message	Description
BSU <*bsu no.*> is already active.	The specified BSU is already in `active` status. The command does not need to be executed if you correctly specified the BSU. <*bsu no.*> BSU number
BSU <*bsu no.*> is already initializing.	The specified BSU is already being initialized. The command does not need to be executed if you correctly specified the BSU. <*bsu no.*> BSU number
BSU <*bsu no.*> is disabled.	The specified BSU is disabled in the configuration. Make sure the specified parameter is correct. <*bsu no.*> BSU number
BSU <*bsu no.*> is failed.	The specified BSU is faulty. Make sure the specified parameter is correct. <*bsu no.*> BSU number
BSU <*bsu no.*> is notconnected.	The specified BSU is not installed. Make sure the specified parameter is correct. <*bsu no.*> BSU number
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

- When the status of a BSU is restored to `active` from `inactive`, the NIFs and ports installed

on the BSU are also restored to `active` status.

- When a system switchover occurs automatically due to the execution of the `inactivate bsu` command, and the standby BSU after the system switchover changes to `inactive` status, use the `activate bsu` command to restore the standby BSU to `active` status.

inactivate bsu [AX6700S]

Switches the BSU board from `active` to `inactive` status. This setting also turns off the power supply unit to the board.

Syntax

`inactivate [-f] bsu <bsu no.>`

Input mode

User mode and administrator mode

Parameters

-f

If this parameter is specified, this command is executed without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

<bsu no.>

Specifies the number of a BSU to be switched to `inactive` status. Specifiable values for the BSU number are in the range from 1 to 3.

Example

1. Switches the BSU board whose BSU number is 1 to `inactive` status.
```
> inactivate bsu 1
```

2. A confirmation message appears.
```
inactivate bsu OK? (y/n):
```

If `y` is entered, the BSU is changed to `inactive` status.

Display items

None

Impact on communication

Yes

Response messages

Table 10-2: List of response messages for the inactivate bsu command

Message	Description
BSU <*bsu no.*> is already inactive.	The specified BSU is already in `inactive` status. The command does not need to be executed if you correctly specified the BSU. <*bsu no.*> BSU number
BSU <*bsu no.*> is disabled.	The specified BSU is disabled in the configuration. Make sure the specified parameter is correct. <*bsu no.*> BSU number
BSU <*bsu no.*> is notconnected.	The specified BSU is not installed. Make sure the specified parameter is correct. <*bsu no.*> BSU number

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

- To restore the BSU board that has been changed to `inactive` by this command to `active`, use the `activate bsu` command.
- If the switch is operating in a redundant configuration, and system switchover is available, when this command is executed then system switchover occurs automatically, and the standby BSU after the system switchover is changed to `inactive`.
- If the switch is operating in a redundant configuration, and the standby BSU is in cold standby status, when this command is executed on a BSU that is in `active` status, the BSU status is changed to `inactive`. However, communication continues until the standby BSU becomes `active`.
- If the device is restarted after the execution of this command, the `inactive` status is canceled.
- Note that, when all the installed BSUs are set to `inactive` status, the status of NIFs and ports other than remote management ports and maintenance ports are also changed to `inactive`.

show nif

Display NIF information and summary information about ports.

Syntax

```
show nif [<nif no.>]
```

Input mode

User mode and administrator mode

Parameters

<nif no.>

Specifies a NIF number. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All the NIFs in the Switch are the target for the command.

Example

Display NIF information and summary information about ports.

Figure 10-1: Execution result of specifying NIFs

```
>show nif 1
Date 2008/04/16 12:00:00 UTC
NIF1: active(restart required)  48-port 10BASE-T/100BASE-TX/1000BASE-T  retry:0
        Average:103Mbps/24Gbps  Peak:150Mbps at 08:10:30
Port1: active up  1000BASE-T full(auto)  0012.e240.0a04
        Bandwidth:1000000kbps  Average out:20Mbps  Average in:10Mbps
        description: test lab area network
Port2: active up  1000BASE-T full(auto)  0012.e240.0a05
        Bandwidth:1000000kbps  Average out:0Mbps   Average in:0Mbps
        description: computer management floor network
Port3: active up  1000BASE-T full(auto)  0012.e240.0a06
        Bandwidth:1000000kbps  Average out:2Mbps   Average in:1Mbps

(Omitted)

>
```

Display items

NIF information is displayed in the following format. *Table 10-3: Information displayed as NIF information* describes the displayed items.

`NIF`*<nif no.>*`:` *<NIF status>*`[(`*<Necessity to restart NIF>*`)]` *<NIF type>* `retry:`*<Counts>*
`Average:`*<Average used bandwidth>*`bps/`*<NIF maximum bandwidth>*`bps Peak:`*<Maximum used bandwidth>*`bps at` *<hh>*`:`*<mm>*`:`*<ss>*

Summary information about ports is displayed in the following format. *Table 10-4: Information displayed as summary information about ports* describes the displayed items.

`Port`*<port no.>*`:` *<Port status>* *<Line type>* *<MAC address>*
<transceiver type>[#] *<transceiver status>*[#]
`Bandwidth:`*<Bandwidth of the line>*`kbps Average out:`*<Average bandwidth used on the sending side>*`bps Average in:`*<Average bandwidth used on the receiving side>*`bps`
`description:`*<supplementary explanation>*

#: These items are displayed for NIFs in which a transceiver can be replaced.

Table 10-3: Information displayed as NIF information

Item	Detailed information	Meaning
NIF<*nif no.*>	NIF number	
<*NIF status*>	active	Active (normal operating state)
	initialize	Currently initializing
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • The NIF is not running. • An unsupported board is installed.
	notconnect	• Not installed • Not used (If a double-sized NIF is installed, this item applies to the even NIF number.)
	disable	Operation was stopped by using the `no power enable` or the `schedule-power-control` shutdown configuration command.
	standby cold [AX6700S] [AX6600S]	Placed in a cold standby status by NIF redundancy control
(<*whether-NIF-restart-required*>)	restart required	The NIF HDC must be updated.
<*NIF type*>	24-port 10BASE-T/100BASE-TX/ 1000BASE-T	24 10BASE-T, 100BASE-TX, or 1000BASE-T lines
	48-port 10BASE-T/100BASE-TX/ 1000BASE-T	48 10BASE-T, 100BASE-TX, or 1000BASE-T lines
	16-port 1000BASE-X(SFP)	16 1000BASE-X (SFP) lines
	24-port 1000BASE-X(SFP)	24 1000BASE-X (SFP) lines
	4-port 10BASE-T/100BASE-TX/ 1000BASE-T-SHAPER + 2-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, or 1000BASE-T lines with the hierarchical shaper and two 1000BASE-X SFP lines with the hierarchical shaper
	4-port 10BASE-T/100BASE-TX/ 1000BASE-T-SHAPER or 1000BASE-X(SFP)-SHAPER + 4-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X SFP lines (user selectable) with the hierarchical shaper and four 1000BASE-X SFP lines with the hierarchical shaper
	1-port 10GBASE-R(XFP)	One 10GBASE-R (XFP) line
	4-port 10GBASE-R(XFP)	Four 10GBASE-R (XFP) lines
	8-port 10GBASE-R(XFP)	Eight 10GBASE-R (XFP) lines
	-	The NIF type is unknown. A dash is displayed in the following cases: • No NIFs are installed. • An unsupported board is installed.
retry:<*Counts*>	Displays the number of times a NIF was restarted due to a fault.#	

Item	Detailed information	Meaning
Average: <*average-bandwidth-used/ maximum-NIF-bandwidth*> bps	Displays the average bandwidth (in bps) used for each NIF for the one minute interval before the command was executed (line bandwidth used per NIF / maximum bandwidth per NIF). `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak: <*maximum-bandwidth-used*>bps at <*hh*>:<*mm*>:<*ss*>	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#: The number of times a NIF was restarted due to a fault is initialized every one hour.

Table 10-4: Information displayed as summary information about ports

Item	Detailed information	Meaning
Port<*port no.*>	Port number	
<*port status*>	active up	Active (normal operating state)
	active down	Active (normal operating state)
	initialize	Currently initializing or negotiating (auto-negotiation is operating)
	test	Line under test
	fault	Failed
	inactive	• Operation was stopped by using the inactivate command. • Due to the standby link functionality of link aggregation • Due to the BPDU guard functionality of the Spanning Tree Protocol • Due to port resetting function of GSRP • The port has been deactivated by unidirectional link failure detection function. • The port has been deactivated by the L2 loop detection functionality. • The port has been deactivated by storm control.
	disable	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown` configuration commands.
<*line type*>	For details about line types, see <*line type*> in the Display item column of the tables in *show interfaces.*	
<*MAC address*>	The MAC address of the line	
<*transceiver type*>[#]	SFP	SFP

Item	Detailed information	Meaning
	XFP	XFP
<*transceiver status*>[#]	connect	Installed
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. A dash is displayed in the following cases: • A port is in the `initialize` status. • A port is in the `fault` status.
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out: <*average bandwidth used on sending side*>bps	Displays the average bandwidth (in bps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in: <*average bandwidth used on receiving side*>bps	Displays the average bandwidth (in bps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
description:<*supplementary explanation*>	Displays the contents of the `description` configuration. The `description` configuration can be used to set comments, such as a comment about the purpose of the line. This item is not displayed if the description configuration has not been set.	

#: These items are displayed for NIFs in which a transceiver can be replaced.

Impact on communication

None

Response messages

Table 10-5: List of response messages for the show nif command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: NIF number

Notes

None

clear counters nif

Clears to zero the statistics of a NIF.

Syntax

```
clear counters nif [<nif no.>]
```

Input mode

User mode and administrator mode

Parameters

<nif no.>

Specifies a NIF number. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All the NIFs in the Switch are the target for the command.

Example and display items

None

Impact on communication

None

Response messages

Table 10-6: List of response messages for the clear counters nif command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: NIF number

Notes

- The following information items displayed by the `show interfaces` command are cleared to zero:
  - Send and receive statistics
  - Send error statistics
  - Receive error statistics
  - Failure statistics
- Even if the statistics counter is cleared to zero, the value of the MIB information obtained by using SNMP is not cleared to zero.
- All display items are cleared in the following cases:
  - Restarting a NIF
  - NIF hardware failure
  - After an `inactivate nif` inactive status setting command is issued to a NIF, the NIF can

be reverted from `inactive` to `active` status by the `activate nif` command.

- After a `no power enable` or `schedule-power-control shutdown` configuration command is issued to a NIF to set `disable` status, the `power enable` or `no schedule-power-control shutdown` configuration command can be used to revert status from `disable` to `enable`.
- The `restart vlan` command is executed.
- An error occurs in the network interface management program (nimd).

activate nif

Restores the status of the NIF board from `inactive` to `active` when the `inactivate nif` command has been used to set `inactive` status.

Syntax

`activate nif` <*nif no.*>

Input mode

User mode and administrator mode

Parameters

<*nif no.*>

Specifies the number of a NIF to be restored to `active` status. For the specifiable range of values for the NIF number, see *Specifiable values for parameters.*

Example

Revert the NIF board whose NIF number is 1 to `active` status.

```
> activate nif 1
```

Display items

None

Impact on communication

Yes

Response messages

Table 10-7: List of response messages for the activate nif command

Message	Description
BSU that controls NIF <*nif no.*> is not operational.	The BSU that controls the specified NIF is not in `active` status. Activate the BSU. <*nif no.*>: NIF number
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: NIF number
NIF <*nif no.*> is already active.	The specified NIF is already in `active` status. The command does not need to be executed if you correctly specified the NIF. <*nif no.*>: NIF number
NIF <*nif no.*> is already initializing.	The specified NIF is already being initialized. The command does not need to be executed if you correctly specified the NIF. <*nif no.*>: NIF number
NIF <*nif no.*> is disabled.	The specified NIF is disabled in the configuration. Make sure the specified parameter is correct. <*nif no.*>: NIF number
NIF <*nif no.*> is failed.	The specified NIF is faulty. Make sure the specified parameter is correct. <*nif no.*>: NIF number

Message	Description
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: NIF number
NIF <*nif no.*> is standby.	The specified NIF is in standby mode. Make sure the specified parameter is correct. <*nif no.*>: NIF number
PSP that controls NIF <*nif no.*> is not operational.	The PSP that controls the specified NIF is not in `active` status. Activate the PSP. <*nif no.*>: NIF number

Notes

When the status of a NIF is restored from `inactive` to `active`, the ports installed on the NIF are also reverted to `active` status.

inactivate nif

Switches the NIF board from `active` to `inactive` status. This setting also turns off the power supply unit to the board.

Syntax

```
inactivate [-f] nif <nif no.>
```

Input mode

User mode and administrator mode

Parameters

-f

If this parameter is specified, this command is executed without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

<nif no.>

Specifies the number of a NIF to be switched to `inactive` status. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

Example

1. Switch the NIF board whose NIF number is 1 to `inactive` status.
   ```
   > inactivate nif 1
   ```
2. A confirmation message appears.
   ```
   nif 1 inactivate OK? (y/n):
   ```

   If `y` is entered, the NIF board whose NIF number is 1 is switched to `inactive` status.

Display items

None

Impact on communication

Yes

Response messages

Table 10-8: List of response messages for the inactivate command

Message	Description
BSU that controls NIF *<nif no.>* is not operational.	The BSU that controls the specified NIF is not in `active` status. Activate the BSU. *<nif no.>*: NIF number
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- *<nif no.>*.	The NIF number is outside the valid range. Make sure the specified parameter is correct. *<nif no.>*: NIF number

Message	Description
NIF <*nif no.*> is already inactive.	The specified NIF is already in `inactive` status. The command does not need to be executed if you correctly specified the NIF. <*nif no.*>: NIF number
NIF <*nif no.*> is disabled.	The specified NIF is disabled in the configuration. Make sure the specified parameter is correct. <*nif no.*>: NIF number
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: NIF number
PSP that controls NIF <*nif no.*> is not operational.	The PSP that controls the specified NIF is not in `active` status. Activate the PSP. <*nif no.*>: NIF number

Notes

- If the device is restarted after the execution of this command, the `inactive` status is canceled.
- To return the NIF board that has been changed to `inactive` by this command to `active`, use the `activate` command.
- When the status of a NIF is changed to `inactive`, the ports installed on the NIF are also changed to `inactive`.

show redundancy nif-group [AX6700S] [AX6600S]

Displays the information of a NIF redundancy group.

Syntax

```
show redundancy nif-group [<nif group no.>]
```

Input mode

User mode and administrator mode

Parameters

<nif group no.>

Specifies a NIF redundancy group number. The range of specifiable values for the NIF redundancy group number is all the NIF redundancy group numbers set by configuration commands.

Operation when this parameter is omitted:

Displays the information of all NIF redundancy groups.

Example

Display the information of a NIF redundancy group.

Figure 10-2: Result of executing show redundancy nif-group

```
> show redundancy nif-group
Date 2010/03/01 12:00:00 UTC
NIF Group Counts:4
NIF Group No:1
  NIF Counts:2 Max-Standby-NIF:0 Active NIF:2 Standby NIF:0
  NIF:1    Priority:1    Status:active
  NIF:2    Priority:2    Status:active
NIF Group No:2
  NIF Counts:2 Max-Standby-NIF:1 Active NIF:1 Standby NIF:1
  NIF:3    Priority:1    Status:active
  NIF:4    Priority:2    Status:standby cold
NIF Group No:3
  NIF Counts:2 Max-Standby-NIF:1 Active NIF:1 Standby NIF:0
  NIF:5    Priority:1    Status:fault
  NIF:6    Priority:2    Status:active
NIF Group No:4
  NIF Counts:2 Max-Standby-NIF:1 Active NIF:0 Standby NIF:0
  NIF:7    Priority:2    Status:inactive
  NIF:8    Priority:1    Status:disable
```

Display items

Table 10-9: Information displayed by the show redundancy nif-group command

Item	Displayed information	Displayed detailed information
NIF Group Counts	Number of NIF redundancy groups	Number of NIF redundancy groups to be displayed
NIF Group No	NIF redundancy group number	--
NIF Counts	Number of set NIFs	Number of NIFs belonging to NIF redundancy groups
Max-Standby-NIF	Maximum number of NIFs that are in standby status	0 to 1
Active NIF	Number of active NIFs	Number of active NIFs in NIF redundancy groups

Item	Displayed information	Displayed detailed information
Standby NIF	Number of standby NIFs	Number of standby NIFs in NIF redundancy groups
NIF	NIF information	NIF number
Priority	NIF priority	1 to 8 (1 is the highest priority)
Status	Operating status of the NIF	`active`: Active
		`initialize`: Initializing
		`fault`: Failed
		`inactive`: In any of the following states • Operation stopped by the `inactivate` command. • The NIF is not running. • An unsupported board is installed.
		`notconnect`: Not installed
		`disable`: Operation stopped by the `no power enable` or `schedule-power-control shutdown` configuration command.
		`standby cold`: In a cold standby status due to the NIF redundancy control functionality

Impact on communication

None

Response messages

Table 10-10: List of response messages for the show redundancy nif-group command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Specified redundancy nif-group is not configured.	The NIF redundancy group has not been set. Check the configuration.

Notes

None

Chapter

11. Power Saving Functionality

show power-control schedule [AX6700S] [AX6600S]
show engine-traffic statistics
clear engine-traffic statistics
show power
clear power

show power-control schedule [AX6700S] [AX6600S]

Display the current status of the power saving schedule and the dates and times the power saving schedule has been enabled.

Syntax

```
show power-control schedule [<yymmdd>] [count <count>]
```

Input mode

User mode and administrator mode

Parameters

<yymmdd>

The scheduled date and time is displayed from midnight of the day specified here. The specifiable values are from January 1, 2000 to January 17, 2038.

yy

Specify the last two digits of the year in the range from 00 to 38.

For example, 00 means the year 2000.

mm

Specify the month in the range from 01 to 12.

dd

Specify the day of the month in the range from 01 to 31.

Operation when this parameter is omitted:

The scheduled date and time from the time of command execution is displayed.

count *<count>*

Scheduled dates and times equivalent to the number of specified schedules are displayed. The specifiable range of schedules is from 1 to 50.

Operation when this parameter is omitted:

The scheduled dates and times for 10 schedules are displayed.

Operation when all parameters are omitted:

Operation proceeds as described for each Operation when this parameter is omitted section.

Example

Display the current status of the power saving schedule and the dates and times the power saving schedule has been enabled.

Figure 11-1: Result of executing the show power-control schedule command

```
> show power-control schedule 090401 count 5
Date 2009/04/01(Thu) 18:36:57 UTC
Current Schedule Status : Disable
Schedule Power Control Date:
  2009/04/01(Wed) 20:00 UTC  -  2009/04/02(Thu) 06:00 UTC
  2009/04/02(Thu) 20:00 UTC  -  2009/04/03(Fri) 06:00 UTC
  2009/04/03(Fri) 20:00 UTC  -  2009/04/06(Mon) 06:00 UTC
  2009/04/06(Mon) 20:00 UTC  -  2009/04/07(Tue) 06:00 UTC
  2009/04/07(Tue) 20:00 UTC  -  2009/04/08(Wed) 06:00 UTC
>
```

Display items

Table 11-1: Information displayed by the show power-control schedule command

Item	Displayed information	Displayed detailed information
Current Schedule Status	Power saving schedule status	`Enable`: Power saving is in effect as scheduled. `Disable`: Normal power control is in effect.
Schedule Power Control Date	Scheduled date and time that the power saving schedule is enabled	Scheduled date and time that the power saving schedule is enabled *<date and time power saving schedule started> - <date and time power saving schedule ended>*

Impact on communication

None

Response messages

Table 11-2: List of response messages for the show power-control schedule command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

show engine-traffic statistics

Displays information about the traffic passing through the forwarding engine.

Syntax

```
show engine-traffic statistics
        {average-bps|peak-bps|accumulated-octets|accumulated-packets}
        [{days|hours|minutes}] [{inbound|outbound}]
show engine-traffic statistics detail [nif <nif no.>]
        [{days|hours|minutes}] [{inbound|outbound}]
```

Input mode

User mode and administrator mode

Parameters

{average-bps | peak-bps | accumulated-octets | accumulated-packets}

Specifies an item to be displayed.

average-bps

Displays average bandwidth used within the specified period for each forwarding engine. It is displayed in bit/s.

peak-bps

Displays the maximum bandwidth used within the specified period for each forwarding engine. It is displayed in bit/s.

accumulated-octets

Displays the total number of bytes in packets forwarded within the specified period for each forwarding engine. It is displayed in bytes.

accumulated-packets

Displays the total number of packets forwarded within the specified period for each forwarding engine.

{days | hours | minutes}

Specifies time that the information is displayed.

days

Displays statistics collected daily. Statistics for the past 30 days are displayed.

hours

Displays statistics collected hourly. Statistics for the past 24 hours are displayed.

minutes

Displays statistics collected by the minute. Statistics for the past 60 minutes are displayed.

Operation when this parameter is omitted:

Displays statistics collected by the minute.

{inbound | outbound}

Specifies receive traffic or send traffic.

inbound

Displays the volume of packets transferred from a NIF to each forwarding engine.

outbound

Displays the volume of packets transferred from each forwarding engine to a NIF.

Operation when this parameter is omitted:

Displays both inbound traffic and outbound traffic. The information is displayed for the specified time. Inbound traffic information is displayed first, and then outbound traffic information is displayed.

detail

Displays average bandwidth used within the specified period for each packet transfer bus. It is displayed in bit/s.

NIF<*nif no.*>

Specifies a NIF number. For the specifiable range of values, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the bandwidth used for all the packet transfer buses. Displays the total values of the bandwidth used for each forwarding engine. This information is displayed in ascending order of NIF number.

Example 1

Display average bandwidth used for the last 60 minutes. [AX6700S]

Figure 11-2: Average bandwidth used for the last 60 minutes

```
> show engine-traffic statistics average-bps
Date 2010/03/01 12:00:00 UTC
                  BSU/Forwarding Engine
                    1/1      1/2      2/1      2/2      3/1      3/2      total
                  Average bps
Mar 01 11:00
     Inbound      17.5G    18.5G    20.0G    17.5G     0.0G     0.0G      73.5G
     Outbound     17.5G    18.5G    20.0G    17.5G     0.0G     0.0G      73.5G
Mar 01 11:01
     Inbound      17.5G    18.5G    20.0G    17.5G     0.0G     0.0G      73.5G
     Outbound     17.5G    18.5G    20.0G    17.5G     0.0G     0.0G      73.5G
           :
           :
Mar 01 11:59
     Inbound      17.0G    18.0G    21.0G    17.0G     0.0G     0.0G      73.0G
     Outbound     17.0G    18.0G    21.0G    17.0G     0.0G     0.0G      73.0G
```

Example 2

Display the maximum bandwidth used for inbound traffic for the last 60 minutes. [AX6700S]

Figure 11-3: Maximum bandwidth used for inbound traffic for the last 60 minutes

```
> show engine-traffic statistics peak-bps minutes inbound
Date 2010/03/01 12:00:00 UTC
                  BSU/Forwarding Engine
                    1/1      1/2      2/1      2/2      3/1      3/2      total
                  Peak bps
Mar 01 11:00
     Inbound      12.0G    13.0G    12.0G    14.0G    13.0G     9.0G      73.0G
Mar 01 11:01
     Inbound      12.3G    13.5G    13.1G    12.9G    12.8G    10.2G      74.8G
           :
           :
Mar 01 11:59
     Inbound      12.0G    13.0G    12.0G    14.0G    13.0G     9.0G      73.0G
```

Example 3

Display the number of octets for outbound traffic for the last 24 hours. [AX6700S]

Figure 11-4: Number of octets for outbound traffic for the last 24 hours

```
> show engine-traffic statistics accumulated-octets hours outbound
Date 2010/03/01 12:00:10 UTC
                  BSU/Forwarding Engine
                    1/1      1/2      2/1      2/2      3/1      3/2      total
                  Accumulated Octets
Feb 28 12:00
     Outbound   4800.0G  4700.0G  5100.0G  5000.0G  3800.0G  4100.0G   27500.0G
Feb 28 13:00
     Outbound   4600.0G  4500.0G  5000.0G  5100.0G  4000.0G  4000.0G   27200.0G
           :
           :
Mar 01 11:00
     Outbound   4900.0G  4600.0G  4800.0G  5000.0G  4000.0G  4200.0G   27500.0G
```

Example 4

Display the number of packets for the last 30 days. [AX6700S]

Figure 11-5: Number of packets for the last 30 days

```
> show engine-traffic statistics accumulated-packets days
Date 2010/03/01 12:00:15 UTC
                  BSU/Forwarding Engine
                    1/1      1/2      2/1      2/2      3/1      3/2      total
                  Accumulated Packets
Jan 30 00:00
     Inbound      48.0G    47.0G    51.0G    50.0G    38.0G    41.0G     275.0G
     Outbound     48.0G    47.0G    51.0G    50.0G    38.0G    41.0G     275.0G
Jan 31 00:00
     Inbound      46.0G    45.0G    50.0G    51.0G    40.0G    40.0G     272.0G
     Outbound     46.0G    45.0G    50.0G    51.0G    40.0G    40.0G     272.0G
           :
           :
Feb 28 00:00
     Inbound      49.0G    46.0G    48.0G    50.0G    40.0G    42.0G     275.0G
     Outbound     49.0G    46.0G    48.0G    50.0G    40.0G    42.0G     275.0G
```

Example 5

Display average bandwidth used for the last 60 minutes. [AX6600S]

Figure 11-6: Average bandwidth used for the last 60 minutes

```
> show engine-traffic statistics average-bps minutes
Date 2010/03/01 12:00:00 UTC
                  PSP/Forwarding Engine
                    1/1      2/1      total
                  Average bps
Mar 01 11:00
     Inbound      17.5G    18.5G      36.0G
     Outbound     17.5G    18.5G      36.0G
Mar 01 11:01
     Inbound      17.5G    18.5G      36.0G
     Outbound     17.5G    18.5G      36.0G
           :
           :
Mar 01 11:59
     Inbound      17.0G    18.0G      35.0G
     Outbound     17.0G    18.0G      35.0G
```

Example 6

Display average bandwidth used for the last 60 minutes. [AX6300S]

Figure 11-7: Average bandwidth used for the last 60 minutes

```
> show engine-traffic statistics average-bps minutes
Date 2010/03/01 12:00:00 UTC
                  PSP/Forwarding Engine
                    1/1      2/1      total
                  Average bps
Mar 01 11:00
     Inbound      17.5G     0.0G      17.5G
     Outbound     17.5G     0.0G      17.5G
Mar 01 11:01
     Inbound      17.5G     0.0G      17.5G
     Outbound     17.5G     0.0G      17.5G
           :
           :
Mar 01 11:59
     Inbound      17.0G     0.0G      17.0G
     Outbound     17.0G     0.0G      17.0G
```

Example 7

Display bandwidth used for each packet transfer bus for the last 60 minutes. [AX6700S]

Figure 11-8: Bandwidth used for each packet transfer bus for the last 60 minutes

```
> show engine-traffic statistics detail
Date 2010/03/01 12:00:10 UTC
                  BSU/Forwarding Engine
                    1/1      1/2      2/1      2/2      3/1      3/2      total
                  Average bps
Mar 01 11:00
NIF1 Inbound       7.0G     6.0G     7.0G     5.0G     0.0G     0.0G      25.0G
NIF1 Outbound      7.0G     6.0G     7.0G     5.0G     0.0G     0.0G      25.0G
NIF2 Inbound       5.9G     4.8G     6.8G     7.1G     0.0G     0.0G      24.6G
NIF2 Outbound      5.9G     4.8G     6.8G     7.1G     0.0G     0.0G      24.6G
NIF3 Inbound       5.9G     4.8G     6.8G     7.1G     0.0G     0.0G      24.6G
NIF3 Outbound      5.9G     4.8G     6.8G     7.1G     0.0G     0.0G      24.6G
           :
           :
Mar 01 11:59
NIF1 Inbound       7.0G     6.0G     7.0G     5.0G     0.0G     0.0G      25.0G
NIF1 Outbound      7.0G     6.0G     7.0G     5.0G     0.0G     0.0G      25.0G
           :
           :
NIF7 Inbound       0.0G     0.0G     0.0G     0.0G     0.0G     0.0G       0.0G
NIF7 Outbound      0.0G     0.0G     0.0G     0.0G     0.0G     0.0G       0.0G
NIF8 Inbound       6.1G     4.8G     6.8G     6.9G     0.0G     0.0G      24.6G
NIF8 Outbound      6.1G     4.8G     6.8G     6.9G     0.0G     0.0G      24.6G
```

Display items in Examples 1 to 7

Table 11-3: Information displayed by the show engine-traffic statistics command

Item	Displayed information	Displayed detailed information
Interface information	BSU/Forwarding Engine	A forwarding engine in a BSU/BSU
	PSP/Forwarding Engine	A forwarding engine in a PSP/PSP
	<bsu no.>/<forwarding engine no.>	BSU number/BSU forwarding engine number
	<psp no.>/<forwarding engine no.>	PSP number/PSP forwarding engine number
	NIF*<nif no.>*	NIF number
	Inbound	Receive traffic for the BSU/PSP forwarding engine#1
	Outbound	Send traffic for the BSU/PSP forwarding engine#1

Item	Displayed information	Displayed detailed information
	total	Total value of traffic
Statistics	Average bps	Average bandwidth used for a packet transfer bus#2
	Peak bps	Maximum bandwidth used for a packet transfer bus#2
	Accumulated Octets	Number of octets#2
	Accumulated Packets	Number of packets#2

#1: The bandwidth used is rounded down to one decimal place and is displayed rounded off to multiples of 0.1 Gbit/s. Bandwidth less than 0.1 Gbit/s is displayed as 0.0 G.

#2: The display unit differs depending on the time parameter specified. Specifying minutes displays the information in minutes, specifying hours displays the information in hours, and specifying days displays the information in days. If the time parameter is not specified, the information is displayed in minutes.

Impact on communication

None

Response messages

Table 11-4: List of response messages for the show engine-traffic statistics command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.

Notes

If the date and time of the switch are changed, statistics for the time interval during which the change is performed might be different from actual statistics.

clear engine-traffic statistics

Clears the information about the traffic passing through the forwarding engine.

Syntax

```
clear engine-traffic statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

None

Display items

None

Impact on communication

None

Response messages

Table 11-5: List of response messages for the clear engine-traffic statistics command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

If this command is executed when the traffic-based power saving functionality is enabled, the traffic monitoring time is cleared, and monitoring is restarted. [AX6700S] [AX6600S]

show power

Displays estimated current power consumption, power consumption totals, and power control status of the Switch and each board.

Syntax

```
show power
```

Input mode

User mode and administrator mode

Parameters

None

Example 1

Figure 11-9: Result of executing the show power command [AX6700S]

```
>show power
Date 2010/04/13 12:00:00 UTC
Elapsed time 2Days 03:25
H/W      Wattage  Accumulated Wattage  Power-Status  Status
Chassis  56.00 W            41.66 kWh        -       active
BCU1     42.00 W            31.25 kWh        -       active
BCU2     42.00 W            31.25 kWh        -       standby
BSU1    308.00 W           229.15 kWh        saving  active
BSU2    308.00 W           279.00 kWh        saving  active
BSU3      0.00 W            90.00 kWh        -       standby cold2
NIF1    118.00 W            65.47 kWh        normal  active
NIF2    118.00 W            21.12 kWh        normal  active
NIF3    109.00 W            81.10 kWh        normal  active
NIF4    108.00 W            80.35 kWh        normal  active
NIF5    144.00 W           107.14 kWh        normal  active
NIF6      0.00 W            21.12 kWh        -       notconnect
NIF7      0.00 W            21.12 kWh        -       disable
NIF8      0.00 W            21.12 kWh        -       inactive
Total  1311.00 W          1120.85 kWh
>
```

Example 2

Figure 11-10: Result of executing the show power command [AX6600S]

```
>show power
Date 2010/04/13 12:00:00 UTC
Elapsed time 2Days 03:25
H/W      Wattage  Accumulated Wattage  Power-Status  Status
Chassis  28.00 W            41.66 kWh        -       active
CSU1    194.00 W           167.40 kWh        saving  active
CSU2     43.00 W           144.34 kWh        cold2   standby
NIF1     88.00 W            65.47 kWh        normal  active
NIF2    118.00 W            21.12 kWh        normal  active
NIF3    109.00 W            81.10 kWh        normal  active
NIF4    108.00 W            80.35 kWh        normal  active
Total   688.00 W           601.44 kWh
>
```

Example 3

Figure 11-11: Result of executing the show power command [AX6300S]

```
>show power
Date 2010/04/13 12:00:00 UTC
Elapsed time 2Days 03:25
H/W      Wattage  Accumulated Wattage  Power-Status  Status
Chassis  28.00 W            41.66 kWh        -       active
```

```
MSU1    225.00 W          167.40 kWh        normal  standby
MSU2    225.00 W          144.34 kWh        normal  active
NIF1     88.00 W           65.47 kWh        normal  active
NIF2    118.00 W           21.12 kWh        normal  active
NIF3    109.00 W           81.10 kWh        normal  active
NIF4    108.00 W           80.35 kWh        normal  active
Total   901.00 W          601.44 kWh
>
```

Display items in Examples 1 to 3

Table 11-6: Information displayed by the show power command

Item	Displayed information	Displayed detailed information
Elapsed time	Elapsed time	If the `clear power` command was not executed, the time elapsed since the switch started is displayed. If the `clear power` command was executed, the time elapsed since the `clear power` command was executed is displayed. It is displayed in days and then hours: minutes.
H/W	Information of parts	Displays the switch and each board installed on the switch.#1
Wattage	Power consumption	Displays estimated power consumption. It is displayed in W.#2, #3
Accumulated Wattage	Amount of power consumption	Displays cumulative power consumption. It is displayed in kWh.#4
Power-Status	Power control status	Displays the power control information set by the `power-control` or `redundancy standby-psp` [AX6600S] configuration setting. `normal`: Operation is in normal power mode. `saving`: Operation is in power saving mode. `changing`: The power control mode is being changed. `cold2`: Operation is in cold standby 2 mode. [AX6600S] `-`: Power control is not performed.
Status	Operating status	Displays the operating status of the corresponding part. For details about the status, see *9. Checking Software Versions and Device Statuses* and *10. BSU/NIF Management*.
Total	Total	Displays information about the current power consumption and the total power consumption for each device.

#1: This information is displayed for the number of installable boards.

#2: This estimated value is different from actual power consumption. To obtain an accurate value, measure it with a measuring instrument.

#3: The power consumption of the chassis is the total power consumption of the fans and power supply unit.

#4: Because this information is rounded off to two decimal places, there are some errors between this information and the power consumption value obtained by a MIB (axsPconPowerConPowerConsumption).

Impact on communication

None

Response messages

Table 11-7: List of response messages for the show power command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.

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

Notes

- The value of cumulative power consumption is cleared when the device is restarted.
- When the board is replaced, or the installation location is changed, information saved for the original cumulative power consumption for the installation location is displayed.
- For information about the installation environment or power functionality of the device, see the values listed in the *Hardware Instruction Manual*.

clear power

Clears the information about the power consumption of the switch.

Syntax

```
clear power
```

Input mode

User mode and administrator mode

Parameters

None

Example

Clears the information about the power consumption of the switch.

```
> clear power
>
```

Display items

None

Impact on communication

None

Response messages

Table 11-8: List of response messages for the clear power command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

Even if information about the power consumption is cleared by using this command, the value of the MIB information obtained by using SNMP is not cleared to zero.

Chapter

12. Checking Internal Memory and Memory Cards

show mc
format mc
show flash

show mc

Displays the memory card format and card usage.

Syntax

```
show mc
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
>show mc
Date 2006/03/13 06:35:27 UTC
MC  : enabled
    Manufacture ID : 00000003
    19,343kB used
    103,616kB free
    122,959kB total
>
```

Display items

Table 12-1: Information displayed by the show mc command

Item		Displayed information	Displayed detailed information
MC	--	Memory card status	`enabled`: The memory card can be accessed. `notconnect`: The memory card is not installed. `write protect`: Writing to the memory card is not allowed. `--------`: Another process is accessing the memory card.#1
	Manufacture ID	Production ID number#2	Memory card production ID number
	used	Used capacity#2	Used capacity of the memory card file system
	free	Unused capacity#2	Unused capacity of the memory card file system
	total	Total capacity#2	Total of capacity in use and capacity not in use for the memory card file system

#1: Another process is accessing the memory card. Wait a while, and then re-execute the command.

#2: Those items are displayed when the memory card status is `enabled` or `write protect`.

Impact on communication

None

Response messages

Table 12-2: List of response messages for the show mc command

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

Notes

This command shows both the used and the unused capacity for the file system on the memory card.

format mc

Initializes formats the memory card for use by the Switch.

Syntax

```
format mc [-f]
```

Input mode

User mode and administrator mode

Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

1. Insert the memory card to be initialized into the slot, and then enter the following command:
   ```
   >format mc    Press the Enter key.
   ```
2. A message asking for confirmation is displayed after executing the `format` command.
   ```
   MC initialize OK?  (y/n):_
   ```

   If `y` is entered, the memory card will be initialized.

   If an error occurs, an error message is displayed.

   If `n` is entered, the memory card will not be initialized, and you will be returned to command mode.

Display items

None

Impact on communication

None

Response messages

Table 12-3: List of response messages for the format mc command

Message	Description
Can't access to MC by write protection.	The write protection switch of the memory card is set for the write-protected status. Reset the write protection switch to the write-permitted status, and then re-execute the command.
Can't execute.	The command could not be executed. Re-execute the command.
Can't gain access to MC.	The memory card is not installed, or an attempt to access the memory card failed.

Notes

- Executing this command deletes all the data on the memory card.
- When the current directory is a directory on the memory card, if this command is executed, the current directory will no longer be valid. In such a case, use the `cd` command to change the directory by specifying the home directory or full path name.

show flash

Shows internal flash memory usage.

Syntax

```
show flash
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
>show flash
Date 2006/07/18 18:45:14 UTC
Flash :
          user area   config area     dump area    area total
    used   62,699kB          91kB       4,800kB      67,590kB
    free   30,643kB      19,318kB      16,260kB      66,221kB
    total  93,342kB      19,409kB      21,060kB     133,811kB
>
```

Display items

Table 12-4: Information displayed by the show flash command

Item		Displayed information	Displayed detailed information
Flash	--	--	--
	used	Used capacity	Capacity being used by the file system in the internal flash memory# `user area`: Used capacity of the user area `config area`: Used capacity of the configuration area `dump area`: Used capacity of the dump area `area total`: Total of each used capacity of the user area, configuration area, and dump area
	free	Unused capacity	Capacity not being used by the file system in the internal flash memory# `user area`: Unused capacity of the user area `config area`: Unused capacity of the configuration area `dump area`: Unused capacity of the dump area `area total`: Total of each unused capacity of the user area, configuration area, and dump area
	total	Total capacity	Total of capacity being used and capacity not being used for the file system in the internal flash memory# `user area`: Total of used and unused capacity of the user area `config area`: Total of used and unused capacity of the configuration area `dump area`: Total of used and unused capacity of the dump area `area total`: Total capacity being used and not being used by the file system in the internal flash memory

#: If used capacity exceeds 95 percent of the total capacity, unused capacity might be displayed as a negative value. If unused capacity is displayed as a negative value, delete user files so as to free up enough unused capacity.

Impact on communication

None

Response messages

Table 12-5: List of response messages for the show flash command

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

Notes

- This command shows the used and unused capacity secured by the file system in the internal flash memory.
- Even if the BCU, CSU, and MSU have the same model names, the used capacity of their internal flash memory might be different.

Chapter

13. Log

show logging
clear logging
show logging console
set logging console

show logging

Shows the log entries recorded by the Switch.

This command handles two types of logs, operation logs and reference logs, which are displayed or controlled independently. The operation logs consist of entered command strings, command response messages, and various event messages. The reference logs contain statistics information obtained by compiling events that occurred for each code.

For details about the information to be displayed as the command execution results, see *1.2 Checking logs* in the manual *Message and Log Reference For Version Ver. 11.7*.

Syntax

```
show logging [<kind>] [<command classification>] [<system>]
```

Input mode

User mode and administrator mode

Parameters

<kind>

reference

Specifies the reference log.

Operation when this parameter is omitted:

Specifies the operation log.

<command classification>

-h

Displays log entries with no header information (`System information`).

The above system information is as follows:

For AX6700S series switches: Device model, software information, and BCU information

For AX6600S series switches: Device model, software information, and CSU information

For AX6300S series switches: Device model, software information, and MSU information

Operation when this parameter is omitted:

Log entries with header information (`System information`) are displayed.

<system>

standby

Specifies the log of the standby system.

Operation when this parameter is omitted:

Specifies the log of the active system.

Operation when all parameters are omitted:

Operation proceeds as described for each Operation when this parameter is omitted section.

Example

- Display the operation log entries of the active system.
  ```
  > show logging    Press the Enter key.
  ```

  The result of executing the command is described below.

  Figure 13-1: Operation log display [AX6700S]

```
> show logging
Date 2009/04/10 18:39:19 UTC
System information
    AX6708S, OS-SE Ver. 11.1 (Build:100), BCU1(active)
Logging information
KEY 08/03 20:10:00 user1(tty00):> ping 192.111.214.10
     .
     .
     .
>
```

  Figure 13-2: Operation log display [AX6600S]

```
> show logging
Date 2009/04/10 18:39:19 UTC
System information
    AX6608S, OS-SE Ver. 11.1 (Build:100), CSU1(active)
Logging information
KEY 08/03 20:10:00 user1(tty00):> ping 192.111.214.10
     .
     .
     .
>
```

  Figure 13-3: Operation log display [AX6300S]

```
> show logging
Date 2009/04/10 18:39:19 UTC
System information
    AX6308S, OS-SE Ver. 11.1 (Build:100), MSU1(active)
Logging information
KEY 08/03 20:10:00 user1(tty00):> ping 192.111.214.10
     .
     .
     .
>
```

- Display the reference log entries of the active system.
  ```
  > show logging reference    Press the Enter key.

  The result of executing the command is described below.
  ```

  Figure 13-4: Reference log display [AX6700S]

```
> show logging reference
Date 2009/04/10 18:39:19 UTC
System information
    AX6708S, OS-SE Ver. 11.1 (Build:100), BCU1(active)
Logging information
E4 PORT GigabitEthernet7/3 25011001 1350:000045e12300
  08/03 18:34:36    08/03 18:34:36    1
     .
     .
     .
>
```

  Figure 13-5: Reference log display [AX6600S]

```
> show logging reference
```

```
Date 2009/04/10 18:39:19 UTC
System information
    AX6608S, OS-SE Ver. 11.1 (Build:100), CSU1(active)
Logging information
E4 PORT GigabitEthernet7/3 25011001 1350:000045e12300
  08/03 18:34:36    08/03 18:34:36    1
     .
     .
     .
>
```

Figure 13-6: Reference log display [AX6300S]

```
> show logging reference
Date 2009/04/10 18:39:19 UTC
System information
    AX6308S, OS-SE Ver. 11.1 (Build:100), MSU1(active)
Logging information
E4 PORT GigabitEthernet7/3 25011001 1350:000045e12300
  08/03 18:34:36    08/03 18:34:36    1
     .
     .
     .
>
```

Display items

None

Impact on communication

None

Response messages

Table 13-1: List of response messages for the show logging command

Message	Description
Can't execute log command of standby system because standby system is not ready.	The standby system is not installed, or an attempt to access the standby system failed. Check the status of the standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

- Log information is obtained at the UTC time immediately after the device is started.
- The operation log entries are displayed in reverse chronological order from the latest message or operation (the latest information is displayed at the top). Note that the reboot reason log entry of the switch appears after the startup log entry, but its timestamp is earlier than that of the startup log entry. If a device failure occurs at the same time as when event information log entries are generated, events indicating the same time might not be displayed in the order they occurred, or device failure and event information log entries might be displayed in reverse chronological order for the following logs:
  - Entered commands
  - Command response messages
  - Routing protocol event information
  - Access list log
- The reference log entries are collected for each event in chronological order. However, the order in which command execution results are displayed is not always in chronological order because the information about events that have occurred is grouped by event type.

clear logging

Erases the log entries recorded by the Switch.

Syntax

```
clear logging [<kind>] [<system>]
```

Input mode

User mode and administrator mode

Parameters

<kind>

reference

Specifies the reference log.

Operation when this parameter is omitted:

Specifies the operation log.

<system>

standby

Specifies the log of the standby system.

Operation when this parameter is omitted:

Specifies the log of the active system.

Example

- Erase the operation log entries.
  ```
  > clear logging    Press the Enter key.
  ```

- Erase the reference log.
  ```
  > clear logging reference    Press the Enter key.
  ```

Display items

None

Impact on communication

None

Response messages

Table 13-2: List of response messages for the clear logging command

Message	Description
Can't execute log command of standby system because standby system is not ready.	The standby system is not installed, or an attempt to access the standby system failed. Check the status of the standby system.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

show logging console

Shows the contents (event level suppressing the display) set by the `set logging console` command.

Syntax

```
show logging console
```

Input mode

User mode and administrator mode

Parameters

None

Example

- Indicate that all the system messages are set to be displayed.

```
> show logging console    Press the Enter key.
  System message mode : Display all
```

- Indicate that system messages whose event level is E6 or less are prevented from being displayed.

```
> show logging console    Press the Enter key.
  System message mode : E6
```

Display items

None

Impact on communication

None

Response messages

Table 13-3: List of response messages for the show logging console command

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

Notes

None

set logging console

Controls the display of system messages by event level. Low priority system messages that might be displayed frequently due to system configuration changes can be suppressed.

Syntax

```
set logging console { disable <event level> | enable }
```

Input mode

User mode and administrator mode

Parameters

{ disable <*event level*> | enable }

disable <*event level*>

Specifies an event level (E3 to E9); messages related to events at this specified level and lower levels will not be displayed.

enable

Specifies that all system messages will be displayed.

Example

- Specify that all system messages be displayed.

```
> set logging console enable    Press the Enter key.
```

- Specify that system messages whose event level is E5 or less not be displayed.

```
> set logging console disable E5    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 13-4: List of response messages for the set logging console command

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

Notes

None

Chapter

14. Software Management

ppupdate
set license
show license
erase license

ppupdate

Updates the current software in flash memory with new software, which is downloaded via FTP or a similar method.

Syntax

```
ppupdate [test][no-display][-f] [no-reload] <file-name> {active|standby}
```

Input mode

Administrator mode

Parameters

test

Performs a check by simulating command execution. The software is not actually updated.

no-display

Does not display the message output when the command is executed.

-f

Forces the processing without displaying confirmation messages when the command is executed.

Operation when this parameter is omitted:

A confirmation message is displayed.

no-reload

When the update is complete, the device is not automatically restarted. Instead, the device starts up with the new software next time the device is restarted.

<*file-name*>

Specifies the update file name.

{ active | standby }

Specifies the system in which the software is to be updated.

active

Specifies an active system.

standby

Specifies a standby system.

Example

List the current software version and the new software version, and display a confirmation message.

```
# ppupdate k.img active

Software update start

Broadcast Message from operator@
        (??) at 15:32 UTC...

*******************************************
** UPDATE IS STARTED.                    **
*******************************************
```

```
Current version is 10.2
New version is 10.2
Automatic reboot process will be run after installation process.
Do you wish to continue? (y/n) y


If you enter y, the system starts update processing. After the processing
finishes, the system automatically restarts the switch.
If you enter n, the system displays the command prompt without starting update
processing.
```

Display items

None

Impact on communication

Yes

Response messages

Table 14-1: List of response messages for the ppupdate command

Message	Description
another user is executing now.	Because another user is updating the software, the command could not be executed.
Can't execute.	The command could not be executed. Re-execute the command.
Can't open <*file-name*>.	The specified file could not be opened. Specify the correct file name.
extract failed.	Updating has failed. Re-execute the command.
Invalid file <*file-name*>.	The contents of the specified file are invalid. Specify a valid file.
OS Type mismatch. Can not apply this package.	The specified file cannot be used because it is intended for a different device.
Standby system not exist.	The standby system does not exist.
Standby system not ready.	The standby system has not started up.

Notes

1. If the `no-reload` parameter is not specified, the device is automatically restarted after the update finishes. During the restart, communication is temporarily suspended. If the `no-reload` parameter is specified, the device is not automatically restarted after the update finishes. In this case, the device starts up with the new software the next time the device is restarted.
2. When software is updated, the configuration in effect before the update is inherited. Note that, when the inherited configuration includes a configuration that is not supported by the updated software version, the unsupported configuration command is not inherited. At this time, the startup configuration and running configuration do not match. Therefore, a prompt indicating that the configuration has not been saved is displayed until a save operation is performed.

   When software is updated in a state where a BSU, CSU, or MSU is operating in a redundant configuration, if a skipped configuration command exists, the device restarts because the operating status cannot be inherited at the time of system switchover. In addition, an unsupported configuration command that is not inherited is output as an operation log entry for the system in which the software was updated. In such a case, restore the software to the version that existed before the update, delete the corresponding configuration command, and then update the software again.
3. When HDC (Hardware Dependent Code) is updated concurrently with the update of software

in an active system, a standby system which is `inactive` is restored to `active` status.

4. If hardware support is different between versions before and after a software update, remove the applicable hardware commands from the configuration before the update.
5. If BSU, CSU, or MSU are operating in a redundant configuration and both systems are restarted concurrently, after software is updated with the `no-reload` parameter specified, if the software update involves an HDC update, the active system might be different than before the update.
6. If many configurations are set and software is updated, device startup might take some time because the configurations are inherited to the new version.
7. Where a memory card that contains the software image file `k.img` is mounted in a Switch, the switch boots from the memory card when it is restarted. If you do this, the account and configuration information reverts to the factory defaults and you cannot save your own settings. Avoid using this method under normal circumstances.

set license

Registers a purchased optional license onto the Switch. If the Switch is operating in a duplex configuration, the optional license is automatically synchronized on the standby system.

Syntax

```
set license {key-file <file name> | key-code <license key>}
```

Input mode

Administrator mode

Parameters

key-file *<file name>*

Sets an optional license with the specified file name.

key-code *<license key>*

Sets an optional license with the specified license key. The license key consists of 32 characters within the range from 0 to 9 and from a to f (lower-case letters), and a hyphen is placed between every 4 digits in the license key.

Example

- Example of specifying a file name (In this example, the file `addopt.dat` is specified as a license key file)

```
# set license key-file addopt.dat
#
```

- Example of specifying a license key (In this example, `0123-4567-89ab-cdef-0123-4567-89ab-cdef` is specified as a license key)

```
Specify the license key with hyphens.
#set license key-code 0123-4567-89ab-cdef-0123-4567-89ab-cdef

Specify the license key without hyphens.
#set license key-code 0123456789abcdef0123456789abcedf
```

Display items

None

Impact on communication

None

Response messages

Table 14-2: List of response messages for the set license command

Message	Description
<license key> is not for this hardware.	The license key is not for this hardware. *<license key>*: License key
<license key> is not for this system.	The license key is not for this system. *<license key>*: License key
A license key cannot be added any more.	The number of optional licenses exceeds the maximum allowed number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Invalid contents of <*file name*>.	The contents of the specified license key file are invalid. Specify a valid license key file. <*file name*>: Specified license key file
Invalid license key <*license key*>.	The entered license key is invalid.
Invalid serial number <*license key*>.	The license key is invalid. <*license key*>: License key
No such file <*file name*>	The specified license key file does not exist. <*file name*>: Specified license key file
This license is already registered.	This optional license has already been set.

Notes

1. The applied license key takes effect after the Switch is restarted.
2. When the license key information of the active system and the standby system do not match, a level-E5 failure occurs.

   Operate the switch with matching license keys for the active system and the standby system. If the license keys do not match, the system can be recovered from the failure by using the `synchronize` command to synchronize them, and then restarting the standby system.
3. The optional license OP-NPAR cannot be applied for CSU-1A. [AX6600S]
4. The optional license OP-NPAR cannot be applied for MSU-1A and MSU-1A1. [AX6300S]

show license

Displays authorized optional licenses.

Syntax

```
show license [detail]
```

Input mode

User mode and administrator mode

Parameters

detail

Displays optional license information that takes effect and has been set in the active system and the standby system.

Operation when this parameter is omitted:

Displays optional license information that takes effect and has been set in the active system.

Example

An example of displaying authorized optional licenses is described below:

```
# show license
Date 2009/01/23 12:00:00 UTC
  Available: OP-VAA
    Serial Number        Licensed software
    0600-0001-0200-0000  OP-VAA(AX-P6300-F2)
#

# show license detail
Date 2009/01/23 12:00:00 UTC
Active System:
  Available: OP-VAA
    Serial Number        Licensed software
    0600-0001-0200-0000  OP-VAA(AX-P6300-F2)
Standby System:
  Available: OP-VAA
    Serial Number        Licensed software
    0600-0001-0200-0000  OP-VAA(AX-P6300-F2)
#
```

Display items

Table 14-3: Information displayed by the show license command

Item	Displayed information	Displayed detailed information
Active System:	Optional license information in the active system	--
Standby System:	Optional license information in the standby system	--
Available:	Name of an option that takes effect	----- is displayed when no option exists.
Serial Number	Specified optional license serial number	--

Item	Displayed information	Displayed detailed information
Licensed software	Name of purchased software (abbreviated name). (The model name is displayed in parentheses.) If multiple options are purchased for one license, each option is displayed.	`unknown(-----)`is displayed when the software name is unknown.

Impact on communication

None

Response messages

Table 14-4: List of response messages for the show license command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

erase license

Erases the specified optional license. If the Switch is operating in a duplex configuration, the optional license is synchronized on a standby system.

Syntax

```
erase license <serial no.>
```

Input mode

Administrator mode

Parameters

<serial no.>

Specifies the serial number to be deleted. The serial number consists of 16 characters within the range from 0 to 9 and from a to f (lower-case letters), and a hyphen is placed every 4 digits of the serial number.

Example

List option names included in the specified serial number and display a confirmation message.

```
# erase license 0100-0001-0200-0000


This serial number enable OP-VAA
Erase OK? (y/n)

If you enter y here, the optional license is deleted.
If you enter n here, the optional license is not deleted, and the command prompt
is displayed.
```

Display items

None

Impact on communication

None

Response messages

Table 14-5: List of response messages for the erase license command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Invalid serial number *<serial no.>*	The optional license of the specified serial number does not exist. *<serial no.>*: Serial number

Notes

The deleted license key is no longer valid when the switch is restarted.

Chapter

15. Resource Information

show cpu
show processes
show memory
df
du

show cpu

Shows CPU usage.

Syntax

```
show cpu { days [hours] [minutes] [seconds]
                        | hours [days] [minutes] [seconds]
                        | minutes [days] [hours] [seconds]
                        | seconds [days] [hours] [minutes] }
```

Input mode

User mode and administrator mode

Parameters

days

Displays statistics collected daily. Statistics for the past month are displayed.

hours

Displays statistics collected hourly. Statistics for the past day are displayed.

minutes

Displays statistics collected by the minute. Statistics for the past hour are displayed.

seconds

Displays statistics collected by the second. Statistics for the past minute are displayed.

Operation when a parameter is omitted

This command displays only the information that meets the condition of the specified parameters. If you do not specify a parameter, information for the conditions specified by the parameter will not be displayed.

Operation when all parameters are omitted:

You cannot omit all of the parameters.

Example and display items

Figure 15-1: Example of specifying days

```
> show cpu days
Date 2006/03/13 14:15:37 UTC
*** day ***
date    time              cpu average
Dec 13  16:00:00-23:59:59     5
Dec 14  00:00:00-23:59:59     4
Dec 15  00:00:00-23:59:59    25
     :
Dec 29  00:00:00-23:59:59     5
>
```

Table 15-1: Information displayed by specifying days

Item	Displayed information
cpu average	The average CPU utilization within the time range indicated under `time`

Figure 15-2: Example of specifying hours

```
> show cpu hours
Date 2006/03/13 14:15:37 UTC
```

```
*** hour ***
date    time              cpu average
Dec 13  15:00:00-16:59:59     6
                    :
Dec 13  23:00:00-23:59:59     7
Dec 13  00:00:00-00:59:59    10
Dec 13  01:00:00-01:59:59    20
                    :
                    :
Dec 13  14:00:00-14:59:59     3
>
```

Table 15-2: Information displayed by specifying hours

Item	Displayed information
cpu average	The average CPU utilization within the time range indicated under `time`

Figure 15-3: Example of specifying minutes

```
> show cpu minutes
Date 2006/03/13 14:15:37 UTC
*** minute ***
date    time              cpu average
Dec 13  14:42:00-14:42:59     6
Dec 13  14:43:00-14:43:59    20
                    :
                    :
Dec 13  15:41:00-15:41:59    10
>
```

Table 15-3: Information displayed by specifying minutes

Item	Displayed information
cpu average	The average CPU utilization within the time range indicated under `time`

Figure 15-4: Example of specifying seconds

```
> show cpu seconds
Date 2006/03/13 14:15:37 UTC
*** second ***
date    time                cpu average
Dec 13  14:43:14-14:43:23    20  10   5   4  70   9  80  30   7  50
Dec 13  14:43:24-14:43:33    10   9  40  40   7   4   6  10   7   4
Dec 13  14:43:34-14:43:43    20  10   5   4  52   9  80  30   7  50
Dec 13  14:43:44-14:43:53    10   9  40  40   7   4   6  10   7   4
Dec 13  14:43:54-14:44:03    20  10   5   4  63   9  80  30   7  50
Dec 13  14:44:04-14:44:13    10   9  40  40   7   4   6  10   7   4

>
```

Table 15-4: Information displayed by specifying seconds

Item	Displayed information
cpu average	The CPU utilization per second within the time range indicated under `time`.

Impact on communication

None

Response messages

Table 15-5: List of response messages for the show cpu commands

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

None

show processes

Shows information about processes being executed by the Switch.

Syntax

```
show processes memory
show processes cpu
```

Input mode

User mode and administrator mode

Parameters

memory

Shows the memory usage of processes with a higher priority that are being executed by the Switch.

cpu

Shows the CPU usage of processes with a higher priority that are being executed by the Switch.

Example

- Show the memory usage of processes with a higher priority.

Figure 15-5: Example of displaying the memory usage of processes

```
> show processes memory    Press the Enter key.
Date 2009/01/23 12:00:00 UTC
  PID  From             Text Static Alloc Stack  Real  Process
    0  ??                  0      0     0     0 24396  swapper
    1  ??                 16      8    36     4   208  init
    2  ??                  0      0     0     0 24396  tef_ev
    3  ??                  0      0     0     0 24396  tef_io
    4  ??                  0      0     0     0 24396  tef_led
    5  ??                  0      0     0     0 24396  tffs_io
   14  ??                  0      0     0     0 24396  pagedaemon
   15  ??                  0      0     0     0 24396  ioflush
   16  ??                  0      0     0     0 24396  aiodoned
  108  console            24     40     8     4   316  configEvent
  110  console            20      4     8     4   140  configTimer
  112  console            44     16    68    16   356  configResource
  160  console           232     44    12    12   500  Node Control
  162  console           120    168     8     8     0  Interface Control
  163  console            20     24    16    12     0  Duplex Control
  168  console            40     16    12    12   236  commandCpustat
  180  ??                 28     12   104    16     0  syslogd
  212  console          3620    552  2272    16   556  configManager
  215  ??                 60     16    24     8   256  inetd
  230  ??                408    976  5324     8   864  stpd
  237  console           312   3052    24    12   624  gsrpd
  241  console           252    716    28    40   612  L2MacManager
  285  ??                 72     16     8     4     0  sdwatchd
  295  ??               2532   3120  4748    16  3352  rtm
  312  ??                 12      8     0     4     0  krfclogd
  315  ??                  8      8    16     4   100  snooper
  350  console            72     28   132    16   556  RFC Log Control
  362  console            16     12    24    24     0  getty
  380  console            60    176   224    16   748  System Log Control
  411  ??                 52    284    72     4     0  ifidxd
  431  192.168.111.50   3056    156   148    56  2228  cli
  445  console          1480    308  3108    88  1372  snmpd
  470  ??               1040   4820  4452    96  2832  nimd
  502  console           144    172    52    16   484  configControl
```

```
  505  console           212    268   300    20   260  rmon
  563  console            44    104    16    12   248  Node Command Control
  575  ??                200    112   428    16  1604  ntpd
  607  console            84     24    16    36   244  configAPI
  794  192.168.111.50     12      4    60     4   628  process
  796  192.168.111.50    120     12    16     4   676  sh
 1202  ??                 68     16    96    12   948  telnetd
>
```

- Show the CPU usage of processes with a higher priority.

Figure 15-6: Example of displaying the CPU usage of processes

```
> show processes cpu    Press the Enter key.
Date 2009/01/23 12:00:00 UTC
  PID From              5Sec   1Min   5Min Runtime(ms) Process
    0 ??                  0%     0%     0%          240 swapper
    1 ??                  0%     0%     0%           25 init
    2 ??                  0%     0%     0%            0 tef_ev
    3 ??                  0%     0%     0%            0 tef_io
    4 ??                  0%     0%     0%         1569 tef_led
    5 ??                9.48%  2.20%  0.78%         6075 tffs_io
   14 ??                  0%     0%     0%            6 pagedaemon
   15 ??                  0%     0%     0%       295260 ioflush
   16 ??                  0%     0%     0%           34 aiodoned
  108 console             0%     0%     0%          319 configEvent
  110 console             0%     0%     0%       115504 configTimer
  112 console             0%     0%     0%         1868 configResource
  160 console             0%     0%     0%       910476 Node Control
  162 console             0%     0%     0%           26 Interface Control
  163 console             0%     0%     0%           11 Duplex Control
  168 console             0%     0%     0%       158688 commandCpustat
  180 ??                  0%     0%     0%           49 syslogd
  212 console             0%     0%     0%          333 configManager
  215 ??                  0%     0%     0%           13 inetd
  230 ??                  0%     0%     0%        93299 stpd
  237 console             0%     0%     0%         1011 gsrpd
  241 console             0%     0%     0%         1564 L2MacManager
  285 ??                  0%     0%     0%            4 sdwatchd
  295 ??                  0%     0%     0%       324249 rtm
  312 ??                  0%     0%     0%            9 krfclogd
  315 ??                  0%     0%     0%           47 snooper
  350 console             0%     0%     0%         3464 RFC Log Control
  362 console             0%     0%     0%           13 getty
  380 console           0.63%  0.24%  0.08%         1376 System Log Control
  411 ??                  0%     0%     0%         4047 ifidxd
  431 192.168.111.50    5.06%  3.75%  0.28%          197 cli
  445 console             0%     0%     0%        41847 snmpd
  470 ??                0.63%  0.05%  0.02%      3717524 nimd
  502 console             0%     0%     0%          558 configControl
  505 console             0%     0%     0%       129625 rmon
  563 console             0%     0%     0%        10313 Node Command Control
  575 ??                  0%     0%     0%        77018 ntpd
  607 console             0%     0%     0%        43297 configAPI
  873 192.168.111.50      0%     0%     0%            9 sh
  921 192.168.111.50      0%     0%     0%            9 process
 1202 ??                  0%  0.22%  0.02%           32 telnetd
>
```

Display items

Table 15-6: Items displayed when the show processes command is executed

Item	Displayed information	Displayed detailed information
PID	Process number	Displays the process management number for each process.

Item	Displayed information	Displayed detailed information
From	Input terminal	console Management terminal connected to the serial port (CONSOLE) on the Switch aux Management terminal connected to the serial port (AUX) on the Switch IP address IP address of a remotely connected terminal ?? No terminal associated with this process
Text	Text size	Shows the text size of each running process in kB.
Static	Static data size	Shows the size of static data area for each running process in kB.
Alloc	Dynamic data size	Shows the size of dynamic data area for each running process in kB.
Stack	Stack size	Shows the amount of stack usage for each running process in kB.
Real	Real memory usage	Shows the size of real memory usage for each running process in kB.
Process	Function name	Shows the function name of each running process.
5Sec	CPU usage for the past 5 seconds	Shows the CPU usage of each running process for the past 5 seconds in percentages.
1Min	CPU usage for the past minute	Shows the CPU usage of each running process for the past minute in percentages.
5Min	CPU usage for the past 5 minutes	Shows the CPU usage of each running process for the past 5 minutes in percentages.
Runtime	Actual run time of CPU	Shows actual CPU run time for each running process in milliseconds.

Impact on communication

None

Response messages

Table 15-7: List of response messages for the show processes command

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

Notes

None

show memory

Shows information about memory being used by the Switch.

Syntax

```
show memory [summary]
```

Input mode

User mode and administrator mode

Parameters

summary

Display the installed capacity, used capacity, and free capacity of the physical memory of the device.

Operation when this parameter is omitted:

Shows information about pages related to processes with a higher priority in memory being used by the Switch.

Example

- Display the installed capacity, used capacity, and free capacity of the physical memory of the device.

  Figure 15-7: Example of displaying information about the physical memory being used

```
> show memory summary
Date 2009/01/23 12:00:00 UTC
    physical memory = 262144KB(256.00MB)
    used     memory = 158856KB(155.13MB)
    free     memory = 103288KB(100.87MB)
```

- Display information about virtual memory related to processes with a higher priority in memory being used.

  Figure 15-8: Example of displaying information about the memory related to processes being used

```
> show memory
Date 2009/01/23 12:00:00 UTC
process init (pid: 1):
   start   size flag              name
-------------------------------------------------
01800000     20K read/exec         / -?-
01814000      4K read/write/exec     [ heap ]
01815000     32K read/write          [ anon ]
41814000      4K read/exec           [ uvm_aobj ]
41815000     36K read/write          [ anon ]
41820000     52K read/write/exec   /usr/libexec/ld.elf_so
4182D000      4K read/write/exec     [ anon ]
41830000    760K read/exec         /lib/libc.so.12.114.1
418EE000     60K                   /lib/libc.so.12.114.1
418FD000     36K read/write/exec   /lib/libc.so.12.114.1
41906000     60K read/write/exec     [ anon ]
41920000     40K read/exec         /lib/libutil.so.7.3
4192A000     60K                   /lib/libutil.so.7.3
41939000      4K read/write/exec   /lib/libutil.so.7.3
4193A000      8K read/write/exec     [ anon ]
41940000     20K read/exec         /lib/libcrypt.so.0.1
41945000     60K                   /lib/libcrypt.so.0.1
41954000      4K read/write/exec   /lib/libcrypt.so.0.1
41955000     16K read/write/exec     [ anon ]
```

```
EE000000  30720K                    [ stack ]
EFE00000   1984K read/write         [ stack ]
EFFF0000     64K read/write         [ stack ]
```

Display items

The following table describes the items displayed when the `summary` parameter is specified.

Table 15-8: Information displayed when the summary parameter is specified

Item	Displayed information
physical memory	Displays the installed capacity of physical memory.
used memory	Displays the used capacity of physical memory.
free memory	Displays the free capacity of physical memory.

The following table describes the items displayed when the `summary` parameter is omitted.

Table 15-9: Information displayed when the summary parameter is omitted

Item	Displayed information
process	Displays the name of processes running in the device.
pid	Displays the number of processes running in the device.
start	Displays the start address of virtual memory.
size	Displays the size of virtual memory.
flag	Displays the attribute of virtual memory. [`read`] The memory can be read. [`write`] The memory can be written. [`exec`] The memory can be executed.
name	Displays a summary of information in memory.

Impact on communication

None

Response messages

Table 15-10: List of response messages for the show memory command

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

Notes

None

df

Shows the available disk space.

Syntax

`df [<option>] [<file name>]`

Input mode

User mode and administrator mode

Parameters

<option>

`-t`: Specifies the type of file system.

<file name>

Displays information about the file system in which this file or directory exists.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

du

Shows the amount of space being used by the files in a directory.

Syntax

`du [<option>] [<file name>]`

Input mode

User mode and administrator mode

Parameters

<option>

`-s`: Displays only the total number of blocks.

<file name>

Displays information about this file or directory.

Example and display items

None

Impact on communication

None

Response messages

None

Notes

None

Chapter

16. Dump Information

dump psp [AX6600S] [AX6300S]
dump bsu [AX6700S]
dump nif
erase dumpfile
show dumpfile

dump psp [AX6600S] [AX6300S]

Collects memory dump information for PSP.

The collected memory dump file is stored as the file name `psp01.cmd` (if the collection is performed in CSU1 or MSU1) or `psp02.cmd` (if the collection is performed in CSU2 or MSU2) in `/usr/var/hardware` in the system where the command was executed. For details about how to collect the information, see the *Troubleshooting Guide*.

Syntax

`dump [-f][-r] psp [<`*system*`>] [directory <`*directory*`>]`

Input mode

User mode and administrator mode

Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

-r

Restarts the switch and collects a memory dump. Concurrently, the file `rmdump` is stored in `/dump0`. Note that if the command is executed in a state where the operating status of PSP is a status other than `active` or `standby`, a memory dump is collected without restarting the switch.

When the command is executed from a standby system, this parameter cannot be specified.

Operation when this parameter is omitted:

Collects a memory dump without restarting the switch.

<*system*>

Specifies a system where a memory dump is to be collected when the switch is operating in a redundant configuration.

standby

Collects the memory dump of PSP in a standby system.

active

Collects the memory dump of PSP in an active system.

When the command is executed from a standby system, this parameter cannot be specified.

Operation when this parameter is omitted:

Collects the memory dump of PSP in the system where the command was executed.

directory <*directory*>

Specifies the path to a directory where a memory dump file is to be stored. You can specify a maximum of 280 characters for a directory path. Specify a directory path under the user home directory. To specify the directory path, place ~ (tilde) at the beginning or use an absolute path. The number of characters for specifying ~ is calculated by adding the number of characters obtained by replacing the ~ part with an absolute path to the number of characters of the directory path below ~.

Operation when this parameter is omitted:

A memory dump file is stored in `/usr/var/hardware` in the system where the command is executed.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

Example

1. Restart the switch and collect a memory dump in the internal memory.
```
>dump -r psp
restart psp OK? (y/n):y
old dump file(psp01.cmd) delete OK? (y/n):y
Dump command accept.
>
```

2. A PSP dump confirmation message is displayed.
```
restart psp OK?  (y/n):
```

If `y` is entered, the memory dump of PSP is collected. If the memory dump file of the same PSP already exists in the specified directory,
```
old dump file (psp01.cmd) delete OK?  (y/n):
```

the above message appears. If `y` is entered, the existing memory dump file is deleted. When the collection processing of the PSP memory dump is accepted, the execution result is displayed.
```
Dump command accept.
```

When the collection of the memory dump has been completed, the message `PSP offline dump command executed.` is displayed in the system where the memory dump was collected. The collected memory dump file is stored as the file name `psp01.cmd` (if the collection is performed in CSU1 or MSU1) or `psp02.cmd` (if the collection is performed in CSU2 or MSU2) in `/usr/var/hardware` in the system where the command was executed.

Impact on communication

None

Response messages

Table 16-1: List of response messages for the dump psp command

Message	Description
<*directory*>: No such directory.	The specified directory does not exist. Specify the correct directory name. <*directory*> Directory name
<*directory*>: Permission denied.	The access permission to the specified directory does not exist. Change the specified directory. <*directory*> Directory name
Can't execute <*parameter*> parameter in standby system.	This parameter cannot be specified in a standby system. <*parameter*> Parameter name
Can't execute.	The command could not be executed. Re-execute the command.
Directory length over.	The length of the specified path exceeds 280 characters. Reduce the length of the specified path.
Dump command accept.	The dump collection has been accepted normally.

Message	Description
Illegal directory name <*directory*>. The top of directory name is "<*User home directory*>".	The specified path is invalid. Specify a path under the user home directory. <*directory*> Directory name <*User home directory*> User home directory name

Notes

While specifying a parameter for restart and collecting a dump, the switch stops operation. Accordingly, communication via the switch cannot be performed.

dump bsu [AX6700S]

Collects memory dump information on BSU.

The collected memory dump file is stored in `/usr/var/hardware` in the system where the command was executed with the file name `bsu**.cmd`. The specified BSU number is displayed in "`**`". For details about how to collect the information, see the *Troubleshooting Guide*.

Syntax

`dump [-f][-r] bsu` <*bsu no.*> `[directory` <*directory*>`]`

Input mode

User mode and administrator mode

Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

-r

Restarts the BSU and collects a memory dump. Note that where the operating status of BSU is other than `active`, `standby hot`, or `standby cold`, when the command is executed, a memory dump is collected without restarting the BSU.

When the command is executed from the standby BSU, this parameter cannot be specified.

Operation when this parameter is omitted:

Collects a memory dump without restarting the switch.

<*bsu no.*>

Specifies the number of a BSU whose memory dump is to be collected. Specifiable values for the BSU number are in the range from 1 to 3.

directory <*directory*>

Specifies the path to a directory where a memory dump file is to be stored. You can specify a maximum of 280 characters for a directory path. Specify a directory path under the user home directory. To specify the directory path, place ~ (tilde) at the beginning or use an absolute path. The number of characters for specifying ~ is calculated by adding the number of characters obtained by replacing the ~ part with an absolute path to the number of characters of the directory path below ~.

Operation when this parameter is omitted:

A memory dump file is stored in `/usr/var/hardware` in the system where the command is executed.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

Example

Restart the BSU and collect a memory dump in the internal memory.

```
>dump -r bsu 1
restart bsu 1 OK?  (y/n):y
old dump file(bsu01.cmd) delete OK? (y/n):y
Dump command accept.
```

```
>
```

1. A BSU dump confirmation message appears.
   `restart bsu 1 OK?  (y/n):`

2. If `y` is entered, the memory dump of BSU is collected. If the memory dump file of the same BSU already exists in the specified directory, the following message appears:
   `old dump file(bsu01.cmd) delete OK?  (y/n):`

3. If `y` is entered, the existing memory dump file is deleted. When the collection processing of the BSU memory dump is accepted, the execution result is displayed.
   `Dump command accept.`

4. When the collection of the memory dump has been completed, the message `BSU offline dump command executed.` is displayed in the system where the memory dump was collected. The collected memory dump file is stored as the file name `bsu0*.cmd` in `/usr/var/hardware` in the system where the command was executed.

Display items

None

Impact on communication

None

Response messages

Table 16-2: List of response messages for the dump bsu command

Message	Description
<*directory*>: No such directory.	The specified directory does not exist. Specify the correct directory name. <*directory*> Directory name
<*directory*>: Permission denied.	The access permission to the specified directory does not exist. Change the specified directory. <*directory*> Directory name
Can't execute <*parameter*> parameter in standby system.	This parameter cannot be specified in the standby BSU. <*parameter*> Parameter name
Can't execute.	The command could not be executed. Re-execute the command.
Directory length over.	The length of the specified path exceeds 280 characters. Reduce the length of the specified path.
Dump command accept.	The dump collection has been accepted normally.
Illegal BSU -- <*bsu no.*>.	The BSU number is outside the valid range. Make sure the specified parameter is correct. <*bsu no.*> BSU number
Illegal directory name <*directory*>.The top of directory name is "<*User home directory*>".	The specified path is invalid. Specify a path under the user home directory. <*directory*> Directory name <*User home directory*> User home directory name

Notes

While specifying a parameter for restart and collecting a dump, the BSU stops operation.

Accordingly, communication via the BSU cannot be performed.

dump nif

Collects memory dump information on NIF.

The collected memory dump file is stored in `/usr/var/hardware` in an active system with the file name `nif**.cmd`. The specified NIF number is displayed in "`**`". For details about how to collect the information, see the *Troubleshooting Guide*.

Syntax

`dump [-f][-r] nif` <*nif no.*> `[directory` <*directory*>`]`

Input mode

User mode and administrator mode

Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

-r

Restarts the NIF and collects a memory dump. Note that if the command is executed in a state where the operating status of NIF is other than `active`, a memory dump is collected without restarting the NIF.

Operation when this parameter is omitted:

Collects a memory dump without restarting the switch.

<*nif no.*>

Specifies the number of a NIF whose memory dump is to be collected. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

directory <*directory*>

Specifies the path to a directory where a memory dump file is to be stored. You can specify a maximum of 280 characters for a directory path. Specify a directory path under the user home directory. To specify the directory path, place ~ (tilde) at the beginning or use an absolute path. The number of characters for specifying ~ is calculated by adding the number of characters obtained by replacing the ~ part with an absolute path to the number of characters of the directory path below ~.

Operation when this parameter is omitted:

A memory dump file is stored in `/usr/var/hardware` in the active system.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

Example

1. Collect the memory dump of the NIF whose NIF number is 1 in the internal memory.

```
>dump -r nif 1
restart nif 1 OK?  (y/n):y
old dump file(nif01.cmd) delete OK? (y/n):y
Dump command accept.
>
```

2. A NIF dump confirmation message is displayed.

```
restart nif 1 OK? (y/n):
```

If y is entered, the memory dump of NIF is collected. If the memory dump file of the same NIF already exists in the specified directory,

```
old dump file(nif01.cmd) delete OK? (y/n):
```

the above message appears. If y is entered, the existing memory dump file is deleted. When the collection processing of the NIF memory dump is accepted, the execution result is displayed.

```
Dump command accept.
```

When the memory dump has been successfully collected, the message `NIF offline dump command executed.` is displayed in the system where the memory dump was collected. The collected memory dump file is stored with the file name `nif0*.cmd` in `/usr/var/hardware` in the active system. The specified NIF number is displayed in "*".

Impact on communication

None

Response messages

Table 16-3: List of response messages for the dump nif command

Message	Description
<*directory*>: No such directory.	The specified directory does not exist. Specify the correct directory name. <*directory*> Directory name
<*directory*>: Permission denied.	The access permission to the specified directory does not exist. Change the specified directory. <*directory*> Directory name
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Directory length over.	The length of the specified path exceeds 280 characters. Reduce the length of the specified path.
Dump command accept.	The dump collection has been accepted normally.
Illegal directory name <*directory*>. The top of directory name is "<*User home directory*>".	The specified path is invalid. Specify a path under the home directory. <*directory*> Directory name <*User home directory*> User home directory name
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: NIF number

Notes

While specifying a parameter for restart and collecting a dump, the NIF stops operation. Accordingly, communication via the NIF cannot be performed.

erase dumpfile

Deletes dump files stored in the dump file storage directory.

The dump file storage directory is `/dump0` and `/usr/var/hardware`.

Syntax

`erase dumpfile { all | <`*file name*`> }`

Input mode

User mode and administrator mode

Parameters

all

Specifies all dump files.

<*file name*>

Specifies the name of a file to be deleted. The permissible format of the file name is as follows. # represents a number in the range from 0 to 9.

- `rmdump`: Memory dump file of a BCU, CSU, or MSU
- `bsu##.###`: BSU failure dump file [AX6700S]
- `psp##.###`: PSP failure dump file [AX6600S] [AX6300S]
- `nif##.###`: NIF failure dump file
- `bsu##.cmd`: BSU command dump file [AX6700S]
- `psp##.cmd`: PSP command dump file [AX6600S] [AX6300S]
- `nif##.cmd`: NIF command dump file

Example

- Delete all the dump files stored in the dump file storage directory.
  ```
  > erase dumpfile  all    Press the Enter key.
  ```

- Delete the `rmdump` dump file stored in the dump file storage directory.
  ```
  > erase dumpfile rmdump    Press the Enter key.
  ```

Impact on communication

None

Response messages

Table 16-4: List of response messages for the erase dumpfile command

Message	Description
<*file name*>: No such file or directory.	The specified file does not exist. Or, the specified file is not a dump file.
Can't execute.	The command could not be executed. Re-execute the command.

Notes

This command deletes dump files only in the system where the command was executed.

show dumpfile

Lists the dump files stored in the dump file storage directory.

Syntax

```
show dumpfile [<system>]
```

Input mode

User mode and administrator mode

Parameters

<*System*>

active

Displays a dump file in an active system.

standby

Displays a dump file in a standby system.

Operation when this parameter is omitted:

Displays a dump file in an active system and standby system.

Example

Display dump files stored in the dump file storage directory.

- For AX6700S series switches:

```
> show dumpfile    Press the Enter key.
Date 2009/04/10 18:43:22 UTC
  BCU1(active):
    [/dump0]:
      File name       rmdump
      Date            2009/03/18 17:11:00
      Version          1 10.3
      Serial No       AB1BCUS1000004401659102
      Factor          User operation
   [/usr/var/hardware]
      File name         bsu02.000
      Date              2009/03/31 09:39:51
      Version           OS-SE Ver. 11.1
      Serial No         AA BSULB00000510268A000
      Factor            1681 25070201
  BCU2(standby):
    [/standby/dump0]:
       File name       rmdump
       Date            2009/03/18 18:34:37
       Version          1 10.3
       Serial No       AB1BCUS1000004401659104
       Factor          1000 00003005
    [/standby/usr/var/hardware]
      No dump file
>
```

- For AX6600S series switches:

```
> show dumpfile    Press the Enter key.
Date 2009/04/10 18:43:22 UTC
  CSU1(active):
    [/dump0]:
      File name       rmdump
      Date            2009/03/12 17:11:00
      Version          1 11.1
```

```
      Serial No       AE0CSU1A0000045318AE071
      Factor          User operation
    [/usr/var/hardware]
      File name        nif04.cmd
      Date              2009/03/03 16:02:37
      Version           OS-SE Ver. 11.1
      Serial No         AB1K1G24T000S010657M089
      Factor            User operation
  CSU2(standby):
    [/standby/dump0]:
      File name       rmdump
      Date            2009/03/18 18:34:37
      Version          1 11.1
      Serial No       AE0CSU1A0000045318AH071
      Factor          1000 00003005
    [/standby/usr/var/hardware]
      No dump file
>
```

- For AX6300S series switches:

```
> show dumpfile    Press the Enter key.
Date 2009/04/10 18:43:22 UTC
  MSU1(active):
    [/dump0]:
      File name       rmdump
      Date            2009/03/18 17:11:00
      Version          1 10.3
      Serial No       AB1MSU1A000004401659102
      Factor          User operation
    [/usr/var/hardware]
      File name        nif04.cmd
      Date              2009/03/31 16:02:37
      Version           OS-SE Ver. 11.1
      Serial No         AA0H10G1RX000600169T000
      Factor            User operation
  MSU2(standby):
    [/standby/dump0]:
      File name       rmdump
      Date            2009/03/18 18:34:37
      Version          1 10.3
      Serial No       AB1MSU1A000004401659104
      Factor          1000 00003005
    [/standby/usr/var/hardware]
      No dump file
>
```

Display items

Table 16-5: Information displayed by the show dumpfile command

Item	Displayed information	Displayed detailed information
File name	File name	Dump file name
Date	Dump collection date	Date and time of the dump file collection
Version#	Version information	Software type and version
Serial No.	Serial number	Serial number
Factor	Reason for collecting dump	*xxxx xxxxxxxx*: Error description `User operation`: A dump is collected by user operation.

#: The version information of rmdump is displayed as `X YY.Y`. "`X`" means nothing. "`YY.Y`" represents the version information. Software type is not displayed.

Impact on communication

None

Response messages

Table 16-6: List of response messages for the show dumpfile command

Message	Description
Can't execute dump information command of standby system because standby system is not ready.	The standby system is not installed, or an attempt to access the standby system failed. Check the status of the standby system.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Standby system is notconnect.	The standby system is not installed.

Notes

- When the displayed content is for `rmdump`, the dump collection date (Date) is displayed in UTC time. Additionally, software type is not displayed in the version information. Instead, internal management information, which indicates software type is displayed in the version information.
- If there is no dump information in the dump file storage directory, `No dump file.` is displayed. Similarly, if there is no dump file storage directory, `No such directory.` is displayed.
- If a standby system is not installed, or an attempt to access a standby system failed, `standby system is not ready.` is displayed.

Chapter 17. Ethernet

show interfaces
clear counters
show port
activate
inactivate
test interfaces
no test interfaces

show interfaces

Displays Ethernet information.

Syntax

```
show interfaces {gigabitethernet | tengigabitethernet}
                 <nif no.>/<port no.> [detail]
```

Input mode

User mode and administrator mode

Parameters

{gigabitethernet | tengigabitethernet}

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters.*

detail

Specifies that detailed statistics be displayed.

Operation when this parameter is omitted:

Normal statistics are displayed.

Example 1

The following shows an example of displaying the NIF information and detailed port information about the specified 10BASE-T/100BASE-TX/1000BASE-T interface.

Figure 17-1: Execution results when a 10BASE-T/100BASE-TX/1000BASE-T interface is specified

```
> show interfaces gigabitethernet 1/1
Date 2008/04/16 12:00:00 UTC
NIF1 : active(restart required)  48-port 10BASE-T/100BASE-TX/1000BASE-T     -|
retry:0                                                                     |1
        Average:700Mbps/24Gbps  Peak:750Mbps at 08:10:30                   -|
Port1: active up  1000BASE-T full(auto) 0012.e240.0a04                     <-2
        Time-since-last-status-change:10:30:30                             -|
        Bandwidth:1000000kbps  Average out:350Mbps  Average in:350Mbps       |
        Peak out:380Mbps at 08:10:30  Peak in:370Mbps at 08:10:30           |
        Output rate:290Mbps  340pps                                         |
        Input  rate:290Mbps  340pps                                         |3
        Flow control send   :on                                             |
        Flow control receive:on                                             |
        TPID:8100                                                           |
        Frame size:1518 Octets  retry:1  Interface name:geth1/1             |
        description:test lab area network                                  -|
        <Out octets/packets counter>       <In octets/packets counter>      -|
        Octets       :                  0  Octets       :                 0 |
        Unicast packets        :         0  Unicast packets        :       0 |4
        Multicast packets      :         0  Multicast packets      :       0 |
        Broadcast packets      :         0  Broadcast packets      :       0 |
        Pause packets          :         0  Pause packets          :       0-|
```

```
        <Out line error counter>                                          -|
        Late collision         :        0  Carrier sense lost     :       0 |
        Single collision       :        0  Defer indication       :       0 |5
        Multiple collisions    :        0  Excessive deferral     :       0 |
        Excessive collisions   :        0  Underrun               :       0 |
        Error frames           :        0                                  -|
        <In line error counter>                                           -|
        CRC errors             :        0  Symbol errors          :       0 |
        Alignment              :        0  Short frames           :       0 |6
        Fragments              :        0  Long frames            :       0 |
        Jabber                 :        0  Error frames           :       0-|
        <Line fault counter>                                              -|
        MDI cross over changed :        0                                  |7
        Link down              :        0                                  |
        Link down in operational state                            :       0-|
>
```

1. NIF information
2. Summary port information
3. Detailed port information
4. Send and receive statistics
5. Send error statistics
6. Receive error statistics
7. Failure statistics

Example 2

The following shows an example of displaying the NIF information, detailed port information, and detailed statistics about the specified 10BASE-T/100BASE-TX/1000BASE-T interface.

Figure 17-2: Execution results for the specification of 10BASE-T/100BASE-TX/1000BASE-T detailed statistics

```
> show interfaces gigabitethernet 1/1 detail
Date 2008/04/16 12:00:00 UTC
NIF1 : active(restart required)  48-port 10BASE-T/100BASE-TX/1000BASE-T     -|
retry:0                                                                     |1
        Average:700Mbps/24Gbps  Peak:750Mbps at 08:10:30                   -|
Port1: active up  1000BASE-T full(auto) 0012.e240.0a04                     <-2
        Time-since-last-status-change:10:30:30                             -|
        Bandwidth:1000000kbps  Average out:350Mbps  Average in:350Mbps      |
        Peak out:380Mbps at 08:10:30  Peak in:370Mbps at 08:10:30           |
        Output rate:290Mbps  340pps                                         |
        Input  rate:290Mbps  340pps                                         |3
        Flow control send   :on                                             |
        Flow control receive:on                                             |
        TPID:8100                                                           |
        Frame size:1518 Octets  retry:1  Interface name:geth1/1             |
        description:test lab area network                                  -|
        <Out octets/packets counter>       <In octets/packets counter>     -|
        Octets       :                  0  Octets       :                 0 |
        Unicast packets        :        0  Unicast packets        :       0 |
        Multicast packets      :        0  Multicast packets      :       0 |
        Broadcast packets      :        0  Broadcast packets      :       0 |
        Pause packets          :        0  Pause packets          :       0 |
        64 packets             :        0  64 packets             :       0 |4
        65-127 packets         :        0  65-127 packets         :       0 |
        128-255 packets        :        0  128-255 packets        :       0 |
        256-511 packets        :        0  256-511 packets        :       0 |
        512-1023 packets       :        0  512-1023 packets       :       0 |
        1024-1518 packets      :        0  1024-1518 packets      :       0-|
        <Out line error counter>                                          -|
        Late collision         :        0  Carrier sense lost     :       0 |
```

```
          Single collision       :        0  Defer indication       :        0 |5
          Multiple collisions    :        0  Excessive deferral     :        0 |
          Excessive collisions   :        0  Underrun               :        0 |
          Error frames           :        0                                   -|
          <In line error counter>                                             -|
          CRC errors             :        0  Symbol errors          :        0 |
          Alignment              :        0  Short frames           :        0 |6
          Fragments              :        0  Long frames            :        0 |
          Jabber                 :        0  Error frames          :        0-|
          <Line fault counter>                                                -|
          MDI cross over changed :        0                                    |7
          Link down              :        0                                    |
          Link down in operational state                          :        0-|
>
```

1. NIF information
2. Summary port information
3. Detailed port information
4. Send and receive statistics
5. Send error statistics
6. Receive error statistics
7. Failure statistics

Display items in Example 1 and 2

The following table describes the items displayed as the NIF information, detailed port information, and detailed statistics for 10BASE-T/100BASE-TX/1000BASE-T interfaces.

Table 17-1: NIF information about 10BASE-T/100BASE-TX/1000BASE-T interfaces

Item	Detailed information	Meaning
NIF<*nif no.*>	NIF number	
<*NIF status*>	active	Active (normal operating state)
	initialize	Currently initializing
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • The NIF is not running. • An unsupported board is installed.
	notconnect	• Not installed • Not used (If a double-sized NIF is installed, this item applies to the even NIF number.)
	disable	Operation was stopped by using the `no power enable` or the `schedule-power-control` shutdown configuration command.
	standby cold [AX6700S] [AX6600S]	Placed in a cold standby status by NIF redundancy control
(<*whether NIF restart required*>)	restart required	The NIF HDC must be updated.
<*NIF type*>#1	24-port 10BASE-T/ 100BASE-TX/ 1000BASE-T	24 10BASE-T, 100BASE-TX, or 1000BASE-T lines

Item	Detailed information	Meaning
	48-port 10BASE-T/ 100BASE-TX/ 1000BASE-T	48 10BASE-T, 100BASE-TX, or 1000BASE-T lines
	4-port 10BASE-T/ 100BASE-TX/ 1000BASE-T-SHAPER + 2-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, or 1000BASE-T lines with the hierarchical shaper and two 1000BASE-X SFP lines with the hierarchical shaper
	4-port 10BASE-T/ 100BASE-TX/ 1000BASE-T-SHAPER or 1000BASE-X(SFP)-SHAPER + 4-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X SFP lines (user selectable) with the hierarchical shaper and four 1000BASE-X SFP lines with the hierarchical shaper
	-	The NIF type is unknown. A dash is displayed in the following cases: • No NIFs are installed. • An unsupported board is installed.
retry:<*Counts*>	Displays the number of times a NIF was restarted due to a fault.#2	
Average:<*average bandwidth used/ maximum NIF bandwidth*> Mbps	Displays the average bandwidth (in Mbps) used per NIF for the one minute interval before the command was executed. (line bandwidth used per NIF / maximum bandwidth per NIF) `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak:<*maximum bandwidth used*>Mbps at <*hh*>:<*mm*>:<*ss*>	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#1: This item is displayed when the interface is normally operating.

#2: The number of times a NIF was restarted due to a fault is reset every hour.

Table 17-2: Summary information about 10BASE-T/100BASE-TX/1000BASE-T interfaces

Item	Displayed information	
	Detailed information	Meaning
Port<*port no.*>	Port number	
<*port status*>	active up	Active (normal operating state)
	active down	Active (Line failure)
	initialize	Currently initializing or negotiating (auto-negotiation is operating)
	test	Line under test

Item	Displayed information	
	Detailed information	Meaning
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • Due to standby link functionality of link aggregation • Due to the BPDU guard functionality of the Spanning Tree Protocol • Due to port resetting function of GSRP • The port has been deactivated by unidirectional link failure detection function. • The port has been deactivated by the L2 loop detection functionality. • The port has been deactivated by storm control.
	disable	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown` configuration commands.
<*line type*>	10BASE-T half	10BASE-T half duplex
	10BASE-T half(auto)	10BASE-T half duplex (Line type determined by auto-negotiation.)
	10BASE-T full	10BASE-T full duplex
	10BASE-T full(auto)	10BASE-T full duplex (Line type determined by auto-negotiation.)
	100BASE-TX half	100BASE-TX half duplex
	100BASE-TX half(auto)	100BASE-TX half duplex (Line type determined by auto-negotiation.)
	100BASE-TX full	100BASE-TX full duplex
	100BASE-TX full(auto)	100BASE-TX full duplex (Line type determined by auto-negotiation.)
	1000BASE-T full(auto)	1000BASE-T full duplex (Line type determined by auto-negotiation.)
	-	The line type is unknown. A dash is displayed in the following cases: • Auto-negotiation is enabled but the port status is neither `active up` nor `test`. • A port is in the `initialize` status. • A port is in the `fault` status.
<*MAC address*>	MAC address of the port	

Table 17-3: Detailed information and statistics about 10BASE-T/100BASE-TX/1000BASE-T interfaces

Item	Displayed information	
	Detailed information	Meaning
Time-since-last-status-change	Displays the elapsed time since the last change in status. *hh*:*mm*:*ss* (when the elapsed time is 24 hours or less: *hh* = hours, *mm* = minutes, *ss* = seconds) *dd*.*hh*:*mm*:*ss* (when the elapsed time is more than 24 hours: *dd* = number of days, *hh* = hours, *mm* = minutes, *ss* = seconds) `Over 100 days` (when the elapsed time is more than 100 days)	

Item	Displayed information	
	Detailed information	Meaning
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out:<*average bandwidth used on sending side*>Mbps	Displays the average bandwidth (in Mbps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in:<*average bandwidth used on receiving side*>Mbps	Displays the average bandwidth (in Mbps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak out	Displays the maximum bandwidth used on the sending side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak in	Displays the maximum bandwidth used on the receiving side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate[#1]	Displays the send throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate[#1]	Displays the receive throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send[#2]	on	A pause packet is sent.
	off	A pause packet is not sent.
Flow control receive[#2]	on	A pause packet is received.
	off	A pause packet is not received.
TPID	Displays a `TagProtocolIDentifier` value that is used on the port to identify the VLAN.	

Item		Displayed information	
		Detailed information	Meaning
Frame size[#3]		Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA/PAD field. For details about frame formats, see the description of frame formats in *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.	
retry:<*Counts*>		Displays the number of times the port was reactivated due to a fault.[#4]	
Interface name		Displays the name assigned to a port.	
description:<*supplementary explanation*>		Displays the contents of the `description` configuration. The `description` configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the description configuration has not been set.	
Statistics	Category	<*Out octets/packets counter*>	Send statistics
		<*In octets/packets counter*>	Receive statistics
		<*Out line error counter*>	Send error statistics
		<*In line error counter*>	Receive error statistics
		<*Line fault counter*>	Failure statistics
	Detailed statistical items for sending and receiving	Octets	The number of octets The frame length used to calculate the number of octets starts from the DA field in the MAC header and ends with the FCS field (bad packets included).
		Unicast packets	Number of unicast packets Sending side: Includes send error statistics. Receiving side: Does not include receive error statistics.
		Multicast packets	Number of multicast packets Does not include send and receive error statistics. Note that the value increments when pause packets are sent and received. However, for the following NIFs, the value does not increment: • NK1GS-8M • NH1G-48T • NH1GS-6M
		Broadcast packets	Number of broadcast packets Does not include send and receive error statistics.

Item		Displayed information	
		Detailed information	Meaning
		Pause packets	Number of pause packets. The value increments regardless of the send flow control settings. However, the following operations apply to some NIFs, which are listed below. Sending side: The value increments regardless of the send flow control settings. Receiving side: The value increments only when the receive flow control settings are specified to receive pause packets. • NK1GS-8M • NH1G-48T • NH1GS-6M
		64 packets	The number of packets whose frame length is 64 octets.#5 Includes send and receive error statistics.
		65-127 packets	The number of packets whose frame length is from 65 to 127 octets.#5 Includes send and receive error statistics.
		128-255 packets	The number of packets whose frame length is from 128 to 255 octets.#5 Includes send and receive error statistics.
		256-511 packets	The number of packets whose frame length is from 256 to 511 octets.#5 Includes send and receive error statistics.
		512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets.#5 Includes send and receive error statistics.
		1024-1518 packets	The number of packets whose frame length is 1024 or more octets.#5 Includes send and receive error statistics (`Jabber` and `Long frames` are excluded). Note that for the following NIFs, this information indicates the number of packets whose frame length is from 1024 to 1518 octets#5 (includes send and receive error statistics): • NK1GS-8M • NH1G-48T • NH1GS-6M
	Detailed statistical items for send errors	Late collision	The number of collisions detected after the 512-bit time has elapsed
		Carrier sense lost	The number of no-carrier errors that occurred during sending
		Single collision	The number of transmissions that were successful after one collision

Item		Displayed information	
		Detailed information	Meaning
		Multiple collisions	The number of transmissions that were successful after two or more collisions
		Defer indication	The number of times the initial transmission was delayed because the transmit line was busy
		Excessive deferral	The number of times an excessive delay occurred
		Excessive collisions	The number of transfer failures due to excessive collisions (16 collisions)
		Underrun	The number of underrun errors that occurred
		Error frames	The total number of frames discarded due to errors (total value of the following items: `Late collision`, `Excessive deferral`, `Excessive collisions`, `Carrier sense lost`, `Underrun`)
	Detailed statistical items for receive errors	CRC errors	The number of times the frame length was valid but an error was detected by the FCS check[#5]
		Alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#5]
		Fragments	The number of times a short frame (whose length is shorter than 64 octets) is received and an FCS error or an alignment error occurred[#5]
		Jabber	The number of times a long frame (whose length exceeds the max frame length) was received and an FCS error or an alignment error occurred[#5]
		Symbol errors	The number of symbol errors
		Short frames	The number of received packets that are shorter than the frame length[#5]
		Long frames	The number of received packets that exceed the frame length[#5]
		Error frames	The total number of frames discarded due to errors (total value of the following items: `Short frames`, `Fragments`, `Jabber`, `CRC errors`, `Long frames`, `Symbol errors`)
	Detailed statistical items for errors	MDI cross over changed	The number of times the send or receive pin of a twisted pair cable was changed
		Link down	The number of times a link was not established

Item		Displayed information	
		Detailed information	Meaning
		Link down in operational state	The number of link failures that occurred during communication

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the unit is K and one digit is displayed below the decimal point. If the displayed value is 10000 K or larger, the unit is M and one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is either `active up` or `test`.

#3: This item is always - except when the status of the port is either `active up` or `test`.

#4: The number of times the port was reactivated due to a fault is initialized every one hour.

#5: The frame length indicates the length starting from the MAC header and ending with the FCS field.

For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

Example 3

The following shows an example of displaying the NIF information and detailed port information about the 1000BASE-X interface.

Figure 17-3: Execution results when 1000BASE-X is specified

```
>show interfaces gigabitethernet 1/1
Date 2008/04/16 12:00:00 UTC
NIF1: active(restart required)  16-port 1000BASE-X(SFP)  retry:0           -|1
        Average:700Mbps/8000Mbps  Peak:750Mbps at 08:10:30                  -|
Port1: active up  1000BASE-SX full(auto)  0012.e240.0a04                    -|2
        SFP connect                                                         -|
        Time-since-last-status-change:10:30:30                              -|
        Bandwidth:1000000kbps  Average out:350Mbps  Average in:350Mbps       |
        Peak out:380Mbps at 08:10:30  Peak in:370Mbps at 08:10:30            |
        Output rate:290Mbps 340pps                                           |
        Input  rate:290Mbps 340pps                                           |3
        Flow control send   :on                                              |
        Flow control receive:on                                              |
        TPID:8100                                                            |
        Frame size:1518 Octets  retry:0  Interface name:geth1/1              |
        description:test lab area network                                  -|
        <Out octets/packets counter>       <In octets/packets counter>      -|
        Octets       :                  0  Octets       :                 0 |
        Unicast packets        :        0  Unicast packets        :        0 |4
        Multicast packets      :        0  Multicast packets      :        0 |
        Broadcast packets      :        0  Broadcast packets      :        0 |
        Pause packets          :        0  Pause packets          :        0-|
        <Out line error counter>                                             -|5
        Underrun               :        0  Error frames           :        0-|
        <In line error counter>                                              -|
        CRC errors             :        0  Symbol errors          :        0 |
        Alignment              :        0  Short frames           :        0 |6
        Fragments              :        0  Long frames            :        0 |
        Jabber                 :        0  Overrun                :        0 |
        Error frames           :        0                                   -|
        <Line fault counter>                                                 -|
        Link down              :        0  Signal detect errors   :        0 |
        Transceiver notconnect :        0                                    |7
        Link down in operational state                           :        0 |
        Signal detect errors in operational state                :        0 |
        Transceiver notconnect in operational state              :        0-|
```

```
>
```

1. NIF information
2. Summary port information
3. Detailed port information
4. Send and receive statistics
5. Send error statistics
6. Receive error statistics
7. Failure statistics

Example 4

The following shows an example of displaying the NIF information, detailed port information, and detailed statistics about the 1000BASE-X interface.

Figure 17-4: Execution results for the specification of 1000BASE-X detailed statistics

```
>show interfaces gigabitethernet 1/1 detail
Date 2008/04/16 12:00:00 UTC
NIF1: active(restart required)  16-port 1000BASE-X(SFP)  retry:0            -|1
        Average:700Mbps/8000Mbps  Peak:750Mbps at 08:10:30                   -|
Port1: active up  1000BASE-SX full(auto)  0012.e240.0a04                    -|2
        SFP connect                                                         -|
        Time-since-last-status-change:10:30:30                              -|
        Bandwidth:1000000kbps  Average out:350Mbps  Average in:350Mbps       |
        Peak out:380Mbps at 08:10:30  Peak in:370Mbps at 08:10:30            |
        Output rate:290Mbps 340pps                                           |
        Input  rate:290Mbps 340pps                                          |3
        Flow control send   :on                                              |
        Flow control receive:on                                              |
        TPID:8100                                                            |
        Frame size:1518 Octets  retry:0  Interface name:geth1/1              |
        description:test lab area network                                  -|
        <Out octets/packets counter>       <In octets/packets counter>      -|
        Octets       :                  0  Octets       :                 0 |
        Unicast packets        :         0  Unicast packets        :       0 |
        Multicast packets      :         0  Multicast packets      :       0 |
        Broadcast packets      :         0  Broadcast packets      :       0 |
        Pause packets          :         0  Pause packets          :       0 |4
        64 packets             :         0  64 packets             :       0 |
        65-127 packets         :         0  65-127 packets         :       0 |
        128-255 packets        :         0  128-255 packets        :       0 |
        256-511 packets        :         0  256-511 packets        :       0 |
        512-1023 packets       :         0  512-1023 packets       :       0 |
        1024-1518 packets      :         0  1024-1518 packets      :       0-|
        <Out line error counter>                                            -|5
        Underrun               :         0  Error frames          :       0-|
        <In line error counter>                                             -|
        CRC errors             :         0  Symbol errors         :       0 |
        Alignment              :         0  Short frames          :       0 |6
        Fragments              :         0  Long frames           :       0 |
        Jabber                 :         0  Overrun               :       0 |
        Error frames           :         0                                  -|
        <Line fault counter>                                                -|
        Link down              :         0  Signal detect errors  :       0 |
        Transceiver notconnect :         0                                   |7
        Link down in operational state                          :       0 |
        Signal detect errors in operational state               :       0 |
        Transceiver notconnect in operational state             :       0-|
>
```

1. NIF information
2. Summary port information

3. Detailed port information
4. Send and receive statistics
5. Send error statistics
6. Receive error statistics
7. Failure statistics

Display items in Example 3 and 4

The following table describes the items displayed as the NIF information, detailed port information, and statistics about the 1000BASE-X interface.

Table 17-4: NIF information about 1000BASE-X interfaces

Item	Detailed information	Meaning
NIF<*nif no.*>	NIF number	
<*NIF status*>	active	Active (normal operating state)
	initialize	Currently initializing
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • The NIF is not running. • An unsupported board is installed.
	notconnect	• Not installed • Not used (If a double-sized NIF is installed, this item applies to the even NIF number.)
	disable	Operation was stopped by using the `no power enable` or the `schedule-power-control` shutdown configuration command.
	standby cold [AX6700S] [AX6600S]	Placed in a cold standby status by NIF redundancy control
(<*whether NIF restart required* >)	restart required	The NIF HDC must be updated.
<*NIF type*>	16-port 1000BASE-X(SFP)	16 1000BASE-X (SFP) lines
	24-port 1000BASE-X(SFP)	24 1000BASE-X (SFP) lines
	4-port 10BASE-T/100BASE-TX/ 1000BASE-T-SHAPER + 2-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, or 1000BASE-T lines with the hierarchical shaper and two 1000BASE-X SFP lines with the hierarchical shaper
	4-port 10BASE-T/100BASE-TX/ 1000BASE-T-SHAPER or 1000BASE-X(SFP)-SHAPER + 4-port 1000BASE-X(SFP)-SHAPER	Four 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X SFP lines (user selectable) with the hierarchical shaper and four 1000BASE-X SFP lines with the hierarchical shaper
	-	The NIF type is unknown. A dash is displayed in the following cases: • No NIFs are installed. • An unsupported board is installed.
retry:<*Counts*>	Displays the number of times a NIF was restarted due to a fault.#	

Item	Detailed information	Meaning
Average:<*average bandwidth used/ maximum NIF bandwidth*> Mbps	Displays the average bandwidth (in Mbps) used per NIF for the one minute interval before the command was executed. (line bandwidth used per NIF / maximum bandwidth per NIF) `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak:<*maximum bandwidth used*>Mbps at <*hh*>:<*mm*>:<*ss*>	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#: The number of times a NIF was restarted due to a fault is reset every hour.

Table 17-5: Summary information about 1000BASE-X interfaces

Item	Displayed information	
	Detailed information	Meaning
Port<*port no.*>	Port number	
<*port status*>	active up	Active (normal operating state)
	active down	Active (Line failure)
	initialize	Currently initializing or negotiating (auto-negotiation is operating)
	test	Line under test
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • Due to standby link functionality of link aggregation • Due to the BPDU guard functionality of the Spanning Tree Protocol • Due to port resetting function of GSRP • The port has been deactivated by unidirectional link failure detection function. • The port has been deactivated by the L2 loop detection functionality. • The port has been deactivated by storm control.
	disable	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown` configuration commands.
<*line type*>	1000BASE-LX full	1000BASE-LX full duplex
	1000BASE-SX full	1000BASE-SX full duplex
	1000BASE-SX2 full	1000BASE-SX2 full duplex
	1000BASE-LH full	1000BASE-LH full duplex
	1000BASE-BX10-D full	1000BASE-BX-D (10km) full duplex

Item	Displayed information	
	Detailed information	**Meaning**
	1000BASE-BX10-U full	1000BASE-BX-U (10km) full duplex
	1000BASE-BX40-D full	1000BASE-BX-D (40km) full duplex
	1000BASE-BX40-U full	1000BASE-BX-U (40km) full duplex
	1000BASE-LHB full	1000BASE-LHB full duplex
	1000BASE-LX full(auto)	1000BASE-LX full duplex (Line type determined by auto-negotiation.)
	1000BASE-SX full(auto)	1000BASE-SX full duplex (Line type determined by auto-negotiation.)
	1000BASE-SX2 full(auto)	1000BASE-SX2 full duplex (Line type determined by auto-negotiation.)
	1000BASE-LH full(auto)	1000BASE-LH full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX10-D full(auto)	1000BASE-BX-D (10km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX10-U full(auto)	1000BASE-BX-U (10km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX40-D full(auto)	1000BASE-BX-D (40km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX40-U full(auto)	1000BASE-BX-U (40km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-LHB full(auto)	1000BASE-LHB full duplex (Line type determined by auto-negotiation.)
	-	The line type is unknown. A dash is displayed in the following cases: • A port is in the `initialize` status. • A port is in the `fault` status. • The transceiver status is not `connect`.
<MAC address>	MAC address of the port	
<type of transceiver>	SFP	SFP
<transceiver status>	connect	Installed
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. A dash is displayed in the following cases: • A port is in the `initialize` status. • A port is in the `fault` status.

Table 17-6: Detailed information and statistics about 1000BASE-X interfaces

Item	Displayed information	
	Detailed information	**Meaning**
Time-since-last-status-change	Displays the elapsed time since the last change in status. *hh*:*mm*:*ss* (when the elapsed time is 24 hours or less: *hh* = hours, *mm* = minutes, *ss* = seconds) *dd*.*hh*:*mm*:*ss* (when the elapsed time is more than 24 hours: *dd* = number of days, *hh* = hours, *mm* = minutes, *ss* = seconds) `Over 100 days` (when the elapsed time is more than 100 days)	
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out:<*average bandwidth used on sending side*>Mbps	Displays the average bandwidth (in Mbps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in:<*average bandwidth used on receiving side*>Mbps	Displays the average bandwidth (in Mbps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak out	Displays the maximum bandwidth used on the sending side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak in	Displays the maximum bandwidth used on the receiving side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate[#1]	Displays the send throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate[#1]	Displays the receive throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send[#2]	on	A pause packet is sent.

Item		Displayed information	
		Detailed information	Meaning
		off	A pause packet is not sent.
Flow control receive[#2]		on	A pause packet is received.
		off	A pause packet is not received.
TPID		Displays a `TagProtocolIDentifier` value that is used on the port to identify the VLAN.	
Frame size[#3]		Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA/PAD field. For details about frame formats, see the description of frame formats in *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.	
retry:<*Counts*>		Displays the number of times the port was reactivated due to a fault.[#4]	
Interface name		Displays the name assigned to a port.	
description:<*supplementary explanation*>		Displays the contents of the `description` configuration. The `description` configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the description configuration has not been set.	
Statistics	Category	<*Out octets/packets counter*>	Send statistics
		<*In octets/packets counter*>	Receive statistics
		<*Out line error counter*>	Send error statistics
		<*In line error counter*>	Receive error statistics
		<*Line fault counter*>	Failure statistics
	Detailed statistical items for sending and receiving	Octets	The number of octets The frame length used to calculate the number of octets starts from the DA field in the MAC header and ends with the FCS field (bad packets included).
		Unicast packets	Number of unicast packets Sending side: Includes send error statistics. Receiving side: Does not include receive error statistics.
		Multicast packets	Number of multicast packets Does not include send and receive error statistics. Note that the value increments when pause packets are sent and received. However, for the following NIFs, the value does not increment: • NK1GS-8M • NH1G-16S • NH1GS-6M
		Broadcast packets	Number of broadcast packets Does not include send and receive error statistics.

Item		Displayed information	
		Detailed information	Meaning
		Pause packets	Number of pause packets. The value increments regardless of the send flow control settings. However, the following operations apply to some NIFs, which are listed below. Sending side: The value increments regardless of the send flow control settings. Receiving side: The value increments only when the receive flow control settings are specified to receive pause packets. • NK1GS-8M • NH1G-16S • NH1GS-6M
		64 packets	The number of packets whose frame length is 64 octets.#5 Includes send and receive error statistics.
		65-127 packets	The number of packets whose frame length is from 65 to 127 octets.#5 Includes send and receive error statistics.
		128-255 packets	The number of packets whose frame length is from 128 to 255 octets.#5 Includes send and receive error statistics.
		256-511 packets	The number of packets whose frame length is from 256 to 511 octets.#5 Includes send and receive error statistics.
		512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets.#5 Includes send and receive error statistics.
		1024-1518 packets	The number of packets whose frame length is 1024 or more octets.#5 Includes send and receive error statistics (`Jabber` and `Long frames` are excluded). Note that for the following NIFs, this information indicates the number of packets whose frame length is from 1024 to 1518 octets#5 (includes send and receive error statistics): • NK1GS-8M • NH1G-16S • NH1GS-6M
	Detailed statistical items for send errors	Underrun	The number of underrun errors that occurred
		Error frames	The total number of frames discarded due to errors

Item		Displayed information	
		Detailed information	Meaning
	Detailed statistical items for receive errors	CRC errors	The number of times the frame length was valid but an error was detected by the FCS check[#5]
		Symbol errors	The number of symbol errors
		Alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#5]
		Fragments	The number of times a short frame (whose length is shorter than 64 octets) is received and an FCS error or an alignment error occurred[#5]
		Jabber	The number of times a long frame (whose length exceeds the max frame length) was received and an FCS error or an alignment error occurred[#5]
		Short frames	The number of received packets that are shorter than the frame length[#5]
		Long frames	The number of received packets that exceed the frame length[#5]
		Overrun	The number of overrun errors that occurred
		Error frames	The total number of frames discarded due to errors (total value of the following items: `Short frames`, `Fragments`, `Jabber`, `CRC errors`, `Long frames`, `Symbol errors`, `Overrun`)
	Detailed statistical items for errors	Link down	The number of times a link was not established
		Signal detect errors	The number of times a signal line could not be detected
		Transceiver notconnect	The number of times a transceiver was disconnected
		Link down in operational state	The number of link failures that occurred during communication
		Signal detect errors in operational state	The number of failures that occurred during communication (signal line was not detected)
		Transceiver notconnect in operational state	The number of failures that occurred during communication (transceiver was removed)

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the unit is K and one digit is displayed below the decimal point. If the displayed value is 10000 K or larger, the unit is M and one digit is

displayed below the decimal point.

#2: This item is always `off` except when the status of the port is either `active up` or `test`.

#3: This item is always `-` except when the status of the port is either `active up` or `test`.

#4: The number of times the port was reactivated due to a fault is initialized every one hour.

#5: The frame length indicates the length starting from the MAC header and ending with the FCS field.

For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

Example 5

The following shows an example of displaying the NIF information and detailed port information about the 10GBASE-R interface.

Figure 17-5: Execution results when the 10GBASE-R is specified

```
>show interfaces tengigabitethernet 1/1
Date 2008/04/16 12:00:00 UTC
NIF1: active(restart required)  1-port 10GBASE-R(XFP)  retry:0              -|1
        Average:7000Mbps/20Gbps  Peak:7500Mbps at 08:10:30                   -|
Port1: active up  10GBASE-LR  0012.e240.0a04                                -|2
        XFP connect                                                          -|
        Time-since-last-status-change:10:30:30                               -|
        Bandwidth:10000000kbps  Average out:3500Mbps  Average in:3500Mbps     |
        Peak out:3800Mbps at 08:10:30  Peak in:3700Mbps at 08:10:30           |
        Output rate:2900Mbps 3400pps                                          |
        Input  rate:2900Mbps 3400pps                                         |3
        Flow control send   :on                                               |
        Flow control receive:on                                               |
        TPID:8100                                                             |
        Frame size:1518 Octets  retry:0  Interface name:tengeth1/1            |
        description:test lab area network                                   -|
        <Out octets/packets counter>                                        -|
        Octets                                        :                    0 |
        Unicast packets                               :                    0 |4
        Multicast packets                             :                    0 |
        Broadcast packets                             :                    0 |
        Pause packets                                 :                    0-|
        <In octets/packets counter>                                         -|
        Octets                                        :                    0 |
        Unicast packets                               :                    0 |5
        Multicast packets                             :                    0 |
        Broadcast packets                             :                    0 |
        Pause packets                                 :                    0-|
        <Out line error counter>                                            -|
        Underrun/Overrun       :         0                                   |6
        Error frames                                  :                    0-|
        <In line error counter>                                             -|
        CRC errors                                    :                    0 |
        Alignment                                     :                    0 |
        Fragments                                     :                    0 |
        Jabber                                        :                    0 |7
        Underrun/Overrun       :         0                                   |
        Symbol errors                                 :                    0 |
        Short frames                                  :                    0 |
        Long frames                                   :                    0 |
        Error frames                                  :                    0-|
        <Line fault counter>                                                -|
        Signal detect errors   :         0  HI_BER             :          0 |
        Transceiver notconnect :         0  LF                 :          0 |
        LOS of sync            :         0  RF                 :          0 |
        Signal detect errors in operational state              :          0 |8
        Transceiver notconnect in operational state            :          0 |
        LOS of sync in operational state                       :          0 |
```

```
        HI_BER in operational state                          :          0 |
        LF in operational state                              :          0 |
        RF in operational state                              :          0-|
>
```

1. NIF information
2. Summary port information
3. Detailed port information
4. Send statistics
5. Receive statistics
6. Send error statistics
7. Receive error statistics
8. Failure statistics

Example 6

The following shows an example of displaying the NIF information, detailed port information, and detailed statistics about the 10BASE-R interface.

Figure 17-6: Execution results for the specification of 10GBASE-R detailed statistics

```
>show interfaces tengigabitethernet 1/1 detail
Date 2008/04/16 12:00:00 UTC
NIF1: active(restart required)  1-port 10GBASE-R(XFP)  retry:0              -|1
        Average:7000Mbps/20Gbps  Peak:7500Mbps at 08:10:30                   -|
Port1: active up  10GBASE-LR  0012.e240.0a04                                -|2
        XFP connect                                                          -|
        Time-since-last-status-change:10:30:30                               -|
        Bandwidth:10000000kbps  Average out:3500Mbps  Average in:3500Mbps     |
        Peak out:3800Mbps at 08:10:30  Peak in:3700Mbps at 08:10:30          |
        Output rate:2900Mbps 3400pps                                         |
        Input  rate:2900Mbps 3400pps                                         |3
        Flow control send   :on                                              |
        Flow control receive:on                                              |
        TPID:8100                                                            |
        Frame size:1518 Octets  retry:0  Interface name:tengeth1/1           |
        description:test lab area network                                   -|
        <Out octets/packets counter>                                        -|
        Octets                                          :                 0 |
        Unicast packets                                 :                 0 |
        Multicast packets                               :                 0 |
        Broadcast packets                               :                 0 |
        Pause packets                                   :                 0 |4
        64 packets                                      :                 0 |
        65-127 packets                                  :                 0 |
        128-255 packets                                 :                 0 |
        256-511 packets                                 :                 0 |
        512-1023 packets                                :                 0 |
        1024-1518 packets                               :                 0-|
        <In octets/packets counter>                                          -|
        Octets                                          :                 0 |
        Unicast packets                                 :                 0 |
        Multicast packets                               :                 0 |
        Broadcast packets                               :                 0 |
        Pause packets                                   :                 0 |5
        64 packets                                      :                 0 |
        65-127 packets                                  :                 0 |
        128-255 packets                                 :                 0 |
        256-511 packets                                 :                 0 |
        512-1023 packets                                :                 0 |
        1024-1518 packets                               :                 0-|
        <Out line error counter>                                             -|
        Underrun/Overrun       :         0                                   |6
```

```
          Error frames                                    :                0-|
          <In line error counter>                                           -|
          CRC errors                                      :                0 |
          Alignment                                       :                0 |
          Fragments                                       :                0 |
          Jabber                                          :                0 |7
          Underrun/Overrun       :         0                                 |
          Symbol errors                                   :                0 |
          Short frames                                    :                0 |
          Long frames                                     :                0 |
          Error frames                                    :                0-|
          <Line fault counter>                                              -|
          Signal detect errors   :         0  HI_BER              :         0 |
          Transceiver notconnect :         0  LF                  :         0 |
          LOS of sync            :         0  RF                  :         0 |
          Signal detect errors in operational state               :         0 |8
          Transceiver notconnect in operational state             :         0 |
          LOS of sync in operational state                        :         0 |
          HI_BER in operational state                             :         0 |
          LF in operational state                                 :         0 |
          RF in operational state                                 :         0-|
>
```

1. NIF information
2. Summary port information
3. Detailed port information
4. Send statistics
5. Receive statistics
6. Send error statistics
7. Receive error statistics
8. Failure statistics

Display items in Example 5 and 6

The following table describes the items displayed as the NIF information, detailed port information, and statistics about the 10GBASE-R interface.

Table 17-7: NIF information about 10GBASE-R interfaces

Item	Detailed information	Meaning
NIF<*nif no.*>	NIF number	
<*NIF status*>	active	Active (normal operating state)
	initialize	Currently initializing
	fault	Failed
	inactive	• Operation stopped by the `inactivate` command. • The NIF is not running. • An unsupported board is installed.
	notconnect	• Not installed • Not used (If a double-sized NIF is installed, this item applies to the even NIF number.)

Item	Detailed information	Meaning
	disable	Operation was stopped by using the `no power enable` or the `schedule-power-control` shutdown configuration command.
	standby cold [AX6700S][AX6600S]	Placed in a cold standby status by NIF redundancy control
(<*whether NIF restart required* >)	restart required	The NIF HDC must be updated.
<*NIF type*>	1-port 10GBASE-R(XFP)	One 10GBASE-R (XFP) line
	4-port 10GBASE-R(XFP)	Four 10GBASE-R (XFP) lines
	8-port 10GBASE-R(XFP)	Eight 10GBASE-R (XFP) lines
	-	The NIF type is unknown. A dash is displayed in the following cases: • No NIFs are installed. • An unsupported board is installed.
retry:<*Counts*>	Displays the number of times a NIF was restarted due to a fault.#	
Average:<*average bandwidth used/maximum NIF bandwidth*> Mbps	Displays the average bandwidth (in Mbps) used per NIF for the one minute interval before the command was executed. (line bandwidth used per NIF / maximum bandwidth per NIF) `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak:<*maximum bandwidth used*>Mbps at <*hh*>:<*mm*>:<*ss*>	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#: The number of times a NIF was restarted due to a fault is initialized every one hour.

Table 17-8: Summary information about 10GBASE-R interfaces

Item	Displayed information	
	Detailed information	Meaning
Port<*port no.*>	Port number	
<*port status*>	active up	Active (normal operating state)
	active down	Active (Line failure)
	initialize	Currently initializing
	test	Line under test
	fault	Failed

Item	Displayed information	
	Detailed information	**Meaning**
	inactive	• Operation stopped by the `inactivate` command. • Due to standby link functionality of link aggregation • Due to the BPDU guard functionality of the Spanning Tree Protocol • Due to port resetting function of GSRP • The port has been deactivated by unidirectional link failure detection function. • The port has been deactivated by the L2 loop detection functionality. • The port has been deactivated by storm control.
	disable	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown` configuration commands.
<*line type*>	10GBASE-SR	10GBASE-SR
	10GBASE-LR	10GBASE-LR
	10GBASE-ER	10GBASE-ER
	10GBASE-ZR	10GBASE-ZR
	-	The line type is unknown. A dash is displayed in the following cases: • A port is in the `initialize` status. • A port is in the `fault` status. • The transceiver status is not `connect`.
<*MAC address*>	MAC address of the port	
<*type of transceiver*>	XFP	XFP
<*transceiver status*>	connect	Installed
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. A dash is displayed in the following cases: • A port is in the `initialize` status. • A port is in the `fault` status.

Table 17-9: Detailed information and statistics about 10GBASE-R interfaces

Item	Displayed information	
	Detailed information	**Meaning**
Time-since-last-status-change	Displays the elapsed time since the last change in status. *hh*:*mm*:*ss* (when the elapsed time is 24 hours or less: *hh* = hours, *mm* = minutes, *ss* = seconds) *dd*.*hh*:*mm*:*ss* (when the elapsed time is more than 24 hours: *dd* = number of days, *hh* = hours, *mm* = minutes, *ss* = seconds) `Over 100 days` (when the elapsed time is more than 100 days)	

Item	Displayed information	
	Detailed information	Meaning
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out:<*average bandwidth used on sending side*>Mbps	Displays the average bandwidth (in Mbps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in:<*average bandwidth used on receiving side*>Mbps	Displays the average bandwidth (in Mbps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak out	Displays the maximum bandwidth used on the sending side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak in	Displays the maximum bandwidth used on the receiving side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate[#1]	Displays the send throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate[#1]	Displays the receive throughput of the line (in bps and pps) for the 1 second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send[#2]	on	A pause packet is sent.
	off	A pause packet is not sent.
Flow control receive[#2]	on	A pause packet is received.
	off	A pause packet is not received.
TPID	Displays a `TagProtocolIDentifier` value that is used on the port to identify the VLAN.	

Item		Displayed information	
		Detailed information	Meaning
Frame size[#3]		Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA and PAD fields. For details about frame formats, see the description of frame formats in *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.	
retry:<*Counts*>		Displays the number of times the port was reactivated due to a fault.[#4]	
Interface name		Displays the name assigned to a port.	
description:<*supplementary explanation*>		Displays the contents of the `description` configuration. The `description` configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the description configuration has not been set.	
Statistics	Category	<*Out octets/packets counter*>	Send statistics
		<*In octets/packets counter*>	Receive statistics
		<*Out line error counter*>	Send error statistics
		<*In line error counter*>	Receive error statistics
		<*Line fault counter*>	Failure statistics
	Detailed statistical items for sending and receiving	Octets	The number of octets The frame length used to calculate the number of octets starts from the DA field in the MAC header and ends with the FCS field (bad packets included).
		Unicast packets	Number of unicast packets Does not include send and receive error statistics.
		Multicast packets	Number of multicast packets Does not include send and receive error statistics. Note that the value increments when pause packets are sent and received.
		Broadcast packets	Number of broadcast packets Does not include send and receive error statistics.
		Pause packets	Number of pause packets. Sending side: The value increments regardless of the send flow control settings. Receiving side: The value increments only when the receive flow control settings are specified to receive pause packets.
		64 packets	The number of packets whose frame length is 64 octets.[#5] Includes send and receive error statistics.
		65-127 packets	The number of packets whose frame length is from 65 to 127 octets.[#5] Includes send and receive error statistics.

Item		Displayed information	
		Detailed information	Meaning
		128-255 packets	The number of packets whose frame length is from 128 to 255 octets.[#5] Includes send and receive error statistics.
		256-511 packets	The number of packets whose frame length is from 256 to 511 octets.[#5] Includes send and receive error statistics.
		512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets.[#5] Includes send and receive error statistics.
		1024-1518 packets	The number of packets whose frame length is 1024 or more octets.[#5] Includes send and receive error statistics (`Jabber` and `Long frames` are excluded).
	Detailed statistical items for send errors	Underrun/Overrun	The number of underrun and overrun errors that occurred
		Error frames	The total number of frames discarded due to errors
	Detailed statistical items for receive errors	CRC errors	The number of times the frame length was valid but an error was detected by the FCS check[#5]
		Alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#5]
		Fragments	The number of times a short frame (whose length is shorter than 64 octets) is received and an FCS error or an alignment error occurred[#5]
		Jabber	The number of times a long frame (whose length exceeds the max frame length) was received and an FCS error or an alignment error occurred[#5]
		Underrun/Overrun	The number of underrun and overrun errors that occurred
		Symbol errors	The number of symbol errors that occurred
		Short frames	The number of received packets that are shorter than the frame length[#5]
		Long frames	The number of received packets that exceed the frame length[#5]
		Error frames	The total number of frames discarded due to errors (total value of the following items: `Short frames`, `Fragments`, `Jabber`, `CRC errors`, `Long frames`, `Symbol errors`, `Underrun/Overrun`)

Item		Displayed information	
		Detailed information	Meaning
	Detailed statistical items for errors	Signal detect errors	The number of times a signal line could not be detected
		HI_BER	The number of HI_BER (High Bit Error Rate) errors that occurred
		Transceiver notconnect	The number of times a transceiver was disconnected
		LF	The number of LF (Local Fault) errors that occurred
		LOS of sync	The number of synchronization errors that occurred
		RF	The number of RF (Remote Fault) errors that occurred
		Signal detect errors in operational state	The number of failures that occurred during communication (signal line was not detected)
		Transceiver notconnect in operational state	The number of failures that occurred during communication (transceiver was removed)
		LOS of sync in operational state	The number of failures (synchronization errors) that occurred during communication
		HI_BER in operational state	The number of failures (HI_BER errors) that occurred during communication
		LF in operational state	The number of failures (LF errors) that occurred during communication
		RF in operational state	The number of failures (RF errors) that occurred during communication

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the unit is K and one digit is displayed below the decimal point. If the displayed value is 10000 K or larger, the unit is M and one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is either `active up` or `test`.

#3: This item is always `-` except when the status of the port is either `active up` or `test`.

#4: The number of times the port was reactivated due to a fault is initialized every one hour.

#5: The frame length indicates the length starting from the MAC header and ending with the FCS field.

For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

Impact on communication

None

Response messages

Table 17-10: List of response messages for the show interfaces (Ethernet) command

Message	Description
<*nif no.*>/<*port no.*> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/ 1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
`NIF` <*nif no.*> `is notconnected.`	The specified NIF is not installed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
`NIF` <*nif no.*> `that controls Port` <*port no.*> `is inactive.`	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
No operational Port.	There are no available ports. Make sure the specified parameter is correct.

Notes

- To display only the NIF information and the line summary information, execute the `show nif` command.
- All display items are cleared in the following cases:
  - A NIF is restarted.
  - A NIF hardware failure occurs.
  - After the `inactivate nif` command is used to deactivate a NIF, the `activate nif` command is used to re-activate the NIF.
  - After the `no power enable` or `schedule-power-control shutdown` configuration command is used to disable a NIF, the `power enable` or `no schedule-power-control shutdown` configuration command is used to re-enable the NIF.
  - The `restart vlan` command is executed.
  - An error occurs in the network interface management program (nimd).

clear counters

Clears the Ethernet statistics counters to zero.

Syntax

```
clear counters
clear counters {gigabitethernet | tengigabitethernet} <nif no.>/<port no.>
```

Input mode

User mode and administrator mode

Parameters

{gigabitethernet | tengigabitethernet}

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

Operation when all parameters are omitted:

The statistics counters of all Ethernet interfaces are cleared to zero.

Example and display items

None

Impact on communication

None

Response messages

Table 17-11: List of response messages for the clear counters (Ethernet) command

Message	Description
<nif no.>/<port no.> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/ 1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
<nif no.>/<port no.> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- *<nif no.>*.	The NIF number is outside the valid range. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number.

Message	Description
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
`NIF` <*nif no.*> `is notconnected.`	The specified NIF is not installed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
`NIF` <*nif no.*> `that controls Port` <*port no.*> `is inactive.`	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
No operational Port.	There are no available ports. Make sure the specified parameter is correct.

Notes

- Even if the statistics counter is cleared to zero, the value of the MIB information obtained by using SNMP is not cleared to zero.
- The following information items displayed by the `show interfaces` command are cleared to zero:
  - Send and receive statistics
  - Send error statistics
  - Receive error statistics
  - Failure statistics
- All display items are cleared in the following cases:
  - A NIF is restarted.
  - A NIF hardware failure occurs.
  - After the `inactivate nif` command is used to deactivate a NIF, the `activate nif` command is used to re-activate the NIF.
  - After the `no power enable` or `schedule-power-control shutdown` configuration command is used to disable a NIF, the `power enable` or `no schedule-power-control shutdown` configuration command is used to re-enable the NIF.
  - The `restart vlan` command is executed.
  - An error occurs in the network interface management program (nimd).

show port

Lists information about the Ethernet ports implemented on the device.

Syntax

```
show port [<port list>]
show port protocol [<port list>]
show port statistics [<port list>] [{ up | down }] [discard]
show port transceiver [<port list>] [detail]
show port vlan [<port list>] [{ access | trunk | protocol | mac | tunnel }]
```

Input mode

User mode and administrator mode

Parameters

<port list>

Lists information about the port numbers specified for Ethernet ports in list format. For details about how to specify *<port list>* and the specifiable range of values, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the Ethernet information for all ports in list format.

protocol

Displays the protocol information of the port.

statistics

Displays the number of sent, received, and discarded packets for ports implemented on the device.

{ up | down }

up

Displays information for ports whose status is `up`.

down

Displays information for ports whose status is not `up`. The statuses other than `up` are as follows:

- `down`: A line failure has occurred.
- `init`: Initialization or auto-negotiation is in progress.
- `test`: A line test is in progress.
- `fault`: A fault has occurred.
- `inact`: Operation has been stopped by the `inactivate` command.
- `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown` configuration command.

Operation when this parameter is omitted:

Information is displayed with no conditions applied.

discard

Displays only the information for ports on which the number of discarded packets is 1 or more.

Operation when this parameter is omitted:

Information is displayed with no conditions applied.

transceiver

Lists information about whether transceivers are installed on ports that can use removable transceivers and provides type and identification information.

This command allows you to check the identification information of each transceiver.

For AX6700S and AX6600S series switches, for a port that can be used as either a 10BASE-T/100BASE-TX/1000BASE-T port or a 1000BASE-X port, information about the 1000BASE-X (SFP) port is displayed even if `rj45` is specified by using the `media-type` configuration command.

detail

Displays detailed information about transceivers.

Operation when this parameter is omitted:

Normal information about transceivers is displayed.

vlan

Displays VLAN information for ports.

{ access | trunk | protocol | mac | tunnel }

Specifies one of the above keywords as the type of port for which information is to be displayed.

access

Displays VLAN information for access ports.

trunk

Displays VLAN information for trunk ports.

protocol

Displays VLAN information for protocol ports.

mac

Displays VLAN information for MAC ports.

tunnel

Displays VLAN information for tunneling ports.

Operation when this parameter is omitted:

Displays information for all kinds of ports.

Operation when all parameters are omitted:

Lists information for all implemented Ethernet ports.

Example 1

Figure 17-7: Example of listing link information for ports

```
>show port
Date 2009/02/10 11:23:29 UTC
Port Counts: 24
Port  Name           Status   Speed         Duplex     FCtl  FrLen  ChGr/Status
 1/ 1 geth1/1        up       1000BASE-SX   full(auto) off   1518   -/-
 1/ 2 geth1/2        up       1000BASE-SX   full       on    1518   -/-
 1/ 3 geth1/3        dis      1000BASE-SX   full(auto) -     -      -/-
 1/ 4 geth1/4        inact    1000BASE-SX   full(auto) -     -      -/-
```

```
 1/ 5 geth1/5        test     1000BASE-SX   full(auto) off   1518   -/-
 1/ 6 geth1/6        up       1000BASE-SX   full(auto) off   9596   -/-
 1/ 7 geth1/7        down     1000BASE-SX   full(auto) -     -      -/-
 1/ 8 geth1/8        inact    -             -          -     -      -/-
 1/ 9 geth1/9        up       1000BASE-SX   full(auto) off   1518  10/up
 1/10 geth1/10       up       1000BASE-SX   full(auto) off   1518  10/up
 1/11 geth1/11       up       1000BASE-SX   full(auto) off   1518  11/down
 1/12 geth1/12       up       1000BASE-SX   full(auto) off   1518  11/down
 1/13 geth1/13       up       1000BASE-SX   full(auto) off   1518  12/dis
 1/14 geth1/14       down     -             -          -     -      -/-
 1/15 geth1/15       down     -             -          -     -      -/-
 1/16 geth1/16       down     -             -          -     -      -/-
 1/17 geth1/17       down     -             -          -     -      -/-
 1/18 geth1/18       down     -             -          -     -      -/-
 1/19 geth1/19       down     -             -          -     -      -/-
 1/20 geth1/20       down     -             -          -     -      -/-
 1/21 geth1/21       down     -             -          -     -      -/-
 1/22 geth1/22       down     -             -          -     -      -/-
 1/23 geth1/23       down     -             -          -     -      -/-
 1/24 geth1/24       down     -             -          -     -      -/-
>
```

Display items in Example 1

Table 17-12: Display of the link information list for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Name	Port name	The name assigned to a port is displayed.
Status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `init`: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating) `test`: During line test `fault`: Failed `inact`: Operation has been stopped by the `inactivate` command. - The standby link functionality of link aggregation - The BPDU guard functionality of the Spanning Tree Protocol - Port resetting of GSRP - The port has been deactivated by the unidirectional link failure detection functionality. - The port has been deactivated by the L2 loop detection functionality. - The port has been deactivated by storm control. `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown` configuration command.

Item	Meaning	Displayed information
Speed	Line speed	10BASE-T: 10BASE-T 100BASE-TX: 100BASE-TX 1000BASE-T: 1000BASE-T 1000BASE-LX: 1000BASE-LX 1000BASE-SX: 1000BASE-SX 1000BASE-SX2: 1000BASE-SX2 1000BASE-LH: 1000BASE-LH 1000BASE-BX10-D: 1000BASE-BX10-D 1000BASE-BX10-U: 1000BASE-BX10-U 1000BASE-BX40-D: 1000BASE-BX40-D 1000BASE-BX40-U: 1000BASE-BX40-U 1000BASE-LHB: 1000BASE-LHB 10GBASE-SR: 10GBASE-SR 10GBASE-LR: 10GBASE-LR 10GBASE-ER: 10GBASE-ER 10GBASE-ZR: 10GBASE-ZR -: The speed is unknown (If auto-negotiation is enabled for a 10BASE-T/100BASE-TX/1000BASE-T port and `Status` is neither `up` nor `test`, if `Status` is `init` or `fault`, or if the transceiver status is not `connect`, a hyphen (-) is displayed.)
Duplex	Full duplex/half duplex	`full`: Full duplex `full(auto)`: Full duplex (resulting from auto-negotiation) `half`: Half duplex `half(auto)`: Half duplex (resulting from auto-negotiation) -: The duplex mode is unknown (If auto-negotiation is enabled for a 10BASE-T/100BASE-TX/1000BASE-T port and `Status` is neither `up` nor `test`, if `Status` is `init` or `fault`, or if the transceiver status is not `connect`, a hyphen (-) is displayed.)
FCtl	Flow control	`on`: Flow control is enabled. `off`: Flow control is disabled. `-`: `Status` is neither `up` nor `test`.
FrLen	Maximum frame length	Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA/PAD field. For details about frame formats, see the description of frame formats in *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*. `-`: `Status` is neither `up` nor `test`.
ChGr /Status	Channel group and status	The channel group to which the port belongs and the status. Channel group number `up`: Data packets can be sent and received. `down`: Data packets cannot be sent or received. `dis`: Link aggregation is disabled. For a port that does not belong to link aggregation, `-/-` is displayed.

Example 2

Figure 17-8: Example of listing protocol information for ports

```
> show port protocol
Date 2007/01/26 17:01:40 UTC
Port Counts: 24
```

```
Port  Name          Type        VLAN  STP   QoS Filter MACTbl    Ext.
 1/ 1 geth1/1       Trunk          1    1     0      0      0    - - - - - -
 1/ 2 geth1/2       Trunk       1024  250   100    100      7    - - - - - -
 1/ 3 geth1/3       Trunk        256  200     0      0      0    - - - - - -
 1/ 4 geth1/4       Protocol      16    0     1      1      0    - - - - - -
 1/ 5 geth1/5       Access         1    0     0      0      0    - - - - - -
 1/ 6 geth1/6       Access         1    0     0      0      0    - - - - - -
 1/ 7 geth1/7       Access      1000  100     0      0      0    - - - - - -
 1/ 8 geth1/8       Access         1    0     0      0      0    - - - - - -
 1/ 9 geth1/9       Access         1    0     0      0      0    - - - - - -
 1/10 geth1/10      Access         1    0     0      0      0    - - - - - -
 1/11 geth1/11      Access         1    0     0      0      0    - - - - - -
 1/12 geth1/12      Trunk       4000    0     1      1   8000    - - T L - -
 1/13 geth1/13      Trunk       4000    0     1      1      3    - - T L - -
 1/14 geth1/14      Trunk       4000    0     1      1      0    - - T L - -
 1/15 geth1/15      Access         1    0     0      0      0    - - T L - -
 1/16 geth1/16      Access         1    0     0      0      0    - - - - - -
 1/17 geth1/17      Access         1    0     0      0      0    - - - - - -
 1/18 geth1/18      Access         1    0     0      0      0    - - - - - -
 1/19 geth1/19      Access         1    0     0      0      0    - - - - O -
 1/20 geth1/20      Access         1    0     0      0      0    - - - - - -
 1/21 geth1/21      Access         1    0     0      0      0    - - - - - -
 1/22 geth1/22      Access         1    0     0      0      0    - - - - - -
 1/23 geth1/23      Access         1    0     0      0      0    - - - - - -
 1/24 geth1/24      Access         1    0     0      0      0    - - - - - -
>
```

Display items in Example 2

Table 17-13: Display of the protocol information list for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Name	Port name	The name assigned to a port is displayed.
Type	Port type	`Protocol`: Protocol VLAN port `Trunk`: Trunk port `Access`: Access port `MAC`: MAC VLAN port `Tunnel`: Tunneling port
VLAN	Number of VLANs that share the port	Number of VLANs that share the port (including the default VLAN and VLANs in `suspend` status.)
STP	The number used in the Spanning Tree topology calculation	When `single` is used: 1 When `pvst+` is used: The number of VLANs set by `pvst+` When `mstp` is used: The number of instances (When `single` and `pvst+` are mixed, the number of VLANs set by `pvst+` + 1)
QoS	The number of QoS flow lists	Displays the number of QoS flow lists set for the port. This number includes the number of QoS flow lists set for the VLAN to which the port belongs.
Filter	The number of access lists	Displays the number of access lists set for the port. This number includes the number of access lists set for the VLAN to which the port belongs. Note that this value does not include the number of implicitly discarded access lists.
MACTbl	The number of dynamically learned entries in mac-address-table	The number of dynamically learned mac-address-table entries

Item	Meaning	Displayed information
Ext.	Extended functionality information	S: Indicates that storm control information is set. T: Indicates that tag translation is set. L: Indicates that LLDP is running. O: Indicates that OADP is running. A: Indicates that the Ring Protocol is running. - is displayed if the relevant extended functionality is not set or is not running.

Example 3

Figure 17-9: Example of displaying the number of sent, received, and discarded packets for ports

```
> show port statistics
Date 2006/03/23 12:00:00 UTC
Port Counts: 24
Port  Name          Status T/R      Unicast   Multicast   Broadcast     Discard
 1/ 1 geth1/1        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 2 geth1/2        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 3 geth1/3        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 4 geth1/4        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 5 geth1/5        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 6 geth1/6        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 7 geth1/7        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 8 geth1/8        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/ 9 geth1/9        down   Tx            0           0           0           0
                             Rx            0           0           0           0
 1/10 geth1/10       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/11 geth1/11       dis    Tx            0           0           0           0
                             Rx            0           0           0           0
 1/12 geth1/12       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/13 geth1/13       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/14 geth1/14       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/15 geth1/15       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/16 geth1/16       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/17 geth1/17       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/18 geth1/18       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/19 geth1/19       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/20 geth1/20       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/21 geth1/21       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/22 geth1/22       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/23 geth1/23       inact  Tx            0           0           0           0
                             Rx            0           0           0           0
 1/24 geth1/24       inact  Tx            0           0           0           0
```

```
                                   Rx              0            0            0            0
>
```

Display items in Example 3

Table 17-14: Display of the number of sent, received, and discarded packets for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Name	Port name	The name assigned to a port is displayed.
Status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `init`: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating). `test`: During line test `fault`: Failed `inact`: Operation has been stopped by the `inactivate` command. - The standby link functionality of link aggregation - The BPDU guard functionality of the Spanning Tree Protocol - Port resetting of GSRP - The port has been deactivated by the unidirectional link failure detection functionality. - The port has been deactivated by the L2 loop detection functionality. - The port has been deactivated by storm control. `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown` configuration command.
T/R	Receiving/sending	`Tx`: Sending `Rx`: Receiving
Unicast	The number of unicast packets (excluding discarded ones)	
Multicast	The number of multicast packets (excluding discarded ones) Note that the value increments when pause packets are sent and received. However, for the following NIFs, the value does not increment: • NK1GS-8M • NH1G-16S • NH1G-48T • NH1GS-6M	
Broadcast	The number of broadcast packets (excluding discarded ones)	
Discard	Number of discarded packets	

Example 4

Figure 17-10: Example of listing transceiver information

```
> show port transceiver
Date 2006/03/23 12:00:00 UTC
Port Counts: 16
Port: 1/ 1 Status:connect  Type:SFP  Speed:1000BASE-SX
           Vendor name:xxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxx
           Vendor PN  :xxxxxxxxxxxxxxx      Vendor rev:xxxx
Port: 1/ 2 Status:notconnect  Type:SFP  Speed:-
           Vendor name:-                    Vendor SN :-
           Vendor PN  :-                    Vendor rev:-
Port: 1/ 3 Status:not support  Type:SFP  Speed:-
```

```
           Vendor name:-                    Vendor SN :-
           Vendor PN  :-                    Vendor rev:-
Port: 1/ 4 Status:connect  Type:SFP  Speed:1000BASE-SX
           Vendor name:xxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxx
           Vendor PN  :xxxxxxxxxxxxxxx      Vendor rev:xxxx

(data omitted)

>
```

Example 5

Figure 17-11: Example of listing detailed transceiver information

```
> show port transceiver detail
Date 2009/10/08 12:00:00 UTC
Port Counts: 16
Port: 1/ 1 Status:connect  Type:SFP  Speed:1000BASE-SX
           Vendor name:xxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxx
           Vendor PN  :xxxxxxxxxxxxxxx      Vendor rev:xxxx
           Tx power   :-4.7dBm              Rx power  :-40.0dBm
Port: 1/ 2 Status:notconnect  Type:SFP  Speed:-
           Vendor name:-                    Vendor SN :-
           Vendor PN  :-                    Vendor rev:-
           Tx power   :-                    Rx power  :-
Port: 1/ 3 Status:not support  Type:SFP  Speed:-
           Vendor name:-                    Vendor SN :-
           Vendor PN  :-                    Vendor rev:-
           Tx power   :-                    Rx power  :-
Port: 1/ 4 Status:connect  Type:SFP  Speed:1000BASE-SX
           Vendor name:xxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxx
           Vendor PN  :xxxxxxxxxxxxxxx      Vendor rev:xxxx
           Tx power   :-4.7dBm              Rx power  :-40.0dBm
```

Display items in Example 4 and 5

Table 17-15: Display of the transceiver information list

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Status	Status of the transceiver	`connect`: A transceiver is installed. `notconnect`: Not installed `not support`: An unsupported transceiver is installed. `fault`: Failed `-`: The status of the transceiver is unknown (`-` is displayed if the port status is `init` or `fault`).
Type	Type of transceiver	SFP:SFP XFP:XFP

Item	Meaning	Displayed information
Speed	Line speed	10BASE-T/100BASE-TX/1000BASE-T: 10BASE-T/100BASE-TX/1000BASE-T 1000BASE-LX: 1000BASE-LX 1000BASE-SX: 1000BASE-SX 1000BASE-SX2: 1000BASE-SX2 1000BASE-LH: 1000BASE-LH 1000BASE-BX10-D: 1000BASE-BX10-D 1000BASE-BX10-U: 1000BASE-BX10-U 1000BASE-BX40-D: 1000BASE-BX40-D 1000BASE-BX40-U: 1000BASE-BX40-U 1000BASE-LHB: 1000BASE-LHB 10GBASE-SR: 10GBASE-SR 10GBASE-LR: 10GBASE-LR 10GBASE-ER: 10GBASE-ER 10GBASE-ZR: 10GBASE-ZR `-`: Unknown line speed (`-` is displayed if the port status is `init` or `fault`, or if the transceiver state is not `connect`).
Vendor name	Vendor name	Displays the vendor's name.#1#2
Vendor SN	Vendor serial number	Displays the serial number added by the vendor.#1#2
Vendor PN	Vendor part number	Displays the part number added by the vendor.#1#2
Vendor rev	Vendor revision	Displays a part number revision added by the vendor.#1#2
Tx power	Sending optical power	Displays the sending optical power in dBm.#1#2#3#4
Rx power	Receiving optical power	Displays the receiving optical power in dBm.#1#2#3#4

#1: `-` is displayed if the transceiver status is neither `connect` nor `fault`.

#2: `****` is displayed while transceiver information is being loaded even if the transceiver status is neither `connect` nor `fault`. Information is displayed when you re-execute the command. If transceiver information could not be loaded, a hyphen (`-`) is displayed.

#3: If the optical power is outside the range from -40 to 8.2 dBm, a hyphen (`-`) is displayed.

#4: An error might arise depending on the ambient conditions. For checking the correct value, use an optical power meter.

Example 6

Figure 17-12: Example of listing VLAN information for ports

```
> show port vlan
Date 2007/11/15 14:15:00
Port Counts: 13
Port  Name             Status Type       VLAN
 1/ 1 geth1/1          up     Protocol   100,1100-1103
 1/ 2 geth1/2          up     Mac        200,1200,1204,1205
 1/ 3 geth1/3          up     Trunk      1-4095
 1/ 4 geth1/4          up     Trunk      1,3,5,7,9,11,13,15,17,19,21,23,25,27,
                                         29,31,33,35,37,39,41,43,45,47,49,120,
                                         130,140
 1/ 5 geth1/5          up     Access     100  (Global IP Network VLAN)
 1/ 6 geth1/6          down   Access     100  (Global IP Network VLAN)
 1/ 7 geth1/7          down   Access     100  (Global IP Network VLAN)
 1/ 8 geth1/8          up     Access     1    (DefaultVLAN)
 1/ 9 geth1/9          up     Access     1    (DefaultVLAN)
 1/10 geth1/10         up     Access     1    (DefaultVLAN)
 1/11 geth1/11         up     Access     1    (DefaultVLAN)
 1/12 geth1/12         up     Access     1    (DefaultVLAN)
 2/ 1 tengeth2/1       up     Access     1    (DefaultVLAN)
```

Figure 17-13: Example of listing VLAN information for trunk ports

```
> show port vlan trunk
Date 2007/11/15 14:15:00
Port Counts: 2
Port  Name             Status Type       VLAN
 1/ 3 geth1/3          up     Trunk      1-4095
 1/ 4 geth1/4          up     Trunk      1,3,5,7,9,11,13,15,17,19,21,23,25,27,
                                         29,31,33,35,37,39,41,43,45,47,49,120,
                                         130,140
```

Display items in Example 6

Table 17-16: Description of displayed items (VLAN information for ports)

Item	Meaning	Displayed information
Port counts	Number of target ports	--
Port	Port number	The NIF number and the port number of the port whose information is to be displayed
Name	Model name	The name assigned to a port
Status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `init`: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating). `test`: During line test `fault`: Failed `inact`: Operation has been stopped by the `inactivate` command. - The standby link functionality of link aggregation - The BPDU guard functionality of the Spanning Tree Protocol - Port resetting of GSRP - The port has been deactivated by the unidirectional link failure detection functionality. - The port has been deactivated by the L2 loop detection functionality. - The port has been deactivated by storm control. `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown` configuration command.
Type	Port type	`Access`: Access port `Trunk`: Trunk port `Protocol`: Protocol VLAN port `Mac`: MAC VLAN port `Tunnel`: Tunneling port
VLAN	VLAN ID	The list of VLANs set for a port. If only one VLAN has been set, the VLAN name is also displayed. If no VLAN exists, a hyphen (-) is displayed.

Impact on communication

None

Response messages

Table 17-17: List of response messages for the show port command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
Connection failed to Link Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Connection failed to LLDP.	Communication with the LLDP program failed. Re-execute the command. If the failure occurs frequently, use the `restart lldp` command to restart the LLDP program.
Connection failed to OADP.	Communication with the OADP program failed. Re-execute the command. If the failure occurs frequently, use the `restart oadp` command to restart the OADP program.
Connection failed to Ring Protocol.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.
Connection failed to Spanning Tree.	Communication with the `Spanning Tree` program failed. Re-execute the command. If this message is output frequently, execute the `restart spanning-tree` command to restart the `Spanning Tree` program.
No operational Port.	There are no available ports. Make sure the specified parameter is correct.

Notes

- The displayed number of discarded packets is the total of the values for the items listed in the following table.

  Table 17-18: Statistical items used for calculating the number of discarded packets

Port	Statistical item	
	Sending	Receiving
Ethernet	Late collision Excessive collisions Carrier sense lost Excessive deferral Underrun Underrun/Overrun	CRC errors Alignment Fragments Jabber Overrun Underrun/Overrun Symbol errors Short frames Long frames

- The statistic counter is cleared in the following cases:
  - A NIF is restarted.

  - A NIF hardware failure occurs.
  - After the `inactivate nif` command is used to deactivate a NIF, the `activate nif` command is used to re-activate the NIF.
  - After the `no power enable` or `schedule-power-control shutdown` configuration command is used to disable a NIF, the `power enable` or `no schedule-power-control shutdown` configuration command is used to re-enable the NIF.
  - The `clear counters` command is executed
  - The `restart vlan` command is executed.
  - An error occurs in the network interface management program (nimd).
- The execution results of this command are displayed only for the lines of a NIF whose status is `Active`. The command execution results are not displayed for lines of a NIF whose status is not `Active`.

activate

Returns the status of the Ethernet port to `active` from `inactive` when the `inactivate` command has been used to set `inactive`.

Syntax

`activate {gigabitethernet | tengigabitethernet}` *<nif no.>/<port no.>*

Input mode

User mode and administrator mode

Parameters

{gigabitethernet | tengigabitethernet}

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

Example

In the following example, the status of the port whose NIF number is 1 and port number is 1 is reset to `active`.

```
activate gigabitethernet 1/1
```

Display items

None

Impact on communication

Yes

Response messages

Table 17-19: List of response messages for the activate command

Message	Description
<nif no.>/<port no.> is already active.	The specified port is already `active`. The command does not need to be executed if you correctly specified the port. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
<nif no.>/<port no.> is already initializing.	The specified port is already being initialized. The command does not need to be executed if you correctly specified the port. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
<nif no.>/<port no.> is disabled.	The specified port is in `disable` status due to the configuration. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.

Message	Description
<*nif no.*>/<*port no.*> is failed.	A failure has occurred or a line test is being conducted on the specified port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Port number
Line test executing.	A line test is being conducted. To change the status of the specified port to `inactive`, cancel the line test, and then re-execute the command (for details about canceling a line test, see *no test interfaces*.
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
NIF <*nif no.*> that controls Port <*port no.*> is disabled.	The NIF that controls the specified port is in `disable` status due to configuration. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is failed.	The NIF that controls the specified port has failed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is inactive.	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is initializing.	The NIF that controls the specified port is being initialized. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is standby.	The NIF that controls the specified port is in standby status. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.

Message	Description
No operational Port <*port no.*>.	The specified port is not in a state in which commands can be executed. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.

Notes

Executing this command does not change the configuration.

inactivate

Changes the status of an Ethernet port from `active` to `inactive` without changing the configuration. As a result, power to the port is cut.

Syntax

`inactivate {gigabitethernet | tengigabitethernet}` *<nif no.>/<port no.>*

Input mode

User mode and administrator mode

Parameters

{gigabitethernet | tengigabitethernet}

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

Example

In the following example, the status of the port whose NIF number is 1 and port number is 1 is changed to `inactive`.

```
inactivate gigabitethernet 1/1
```

Display items

None

Impact on communication

Yes

Response messages

Table 17-20: List of response messages for the inactivate command

Message	Description
<nif no.>/<port no.> is already inactive.	The specified port is already `inactive`. The command does not need to be executed if you correctly specified the port. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
<nif no.>/<port no.> is disabled.	The specified port is in `disable` status due to the configuration. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.
<nif no.>/<port no.> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. *<nif no.>*: Indicates the NIF number. *<port no.>*: Indicates the port number.

Message	Description
<*nif no.*>/<*port no.*> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
Line test executing.	A line test is being conducted. To change the status of the specified port to `inactive`, cancel the line test, and then re-execute the command (for details about canceling a line test, see *no test interfaces*.
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
NIF <*nif no.*> that controls Port <*port no.*> is disabled.	The NIF that controls the specified port is in `disable` status due to configuration. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is failed.	The NIF that controls the specified port has failed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is inactive.	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is initializing.	The NIF that controls the specified port is being initialized. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is standby.	The NIF that controls the specified port is in standby status. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
No operational Port <*port no.*>.	The specified port is not in a state in which commands can be executed. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.

Notes

- Executing this command does not change the configuration.
- If the device is restarted after command execution, the `inactive` status is canceled.
- To re-activate an Ethernet port that has been inactivated by this command, use the `activate`

command.

- This command cannot be executed for a line being tested, as well as the higher-level NIF and the lower-level port. Before executing the command, make sure you execute the `no test interfaces` command to stop the line test.
- This command cannot be executed for a port for which a line test is being conducted. Before executing the command, make sure you use the `no test interfaces` command to stop the line test.

test interfaces

If an error occurs in communication over an Ethernet network, this command can be used to identify the faulty part. After the faulty part (such as a cable) has been replaced, this command can also be used to verify operation (conduct a line test) on a frame basis.

Before you conduct a line test, make sure you use the `inactivate` command to change the status of the port to `inactive`. For details about line tests, see the *Troubleshooting Guide*.

Syntax

```
test interfaces gigabitethernet <nif no.>/<port no.> {internal | connector}
     [auto_negotiation {10base-t | 100base-tx | 1000base-t}]
     [interval <interval time>] [pattern <test pattern no.>]
     [length <data length>]
test interfaces tengigabitethernet <nif no.>/<port no.> {internal | connector}
     [interval <interval time>] [pattern <test pattern no.>]
     [length <data length>]
```

Input mode

User mode and administrator mode

Parameters

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

internal

Specifies that an internal loopback test will be conducted.

connector

Specifies that a loop connector loopback test will be conducted.

Before you conduct a loop connector loopback test, make sure that the loop connector has been connected.

auto_negotiation {10base-t | 100base-tx | 1000base-t}

Specifies the segment standard that will be used for a line test conducted when `auto` is specified in the `speed` configuration command.

Note that this parameter can be specified only when `auto` is specified in the `speed` command. Also note that this parameter can be specified only when the line type is 10BASE-T/100BASE-TX/1000BASE-T.

Operation when this parameter is omitted:

The command assumes that `100base-tx` is specified.

interval *<interval time>*

Specifies the number of seconds as the sending interval. You can specify a decimal number from 1 to 30.

Operation when this parameter is omitted:

The sending interval defaults to 1 second.

pattern <*test pattern no.*>

Specifies the number of the test pattern. You can specify a value from 0 to 4.

`0`: Repeats using test patterns 1 to 4.

`1`: all 0xff

`2`: all 0x00

`3`:

`** THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG.0123456789 **` pattern repeated

`4`: Send a data corruption detection pattern.

Operation when this parameter is omitted:

Test pattern `3` is used.

length <*data length*>

Specifies in octets the data length of the frame (excluding the MAC header and the FCS field) to be used for the test. For the value that you can specify, see the following table.

Table 17-21: Specifiable range of values for each test

#	Test	Data length (in octets)	Default (in octets)
1	Internal loopback test	46 to 1500	500
2	Loop connector loopback test	46 to 9582#	500

#: If `10base-t` is specified for the `auto_negotiation` parameter, a value from 46 to 1500 can be specified.

Operation when all parameters are omitted:

Operation proceeds as described for each Operation when this parameter is omitted section.

Example

The following figure shows an example of the screen displayed at the start of an Ethernet line test. This example starts an internal loopback test that sends a 100-octet frame in the all-0xff test pattern at five-second intervals to the port with a NIF number of `1` and a port number of `2`.

Figure 17-14: Example of a screen displayed at the start of a line test

```
> test interfaces gigabitethernet 1/2 internal interval 5 pattern 1 length 100
```

Display items

None

Impact on communication

Yes

Response messages

Table 17-22: List of response messages for the test interfaces command

Message	Description
<*nif no.*>/<*port no.*> is disabled.	The specified port is in `disable` status due to the configuration. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is failed.	The specified port has failed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
NIF <*nif no.*> that controls Port <*port no.*> is disabled.	The NIF that controls the specified port is in `disable` status due to configuration. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is failed.	The NIF that controls the specified port has failed. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is inactive.	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is initializing.	The NIF that controls the specified port is being initialized. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.

Message	Description
NIF <*nif no.*> that controls Port <*port no.*> is standby.	The NIF that controls the specified port is in standby status. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
No auto negotiation Port <*nif no.*>/<*port no.*>	The specified port is not subject to auto-negotiation. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
No operational Port <*port no.*>.	The specified port is not in a state in which commands can be executed. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
No support auto negotiation parameter.	The specified port does not support auto-negotiation parameters. Make sure the specified parameter is correct.
Test already executing.	A test is already being conducted on the specified port or another port. The command does not need to be executed if you correctly specified the port. Alternatively, stop the test for the other port, and then re-execute the command.

Notes

- Before you insert or remove a loop connector, make sure that the port is in `inactive` status.
- After a line test has started, the test processing is repeated until a request to stop the test is issued.
- To conduct a loop connector loopback test by specifying `1000base-t` for the `auto_negotiation` parameter, an eight-core, four-pair loop connector of category 5 or higher is required.
- Please conduct a line test for each port.
- To conduct a loop connector loopback test on a 1000BASE-LH, 1000BASE-LHB, 10GBASE-ER, or 10GBASE-ZR port, an optical attenuator is required. For details about optical attenuation, see the following table.

  Table 17-23: Optical attenuation

Line type	Attenuation value (dB)
1000BASE-LH	5 to 22
1000BASE-LHB	17 to 36
10GBASE-ER	5 to 11
10GBASE-ZR	15 to 24

- You cannot conduct a loop connector loopback test on a 1000BASE-BX port because the port uses a one-core optical fiber cable to perform both sending and receiving with lights of different wavelengths.
- Before you conduct a line test on a NIF that supports the hierarchical shaper functionality (NK1GS-8M or NH1GS-6M), make sure that a user ID of `1` or `llrlq1` is set for the line.
- When you conduct a line test on a NIF that supports the hierarchical shaper functionality (NK1GS-8M or NH1GS-6M), if you specify a value of 1983 or more octets, only the first 1982 octets are used for the test.

no test interfaces

Stops an Ethernet line test, and displays the test results.

For details about line tests, see the *Troubleshooting Guide*.

Syntax

```
no test interfaces gigabitethernet <nif no.>/<port no.>
no test interfaces tengigabitethernet <nif no.>/<port no.>
```

Input mode

User mode and administrator mode

Parameters

gigabitethernet

Specifies that a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X port will be configured.

tengigabitethernet

Specifies that a 10GBASE-R port will be configured.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

Example 1

- Line test for 10BASE-T/100BASE-TX/1000BASE-T

This example starts an internal loopback test that sends a 100-octet frame in the all-0xff test pattern at five-second intervals to the port with a NIF number of `1` and a port number of `2`. The following figure shows an example of displaying the line test results for a 10BASE-T/100BASE-TX/1000BASE-T Ethernet board.

Figure 17-15: Example of displaying line test results (for 10BASE-T/100BASE-TX/1000BASE-T)

```
>test interfaces gigabitethernet 1/2 internal interval 5 pattern 1 length 100
>no test interfaces gigabitethernet 1/2
Date 2006/03/23 12:00:00 UTC
Interface type             :100BASE-TX
Test count                 :60
Send-OK                    :60             Send-NG                :0
Receive-OK                 :60             Receive-NG             :0
Data compare error         :0              Out underrun           :0
Out buffer hunt error      :0              Out line error         :0
In CRC error               :0              In alignment           :0
In monitor time out        :0              In line error          :0
H/W error                  :none
>
```

Display items in Example 1

Table 17-24: Items displayed as line test results (for 10BASE-T/100BASE-TX/1000BASE-T)

Item	Meaning	Presumed cause	Measures
Interface type	Line type (`10BASE-T`, `100BASE-TX`, `1000BASE-T`, or `----` #1)	--	--

Item	Meaning	Presumed cause	Measures
Test count	Number of times a test was conducted	--	--
Send-OK	Number of times data was sent normally	--	--
Send-NG	Number of times data was sent abnormally	Sum of frames discarded due to a line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
Receive-OK	Number of times data was received normally	--	--
Receive-NG	Number of times data was received abnormally	Sum of the number of times a data compare error occurred and the number of times reception monitoring timed out	See *Data compare error* and subsequent items in this table.
Data compare error	Number of data compare errors (number of received frames that did not match the sent frames)	NIF failure	Replace the NIF.
Out underrun	Number of times an underrun error occurred	NIF failure	Replace the NIF.
Out buffer hunt error	Number of times a send buffer could not be secured	Congestion on another port	Resolve the congestion on the other port, and then try again.
Out line error	Number of send line errors that occurred	NIF failure	Replace the NIF.
In CRC error	The number of times the frame length was valid but an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In monitor time out	Timeout for the reception monitoring timer	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.[#3]
In line error	Number of receive line errors that occurred	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
H/W error	Whether a hardware error has occurred. `none`: No hardware errors have occurred. `occurred`: Hardware errors have occurred.	NIF failure	Replace the NIF.

#1: The line type is unknown. This indication is used in the following cases:

- A line test was stopped immediately after it was started.
- A NIF failure occurred.

#2: The frame length indicates the length starting from the MAC header and ending with the FCS field. For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

#3: If the loop connector is connected correctly, packets for the line test might have accumulated in the device. Make sure that the packet forwarding load on the device on which a line test is being conducted becomes low, and then try again.

Example 2

■ Line test for 1000BASE-X

This example starts an internal loopback test that sends a 100-octet frame in the all-0xff test pattern at five-second intervals to the port with a NIF number of `1` and a port number of `2`. The following figure shows an example of displaying the line test results for a 1000BASE-X Ethernet board.

Figure 17-16: Example of displaying line test results (for 1000BASE-X)

```
>test interfaces gigabitethernet 1/2 internal interval 5 pattern 1 length 100
>no test interfaces gigabitethernet 1/2
Date 2006/03/23 12:00:00 UTC
Interface type             : 1000BASE-LX
Test count                 :60
Send-OK                    :60             Send-NG                :0
Receive-OK                 :60             Receive-NG             :0
Data compare error         :0              Out underrun           :0
Out buffer hunt error      :0              Out line error         :0
In CRC error               :0              In alignment           :0
In overrun                 :0              In monitor time out    :0
In line error              :0              H/W error:  none
>
```

Display items in Example 2

Table 17-25: Items displayed as line test results (for 1000BASE-X)

Item	Meaning	Presumed cause	Measures
Interface type	Line type (`1000BASE-LX`, `1000BASE-SX`, `1000BASE-SX2`, `1000BASE-LH`, `1000BASE-BX10-D`, `1000BASE-BX10-U`, `1000BASE-BX40-D`, `1000BASE-BX40-U`, `1000BASE-LHB`, or `----` #1)	--	--
Test count	Number of times a test was conducted	--	--
Send-OK	Number of times data was sent normally	--	--
Send-NG	Number of times data was sent abnormally	Sum of frames discarded due to a line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
Receive-OK	Number of times data was received normally	--	--

Item	Meaning	Presumed cause	Measures
Receive-NG	Number of times data was received abnormally	Sum of the number of times a data compare error occurred and the number of times reception monitoring timed out	See *Data compare error* and subsequent items in this table.
Data compare error	Number of data compare errors (number of received frames that did not match the sent frames)	NIF failure	Replace the NIF.
Out underrun	Number of times an underrun error occurred	NIF failure	Replace the NIF.
Out buffer hunt error	Number of times a send buffer could not be secured	Congestion on another port	Resolve the congestion on the other port, and then try again.
Out line error	Number of send line errors that occurred	NIF failure	Replace the NIF.
In CRC error	The number of times the frame length was valid but an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In overrun	Number of times an overrun error occurred	NIF failure	Replace the NIF.
In alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In monitor time out	Timeout for the reception monitoring timer	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
In line error	Number of receive line errors that occurred	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
H/W error	Whether a hardware error has occurred. `none`: No hardware errors have occurred. `occurred`: Hardware errors have occurred.	NIF failure	Replace the NIF.

#1: The line type is unknown. This indication is used in the following cases:

- The transceiver status is not `connect`.
- A line test was stopped immediately after it was started.
- A NIF failure occurred.

#2: The frame length indicates the length starting from the MAC header and ending with the FCS field. For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

Example 3

- Line test for 10GBASE-R

This example starts an internal loopback test that sends a 100-octet frame in the all-0xff test pattern at five-second intervals to the port with a NIF number of `1` and a port number of `1`. The following figure shows an example of displaying the line test results for a 10GBASE-R Ethernet board.

Figure 17-17: Example of displaying line test results (for 10GBASE-R)

```
>test interfaces tengigabitethernet 1/1 internal interval 5 pattern 1 length 100
>no test interfaces tengigabitethernet 1/1
Date 2006/03/23 12:00:00 UTC
Interface type             :10GBASE-LR
Test count                 :60
Send-OK                    :60             Send-NG                  :0
Receive-OK                 :60             Receive-NG               :0
Data compare error         :0              Out underrun/overrun     :0
Out buffer hunt error      :0              Out line error           :0
In CRC error               :0              In alignment             :0
In underrun/overrun        :0              In monitor time out      :0
In line error              :0              H/W error                :none
>
```

Display items in Example 3

Table 17-26: Items displayed as line test results (for 10GBASE-R)

Item	Meaning	Presumed cause	Measures
Interface type	Line type (`10GBASE-SR`, `10GBASE-LR`, `10GBASE-ER`, `10GBASE-ZR`, or `----` #1)	--	--
Test count	Number of times a test was conducted	--	--
Send-OK	Number of times data was sent normally	--	--
Send-NG	Number of times data was sent abnormally	Sum of the number of times an underrun or overrun error occurred and the number of times a frame was discarded due to a line error	For a loop connector loopback test, if the number of underrun and overrun errors is not counted, verify that a loopback connector is correctly connected to the port.
Receive-OK	Number of times data was received normally	--	--
Receive-NG	Number of times data was received abnormally	Sum of the number of times a data compare error occurred and the number of times reception monitoring timed out	See Data compare error and subsequent items in this table.
Data compare error	Number of data compare errors (number of received frames that did not match the sent frames)	NIF failure	Replace the NIF.
Out underrun/overrun	Number of times an underrun or overrun error occurred	NIF failure	Replace the NIF.

Item	Meaning	Presumed cause	Measures
Out buffer hunt error	Number of times a send buffer could not be secured	Congestion on another port	Resolve the congestion on the other port, and then try again.
Out line error	Number of send line errors that occurred	NIF failure	Replace the NIF.
In CRC error	The number of times the frame length was valid but an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In underrun/overrun	Number of times an underrun or overrun error occurred	NIF failure	Replace the NIF.
In alignment	The number of times the frame length was invalid and an error was detected by the FCS check[#2]	NIF failure	Replace the NIF.
In monitor time out	Timeout for the reception monitoring timer	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
In line error	Number of receive line errors that occurred	Line error	For a loop connector loopback test, verify that a loopback connector is correctly connected to the port.
H/W error	Whether a hardware error has occurred. `none`: No hardware errors have occurred. `occurred`: Hardware errors have occurred.	NIF failure	Replace the NIF.

#1: The line type is unknown. This indication is used in the following cases:

- The transceiver status is not `connect`.
- A line test was stopped immediately after it was started.
- A NIF failure occurred.

#2: The frame length indicates the length starting from the MAC header and ending with the FCS field. For details about frame formats, see *15.1.3 Control on the MAC and LLC sublayers* in the manual *Configuration Guide Vol. 1 For Version 11.7*.

Impact on communication

None

Response messages

Table 17-27: List of response messages for the no test interfaces command

Message	Description
<*nif no.*>/<*port no.*> is not gigabitethernet.	The specified port is neither a 10BASE-T/100BASE-TX/ 1000BASE-T port nor a 1000BASE-X port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
<*nif no.*>/<*port no.*> is not tengigabitethernet.	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Illegal NIF -- <*nif no.*>.	The NIF number is outside the valid range. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
Illegal Port -- <*port no.*>.	The port number is outside the valid range. Make sure the specified parameter is correct. <*port no.*>: Indicates the port number.
Test not executing.	No line test has been conducted. Make sure the specified parameter is correct.
NIF <*nif no.*> is notconnected.	The specified NIF is not installed, or not used. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number.
NIF <*nif no.*> that controls Port <*port no.*> is disabled.	The NIF that controls the specified port is in `disable` status due to configuration. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.
NIF <*nif no.*> that controls Port <*port no.*> is inactive.	The NIF that controls the specified port is in the `inactive` state. Make sure the specified parameter is correct. <*nif no.*>: Indicates the NIF number. <*port no.*>: Indicates the port number.

Notes

- Before you insert or remove a loop connector, make sure that the port is in `inactive` status.
- When a line test is stopped, depending on the timing, the test might stop while the command is waiting for the response to a test frame that was sent. Therefore, in the displayed test results, the total of `Receive-OK` and `Receive-NG` values could be one smaller than the `Send-OK` value.

Chapter

18. Link Aggregation

show channel-group
show channel-group statistics
clear channel-group statistics lacp
restart link-aggregation
dump protocols link-aggregation

show channel-group

Link aggregation information is displayed.

Syntax

```
show channel-group [{[<channel group list>] [detail] | summary}]
```

Input mode

User mode and administrator mode

Parameters

{[<*channel group list*>] [detail] | summary}

<*channel group list*>

Displays link aggregation information for the channel group numbers specified in list format. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All link aggregation information is displayed.

detail

Displays detailed link aggregation information.

Operation when this parameter is omitted:

Link aggregation information is displayed.

summary

Displays summary information about link aggregation.

Operation when this parameter is omitted:

Complete link aggregation information is displayed.

Example 1

Figure 18-1: Example of displaying information about link aggregation

```
>show channel-group
Date 2006/03/14 12:00:00 UTC
channel-group Counts:4
ChGr:1    Mode:LACP
  CH Status    :Up        Elapsed Time:10:10:39
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  Description : 6 ports aggregated.
  MAC address: 0012.e2ac.8301     VLAN ID:
  Periodic Timer:Short
  Actor   information: System Priority:1     MAC: 0012.e212.ff02
                       KEY:1
  Partner information: System Priority:10000 MAC: 0012.e2f0.69be
                       KEY:10
  Port(6)        :1/1-3,10,12-13
  Up Port(2)     :1/1-2
  Down Port(4)   :1/3,10,12-13
ChGr:11   Mode:LACP
  CH Status    :Down      Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
```

```
  MAC address: 0012.e2ac.830b     VLAN ID:30-35,40
  Periodic Timer:Long
  Actor   information: System Priority:1     MAC: 0012.e212.ff02
                       KEY:11
  Partner information: System Priority:10000 MAC: 0012.e2f0.69bd
                       KEY:20
  Port(3)        :1/4-6
  Up Port(0)     :
  Down Port(3)   :1/4-6
ChGr:21   Mode:Static
  CH Status    :Disabled  Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.8315     VLAN ID:200
  Port(2)        :1/7-8
  Up Port(0)     :
  Down Port(2)   :1/7-8
ChGr:22   Mode:Static
  CH Status    :Up        Elapsed Time:160.11:45:10
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:2  (no-link-down mode)
  Max Detach Port:15
  MAC address: 0012.e2ac.8316     VLAN ID:250
  Port(3)        :1/9,14-15
  Up Port(2)     :1/9,14
  Down Port(1)   :1/15
  Standby Port(1):1/15
>
```

Figure 18-2: Example of displaying the link aggregation information for a specific channel group number

```
>show channel-group 21-30
Date 2006/03/14 12:00:00 UTC
channel-group Counts:2
ChGr:21   Mode:Static
  CH Status    :Disabled  Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.8315     VLAN ID:200
  Port(2)        :1/7-8
  Up Port(0)     :
  Down Port(2)   :1/7-8
ChGr:22   Mode:Static
  CH Status    :Up        Elapsed Time:160.11:45:10
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:2  (no-link-down mode)
  Max Detach Port:15
  MAC address: 0012.e2ac.8316      VLAN ID:250
  Port(3)        :1/9,14-15
  Up Port(2)     :1/9,14
  Down Port(1)   :1/15
  Standby Port(1):1/15
>
```

Display items in Example 1

Table 18-1: Display items for link aggregation information

Item	Meaning	Displayed information
channel-group Counts	Number of channel groups to be displayed	Number of channel groups
ChGr	Channel group number	Channel group number

Item	Meaning	Displayed information
Mode	Link aggregation mode	`LACP`: LACP link aggregation mode
		`Static`: Static link aggregation mode
		`-`: Link aggregation mode is not set.
CH Status	Channel group status	`Up`: Data packets can be sent and received.
		`Down`: Data packets cannot be sent or received.
		`Disabled`: Link aggregation is disabled.
Elapsed Time	Time the channel group has been up	*hh*:*mm*:*ss* (when the elapsed time is less than 24 hours) *ddd*.*hh*:*mm*:*ss* (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days) `-` is displayed when the channel group status is not Up.
Max Active Port	Maximum number of ports used by link aggregation	1 to 16 (16 is displayed as the initial value.) `-` is displayed when link aggregation mode is not set.
	Standby link mode	Standby link link-down mode
		`(link-down mode)`: Link-down mode
		`(no-link-down mode)`: Link-not-down mode
Max Detach Port	Restriction on the number of detached ports	0 or 15 (15 is displayed as the initial value.) `-` is displayed when link aggregation mode is not set.
Load Balance	Distribution method	`MAC-IP-PORT`: Distributes traffic based on the information in frames. `VLAN`: Distributes traffic on a VLAN basis.
Multi Speed	Mixed-speed mode	`Off`: Does not permit a channel group to consist of ports with different transmission speeds. `On`: Permits a channel group to consist of ports with different transmission speeds.
Description	Supplementary explanation regarding the channel group	This item is not displayed if a supplementary explanation has not been set in the configuration.
MAC Address	Channel group's MAC address	The MAC address of the group.
VLAN ID	VLAN ID to which the channel group belongs	VLAN ID
Periodic Time	Sending interval for LACPDU	This item is displayed only when LACP mode is enabled.
		`Short`: The sending interval is 1 second.
		`Long`: The sending interval is 30 seconds.
Actor information	Information about the actor system	Information about the actor system. This item is displayed only when LACP mode is enabled.
System Priority	System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address	The MAC address of the LACP system ID
KEY	Group key	Group key This value is the same as the channel group number.

Item	Meaning	Displayed information
Partner information	Information about the partner system	Information about the partner system. This item is displayed only when LACP mode is enabled. - is displayed if the partner system is not defined for LACP.
System Priority	System priority	Priority of the LACP system ID 0 to 65535 can be specified as the priority value (0 indicates the highest priority).
MAC	MAC address	MAC address
KEY	Group key	0 to 65535
Port(*n*)	Port information of a channel group	*n*: Number of ports NIF number/port number of a channel group
Up Port(*n*)	Information about ports that can be used for sending or receiving in a channel group	*n*: Number of ports that can be used for sending and receiving NIF number/port number of a port that can be used for sending or receiving
Down Port(*n*)	Information about ports that cannot be used for sending or receiving in a channel group	*n*: Number of ports that cannot be used for sending and receiving NIF number/port number of a port that cannot be used for sending or receiving (For a standby link in link-not-down mode, sending is impossible but receiving is possible.)
Standby Port(*n*)	Information about standby ports in a channel group	*n*: Number of standby ports NIF number/port number of a port in a standby state

Example 2

Figure 18-3: Example of displaying summary information about link aggregation

```
>show channel-group summary
Date 2006/03/14 12:00:00 UTC
CH Status            :ChGr ID
Up(2)                :1,22
Down(1)              :11
Disabled(1)          :21
>
```

Display items in Example 2

Table 18-2: Display items for the summary information about link aggregation

Item	Meaning	Displayed information
Up(*n*)	Information about link aggregations in `Up` status	*n*: Number of link aggregations IDs of link aggregations in `Up` status
Down(*n*)	Information about link aggregations in `Down` status	*n*: Number of link aggregations IDs of link aggregations in `Down` status
Disabled(*n*)	Information about link aggregations in `Disabled` status	*n*: Number of link aggregations IDs of link aggregations in `Disabled` status

Example 3

Figure 18-4: Example of displaying detailed information about link aggregation

```
>show channel-group detail
Date 2006/03/14 12:00:00 UTC
channel-group Counts:4
ChGr:1    Mode:LACP
```

```
  CH Status    :Up        Elapsed Time:10:10:39
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  Description : All 100M Full-Duplex
  MAC address: 0012.e2ac.8301     VLAN ID:
  Periodic Timer:Short
  Actor   information: System Priority:1     MAC: 0012.e212.ff02
                       KEY:1
  Partner information: System Priority:10000 MAC: 0012.e2f0.69be
                       KEY:10
  Port Counts:6        Up Port Counts:2
  Port:1/1   Status:Up    Reason:-
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
  Port:1/2   Status:Up    Reason:-
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
  Port:1/3   Status:Down  Reason:LACPDU Expired
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
  Port:1/10  Status:Down  Reason:LACPDU Expired
             Speed: 100M  Duplex:Full  LACP Activity:Passive
             Actor   Priority:128     Partner Priority:100
  Port:1/12  Status:Down  Reason:Partner Aggregation Individual
             Speed: 100M  Duplex:Full  LACP Activity:Passive
             Actor   Priority:128     Partner Priority:100
  Port:1/13  Status:Down  Reason:Synchronization OUT_OF_SYNC
             Speed: 100M  Duplex:Full  LACP Activity:Passive
             Actor   Priority:128     Partner Priority:100
ChGr:11   Mode:LACP
  CH Status    :Down      Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.830b     VLAN ID:30-35,40
  Periodic Timer:Long
  Actor   information: System Priority:1     MAC: 0012.e212.ff02
                       KEY:11
  Partner information: System Priority:10000 MAC: 0012.e2f0.69bd
                       KEY:20
  Port Counts:3        Up Port Counts:0
  Port:1/4   Status:Down    Reason:Port Down
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
  Port:1/5   Status:Down  Reason:Partner Key Unmatch
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
             Unmatched Partner Key:201
  Port:1/6   Status:Down  Reason:Partner System ID Unmatch
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:1
             Unmatched System ID:  Priority:5000   MAC:0012.e2f0.69ba
ChGr:21   Mode:Static
  CH Status    :Disabled  Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.8315     VLAN ID:200
  Port Counts:2        Up Port Counts:0
  Port:1/7   Status:Down  Reason:CH Disabled
             Speed :100M  Duplex:Full      Priority:128
  Port:1/8   Status:Down  Reason:CH Disabled
             Speed :100M  Duplex:Full      Priority:128
ChGr:22   Mode:Static
  CH Status    :Up        Elapsed Time:160.11:45:10
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
```

```
  Max Active Port:2  (no-link-down mode)
  Max Detach Port:15
  MAC address: 0012.e2ac.8316     VLAN ID:250
  Port Counts:3        Up Port Counts:2
  Port:1/9   Status:Up    Reason:-
             Speed :100M  Duplex:Full      Priority:0
  Port:1/14  Status:Up    Reason:-
             Speed :100M  Duplex:Full      Priority:0
  Port:1/15  Status:Down  Reason:Standby
             Speed :100M  Duplex:Full      Priority:0
>
```

Figure 18-5: Example of displaying the detailed link aggregation information for a specific channel group number

```
>show channel-group 10-21 detail
Date 2006/03/14 12:00:00 UTC
channel-group Counts:2
ChGr:11   Mode:LACP
  CH Status    :Down      Elapsed Time:-
  Multi Speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.830b     VLAN ID:30-35,40
  Periodic Timer:Long
  Actor   information: System Priority:1     MAC: 0012.e212.ff02
                       KEY:11
  Partner information: System Priority:10000 MAC: 0012.e2f0.69bd
                       KEY:20
  Port Counts:3        Up Port Counts:0
  Port:1/4   Status:Down    Reason:Port Down
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
  Port:1/5   Status:Down  Reason:Partner Key Unmatch
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:100
             Unmatched Partner Key:201
  Port:1/6   Status:Down  Reason:Partner System ID Unmatch
             Speed :100M  Duplex:Full  LACP Activity:Active
             Actor   Priority:128     Partner Priority:1
             Unmatched System ID:  Priority:5000   MAC:0012.e2f0.69ba
ChGr:21   Mode:Static
  CH Status    :Disabled  Elapsed Time:-
  Multi speed  :Off       Load Balance:MAC-IP-PORT
  Max Active Port:16
  Max Detach Port:15
  MAC address: 0012.e2ac.8315     VLAN ID:200
  Port Counts:2        Up Port Counts:0
  Port:1/7   Status:Down  Reason:CH Disabled
             Speed :100M  Duplex:Full      Priority:128
  Port:1/8   Status:Down  Reason:CH Disabled
             Speed :100M  Duplex:Full      Priority:128
>
```

Display items in Example 3

Table 18-3: Display items for the detailed link aggregation information

Item	Meaning	Displayed information
channel-group Counts	Number of channel groups to be displayed	Number of channel groups
ChGr	Channel group number	Channel group number
Mode	Link aggregation mode	`LACP`: LACP link aggregation mode
		`Static`: Static link aggregation mode

Item	Meaning	Displayed information
		`-`: Link aggregation mode is not set.
CH Status	Channel group status	`Up`: Data packets can be sent and received.
		`Down`: Data packets cannot be sent or received. (For a standby link in link-not-down mode, sending is impossible but receiving is possible.)
		`Disabled`: Link aggregation is disabled.
Elapsed Time	Time the channel group has been up	*hh*:*mm*:*ss* (when the elapsed time is less than 24 hours) *ddd*.*hh*:*mm*:*ss* (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days) `-` is displayed when the channel group status is not Up.
Max Active Port	Maximum number of ports used by link aggregation	1 to 16 (16 is displayed as the initial value.) `-` is displayed when link aggregation mode is not set.
	Standby link mode	Standby link link-down mode
		`(link-down mode)`: Link-down mode
		`(no-link-down mode)`: Link-not-down mode
Max Detach Port	Restriction on the number of detached ports	0 or 15 (15 is displayed as the initial value.) `-` is displayed when link aggregation mode is not set.
Load Balance	Distribution method	`MAC-IP-PORT`: Distributes traffic based on the information in frames. `VLAN`: Distributes traffic on a VLAN basis.
Multi Speed	Mixed-speed mode	`Off`: Does not permit a channel group to consist of ports with different transmission speeds. `On`: Permits a channel group to consist of ports with different transmission speeds.
Description	Supplementary explanation regarding the channel group	This item is not displayed if a supplementary explanation has not been set in the configuration.
MAC Address	Channel group's MAC address	The MAC address of the group.
VLAN ID	VLAN ID to which the channel group belongs	VLAN ID
Periodic Time	Sending interval for LACPDU	This item is displayed only when LACP mode is enabled.
		`Short`: The sending interval is 1 second.
		`Long`: The sending interval is 30 seconds.
Actor information	Information about the actor system	Information about the actor system. This item is displayed only when LACP mode is enabled.
System Priority	System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address	The MAC address of the LACP system ID
KEY	Group key	Group key This value is the same as the channel group number.

Item	Meaning	Displayed information
Partner information	Information about the partner system	Information about the partner system. This item is displayed only when LACP mode is enabled. - is displayed if the partner system is not defined for LACP.
System Priority	System priority	Priority of the LACP system ID 0 to 65535 can be specified as the priority value (0 indicates the highest priority).
MAC	MAC address	MAC address
KEY	Group key	0 to 65535
Port Counts	Number of ports that have been set up	Number of ports that have been set up by configuration
Up Port Counts	Number of ports that can be used for sending and receiving data packets	Number of ports that can be used for sending and receiving data
Port	Port information (NIF number/port number)	Port number
Status	Status of the port aggregation	Up: Data packets can be sent and received.
		Down: Data packets cannot be sent or received.
Reason	Cause of the failure	-: Status is Up.
		Standby: The ports in the local channel group are in Standby status.
		CH Disabled: The status of the local channel group is Disable.
		Port Down: The ports in the local channel group are in Down status.
		Port Speed Unmatch: Ports in the local channel group do not use the same line speed.
		Duplex Half: The ports in the local channel group are in half duplex mode.
		Port Selecting: A port aggregation condition check is being conducted on the local channel group.
		Waiting Partner Synchronization: The port aggregation condition check on the local channel group has finished, and the channel group is waiting for the connected port to synchronize.
		LACPDU Expired: The valid time period of the LACPDU received from the connected port expired.
		Partner System ID Unmatch: The partner system ID received from the connected port is different from the partner system ID of the group. The unmatched partner system ID is also displayed.
		Partner Key Unmatch: The key received from the connected port is different from the partner key of the group. The unmatched partner key is also displayed.
		Partner Aggregation Individual: The connected port cannot be a member of link aggregation.

Item	Meaning	Displayed information
		`Partner Synchronization OUT_OF_SYNC`: The port connected to the local port cannot synchronize with the local port.
		`Port Moved`: A port moved in the channel group.
		`Operation of Detach Port Limit`: The maximum number of ports that can be detached is limited.
Speed	Line speed	`10M`: 10 Mbit/s
		`100M`: 100 Mbit/s
		`1G`: 1 Gbit/s
		`10G`: 10 Gbit/s
Duplex	Duplex mode	`Full`: Full duplex
		`Half`: Half duplex
LACP Activity	LACP activation method	This item is displayed only when LACP mode is enabled.
		`Active`: LACPDUs are always sent.
		`Passive`: An LACPDU is sent after an LACPDU is received.
Actor Priority	Priority of the actor system port	0 to 65535 can be specified as the priority value (0 indicates the highest priority). This item is displayed only when LACP mode is enabled.
Partner Priority	Priority of the partner system port	0 to 65535 can be specified as the priority value (0 indicates the highest priority). This item is displayed only when LACP mode is enabled.
Priority	Priority of the actor system port	0 to 65535 can be specified as the priority value (0 indicates the highest priority). This item is displayed only in static mode.
Unmatched Partner Key	Partner key that is unmatched	1 to 65535 This item is displayed only when `Status` is `Down` and `Reason` is `Unmatched Partner Key`.
Unmatched Partner System ID	Partner system ID that is unmatched	This item is displayed only when `Status` is `Down` and `Reason` is `Unmatched Partner System ID`.
Priority	System priority	0 to 65535 can be specified as the priority value (0 indicates the highest priority).
MAC Address	MAC address	The MAC address for the system ID

Impact on communication

None

Response messages

Table 18-4: List of response messages for the show channel-group command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
Connection failed to Link Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Specified channel-group is not configured.	The channel group has not been configured. Check the configuration.

Notes

None

show channel-group statistics

Displays link aggregation statistics.

Syntax

```
show channel-group statistics [lacp] [<channel group list>]
```

Input mode

User mode and administrator mode

Parameters

lacp

Displays for each port the statistics for sent and received LACPDUs in link aggregation. Information is not displayed if static link aggregation mode is enabled or link aggregation mode has not been set.

<channel group list>

Displays link aggregation statistics for the channel group numbers specified in list format. For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all link aggregations are displayed.

Operation when all parameters are omitted:

Statistics for sent and received data packets (for each port) in all link aggregations are displayed.

Example 1

Figure 18-6: Example of displaying statistics on sent and received data packets for link aggregation (by port)

```
>show channel-group statistics
Date 2006/03/14 12:00:00 UTC
channel-group counts:4
ChGr:1(Up)
 Total:      Octets    Tx:            12760301  Rx:             9046110
             Frames    Tx:               71483  Rx:               64377
             Discards  Tx:                  96  Rx:                   9
 Port:1/1    Octets    Tx:            12745991  Rx:             9033008
             Frames    Tx:               71432  Rx:               64332
             Discards  Tx:                  95  Rx:                   5
 Port:1/2    Octets    Tx:               14310  Rx:               13102
             Frames    Tx:                  51  Rx:                  45
             Discards  Tx:                   1  Rx:                   4
 Port:1/3    Octets    Tx:                   0  Rx:                   0
             Frames    Tx:                   0  Rx:                   0
             Discards  Tx:                   0  Rx:                   0
 Port:1/10   Octets    Tx:                   0  Rx:                   0
             Frames    Tx:                   0  Rx:                   0
             Discards  Tx:                   0  Rx:                   0
 Port:1/12   Octets    Tx:                   0  Rx:                   0
             Frames    Tx:                   0  Rx:                   0
             Discards  Tx:                   0  Rx:                   0
 Port:1/13   Octets    Tx:                   0  Rx:                   0
             Frames    Tx:                   0  Rx:                   0
             Discards  Tx:                   0  Rx:                   0
ChGr:11(Up)
 Total:      Octets    Tx:             2031141  Rx:             1643359
             Frames    Tx:                3344  Rx:                2353
             Discards  Tx:                  14  Rx:                  25
```

```
 Port:1/4    Octets    Tx:              2008831  Rx:              1623147
             Frames    Tx:                 3312  Rx:                 2332
             Discards  Tx:                   10  Rx:                   22
 Port:1/5    Octets    Tx:                22310  Rx:                20212
             Frames    Tx:                   32  Rx:                   21
             Discards  Tx:                    4  Rx:                    3
 Port:1/6    Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0
ChGr:21(Down)
 Total:      Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0
 Port:1/7    Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0
 Port:1/8    Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0

ChGr:22(Up)
 Total:      Octets    Tx:              5971370  Rx:              5205702
             Frames    Tx:                11133  Rx:                10286
             Discards  Tx:                   12  Rx:                   32
 Port:1/9    Octets    Tx:              4023121  Rx:              3403392
             Frames    Tx:                 7211  Rx:                 6884
             Discards  Tx:                    0  Rx:                    0
 Port:1/14   Octets    Tx:              1948249  Rx:              1802310
             Frames    Tx:                 3922  Rx:                 3402
             Discards  Tx:                   12  Rx:                   32
 Port:1/15   Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0
>
```

Figure 18-7: Example of displaying statistics on sent and received data packets for a specific channel group number (by port)

```
>show channel-group statistics 22-30
Date 2006/03/14 12:00:00 UTC
channel-group counts:1
ChGr:22(Up)
 Total:      Octets    Tx:              5971370  Rx:              5205702
             Frames    Tx:                11133  Rx:                10286
             Discards  Tx:                   12  Rx:                   32
 Port:1/9    Octets    Tx:              4023121  Rx:              3403392
             Frames    Tx:                 7211  Rx:                 6884
             Discards  Tx:                    0  Rx:                    0
 Port:1/14   Octets    Tx:              1948249  Rx:              1802310
             Frames    Tx:                 3922  Rx:                 3402
             Discards  Tx:                   12  Rx:                   32
 Port:1/15   Octets    Tx:                    0  Rx:                    0
             Frames    Tx:                    0  Rx:                    0
             Discards  Tx:                    0  Rx:                    0
>
```

Display items in Example 1

Table 18-5: Display items for the statistics for sent and received data packets related to link aggregation

Item	Meaning	Displayed information
channel-group counts	Number of channel groups to be displayed	Number of channel groups

Item	Meaning	Displayed information
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	Channel group number `Up`: Data packets can be sent and received. `Down`: Data packets cannot be sent or received. `Disabled`: Link aggregation is disabled.
Total	Total statistics	Statistics are displayed for each channel group.
Port	NIF number/port number	Statistics are displayed for each port.
Octets	Data size of the sent and received data packets	`Tx`: Total number of sent bytes `Rx`: Total number of received bytes This item is displayed in octets starting with the MAC header and ending with the FCS.
Frames	Number of sent and received data frames	`Tx`: Total number of sent data frames `Rx`: Total number of received data frames
Discards	Number of discarded sent and received data frames	`Tx`: Total number of discarded sent data frames `Rx`: Total number of discarded received data frames For details about the items used for counting the number of discarded frames, see *Table 17-18: Statistical items used for calculating the number of discarded packets*.

Example 2

Figure 18-8: Displaying statistics for sent and received LACPDUs in link aggregation

```
>show channel-group statistics lacp
Date 2006/03/14 12:00:00 UTC
channel-group counts:2
ChGr:1     Port Counts:6
  Port:1/1
    TxLACPDUs           : 50454011  RxLACPDUs   : 16507650
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/2
    TxLACPDUs           : 50454011  RxLACPDUs   : 16507650
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/3
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/10
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/12
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/13
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
ChGr:11    Port counts:3
  Port:1/4
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/5
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/6
```

```
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
>
```

Figure 18-9: Displaying statistics for sent and received LACPDUs for the specified channel group

```
>show channel-group statistics lacp 10-20
Date 2006/03/14 12:00:00 UTC
channel-group counts:1
ChGr:11    Port counts:3
  Port:1/4
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/5
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
  Port:1/6
    TxLACPDUs           :      100  RxLACPDUs   :      100
    TxMarkerResponsePDUs:       10  RxMarkerPDUs:       10
    RxDiscards          :        8
>
```

Display items in Example 2

Table 18-6: Display items for the statistics for sent and received LACPDUs in link aggregation

Item	Meaning	Displayed information
channel-group counts	Number of channel groups to be displayed	Number of channel groups
ChGr	Channel group number	Channel group number
Port Counts	Number of ports to be displayed	Number of ports
Port	NIF number/port number	--
TxLACPDUs	Number of sent LACPDUs	--
RxLACPDUs	Number of received LACPDUs	--
Tx MarkerResponsePDUs	Number of sent marker response PDUs	--
RxMarkerPDUs	Number of received marker PDUs	--
RxDiscards	Number of discarded received PDUs	Number of LACPDUs discarded due to parameter errors

Impact on communication

None

Response messages

Table 18-7: List of response messages for the show channel-group statistics command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
Connection failed to L2 Manager.	Communication with the network interface management program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the network interface management program.
Connection failed to Link Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Specified channel-group is not configured.	The channel group has not been configured. Check the configuration.

Notes

- Statistics are cleared when the device starts up or when the following commands are executed:

  Statistics for sent and received data packets: `clear counters`

  Information about sent and received LACPs: `clear channel-group statistics lacp`

- The statistics for the sent and received data packets displayed by this command are the sum of the statistics on the Ethernet lines for each channel group. To clear the statistics for sent and received data packets, use a command that clears Ethernet lines. The following are related commands:

  Related commands: `show interfaces, clear counters`

clear channel-group statistics lacp

Clears the statistics for sent and received LACPDUs in link aggregation.

Syntax

```
clear channel-group statistics lacp [<channel group list>]
```

Input mode

User mode and administrator mode

Parameters

<channel group list>

Specifies a list of the channel group numbers for which you want to clear LACPDU statistics. For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The statistics on the sent and received LACPDUs for all channel groups are cleared.

Example

Figure 18-10: Clearing statistics on sent and received LACPDUs for link aggregation

```
>clear channel-group statistics lacp
>
```

Figure 18-11: Clearing statistics on sent and received LACPDUs for a specific channel group

```
>clear channel-group statistics lacp 11
>
```

Display items

None

Impact on communication

None

Response messages

Table 18-8: List of response messages for the clear channel-group statistics lacp command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Link Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Specified channel-group is not configured.	The channel group has not been configured. Check the configuration.

Notes

- This command clears only LACPDU statistics. It cannot clear the statistics for the data packets for each channel group. Also see *Notes* for the `show channel-group statistics` command.
- Even if statistics are cleared, the value for the MIB information obtained by using SNMP is

not cleared.

- If deletion or addition is performed in the configuration, the relevant LACPDU statistical items are cleared to zero.

restart link-aggregation

Restarts the link aggregation program.

Syntax

```
restart link-aggregation [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the link aggregation program without outputting any confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the link aggregation program's core file (`LAd.core`) when restarting the link aggregation program.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

After a restart confirmation message is output, the link aggregation program is restarted.

Example

Figure 18-12: Restarting the link aggregation program

```
> restart link-aggregation
Link Aggregation restart OK? (y/n):y
>
```

Figure 18-13: Restarting the link aggregation program (-f parameter specified)

```
> restart link-aggregation -f
>
```

Impact on communication

Ports for which link aggregation is enabled temporarily become unable to send or receive data.

Response messages

Table 18-9: List of response messages for the restart link-aggregation command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Link Aggregation doesn't seem to be running.	Because the link aggregation program has not started, the command could not be executed. The link aggregation program starts only when link aggregations are set up. If no link aggregations are set up, this message is output. If this message is output when link aggregations have been set up, wait until the link aggregation program is restarted, 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/`

File name: `LAd.core`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

dump protocols link-aggregation

Outputs to a file detailed event trace information and control table information collected for the link aggregation program.

Syntax

```
dump protocols link-aggregation
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 18-14: Obtaining a link aggregation dump

```
> dump protocols link-aggregation
>
```

Impact on communication

None

Response messages

Table 18-10: List of response messages for the dump protocols link-aggregation command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Link-Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Specified channel-group is not configured.	The channel group has not been configured. Check the configuration.

Notes

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

Storage directory: `/usr/var/LA/`

File name: `LAd_dump.gz`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

Chapter 19. MAC Address Table

show mac-address-table
clear mac-address-table

show mac-address-table

Displays information about the MAC address table.

Syntax

```
show mac-address-table [ <mac> ] [ vlan <vlan id list> ] [ port <port list> ]
     [channel-group-number <channel group list>]
     [{ static | dynamic | snoop | dot1x | wa | macauth }]
show mac-address-table learning-counter [ port <port list> ]
     [channel-group-number <channel group list>]
show mac-address-table learning-counter vlan [<vlan id list>]
```

Input mode

User mode and administrator mode

Parameters

<mac>

Displays the information in the MAC address table for the specified MAC address.

vlan *<vlan id list>*

Displays the information in the MAC address table for the VLAN IDs specified in list format.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*.

[port *<port list>*] [channel-group-number *<channel group list>*]

Displays the information in the MAC address table for the specified ports or the specified channel groups. If you specify both a list of ports and a list of channel groups, the informationin the MAC address table for either the specified ports or channel groups is displayed.

port *<port list>*

Displays the information in the MAC address table for the ports specified in list format. The mac-address-table entries that include at least one of the ports specified in the list are displayed. For details about how to specify *<port list>* and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number *<channel group list>*

Displays the information in the MAC address table for the channel groups specified in list format for the specified link aggregation. For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

Even if the command is executed with this parameter set, information about the MAC address table is displayed in port-list format.

Operation when this parameter is omitted:

The information in the MAC address table for all ports and channel groups is displayed.

{ static | dynamic | snoop | dot1x | wa | macauth }

Displays the information in the MAC address table that was registered under the specified condition.

static

Displays the information in the MAC address table registered by the `mac-address-table static` configuration command.

dynamic

Displays the information in the MAC address table registered dynamically through MAC address learning.

snoop

Displays the information in the MAC address table registered by using the IGMP snooping or MLD snooping functionality.

dot1x

Displays the information in the MAC address table registered by using the IEEE 802.1X.

wa

Displays the information in the MAC address table registered by using the Web authentication functionality.

macauth

Displays the information in the MAC address table registered by using the MAC-based authentication functionality.

Operation when a 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.

learning-counter

Displays the number of learned addresses in the MAC address table. If the `vlan` parameter is not specified, the command displays the number of learned addresses for each port.

vlan

Displays the number of learned addresses in the MAC address table for each VLAN.

Operation when this parameter is omitted:

Displays the number of learned addresses in the MAC address table for each port.

[<*vlan id list*>]

Displays the number of learned addresses for the specified VLANs. For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the number of learned addresses for all VLANs.

Operation when all parameters are omitted:

Displays all information about the MAC address table.

Example 1

Figure 19-1: Displaying all information in a MAC address table

```
>show mac-address-table
Date 2006/03/11 11:16:46 UTC
MAC address        VLAN    Aging-Time Type     Port-list
0012.e200.1111      100             - Static   1/10
0012.e211.2222      200             - Static   1/10
0012.e200.1111        1           100 Dynamic  1/5
0012.e244.f073      100           230 Dynamic  1/21-22
0012.e244.f072      100         10000 Dynamic  1/21-22
0012.e244.f070      100            10 Dynamic  1/24
>
```

Display items in Example 1

Table 19-1: Display items for the information in the MAC address table

Item	Meaning	Displayed information
MAC address	MAC address	--
VLAN	VLAN ID	--
Aging-Time	Aging time.	Aging time. `-`: A hyphen (`-`) is displayed if `Type` is `Static`, `Dot1x`, `Wa`, or `Macauth` and `aging-time 0` (aging disabled) is specified by the MAC address table configuration.
Type	Type of a mac-address-table entry	`Dynamic`: Entry registered dynamically `Static`: Entry registered statically `Dot1x`: Entry registered via IEEE 802.1X `Wa`: Entry registered via Web authentication `Macauth`: Entry registered via MAC-based authentication
Port-list	Port (NIF number/port number)	Ports are listed.

Example 2

Figure 19-2: Displaying the status of learning in the MAC address table

```
>show mac-address-table learning-counter port 1/1-10
Date 2006/03/21 20:00:57 UTC
Port counts:10
Port       Count  Maximum Threshold  Status
1/1            3        -         -  -
1/2         1000     1000       800  Learning
1/3            0        -         -  -
1/4           50       60        40  Stop learning
1/5           45       60        40  Learning
1/6            0       60        40  Learning
1/7           22     1000      1000  Learning
1/8            0        -         -  -
1/9            0        -         -  -
1/10           0        -         -  -

>show mac-address-table learning-counter vlan
Date 2006/03/21 20:00:57 UTC
VLAN counts:4
ID         Count  Maximum Threshold  Status
   1           3        -         -  -
 100        1000     1000       800  Stop learning
 200           0        -         -  No learning
4095          90      100       100  Learning
```

Display items in Example 2

Table 19-2: Display items for the status of learning in the MAC address table

Item	Meaning	Displayed information
Port counts	Number of target ports	--
VLAN counts	Number of applicable VLANs	--
Port	Port (NIF number/Port number)	--
ID	VLAN ID	VLAN ID

Item	Meaning	Displayed information
Maximum	Maximum number of addresses that can be learned in the mac-address-table	`0`: Learning is prohibited. `-`: The maximum number of addresses that can be learned is not set.
Threshold	Threshold value for the number of addresses that can be learned in the mac-address-table	`-`: The maximum number of addresses that can be learned is either 0 or not set.
Count	Number of addresses that are currently learned in the mac-address-table	--
Status	Status of learning	`Learning`: Learning is possible. `Stop learning`: Learning is stopped by `mac-address-table limit`. `No learning`: Learning is suppressed by `no mac-address-table learning`. If suppression or limitation for learning is not set, a hyphen (`-`) is displayed.

Impact on communication

None

Response messages

Table 19-3: List of response messages for the show mac-address-table command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Connection failed to L2 Mac Manager.	Communication with the `L2 Mac Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2 Mac Manager` program.
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
Connection failed to Snoopd.	Communication with the IGMP or MLD snooping program failed. Re-execute the command. If this message is output frequently, execute the `restart snooping` command to restart the IGMP or MLD snooping program.
No mac-address-table entry.	There are no mac-address-table entries. Make sure the specified parameter is correct, and then try again.
No operational Port.	There are no available ports. Make sure the specified parameter is correct, and then try again.
Specified VLAN is not configured.	The specified VLAN has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

clear mac-address-table

Clears the information in the MAC address table registered dynamically through MAC address learning.

Syntax

```
clear mac-address-table [ vlan <vlan id list> ]
     [ port <port list> ][channel-group-number <channel group list>][-f]
```

Input mode

User mode and administrator mode

Parameters

vlan <*vlan id list*>

Specifies a list of VLAN IDs for which you want to clear the information in the MAC address table.

For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

[port <*port list*>] [channel-group-number <*channel group list*>]

Specifies a list of ports or channel groups for which you want to clear the information in the MAC address table. If you specify both a list of ports and a list of channel groups, the information in the MAC address table for either the specified ports or channel groups will be cleared.

port <*port list*>

Specifies a list of ports for which you want to clear the information in the MAC address table that have been learned. For details about how to specify <*port list*> and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number <*channel group list*>

Specifies a list of channel groups in the link aggregation for which you want to clear the information in the MAC address table that have been learned. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

-f

Clears information in the MAC address table without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Operation when a parameter is omitted

This command can clear only the information in the MAC address table that meets the conditions specified by the parameter. If no parameter is specified, information in the MAC address table is cleared without being limited by any conditions. If multiple parameters are specified, the information in the MAC address table conforming to the conditions will be cleared.

Operation when all parameters are omitted:

All dynamically learned MAC address table information is cleared.

Example

Figure 19-3: Example of clearing mac-address-table entries when a VLAN ID and a port are specified

```
>clear mac-address-table vlan 90 port 1/9
mac-address-table clear OK? (y/n): y
>
```

Figure 19-4: Example of clearing MAC address table without displaying a confirmation message

```
>clear mac-address-table vlan 100-200 -f
>
```

Display items

None

Impact on communication

Frames are flooded until learning is completed again. Execute this command at a time when flooding will have a minimal impact.

Response messages

Table 19-4: List of response messages for the clear mac-address-table command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
No operational Port.	There are no available ports. Make sure the specified parameter is correct, and then try again.
Specified VLAN is not configured.	The specified VLAN has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

Chapter

20. VLANs

show vlan
show vlan mac-vlan
show vlan rate
restart vlan
dump protocols vlan

show vlan

Displays various VLAN statuses and the status of accommodated lines.

Syntax

```
show vlan [{ summary | detail | list | configuration }]
show vlan <vlan id list> [{ summary | detail | list | configuration }]
show vlan [port <port list>] [ channel-group-number < Channel Group list>]
          [{ summary | detail | list | configuration }]
```

Input mode

User mode and administrator mode

Parameters

{ summary | detail | list | configuration }

summary

Displays the VLAN summary information.

detail

Displays detailed information about VLANs.

list

Displays VLAN information with the information for one VLAN being displayed on one line.

configuration

Displays information about the ports assigned in a VLAN.

Operation when this parameter is omitted:

VLAN information is displayed.

<*vlan id list*>

Displays the VLAN information for the VLAN IDs specified in list format.

For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Information about all VLANs is displayed.

[port <*port list*>] [channel-group-number <*channel group list*>]

Specify a list of ports or channel groups for which you want to display VLAN information. If you specify both a list of ports and a list of channel groups, the VLAN information for either the specified ports or channel groups is displayed.

port <*port list*>

Specify a list of ports for which you want to display VLAN information. The information about all VLANs that contain one or more specified ports is displayed. For details about how to specify <*port list*> and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number <*channel group list*>

Specify a list of channel groups for which you want to display VLAN information. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All VLAN information, not limited by port or channel group, is displayed.

Operation when all parameters are omitted:

All VLAN information is displayed.

Example 1

The following shows an example of displaying summary information about all configured VLANs.

Figure 20-1: Example of displaying VLAN summary information

```
> show vlan summary
Date 2006/03/15 14:15:00 UTC
Total(18)          :1,3-5,8,10-20,100,2000
Port based(10)     :1,3-5,8,10,12,14,16,18
Protocol based(8)  :11,13,15,17,19-20,100,2000
MAC based(0)       :
>
```

Display items in Example 1

Table 20-1: Display items of VLAN summary

Item	Meaning	Displayed information
Total(*n*)	Applicable VLAN information	*n*: Number of applicable VLANs VLAN ID list
Port based(*n*)	Port VLAN information	*n*: Number of applicable VLANs VLAN ID list
Protocol based(*n*)	Protocol VLAN information	*n*: Number of applicable VLANs VLAN ID list
MAC based(*n*)	MAC VLAN information	*n*: Number of applicable VLANs VLAN ID list

Example 2

The following shows an example of displaying the statuses of all configured VLANs and the status of accommodated ports.

Figure 20-2: Example of displaying VLAN information

```
> show vlan
Date 2007/01/26 17:01:40 UTC
VLAN counts:4
VLAN ID:1     Type:Port based      Status:Up
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0001
  IP Address:10.215.201.1/24
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0001
  Spanning Tree:PVST+(802.1D)
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Untagged(18)  :1/1-4,13-26
VLAN ID:3     Type:Port based      Status:Up
  Learning:On            Tag-Translation:On
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0003
  IP Address:10.215.196.1/23
             ee80::220:afff:fed7:8f0a/64
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0003
```

```
  Spanning Tree:Single(802.1D)
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:MAC
  Untagged(8)   :1/5-12
  Tagged(2)     :1/25-26
  Tag-Trans(2)  :1/25-26
VLAN ID:120   Type:Protocol based  Status:Up
  Protocol VLAN Information  Name:ipv6
  EtherType:08dd  LLC:  Snap-EtherType:
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0120
  IP Address:
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0120
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:MAC
  Untagged(3)   :1/5,7,9
  Tagged(2)     :1/25-26
VLAN ID:1340  Type:Mac based       Status:Up
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN1340
  IP Address:10.215.202.1/24
  Source MAC address: 0012.e2de.053c(VLAN)
  Description:VLAN1340
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Untagged(6)   :1/13-18
  Tagged(2)     :1/25-26
>
```

Figure 20-3: Example of displaying VLAN information in list format (when the Ring Protocol is used)

```
> show vlan 3,5
Date 2007/11/15 17:01:40 UTC
VLAN counts:2
VLAN ID:3     Type:Port based      Status:Up
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0003
  IP Address:
  Source MAC address: 0012.e212.ad1e(System)
  Description:VLAN0003
  Spanning Tree:
  AXRP RING ID:1      AXRP VLAN group:2
  AXRP RING ID:100    AXRP VLAN group:1
  AXRP RING ID:500    AXRP VLAN group:2
  AXRP RING ID:1000   AXRP VLAN group:2
  AXRP Virtual-Link-VLAN
  GSRP ID:       GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Untagged(8)   :1/5-12
  Tagged(8)     :1/25-32
VLAN ID:5     Type:Port based      Status:Up
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0005
```

```
  IP Address:
  Source MAC address: 0012.e212.ad1e(System)
  Description:VLAN0005
  Spanning Tree:
  AXRP RING ID:100   AXRP VLAN group:Control-VLAN
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Tagged(2)     :1/25-26
>
```

Figure 20-4: Example of displaying VLAN information for a specific port

```
> show vlan port 1/5
Date 2008/12/17 17:01:40 UTC
VLAN counts:2
VLAN ID:3     Type:Port based      Status:Up
  Learning:On            Tag-Translation:On
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0003
  VRF:3
  IP Address:10.215.196.1/23
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0003
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Untagged(8)   :1/5-12
  Tagged(2)     :1/25-26
  Tag-Trans(2)  :1/25-26
VLAN ID:120   Type:Protocol based  Status:Up
  Protocol VLAN Information  Name:ipv6
  EtherType:08dd  LLC:  Snap-EtherType:
  EtherType:  LLC:  Snap-EtherType:
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0120
  IP Address:
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0120
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:MAC
  Untagged(3)   :1/5,7,9
  Tagged(2)     :1/25-26
>
```

Display items in Example 2

Table 20-2: Basic display items for VLANs

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
VLAN tunneling enabled	VLAN tunneling information	VLAN tunneling is enabled. (This item is displayed only when VLAN tunneling is used.)
VLAN ID	VLAN information	VLAN ID
Type	VLAN type	`Port based`: Port VLAN `Protocol based`: Protocol VLAN `Mac based`: MAC VLAN

Item	Meaning	Displayed information
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disable`: Indicates Disable status.
Protocol VLAN Information	Protocol VLAN information	This item is displayed only for a protocol VLAN.
Name	Name	--
EtherType	EtherType value of Ethernet V2 frames	Displayed as a four-digit hexadecimal number
LLC	LLC value of 802.3 frames	Displayed as a four-digit hexadecimal number
Snap-EtherType	EtherType value of 802.3 SNAP frames	Displayed as a four-digit hexadecimal number
Learning	Status of MAC address learning	`On`: MAC address learning is enabled. `Off`: MAC address learning is disabled.
Tag-Translation	Tag translation	Blank: No setting `On`: Tag translation is being used.
BPDU Forwarding	BPDU forwarding	Blank: No setting `On`: BPDU forwarding functionality is being used.
EAPOL Forwarding	EAPOL forwarding	Blank: The setting for this item does not exist. `On`: EAPOL forwarding functionality is being used.
Router Interface Name	Interface name	Displays the name of the interface assigned to the VLAN.
VRF [OP-NPAR]	VRF information	VRF ID. (This item is displayed only when VRF is assigned to the VLAN interface.)
IP Address	IP address (/mask)	Blank: No setting
Source MAC address	Source MAC address used during Layer 3 communication	`System`: The MAC address for the device is used. `VLAN`: The MAC address of each VLAN is used.
Description	Description	The character string set for the VLAN name is displayed. `VLAN`xxxx is displayed if this item is not set. (xxxx: VLAN ID)
Spanning Tree	Spanning Tree Protocol being used	`Single (802.1D)`: IEEE 802.1D is used for the entire Switch. `Single (802.1w)`: IEEE 802.1w is used for the entire Switch. `PVST+ (802.1D)`: IEEE 802.1D is used for the VLAN. `PVST+ (802.1w)`: IEEE 802.1w is used for the VLAN. `MSTP (802.1s)`: Multiple Spanning Tree is used.
AXRP RING ID	Ring Protocol ring ID	Blank: No setting (Information about a maximum of 16 IDs is displayed.)
AXRP VLAN group	ID of the VLAN group using the Ring Protocol functionality or the control VLAN	Blank: No setting `1` or `2`: ID of the assigned VLAN group `Control-VLAN`: The control VLAN is assigned.
AXRP Virtual-Link-VLAN	The VLAN is a virtual link VLAN for the Ring Protocol functionality.	This item is displayed when the VLAN is assigned to the virtual link VLAN for the Ring Protocol functionality.

Item	Meaning	Displayed information
GSRP ID	GSRP ID	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used.
GSRP VLAN group	GSRP VLAN group ID	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used. -: No VLAN group has been assigned.
L3	Layer 3 redundancy switching functionality	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used. On: The Layer 3 redundancy switching functionality is being used.
IGMP snooping	Setting status of IGMP snooping	Blank: No setting On: IGMP snooping is being used.
MLD snooping	Setting status of MLD snooping	Blank: No setting On: MLD snooping is being used.
Flow mode	Setting status of the flow mode	Blank: No setting MAC: MAC mode is being used for the flow mode.
Untagged(*n*)	Untagged port	*n*: Number of applicable ports Port list
Tagged(*n*)	Tagged port	*n*: Number of applicable ports Port list
Tag-Trans(*n*)	Port for which tag translation is set	*n*: Number of applicable ports Port list

Example 3

The following shows an example of displaying VLAN detailed information when a VLAN ID is specified.

Figure 20-5: Example of displaying VLAN detailed information for a specific VLAN ID

```
>show vlan 3,1000-1500 detail
Date 2008/12/17 17:01:40 UTC
VLAN counts:2
VLAN ID:3     Type:Port based      Status:Up
  Learning:On            Tag-Translation:On
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN0003
  VRF:3
  IP Address:10.215.196.1/23
  Source MAC address: 0012.e205.0800(System)
  Description:VLAN0003
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:
  Port Information
   1/5          Up   Forwarding      Untagged
   1/6          Up   Blocking(STP)   Untagged
   1/7          Up   Forwarding      Untagged
   1/8          Up   Forwarding      Untagged
   1/9          Up   Forwarding      Untagged
```

```
   1/10         Up   Forwarding      Untagged
   1/11         Up   Forwarding      Untagged
   1/12         Up   Forwarding      Untagged
   1/25(CH:9)   Up   Forwarding      Tagged   Tag-Translation:103
   1/26(CH:9)   Up   Blocking(CH)    Tagged   Tag-Translation:103
VLAN ID:1340  Type:Mac based       Status:Up
  Learning:On            Tag-Translation:
  BPDU Forwarding:       EAPOL Forwarding:
  Router Interface Name:VLAN1340
  IP Address:10.215.202.1/24
  Source MAC address: 0012.e2de.053c(VLAN)
  Description:VLAN1340
  Spanning Tree:
  AXRP RING ID:      AXRP VLAN group:
  GSRP ID:      GSRP VLAN group:    L3:
  IGMP snooping:     MLD snooping:
  Flow mode:MAC
  Port Information
   1/13         Up   Forwarding      Untagged
   1/14         Up   Forwarding      Untagged
   1/15         Up   Forwarding      Untagged
   1/16         Up   Forwarding      Untagged
   1/17         Up   Forwarding      Untagged
   1/18         Up   Forwarding      Untagged
   1/25(CH:9)   Up   Forwarding      Tagged
   1/26(CH:9)   Up   Blocking(CH)    Tagged
```

Display items in Example 3

Table 20-3: Display items of detailed VLAN information

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
VLAN tunneling enabled	VLAN tunneling information	VLAN tunneling is enabled. (This item is displayed only when VLAN tunneling is used.)
VLAN ID	VLAN information	VLAN ID
Type	VLAN type	`Port based`: Port VLAN `Protocol based`: Protocol VLAN `Mac based`: MAC VLAN
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disable`: Indicates Disable status.
Protocol VLAN Information	Protocol VLAN information	This item is displayed only for a protocol VLAN.
Name	Name	--
EtherType	EtherType value of Ethernet V2 frames	Displayed as a four-digit hexadecimal number
LLC	LLC value of 802.3 frames	Displayed as a four-digit hexadecimal number
Snap-EtherType	EtherType value of 802.3 SNAP frames	Displayed as a four-digit hexadecimal number
Learning	Status of MAC address learning	`On`: MAC address learning is enabled. `Off`: MAC address learning is disabled.
Tag-Translation	Tag translation	Blank: No setting `On`: Tag translation is being used.

Item	Meaning	Displayed information
BPDU Forwarding	BPDU forwarding	Blank: No setting `On`: BPDU forwarding functionality is being used.
EAPOL Forwarding	EAPOL forwarding	Blank: No setting `On`: EAPOL forwarding functionality is being used.
Router Interface Name	Router interface name	Displays the name of the interface assigned to the VLAN.
VRF [OP-NPAR]	VRF information	VRF ID. (This item is displayed only when VRF is assigned to the VLAN interface.)
IP Address	IP address (/mask)	Blank: No setting
Source MAC address	Source MAC address used during Layer 3 communication	`System`: The MAC address for the device is used. `VLAN`: The MAC address of each VLAN is used.
Description	Description	The character string set for the VLAN name is displayed. `VLAN`xxxx is displayed if this item is not set. (xxxx: VLAN ID)
Spanning Tree	Spanning Tree Protocol being used	`Single (802.1D)`: IEEE 802.1D is used for the entire Switch. `Single (802.1w)`: IEEE 802.1w is used for the entire Switch. `PVST+ (802.1D)`: IEEE 802.1D is used for the VLAN. `PVST+ (802.1w)`: IEEE 802.1w is used for the VLAN. `MSTP (802.1s)`: Multiple Spanning Tree is used.
AXRP RING ID	Ring Protocol ring ID	Blank: No setting (Information about a maximum of 16 IDs is displayed.)
AXRP VLAN group	ID of the VLAN group using the Ring Protocol functionality or the control VLAN	Blank: No setting `1` or `2`: ID of the assigned VLAN group `Control-VLAN`: The control VLAN is assigned.
AXRP Virtual-Link-VLAN	The VLAN is a virtual link VLAN for the Ring Protocol functionality.	This item is displayed when the VLAN is assigned to the virtual link VLAN for the Ring Protocol functionality.
GSRP ID	GSRP ID	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used.
GSRP VLAN group	GSRP VLAN group ID	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used. `-`: No VLAN group has been assigned.
L3	Layer 3 redundancy switching functionality	Blank: The setting for this item does not exist. Alternatively, no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is used. `On`: The Layer 3 redundancy switching functionality is being used.
Virtual MAC Address	Virtual MAC address	The virtual MAC address used for the Layer 3 redundancy switching functionality is displayed.
IGMP snooping	Setting status of IGMP snooping	Blank: No setting `On`: IGMP snooping is being used.

Item	Meaning	Displayed information
MLD snooping	Setting status of MLD snooping	Blank: No setting `On`: MLD snooping is being used.
Flow mode	Setting status of the flow mode	Blank: No setting `MAC`: MAC mode is being used for the flow mode.
Port Information	Port information (NIF number/Port number)	`No Port information` is displayed if there is no port information for the VLAN.
CH	Channel group number	This item is not displayed for the ports that do not belong to the channel group.
<line status>	Port state	`Up`: Indicates that the port status is Up. `Down`: Indicates that the port status is Down.
<data forwarding status>	Data forwarding status	`Forwarding`: Data is being forwarded. `Blocking`: Data forwarding is blocked. `(VLAN)`: The VLAN is disabled. (CH): Data forwarding has been stopped by link aggregation. `(STP)`: Data forwarding has been stopped by STP. `(GSRP)`: Data forwarding has been stopped by GSRP. `(dot1x)`: Data forwarding has been stopped by IEEE 802.1X. `(CNF)`: Data forwarding has been stopped because a duplicated protocol value was encountered in the protocol VLAN configuration (data is being forwarded for the protocol values that have successfully been set). `(AXRP)`: Forwarding has been suspended by the Ring Protocol. `-`: Down status
Tag	Tag setting status	`Untagged`: Untagged port `Tagged`: Tagged port
Tag-Translation	ID subject to tag translation	1 to 4095

Example 4

The following shows an example of displaying VLAN information in list format.

Figure 20-6: Example of displaying VLAN information in list format

```
> show vlan list
Date 2007/11/15 17:01:40 UTC
VLAN counts:4
ID   Status  Fwd/Up /Cfg Name            Type  Protocol       Ext.    IP
   1 Up       16/ 18/ 18 VLAN0001        Port  STP PVST+:1D   - - - - 4
   3 Up        9/ 10/ 10 VLAN0003        Port  STP Single:1D  - - T M 4/6
 120 Up        4/  5/  5 VLAN0120        Proto -              - - - - -
1340 Disable   0/  8/  8 VLAN1340        Mac   -              - - - M 4
     AXRP (C:Control-VLAN)
     GSRP GSRP ID:VLAN Group ID(M:Master/B:Backup)
     S:IGMP/MLD snooping  T:Tag Translation  M:Flow MAC mode
     4:IPv4 address configured  6:IPv6 address configured
>
```

Figure 20-7: Example of displaying VLAN information in list format (when GSRP is used)

```
> show vlan list
Date 2007/11/15 17:01:40 UTC
VLAN counts:2
ID   Status  Fwd/Up /Cfg Name            Type  Protocol         Ext.    IP
   1 Up        2/  2/  2 VLAN0001        Port  GSRP 100:  1(M)  - - - M 4
   3 Up        0/  2/  6 VLAN0003        Port  GSRP 100:  2(B)  - - T - 4/6
```

```
     AXRP (C:Control-VLAN)
     GSRP GSRP ID:VLAN Group ID(M:Master/B:Backup)
     S:IGMP/MLD snooping  T:Tag Translation  M:Flow MAC mode
     4:IPv4 address configured  6:IPv6 address configured
>
```

Figure 20-8: Example of displaying VLAN information in list format (when the Ring Protocol is used)

```
> show vlan list
Date 2007/11/15 17:01:40 UTC
VLAN counts:4
ID   Status  Fwd/Up /Cfg Name            Type  Protocol       Ext.    IP
   1 Up        1/  2/  2 VLAN0001        Port  AXRP (-)       - - - - -
   5 Up        2/  2/  2 VLAN0005        Port  AXRP (C)       - - - - -
  10 Up        1/  2/  2 VLAN0010        Port  AXRP (-)       - - - - -
  20 Up        3/  4/  4 VLAN0020        Port  AXRP (-)       - - - - -
     AXRP (C:Control-VLAN)
     GSRP GSRP ID:VLAN Group ID(M:Master/B:Backup)
     S:IGMP/MLD snooping  T:Tag Translation  M:Flow MAC mode
     4:IPv4 address configured  6:IPv6 address configured
>
```

Figure 20-9: Example of displaying VLAN information in list format (when both the Ring Protocol and STP are used)

```
> show vlan list
Date 2007/11/15 17:01:40 UTC
VLAN counts:4
ID   Status  Fwd/Up /Cfg Name            Type  Protocol       Ext.  IP
   1 Up        3/  3/  3 VLAN0001        Port  STP Single:1D  - - - -
   5 Up        2/  2/  2 VLAN0005        Port  AXRP (C)       - - - -
  10 Up        3/  3/  3 VLAN0010        Port  STP PVST+:1D   - - - -
  20 Up        3/  3/  3 VLAN0020        Port  STP Single:1D  - - - -
     AXRP (C:Control-VLAN)
     GSRP GSRP ID:VLAN Group ID(M:Master/B:Backup)
     S:IGMP/MLD snooping  T:Tag Translation
     4:IPv4 address configured  6:IPv6 address configured
>
```

Display items in Example 4

Table 20-4: Display items for VLAN information in list format

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
VLAN tunneling enabled	VLAN tunneling information	VLAN tunneling is enabled. (This item is displayed only when VLAN tunneling is used.)
ID	VLAN ID	VLAN ID
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disable`: Indicates Disable status.
Fwd	Number of ports in `Forward` status	The number of ports belonging to the VLAN that are in `Forward` status
Up	Number of ports in `Up` status	The number of ports belonging to the VLAN that are in `Up` status
Cfg	Number of VLAN ports	The number of ports belonging to the VLAN
Name	VLAN name	The character string set for the VLAN name is displayed. `VLAN`xxxx is displayed if this item is not set. (xxxx: VLAN ID)

Item	Meaning	Displayed information
Type	VLAN type	`Port`: Port VLAN `Proto`: Protocol VLAN `Mac`: MAC VLAN
Protocol	STP information, GSRP information, Ring Protocol information	For STP: `STP` <*type*>:<*protocol*> <*type*>: `Single`, `PVST+`, or `MSTP` <*protocol*>: `802.1D`, `802.1w`, or `802.1s` For GSRP: `GSRP` <*GSRP ID*>:<*VLAN Group ID*> `(M/B)` (If no VLAN group is assigned when the functionality limiting GSRP control to VLANs in VLAN groups is enabled, a hyphen (`-`) is displayed, and the subsequent items are not displayed.) - <*GSRP ID*>: GSRP group ID - <*VLAN Group ID*>: VLAN group ID (If no VLAN group is assigned, a hyphen (`-`) is displayed.) `(M)`: Master `(B)`: Backup For the Ring Protocol: AXRP `(C)`: Indicates that the control VLAN is assigned, `(-)` is displayed if the control VLAN is not assigned). Note, however, that `(-)` is not displayed for a VLAN for other protocols are also used. If nothing is specified, a hyphen (`-`) is displayed.
Ext.	Extended functionality information	`S`: Indicates that IGMP snooping or MLD snooping is set. `T`: Indicates that tag translation is set. `M`: Indicates that MAC mode is set as the flow mode. `-`: Indicates that the relevant functionality is not set.
IP	IP address setting information	`4`: Indicates that an IPv4 address is set. `6`: Indicates that an IPv4 address is set. `4/6`: Indicates that both an IPv4 address and an IPv6 address are set. `-`: Indicates that an IP address is not set for the VLAN.

Example 5

The following shows an example of displaying VLAN information in list format.

Figure 20-10: Example of displaying information about all ports set for the VLAN

```
> show vlan configuration
Date 2007/11/15 14:15:00
VLAN counts: 3
ID   Name             Status  Ports
   1 DefaultVLAN      Up      1/2,1/4,1/6,2/1-3,3/1-3,4/1-3,5/1-3,6/1-3, 7/1-3,
                              8/1-3,8/6,8/10
 200 Global IP Netw.. Down    1/2,2/2-3
4000 VLAN4000         Disable 4/2-5
>
```

Display items in Example 5

Table 20-5: Display items for the information about all ports set for the VLAN

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
ID	VLAN ID	VLAN ID

Item	Meaning	Displayed information
Name	VLAN name	VLAN name (a maximum of 14 characters from the beginning)
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disable`: Indicates Disable status.
Ports	Port information	NIF number/port number If no port exists, a hyphen (`-`) is displayed.

Impact on communication

None

Response messages

Table 20-6: List of response messages for the show vlan command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Connection failed to GSRP.	Communication with the GSRP program failed. Re-execute the command. If the failure occurs frequently, use the `restart gsrp` command to restart the GSRP program.
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
Connection failed to Link Aggregation.	Communication with the link aggregation program failed. Re-execute the command. If this message is output frequently, execute the `restart link-aggregation` command to restart the link aggregation program.
Connection failed to Ring Protocol.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.
Connection failed to Snoopd.	Communication with the IGMP or MLD snooping program failed. Re-execute the command. If this message is output frequently, execute the `restart snooping` command to restart the IGMP or MLD snooping program.
Connection failed to Spanning Tree.	Communication with the `Spanning Tree` program failed. Re-execute the command. If this message is output frequently, execute the `restart spanning-tree` command to restart the `Spanning Tree` program.
No operational Port.	There are no available ports. Make sure the specified parameter is correct, and then try again.
No operational VLAN.	There are no available VLANs. Make sure the specified parameter is correct, and then try again.

Notes

None

show vlan mac-vlan

Displays the MAC addresses registered for MAC VLANs.

Syntax

```
show vlan mac-vlan [<vlan id list>] [{ static | dynamic }]
show vlan mac-vlan <mac>
```

Input mode

User mode and administrator mode

Parameters

<vlan id list>

Displays the MAC VLAN information for the VLAN IDs specified in list format.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

{ static | dynamic }

static

Displays the MAC address information registered in the configuration.

The MAC address information disabled by hardware conditions is also displayed.

dynamic

Displays the MAC address information registered by Layer 2 authentication. The MAC address information disabled because it is also registered by configuration is also displayed.

<mac>

Displays VLANs for which the specified MAC address is registered.

The MAC address information disabled because it is registered by both configuration and Layer 2 authentication is also displayed.

The MAC address information in the configuration disabled by hardware conditions is also displayed.

Example

The following shows an example of displaying information related to MAC VLANs from the information for all configured VLANs.

Figure 20-11: Example of displaying MAC VLAN information

```
> show vlan mac-vlan
Date 2006/03/15 14:15:00 UTC
VLAN counts:2    Total MAC Counts:5
VLAN ID:100     MAC Counts:4
   0012.e200.0001 (static)    0012.e200.0002 (static)
   0012.e200.0003 (static)    0012.e200.0004 (dot1x)
VLAN ID:200     MAC Counts:1
   0012.e200.1111 (dot1x)
>
```

Figure 20-12: Example of displaying MAC VLAN information when "dynamic" is specified

```
> show vlan mac-vlan dynamic
Date 2006/03/15 14:15:00 UTC
VLAN counts:2    Total MAC Counts:3
```

```
VLAN ID:100     MAC Counts:2
 * 0012.e200.0003 (dot1x)    0012.e200.0004 (dot1x)
VLAN ID:200     MAC Counts:1
 0012.e200.1111 (dot1x)
>
```

Figure 20-13: Example of displaying MAC VLAN information when a MAC address is specified

```
> show vlan mac-vlan 0012.e200.0003
Date 2006/03/15 14:15:00 UTC
VLAN counts:1    Total MAC Counts:2
VLAN ID:100     MAC Counts:2
  0012.e200.0003 (static)   * 0012.e200.0003 (dot1x)
>
```

Display items

Table 20-7: Display items for MAC VLAN information

Item	Meaning	Displayed information
VLAN Counts	Number of displayed MAC VLANs	--
Total MAC Counts	Number of displayed MAC addresses	Number of displayed MAC addresses. The total number of MAC addresses that include valid entries already assigned to the hardware (an asterisk (*) does not appear next to the displayed MAC address) and invalid entries that have not been assigned to the hardware (an asterisk (*) appears next to the displayed MAC address).
VLAN ID	VLAN information	VLAN ID
MAC Counts	Number of displayed MAC addresses for each VLAN	Number of MAC addresses displayed for the applicable VLAN
<*MAC-address*> (*type*)	Registered MAC address	type: Indicates which functionality registered the address. `static`: Indicates that the address was registered by configuration. `dot1x`: Indicates that the address was registered by IEEE 802.1X authentication. `vaa`: Indicates that the address was registered by authentication VLAN. `wa`: Indicates that the address was registered by Web authentication. `macauth`: Indicates that the address was registered by MAC-based authentication. `*`: An asterisk (`*`) is added in either of the following cases: - Dynamically registered entry that specifies a MAC address that is also specified in an entry registered by configuration - Entry that has not been registered on hardware due to capacity limits

Impact on communication

None

Response messages

Table 20-8: List of response messages for the show vlan mac-vlan command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Connection failed to L2 Mac Manager.	Communication with the `L2 Mac Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2 Mac Manager` program.
No MAC address entry.	The relevant MAC address does not exist. Make sure the specified parameter is correct, and then try again.
No operational VLAN.	There are no available VLANs. Make sure the specified parameter is correct, and then try again.

Notes

None

show vlan rate

Displays VLAN traffic. The traffic of each VLAN can be obtained from the number of sent and received octets and the throughput for a one-second period after the command entry.

Syntax

```
show vlan rate [ <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 the VLAN traffic information.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters.*

Operation when this parameter is omitted:

Information about all VLANs is displayed.

Example

Figure 20-14: Example of displaying VLAN traffic information

```
>show vlan rate
 Date 2006/10/15 14:15:00
VLAN counts:3
ID           Out octets  rate(bps)         In octets  rate(bps)
   1              4400      35.2M               320      25.6k
  10          12345600      98.8M             66540     532.3k
 100               200       1600            123456     987.6k
>
```

Display items

Table 20-9: Display items for VLAN traffic information

Item	Meaning
VLAN counts	Number of applicable VLANs
ID	The specified VLAN ID
Out octets	The number of octets output from the VLAN during the one-second period after the command entry. The frame length used to calculate the number of octets starts from the MAC header and ends with the FCS field.#2
rate(bps)#1	The VLAN's sending throughput for one-second period after the command entry is displayed in bps. The frame length used to calculate the bps value starts from the MAC header and ends with the FCS field.
In octets	The number of octets received by the VLAN during the one-second period after the command entry. The frame length used to calculate the number of octets starts from the MAC header and ends with the FCS field.#2
rate(bps)#1	The VLAN's reception throughput for one-second period after the command entry is displayed in bps. The frame length used to calculate the bps value starts from the MAC header and ends with the FCS field.

#1: If the value is smaller than 10000, the decimal places are not displayed. If the value is 10000 or greater, the value is displayed in Kbps, and is rounded to one decimal place. If the value is 10000000 or greater, the value is displayed in Mbps, and is rounded to one decimal place.

#2: If the frame has 8192 or more octets, the frame length minus 8192 is displayed.

Impact on communication

None

Response messages

Table 20-10: List of response messages for the show vlan rate command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Connection failed to L2 Manager.	Communication with the `L2Manager` program failed. Re-execute the command. If this message is output frequently, execute the `restart vlan` command to restart the `L2Manager` program.
No operational VLAN.	There are no available VLANs. Make sure the specified parameter is correct, and then try again.

Notes

This command displays the number of octets sent and received in 1 second by the VLAN and the throughput. However, depending on the load on the device, the period for which the number of octets and throughput are measured might be longer than 1 second.

The values displayed by this command as the number of octets sent by a VLAN and the sending throughput pertain to only the sending to the lower-level layer. Measurement of these values does not take into account that the outgoing traffic might exceed the LAN bandwidth or outgoing frames might be discarded by the filtering and the QoS control functionality. On the other hand, the values displayed by this command as the number of octets received by the VLAN and the reception throughput pertain to only the reception from the lower-level layer. These values do not include frames discarded by the storm control, the filtering, or the QoS functionality before arrival at the VLAN.

restart vlan

Restarts the VLAN program.

Syntax

```
restart vlan [mac-manager] [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

mac-manager

Restarts the MAC management program that operates with the VLAN program (operates when MAC VLAN is set).

Operation when this parameter is omitted:

The VLAN program is restarted. If the MAC management program is running, it is also restarted.

-f

Restarts VLAN program without outputting any confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the VLAN program's core files when restarting the VLAN program.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

After a restart confirmation message is output, the VLAN program is restarted.

Example

Figure 20-15: Restarting the VLAN program

```
> restart vlan
VLAN Program restart OK? (y/n): y
>
```

Figure 20-16: Restarting the VLAN program (mac-manager parameter specified)

```
> restart vlan mac-manager
L2 Mac Manager restart OK? (y/n): y
>
```

Figure 20-17: Restarting the VLAN program (-f parameter specified)

```
> restart vlan -f
>
```

Display items

None

Impact on communication

All Ethernet interfaces are re-initialized, and the ports that make up the LAN temporarily become unable to send or receive data.

Response messages

Table 20-11: List of response messages for the restart vlan 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 core file are as follows.

  Storage directory: `/usr/var/core/`

  Core files: `nimd.core` and `L2MacManager.core`

  If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.
- Because all Ethernet interfaces are re-initialized, statistics are cleared.
- If this command is executed in either of the situations listed below, the entries in the IPv4 and IPv6 routing tables might not stabilize for a few minutes. If this is the case, wait at least five minutes before executing the command:

  1. The active device is switched over in a duplex system.
  2. The `restart unicast` command is executed.

dump protocols vlan

Outputs to a file detailed event trace information and control table information collected for a VLAN program.

Syntax

```
dump protocols vlan
```

Input mode

User mode and administrator mode

Parameters

None

Dumps detailed event trace information and control table information to a file.

Example

Figure 20-18: Obtaining a VLAN dump

```
> dump protocols vlan
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

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

Location: `/usr/var/l2/`

File: `L2MacManager_dump.gz`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

Chapter

21. Spanning Tree Protocols

show spanning-tree
show spanning-tree statistics
clear spanning-tree statistics
clear spanning-tree detected-protocol
show spanning-tree port-count
restart spanning-tree
dump protocols spanning-tree

show spanning-tree

Displays Spanning Tree information.

Syntax

```
show spanning-tree [ { vlan [ <vlan id list> ] | single | mst [ instance <mst instance id list> ] } [ port <port list> ] [channel-group-number <channel group list>] [virtual-link <link id>]][ detail ] [active]
```

Input mode

User mode and administrator mode

Parameters

{ vlan [<*vlan id list*>] | single | mst [instance <*mst instance id list*>] }

vlan

Displays PVST+ Spanning Tree information.

<*vlan id list*>

Displays PVST+ Spanning Tree information for the VLAN IDs specified in list format.

For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all VLANs for which PVST+ is operating are displayed.

single

Displays information about Single Spanning Tree.

mst

Displays information about Multiple Spanning Tree.

instance <*mst instance id list*>

Displays information about Multiple Spanning Tree for the MST instance IDs specified in list format. Specifiable values for MST instance ID are in the range from 0 to 4095.

If `0` is specified as an MST instance ID, information about CISTs is displayed.

Operation when this parameter is omitted:

All MST instances are subject to display.

port <*port list*>

Displays Spanning Tree information for the specified port number. For details about how to specify <*port list*> and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number <*channel group list*>

Displays Spanning Tree information for the channel groups specified in list format. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

virtual-link <*link id*>

Displays Spanning Tree information for the specified virtual link ID. Specifiable values for the virtual link ID are in the range from 1 to 250.

Operation when a parameter is omitted

This command displays only the specific information corresponding to the parameters. If a parameter is not specified, the displayed information is not restricted by that parameter. If

multiple parameters are specified, information conforming to the conditions will be displayed.

detail

Displays detailed information about Spanning Tree Protocols.

Operation when this parameter is omitted:

All MST instances are subject to display.

active

Displays port information for only those ports in the `Up` status.

Operation when this parameter is omitted:

Displays information for all ports.

Operation when all parameters are omitted:

Displays Spanning Tree information for Single Spanning Tree, PVST+ Spanning Tree Protocols, and Multiple Spanning Tree.

Example 1

Figure 21-1: Example of displaying PVST+ Spanning Tree information

```
> show spanning-tree vlan 10-13
Date 2006/03/14 12:00:00 UTC
VLAN 10   PVST+ Spanning Tree:Enabled   Mode:Rapid PVST+
  Bridge ID       Priority: 32778   MAC Address: 0012.e200.0004
    Bridge Status: Designated
  Root Bridge ID  Priority: 32778   MAC Address: 0012.e200.0001
    Root Cost:2000000
    Root Port:1/1
  Port Information
    1/1  Up   Status:Forwarding  Role:Root            LoopGuard
    1/3  Up   Status:Discarding  Role:Backup
    1/4  Up   Status:Forwarding  Role:Designated      PortFast(BPDU Guard)
    1/5  Up   Status:Discarding  Role:Alternate       LoopGuard
    1/8  Up   Status:Forwarding  Role:Designated      RootGuard
    1/9  Down Status:Disabled    Role:-
    1/10 Up   Status:Forwarding  Role:Designated      PortFast BPDU Filter
VLAN 11   PVST+ Spanning Tree:Disabled  Mode:Rapid PVST+
VLAN 12   PVST+ Spanning Tree:Enabled   Mode:Rapid PVST+
  Bridge ID       Priority: 32780   MAC Address: 0012.e200.0004
    Bridge Status: Designated
  Root Bridge ID  Priority: 32780   MAC Address: 0012.e200.0002
    Root Cost:2000000
    Root Port:1/5
  Port Information
    1/5  Up   Status:Forwarding  Role:Root            Compatible
    1/6  Up   Status:Forwarding  Role:Designated      Compatible
    1/7  Up   Status:Forwarding  Role:Designated
    1/9  Down Status:Disabled    Role:-
VLAN 13(Disabled)  PVST+ Spanning Tree:Enabled   Mode:Rapid PVST+
>
```

Display items in Example 1

Table 21-1: Display items for the PVST+ Spanning Tree information

Item	Meaning	Displayed information
VLAN	VLAN ID	ID of the VLAN on which PVST+ Spanning Tree Protocol is operating. `(Disabled)` is displayed if the VLAN is not running.
PVST+ Spanning Tree:	Operating status of the PVST+ Spanning Tree Protocol	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.

Item	Meaning	Displayed information
Mode	Configured protocol type	`PVST+`: The protocol type is set to PVST+ mode. `Rapid PVST+`: The protocol type is set to Rapid PVST+ mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (-) is displayed if the Switch is the root bridge.
Port Information	Displays information about the ports managed by the PVST+ Spanning Tree Protocol.	
<nif no.>/<port no.>	Port number, channel group number, or virtual link ID	The port number, channel group number, or virtual link ID of the port for which information is displayed.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Status	Port state	If `Mode` is `PVST+`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled If `Mode` is `Rapid PVST+`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.

Item	Meaning	Displayed information
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are commonly used when `Mode` is `PVST+` or `Rapid PVST+`.
PortFast	PortFast	Indicates that the port is a PortFast port.
PortFast(BPDU Guard)	PortFast (BPDU guard functionality is applied)	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied.
BPDU Filter	BPDU filter	Indicates that the BPDU filter functionality is applied.
LoopGuard	Loop guard	Indicates that the port applies the loop guard functionality.
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode when `Mode` for the Spanning Tree Protocol is `Rapid PVST+`. Ports operating in compatible mode do not perform rapid status transitions.

Example 2

Figure 21-2: Example of displaying information about Single Spanning Tree

```
> show spanning-tree single
Date 2006/03/14 12:00:00 UTC
Single Spanning Tree:Enabled   Mode:STP
  Bridge ID       Priority: 32768   MAC Address: 0012.e200.0004
    Bridge Status: Designated
  Root Bridge ID  Priority: 32768   MAC Address: 0012.e200.0001
    Root Cost:2000000
    Root Port:1/1-2(ChGr:32)
  Port Information
    1/3         Up   Status:Blocking    Role:Alternate
    1/4         Up   Status:Forwarding  Role:Designated   PortFast(BPDU Guard)
    1/5         Up   Status:Blocking    Role:Alternate    LoopGuard
    1/6         Up   Status:Forwarding  Role:Designated
    1/7         Up   Status:Forwarding  Role:Designated   PortFast
    1/8         Up   Status:Forwarding  Role:Designated   RootGuard
    1/9         Down Status:Disabled    Role:-
    1/10        Up   Status:Forwarding  Role:Designated   PortFast BPDU Filter
    ChGr:32     Up   Status:Forwarding  Role:Root         LoopGuard
>
```

Display items in Example 2

Table 21-2: Display items for information about Single Spanning Tree

Item	Meaning	Displayed information
Single Spanning Tree:	Operating status of the Spanning Tree Protocol	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`STP`: The protocol type is set to STP mode. `Rapid STP`: The protocol type is set to Rapid STP mode.
Bridge ID	Bridge ID on the Switch	--

Item	Meaning	Displayed information
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Port Information	Displays information about the ports managed by Single Spanning Tree.	
<nif no.>/<port no.>	Port number, channel group number, or virtual link ID	The port number, channel group number, or virtual link ID of the port for which information is displayed.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Status	Port state	If `Mode` is `STP`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled If `Mode` is `Rapid STP`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.

Item	Meaning	Displayed information
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are commonly used when `Mode` is `STP` or `Rapid STP`.
PortFast	PortFast	Indicates that the port is a PortFast port.
PortFast(BPDU Guard)	PortFast (BPDU guard functionality is applied)	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied.
BPDU Filter	BPDU filter	Indicates that the BPDU filter functionality is applied.
LoopGuard	Loop guard	Indicates that the port applies the loop guard functionality.
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode when `Mode` for the Spanning Tree Protocol is `Rapid STP`. Ports operating in compatible mode do not perform rapid status transitions.

Example 3

Figure 21-3: Example of displaying information about Multiple Spanning Tree

```
> show spanning-tree mst instance 0-4095
Date 2008/04/16 12:00:00 UTC
Multiple Spanning Tree: Enabled
Revision Level: 65535  Configuration Name: MSTP Region Tokyo
CIST Information
  VLAN Mapped: 1,3-4093,4095
  Unmatch VLAN Mapped: -
  CIST Root      Priority: 4096        MAC      : 0012.e200.0001
  External Root Cost     : 2000000     Root Port: 1/1-2(ChGr: 32)
  Regional Root  Priority: 32768       MAC      : 0012.e200.0003
  Internal Root Cost     : 0
  Bridge ID      Priority: 32768       MAC      : 0012.e200.0003
  Regional Bridge Status : Root
  Port Information
    1/4        Up   Status:Blocking    Role:Alternate   Boundary  Compatible
    1/7        Up   Status:Forwarding  Role:Designated
    1/8        Up   Status:Forwarding  Role:Designated  RootGuard
    1/10       Up   Status:Forwarding  Role:Designated
    1/11       Up   Status:Forwarding  Role:Designated  BPDUGuard
    1/12       Up   Status:Forwarding  Role:Designated  BPDUFilter
    ChGr:32    Up   Status:Forwarding  Role:Root        Boundary
MST Instance 1
  VLAN Mapped: 2,4094
  Unmatch VLAN Mapped: -
  Regional Root  Priority: 4097        MAC      : 0012.e200.0004
  Internal Root Cost     : 2000000     Root Port: 1/7
  Bridge ID      Priority: 32769       MAC      : 0012.e200.0003
  Regional Bridge Status : Designated
  Port Information
    1/4        Up   Status:Blocking    Role:Alternate   Boundary  Compatible
    1/7        Up   Status:Forwarding  Role:Root
    1/10       Up   Status:Blocking    Role:Alternate
    1/11       Up   Status:Forwarding  Role:Designated  BPDUGuard
    ChGr:32    Up   Status:Forwarding  Role:Master      Boundary
>
```

Display items in Example 3

Table 21-3: Display items for information about Multiple Spanning Tree

Item	Meaning	Displayed information
Multiple Spanning Tree	Operating status of Multiple Spanning Tree	`Enabled`: Running `Disabled`: Disabled
Revision Level	Revision level	Displays the revision level that is set in the configuration. 0 to 65535
Configuration Name	Region name	Displays the region name that is set in the configuration. 0 to 32 characters
CIST Information	CIST Spanning Tree information	CIST Spanning Tree information
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to MST instance 0 (IST). A hyphen (`-`) is displayed if no VLANs are allocated.
Unmatch VLAN Mapped	Instance mapping VLAN in `Blocking` status	If Ring Protocol is also used, this item displays instance mapping VLANs whose Spanning Tree Protocols are blocked because of mismatches with the VLAN mapping of Ring Protocol. A hyphen (`-`) is displayed if there is no mismatch.
CIST Root	Bridge ID for the CIST root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the CIST root bridge
External Root Cost	External root path cost	Path cost value from the Switch's CIST internal bridge to the CIST root bridge. `0` is displayed if the Switch is the CIST root bridge.
Root Port	Root port	Displays the port number of the CIST root port. If the CIST root port is a link aggregation port, the link aggregation port list and the channel group number are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the CIST root bridge.
Regional Root	Bridge ID for the regional root bridge of MST instance 0 (IST)	Displays information about the regional root bridge of MST instance 0 (IST).
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of MST instance 0 (IST)
Internal Root Cost	Internal root path cost for MST instance 0 (IST)	Path cost value from the Switch to the regional root bridge of MST instance 0 (IST). `0` is displayed if the Switch is the regional root bridge of MST instance 0 (IST). A hyphen (`-`) is displayed if Multiple Spanning Tree is disabled.
Bridge ID	Bridge ID for MST instance 0 (IST) of the Switch	Displays information about the bridge of MST instance 0 (IST) of the Switch.

Item	Meaning	Displayed information
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for MST instance 0 (IST) of the Switch	`Root`: Root bridge `Designated`: Designated bridge
MST Instance	MST instance ID	Displays the MST instance ID and information about the instance.
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to the MST instance. A hyphen (`-`) is displayed if no VLANs are allocated.
Unmatch VLAN Mapped	Instance mapping VLAN in `Blocking` status	If Ring Protocol is also used, this item displays instance mapping VLANs whose Spanning Tree Protocols are blocked because of mismatches with the VLAN mapping of Ring Protocol. A hyphen (`-`) is displayed if there is no mismatch.
Regional Root	ID for the regional root bridge of the MST instance	Displays information about the regional root bridge of the MST instance.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of the MST instance
Internal Root Cost	Internal root path cost for the MST instance	Path cost value from the Switch to the regional root bridge of MST instance. `0` is displayed if the Switch is the regional root bridge of the MST instance.
Root Port	Root port of the MST instance	Displays the port number of the root port of the MST instance. If the root port of the MST instance is a link aggregation port, the link aggregation port list and the channel group number are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the regional root bridge of the MST instance.
Bridge ID	Bridge ID for the MST instance of the Switch	Displays information about the bridge of the MST instance of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for the MST instance of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Port Information	Information about the ports of the MST instance	Displays information about the ports managed by Multiple Spanning Tree. If no VLANs are allocated to the MST instance, a response message is displayed because there are no ports.
<nif no.>/<port no.>	Port number, channel group number, or virtual link ID	The port numbers, channel group numbers, or virtual link IDs of the ports for which information is displayed.

Item	Meaning	Displayed information
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Status	Port state	`Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port `Master`: Master port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations.
Boundary	Boundary port	Indicates that the port is the boundary port for the region. If the role of the partner device port is alternate port or backup port, the boundary port might never receive BPDUs. In such cases, the port is not displayed as the boundary port.
PortFast	PortFast	Indicates that the port is a PortFast port. `(Received)`: Indicates that the port is subject to the Spanning Tree topology calculations because BPDUs are received while `PortFast` is being applied.
BPDUGuard	Application of the BPDU guard functionality for PortFast	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied. `(Received)`: Indicates that the port is down because BPDUs are received while `PortFast` is being applied.
BPDUFilter	BPDU filter	Indicates that the BPDU filter functionality is applied.
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode for an MSTP Spanning Tree Protocol. Ports operating in compatible mode do not perform rapid status transitions.

Example 4

Figure 21-4: Example of displaying detailed PVST+ Spanning Tree information

```
> show spanning-tree vlan 10 detail
Date 2006/03/14 12:00:00 UTC
VLAN 10       PVST+ Spanning Tree:Enabled   Mode:Rapid PVST+
  Bridge ID
    Priority: 32778               MAC Address: 0012.e200.0004
    Bridge Status: Designated     Path Cost Method:Long
    Max Age:20                    Hello Time:2
    Forward Delay:15
```

```
Root Bridge ID
  Priority: 32778               MAC Address: 0012.e200.0001
  Root Cost:2000000
  Root Port:1/1
  Max Age:20                    Hello Time:2
  Forward Delay:15
Port Information
Port:1/1  Up
  Status:Forwarding             Role:Root
  Priority:128                  Cost:2000000
  LinkType:point-to-point       Compatible Mode:-
  LoopGuard:ON                  PortFast:OFF
  BpduFilter:OFF                RootGuard:OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Designated Root
      Priority:32778            MAC Address: 0012.e200.0001
    Designated Bridge
      Priority:32778            MAC Address: 0012.e200.0001
      Root Cost:0
    Port ID
      Priority:128              Number:16
    Message Age Timer:1(2)/20
Port:1/3  Up
  Status:Discarding             Role:Alternate
  Priority:128                  Cost:2000000
  LinkType:point-to-point       Compatible Mode:-
  LoopGuard:OFF                 PortFast:OFF
  BpduFilter:OFF                RootGuard:OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Designated Root
      Priority:32778            MAC Address: 0012.e200.0001
    Designated Bridge
      Priority:32778            MAC Address: 0012.e200.0001
      Root Cost:0
    Port ID Priority:128        Number:8
    Message Age Timer:5(2)/20
Port:1/4  Up
  Status:Disabled               Role:-
  Priority:-                    Cost:-
  LinkType:-                    Compatible Mode:-
  LoopGuard:OFF                 PortFast:BPDU Guard(BPDU not received)
  BpduFilter:OFF                RootGuard:OFF
Port:1/5  Up
  Status:Discarding             Role:Alternate
  Priority:128                  Cost:2000000
  LinkType:point-to-point       Compatible Mode:-
  LoopGuard:ON(Blocking)        PortFast:OFF
  BpduFilter:OFF                RootGuard:OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Designated Root
      Priority:32778            MAC Address: 0012.e200.0001
    Designated Bridge
      Priority:32778            MAC Address: 0012.e200.0002
      Root Cost:200000
    Port ID Priority:128        Number:16
    Message Age Timer:2(2)/20
Port:1/10  Up
  Status:Forwarding             Role:Designated
  Priority:128                  Cost:2000000
  LinkType:point-to-point       Compatible Mode:-
  LoopGuard:OFF                 PortFast:ON
  BpduFilter:ON                 RootGuard:OFF
Port:1/11  Up
  Status:Discarding             Role:Designated
  Priority:128                  Cost:2000000
  LinkType:point-to-point       Compatible Mode:-
  LoopGuard:OFF                 PortFast:OFF
```

```
        BpduFilter:OFF                  RootGuard:ON(Blocking)
        BPDU Parameters(2006/03/14 12:00:00):
          Designated Root
            Priority:4096               MAC Address: 0012.e200.0011
          Designated Bridge
            Priority:32778              MAC Address: 0012.e200.0022
            Root Cost:200000
          Port ID Priority:128          Number:16
          Message Age Timer:2(2)/20
>
```

Display items in Example 4

Table 21-4: Display items for detailed PVST+ Spanning Tree information

Item	Meaning	Displayed information
VLAN	VLAN ID	ID of the VLAN on which PVST+ Spanning Tree Protocol is operating. `(Disabled)` is displayed if the VLAN is not running.
PVST+ Spanning Tree:	Operating status of the PVST+ Spanning Tree Protocol	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`PVST+`: The protocol type is set to PVST+ mode. `Rapid PVST+`: The protocol type is set to Rapid PVST+ mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value. `Short`: 16-bit values are used for the path cost value.
Max Age	Maximum valid time of BPDUs	Maximum valid time of BPDUs sent from the Switch
Hello Time	Interval for sending BPDUs	Interval for sending BPDUs that are regularly sent from the Switch
Forward Delay	Time required for a state transition of the port	Time required for a state transition when the state transition is triggered by the timer
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.

Item	Meaning	Displayed information
Max Age	Maximum valid time of BPDUs sent from the root bridge	Maximum valid time of BPDUs sent from the root bridge
Hello Time	Interval for sending BPDUs sent from the root bridge	Interval for sending BPDUs that are regularly sent from the root bridge
Forward Delay	Time required for a state transition of the root bridge port	Time required for a state transition when the state transition in the root bridge is triggered by the timer
Port	Port number, channel group number, or virtual link ID	The port number, channel group number, or virtual link ID of the port for which information is displayed.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Status	Port state	If `Mode` is `PVST+`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. If `Mode` is `Rapid PVST+`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are used by both `STP` and `Rapid STP`.
Priority	Port priority	Value set for the priority of the port on the Switch If the port is in the `Down` status, a hyphen (`-`) is displayed.
Cost	Port cost	Value set for the port cost of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `PVST+` or when the port is in the `Down` status.

Item	Meaning	Displayed information
Compatible Mode	Compatible mode	`ON`: Operation is in progress in compatible mode. A hyphen (`-`) is displayed when operation is in progress in normal mode (non-compatible mode) or when the port is in the `Down` status. Ports operating in compatible mode do not perform rapid status transitions.
Loop Guard	Loop guard functionality	`ON`: The loop guard functionality is being applied. `ON(Blocking)`: The loop guard functionality is running and the port is blocked. `OFF`: The loop guard functionality is not being used.
PortFast	The PortFast status. The receive status of BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. • `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) • `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: The root guard functionality is running and the port is blocked. `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed in parentheses.	Displays information about the BPDUs received on the port. This item is not displayed if BPDUs are not received. If the port is blocked by the root guard functionality, this item displays information about the BPDUs that caused the port to be blocked.
Designated Root	Root bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Designated Bridge	Bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address
Root Cost	Root path cost	Root path cost stored in the BPDU
Port ID	Port information stored in the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 897

Item	Meaning	Displayed information
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (-) is displayed if this period has expired. <*current-time*>(<*time-BPDU-received*>)/<*maximum-time*> <*current-time*>: The time at which the BPDU is received plus the time that has elapsed <*time-BPDU-received*>: The time that has elapsed when the BPDU is received (Message Age of the received BPDU) <*maximum-time*>: Valid time (Max Age of the received BPDU)

Example 5

Figure 21-5: Example of displaying detailed information about Single Spanning Tree

```
> show spanning-tree single detail
Date 2006/03/14 12:00:00 UTC
Single Spanning Tree:Enabled   Mode:STP
  Bridge ID
    Priority: 32768                MAC Address: 0012.e200.0004
    Bridge Status: Designated      Path Cost Method:Long
    Max Age:20                     Hello Time:2
    Forward Delay:15
  Root Bridge ID
    Priority: 32768                MAC Address: 0012.e200.0001
    Root Cost:2000000
    Root Port:1/1-2(ChGr:32)
    Max Age:20                     Hello Time:2
    Forward Delay:15
  Port Information
  Port:1/3  Up
    Status:Blocking                Role:Alternate
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:OFF                  PortFast:OFF
    BpduFilter:OFF                 RootGuard:OFF
    BPDU Parameters(2006/03/14 12:00:00):
      Designated Root
        Priority:32768             MAC Address: 0012.e200.0001
      Designated Bridge
        Priority:32768             MAC Address: 0012.e200.0001
        Root Cost:0
      Port ID
        Priority:128               Number:8
      Message Age Timer:5(2)/20
  Port:1/4  Up
    Status:Forwarding              Role:Designated
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:OFF                  PortFast:BPDU Guard(BPDU not received)
    BpduFilter:OFF                 RootGuard:OFF
  Port:1/5  Up
    Status:Blocking                Role:Alternate
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:ON(Blocking)         PortFast:OFF
    BpduFilter:OFF                 RootGuard:OFF
  Port:1/9  Up
    Status:Disabled(unavailable)   Role:-
    Priority:-                     Cost:-
    LinkType:-                     Compatible Mode:-
    LoopGuard:OFF                  PortFast:OFF
    BpduFilter:OFF                 RootGuard:OFF
```

```
  Port:1/10  Up
    Status:Forwarding              Role:Designated
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:OFF                  PortFast:ON
    Bpdu Filter:ON                 RootGuard:OFF
  Port:1/11  Up
    Status:Blocking                Role:Designated
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:OFF                  PortFast:OFF
    BpduFilter:OFF                 RootGuard:ON(Blocking)
    BPDU Parameters(2006/03/14 12:00:00):
      Designated Root
        Priority:4096              MAC Address: 0012.e200.0011
      Designated Bridge
        Priority:32768             MAC Address: 0012.e200.0022
        Root Cost:2000000
      Port ID
        Priority:128               Number:16
      Message Age Timer:1(2)/20
  Port:ChGr:32  Up
    Status:Forwarding              Role:Root
    Priority:128                   Cost:2000000
    LinkType:-                     Compatible Mode:-
    LoopGuard:ON                   PortFast:OFF
    BpduFilter:OFF                 RootGuard:OFF
    BPDU Parameters(2006/03/14 12:00:00):
      Designated Root
        Priority:32768             MAC Address: 0012.e200.0001
      Designated Bridge
        Priority:32768             MAC Address: 0012.e200.0001
        Root Cost:0
      Port ID
        Priority:128               Number:16
      Message Age Timer:1(2)/20
>
```

Display items in Example 5

Table 21-5: Display items for detailed Single Spanning Tree information

Item	Meaning	Displayed information
Single Spanning Tree:	Operating status of the Spanning Tree Protocol	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`STP`: The protocol type is set to STP mode. `Rapid STP`: The protocol type is set to Rapid STP mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value. `Short`: 16-bit values are used for the path cost value.
Max Age	Maximum valid time of BPDUs	Maximum valid time of BPDUs sent from the Switch

Item	Meaning	Displayed information
Hello Time	Interval for sending BPDUs	Interval for sending BPDUs that are regularly sent from the Switch
Forward Delay	Time required for a state transition of the port	Time required for a state transition when the state transition is triggered by the timer
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list and the channel group number (ChGr) for the link aggregation are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Max Age	Maximum valid time of BPDUs sent from the root bridge	Maximum valid time of BPDUs sent from the root bridge
Hello Time	Interval for sending BPDUs sent from the root bridge	Interval for sending BPDUs that are regularly sent from the root bridge
Forward Delay	Time required for a state transition of the root bridge port	Time required for a state transition when the state transition in the root bridge is triggered by the timer
Port	Port number, channel group number, or virtual link ID	The port number, channel group number, or virtual link ID of the port for which information is displayed.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.

Item	Meaning	Displayed information
Status	Port state	If `Mode` is `STP`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unavailable)`: Disabled. Single Spanning Tree cannot be used because PVST+ is enabled for the port. If `Mode` is `Rapid STP`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unavailable)`: Disabled. Single Spanning Tree cannot be used because PVST+ is enabled for the port.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are used by both `STP` and `Rapid STP`.
Priority	Port priority	Value set for the priority of the port on the Switch If the port is in the `Down` status, a hyphen (`-`) is displayed.
Cost	Port cost	Value set for the port cost of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `PVST+` or when the port is in the `Down` status.
Compatible Mode	Compatible mode	`ON`: Operation is in progress in compatible mode. A hyphen (`-`) is displayed when operation is in progress in normal mode (non-compatible mode) or when the port is in the `Down` status. Ports operating in compatible mode do not perform rapid status transitions.
Loop Guard	Loop guard functionality	`ON`: The loop guard functionality is being applied. `ON(Blocking)`: The loop guard functionality is running and the port is blocked. `OFF`: The loop guard functionality is not being used.
PortFast	The PortFast status. The receive status of BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. • `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) • `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)

Item	Meaning	Displayed information
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: The root guard functionality is running and the port is blocked. `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed in parentheses.	Displays information about the BPDUs received on the port. This item is not displayed if BPDUs are not received. If the port is blocked by the root guard functionality, this item displays information about the BPDUs that caused the port to be blocked.
Designated Root	Root bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Designated Bridge	Bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address
Root Cost	Root path cost	Root path cost stored in the BPDU
Port ID	Port information stored in the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 897
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (`-`) is displayed if this period has expired. <*current-time*>(<*time-BPDU-received*>)/<*maximum-time*> <*current-time*>: The time at which the BPDU is received plus the time that has elapsed <*time-BPDU-received*>: The time that has elapsed when the BPDU is received (Message Age of the received BPDU) <*maximum-time*>: Valid time (Max Age of the received BPDU)

Example 6

Figure 21-6: Example of displaying detailed information about Multiple Spanning Tree

```
> show spanning-tree mst detail
Date 2008/04/16 12:00:00 UTC
Multiple Spanning Tree: Enabled
Revision Level: 65535  Configuration Name: MSTP Region Tokyo
CIST Information           Time Since Topology Change: 2.4:25:50
  VLAN Mapped: 1,3-4093,4095
  Unmatch VLAN Mapped: -
  CIST Root      Priority: 4096        MAC           : 0012.e200.0001
  External Root Cost     : 2000000     Root Port     : 1/1-2(ChGr: 32)
```

```
Max Age                : 20
Forward Delay          : 15
Regional Root  Priority: 32768       MAC           : 0012.e200.0003
Internal Root Cost     : 0
Remaining Hops         : 20
Bridge ID      Priority: 32768       MAC             : 0012.e200.0003
Regional Bridge Status : Root        Path Cost Method: Long
Max Age                : 20          Hello Time      : 2
Forward Delay          : 15          Max Hops        : 20
Port Information
Port: 1/4  Up    Boundary  Compatible
  Status    : Blocking         Role    : Alternate
  Priority  : 128              Cost    : 2000000
  Link Type : shared           PortFast: OFF
  BpduFilter:OFF               Hello Time: 4
  RootGuard :OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Protocol Version  : STP(IEEE802.1D)
    Root                Priority: 4096    MAC    : 0012.e200.0001
    External Root Cost           : 2000000
    Designated Bridge   Priority: 32768   MAC    : 0012.e200.0002
    Designated Port ID  Priority: 128     Number : 1
    Message Age Timer : 1(2)/20    Remaining Hops: -
Port:1/7  Up
  Status    : Forwarding       Role    : Designated
  Priority  : 128              Cost    : 2000000
  Link Type : point-to-point   PortFast: OFF
  BpduFilter:OFF               Hello Time: 2
  RootGuard :OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Protocol Version  : MSTP(IEEE802.1s)
    Root                Priority: 4096    MAC    : 0012.e200.0001
    External Root Cost           : 2000000
    Regional Root       Priority: 4096    MAC    : 0012.e200.0003
    Internal Root Cost           : 2000000
    Designated Bridge   Priority: 32768   MAC    : 0012.e200.0004
    Designated Port ID  Priority: 128     Number : 2
    Message Age Timer : 1(2)/20    Remaining Hops: 19
Port:1/10  Up
  Status    : Forwarding       Role    : Designated
  Priority  : 128              Cost    : 2000000
  LinkType  : point-to-point   PortFast: OFF
  BpduFilter:OFF               Hello Time: 2
  RootGuard :OFF
  BPDU Parameters(2006/03/14 12:00:00):
    Protocol Version  : MSTP(IEEE802.1s)
    Root                Priority: 4096    MAC    : 0012.e200.0001
    External Root Cost           : 2000000
    Regional Root       Priority: 4096    MAC    : 0012.e200.0003
    Internal Root Cost           : 2000000
    Designated Bridge   Priority: 32768   MAC    : 0012.e200.0005
    Designated Port ID  Priority: 128     Number : 3
    Message Age Timer : 1(2)/20    Remaining Hops: 19
Port:1/11  Up
  Status    : Forwarding       Role    : Designated
  Priority  : 128              Cost    : 2000000
  Link Type : point-to-point   PortFast: BPDU Guard(BPDU not received)
  BpduFilter:OFF               Hello Time: 2
  RootGuard :OFF
Port:1/12  Up
  Status    :Forwarding        Role    : Designated
  Priority  : 128              Cost    : 2000000
  Link Type : point-to-point   PortFast: BPDU Filter
  BpduFilter:ON                Hello Time: 2
  RootGuard:OFF
Port:ChGr:32  Up    Boundary
  Status    : Forwarding       Role    : Root
```

```
    Priority  : 128              Cost    : 2000000
    Link Type : point-to-point   PortFast: OFF
    BpduFilter:OFF               Hello Time: 4
    RootGuard :OFF
    BPDU Parameters(2006/03/14 12:00:00):
      Protocol Version  : MSTP(IEEE802.1s)
      Root              Priority: 4096    MAC    : 0012.e200.0001
      External Root Cost          : 0
      Regional Root     Priority: 4096    MAC    : 0012.e200.0001
      Internal Root Cost          : 0
      Designated Bridge Priority: 32768   MAC    : 0012.e200.0001
      Designated Port ID  Priority: 128     Number : 800
      Message Age Timer : 1(2)/20    Remaining Hops: 19
MST Instance 1             Time Since Topology Change: 2.4:25:30
  VLAN Mapped: 2,4094
  Unmatch VLAN Mapped: -
  Regional Root  Priority: 4097        MAC           : 0012.e200.0004
  Internal Root Cost     : 2000000     Root Port     : 1/7
  Remaining Hops         : 20
  Bridge ID      Priority: 32768       MAC           : 0012.e200.0003
  Regional Bridge Status : Designated
  Max Age                : 20          Hello Time    : 2
  Forward Delay          : 15          Max Hops      : 20
  Port Information
  Port: 1/4  Up    Boundary  Compatible
    Status    : Blocking         Role    : Alternate
    Priority  : 128              Cost    : 2000000
    Link Type : shared           PortFast: OFF
    BpduFilter:OFF               Hello Time: 2
    RootGuard :OFF
  Port:1/7  Up
    Status    : Forwarding       Role    : Root
    Priority  : 128              Cost    : 2000000
    Link Type : point-to-point   PortFast: OFF
    BpduFilter:OFF               Hello Time: 4
    RootGuard :OFF
    BPDU Parameters(2006/03/14 12:00:00):
      Protocol Version  : MSTP(IEEE802.1s)
      Regional Root       Priority: 4096    MAC    : 0012.e200.0004
      Internal Root Cost          : 2000000
      Designated Bridge   Priority: 32768   MAC    : 0012.e200.0004
      Designated Port ID  Priority: 128     Number : 2
      Message Age Timer : 1(2)/20    Remaining Hops: 19
  Port:1/10  Up
    Status    : Blocking         Role    : Alternate
    Priority  : 128              Cost    : 2000000
    Link Type : point-to-point   PortFast: OFF
    BpduFilter:OFF               Hello Time: 4
    RootGuard :OFF
    BPDU Parameters(2006/03/14 12:00:00):
      Protocol Version  : MSTP(IEEE802.1s)
      Regional Root       Priority: 4096    MAC    : 0012.e200.0004
      Internal Root Cost          : 2000000
      Designated Bridge   Priority: 32768   MAC    : 0012.e200.0002
      Designated Port ID  Priority: 128     Number : 3
      Message Age Timer : 1(2)/20    Remaining Hops: 19
  Port:1/11  Up
    Status    : Forwarding       Role    : Designated
    Priority  : 128              Cost    : 2000000
    Link Type : point-to-point   PortFast: BPDU Guard(BPDU not received)
    BpduFilter:OFF               Hello Time: 2
    RootGuard :OFF
  Port:ChGr:32  Up    Boundary
    Status    : Forwarding       Role    : Master
    Priority  : 128              Cost    : 2000000
    Link Type : point-to-point   PortFast: OFF
    BpduFilter:OFF               Hello Time: 4
```

```
        RootGuard :OFF
        BPDU Parameters(2006/03/14 12:00:00):
          Protocol Version  : MSTP(IEEE802.1s)
          Regional Root       Priority: 4096    MAC    : 0012.e200.0004
          Internal Root Cost          : 2000000
          Designated Bridge   Priority: 32768   MAC    : 0012.e200.0001
          Designated Port ID  Priority: 128     Number : 800
          Message Age Timer : 1(2)/20    Remaining Hops: 19
>
```

Display items in Example 6

Table 21-6: Display items for detailed Multiple Spanning Tree information

Item	Meaning	Displayed information
Multiple Spanning Tree	Operating status of Multiple Spanning Tree	`Enabled`: Running `Disabled`: Disabled
Revision Level	Revision level	Displays the revision level that is set in the configuration. 0 to 65535
Configuration Name	Region name	Displays the region name that is set in the configuration. 0 to 32 characters
CIST Information	CIST Spanning Tree information	CIST Spanning Tree information
Time Since Topology Change	Time since a topology change was detected	hh: mm: ss (when the elapsed time is less than 24 hours) ddd. hh: mm: ss (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days)
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to MST instance 0 (IST). A hyphen (-) is displayed if no VLANs are allocated.
Unmatch VLAN Mapped	Instance mapping VLAN in `Blocking` status	If Ring Protocol is also used, this item displays instance mapping VLANs whose Spanning Tree Protocols are blocked because of mismatches with the VLAN mapping of Ring Protocol. A hyphen (-) is displayed if there is no mismatch.
CIST Root	Bridge ID for the CIST root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the CIST root bridge
External Root Cost	External root path cost	Path cost value from the Switch's CIST internal bridge to the CIST root bridge. `0` is displayed if the Switch is the CIST root bridge.
Root Port	Root port	Displays the port number of the CIST root port. If the CIST root port is a link aggregation port, the link aggregation port list and the channel group number are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (-) is displayed if the Switch is the CIST root bridge.
Max Age	Maximum valid time of BPDUs sent from the CIST root bridge	Displays the maximum valid time of BPDUs sent from the CIST root bridge.
Forward Delay	Time required for a state transition of the CIST root bridge port	Displays the time required for a state transition when the state transition in the CIST root bridge is triggered by the timer

Item	Meaning	Displayed information
Regional Root	Bridge ID for the regional root bridge of MST instance 0 (IST)	Displays information about the regional root bridge of MST instance 0 (IST).
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of MST instance 0 (IST)
Internal Root Cost	Internal root path cost for MST instance 0 (IST)	Path cost value from the Switch to the regional root bridge of MST instance 0 (IST). `0` is displayed if the Switch is the regional root bridge of MST instance 0 (IST).
Remaining Hops	Number of remaining hops	0 to 40 Displays the remaining number of hops for BPDUs that the regional root bridge of MST instance 0 (IST) sends.
Bridge ID	Bridge ID for MST instance 0 (IST) of the Switch	Displays information about the bridge of MST instance 0 (IST) of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for MST instance 0 (IST) of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value.
Max Age	Maximum valid time for BPDUs sent from the MST instance 0 (IST) of the Switch	Displays the maximum valid time for BPDUs sent from the MST instance 0 (IST) bridge of the Switch.
Hello Time	Interval for sending the BPDUs of MST instance 0 (IST) of the Switch	Displays the interval for sending BPDUs that are regularly sent from the MST instance 0 (IST) bridge of the Switch.
Forward Delay	Time required for a state transition of the MSI instance 0 (IST) port on the Switch	Displays the time required for a state transition when the state transition in the bridge of MSI instance 0 (IST) on the Switch is triggered by the timer.
Max Hops	Maximum number of hops in MST instance 0 (IST) of the Switch	2 to 40 Displays the maximum number of hops for BPDUs sent from the MST instance 0 (IST) bridge of the Switch.
MST Instance	MST instance ID	Displays the MST instance ID and information about the instance.
Time Since Topology Change	Time since a topology change was detected	hh: mm: ss (when the elapsed time is less than 24 hours) ddd. hh: mm: ss (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days)
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to the MST instance. A hyphen (-) is displayed if no VLANs are allocated.
Unmatch VLAN Mapped	Instance mapping VLAN in `Blocking` status	If Ring Protocol is also used, this item displays instance mapping VLANs whose Spanning Tree Protocols are blocked because of mismatches with the VLAN mapping of Ring Protocol. A hyphen (-) is displayed if there is no mismatch.

Item	Meaning	Displayed information
Regional Root	Bridge ID for the regional root bridge of the MST instance	Displays information about the regional root bridge of the MST instance.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of the MST instance
Internal Root Cost	Internal root path cost for the MST instance	Path cost value from the Switch to the regional root bridge of MST instance. `0` is displayed if the Switch is the regional root bridge of the MST instance.
Root Port	Root port of the MST instance	Displays the port number of the root port of the MST instance. If the root port of the MST instance is a link aggregation port, the link aggregation port list and the channel group number are displayed. If a virtual link is used, the port list for the virtual link and the virtual link ID are displayed. A hyphen (`-`) is displayed if the Switch is the regional root bridge of the MST instance.
Remaining Hops	Number of remaining hops	0 to 40 Displays the remaining number of hops for BPDUs that the regional root bridge of the MST instance sends.
Bridge ID	Bridge ID for the MST instance of the Switch	Displays information about the bridge of the MST instance of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for the MST instance of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Max Age	Maximum valid time of BPDUs sent from the MST instance of the Switch	Displays the maximum valid time of BPDUs sent from the MST instance bridge of the Switch.
Hello Time	Interval for sending BPDUs sent from the MST instance of the Switch	Displays the interval for sending BPDUs that are regularly sent from the MST instance bridge of the Switch.
Forward Delay	Time required for a state transition of the MST instance port on the Switch	Displays the time required for a state transition when the state transition in the bridge of the MST instance on the Switch is triggered by the timer.
Max Hops	Maximum number of hops in the MST instance of the Switch	2 to 40 Displays the maximum number of hops for BPDUs sent from the MST instance bridge of the Switch.
Port Information	Information about the ports of the MST instance	Displays information about the ports managed by Multiple Spanning Tree. If no VLANs are allocated to the MST instance, a response message is displayed because there are no ports.
<nif no.>/<port no.>	Port number, channel group number, or virtual link ID	The port numbers, channel group numbers, or virtual link IDs of the ports for which information is displayed.

Item	Meaning	Displayed information
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Boundary	Boundary port	Indicates that the port is the boundary port for the region. If the role of the partner device port is alternate port or backup port, the boundary port might never receive BPDUs. In such cases, the port is not displayed as the boundary port.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode for an MSTP Spanning Tree Protocol. Ports operating in compatible mode do not perform rapid status transitions.
Status	Port state	`Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port `Master`: Master port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations.
Priority	Port priority	Displays the value of the port priority setting for the MST instance of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Cost	Port cost	Displays the value of the port cost setting for the MST instance of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `STP` or when the port is in the `Down` status.
PortFast	The PortFast status. The status of receive BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. • `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) • `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Hello Time	Interval for sending and receiving BPDUs on the port	For the root port, alternate port, and backup port, the value on the partner device is displayed. For the designated port, the value on the Switch is displayed.

Item	Meaning	Displayed information
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: The root guard functionality is running and the port is blocked (all MSTIs for the port are blocked). `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed in parentheses.	Displays information about the BPDUs received at the CIST or MST instance port. This item is not displayed if BPDUs are not received. The BPDU information whose `Mode Version` is `STP` or `Rapid STP` is displayed only by CIST.
Protocol Version	Protocol versions	Displays the protocol version of the received BPDUs. `STP(IEEE802.1D)`: Indicates that BPDUs in which the protocol version is set to STP (IEEE 802.1D) were received from neighboring devices. `Rapid STP(IEEE802.1w)`: Indicates that BPDUs in which the protocol version is set to RSTP (IEEE 802.1w) were received from neighboring devices. `MSTP(IEEE802.1s)`: Indicates that BPDUs in which the protocol version is set to MSTP (IEEE 802.1s) were received from neighboring devices.
Root	Root bridge information stored in the BPDU	If `Protocol Version` is `MSTP`, information about the CIST root bridge is displayed. This item is not displayed for MST instance 1 or later instances. If `Mode Version` is `STP` or `Rapid STP`, information about the root bridge is displayed.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for root bridge
External Root Cost	External root path cost	If `Protocol Version` is `MSTP`, information about the CIST root path cost is displayed. This item is not displayed for MST instance 1 or later instances. If `Mode Version` is `STP` or `Rapid STP`, information about the root path cost is displayed.
Regional Root	Regional root bridge information stored in the BPDU	If `Protocol Version` is `MSTP`, information about the CIST and MSTI regional root bridge is displayed. If `Mode Version` is `STP` or `Rapid STP`, this information is not displayed.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge
Internal Root Cost	Internal root path cost	If `Protocol Version` is `MSTP`, the internal root path cost is displayed. If `Mode Version` is `STP` or `Rapid STP`, this information is not displayed.
Designated Bridge	Bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.

Item	Meaning	Displayed information
MAC	MAC address	MAC address
Port ID	Port information stored in the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 892
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (-) is displayed if this period has expired. <*current-time*>(<*time-BPDU-received*>)/<*maximum-time*> <*current-time*>: The time at which the BPDU is received plus the time that has elapsed <*time-BPDU-received*>: The time that has already elapsed when the BPDU is received (Message Age of the received BPDU) <*maximum-time*>: Valid time (Max Age of the received BPDU)
Remaining Hops	Number of remaining hops	0 to 40 Displays the number of remaining hops for the MST bridge stored in the received BPDU. A hyphen (-) is displayed if `Mode Version` is `STP` or `Rapid STP`.

Impact on communication

None

Response messages

Table 21-7: List of response messages for the show spanning-tree command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.
No corresponding port information.	No port and channel group information exists as Spanning Tree information.
Spanning Tree is not configured.	Spanning Tree Protocol has not been configured. Check the configuration.
Specified Spanning Tree is not configured.	The specified Spanning Tree Protocol has not been configured. Check the configuration.

Notes

None

show spanning-tree statistics

Displays statistics about Spanning Tree Protocols.

Syntax

```
show spanning-tree statistics [ {vlan [ <vlan id list> ] | single | mst [ instance <mst instance id list> ] } [ port <port list> ] [channel-group-number <channel group list>] [virtual-link <link id>]]
```

Input mode

User mode and administrator mode

Parameters

{vlan [<*vlan id list*>] | single | mst [instance <*mst instance id list*>]}

vlan

Displays PVST+ statistics.

<*vlan id list*>

Displays PVST+ Spanning Tree statistics for the VLAN IDs specified in list format.

For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all VLANs for which PVST+ is operating are displayed.

single

Displays statistics about Single Spanning Tree.

mst

Displays statistics about Multiple Spanning Tree.

instance <*mst instance id list*>

Displays statistics about the Multiple Spanning Tree for the MST instance IDs specified in list format. Specifiable values for MST instance ID are in the range from 0 to 4095.

If `0` is specified as the MST instance ID, CIST is subject to display.

Operation when this parameter is omitted:

All MST instances are subject to display.

port <*port list*>

Displays Spanning Tree statistics for the specified port number. For details about how to specify <*port list*> and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number <*channel group list*>

Displays Spanning Tree statistics for the channel groups specified in list format. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

virtual-link <*link id*>

Displays Spanning Tree statistics for the specified virtual link ID. Specifiable values for the virtual link ID are in the range from 1 to 250.

Operation when all parameters are omitted:

Displays statistics about Single Spanning Tree, PVST+, and Multiple Spanning Tree.

Example 1

Figure 21-7: Example of displaying PVST+ Spanning Tree statistics

```
>show spanning-tree statistics vlan 10,12
Date 2006/03/14 12:00:00 UTC
VLAN 10
Time Since Topology Change:1 day 10 hour 50 minute 20 second
Topology Change Times:130
Mac Address Table Clear Times:300(2006/03/14 12:00:00)
 Port:1/1  Up
   TxBPDUs              :    904567  RxBPDUs        :       130
   Forward Transit Times:       120  RxDiscard BPDUs:         3
   Discard BPDUs by reason
         Timeout        :         3  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/2  Up
   TxBPDUs              :       100  RxBPDUs        :     80572
   Forward Transit Times:        10  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/3  Up
   TxBPDUs              :       129  RxBPDUs        :     79823
   Forward Transit Times:        10  RxDiscard BPDUs:         4
   Discard BPDUs by reason
         Timeout        :         2  Invalid        :         0
         Not Support    :         2  Other          :         0
   RxTcBPDUs            :        10
 Port:1/10 Up
   TxBPDUs              :       129  RxBPDUs        :     79823
   Forward Transit Times:        10  RxDiscard BPDUs:       123
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :       123
   RxTcBPDUs            :        10
VLAN 12
Time Since Topology Change:1 day 10 hour 50 minute 20 second
Topology Change Times:130
Mac Address Table Clear Times:300(2006/03/14 12:00:00)
 Port:1/1  Up
   TxBPDUs              :       154  RxBPDUs        :     86231
   Forward Transit Times:        24  RxDiscard BPDUs:         2
   Discard BPDUs by reason
         Timeout        :         2  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/2  Up
   TxBPDUs              :       100  RxBPDUs        :     80572
   Forward Transit Times:        10  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/3  Up
   TxBPDUs              :       421  RxBPDUs        :     84956
   Forward Transit Times:        19  RxDiscard BPDUs:        10
   Discard BPDUs by reason
         Timeout        :        10  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
>
```

Figure 21-8: Example of displaying Single Spanning Tree statistics

```
>show spanning-tree statistics single
Date 2006/03/14 12:00:00 UTC
```

```
Time Since Topology Change:2 day 4 hour 25 minute 50 second
Topology Change Times:280
Mac Address Table Clear Times:300(2006/03/14 12:00:00)
 Port:1/1  Up
   TxBPDUs              :   1865421  RxBPDUs        :       260
   Forward Transit Times:       250  RxDiscard BPDUs:        10
   Discard BPDUs by reason
         Timeout        :        10  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/2  Up
   TxBPDUs              :      1970  RxBPDUs        :    183450
   Forward Transit Times:       120  RxDiscard BPDUs:         5
   Discard BPDUs by reason
         Timeout        :         1  Invalid        :         1
         Not Support    :         3  Other          :         0
   RxTcBPDUs            :        10
 Port:1/3  Up
   TxBPDUs              :   1771092  RxBPDUs        :   1745312
   Forward Transit Times:         2  RxDiscard BPDUs:         1
   Discard BPDUs by reason
         Timeout        :         1  Invalid        :         0
         Not Support    :         0  Other          :         0
   RxTcBPDUs            :        10
 Port:1/10 Up
   TxBPDUs              :       129  RxBPDUs        :     79823
   Forward Transit Times:        10  RxDiscard BPDUs:       123
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :       123
   RxTcBPDUs            :        10
>
```

Display items in Example 1

Table 21-8: Display items for PVST+ and Single Spanning Tree statistics

Item	Meaning	Displayed information
Time Since Topology Change	Time since a topology change was detected	*n* `day`: Days *n* `hour`: Hours *n* `minute`: Minutes *n* `second`: Seconds For `Rapid STP` or `Rapid PVST+`, this item shows the time that has elapsed since Spanning Tree Protocol operation started.
Topology ChangeTimes	Number of detecting topology changes	--
Mac Address Table Clear Times	Number of times the MAC address table was cleared. The time that the table was last cleared is also indicated in parentheses.	*yyyy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second If the number of times the table was cleared is zero, the last clearance time is not displayed.
Port	Port number	--
ChGr	Channel group number	--
VL	Virtual link ID	--
VLAN ID	VLAN ID subject to PVST+	Displayed only when `vlan` is specified.

Item	Meaning	Displayed information
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
Forward Transit Times	Number of transitions to the forwarding state	--
TxBPDUs	Number of sent BPDUs	--
RxBPDUs	Number of received BPDUs	--
RxDiscardsBPDUs	Number of discarded received BPDUs	--
Timeout	Number of BPDUs whose valid time expired	Number of received BPDUs whose valid time (which is set in the BPDUs) expired
Invalid	Number of invalid BPDUs	Number of received BPDUs whose format was invalid
Not Support	Number of unsupported BPDUs	Number of received BPDUs that included unsupported parameters
Other	Number of BPDUs discarded for another reason	Displays the number of discarded received BPDUs when BPDU discard has been configured. - When a BPDU filter has been set - When the root guard functionality is operating - When the port receives BPDUs that were sent from the port
RxTcBPDUs	Number of received topology change notification BPDUs	Number of received BPDUs (RxBPDUs) whose flag is `Tc` (topology change)

Example 2

Figure 21-9: Example of displaying Multiple Spanning Tree statistics

```
>show spanning-tree statistics mst
Date 2006/03/14 12:00:00 UTC
MST Instance ID: 0  Topology Change Times:       280
Mac Address Table Clear Times:300(2006/03/14 12:00:00)
  Port:1/1  Up
    TxBPDUs              :   1865421  RxBPDUs        :       260
    Forward Transit Times:       250  RxDiscard BPDUs:        10
    Discard BPDUs by reason
          Timeout        :        10  Invalid        :         0
          Not Support    :         0  Other          :         0
    Ver3Length Invalid   :         0  Exceeded Hop   :         0
    RxTcBPDUs            :        10
  Port:1/2  Up
    TxBPDUs              :      1970  RxBPDUs        :    183450
    Forward Transit Times:       120  RxDiscard BPDUs:         5
    Discard BPDUs by reason
          Timeout        :         1  Invalid        :         1
          Not Support    :         3  Other          :         0
    Ver3Length Invalid   :        22  Exceeded Hop   :        21
    RxTcBPDUs            :        10
  Port:1/3  Up
```

```
    TxBPDUs              :    177092  RxBPDUs        :      1742
    Forward Transit Times:         2  RxDiscard BPDUs:         0
    Discard BPDUs by reason
          Timeout        :         0  Invalid        :         0
          Not Support    :         0  Other          :         0
    Ver3Length Invalid   :        10  Exceeded Hop   :         5
    RxTcBPDUs            :        10
  Port:1/4  Up
    TxBPDUs              :      1092  RxBPDUs        :      1312
    Forward Transit Times:         3  RxDiscard BPDUs:        41
    Discard BPDUs by reason
          Timeout        :         0  Invalid        :         2
          Not Support    :         0  Other          :        39
    Ver3Length Invalid   :         0  Exceeded Hop   :         0
    RxTcBPDUs            :        10
  ChGr:32   Up
    TxBPDUs              :         2  RxBPDUs        :        15
    Forward Transit Times:         2  RxDiscard BPDUs:         5
    Discard BPDUs by reason
          Timeout        :         0  Invalid        :         0
          Not Support    :         3  Other          :         2
    Ver3Length Invalid   :         0  Exceeded Hop   :         0
    RxTcBPDUs            :        10
MST Instance ID: 1  Topology Change Times: 290
Mac Address Table Clear Times:300(2006/03/14 12:00:00)
  Port:1/1  Up
    TxBPDUs              :   1865421  RxBPDUs        :       260
    Forward Transit Times:       250  Discard Message:         0
    Exceeded Hop         :         0
    RxTcBPDUs            :        10
  Port:1/2  Up
    TxBPDUs              :      1970  RxBPDUs        :    183450
    Forward Transit Times:       120  Discard Message:         7
    Exceeded Hop         :         1
    RxTcBPDUs            :        10
  Port:1/3  Up
    TxBPDUs              :    177092  RxBPDUs        :      1742
    Forward Transit Times:         2  Discard Message:         0
    Exceeded Hop         :         5
    RxTcBPDUs            :        10
  Port:1/4  Up
    TxBPDUs              :      1092  RxBPDUs        :      1312
    Forward Transit Times:         3  Discard Message:         0
    Exceeded Hop         :         0
    RxTcBPDUs            :        10
  ChGr:32   Up
    TxBPDUs              :         2  RxBPDUs        :        15
    Forward Transit Times:         2  Discard Message:         0
    Exceeded Hop         :         0
    RxTcBPDUs            :        10
>
```

Display items in Example 2

Table 21-9: Display items for Multiple Spanning Tree statistics

Item	Meaning	Displayed information
MST Instance ID	Instance ID subject to MST	--
Topology ChangeTimes	Number of detecting topology changes	--

Item	Meaning	Displayed information
Mac Address Table Clear Times	Number of times the MAC address table was cleared. The time that the table was last cleared is also indicated in parentheses.	*yyyy*/*mm*/*dd hh*:*mm*:*ss* Mac Address Table Clear Times If the number of times the table was cleared is zero, the last clearance time is not displayed.
Port	Port number	--
ChGr	Channel group number	--
VL	Virtual link ID	--
Up	The port is in Up status.	Indicates that the port is in Up status. This indicates that the channel group in link aggregation is in the `Up` status. If a virtual link is used, this means that at least one virtual link port is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. This indicates that the channel group in link aggregation is in the `Down` status. If a virtual link is used, this means that all virtual link ports are in the `Down` status.
TxBPDUs	Number of sent BPDUs	--
RxBPDUs	Number of received BPDUs	--
Forward Transit Times	Number of transitions to the forwarding state	--
RxDiscardsFrames	Number of discarded received BPDUs	-- (Displayed only for MST Instance ID:0)
Discard BPDUs by reason	Number of discarded received BPDUs	-- (Displayed only for MST Instance ID:0)
Timeout	Number of BPDUs whose valid time expired	Displays the number of received BPDUs whose valid time (which is set in the BPDUs) expired. (Displayed only for MST Instance ID:0)
Invalid	Number of invalid BPDUs	Displays the number of received BPDUs whose format is invalid (this item is displayed only for MST instance 0). When the length of the configured BPDU is less than 35 octets When the length of the TCN BPDU is less than 4 octets When the length of the RST BPDU is less than 36 octets When the length of the MST BPDU is less than 35 octets When the Version 3 Length value of the MST BPDU is less than 64
Not Support	Number of unsupported BPDUs	Displays the number of received BPDUs that include unsupported parameters (this item is displayed only for MST instance 0). When the BPDU type value is other than 0x00, 0x02, or 0x80

Item	Meaning	Displayed information
Other	Number of BPDUs discarded for another reason	Displays the number of discarded received BPDUs when PVST+ BPDUs are received or when BPDU discard has been configured. - When BPDU filtering has been configured - When the root guard functionality is operating (Displayed only for MST Instance ID:0) - When the port receives BPDUs that were sent from the port
Discard Message	MSTI configuration message when the received BPDUs are discarded	Displays the number of MSTI configuration messages when BPDU discard has set by the following functionality: - When the root guard functionality is set (Displayed only for MST instance IDs 1 to 4095.)
Ver3Length Invalid	Number of received BPDUs whose Version 3 Length value is invalid	Displays the number of received BPDUs whose Version 3 Length value is invalid. - When the value is less than 64 - When the value is 1089 or more - When the value is not a multiple of 16 (Displayed only for MST Instance ID:0)
Exceeded Hop	Number of discarded MST configuration messages whose remaining hop value is 0	--
RxTcBPDUs	Number of received topology change notification BPDUs	Number of received BPDUs (RxBPDUs) whose flag is `Tc` (topology change)

Impact on communication

None

Response messages

Table 21-10: List of response messages for the show spanning-tree statistics command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.
No corresponding port information.	No port and channel group information exists as Spanning Tree information.
No corresponding Spanning Tree information.	The relevant Spanning Tree information does not exist.

Notes

None

clear spanning-tree statistics

Clears statistics about Spanning Tree Protocols.

Syntax

```
clear spanning-tree statistics [ {vlan [ <vlan id list> ] | single | mst [ instance <mst instance id list> ] } [ port <port list> ] [channel-group-number <channel group list>] [virtual-link <link id>]]
```

Input mode

User mode and administrator mode

Parameters

{vlan [<*vlan id list*>] | single | mst [instance <*mst instance id list*>]}

vlan

Clears PVST+ statistics.

<*vlan id list*>

Specify a list of VLAN IDs for which you want to clear PVST+ Spanning Tree statistics.

For details about how to specify <*vlan id list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all VLANs for which PVST+ is operating are cleared.

single

Clears statistics about Spanning Tree Protocols.

mst

Clears statistics about Multiple Spanning Tree .

instance <*mst instance id list*>

Clears statistics about the Multiple Spanning Tree for the MST instance IDs specified in list format. Specifiable values for MST instance ID are in the range from 0 to 4095.

If an MST instance ID of `0` is specified, the CIST statistics are also cleared.

Operation when this parameter is omitted:

All MST instances are subject to clearance.

port <*port list*>

Clears Spanning Tree statistics for the port numbers specified in list format. For details about how to specify <*port list*> and the specifiable range of values, see *Specifiable values for parameters.*

channel-group-number <*channel group list*>

Clears Spanning Tree statistics for the channel groups specified in list format. For details about how to specify <*channel group list*>, see *Specifiable values for parameters*.

virtual-link <*link id*>

Clears statistics about the Spanning Tree Protocols for the specified virtual link ID. Specifiable values for the virtual link ID are in the range from 1 to 250.

Operation when all parameters are omitted:

Statistics about all Spanning Tree Protocols are cleared.

Example

Figure 21-10: Example of clearing the statistics for all Spanning Tree Protocols

```
> clear spanning-tree statistics
>
```

Figure 21-11: Example of clearing Single Spanning Tree statistics

```
> clear spanning-tree statistics single
>
```

Figure 21-12: Example of clearing Multiple Spanning Tree statistics

```
>clear spanning-tree statistics mst
>
```

Display items

None

Impact on communication

None

Response messages

Table 21-11: List of response messages for the clear spanning-tree statistics command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.

Notes

- Even if statistics are cleared, the value for the MIB information obtained by using SNMP is not cleared.

  To clear MIB information, use the `restart spanning-tree` command.
- If the configuration is deleted or added, the target statistics are cleared.

clear spanning-tree detected-protocol

Forces recovery of STP compatible mode for Spanning Tree Protocols.

Syntax

```
clear spanning-tree detected-protocol [ { vlan [ <vlan id list> ] | single | mst }
] [ port <port list> ] [ channel-group-number <channel group list> ]
```

Input mode

User mode and administrator mode

Parameters

{ vlan [*<vlan id list>*] | single | mst }

vlan

Forces recovery of STP compatible mode for PVST+.

<vlan id list>

Forces recovery of STP compatible mode for PVST+ for the VLAN IDs specified in list format.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All VLANs on which PVST+ is running are subject to a forced recovery of STP compatible mode.

single

Forces recovery of STP compatible mode for Single Spanning Tree.

mst

Forces recovery of STP compatible mode for Multiple Spanning Tree.

port *<port list>*

Forces recovery of STP compatible mode for the specified port number.

For details about how to specify *<port list>* and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number *<channel group list>*

Forces recovery of STP compatible mode for the channel groups specified in list format.

For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

Operation when all parameters are omitted:

STP compatible mode is forcibly recovered for the ports of all Spanning Tree Protocols.

Example

The following shows an example of forcing recovery of STP compatible mode for Spanning Tree Protocols.

Figure 21-13: Example of forcibly recovering STP compatible mode for Spanning Tree Protocols

```
> clear spanning-tree detected-protocol
>
```

Display items

None

Impact on communication

None

Response messages

Table 21-12: List of response messages for the clear spanning-tree detected-protocol command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.

Notes

This command is valid only for rapid PVST+, rapid Spanning Tree Protocols, and Multiple Spanning Tree.

show spanning-tree port-count

Displays the number of accommodated Spanning Tree Protocols.

Syntax

```
show spanning-tree port-count [ {vlan | single | mst} ]
```

Input mode

User mode and administrator mode

Parameters

{vlan | single | mst}

vlan

Displays the number of accommodated PVST+ Spanning Trees.

single

Displays the number of accommodated Single Spanning Trees.

mst

Displays the number of accommodated Multiple Spanning Trees.

Operation when this parameter is omitted:

The number of accommodated PVST+ Spanning Tree Protocols, the number of accommodated Single Spanning Trees, and the number of accommodated Multiple Spanning Trees are displayed.

Example 1

The following shows an example of displaying the number of accommodated PVST+ Spanning Tree Protocols.

Figure 21-14: Example of displaying the number of accommodated PVST+ Spanning Tree Protocols

```
> show spanning-tree port-count vlan
Date 2008/04/16 12:00:00 UTC
PVST+    VLAN Counts:    5     VLAN Port Counts:      20     Tree Counts:    7
>
```

Display items in Example 1

Table 21-13: Display items for the number of accommodated PVST+ Spanning Tree Protocols

Item	Meaning	Displayed information
PVST+ VLAN Counts	Number of VLANs	Number of VLANs in which PVST+ Spanning Tree Protocols are operating
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for all VLANs subject to PVST+
Tree Counts	Number of PVST+ Spanning Tree Protocols	Number of VLANs subject to PVST+

Example 2

The following shows an example of displaying the number of accommodated Single Spanning Trees.

Figure 21-15: Example of displaying the number of accommodated Single Spanning Trees

```
> show spanning-tree port-count single
Date 2008/04/16 12:00:00 UTC
Single   VLAN Counts:   16     VLAN Port Counts:      64
>
```

Display items in Example 2

Table 21-14: Display items for the number of accommodated Single Spanning Trees

Item	Meaning	Displayed information
Single VLAN Counts	Number of VLANs	Number of VLANs subject to the Single Spanning Tree
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for all VLANs subject to the Single Spanning Tree

Example 3

The following shows an example of displaying the number of accommodated Multiple Spanning Trees.

Figure 21-16: Example of displaying the number of accommodated Multiple Spanning Trees

```
> show spanning-tree port-count mst
Date 2008/04/16 12:00:00 UTC
CIST     VLAN Counts: 4073     VLAN Port Counts:      48
MST    1 VLAN Counts:    4     VLAN Port Counts:      12
MST  128 VLAN Counts:   10     VLAN Port Counts:      80
MST 1024 VLAN Counts:    8     VLAN Port Counts:      32
>
```

Display items in Example 3

Table 21-15: Display items for the number of accommodated Multiple Spanning Trees

Item	Meaning	Displayed information
CIST VLAN Counts	Number of VLANs	Number of CIST instance VLANs
MST VLAN Counts	Number of VLANs	Number of MSTI instance VLANs
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for the applicable instance VLANs among existing VLANs

Impact on communication

None

Response messages

Table 21-16: List of response messages for the show spanning-tree port-count command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.
Spanning Tree is not configured.	Spanning Tree Protocol has not been configured. Check the configuration.
Specified Spanning Tree is not configured.	The specified Spanning Tree Protocol has not been configured. Check the configuration.

Notes

- The number of PVST+ and Single Spanning Tree VLANs does not include the number of VLANs in the `suspend` status. The total number of PVST+ Spanning Tree Protocol VLANs, including those in the `suspend` status, is displayed under `Tree Counts`.
- The number of VLAN ports for the PVST+, Single Spanning Tree, and Multiple Spanning Tree does not include the following VLANs or ports:
  - VLANs for which the `suspend` parameter is set by the `state` configuration command
  - Ports for which VLAN tunneling is set
  - Ports for which the BPDU filter functionality is not set when the BPDU guard functionality is used.
  - Access ports for which the PortFast functionality and BPDU filter functionality are set

restart spanning-tree

Restarts the Spanning Tree program.

Syntax

```
restart spanning-tree [-f] [core-file]
```

Input mode

User mode and administrator mode

Parameters

-f

Restarts the Spanning Tree program without outputting any confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file when the program is restarted.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

After a restart confirmation message is output, the Spanning Tree program is restarted.

Example

Figure 21-17: Example of restarting Spanning Tree Protocols

```
> restart spanning-tree
Spanning Tree restart OK? (y/n): y
>
```

Display items

None

Impact on communication

Communication over the VLANs in which Spanning Tree Protocols are operating stops until the calculation of the Spanning Tree topology finishes.

Response messages

Table 21-17: List of response messages for the restart spanning-tree command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Spanning Tree program failed to be restarted.	The command could not restart the Spanning Tree program. Re-execute the command.

Notes

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

Storage directory: `/usr/var/core/`

File name: `stpd.core`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

dump protocols spanning-tree

Outputs to a file detailed event trace information and control table information collected for Spanning Tree Protocols.

Syntax

```
dump protocols spanning-tree
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 21-18: Example of obtaining a Spanning Tree Protocol dump

```
> dump protocols spanning-tree
>
```

Display items

None

Impact on communication

None

Response messages

Table 21-18: List of response messages for the dump protocols spanning-tree command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Spanning Tree program.	Communication with the Spanning Tree program failed.
File open error.	An attempt to open or access a dump file failed.

Notes

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

Location: `/usr/var/stp/`

Event trace information file: `stpd_trace.gz`

Control table information file: `stpd_dump.gz`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

Chapter

22. Ring Protocol

show axrp
clear axrp
clear axrp preempt-delay
restart axrp
dump protocols axrp

show axrp

Displays Ring Protocol information.

Syntax

```
show axrp [<ring id list>] [detail]
```

Input mode

User mode and administrator mode

Parameters

<ring id list>

Specify a list of ring IDs for which you want to display information. If you specify multiple ring IDs, you can specify a range.

[Specifying a range by using "-" or ","]

All rings defined by the range are specified. The specifiable values are from 1 to 65535.

detail

Displays detailed Ring Protocol information.

Operation when all parameters are omitted:

All summary information about the Ring Protocol is displayed.

Example 1

The following shows an example of displaying summary information about the Ring Protocol.

Figure 22-1: Example of displaying summary information about the Ring Protocol

```
> show axrp
Date 2007/01/26 12:00:00 UTC

Total Ring Counts:4

Ring ID:1
 Name:RING#1
 Oper State:enable           Mode:Master     Attribute:-

 VLAN Group ID  Ring Port  Role/State            Ring Port  Role/State
 1              1/1        primary/forwarding    1/2        secondary/blocking
 2              1/1        secondary/blocking    1/2        primary/forwarding

Ring ID:2
 Name:RING#2
 Oper State:enable           Mode:Transit    Attribute:-

 VLAN Group ID  Ring Port  Role/State            Ring Port  Role/State
 1              1(ChGr)    -/forwarding          2(ChGr)    -/forwarding
 2              1(ChGr)    -/forwarding          2(ChGr)    -/forwarding

Ring ID:3
 Name:
 Oper State:disable          Mode:-          Attribute : -

 VLAN Group ID  Ring Port  Role/State            Ring Port  Role/State
 1              -          -/-                   -          -/-
 2              -          -/-                   -          -/-

Ring ID:4
 Name:RING#4
 Oper State:enable           Mode:Transit    Attribute:rift-ring-edge(1)
```

```
 Shared Edge Port:1/3

 VLAN Group ID  Ring Port  Role/State            Ring Port  Role/State
 1              1/3        -/-                   1/4        -/forwarding
 2              1/3        -/-                   1/4        -/forwarding
>
```

Figure 22-2: Example of displaying summary information about the Ring Protocol for a specific ring ID

```
> show axrp 1
Date 2007/01/26 12:00:00 UTC

Total Ring Counts:1

Ring ID:1
 Name:RING#1
 Oper State:enable           Mode:Master     Attribute:-

 VLAN Group ID  Ring Port  Role/State            Ring Port  Role/State
 1              1/1        primary/forwarding    1/2        secondary/blocking
 2              1/1        secondary/blocking    1/2        primary/forwarding
>
```

Display items in Example 1

Table 22-1: Items displayed for summary information about the Ring Protocol

Item	Meaning	Displayed information
Total Ring Counts	Number of rings	1 to 16
Ring ID	Ring ID	1 to 65535
Name	Ring identification name	--
Oper State	Whether the ring is enabled or disabled	`enable`: Enabled `disable`: Disabled `Not Operating`: Ring Protocol functionality is not operating for a reason such as invalid configuration (if all necessary configuration entries for using Ring Protocol functionality have not been set, a hyphen (`-`) is displayed).
Mode	Operating mode	`Master`: Master node `Transit`: Transit node
Attribute	In a multi-ring configuration, the attribute of the Switch in a shared-link non-monitoring ring	`rift-ring`: Master node in a shared-link non-monitoring ring `rift-ring-edge (1)`: Terminal node having an edge node ID of 1 in a shared-link non-monitoring ring (both master and transit nodes can have this attribute) `rift-ring-edge (2)`: Terminal node having an edge node ID of 2 in a shared-link non-monitoring ring (both master and transit nodes can have this attribute) `-`: Node that is neither a `rift-ring` node nor a `rift-ring-edge` node
Shared Edge Port	Port number on the shared-link side of the terminal node in a shared-link non-monitoring ring	Physical port number (NIF number/port number) or channel group number (ChGr) Note: This item is displayed only for the terminal nodes in a shared-link non-monitoring ring. However, if `Not Operating` or a hyphen (`-`) is displayed for `Oper State`, the value that has been set is displayed regardless of the node type.

Item	Meaning	Displayed information
Shared Port	Shared-link port number for the transit node on the shared link	Physical port number (NIF number/port number) or channel group number (ChGr) Note: This item is displayed only for transit nodes on a shared link. However, if `Not Operating` or a hyphen (`-`) is displayed for `Oper State`, the value that has been set is displayed regardless of the node type.
VLAN Group ID	Data transfer VLAN group ID	1 to 2
Ring Port	Ring port number	Physical port number (NIF number/port number) or channel group number (ChGr)
Role	The role of the ring port	`primary`: Primary port `secondary`: Secondary port Note: A hyphen (`-`) is displayed for nodes other than the master node on which Ring Protocol functionality is enabled.
State	Ring port state	`Forwarding`: Forwarding `Blocking`: Blocking `down`: The port or channel group is down. Note: If Ring Protocol functionality is not enabled, or if the port is a shared port in a shared-link non-monitoring ring, a hyphen (`-`) is displayed.

Example 2

The following shows an example of displaying detailed Ring Protocol information.

Figure 22-3: Example of displaying detailed Ring Protocol information

```
> show axrp detail
Date 2009/10/06 12:00:00 UTC

Total Ring Counts:4

Ring ID:1
 Name:RING#1
 Oper State:enable           Mode:Master     Attribute:-
 Control VLAN ID:5           Ring State:normal
 Health Check Interval  (msec):100
 Health Check Hold Time (msec):256
 Preempt Delay Time      (sec):-
 Flush Request Counts:3
 Flush Request Transmit VLAN ID:12

 VLAN Group ID:1
  VLAN ID:6-10,12
  Ring Port:1/1         Role:primary      State:forwarding
  Ring Port:1/2         Role:secondary    State:blocking

 VLAN Group ID:2
  VLAN ID:16-20,22
  Ring Port:1/1         Role:secondary    State:blocking
  Ring Port:1/2         Role:primary      State:forwarding

 Last Transition Time:2009/10/03 10:00:00
 Fault Counts    Recovery Counts    Total Flush Request Counts
 1               1                  12

Ring ID:2
 Name:RING#2
 Oper State:enable           Mode:Transit    Attribute:-
 Control VLAN ID:15
 Forwarding Shift Time (sec):10
```

```
 Last Forwarding:flush request receive

 VLAN Group ID:1
  VLAN ID:26-30,32
  Ring Port:1(ChGr)     Role:-            State:forwarding
  Ring Port:2(ChGr)     Role:-            State:forwarding

 VLAN Group ID:2
  VLAN ID:36-40,42
  Ring Port:1(ChGr)     Role:-            State:forwarding
  Ring Port:2(ChGr)     Role:-            State:forwarding

Ring ID:3
 Name:
 Oper State:disable          Mode:-          Attribute : -
 Control VLAN ID:-

 VLAN Group ID:1
  VLAN ID:-
  Ring Port:-           Role:-            State:-
  Ring Port:-           Role:-            State:-

 VLAN Group ID:2
  VLAN ID:-
  Ring Port:-           Role:-            State:-
  Ring Port:-           Role:-            State:-

Ring ID : 4
 Name:RING#4
 Oper State:enable           Mode:Transit    Attribute:rift-ring-edge(1)
 Shared Edge Port:1/3
 Control VLAN ID:45
 Health Check Interval  (msec):1000
 Forwarding Shift Time (sec):10
 Last Forwarding:flush request receive

 VLAN Group ID:1
  VLAN ID:46-50,52
  Ring Port:1/3         Role:-            State:-
  Ring Port:1/4         Role:-            State:forwarding

 VLAN Group ID:2
  VLAN ID:56-60,62
  Ring Port:1/3         Role:-            State:-
  Ring Port:1/4         Role:-            State:forwarding
>
```

Display items in Example 2

Table 22-2: Items displayed for detailed information about the Ring Protocol

Item	Meaning	Displayed information
Total Ring Counts	Number of rings	1 to 16
Ring ID	Ring ID	1 to 65535
Name	Ring identification name	--
Oper State	Whether the ring is enabled or disabled	`enable`: Enabled `disable`: Disabled `Not Operating`: Ring Protocol functionality is not operating for a reason such as invalid configuration (if all necessary configuration entries for using Ring Protocol functionality have not been set, a hyphen (`-`) is displayed).

Item	Meaning	Displayed information
Mode	Operating mode	`Master`: Master node `Transit`: Transit node
Attribute	In a multi-ring configuration, the attribute of the Switch in a shared-link non-monitoring ring	`rift-ring`: Master node in a shared-link non-monitoring ring `rift-ring-edge (1)`: Terminal node having an edge node ID of 1 in a shared-link non-monitoring ring (both master and transit nodes can have this attribute) `rift-ring-edge (2)`: Terminal node having an edge node ID of 2 in a shared-link non-monitoring ring (both master and transit nodes can have this attribute) `-`: Node that is neither a `rift-ring` node nor a `rift-ring-edge` node
Shared Edge Port	Port number on the shared-link side of the terminal node in a shared-link non-monitoring ring	Physical port number (NIF number/port number) or channel group number (ChGr) Note: This item is displayed only for the terminal nodes in a shared-link non-monitoring ring. However, if `Not Operating` or a hyphen (`-`) is displayed for `Oper State`, the value that has been set is displayed regardless of the node type.
Shared Port	Shared-link port number for the transit node on the shared link	Physical port number (NIF number/port number) or channel group number (ChGr) Note: This item is displayed only for transit nodes on a shared link. However, if `Not Operating` or a hyphen (`-`) is displayed for `Oper State`, the value that has been set is displayed regardless of the node type.
Control VLAN ID	Control VLAN ID	2 to 4095
Forwarding Delay Time	Timer value of the forwarding shift time for the control VLAN	1 to 65535 (seconds) (This item is displayed only for transit nodes.)
Ring State	Status of the ring	`normal`: Normal `fault`: A fault has occurred. `preempt delay`: Path switchbacks are suppressed. `monitoring recovery`: Recovery is being monitored. Note: This item is displayed only for the master node. However, if Ring Protocol functionality is not enabled, a hyphen (`-`) is displayed.
Health Check Interval	Value of the health-check frame sending interval timer	10 to 10000 (milliseconds) Note: This item is displayed for the master node and terminal nodes in a shared-link non-monitoring ring.
Health Check Hold Time	Time period during which a health-check frame is not received but the judgment that a failure occurred is suppressed	32 to 12288 (milliseconds) (This item is displayed only for the master node.)
Preempt Delay Time	Time required to complete a switchback operation that has been suppressed	1 to 3600 (seconds), or `infinity`. If a switchback operation has not been suppressed, a hyphen (`-`) is displayed. Note: This item is displayed only for the master node. However, this item is not displayed if no value has been set.
Flush Request Counts	Number of times a flush control frame was sent	1 to 10 (This item is displayed only for the master node.)

Item	Meaning	Displayed information
Flush Request Transmit VLAN ID	When a failure occurs in a ring or the failure is corrected, the ID of the VLAN from which neighboring-ring flush control frames are to be sent to the switches in the neighboring ring	1 to 4095 (This item is displayed only for the master node.)
Forwarding Shift Time	Time required to change the status of the data-forwarding VLAN for a ring port to Forwarding	1 to 65535 (seconds), or `infinity`.
Last Forwarding	Reason of why the ring port was set for forwarding lately	`flush request receive`: Flash control frames were received. `forwarding shift time out`: The forwarding shift time expired. (This item is displayed only for transit nodes.)
VLAN Group ID	Data transfer VLAN group ID	1 to 2
Ring Port	Ring port number	Physical port number (NIF number/port number) or channel group number (ChGr)
VLAN ID	Data transfer VLAN ID	1 to 4095
Role	The role of the ring port	`primary`: Primary port `secondary`: Secondary port Note: A hyphen (`-`) is displayed for nodes other than the master node on which Ring Protocol functionality is enabled.
State	Ring port state	`Forwarding`: Forwarding `Blocking`: Blocking `down`: The port or channel group is down. Note: If Ring Protocol functionality is not enabled, or if the port is a shared port in a shared-link non-monitoring ring, a hyphen (`-`) is displayed.
Last Transition Time	Time that the failure or recovery monitoring status changed last	*yyyy*/*mm*/*dd hh*:*mm*:*ss* `UTC`: Year, month, day, hour, minute, second, and time zone (This item is displayed only for the master node.)
Fault Counts	Number of times a fault was detected (statistics)	0 to 4294967295 (This item is displayed only for the master node.)
Recovery Counts	Number of times recovery was detected (statistics)	0 to 4294967295 (This item is displayed only for the master node.)
Total Flush Request Counts	Total number of times a flush control frame was sent (statistics)	0 to 4294967295 (This item is displayed only for the master node.)

Impact on communication

None

Response messages

Table 22-3: List of response messages for the show axrp command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Ring Protocol program.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.
Ring Protocol is initializing.	The Ring Protocol is performing initialization. Processing, such as loading configuration entries, has not been completed. Wait a while, and then re-execute the command.
Ring Protocol is not configured.	The Ring Protocol has not been configured. Check the configuration.
Specified Ring ID is not configured:<*ring id*>.	The specified ring ID has not been configured. <*ring id*>: Ring ID

Notes

The counter values for statistical items do not increment when the upper limit is reached.

clear axrp

Clears Ring Protocol statistics.

Syntax

```
clear axrp [<ring id list>]
```

Input mode

User mode and administrator mode

Parameters

<ring id list>

Specify a list of ring IDs for which you want to clear all Ring Protocol statistics. If you specify multiple ring IDs, you can specify a range.

[Specifying a range by using "-" or ","]

All rings defined by the range are specified. The specifiable values are from 1 to 65535.

Operation when all parameters are omitted:

All Ring Protocol statistics are cleared.

Example

Figure 22-4: Example of clearing all Ring Protocol statistics

```
> clear axrp
>
```

Figure 22-5: Example of clearing all Ring Protocol statistics for a specific ring ID

```
> clear axrp 1
>
```

Display items

None

Impact on communication

None

Response messages

Table 22-4: List of response messages for the clear axrp command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Ring Protocol program.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.
Ring Protocol is initializing.	The Ring Protocol is performing initialization. Processing, such as loading configuration entries, has not been completed. Wait a while, and then re-execute the command.
Ring Protocol is not configured.	The Ring Protocol has not been configured. Check the configuration.

Message	Description
Specified Ring ID is not configured:<*ring id*>.	The specified ring ID has not been configured. <*ring id*>: Ring ID

Notes

- Even if statistics are cleared, the value for the MIB information obtained by using SNMP is not cleared.
- If the configuration is deleted or added, the target statistics are cleared.

clear axrp preempt-delay

Clears the path switchback suppression status for the master node.

Syntax

```
clear axrp preempt-delay <ring id> [-f]
```

Input mode

User mode and administrator mode

Parameters

<ring id>

Specify the ID of the ring whose path switchback suppression status you want to clear.

The specifiable values are from 1 to 65535.

-f

Clears the path switchback suppression status without outputting any messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Figure 22-6: Example of executing the clear axrp preempt-delay command

```
>clear axrp preempt-delay 1
Fault recovery process restore OK? (y/n) :y
>
```

Figure 22-7: Example of executing the clear axrp preempt-delay command (with the -f parameter specified)

```
>clear axrp preempt-delay 1 -f
>
```

Display items

None

Impact on communication

If this command is executed on a ring for which path switchback suppression is enabled, the suppression is disabled and a path switchback operation is performed. At this time, the VLANs that belong to the VLAN group for the ring become unable to receive frames temporarily.

Response messages

Table 22-5: List of response messages for the clear axrp preempt-delay command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Ring Protocol program.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.

Message	Description
Ring Protocol is not configured.	The Ring Protocol has not been configured. Check the configuration.
Specified Ring ID is not configured:<*ring id*>.	The specified ring ID has not been configured. <*ring id*>: Ring ID
Specified Ring ID is not preempt delay state:<*ring id*>	Path switchback suppression is not enabled for the specified ring. <*ring id*>: Ring ID

Notes

None

restart axrp

Restarts a Ring Protocol program.

Syntax

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

Input mode

User mode and administrator mode

Parameters

-f

Restarts the Ring Protocol program without outputting any confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file when the program is restarted.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

After a restart confirmation message is output, the Ring Protocol program is restarted.

Example

Figure 22-8: Example of restarting the Ring Protocol program

```
> restart axrp
axrp program restart OK? (y/n):y
>
```

Figure 22-9: Example of restarting the Ring Protocol program (when the -f parameter is specified)

```
> restart axrp -f
>
```

Display items

None

Impact on communication

The VLANs that belong to the VLAN group for the Ring Protocol become unable to receive frames.

Response messages

Table 22-6: List of response messages for the restart axrp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Ring Protocol doesn't seem to be running.	The Ring Protocol program is not running. Check the configuration.

Message	Description
Ring Protocol program failed to be restarted.	This command could not restart the Ring Protocol program. Re-execute the command.

Notes

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

   Storage directory: `/usr/var/core/`

   Core file name: `axrpd.core`

   If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

2. When this command is used to restart the Ring Protocol program, if the number of entries in the table has already reached the maximum, entries can no longer be added to the table. If all necessary entries are not added to the MAC address table, the Ring Protocol functionality cannot operate correctly. Check the capacity limit for the MAC address table in the description of the applicable MAC address table in *3. Capacity Limit* in the manual *Configuration Guide Vol. 1 For Version 11.7*, and review the configuration entries of the functions that use the MAC address table.

dump protocols axrp

Outputs to a file detailed event trace information and control table information collected by the Ring Protocol program.

Syntax

```
dump protocols axrp
```

Input mode

User mode and administrator mode

Parameters

None

Example

The following example outputs a Ring Protocol dump.

Figure 22-10: Example of obtaining a Ring Protocol dump

```
> dump protocols axrp
>
```

Display items

None

Impact on communication

None

Response messages

Table 22-7: List of response messages for the dump protocols axrp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Connection failed to Ring Protocol program.	Communication with the Ring Protocol program failed. Re-execute the command. If this message is output frequently, execute the `restart axrp` command to restart the Ring Protocol program.
File open error.	An attempt to open or access a dump file failed.
Ring Protocol doesn't seem to be running.	The Ring Protocol program is not running. Check the configuration.

Notes

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

Storage directory: `/usr/var/axrp/`

File name: `axrp_dump.gz`

If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

Chapter

23. Policy-based Switching

show policy-switch
show cache policy-switch
reset policy-switch-list
dump policy
restart policy

show policy-switch

Displays the port number and access list information about the Ethernet interfaces for which policy-based switching is enabled.

Syntax

```
show policy-switch [port <port list>]
```

Input mode

User mode and administrator mode

Parameters

port <*port list*>

Specify a list of port numbers for which you want to display access list information.

For <*port list*>, specify the port numbers for which the policy-based switching is enabled. For details about how to specify <*port list*>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The access list information of all port numbers for which the policy-based switching is enabled is displayed.

Example

Figure 23-1: Result of displaying the access list information for the specified port numbers

```
> show policy-switch port 2/1,3/12
Date 2012/01/11 16:20:40 UTC
Port   Access List Name/Number            Sequence   Policy Switch List
 2/ 1  policy-switch-route1                    100                   10
 2/ 1  policy-switch-route1                    110                   10
 2/ 1  policy-switch-route1                    200                   20
 2/ 1  policy-switch-route2                    220                   20
 3/12  policy-switch-route5-mac                 10                  100
 3/12  policy-switch-route5-mac                 20                  100
 3/12  policy-switch-route5-v4                 100                   10
 3/12  policy-switch-route5-v4                 110                   10
 3/12  policy-switch-route5-v6                 100                   10
 3/12  policy-switch-route5-v6                 110                   10
 3/12  policy-switch-route5-ad                 100                   10
 3/12  policy-switch-route5-ad                 110                   10
>
```

Figure 23-2: Result of displaying the access list information about all port numbers

```
> show policy-switch
Date 2012/01/11 16:20:40 UTC
Port   Access List Name/Number            Sequence   Policy Switch List
 2/ 1  policy-switch-route1                    100                   10
 2/ 1  policy-switch-route1                    110                   10
 2/ 8  policy-switch-route2                    200                   20
 2/ 8  policy-switch-route2                    220                   20
 3/12  policy-switch-route5-mac                 10                  100
 3/12  policy-switch-route5-mac                 20                  100
 3/12  policy-switch-route5-v4                 100                   10
 3/12  policy-switch-route5-v4                 110                   10
 3/12  policy-switch-route5-v6                 100                   10
 3/12  policy-switch-route5-v6                 110                   10
 3/12  policy-switch-route5-ad                 100                   10
 3/12  policy-switch-route5-ad                 110                   10
 4/20  policy-switch-route10                  1010                  110
 4/20  policy-switch-route20                  1200                  120
>
```

Display items

Table 23-1: Items displayed by the show policy-switch command

Item	Displayed information
Port	The port number (NIF number/port number) whose access list contains policy-based switching list information
Access List Name/Number	The name or number of each access list
Sequence	Sequence number of the access list
Policy Switch List	The list number of policy-based switching list information

Impact on communication

None

Response messages

Table 23-2: List of response messages for the show policy-switch command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	An access group with policy-based switching enabled has not been set for the Ethernet interface. Check the configuration.
No policy base switching list configuration on the port list.	No policy-based switching list information is set for the specified port list.

Notes

None

show cache policy-switch

Displays the destination interface information and state information for policy-based switching list information.

Syntax

```
show cache policy-switch [<policy switch list no.>]
```

Input mode

User mode and administrator mode

Parameters

<policy switch list no.>

Specify the list whose destination interface information and state information you want to display.

For *<policy switch list no.>*, specify the list number of policy-based switching list information. The specifiable values are from 1 to 1000.

Operation when this parameter is omitted:

The destination interface information and state information for all policy-based switching list information items is displayed.

Example

Figure 23-3: Result of displaying the destination interface information for the specified list number

```
> show cache policy-switch 1
Date 2012/01/11 16:20:40 UTC
Policy Base Switching Default Init Interval :  240
   Start Time : 2012/01/11 15:00:00
   End Time   : 2012/01/11 15:04:00
Policy Base Switching Default Aging Interval :  240
   Start Time : 2012/01/11 16:00:00
   End Time   : 2012/01/11 16:04:00
Policy Base Switching List :    1
   Default : Permit
   Recover : On
   Priority     Sequence   VLAN ID   Status   Output Interface
 *>       1           10       100   Up       2/1
          2           20       100   Down     2/4
          3           30       100   Up       3/10
          4           40       100   Up       20(ChGr)
>
```

Figure 23-4: Result of displaying the destination interface information for all list numbers

```
> show cache policy-switch
Date 2012/01/11 16:20:40 UTC
Policy Base Switching Default Init Interval :  240
   Start Time : 2012/01/11 15:00:00
   End Time   : 2012/01/11 15:04:00
Policy Base Switching Default Aging Interval :  240
   Start Time : 2012/01/11 16:00:00
   End Time   : 2012/01/11 16:04:00
Policy Base Switching List :  100
   Default : Permit
   Recover : On
   Priority     Sequence   VLAN ID   Status   Output Interface
 *>       1           10       100   Up       2/1
          2           20       100   Down     2/4
          3           30       100   Up       3/10
```

```
          4           40       100   Up       20(ChGr)
Policy Base Switching List :  200
   Default : Permit
   Recover : On
   Priority     Sequence   VLAN ID   Status   Output Interface
          1           10       200   Down     2/3
          2           20       200   Down     2/5
 *>       3           30       200   Up       3/3
          4           40       200   Up       3/4
>
```

Display items

Table 23-3: Items displayed by the show cache policy-switch command

Item	Meaning	Displayed information
Policy Base Switching Default Init Interval	Time during which the route is placed in the `Init` state	The time period during which the monitoring of policy-based switching routes is temporarily stopped (for example, when the switch is being started up)
Policy Base Switching Default Aging Interval	Time during which the route is placed in the `Aging` state	The time period during which the monitoring of policy-based switching routes is temporarily stopped during a system switchover
Start Time	Start time of the temporary non-monitoring period for policy-based switching 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 switching 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 Switching List	The list number of policy-based switching list information	--
Default	Default behavior (how packets are handled if the state of all destination interfaces is `Down`)	`Permit`: Packets are forwarded normally. `Deny`: Packets are discarded.
Recover	Whether to enable the switching back of destination interfaces	`On`: Switchbacks are enabled. `Off`: Switchbacks are disabled.
*>	Destination interface currently being used	The destination interfaces that are currently being used are marked as `*>`. This information is not displayed if the state of all destination interfaces is `Down`, `Init`, or `Aging`.
Priority	Priority of the destination interface	--
Sequence	Destination interface application sequence	--
VLAN ID	VLAN ID of the destination interface	--
Status	Status of the destination interface	`Up`: Packets can be forwarded. `Down`: Packets cannot be forwarded. `Init`: Now starting up `Aging`: Now being switched over
Output Interface	Destination interface	The Ethernet interface (NIF number/port number) or the channel group number (ChGr) that sends a packet

Impact on communication

None

Response messages

Table 23-4: List of response messages for the show cache policy-switch command

Message	Description
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.
No such list number.	The specified list number of policy-based switching list information does not exist. Make sure the specified parameter is correct, and then try again.
Policy base switching is not configured.	Policy-based switching is not set. Check the configuration.

Notes

None

reset policy-switch-list

Used to reselect the priority of destination interface information for policy-based switching list information.

Syntax

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

Input mode

User mode and administrator mode

Parameters

<policy switch list no.>

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

For *<policy switch list no.>*, specify the list number of policy-based switching list information. The specifiable values are from 1 to 1000.

Operation when this parameter is omitted:

The priority of destination interface information for all policy-based switching list information is reselected.

Example

Figure 23-5: Reselecting the priority of the destination interface information for the specified list number

```
> reset policy-switch-list 1
Date 2011/12/10 16:20:40 UTC
>
```

Figure 23-6: Reselecting the priority of the destination interface information for all list numbers

```
> reset policy-switch-list
Date 2011/12/10 16:20:40 UTC
>
```

Display items

None

Impact on communication

If the destination interface is changed by reselecting the priority, affected packets might be discarded temporarily.

Response messages

Table 23-5: List of response messages for the reset policy-switch-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 over. Wait until the system has started or switched over, and then re-execute the command.
Can't execute this command in standby system.	This command cannot be executed on a standby system.
Can't execute.	The command could not be executed. Re-execute the command.

Message	Description
No such list number.	The specified list number of policy-based switching list information does not exist. Make sure the specified parameter is correct, and then try again.
Policy base switching is not configured.	Policy-based switching is not set. Check the configuration.

Notes

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

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

Example

Figure 23-7: Dumping the policy-based program

```
> dump policy
>
```

Display items

None

Impact on communication

None

Response messages

Table 23-6: List of response messages for the dump policy command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Policy base routing or policy base switching is not configured.	Policy-based routing or policy-based switching is not set. Check the configuration.

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 necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

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 confirmation message.

Operation 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.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

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

Example

Figure 23-8: 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 route information selected by policy-based routing or communication that is using the destination interface selected by policy-based switching is temporarily suspended.

Response messages

Table 23-7: List of response messages for the restart policy command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Policy base routing or policy base switching is not configured.	Policy-based routing or policy-based switching is not set. Check the configuration.

Notes

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

Storage directory: `/usr/var/core/`

Core file: `policyd.core`

If necessary, back up the file in advance because the specified file is unconditionally overwritten if it already exists.

Chapter

24. IGMP/MLD Snooping

show igmp-snooping
clear igmp-snooping
show mld-snooping
clear mld-snooping
restart snooping
dump protocols snooping

show igmp-snooping

Displays IGMP snooping information. The following information is displayed for each VLAN:

- Whether the querier functionality is set, the IGMP querier address, and multicast router ports
- Subscription multicast group information for each VLAN or port, and learned MAC addresses
- Statistics (number of IGMP packets sent and received)

Syntax

```
show igmp-snooping [ <vlan id list> ]
show igmp-snooping { group [<ip address>] [<vlan id list>] | port <port list>
                     | channel-group-number <channel group list> }
show igmp-snooping statistics [<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 IGMP snooping information.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

Operation when this parameter is omitted:

IGMP snooping information for all VLANs is displayed.

{ group [*<ip address>*] [*<vlan id list>*] | port *<port list>* | channel-group-number *<channel group list>* }

group

Displays the subscription multicast group addresses for the VLANs.

<ip address>

Specify the multicast group IP address for which you want to display IGMP snooping information.

port *<port list>*

Displays the subscription multicast group addresses for the specified ports. For details about how to specify *<port list>* and the specifiable range of values, see *Specifiable values for parameters.*

channel-group-number *<channel group list>*

Displays the subscription multicast group addresses for the specified channel groups. For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

statistics

Displays statistics.

Example 1

Figure 24-1: Example of displaying IGMP snooping information

```
> show igmp-snooping
Date 2008/09/15 15:20:00 UTC
VLAN counts: 2
VLAN: 100
```

```
  VRF: 2
  IP address: 192.168.11.20      Querier: enable
  IGMP querying system: 192.168.11.20
  Querier version: V3
  IPv4 Multicast routing: On
  Fast-leave: On
  Port(5): 1/1-5
  Mrouter-port: 1/1,1/3
  Group counts:3
VLAN: 200
  IP address:      Querier: disable
  IGMP querying system:
  Querier version: V2
  IPv4 Multicast routing: Off
  Fast-leave: Off
  Port(4): 1/6-9
  Mrouter-port: 1/6
  Group counts: 0
>

> show igmp-snooping 100
Date 2008/09/15 15:20:00 UTC
VLAN: 100
  VRF: 2
  IP address:192.168.11.20       Querier: enable
  IGMP querying system: 192.168.11.20
  Querier version: V3
  IPv4 Multicast routing: On
  Fast-leave: Off
  Port(5): 1/1-5
  Mrouter-port: 1/1,1/3
  Group counts: 3
>
```

Display items in Example 1

Table 24-1: Items displayed for IGMP snooping information

Item	Meaning	Displayed information
VLAN counts	Number of VLANs on which IGMP snooping is enabled	--
VLAN	VLAN information	--
VRF [OP-NPAR]	VRF ID	This item is displayed only when VRF is assigned to the VLAN interface.
IP address	IP address	Blank: No IP address has been set.
Querier	Whether the querier functionality has been set	`enable`: The functionality has been set. `disable`: The functionality has not been set.
IGMP querying system	IGMP querier in the VLAN	Blank: There is no IGMP querier.
Querier version	IGMP version of the querier	`V2`: Version 2 `V3`: Version 3
IPv4 Multicast routing	Whether IPv4 multicast routing has been set for the VLAN	`On`: Multicast routing has been set. `Off`: Multicast routing has not been set.
Fast-leave	Whether the IGMP instant leave functionality has been set for the VLAN	`On`: The functionality has been set. `Off`: Not set.
Port(*n*)	Number of ports in the VLAN	*n*: Number of applicable ports
Mrouter-port	Multicast router ports	--

Item	Meaning	Displayed information
Group counts	Number of multicast groups in the VLAN	--

Example 2

Figure 24-2: Example of displaying IGMP group information for each VLAN

```
> show igmp-snooping group
Date 2008/01/15 15:20:00 UTC
Total Groups: 5
VLAN counts: 2
VLAN: 100  Group counts: 3  IPv4 Multicast routing: Off
  Group Address     MAC Address            Version      Mode
  224.10.10.10      0100.5e0a.0a0a         V2           -
    Port-list:1/1-3
  225.10.10.10      0100.5e0a.0a0a         V3           INCLUDE
    Port-list:1/1-2
  239.192.1.1       0100.5e40.0101         V2,V3        EXCLUDE
    Port-list:1/1
VLAN: 300  Group counts: 2  IPv4 Multicast routing: On
  Group Address     MAC Address            Version      Mode
  239.168.10.5      0100.5e28.0a05         -            -
    Port-list:1/4,1/6
  239.192.20.6      0100.5e40.1406         -            -
    Port-list:1/2-4
>
> show igmp-snooping group 100
Date 2008/01/15 15:20:00 UTC
VLAN counts: 1
VLAN: 100  Group counts: 3  IPv4 Multicast routing: Off
  Group Address     MAC Address            Version      Mode
  224.10.10.10      0100.5e0a.0a0a         V2           -
    Port-list:1/1-3
  225.10.10.10      0100.5e0a.0a0a         V1,V2,V3     EXCLUDE
    Port-list:1/1-2
  239.192.1.1       0100.5e40.0101         V1,V2        -
    Port-list:1/1
>

> show igmp-snooping group 224.10.10.10
Date 2008/01/15 15:20:00 UTC
Total Groups: 2
VLAN counts: 2
VLAN: 100  Group counts: 1  IPv4 Multicast routing: Off
  Group Address     MAC Address            Version      Mode
  224.10.10.10      0100.5e0a.0a0a         V2           -
    Port-list:1/1-3
VLAN: 300  Group counts: 1  IPv4 Multicast routing: On
  Group Address     MAC Address            Version      Mode
  224.10.10.10      0100.5e0a.0a0a         -            -
    Port-list:1/4,1/6
>
> show igmp-snooping group 224.10.10.10 100
Date 2008/01/15 15:20:00 UTC
VLAN counts: 1
VLAN: 100  Group counts: 1  IPv4 Multicast routing: Off
  Group Address     MAC Address            Version      Mode
  224.10.10.10      0100.5e0a.0a0a         V2           -
    Port-list:1/1-3
>
```

Display items in Example 2

Table 24-2: Items displayed for IGMP group information for each VLAN

Item	Meaning	Displayed information
Total Groups	Number of participating groups on the device	--
VLAN counts	Number of VLANs on which IGMP snooping is enabled	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups in the VLAN	--
IPv4 Multicast routing	Whether IPv4 multicast routing has been set for the VLAN	`On`: Multicast routing has been set. `Off`: Multicast routing has not been set.
Group Address	Subscription group addresses	--
MAC Address	Learned MAC addresses	--
Version	IGMP version information	`V1`: IGMP version 1 `V2`: IGMP version 2 `V3`: IGMP version 3 If `IPv4 Multicast routing` is `On`, a hyphen (`-`) is displayed. In this case, to check the IGMP version information, use the `show ip igmp group` command. The displayed information is refreshed when an IGMP General Query message is sent or received, and when an IGMP Report message (subscription request) is received.
Mode	Group mode	`INCLUDE`: INCLUDE mode `EXCLUDE`: EXCLUDE mode If the IGMP version information is `V1` or `V2`, or if `IPv4 Multicast routing` is `On`, a hyphen (`-`) is displayed. If `IPv4 Multicast routing` is `On`, to check the group mode, use the `show ip igmp group` command. The displayed information is refreshed when an IGMP General Query message is sent or received, and when an IGMP Report message (subscription request) is received.
Port-list	Relay port number (NIF number/port number)	--

Example 3

Figure 24-3: Example of displaying IGMP group information for each port

```
> show igmp-snooping port 1/1
Date 2006/10/15 15:20:00 UTC
Port  1/1  VLAN counts: 2
  VLAN: 100  Group counts: 2
    Group Address     Last Reporter      Uptime     Expires
    224.10.10.10      192.168.1.3        00:10      04:10
    239.192.1.1       192.168.1.3        02:10      03:00
  VLAN: 150  Group counts: 1
    Group Address     Last Reporter      Uptime     Expires
    239.10.120.1      192.168.15.10      01:10      02:30
>
```

Display items in Example 3

Table 24-3: Items displayed for IGMP group information for each port

Item	Meaning	Displayed information
Port	Applicable port in the VLAN	--
VLAN counts	Number of VLANs to which the specified port belongs	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups for the specified port	--
Group Address	Subscription multicast group addresses	--
Last Reporter	IP address that last subscribed to the group	--
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. However, `1day`, `2days`, ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	*xx*:*yy* *xx* (minutes), *yy* (seconds)

Example 4

Figure 24-4: Example of displaying IGMP snooping statistics

```
> show igmp-snooping statistics
Date 2007/02/15 15:20:00 UTC
VLAN: 100
  Port 1/1  Rx:  Query(V2)              14353     Tx:  Query(V2)          0
                 Query(V3)                 71          Query(V3)         29
                 Report(V1)                15
                 Report(V2)               271
                 Report(V3)                36
                 Leave                    137
                 Error                     14
  Port 1/2  Rx:  Query(V2)                  0     Tx:  Query(V2)         31
                 Query(V3)                 12          Query(V3)         42
                 Report(V1)                 0
                 Report(V2)                78
                 Report(V3)                24
                 Leave                     28
                 Error                      0
>
```

Display items in Example 4

Table 24-4: Items displayed for IGMP snooping statistics

Item	Meaning	Displayed information
VLAN	VLAN information	--
Port	Applicable port in the VLAN	--
Rx	Number of received IGMP packets	--
Tx	Number of sent IGMP packets. Note: If the querier functionality has been set for the Switch, the number of Query messages sent by the IGMP snooping functionality is counted.	--

Item	Meaning	Displayed information
Query(V2)	IGMP Version 2 Query messages	--
Query(V3)	IGMP Version 3 Query messages	--
Report(V1)	IGMP Version 1 Report messages	--
Report(V2)	IGMP Version 2 Report messages	--
Report(V3)	IGMP Version 3 Report messages	--
Leave	Leave messages	--
Error	Error packets	--

Impact on communication

None

Response messages

Table 24-5: List of response messages for the show igmp-snooping command

Message	Description
<*command name*> connection failed to snoopd.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when IGMP snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command. <*command name*>: Name of the entered command
<*command name*> IGMP snooping not active.	IGMP snooping is not running. <*command name*>: Name of the entered command
No operational Port.	The ports specified in <*port list*> did not include active ones. Alternatively, the channel groups specified in <*channel group list*> did not include active ports.
No operational VLAN.	There are no available VLANs.
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication

Notes

None

clear igmp-snooping

Clears IGMP snooping information.

Syntax

```
clear igmp-snooping { all | group [ <vlan id list> ] | statistics [ <vlan id list> ]
} [ -f ]
```

Input mode

User mode and administrator mode

Parameters

all

Clears all information.

group

Clears the learned MAC address information (group information).

<vlan id list>

Specify a list of VLAN IDs for which you want to clear IGMP snooping information.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

Operation when this parameter is omitted:

IGMP snooping information for all VLANs is cleared.

statistics

Clears the statistics.

-f

Clears statistics without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

None

Display items

None

Impact on communication

Note that when the `clear igmp-snooping all` or `clear igmp-snooping group` command is executed, multicast communication temporarily stops.

Response messages

Table 24-6: List of response messages for the clear igmp-snooping command

Message	Description
<*command name*> connection failed to snoopd.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when IGMP or MLD snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command. <*command name*>: Name of the entered command
<*command name*> IGMP snooping not active.	IGMP snooping is not running. <*command name*>: Name of the entered command
No operational VLAN.	There are no available VLANs.
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication

Notes

None

show mld-snooping

Displays MLD snooping information. The following information is displayed for each VLAN:

- Whether the querier functionality is set, the MLD querier address, and the multicast router ports
- Subscription multicast group information for each VLAN or port, and learned MAC addresses
- Statistics (number of MLD packets sent and received)

Syntax

```
show mld-snooping [ <vlan id list> ]
show mld-snooping { group [<ipv6 address>] [<vlan id list>] | port <port list>
                  | channel-group-number <channel group list> }
show mld-snooping statistics [<vlan id list>]
```

Input mode

User mode and administrator mode

Parameters

<vlan id list>

Displays information about MLD snooping for the VLAN IDs specified in list format.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

Operation when this parameter is omitted:

MLD snooping information for all VLANs is displayed.

{ group [*<ipv6 address>*] [*<vlan id list>*] | port *<port list>* | channel-group-number *<channel group list>* }

group

Displays the subscription multicast group addresses for the VLANs.

<ipv6 address>

Specify the multicast group IP address for which you want to display MLD snooping information.

port *<port list>*

Displays the subscription multicast group addresses for the specified ports. For details about how to specify *<port list>* and the specifiable range of values, see *Specifiable values for parameters*.

channel-group-number *<channel group list>*

Displays the subscription multicast group addresses for the specified channel groups. For details about how to specify *<channel group list>*, see *Specifiable values for parameters*.

statistics

Displays statistics.

Example 1

Figure 24-5: Example of displaying MLD snooping information

```
> show mld-snooping
Date 2008/09/15 15:20:00 UTC
VLAN counts: 2
```

```
VLAN: 100
  IP Address: fe80::b1  Querier: enable
  MLD querying system: fe80::b1
  Querier version: V2
  IPv6 Multicast routing: On
  Port(5): 1/1-5
  Mrouter-port: 1/1,1/3
  Group counts: 3
VLAN: 200
  VRF: 5
  IP Address:      Querier: disable
  MLD querying system:
  Querier version: V1
  IPv6 Multicast routing: Off
  Port(4): 1/6-9
  Mrouter-port: 1/6
  Group counts: 0
>

> show mld-snooping 100
Date 2008/09/15 15:20:00 UTC
VLAN: 100
  IP Address: fe80::b1  Querier: enable
  MLD querying system: fe80::b1
  Querier version: V2
  IPv6 Multicast routing: On
  Port(5): 1/1-5
  Mrouter-port: 1/1,1/3
  Group counts: 3
>
```

Display items in Example 1

Table 24-7: Items displayed for MLD snooping information

Item	Meaning	Displayed information
VLAN counts	Number of VLANs on which MLD snooping is enabled	--
VLAN	VLAN information	--
VRF [OP-NPAR]	VRF ID	This item is displayed only when VRF is assigned to the VLAN interface.
IP Address	IP address	Blank: No IP address has been set.
Querier	Whether the querier functionality has been set	`enable`: The functionality has been set. `disable`: The functionality has not been set.
MLD querying system	MLD querier in the VLAN	Blank: There is no MLD querier.
Querier version	MLD version of the querier	`V1`: Version 1 `V2`: Version 2
IPv6 Multicast routing	Whether IPv6 multicast routing has been set for the VLAN	`On`: Multicast routing has been set. `Off`: Multicast routing has not been set.
Port(n)	Number of ports in the VLAN	n: Number of applicable ports
Mrouter-port	Multicast router ports	--
Group counts	Number of subscription multicast groups in the VLAN	--

Example 2

Figure 24-6: Example of displaying MLD group information for each VLAN

```
> show mld-snooping group
Date 2008/01/15 15:20:00 UTC
Total Groups: 3
VLAN counts: 2
VLAN: 100  Group counts: 2  IPv6 Multicast routing: Off
  Group Address     MAC Address         Version      Mode
  ff35::1           3333.0000.0001      V1           -
    Port-list:1/1-3
  ff35::2           3333.0000.0002      V1,V2        EXCLUDE
    Port-list:1/1-2
VLAN: 300  Group counts: 1  IPv6 Multicast routing: On
  Group Address     MAC Address         Version      Mode
  ff35::3           3333.0000.0003      -            -
    Port-list:1/4,1/6
>
> show mld-snooping group 100
Date 2008/01/15 15:20:00 UTC
VLAN counts: 1
VLAN: 100  Group counts: 2  IPv6 Multicast routing: Off
  Group Address     MAC Address         Version      Mode
  ff35::1           3333.0000.0001      V1,V2        EXCLUDE
    Port-list:1/1-3
  ff35::2           3333.0000.0002      V2           INCLUDE
    Port-list:1/1-2

> show mld-snooping group ff35::1
Date 2008/01/15 15:20:00 UTC
Total Groups: 2
VLAN counts: 2
VLAN: 100  Group counts: 1  IPv6 Multicast routing: Off
  Group Address     MAC Address         Version      Mode
  ff35::1           3333:0000:0001      V1           -
    Port-list:1/1-3
VLAN: 300  Group counts: 1  IPv6 Multicast routing: On
  Group Address     MAC Address         Version      Mode
  ff35::1           3333:0000:0001      -            -
    Port-list:1/4,1/6
>
> show mld-snooping group ff35::1 100
Date 2008/01/15 15:20:00 UTC
VLAN counts: 1
VLAN: 100  Group counts: 1  IPv6 Multicast routing: Off
  Group Address     MAC Address         Version      Mode
  ff35::1           3333:0000:0001      V1,V2        EXCLUDE
    Port-list:1/1-3
```

Display items in Example 2

Table 24-8: Items displayed for MLD group information for each VLAN

Item	Meaning	Displayed information
Total Groups	Number of participating groups on the device	--
VLAN counts	Number of VLANs on which MLD snooping is enabled	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups in the VLAN	--
IPv6 Multicast routing	Whether IPv6 multicast routing has been set for the VLAN	`On`: Multicast routing has been set. `Off`: Multicast routing has not been set.

Item	Meaning	Displayed information
Group Address	Subscription group addresses	--
MAC Address	Learned MAC addresses	--
Version	MLD version information	V1: MLD version 1 V2: MLD version 2 If IPv6 Multicast routing is On, a hyphen (-) is displayed. In this case, to check the MLD version information, use the show ipv6 mld group command. The displayed information is refreshed when an MLD General Query message is sent or received, and when an MLD Report message (subscription request) is received.
Mode	Group mode	INCLUDE: INCLUDE mode EXCLUDE: EXCLUDE mode If the MLD version information is V1, or if IPv6 Multicast routing is On, a hyphen (-) is displayed. If IPv6 Multicast routing is On, to check the group mode, use the show ipv6 mld group command. The displayed information is refreshed when an MLD General Query message is sent or received, and when an MLD Report message (subscription request) is received.
Port-list	Relay port number (NIF number/port number)	--

Example 3

Figure 24-7: Example of displaying MLD group information for each port

```
> show mld-snooping port 1/1
Date 2006/10/15 15:20:00 UTC
Port 1/1  VLAN counts: 1
  VLAN: 100  Group counts: 2
    Group Address     Last Reporter      Uptime     Expires
    ff35::2           fe80::b1           00:10      04:10
    ff35::3           fe80::b2           02:10      03:00
>
```

Display items in Example 3

Table 24-9: Items displayed for MLD group information for each port

Item	Meaning	Displayed information
Port	Applicable port in the VLAN	--
VLAN counts	Number of VLANs to which the specified port belongs	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups for the specified port	--
Group Address	Subscription multicast group addresses	--
Last Reporter	IP address that last subscribed to the group	--

Item	Meaning	Displayed 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. However, `1day`, `2days`, ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	*xx*:*yy* *xx* (minutes), *yy* (seconds)

Example 4

Figure 24-8: Example of displaying MLD snooping statistics

```
> show mld-snooping statistics
Date 2007/02/15 15:20:00 UTC
VLAN: 100
  Port 1/1   Rx:  Query(V1)     22     Tx:  Query(V1)     233
                  Query(V2)     12          Query(V2)     123
                  Report(V1)    32
                  Report(V2)    15
                  Done          28
                  Error          0
  Port 1/2   Rx:  Query(V1)     32     Tx:  Query(V1)     234
                  Query(V2)     19          Query(V2)     115
                  Report(V1)    48
                  Report(V2)    26
                  Done          45
                  Error          1
```

Display items in Example 4

Table 24-10: Items displayed for MLD snooping statistics

Item	Meaning	Displayed information
VLAN	VLAN information	--
Port	Applicable port in the VLAN	--
Rx	Number of received MLD packets	--
Tx	Number of sent MLD packets (Note: If the querier functionality has been set for the Switch, the number of Query messages sent by the MLD snooping functionality is counted.)	--
Query(V1)	MLD Version 1 Query messages	--
Query(V2)	MLD Version 2 Query messages	--
Report(V1)	MLD Version 1 Report messages	--
Report(V2)	MLD Version 2 Report messages	--
Done	Done messages	--
Error	Error packets	--

Impact on communication

None

Response messages

Table 24-11: List of response messages for the show mld-snooping command

Message	Description
<*command name*> connection failed to snoopd.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when MLD snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command. <*command name*>: Name of the entered command
<*command name*> MLD snooping not active.	MLD snooping is not operating. <*command name*>: Name of the entered command
No operational Port.	The ports specified in <*port list*> did not include active ones. Alternatively, the channel groups specified in <*channel group list*> did not include active ports.
No operational VLAN.	There are no available VLANs.
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication

Notes

None

clear mld-snooping

Clears MLD snooping information.

Syntax

```
clear mld-snooping { all | group [ <vlan id list> ] | statistics [ <vlan id list> ] }
[ -f ]
```

Input mode

User mode and administrator mode

Parameters

all

Clears all information.

group

Clears the learned MAC address information (group information).

<vlan id list>

Specify a list of VLAN IDs for which you want to clear MLD snooping information.

For details about how to specify *<vlan id list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

Operation when this parameter is omitted:

MLD snooping information for all VLANs is cleared.

statistics

Clears the statistics.

-f

Clears statistics without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example and display items

None

Impact on communication

Note that when the `clear mld-snooping all` or `clear mld-snooping group` command is executed, multicast communication temporarily stops.

Response messages

Table 24-12: List of response messages for the clear mld-snooping command

Message	Description
<*command name*> connection failed to snoopd.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when IGMP or MLD snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command. <*command name*>: Name of the entered command

Message	Description
<*command name*> MLD snooping not active.	MLD snooping is not operating. <*command name*>: Name of the entered command
No operational VLAN.	There are no available VLANs.
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication

Notes

None

restart snooping

Restarts the IGMP or MLD snooping program.

Syntax

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

Input mode

User mode and administrator mode

Parameters

-f

Restarts the snooping program without outputting any confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the snooping program's core file when restarting the program.

Operation when this parameter is omitted:

A core file is not output.

Operation when all parameters are omitted:

After a restart confirmation message is output, the snooping program is restarted.

Example

None

Display items

None

Impact on communication

After the snooping program has been restarted, multicast communication stops until multicast groups are learned again.

Response messages

Table 24-13: List of response messages for the restart snooping command

Message	Description
<*command name*> connection failed to snoopd.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when IGMP or MLD snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command. <*command name*>: Name of the entered command
pid file <*file name*> mangled!	The PID file for the IGMP or MLD snooping program is corrupted. <*file name*>: PID file name
pid in file <*file name*> unreasonably small (<*pid*>)	The PID file for the IGMP or MLD snooping program is corrupted. <*file name*>: PID file name <*pid*>: Process ID

Message	Description
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication
snoopd failed to terminate.	The `restart snooping` command could not restart the IGMP or MLD snooping program. Re-execute the command.
snoopd restarted after termination: old pid <*pid*>, new pid <*pid*>	Command execution failed because the PID was changed during execution of the `restart snooping` command. The IGMP or MLD snooping program might be restarted automatically. If necessary, wait until the program is restarted, and then re-execute the command. <*pid*>: Process ID
snoopd signaled but still running, waiting 6 seconds more.	The IGMP or MLD snooping program is being restarted by using the `restart snooping` command. Wait a while.
snoopd still running, sending KILL signal.	The Kill signal is being sent to the IGMP or MLD snooping program so that the program can be restarted by using the `restart snooping` command. Wait a while.
snoopd terminated.	The IGMP or MLD snooping program was stopped by the `restart snooping` command. The program will restart automatically. Wait a while.

Notes

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

   Storage directory: `/usr/var/core/`

   File name: `snoopd.core`

   If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

2. When this command is used to restart the IGMP or MLD snooping program, if the number of entries in the MAC address table has already reached the maximum, entries can no longer be added to the table. If all necessary entries are not added to the MAC address table, the IGMP or MLD snooping functionality cannot operate correctly. Check the capacity limit for the MAC address table in the description of the applicable MAC address table in *3. Capacity Limit* in the manual *Configuration Guide Vol. 1 For Version 11.7*, and review the configuration entries of the functions that use the MAC address table.

dump protocols snooping

Exports the detailed event trace information and control table information for the IGMP or MLD snooping program to a file.

Syntax

```
dump protocols snooping
```

Input mode

User mode and administrator mode

Parameters

None

Example

None

Impact on communication

None

Response messages

Table 24-14: List of response messages for the dump protocols snooping command

Message	Description
pid file <*file name*> mangled!	The PID file for the IGMP or MLD snooping program is corrupted. <*file name*>: PID file name
pid in file <*file name*> unreasonably small (<*pid*>)	The PID file for the IGMP or MLD snooping program is corrupted. <*file name*>: PID file name <*pid*>: Process ID
Program error occurred: <*error message*>	A program error occurred. Re-execute the command. <*error message*>: `write`: Write error during socket communication `read`: Read error during socket communication `select`: Select function error during socket communication
snoopd doesn't seem to be running.	Command execution failed because the IGMP or MLD snooping program had not been started. If this message is output when IGMP or MLD snooping is enabled, wait for the IGMP or MLD snooping program to be restarted, and then re-execute the command.

Notes

The following shows the output files for the Switch and the directory to which the files are output.

Directory: `/usr/var/mrp/`

Dump information file: `snoopd_dump.gz`

Trace information file: `snoopd_trace`

If the file has already been output, the existing file is unconditionally overwritten. If the existing file is necessary, back it up before executing the command.

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