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*AX8600R Software Manual*

**Operation Command Reference Vol. 1**  
**For Version 12.1**

AX86R-S007X

**Alaxala**

## ■ Relevant products

This manual applies to the models in the AX8600R series of devices. It also describes the functionality of version 12.1 of the software for the AX8600R series of devices.

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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

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# Preface

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## Applicable products and software versions

This manual applies to the models in the AX8600R series of devices. It also describes the functionality of version 12.1 of the software for the AX8600R series of devices.

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.

## 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 Device.

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 Device.

- **Unpacking the Device and the basic settings for initial installation**

Quick Start Guide  
 (AX86R-Q001X)

- **Determining the hardware setup requirements and how to handle the hardware**

Hardware Instruction Manual  
 (AX86R-H001X)

- **Understanding the software functions, configuration settings, and operation commands**

▽ First, see the following guides to check the functions or capacity limits.

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>- Capacity limits</li> <li>- Basic operations (e.g. logging in)</li> <li>- Ethernet</li> </ul> | <ul style="list-style-type: none"> <li>- Filters and QoS</li> <li>- Network management</li> </ul> | <ul style="list-style-type: none"> <li>- IP packet forwarding</li> <li>- Unicast routing</li> <li>- Multicast routing</li> </ul> |
|---|---|--|

Configuration Guide Vol. 1  
 (AX86R-S001X)

Configuration Guide Vol. 2  
 (AX86R-S002X)

Configuration Guide Vol. 3  
 (AX86R-S003X)

▽ If necessary, see the following references.

- **Learning the syntax of commands and the details of command parameters**

Configuration Command Reference Vol. 1  
 (AX86R-S004X)

Configuration Command Reference Vol. 2  
 (AX86R-S005X)

Configuration Command Reference Vol. 3  
 (AX86R-S006X)

Operation Command Reference Vol. 1  
 (AX86R-S007X)

Operation Command Reference Vol. 2  
 (AX86R-S008X)

Operation Command Reference Vol. 3  
 (AX86R-S009X)

- **Understanding system messages and logs**

Message and Log Reference  
 (AX86R-S010X)

- **Understanding MIBs**

MIB Reference  
 (AX86R-S011X)

- **How to troubleshoot when a problem occurs**

Troubleshooting Guide  
 (AX86R-T001X)

## Conventions: The terms "Device" and "device"

The term Device (upper-case "D") is an abbreviation for the following:

AX8600R series device

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

## Abbreviations used in the manual

AC	Alternating Current
ACK	ACKnowledge
ARP	Address Resolution Protocol
AS	Autonomous System
AUX	Auxiliary
BCU	Basic Control Unit

BEQ	Best Effort Queueing
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)
BOOTP	Bootstrap Protocol
BPDU	Bridge Protocol Data Unit
CC	Continuity Check
CCM	Continuity Check Message
CFM	Connectivity Fault Management
CFP	C Form-factor Pluggable
CIDR	Classless Inter-Domain Routing
CoS	Class of Service
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
DA	Destination Address
DC	Direct Current
DCE	Data Circuit terminating Equipment
DHCP	Dynamic Host Configuration Protocol
DHCPv6	Dynamic Host Configuration Protocol for IPv6
DNS	Domain Name System
DR	Designated Router
DSAP	Destination Service Access Point
DSCP	Differentiated Services Code Point
DTE	Data Terminal Equipment
E-mail	Electronic mail
EAP	Extensible Authentication Protocol
EAPOL	EAP Over LAN
EFM	Ethernet in the First Mile
ETH-AIS	Ethernet Alarm Indicator Signal
ETH-LCK	Ethernet Locked Signal
FAN	Fan Unit
FCS	Frame Check Sequence
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
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IETF	the Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPX	Internetwork Packet Exchange
ISO	International Organization for Standardization
ISP	Internet Service Provider
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LLC	Logical Link Control
LLDP	Link Layer Discovery Protocol
LLQ	Low Latency Queueing
LSA	Link State Advertisement
MA	Maintenance Association
MAC	Media Access Control
MC	Memory Card
MD5	Message Digest 5
MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface crossover
MEG	Maintenance Entity Group
MEP	Maintenance association End Point/Maintenance entity group End Point
MIB	Management Information Base
MIP	Maintenance domain Intermediate Point
MP	Maintenance Point

MRU	Maximum Receive Unit
MTU	Maximum Transfer Unit
NAK	Not AcKnowledge
NAS	Network Access Server
NBMA	Non-Broadcast Multiple-Access
NDP	Neighbor Discovery Protocol
NIF	Network Interface
NLA ID	Next-Level Aggregation Identifier
NSAP	Network Service Access Point
NSSA	Not So Stubby Area
NTP	Network Time Protocol
OAM	Operations,Administration,and Maintenance
OSPF	Open Shortest Path First
OUI	Organizationally Unique Identifier
PA	Protocol Accelerator
packet/s	packets per second (can also appear as pps)
PAD	PADding
PC	Personal Computer
PDU	Protocol Data Unit
PID	Protocol IDentifier
PIM	Protocol Independent Multicast
PIM-SM	Protocol Independent Multicast-Sparse Mode
PIM-SSM	Protocol Independent Multicast-Source Specific Multicast
PQ	Priority Queueing
PRU	Packet Routing Unit
PS	Power Supply
PSINPUT	Power Supply Input
QoS	Quality of Service
RA	Router Advertisement
RADIUS	Remote Authentication Dial In User Service
RDI	Remote Defect Indication
RFC	Request For Comments
RIP	Routing Information Protocol
RIPng	Routing Information Protocol next generation
RMON	Remote Network Monitoring MIB
RPF	Reverse Path Forwarding
RR	Round Robin
RQ	ReQuest
SA	Source Address
SD	Secure Digital
SFD	Start Frame Delimiter
SFP	Small Form factor Pluggable
SFP+	Small Form factor Pluggable Plus
SFU	Switch Fabric Unit
SMTP	Simple Mail Transfer Protocol
SNAP	Sub-Network Access Protocol
SNMP	Simple Network Management Protocol
SNPA	Subnetwork Point of Attachment
SOP	System Operational Panel
SPF	Shortest Path First
SSAP	Source Service Access Point
TA	Terminal Adapter
TACACS+	Terminal Access Controller Access Control System Plus
TCP/IP	Transmission Control Protocol/Internet Protocol
TLV	Type, Length, and Value
TOS	Type Of Service
TPID	Tag Protocol Identifier
TTL	Time To Live
UDP	User Datagram Protocol
URL	Uniform Resource Locator
uRPF	unicast Reverse Path Forwarding
VLAN	Virtual LAN
VPN	Virtual Private Network
VRF	Virtual Routing and Forwarding/Virtual Routing and Forwarding Instance
RRRP	Virtual Router Redundancy Protocol
WAN	Wide Area Network

WFQ	Weighted Fair Queueing
WWW	World-Wide Web

## **Conventions: KB, MB, GB, and TB**

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





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## **Chapter**

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# **1. Reading the Manual**

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

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## 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 Device assigns names to corresponding interfaces set by configuration. When displaying the execution results of a command, the Device uses the port name to display information for Layer 1 or 2, and uses the Layer 3 interface name to display information for Layer 3. If <interface name> is shown in *Display items*, the Device 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 <i>&lt;interface name&gt;</i>		
	Port name	Layer 3 interface name	Numeric value
interface gigabitethernet	geth1/1	Eth1/1	<i>&lt;nif no.&gt;/&lt;port no.&gt;</i>
interface tengigabitethernet	tengeth1/1	Eth1/1	<i>&lt;nif no.&gt;/&lt;port no.&gt;</i>
interface hundredgigabitethernet	hndgeth1/1	Eth1/1	<i>&lt;nif no.&gt;/&lt;port no.&gt;</i>
interface gigabitethernet (subinterface)	--	Eth2/1.5	<i>&lt;nif no.&gt;/&lt;port no.&gt;.&lt;subinterface index&gt;</i>
interface tengigabitethernet (subinterface)	--	Eth2/1.5	<i>&lt;nif no.&gt;/&lt;port no.&gt;.&lt;subinterface index&gt;</i>
interface hundredgigabitethernet (subinterface)	--	Eth2/1.5	<i>&lt;nif no.&gt;/&lt;port no.&gt;.&lt;subinterface index&gt;</i>
interface port-channel	ChGr10		<i>&lt;channel group number&gt;</i>
interface port-channel (subinterface)	--	ChGr10.1	<i>&lt;channel group number&gt;.&lt;subinterface index&gt;</i>
interface loopback	loopback0		0 or <i>&lt;loopback id&gt;</i>
interface null 0	null0		0
interface mgmt 0	MGMT0		0
interface async 1	ASync1		1

## 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 Device assigns names to corresponding interfaces set by configuration. If *<interface name>* is shown in *Response messages*, the Device displays 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	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.	show ip bgp peer-group <u>office1</u>
Access list name, QoS flow list name, policer entry name, policy-based routing list name	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.	only-http1 01_user
MAC address, MAC address mask	Specify these items in hexadecimal format, separating 2-byte hexadecimal values by periods (.)	1234.5607.08ef 0000.00ff.ffff
IPv4 address, subnet mask	Specify these items in decimal format, separating 1-byte decimal values by periods (.)	192.168.0.14 255.255.255.0
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 (:)	2001:db8:1234:5678:9abc:def0:1234:5678 fe80::1
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::212:e2ff:fe86:5300%Eth1/1

## How to specify an interface

The following table describes how to specify the parameters *<interface type>* and *<interface number>* that correspond to each interface type group.



Table 1-4: How to specify an interface

Interface type group	Interface name to specify for <interface type>	Interface number to specify for <interface number>
Ethernet interface	gigabitethernet	<nif no.>/<port no.>
	tengigabitethernet	<nif no.>/<port no.>
	hundredgigabitethernet	<nif no.>/<port no.>
Ethernet subinterface	gigabitethernet	<nif no.>/<port no.>.<subinterface index>
	tengigabitethernet	<nif no.>/<port no.>.<subinterface index>
	hundredgigabitethernet	<nif no.>/<port no.>.<subinterface index>
Port channel interface	port-channel	<channel group number>
Port channel subinterface	port-channel	<channel group number>.<subinterface index>
Loopback interface	loopback	0 or <loopback id>
Null interface	null	0
Management port	mgmt	0
AUX port	async	1

## How to specify multiple interfaces

Use this method to specify the same information for multiple interfaces at one time. From among the groups shown in *Table 1-4: How to specify an interface*, you can specify the interface names and interface numbers that correspond to the following interface type groups.

- Ethernet interface
- Ethernet subinterface
- Port channel interface
- Port channel subinterface

When specifying multiple interfaces, you can specify interfaces that belong to the same interface type group, but you cannot specify interfaces that belong to different interface groups.

## Syntax

```
interface range <interface type> <interface number>
```

You can specify no more than 16 of the input formats, separating each by a comma (,).

## Input example

```
show qos-flow interface range gigabitethernet 1/1-3
show qos-flow interface range gigabitethernet 1/1-3, tengigabitethernet 3/1
show qos-flow interface range port-channel 2.10-20, port-channel 3.100,
port-channel 5.200
```

## Range of <sfu no.>

The following table lists the range of <sfu no.> values.

Table 1-5: Range of &lt;sfu no.&gt; values

No.	Model	Range of <sfu no.> values
1	All models	1 to 4

## Range of <pru no.>

The following table lists the range of <pru no.> values.

Table 1-6: Range of <pru no.> values

No.	Model	Range of <pru no.> values
1	AX8616R	1 to 4
2	AX8632R	1 to 8

## Range of <nif no.> and <port no.>

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

Table 1-7: Range of <nif no.> values

No.	Model	Range of <nif no.> values
1	AX8616R	1 to 16
2	AX8632R	1 to 32

Table 1-8: Range of <port no.> values

No.	NIF type name abbreviation	Range of <port no.> values
1	NL1G-12T	1 to 12
2	NL1G-12S	1 to 12
3	NLXG-6RS	1 to 6
4	NMCG-1C	1

## Range of <channel group number>

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

Table 1-9: Range of <channel group number> values

No.	Model	Range of <channel group number> values
1	AX8616R	1 to 192
2	AX8632R	1 to 384

## Range of <subinterface index>

The range of <subinterface index> values is from 1 to 65535.

## How to specify <port list>

For <port list>, you can specify multiple ports in the <nif no.>/<port no.> format by using a hyphen (-), comma (,), or asterisk (\*). You can also specify one port in the same way as when specifying the parameter <nif no.>/<port no.>. The range of permitted values is the same as the range of <nif no.> and <port no.> 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 device.

1/\*: Specify all ports on a device whose NIF number is 1.

**How to specify <channel group number list>**

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

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

1-3,5,10

**How to specify <sequence list>**

For <*sequence list*>, you can specify multiple sequence numbers by using a hyphen (-) and comma (.). You can also specify one sequence number. The range of permitted values is all the sequence numbers set by the configuration command.

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

10-30,50,100

## List of character codes

Character codes are listed in the following table.

*Table 1-10:* 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	---	---

### Notes

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

## Error messages displayed by the entry-error location detection 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 12.1*).

Table 1-11: List of error messages output by the entry-error location detection functionality

No.	Message	Description	Conditions for occurrence
1	% The command or parameter at the ^ marker is invalid.	An invalid command or parameter is entered at '^'.	When an unsupported command or parameter is entered
2	% The parameter at the ^ marker is too long.	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	% The command at the ^ marker is invalid.	Some parameters are missing.	When some parameters are missing
4	% The parameter at the ^ marker is invalid.	An invalid parameter is entered at '^'.	When an invalid parameter is entered
5	% The value at the ^ marker is invalid.	An invalid numeric value is entered at '^'.	When an invalid numeric value is entered
6	% The name at the ^ marker is invalid.	An invalid name is entered at '^'.	When an invalid name is entered
7	% The value at the ^ marker is outside the valid range.	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	% The IP address format at the ^ marker is invalid.	An invalid IPv4 address or IPv6 address is entered at '^'.	When the input format of the IPv4 address or IPv6 address is invalid
9	% The combination with the already-entered parameter at the ^ marker is invalid.	A parameter entered at '^' has already been entered.	When a parameter that has already been entered is re-entered
10	% The format at the ^ marker is invalid.	A parameter entered at '^' is an invalid format.	When the input format of the parameter is invalid
11	% '<word>' is invalid in this location.	An invalid character '<word>' is entered. <word>: Invalid word	When '<word>' is entered at positions where a character cannot be entered
12	% The command is too long.	The number of characters exceeds the limit that can be entered per operation.	When the number of entered characters exceeds the limit that can be entered in one line



## 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, that 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
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
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The mode cannot change to the administrator mode because of a password error.	The mode cannot be changed to administrator mode because a password entry error occurred.
Timed out after 60 seconds.	A timeout occurred because no password was entered within 60 seconds.

### Notes

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



---

## 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
>
```

### 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 *quit (exit)* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### Syntax

`quit`

### Input mode

User mode, administrator mode, and configuration command mode

### Parameters

None

### Example

Ends administrator mode and returns to user mode.

```
# quit
>
```

### 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 *quit (exit)* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### 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
login:
```

### Display items

None

### Impact on communication

None

### Response messages

None

### Notes

1. 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

Logs out from administrator mode.  
# logout  
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
(config)#
```

### Display items

None

### Impact on communication

None

### Response messages

Table 2-2: List of response messages for the configure (configure terminal) command

Message	Description
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

For details about error messages displayed during configuration editing, see *17.1.6 Errors related to the device and software status* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### 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 edited configuration to the startup configuration file, the edited contents will be lost when the device is restarted. We recommend that, after editing, you execute the `save` or `commit` configuration command to save the edited configuration to the startup configuration file.
2. By using the `status` configuration command, you can check the status of the configuration being edited.
3. Before the `configure` command finishes, do not halt it by pressing **Ctrl + C**. If you do halt it, the `copy`, `erase`, `configuration`, `synchronize`, and `redundancy force-switchover` commands might result in an error with Command execution failed because the

## 2. Switching the Command Input Mode

configuration file was being edited. displayed.

If an error occurs, use this command to switch to configuration command mode, and then use the `end` configuration command to end 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 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

---

Temporarily changes the length of time (in minutes) until the user is automatically logged out.

### 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.

### Example

Sets the auto-logout value to 30 minutes.

```
> set exec-timeout 30
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 3-1:* List of response messages for the set exec-timeout command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

1. This command temporarily changes the target session only, and the change is disabled after you log out from the session. If you want to keep the setting enabled, execute the `username configuration` command with the `exec-timeout` parameter specified.



---

## set terminal help

---

Temporarily changes the list of commands displayed in the help message.

### 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.

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

```
> set terminal help no-utility
```

### Display items

None

### Impact on communication

None

### Response messages

None

### Notes

1. This command temporarily changes the target session only, and the change is disabled after you log out from the session. If you want to keep the setting enabled, execute the `username` configuration command with the `terminal-help` parameter specified.

---

## set terminal pager

---

Temporarily changes whether to enable paging.

### Syntax

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

### Input mode

User mode and administrator mode

### Parameters

{ enable | disable }

enable

Paging is performed.

disable

Paging is not performed.

Operation when this parameter is omitted:

Paging is performed.

### Example

- Paging is not performed.  
> set terminal pager disable
  
- Paging is performed.  
> set terminal pager enable

### Display items

None

### Impact on communication

None

### Response messages

None

### Notes

1. This command temporarily changes the target session only, and the change is disabled after you log out from the session. If you want to keep the setting enabled, execute the `username` configuration command with the `terminal-pager` parameter specified.

---

## 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
Date 20XX/07/19 12:00:00 UTC
  1 show system
  2 show interfaces
  3 show logging
  4 show history
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 3-2:* List of response messages for the `show history` command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

1. This command can display a maximum of 100 log entries.

---

## 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.

Operation when this parameter is omitted:

Establishes a connection via IPv4 or IPv6.

/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 Device is used.

/vrf <vrf id>

Connects to the specified VRF. For <vrf id>, specify a VRF ID that was set by using the 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

```
> telnet 192.168.0.1          <-1
Trying 192.168.0.1 ...
Connected to 192.168.0.1
```

Escape character is '^]'.

login: username <-2  
 Password: \*\*\*\*\* <-3

> <-4

1. Accesses the remote operation terminal whose IP address is 192.168.0.1 via Telnet.

After the command is executed, the message `Trying 192.168.0.1 ...` is displayed, indicating that you will need to wait for a connection with the remote operation terminal to be established.

When the connection is established, the messages `Connected to 192.168.0.1` and `Escape character is '^]'` are displayed. If the connection is not established within 75 seconds, it reverts to command input mode.

2. Enter the login name.
3. Enter the password.
4. If the entries are correct, the prompt appears.

## Display items

None

## Impact on communication

None

## Response messages

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

Message	Description
<host>: hostname nor servname provided, or not known	The address specified for the host and the connection method specified by the 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
A host name and VRF cannot be specified at the same time.	A host name and VRF cannot be specified at the same time.
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.
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 the host was established. <host>: Remote host
Connection closed by foreign host.	The connection was closed from the host.
telnet: Unable to connect to remote host: <reason>	An attempt to connect to the remote host failed. <reason>: Details of the error

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
Trying <host>...	The system is trying to connect to the host. <host>: Remote host

## Notes

1. To interrupt the processing while `Trying...` is displayed, press the **Ctrl + C** keys.
2. After a connection is established, to halt execution of this command while the login prompt is displayed, press the **Ctrl + D** keys.
3. 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.
4. When the escape character `^]` (**Ctrl + ]**) 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). 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 Device 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 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>`.

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 Device is used.

/vrf <vrf id>

Connects to the specified VRF. For `<vrf id>`, specify a VRF ID that was set by using the 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
```

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 Device. 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 Device to the remote operation terminal. If <remote-file> is omitted, the file name becomes the name of the file on the Device.

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>*]

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 Device. 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 Device.

{lopwd | lpwd}

Displays the current directory of the Device.

lpage *<local-file>*

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

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 | 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 3-4: List of response messages for the ftp command

Message	Description
?Ambiguous command.	Multiple commands contain the specified characters.
?Ambiguous help command <i>&lt;command&gt;</i>	Multiple help commands correspond to the specified characters. <i>&lt;command&gt;</i> : Command name
?Invalid command.	The specified command could not be found.
421 Service not available, remote server has closed connection.	The command could not be executed because the connection was closed on the remote host.
A host name and VRF cannot be specified at the same time.	A host name and VRF cannot be specified at the same time.
Already connected to <i>&lt;host&gt;</i> , use close first.	Communication with the remote device has already been established. To connect to another host, use the (ftp) <code>close</code> command or (ftp) <code>quit</code> command to stop the communication. <i>&lt;host&gt;</i> : Remote host IP address
bind: Can't assign requested address	An invalid source IP address has been set.

Message	Description
bind: Invalid argument	An invalid source IP address has been set.
Can't chdir <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
Can't connect to <host>: Connection refused	The host rejected the connection. <host>: Remote host
Can't connect to <host>: No route to host	The connection to the host cannot be established because no route exists. <host>: Remote host
Can't connect to <host>: Operation timed out	The connection timed out. <host>: Remote host
Connected to <host>.	A connection to the host was established. <host>: Remote host
ftp: quit for Ctrl+Z pushed.	The ftp command was ended by pressing the <b>Ctrl + Z</b> keys.
Login failed.	A login attempt has failed.
No control connection for command	The command could not be executed because the control connection with the remote host was lost.
Not connected.	No remote communication.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
Trying <host>:<service> ...	The system is trying to connect to the 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 Device 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 Device) might be displayed. It does not affect operations.

---

## tftp

---

Transfers files between the Device 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 (RFC 2347, 2348, 2349).

### Syntax

```
tftp [<host> [{/ipv4 | /ipv6}] [/source-interface <source address>] [/vrf <vrfid>]
[<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 Device is used.

/vrf <vrf id>

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

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

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
```

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 Device. 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 Device to the remote operation terminal. If *<remote-file>* is omitted, the file name becomes the name of the file on the Device.

### 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 3-5: List of response messages for the tftp command

Message	Description
?Invalid command	The specified command could not be found.
?Invalid help command <i>&lt;command&gt;</i>	The help command applicable to the specified characters could not be found. <i>&lt;command&gt;</i> : Command name
A host name and VRF cannot be specified at the same time.	A host name and VRF cannot be specified at the same time.
Error code <i>&lt;number&gt;</i> : <i>&lt;message&gt;</i>	Displaying other TFTP error messages: <i>&lt;number&gt;</i> : Error code <i>&lt;message&gt;</i> : 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 <i>&lt;host&gt;</i> : <i>&lt;remote file&gt;</i> to <i>&lt;local file&gt;</i> [ <i>&lt;mode&gt;</i> ]	Receiving <i>&lt;remote file&gt;</i> on <i>&lt;host&gt;</i> as <i>&lt;local file&gt;</i> (the transfer mode is <i>&lt;mode&gt;</i> ). <i>&lt;host&gt;</i> : Remote host <i>&lt;remote file&gt;</i> : Remote file name <i>&lt;local file&gt;</i> : Local file name <i>&lt;mode&gt;</i> : File transfer mode
No target machine specified, Use connect command.	The connection destination is not set. Use the <code>connect</code> command to set it.
putting <i>&lt;local file&gt;</i> to <i>&lt;host&gt;</i> : <i>&lt;remote file&gt;</i> [ <i>&lt;mode&gt;</i> ]	Sending <i>&lt;local file&gt;</i> to <i>&lt;host&gt;</i> as <i>&lt;remote file&gt;</i> (the transfer mode is <i>&lt;mode&gt;</i> ). <i>&lt;local file&gt;</i> : Local file name <i>&lt;host&gt;</i> : Remote host <i>&lt;remote file&gt;</i> : Remote file name <i>&lt;mode&gt;</i> : File transfer mode
tftp: <i>&lt;file name&gt;</i> : Is a directory	The specified file is a directory. <i>&lt;file name&gt;</i> : File name
tftp: <i>&lt;file name&gt;</i> : Permission denied	Access permission for the specified file does not exist. <i>&lt;file name&gt;</i> : 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: quit for Ctrl+Z pushed.	The <code>tftp</code> command was ended by pressing the <b>Ctrl + Z</b> keys.
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.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
Transfer timed out.	Transfer timed out. Check the route to the server or the server settings.

## Notes

1. 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.
2. 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.
3. If commands cannot be input, enter the **Ctrl + Z** keys to exit.
4. Use TFTP servers that support TFTP Option Extension (RFC 2347, 2348, 2349) for a connection destination. TFTP (RFC 1350) 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)

---

Display the running configuration.

### Syntax

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

### Input mode

Administrator mode

### Parameters

None

### Example

None

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-1:* List of response messages for the show running-config (show configuration) command

Message	Description
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

For details about error messages displayed during configuration editing, see *17.1.6 Errors related to the device and software status* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### 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 a NIF is inserted while this command is being executed, this command might be aborted.
3. If a NIF is connected or replaced, the configuration might be changed automatically. In this case, the last-modified time displayed on the first line is also updated.

---

## show startup-config

---

Displays the startup configuration used at device startup.

### Syntax

`show startup-config`

### Input mode

Administrator mode

### Parameters

None

### Example

None

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-2: List of response messages for the show startup-config command*

Message	Description
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

For details about error messages displayed during configuration editing, see *17.1.6 Errors related to the device and software status* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### Notes

1. If the configuration is edited, the `copy` command is executed, or a NIF is inserted 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>*

Specifies the name of the configuration file to be copied. To copy a local file, specify the name of the file in the device. To copy a remote file, specify the URL of the file. A remote file is copied by using FTP, TFTP, or HTTP. The following shows the URL formats:

- `ftp://[<user name>[:<password>]@]<host>[:<port>]/<file path>`
- `tftp://<host>[:<port>]/<file path>`
- `http://[<user name>[:<password>]@]<host>[:<port>]/[<file path>]`

*<user name>*

Specifies a user name on the remote server.

*<password>*

Specifies the password for the remote server.

*<host>*

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

To specify an IPv6 address, enclose it in square brackets: [ ].

(Example) [2001:db8::1]

*<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 only *<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.

`<file name>` or `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.

If an error occurs and the message `The file transfer failed.` is output when obtaining a remote file, you can see details about the error (such as server responses) if you re-execute the command with this parameter specified.

Operation when this parameter is omitted:

Details about communication status are not displayed.

### Example

*Figure 4-1: Copying the running configuration to the startup configuration*

```
# copy running-config startup-config
User account information is set in the configuration file.
The home directory of any deleted users will be deleted.
Are you sure you want to copy the configuration file to startup-config?
(y/n): y
```

*Figure 4-2: Saving the running configuration to a file on a remote server*

```
# copy running-config ftp://staff@[2001:db8::1]/backup.cnf
Are you sure you want to copy the configuration file to
ftp://staff@[2001:db8::1]/backup.cnf? (y/n): y

Authentication for 2001:db8::1.
User: staff
Password: xxx          <-1
transferring

Data transfer succeeded.
#
```

1. Enter the password stored on the remote server for the user account `staff`.

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-3: List of response messages for the copy command*

Message	Description
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The configuration file already exists. Are you sure you want to copy the existing file to <code>&lt;target file&gt;?</code> (y/n):	The copy-destination file name already exists. This message asks for confirmation on whether or not to overwrite the file. Entering <code>y</code> performs the copy. Entering <code>n</code> aborts the copy.

Message	Description
User account information is set in the configuration file. The home directory of any deleted users will be deleted. Are you sure you want to copy the configuration file to <i>&lt;target file&gt;?</i> (y/n):	This message asks for confirmation on whether or not to copy a file to the copy-destination file name. Entering <i>y</i> performs the copy. Entering <i>n</i> aborts the copy. Note that if you specify a startup configuration for the copy destination, user accounts that do not exist in the copy-source configuration file or configuration and the home directory of the users will be deleted.

For details about error messages for this command, see *17.1.4 Errors related to the handling of the configuration file* in the manual *Configuration Command Reference Vol. 1 For Version 12.1* and *17.1.6 Errors related to the device and software status* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

For details about error messages displayed during configuration editing by using the copy-source configuration, see the relevant *Configuration Command Reference*.

## Notes

1. You cannot execute this command while editing the configuration. Execute this command after the configuration editing is complete.
2. Editing the startup configuration has no effect on the running configuration or communication.
3. 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, your remote server access permissions must be changed to allow you to write to the remote server.
4. If you copy a configuration file created using an editor or a device that has a different board implementation configuration, operation might be unstable even if the `copy` command completes normally. Before copying, confirm that the configuration file contents and interface settings 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.
5. 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.
6. 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`.
7. 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.
8. If you execute the command with the `startup-config` parameter specified for the copy destination, user accounts that do not exist in the copy-source configuration will be deleted after the device is restarted. Save the necessary files in `/usr/home/share` or back them up to external media because the home directories of deleted users are also deleted.
9. Executing this command does not affect the running configuration or the configuration being edited.

---

## erase configuration

---

Resets the configuration to the default.

### Syntax

```
erase configuration startup
```

### Input mode

Administrator mode

### Parameters

startup

Resets the startup configuration to the default.

### Example

*Figure 4-3: Resetting the startup configuration to the default*

```
# erase configuration startup
User account information is set in the configuration file.
The home directory of any deleted users will be deleted.
Are you sure you want to delete the startup configuration file? (y/n): y
#
```

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
User account information is set in the configuration file. The home directory of any deleted users will be deleted. Are you sure you want to delete the startup configuration file? (y/n):	This message asks you to confirm that you want to reset the startup configuration file to the default. Entering <i>y</i> executes the command. Entering <i>n</i> aborts the command. Note that the user accounts in the configuration file and the home directory of the users are deleted.

For details about error messages displayed during configuration editing, see *17.1.6 Errors related to the device and software status* in the manual *Configuration Command Reference Vol. 1 For Version 12.1*.

### Notes

1. You cannot execute this command while editing the configuration. Execute this command after the configuration editing is complete.
2. When this command is executed, user accounts other than the pre-defined account (username operator 100 password hidden) will be deleted. Save the necessary files in `/usr/home/share` or back them up to external media because the home directories of deleted users are also deleted.

#### 4. Configurations and File Operations

3. Executing this command does not affect the running configuration and the configuration being edited.



---

## 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 name of a file to be displayed. To display a local file, specify the name of the file in the device. To display a remote file, specify the URL of the file. A remote file is displayed by using FTP, TFTP, or HTTP. The following shows the URL formats:

- ftp://[<user name>[:<password>]@]<host>[:<port>]/<filepath>
- tftp://<host>[:<port>]/<filepath>
- http://[<user name>[:<password>]@]<host>[:<port>]/[<filepath>]

*<user name>*

Specifies a user name on the remote server.

*<password>*

Specifies the password for the remote server.

*<host>*

Specifies the name of the remote server, IPv4 address, IPv6 address, or IPv6 address with an interface name (only a link-local address).

To specify an IPv6 address, enclose it in square brackets: [ ].

(Example) [2001:db8:400::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 only *<password>* is omitted, a prompt is displayed requesting the password.

debug

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

If an error occurs and the message `The file transfer failed.` is output when obtaining a remote file, you can see details about the error (such as server responses) if you re-execute the command with this parameter specified.

Operation when this parameter is omitted:

Details about communication status are not displayed.

## Example

*Figure 4-4: Showing the information of a file on the remote server*

```
> show file ftp://staff@[2001:db8:400::101]/backup.cnf
Date 20XX/01/20 12:00:00 UTC

Authentication for 2001:db8:400::101.
User: staff
Password: xxx          <-1
transferring...

interface gigabitethernet 0/1
  switchport mode access
!

### The displayed file has 3 lines.
>
```

*Figure 4-5: Showing the information of a directory on the remote server*

```
> show file ftp://staff@[2001:db8:400::101]//usr/home/staff/
Date 20XX/01/20 12:00:00 UTC

Authentication for 2001:db8:400::101.
User: staff
Password: xxx          <-1
transferring...

### List of remote directories.
total 9
-rw----- 1 staff user   34 Dec  8 11:31 .clihihistory
-rw----- 1 staff user  408 Dec  8 12:32 .clihihistory
-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
>
```

1. Enter the password stored on the remote server for the user account `staff`.

## Display items

None

## Impact on communication

None

## Response messages

*Table 4-5: List of response messages for the show file command*

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The file transfer failed. (reason = <i>&lt;reason&gt;</i> )	File transfer with the remote server failed. Re-execute the command with the <code>debug</code> parameter specified for checking. <i>&lt;reason&gt;</i> : Additional information

## 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 Device again, or reset the terminal.

For HTTP transfers, such files might be discarded part way through the transfer, the transfer might result in the error `The file 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 might be referenced 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`.
5. Specify `<user name>` and `<password>` with no more than 256 characters. If you enter more than 256 characters, only the first 256 characters are treated as `<user name>` or `<password>`. Specify `<host>` with no more than 255 characters. If you enter more than 255 characters, only the first 255 characters are treated as `<host>`.

---

**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 login user.

**Example**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

*Table 4-6:* List of response messages for the cd command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**Notes**

None

---

**pwd**

---

Shows the path to the current directory.

**Syntax**

pwd

**Input mode**

User mode and administrator mode

**Parameters**

None

**Example**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

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

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**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
```

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then try again.
The memory card was 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 specified 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 Device. 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 square brackets: [ ].

`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 square brackets: [ ].

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 internal flash memory including deleted files.

*Figure 4-6: Displayed files when /all and summary are specified*

```
> dir /all summary
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 4-7: Displayed files when only /all is specified*

```
> dir /all
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 4-8: Displayed deleted files*

```

> dir /deleted
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 4-9: Information displayed 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	Indicates the file attribute by using the symbols and display positions. Meaning of the symbols d: Directory attribute r: Read permission exists. w: Write permission exists. x: Execute permission exists. Meaning of the display location +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 4-10: Information displayed 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 4-11:* List of response messages for the dir command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, TACACS+ server, or the configuration.
The current directory is not in the internal flash memory.	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**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

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

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, TACACS+ server, or the configuration.

**Notes**

None

---

## cp

---

Copies a file.

### Syntax

```
cp [<option>] <file name1> <file name2>
cp <file name1> mc-file <mc file name2>      <-1
cp mc-file <mc file name1> <file name2>      <-2
```

1. Copies a file on the internal flash memory to a memory card.
2. 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

*Figure 4-9:* Copying file1 from the internal flash memory to the memory card and name as file2

```
>cp file1 mc-file file2
```

*Figure 4-10:* Copying file1 from the memory card to the internal flash memory and name as file2

```
>cp mc-file file1 file2
```

**Display items**

None

**Impact on communication**

None

**Response messages***Table 4-13: List of response messages for the cp command*

Message	Description
Files cannot be read from or written to the memory card.	Files 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 try again.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The file could not be copied to the memory card.	The file could not be copied to the memory card. Check the state of the memory card such as free capacity, and then try again.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then try again.
The memory card is write-protected by the physical Lock switch.	Make sure the memory card's protect switch is not set to <code>Lock</code> . If the switch is set to <code>Lock</code> , 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.
The memory card was 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 specified when a memory card is not inserted.
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.

---

## 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
```

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The directory could not be created on the memory card.	A directory could not be created in the memory card. Check the state of the memory card such as free capacity, and then try again.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then try again.

Message	Description
The memory card is write-protected by the physical Lock switch.	<p>Make sure the memory card's protect switch is not set to <code>Lock</code>. If the switch is set to <code>Lock</code>, slide the switch, and then insert the memory card again.</p> <p>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.</p>
The memory card was not found.	<p>A memory card was not inserted.</p> <p>Make sure that a memory card is inserted into the device properly.</p> <p>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.</p>

## Notes

1. The `mc-dir` parameter cannot be specified 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

None

### Display items

None

### Impact on communication

None

### Response messages

Table 4-15: List of response messages for the mv command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, TACACS+ server, or the configuration.



## 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

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
```

**Display items**

None

**Impact on communication**

None

**Response messages**

Table 4-16: List of response messages for the rm command

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then try again.
The memory card is write-protected by the physical Lock switch.	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
The memory card was not found.	<p>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.</p>

## Notes

1. The `mc-file` parameter cannot be specified 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.

---

## 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
```

### Display items

None

### Impact on communication

None

### Response messages

Table 4-17: List of response messages for the rmdir command

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then try again.
The memory card is write-protected by the physical Lock switch.	Make sure the memory card's protect switch is not set to <code>Lock</code> . If the switch is set to <code>Lock</code> , 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.
The memory card was 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 specified 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

---

Deletes, in a way that enables the files to be recovered, the files from the internal flash memory used by the Device. Note that the maximum number of files that can 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

Deletes the files, in a way that enables the files to be recovered.

*Figure 4-11: Executing delete for a file*

```
> delete userfile
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-18: List of response messages for the delete command*

Message	Description
A directory is specified.	A directory is specified.
Permission is required to delete the specified file.	No deletion permission for the specified file exists.
The 'delete' command cannot be used with this internal flash memory. (internal code = <code>)	This command cannot be used for the internal flash memory (<internal code>). <code>: Internal code
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified file does not exist.	The specified file does not exist.
The specified file or directory does not exist or is invalid.	The specified file does not exist, or the current directory is not valid.
There is not enough free space in the internal flash memory.	There is not enough free space in the internal flash memory to execute this command.

### Notes

1. This command can operate only on files in internal flash memory. Files on RAM disk (memory) cannot be deleted.
2. This command cannot be used to delete files if there is not enough free space in internal flash memory to store the files in a way that enables the files to be recovered.

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 files that were on the internal flash memory used by the Device, and which were deleted in a way that enabled the files to be recovered.

### 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 4-12: File recovery*

```
> dir /all

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

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-19: List of response messages for the undelete command*

Message	Description
A file or directory with the same name already exists.	A file or directory that has the same name as that of the specified file already exists in the directory for executing the <code>undelete</code> command.
Permission is required to access the current directory or specified file.	You do not have access permission for the current directory or specified file.
Permission is required to write to the directory storing the specified file.	You do not have write permission for the directory where the specified file is to be stored.
Specify a correct index number for the file to be deleted.	Specify a proper index number for the deleted file.
Specify an index number in the range 1-64.	Specify a numeric value between 1 and 64 for the index value.
Specify an index number.	Specify an index number.



Message	Description
The 'undelete' command cannot be used with this internal flash memory. (internal code = <code>&lt;code&gt;</code> )	This command cannot be used for the internal flash memory ( <i>&lt;internal code&gt;</i> ). <i>&lt;code&gt;</i> : Internal code
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The current directory is invalid.	The current directory is not valid.
The current directory is not in the internal flash memory.	The current directory is not the internal flash memory. Move to an appropriate directory.
The index value is invalid. Specify a base-10 number.	Specify decimal values for the index value.
The specified file does not exist.	The specified file does not exist.
There is no directory to store the specified file for the 'undelete' command. Create a directory to store the file.	There is no directory to store the specified file for the <code>undelete</code> command. Create a directory for storing the file.

## 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 file on the internal flash memory used by the Device, after the files were deleted by the `delete` command in a way that enabled the files to be recovered.

### Syntax

`squeeze`

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 4-13: Executing squeeze for a file*

```
> squeeze
Deleted files will be erased. Are you sure you want to do this? (y/n):y
Now squeezing...
Deletion is complete.
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 4-20: List of response messages for the squeeze command*

Message	Description
Deleted files will be erased. Are you sure you want to do this? (y/n):	Erases deleted files. Enter <code>y</code> to erase, otherwise <code>n</code> to abort.
Deletion is complete.	Deletion ended.
Deletion was canceled.	Deletion was canceled.
Now squeezing...	Erasing the file.
Permission is required to access the current directory.	You do not have access permission for the current directory. Move to an appropriate directory.
The 'squeeze' command cannot be used with this internal flash memory. (internal code = <code>&lt;code&gt;</code> )	This command cannot be used for the internal flash memory ( <code>&lt;internal code&gt;</code> ). <code>&lt;code&gt;</code> : Internal code
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The current directory is not in the internal flash memory.	The current directory is not the internal flash memory. Move to an appropriate directory.
There is no such file or directory.	The current directory is not valid. Move to an appropriate directory.

### 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

---

## inactivate mgmt 0

---

Changes the status of a management port from the `active` to the `inactive` status.

### Syntax

```
inactivate mgmt 0
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command changes the management port to the `inactive` status.

```
> 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
The command cannot be executed because the system is busy. Wait a while, and then try the command again.	The command cannot be accepted because the system is busy. Wait a while, and then try the command again.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The management port is already inactive.	The management port is already in the <code>inactive</code> state.
The management port is disabled.	The management port is in <code>disable</code> status due to the configuration.
The management port is not operational.	The management port is not operational.
The management port was not found.	The management port was not found.

### Notes

1. Executing this command does not change the configuration.
2. If the device is restarted after the management port is inactivated by using this command, the `inactive` status of the management port is canceled.
3. After this command changes a management port to the `inactive` status, you can use the `activate mgmt 0` command to return the status to the `active` status.

---

## activate mgmt 0

---

Returns the status of the management port (made inactive by the `inactivate mgmt 0` command) from the `inactive` to the `active` status.

### Syntax

```
activate mgmt 0
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command changes the management port to the `active` status.

```
> 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
The command cannot be executed because the system is busy. Wait a while, and then try the command again.	The command cannot be accepted because the system is busy. Wait a while, and then try the command again.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The management port is already active.	The management port is already in the <code>active</code> state.
The management port is disabled.	The management port is in <code>disable</code> status due to the configuration.
The management port is not operational.	The management port is not operational.
The management port was not found.	The management port was not found.

### Notes

1. Executing this command does not change the configuration.





## Chapter

---

# 6. Login Security and RADIUS or TACACS+

---

```
show users
make hidden-password
show sessions (who)
show whoami (who am i)
killuser
show accounting
clear accounting
restart accounting
dump protocols accounting
```

---

## show users

---

Displays the user accounts for login configured on the Device.

### Syntax

```
show users
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command displays the login user accounts configured on the Device.

```
> show users
Date 20XX/01/07 12:00:00 UTC
User Counts:3
ID  Name                Home-directory
100 operator            /usr/home/operator
101 staff               /usr/home/staff
110 guest               /home/guest
>
```

### Display items

*Table 6-1:* Information displayed by the show users command

Item	Displayed information	Displayed detailed information
User Counts	Number of user accounts	--
ID	User ID	Displays the user ID set for the user account
Name	User account name	--
Home-directory	Home directory	Displays the home directory of the user. If the user was created by the <code>username</code> configuration command with the <code>no-flash</code> parameter specified, the home directory is <code>/home/&lt;user account name&gt;</code> . If the user was created by the <code>username</code> configuration command without the <code>no-flash</code> parameter, the home directory is <code>/usr/home/&lt;user account name&gt;</code> .

### Impact on communication

None

### Response messages

*Table 6-2:* List of response messages for the show users command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

---

## make hidden-password

---

Creates a hashed password string to be set for the `username` and `enable password` configuration command.

### Syntax

```
make hidden-password
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command creates a hashed password string.

```
> make hidden-password
Input password:*****          <-1
Retype password:*****        <-2
```

```
A password was created. Set it in the configuration.
"$6$P7aJEZ$yLYemMiDQ4Xj1r4lSFKH.HI1tQaWFGSJN18/
fl1ngyERfUPr4RSvCs86EsSErBHHcXMR1ihvfthf3ewCiDAwB1"
>
```

1. Enter the password.
2. Re-enter the password.

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
Enter a longer password.	We recommend that your password be at least six characters long.
Enter a shorter password.	You can enter a maximum of 128 characters for the password.
For a strong password, avoid using only lowercase English letters. We recommend using a combination of uppercase and lowercase English letters, symbols, and numbers.	We recommend that upper-case alphabetic characters, symbols, or numbers be used in addition to lower-case alphabetic characters.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The passwords are not the same. Please enter them again.	The new password and the re-entered password are not the same. Re-enter the password.

### Notes

1. If no string is entered for the hashed password, the password is set to "", which indicates that no password is set.

2. Specify the password with no more than 128 characters.
3. We recommend that your password be at least six characters long including upper-case alphabetic characters, numbers, or symbols. If fewer than six characters or only lower-case alphabetic characters are entered, an error is displayed. Note, however, that if you re-enter the same string, the password can be created.

---

## show sessions (who)

---

Displays the users currently logged in to the Device.

### Syntax

```
show sessions
who
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command displays the users currently logged in to the Device.

```
> show sessions
Date 20XX/06/16 12:00:00 UTC
kikuchi console ----- 0   Jun 15 14:16                <-1
shimizu aux      ----- 1   Jun 15 14:15 (ppp0:10.1.1.100)  <-2
shimizu tty0     admin  2   Jun 15 14:16 (192.168.0.1)    <-3
shimizu tty1     ----- 3   Jun 15 14:17 (192.168.0.1)    <-4
tanaka  tty2     ----- 4   Jun 15 15:52 (192.168.0.1 VRF:2) <-5
>
```

1. Login from CONSOLE
2. Connect to the AUX port via a 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)

### 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 VRF)

### Impact on communication

None

## Response messages

*Table 6-4:* List of response messages for the show sessions (who) command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. 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 Device, 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

In this example, the command displays the login name of the current login user.

```
> show whoami
Date 20XX/01/07 12:00:00 UTC
shimizu tty00      -----  2   Jan  6 14:17 (192.168.0.1)
>
```

In this example, the command displays the login name of the current login user when the user logged in from VRF2.

```
> show whoami
Date 20XX/06/16 12:00:00 UTC
tanaka  tty02      -----  4   Jun 15 15:52 (192.168.0.1 VRF:2)
>
```

If command authorization 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 (permitted commands) command list, and enable, inactivate, reload, config, and show ip are set in the Deny (rejected commands) command list:

```
> show whoami
Date 20XX/01/07 12:00:00 UTC
staff1 tty00      -----  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 noenable is set for the class, and reload is set in the Deny (rejected commands) command list:

```
> show whoami
Date 20XX/01/07 12:00:00 UTC
staff2 tty00      -----  2   Jan  6 14:17 (192.168.0.1)

Home-directory: /usr/home/share
Authentication: RADIUS (Server 10.10.10.10)
Class: noenable
  Allow: -----
```

```

    Deny : "enable"
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 20XX/01/07 12:00:00 UTC
staff3 tty0 ----- 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. <ul style="list-style-type: none"> <li>• Login user name</li> <li>• tty name</li> <li>• Command input mode: <code>admin</code> (administrator mode) or <code>-----</code> (user mode)</li> <li>• Login number</li> <li>• Date and time</li> <li>• Terminal IP address (displayed only when the user has logged in from a remote operation terminal)</li> <li>• VRF ID (displayed only when the user has logged in from VRF)</li> </ul>
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, <code>-----</code> is displayed. If the invalid class name is set, a comment ( <code>Invalid Class</code> ) 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 <code>". "</code> in the display.
	Allow	If a class is set, the contents of the <code>Allow</code> (permitted commands) command list of the class are displayed. If the class is <code>root</code> , a command <code>Deny</code> list is not possible. The message ( <code>Command unlimited</code> ) is displayed. If an <code>Allow</code> (permitted commands) command list is not specified for the applicable class, <code>-----</code> is displayed.
	Deny	If a class is set, the contents of the <code>Deny</code> (rejected commands) command list of the class are displayed. If the class is <code>root</code> , a command <code>Deny</code> list is not possible. The message ( <code>Command unlimited</code> ) is displayed. If a <code>Deny</code> (rejected commands) command list is not specified for the applicable class, <code>-----</code> is displayed.



Item		Displayed information
Command list	Command-list	If a command list is not specified, or the class is <code>root</code> , <code>-----</code> is displayed.
	Allow	If an <code>Allow</code> (permitted commands) command list is set, the contents of the list are displayed. If the <code>Allow</code> (permitted commands) command list is not set, <code>-----</code> 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 <code>Deny</code> (rejected commands) command list is set, the contents of the list are displayed. If the <code>Deny</code> (rejected commands) command list is not set, <code>-----</code> 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 login 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 login 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 can be checked by the `show sessions` command.

### Example

In this example, the command `show sessions` checks the login number of a user to be logged out. Execute this command with the login number specified.

```
> show sessions
Date 20XX/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) <-1
shimizu ttyp0 admin 2 Jan 6 14:17 (192.168.0.1)
kikuchi ttyp1 ----- 3 Jan 6 14:20 (localhost)
>
> killuser 1
```

1. To force shimizu to log out, specify login number 1.

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The forced logout failed because the user is from a different account.	Users other than that of the same account cannot be forcibly logged out. For details, see item 3 in <i>Notes</i> . 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.
The specified login number is invalid. (number = <login no.>)	The specified login number is invalid. <login no.>: Specified login number
There is no such user.	The user does not exist.
Users cannot use this command to forcibly log out themselves.	The user who is executing this command cannot forcibly log themselves out.

## 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 forcibly log themselves out. If such a user is specified as described above, an error occurs. However, when the command is executed from the console, the user can forcibly log themselves out.
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 the 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: Displaying accounting information*

```
>show accounting
Date 20XX/09/26 10:52:49 UTC
Since 20XX/09/26 10:45:00 UTC

Event
  Login   :          6          Logout :          6
  Command :          -          Config  :          -
  Total   :         12

  InQueue:          0
  Discard :          0

[RADIUS]
  Host: RADIUS111
    Event Counts:          12          (Timeout: 5 Retransmit: 3)
    Request Information
      Send          :          0          Success          :          0
      Communicate Error:          12        Failure          :          0
      Timeout       :          0          Invalid          :          0

  Host: 192.168.111.111
    Event Counts:          12          (Timeout: 5 Retransmit: 3)
    Request Information
      Send          :          11        Success          :          11
      Communicate Error:          1        Failure          :          0
      Timeout       :          0          Invalid          :          0

>show accounting
Date 20XX/09/26 10:52:49 UTC
Since 20XX/09/26 10:45:00 UTC

Event
  Login   :          5          Logout :          6
  Command :         40          Config  :          4
  Total   :         55

  InQueue:          0
  Discard :          0

[TACACS+]
  Host: 192.168.111.112
    Event Counts:          55          (Timeout: 5)
    Request Information
      Send          :          40        Success          :          40
      Communicate Error:          11        Failure          :          0
      Timeout       :          3          Invalid          :          0
```

## Display items

Table 6-7: Displayed accounting information

Item	Displayed information	Displayed detailed 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	<ul style="list-style-type: none"> <li>Displays the number of transmission queue accounting events when a large volume of accounting events to be transmitted occurs.</li> <li>Displays (Congestion) when a device log is output and a congested state occurs.</li> </ul>
Discard	Number of discarded events	When the congesting of an accounting event transmission occurs, the number of discarded events is counted.
[RADIUS]	<ul style="list-style-type: none"> <li>This item is displayed when a RADIUS server is set to be used by the system accounting configuration.</li> <li>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 authentication only, not accounting.</li> </ul>	
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	<ul style="list-style-type: none"> <li>The number of times the Device sent accounting requests to servers.</li> <li>It is counted as a response timeout (Timeout), but not as a transmission error (Communicate Error).</li> </ul>
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	Displayed information	Displayed detailed 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+]	<ul style="list-style-type: none"> <li>This item is displayed when a TACACS+ server is set to be used by the system accounting configuration.</li> <li>The following accounting statistics are displayed for each TACACS+ server. Not configured is displayed in the following items when the TACACS+ server configuration is not set or all TACACS+ servers are for authentication only, not accounting.</li> </ul>	
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	<ul style="list-style-type: none"> <li>The number of times the Device sent accounting requests to servers.</li> <li>It is not counted as a response timeout (Timeout) or as a transmission error (Communicate Error).</li> </ul>
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
The accounting program is not running.	The command failed because the accounting program was not running.
The command cannot be executed because the connection with the accounting program failed.	Communication with the accounting program failed. Retry the command. If this error occurs frequently, use the <code>restart accounting</code> command to restart the accounting program.

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/ TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**Notes**

None

---

## clear accounting

---

Clears accounting statistics.

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 20XX/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
The accounting program is not running.	The command failed because the accounting program was not running.
The command cannot be executed because the connection with the accounting program failed.	Communication with the accounting program failed. Retry the command. If this error occurs frequently, use the <code>restart accounting</code> command to restart the accounting program.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

1. 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: Restarting the accounting program*

```
> restart accounting
Are you sure you want to restart the accounting program? (y/n): y
Date 20XX/03/26 11:02:42 UTC
>

> restart accounting -f
Date 20XX/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
The accounting program failed to restart. Retry the command.	An attempt to restart the accounting program by this command failed. Retry the command.
The accounting program is not running.	The command failed because the accounting program was not running.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. If the core file already exists, the existing file is overwritten unconditionally. Therefore, if the existing file is necessary, back it up in advance. The output destination and the name of the file are as follows:
  - Directory: `/usr/var/core/`
  - File name: `acctd.core`

---

## dump protocols accounting

---

Outputs the control information collected by the accounting program to a file.

### Syntax

```
dump protocols accounting
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 6-4: Obtaining an accounting dump*

```
> dump protocols accounting
Date 20XX/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
The accounting program is not running.	The command failed because the accounting program was not running.
The command cannot be executed because the connection with the accounting program failed.	Communication with the accounting program failed. Retry the command. If this error occurs frequently, use the <code>restart accounting</code> command to restart the accounting program.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dump file could not be opened.	An attempt to open or access a dump file failed.

### Notes

1. If the specified file already exists, the existing file is overwritten unconditionally. Therefore, if the existing file is necessary, back it up in advance. The output destination and the name of the file are as follows:
  - Directory: `/usr/var/accounting/`
  - File name: `accounting_dump.gz`



## Chapter

---

# 7. Time Settings and NTP/SNTP

---

show clock  
set clock  
show ntp associations  
restart ntp  
set clock sntp  
show sntp status  
restart sntp

---

## show clock

---

Displays the current date and time.

### Syntax

`show clock`

### Input mode

User mode and administrator mode

### Parameters

None

### Example

In this example, the command displays the current time.

```
> show clock
Wed Mar 22 15:30:00 UTC 20XX
>
```

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

---

## set clock

---

Displays and sets the date and time for the local 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 13 to 37.

*mm*

Specifies the month in the range 01 to 12.

*dd*

Specifies the day of the month in the range 01 to 31.

*hh*

Specifies the hour in the range 00 to 23.

*mm*

Specifies the minute in the range 00 to 59.

*ss*

Specifies the second in the range 00 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

In this example, the command sets the date and time to March 22, 2013 at 15:30.

```
> set clock 1303221530
Fri Mar 22 15:30:00 UTC 2013
>
```

### Impact on communication

None

### Response messages

Table 7-2: List of response messages for the set clock command

Message	Description
illegal time.	The date and time values are outside the valid range. Set a value within the range. If summer time (daylight saving time) is set, set the existing date and time values.
invalid day of month supplied.	The day value is outside the valid range. Set a value within the range.

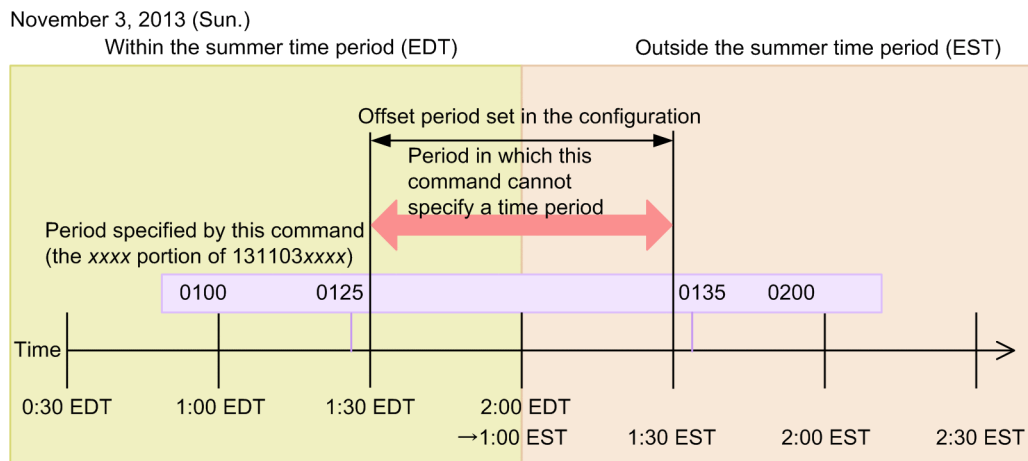
Message	Description
invalid hour supplied.	The hour value is outside the valid range. Set a value within the range.
invalid minute supplied.	The minute value is outside the valid range. Set a value within the range.
invalid month supplied.	The month value is outside the valid range. Set a value within the range.
invalid second supplied.	The second value is outside the valid range. Set a value within the range.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. If you change the time, statistics on CPU usage collected by the Device will be cleared to zero.
2. If the summer time (daylight saving time) period is set by using the `clock summer-time` configuration command, the time overlaps in each zone before and after the summer time ends. In the following example, the summer time with an offset of one hour ends on November 3, 2013 at 2:00, and the time overlaps from 1:00 to 2:00 on November 3, 2013.

When you specify the time included in the above time period by using this command, if the specified time is in the first half, the time is assumed to be in the summer time period, and if the specified time is in the second half, the time is assumed to be not in the summer time period.

Figure 7-1: Time settings before and after the summer time ends





## show ntp associations

Displays the operating 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}

vrf <vrf id>

Displays the operating status of the NTP server of the specified VRF. For <vrf id>, specify a VRF ID that was set by using the configuration command.

global

Displays the operating status of the NTP server of the global network.

Operation when this parameter is omitted:

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

### Example

Figure 7-2: Displaying the operating status of the NTP server of all VRFs

```
> show ntp associations
Date 20XX/05/01 12:00:00 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: Displaying the operating status of the NTP server of the specified VRF

```
> show ntp associations vrf 10
Date 20XX/05/01 12:00:00 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 7-3: Information displayed by the show ntp associations command

Item	Displayed information
VRF	VRF ID

Item	Displayed information
remote	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	Server type [Meaning of displayed server types] u: Unicast server b: Broadcast server l: Local server
when	Time elapsed since the last packet was received from the host (in seconds) - 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	Host polling interval (in seconds)
reach	Reachability (in octal notation)
delay	Total both-way delay time from the reference source to the synchronized subnet (in milliseconds)
offset	Offset value (in milliseconds)
disp	Latency (variation) in the time from the reference source to the synchronized subnet (in milliseconds)

## Impact on communication

None

## Response messages

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

Message	Description
NTP is not active in the specified VRF. (VRF = <vrfid>)	NTP is not active in the specified VRF. <vrfid>: Indicates the VRF ID.
NTP is not running.	NTP is not running.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection to the NTP server is refused. Try again.	A connection with the NTP server could not be established. Try again.
The specified VRF does not exist.	The specified VRF does not exist. Check the parameter.

## Notes

None

---

## restart ntp

---

Restarts the local NTP server.

### Syntax

```
restart ntp
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 7-4: Restarting the NTP server*

```
> restart ntp
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 7-5: List of response messages for the restart ntp command*

Message	Description
NTP is not running.	NTP is not running.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection to the NTP server is refused. Try again.	A connection with the NTP server could not be established. Try again.

### Notes

None

---

## set clock sntp

---

Manually synchronizes the clock time with an SNTP server that has been configured.

### Syntax

```
set clock sntp [{<ip address>|<ipv6 address>} [vrf <vrf id>]]
```

### Input mode

User mode and administrator mode

### Parameters

{<ip address>|<ipv6 address>}

Synchronizes the time with the SNTP server that has the specified address. Specify the address that was set by using the `sntp server` configuration command.

vrf <vrf id>

Synchronizes the time with the SNTP server in the specified VRF. For <vrf id>, specify a VRF ID that was set by using the `vrf definition` configuration command.

Operation when this parameter is omitted:

Synchronizes the time with the SNTP server in the global network.

Operation when all parameters are omitted:

Synchronizes the time with the SNTP server that is currently synchronized.

### Example

*Figure 7-5: Synchronizing the time with the SNTP server*

```
> set clock sntp 192.168.1.100
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 7-6: List of response messages for the set clock sntp command*

Message	Description
SNTP is not running.	SNTP is not running.
The command cannot be executed because synchronization is on going. Wait a while, and then try again.	The command cannot be executed because synchronization is on going. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection to the SNTP server is refused. Try again.	A connection with the SNTP server could not be established. Try again.
The specified address does not exist.	The specified address does not exist. Check the parameter.

## Notes

1. Use the `show sntp status` command to check the result of executing this command.

---

## show sntp status

---

Displays the status of synchronization with the SNTP server.

### Syntax

```
show sntp status
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 7-6: Displaying the status of synchronization with the SNTP server*

```
> show sntp status
Date 20XX/05/01 12:00:00 UTC
Last SNTP Status
Current server: 137.92.140.30 VRF 30
Status:synchronize
Mode : Unicast, Lapsed time : 14(s), Offset : 1(s)
Poll interval: 16
Configured SNTP Status
  SNTP server 2001:db8::1 priority 50
  SNTP server 2001:db5::100 VRF 10 priority 20
*SNTP server 137.92.140.30 VRF 30 priority 10
  SNTP broadcast 137.92.150.0 VRF 20
>
```

### Display items

*Table 7-7: Information displayed by the show sntp status command*

Item	Displayed information
Last SNTP Status	Status of the SNTP server that was referenced most recently
Current server	IPv4 or IPv6 address of the SNTP server that is currently being referenced -: No SNTP servers are referenced
VRF	VRF ID of the SNTP server that is currently being referenced
Status	Status of synchronization with the SNTP server that is currently being referenced synchronize: Synchronized with the SNTP server not synchronize (<reason>): Not synchronized with the SNTP server (reason why the time is not synchronized) [Meaning of the reason why the time is not synchronized] (timeout): There was no response from the SNTP server for five or more seconds. (too large offset): The difference in time relative to the SNTP server time is 1000 or more seconds. (auth error): A packet with mismatched authentication information was received. (bad version): A packet with a mismatched version was received. (protocol error): An invalid SNTP packet was received. (receive kod packet): A KoD packet (indicating that the server rejects inquiries from the client) was received from the SNTP server. (discard by access-list): A packet was discarded by access list filtering. (no select server): There are no SNTP servers to reference.

Item	Displayed information
Mode	Mode of the host Unicast: Information of a unicast server is referenced. Broadcast: Information of a broadcast or multicast server is referenced. Local: The time in the Device is referenced. -: No servers are referenced.
Lapsed time	Time elapsed since time was obtained from the SNTP server (in seconds) - is displayed if time has not been obtained from the SNTP server.
Offset	Difference in time relative to the SNTP server time (in seconds)
Poll interval	Polling interval (in seconds) - is displayed if the time in the Device is referenced.
Configured SNTP Status	Status of SNTP servers that have been configured
*	Indicates that the SNTP server is currently being synchronized
SNTP server	IPv4 address or IPv6 address of the SNTP server
SNTP broadcast	IPv4 address or IPv6 address of the SNTP broadcast server
VRF	VRF ID of the SNTP server
priority	Priority of the SNTP server

### Impact on communication

None

### Response messages

Table 7-8: List of response messages for the show sntp status command

Message	Description
SNTP is not running.	SNTP is not running.
The command is not authorized by the RADIUS/ TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection to the SNTP server is refused. Try again.	A connection with the SNTP server could not be established. Try again.

### Notes

None

---

## restart sntp

---

Restarts the SNTP program.

### Syntax

```
restart sntp
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 7-7: Restarting the SNTP program*

```
> restart sntp
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 7-9: List of response messages for the restart sntp command*

Message	Description
SNTP is not running.	SNTP is not running.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection to the SNTP server is refused. Try again.	A connection with the SNTP server could not be established. Try again.

### Notes

None



## Chapter

---

# 8. Host Names and DNS

---

nslookup

---

## nslookup

---

Queries a DNS server for address information of a host. You can check the connection with the DNS server.

### Syntax

```
nslookup <name> [{<ip address>|<ipv6 address>}]
```

### Input mode

User mode and administrator mode

### Parameters

<name>

Using no more than 63 characters, specify the name of the host whose address information is to be queried. For details about how to specify the name, see *Specifiable values for parameters*.

{<ip address>|<ipv6 address>}

Specify the IPv4 or IPv6 address of the DNS server to which the query is to be sent.

Operation when this parameter is omitted:

The query is sent to the DNS server set by using the `ip name-server` configuration command. The command cannot be executed if `ip name-server` is not set.

### Example

*Figure 8-1: Obtaining address information of the host from the DNS server*

```
> nslookup HOST_NAME
Server: DNS_NAME
Address: 10.10.20.10
Name: HOST_NAME
Address: 10.10.20.20
>
```

### Display items

*Table 8-1: Information displayed by the nslookup command*

Item	Displayed information	Displayed detailed information
Server	Host name of the DNS server	--
Address	IPv4 address or IPv6 address of the DNS server	--
Name	Name of the host whose address information is to be queried	This item is not displayed if the inquiry failed.
Address	IPv4 address or IPv6 address of the host	This item is not displayed if the inquiry failed.

### Impact on communication

None

## Response messages

*Table 8-2:* List of response messages for the nslookup command

Message	Description
*** Can't find server name for address <address>: No response from server *** Default servers are not available	No response was sent from the DNS server with the specified address. Check the parameter. <address>: IPv4 address or IPv6 address of the DNS server
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The DNS server is not configured.	The DNS server is not configured. Check the configuration.

## Notes

None



## Chapter

---

# 9. 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

```
# 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`.

### Display items

None

### Impact on communication

None

## Response messages

*Table 9-1:* List of response messages for the diff command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. 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:

Performs a case-sensitive search of a file, and outputs the search results 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

None

### Display items

None

### Impact on communication

None

### Response messages

Table 9-2: List of response messages for the grep command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### 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**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

*Table 9-3:* List of response messages for the more command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**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

None

### Display items

None

### Impact on communication

None

### Response messages

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

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### 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. Do not specify a file under the `-/standby` directory.

**Example**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

*Table 9-5:* List of response messages for the tail command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**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 every one byte.

*<file name>*

Specifies the file name.

### Example

None

### Display items

None

### Impact on communication

None

### Response messages

*Table 9-6:* List of response messages for the hexdump command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

## Chapter

---

# 10. Device and Software Management

---

- show version
- show system
- show environment
- reload
- show tech-support
- show power
- clear power
- show pru resources
- update software (ppupdate)
- backup
- restore

---

## show version

---

Displays version information and information about the installed boards.

### Syntax

```
show version [software]
```

### Input mode

User mode and administrator mode

### Parameters

software

Only version information is displayed.

Operation when this parameter is omitted:

Displays the version information and information about the installed boards.

### Example 1

*Figure 10-1: Displaying only version information*

```
> show version software
Date 20XX/04/01 02:54:45 UTC
BCU1: AX-P8600-R2, OS-RE, Ver.12.1
      BCU-CPU:          Ver.12.1
      BCU-CPU Boot ROM: Ver.0.0.2
      PA:               Ver.12.1
      PA Boot ROM:      Ver.2.1.12
      HDC:              Ver.0.3
BCU2: notconnect
SFU1: HDC:              Ver.1.18
SFU2: notconnect
SFU3: notconnect
SFU4: notconnect
PRU1: PRU-CPU:          Ver.12.1
      PRU-CPU Boot ROM: Ver.2.1.4
      HDC:              Ver.0.16
PRU2: notconnect
PRU3: notconnect
PRU4: notconnect
NIF1: HDC:              Ver.0.19
NIF2: notconnect
:
NIF16: notconnect
>
```

## Display items in Example 1

Table 10-1: Displayed version information

Item# <sup>1</sup>	Display format# <sup>2</sup>	Displayed information
BCU<bcu no.> <sup>#3</sup>	--	AX-***** OS-**** Ver. *.*.*.* ( Ver.*.*.*.* ) The value in parentheses is the version of the installed software. <sup>#4</sup>
	BCU-CPU BCU-CPU Boot ROM PA PA Boot ROM	Ver.*.*.*.* ( Ver.*.*.*.* ) Running version The value in parentheses is the installed version. <sup>#4</sup>
	HDC	Ver.*.*.* ( Ver.*.*.* ) Running version The value in parentheses is the installed version. <sup>#4</sup>
SFU<sfu no.> <sup>#5</sup>	HDC	Ver.*.*.* ( Ver.*.*.* ) <sfu no.>: Indicates the SFU number. Running version The value in parentheses is the installed version. <sup>#4</sup>
PRU<pru no.> <sup>#5</sup>	PRU-CPU PRU-CPU Boot ROM	Ver.*.*.*.* ( Ver.*.*.*.* ) Running version The value in parentheses is the installed version. <sup>#4</sup>
	HDC	Ver.*.*.* ( Ver.*.*.* ) Running version The value in parentheses is the installed version. <sup>#4</sup>
NIF<nif no.> <sup>#5</sup>	HDC	Ver.*.*.* ( Ver.*.*.* ) <nif no.>: Indicates the NIF number. Running version The value in parentheses is the installed version. <sup>#4</sup>

#1: Information about the board is not displayed if the operating status of the board is other than active or standby.

#2: - is displayed if no information can be obtained.

#3: If this command is executed in the standby BCU, only information about the standby BCU is displayed.

#4: If the running version and the installed version are different, the installed version is displayed in parentheses. If they are the same, the installed version is not displayed.

#5: If this command is executed in the standby BCU, this information is not displayed.

## Example 2

Figure 10-2: Displaying version information and information about the installed boards (when the command is executed in the active BCU)

```
> show version
Date 20XX/04/01 02:56:29 UTC
Model: AX-8600-R16 [AX8616R, AB086AA30000R0001CBK04A]
BCU1: AX-F8600-31R [BCU-1R, AA086AB01000R8001C7Y019]
      AX-P8600-R2, OS-RE, Ver.12.1
      BCU-CPU:          Ver.12.1
```

```

BCU-CPU Boot ROM: Ver.0.0.2
PA: Ver.12.1
PA Boot ROM: Ver.2.1.12
HDC: Ver.0.3
BCU2: AX-F8600-31R [BCU-1R, AA086AB01000R8001C7Y019]
AX-P8600-R2, OS-RE, Ver.12.1
BCU-CPU: Ver.12.1
BCU-CPU Boot ROM: Ver.0.0.2
PA: Ver.12.1
PA Boot ROM: Ver.2.1.12
HDC: Ver.0.3
SFU1: AX-F8600-4M1 [SFU-M1, AB086AC01000C8801CA3261]
HDC: Ver.1.18
SFU2: notconnect
SFU3: notconnect
SFU4: notconnect
PRU1: AX-F8600-51A [PRU-1A, ACE86AD01000R9112D1Y143]
PRU-CPU: Ver.12.1
PRU-CPU Boot ROM: Ver.2.1.4
HDC: Ver.0.16
PRU2: notconnect
PRU3: notconnect
PRU4: notconnect
NIF1: AX-F8600-711T [NL1G-12T, AA086AE11000CA001C9C276]
HDC: Ver.0.19
NIF2: notconnect
:
NIF16: notconnect
PS1: AX-F8600-1A1 [PS-A21, AA086AG01000C0000D1A04F]
PS2: AX-F8600-1A1 [PS-A21, AA086AG01000C0000D1A05D]
PS3: AX-F8600-1A1 [PS-A21, AA086AG01000C0000CC4040]
PS4: AX-F8600-1A1 [PS-A21, AA086AG01000C0000D1A05F]
FAN1: AX-F8600-BFAN1 [FAN-21, AC086AJ01000T0001D2EB12]
FAN2: AX-F8600-BFAN1 [FAN-21, AC086AJ01000T0001D2SC09]
FAN3: AX-F8600-BFAN1 [FAN-21, AC086AJ01000T0001D2EB17]
FAN4: AX-F8600-BFAN2 [FAN-22, AC086AJ02000T0000D2SC17]
FAN5: AX-F8600-BFAN2 [FAN-22, AC086AJ02000T0000D2SC16]
FAN6: AX-F8600-BFAN2 [FAN-22, AC086AJ02000T0000D2SC11]
>

```

*Figure 10-3: Displaying version information and information about the installed boards (when the command is executed in the standby BCU)*

```

> show version
Date 20XX/04/01 02:56:29 UTC
Model: AX-8600-R16 [AX8616R, AB086AA30000R0001CBK04A]
BCU2: AX-F8600-31R [BCU-1R, AA086AB01000R8001C7Y019]
AX-P8600-R2, OS-RE, Ver.12.1
BCU-CPU: Ver.12.1
BCU-CPU Boot ROM: Ver.0.0.2
PA: Ver.12.1
PA Boot ROM: Ver.2.1.12
HDC: Ver.0.3
>

```

## Display items in Example 2

*Table 10-2: Displayed version information and board information*

Item		Display format <sup>#1</sup>	Displayed information
Model	--	AX-****-*** [AX****R, **** ... ****]	AX-****-***: Type name of the chassis AX****R: Abbreviation for the chassis **** ... ****: Serial information of the chassis



Item		Display format <sup>#1</sup>	Displayed information
BCU< <i>bcu no.</i> > <sup>#2#3</sup>	--	AX-***** [BCU-**, **** ... ****]	< <i>bcu no.</i> >: Indicates the BCU number. AX-*****: Type name of the basic control unit BCU-**: Abbreviation for the basic control unit **** ... **: Serial information for the basic control unit
		AX-***** OS-**** Ver. **. **. ( Ver. **. **. )	AX-*****: Software type name OS-****: Software abbreviation Ver. **. **. : Version of the running software The value in parentheses is the version of the installed software. <sup>#4</sup>
	BCU-CPU BCU-CPU Boot ROM PA PA Boot ROM	Ver. **. **. ( Ver. **. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>
	HDC	Ver. **. ( Ver. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>
SFU< <i>sfu no.</i> > <sup>#2#5</sup>	--	AX-***** [SFU-**, **** ... ****]	< <i>sfu no.</i> >: Indicates the SFU number. AX-*****: Type name of the switch fabric unit SFU-**: Abbreviation for the switch fabric unit **** ... **: Serial information of the switch fabric unit
	HDC	Ver. **. ( Ver. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>
PRU< <i>pru no.</i> > <sup>#2#5</sup>	--	AX-***** [PRU-**, **** ... ****]	< <i>pru no.</i> >: Indicates the PRU number. AX-*****: Type name of the packet routing unit PRU-***: Abbreviation for the packet routing unit **** ... **: Serial information of the packet routing unit
	PRU-CPU PRU-CPU Boot ROM	Ver. **. ( Ver. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>
	HDC	Ver. **. ( Ver. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>
NIF< <i>nif no.</i> > <sup>#2#5</sup>	--	AX-***** [N***-****, **** ... ****]	< <i>nif no.</i> >: Indicates the NIF number. AX-*****: Type name of the network interface unit N***-****: Abbreviation for the network interface unit **** ... **: Serial information of the network interface unit
	HDC	Ver. **. ( Ver. **. )	Running version The value in parentheses is the installed version. <sup>#4</sup>

Item		Display format <sup>#1</sup>	Displayed information
PS< <i>ps no.</i> > <sup>#5#6</sup>	--	AX-*****-*** [PS-***, **** ... ****]	< <i>ps no.</i> >: Indicates the power supply unit slot number. AX-*****-***: Type name of the power supply unit PS-***: Abbreviation for the power supply unit **** ... ****: Serial information for the power supply unit
FAN< <i>fan unit no.</i> > <sup>#5#6</sup>	--	AX-*****-*** [FAN-**, **** ... ****]	< <i>fan unit no.</i> >: Indicates the fan unit slot number. AX-*****-***: Type name of the fan unit FAN-**: Abbreviation for the fan unit **** ... ****: Serial information of the fan unit

#1: - is displayed if no information can be obtained.

#2: Items to be displayed depend on the operating status of the board. For details, see *Table 10-3: Operating statuses of the board and corresponding display items*. Use the `show system` command to check the operating status of each board.

#3: If this command is executed in the standby BCU, only information about the standby BCU is displayed.

#4: If the running version and the installed version are different, the installed version is displayed in parentheses. If they are the same, the installed version is not displayed.

#5: If this command is executed in the standby BCU, this information is not displayed.

#6: Items to be displayed depend on the operating status of the power supply unit and fan unit. For details, see *Table 10-4: Operating statuses of the power supply unit and fan and corresponding display items*. Use the `show system` command to check the operating status.

#### ■ Operating statuses and corresponding display items

*Table 10-3: Operating statuses of the board and corresponding display items*

Operating status	BCU	SFU	PRU	NIF
active	A	A	A	A
standby	A	--	--	--
initialize	B	B	B	B
disable (A board is installed.)	--	B	B	B
disable (An unsupported board is installed.)	--	C	C	C
disable (No board is installed.)	--	D	D	D
inactive	B	B	B	B
notconnect	D	D	D	D
fault <sup>#</sup>	B	B	B	B
power shortage	--	--	B	B
notsupport	C	C	C	C

#### Legend

A: The type name, abbreviation, serial information, and running version are displayed.

B: The type name, abbreviation, and serial information are displayed.

C: The operating status and serial information are displayed.

D: Only the operating status is displayed.

--: Not applicable

#: The type name, abbreviation, and serial information are displayed if the hardware can be recognized.

*Table 10-4: Operating statuses of the power supply unit and fan and corresponding display items*

Operating status	PS	FAN
active	B	B
connect	D	--
notconnect	D	D
fault <sup>#</sup>	B	B
notsupport	C	C

#### Legend

B: The type name, abbreviation, and serial information are displayed.

C: The operating status and serial information are displayed.

D: Only the operating status is displayed.

--: Not applicable

#: The type name, abbreviation, and serial information are displayed if the hardware can be recognized.

### Impact on communication

None

### Response messages

*Table 10-5: List of response messages for the show version command*

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

---

## show system

---

Displays the operation status of the device.

### Syntax

```
show system
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 10-4: Information displayed in normal operation status*

```
> show system
Date 20XX/04/01 01:52:01 UTC
System: AX8616R, OS-RE, Ver.12.1, [9896.21]
  Elapsed time: 2 days 04:30
  Name: System
  Contact: Contact
  Location: Location
  Chassis MAC address: 0012.e286.5300
  BCU redundancy status: duplex
  FAN control mode: 1 (normal)
  Temperature warning level: current = 45, average = 45
  High temperature action: stop
  Power redundancy mode: 2 (Power Supply + Input Source)
  System MTU: 1518

Hardware information
  FAN1: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  FAN2: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  FAN3: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  FAN4: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  FAN5: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  FAN6: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
  PS1: active
    Elapsed time: 2 days 04:30
  PS2: active
    Elapsed time: 2 days 04:30
  PS3: active
    Elapsed time: 2 days 04:30
  PS4: active
    Elapsed time: 2 days 04:30
  BCU1: active
    Elapsed time: 2 days 04:30
    Boot device: primary
    BCU-CPU: active
    Boot: 20XX/03/29 09:10:46 UTC, power on, fatal error restart 0 time
```

```

Board: clock 2.0GHz, memory 16,068,212KB
PA: active
  Boot: 20XX/03/29 09:10:46 UTC, power on, fatal error restart 0 time
  Board: clock 1.1GHz, memory 2,097,152KB
  Lamp: STATUS LED = green, ACTIVE LED = green
        SYSTEM1 LED = green, SYSTEM2 LED = light off
  System operation panel: no error
  Management port: active up
        10BASE-T half(auto), 0012.e286.5301
  Temperature: normal (32 degree C)
  Flash: enabled, 6,153,286KB
  MC: notconnect
BCU2: standby
  Elapsed time: 2 days 04:30
  Boot device: primary
  BCU-CPU: active
    Boot: 20XX/03/29 09:10:53 UTC, power on, fatal error restart 0 time
    Board: clock 2.0GHz, memory 16,068,212KB
  PA: active
    Boot: 20XX/03/29 09:10:53 UTC, power on, fatal error restart 0 time
    Board: clock 1.1GHz, memory 2,097,152KB
    Lamp: STATUS LED = green, ACTIVE LED = green
          SYSTEM1 LED = green, SYSTEM2 LED = light off
    System operation panel: no error
    Management port: active up
          10BASE-T half(auto), 0012.e220.3401
    Temperature: normal (32 degree C)
    Flash: enabled, 6,153,286KB
    MC: notconnect
SFU1: active, fatal error restart 0 time
  Elapsed time: 2 days 04:34
  Lamp: STATUS LED = green, ACTIVE LED = green
SFU2: notconnect
SFU3: notconnect
SFU4: notconnect
PRU1: active, fatal error restart 0 time
  Elapsed time: 2 days 04:30
  Boot: 20XX/03/29 09:20:26 UTC
  Board: clock 0.8GHz, memory 3,760,820KB
  Lamp: STATUS LED = green
  Forwarding database management
    Forwarding-table allocation
      Configuration: default
      Current: default
  Flow database management
    Flow-table allocation
      Configuration: default
      Current: default
    Flow detection mode
      Configuration: quantity-oriented
      Current: quantity-oriented
PRU2: notconnect
PRU3: notconnect
PRU4: notconnect
NIF1: active, fatal error restart 0 time
  Elapsed time: 2 days 04:34
  Lamp: STATUS LED = green
NIF2: notconnect
:
NIF16: notconnect
>

```

*Figure 10-5:* Information displayed when the standby system is in an abnormal state

```

> show system
Date 20XX/04/01 01:52:01 UTC
:
:

```

```

:
Hardware information
FAN1: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
FAN2: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
FAN3: notconnect
FAN4: fault
FAN5: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
FAN6: active
    Elapsed time: 2 days 04:30
    Lamp: STATUS LED = green
PS1: active
    Elapsed time: 2 days 04:30
PS2: active
    Elapsed time: 2 days 04:30
PS3: active
    Elapsed time: 2 days 04:30
PS4: fault
BCU1: active
    Elapsed time: 2 days 04:30
    Boot device: primary
    BCU-CPU: active
        Boot: 20XX/03/29 09:10:46 UTC, power on, fatal error restart 0 time
        Board: clock 2.0GHz, memory 16,068,212KB
    PA: active
        Boot: 20XX/03/29 09:10:46 UTC, power on, fatal error restart 0 time
        Board: clock 1.1GHz, memory 2,097,152KB
    Lamp: STATUS LED = green, ACTIVE LED = green
        SYSTEM1 LED = green blink, SYSTEM2 LED = light off
    System operation panel:
        Event level: S1
        Message kind: FAN
        Message identifier: 01203003
        Message kind description: FAN:4
    Management port: active up
        10BASE-T half(auto), 0012.e286.5301
    Temperature: normal (32 degree C)
    Flash: enabled, 6,153,286KB
    MC: notconnect
BCU2: fault
:
:
:
>

```

## Display items

Table 10-6: Information displayed for System

Item	Displayed information	Displayed detailed information <sup>#1</sup>
System	Device model	Device model name
	Software information	Software type, running software version
	Management information	--
Elapsed time	Elapsed time	Time elapsed since the device started (in <i>days hours:minutes</i> )
Name	System name	Identification name set by the user <sup>#2</sup>

Item	Displayed information	Displayed detailed information <sup>#1</sup>
Contact	Contact information	Contact information set by the user <sup>#2</sup>
Location	Installation location	Installation location set by the user <sup>#2</sup>
Chassis MAC address	Chassis MAC address	--
BCU redundancy status	BCU redundancy status	duplex: During duplex operation simplex: During simplex operation
FAN control mode	Fan operating mode	1 (normal): Normal mode 2 (cool): Cooling-focused mode
Temperature warning level	Warning temperature	current: Warning temperature for the intake temperature of the device, specified by the user (in Celsius) <sup>#2</sup> average: Warning temperature for the average intake temperature of the device, specified by the user (in Celsius) <sup>#2</sup>
High temperature action	Operating mode of the device when the high-temperature stop threshold is reached	stop: The device is stopped. no-stop: The operation continues without stopping the device.
Power redundancy mode	Power redundancy monitoring mode	Power redundancy monitoring mode set in the configuration <sup>#2</sup> 1 (Power Supply): Redundant power supply units 2 (Power Supply + Input Source): Redundant power supply units and redundant power feeds
System MTU	Maximum frame length of all ports	Displays the maximum frame length of all ports in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA and PAD fields.

#1: - is displayed if no information can be obtained.

#2: This item is not displayed if the corresponding configuration has not been set.

Table 10-7: Information displayed for FAN

Item <sup>#1</sup>	Displayed information	Displayed detailed information <sup>#2</sup>
FAN<fan unit no.>	--	Operating status of the fan unit <fan unit no.>: Indicates the fan unit number. active: Running fault: A fault has occurred. notsupport: Operation has been stopped because an unsupported fan unit is installed. notconnect: Not installed
Elapsed time	--	Elapsed time Time elapsed since the fan unit started (in <i>days hours:minutes</i> )
Lamp	--	LED information --
	STATUS LED	LED indicating the operating status of the fan unit green: The LED is on and green. red: The LED is on and red. light off: The LED is off.

#1: Items to be displayed depend on the operating status. For details, see Table 10-13: Operating

*statuses and corresponding display items (fan).*

#2: - is displayed if no information can be obtained.

Table 10-8: Information displayed for PS

Item	Displayed information	Displayed detailed information <sup>#1</sup>
PS<ps no.>	Operating status of the power supply unit	<ps no.>: Indicates the power supply unit slot number. active: Supplied normally connect: No power is being supplied. fault: A fault occurred. notsupport: Operation has been stopped because an unsupported power supply unit is installed. notconnect: Not installed
Elapsed time <sup>#2</sup>	Elapsed time	Time elapsed since the power supply unit started (in <i>days hours:minutes</i> )

#1: - is displayed if no information can be obtained.

#2: This item is not displayed if the operating status is not *active*.

Table 10-9: Information displayed for BCU

Item <sup>#1</sup>		Displayed information	Displayed detailed information <sup>#2</sup>
BCU<bcu no.>	--	Operating status of the BSU	<bcu no.>: Indicates the BCU number. active: Operating as an active unit standby: Operating as a standby unit standby(configuration discord): Operating as a standby unit and asynchronous with the active unit due to mismatched configuration <sup>#3</sup> standby(software version discord): asynchronous with the active unit due to mismatched software version <sup>#3</sup> fault: Failed <sup>#4</sup> initialize: Initializing inactive: Operation has been stopped notsupport: Operation has been stopped because an unsupported board is installed. notconnect: Not installed
Elapsed time	--	Elapsed time	Time elapsed since the BCU started (in <i>days hours:minutes</i> )
Boot device	--	Boot device	primary: Normally booted from the internal flash memory. secondary: Booted from the backup software in the internal flash memory. MC: Booted from the memory card.
BCU-CPU	--	BCU-CPU information	active: Running fault: Failed initialize: Initializing
	Boot	Startup time of the BCU-CPU	yyyy/mm/dd hh:mm:ss <i>timezone</i> year/month/day hour:minute:second <i>time zone</i>



Item#1			Displayed information	Displayed detailed information#2
			Cause of BCU-CPU startup	power on: Startup by the power switch operation restart: Restart by a command ACH switch restart: Restart by the system switching switch fatal error restart: Restart due to a failure RESET switch restart: Restart by the RESET button default restart: Restart due to a default restart auto restart: Automatic restart by software
			Number of times the BCU-CPU automatically recovered#5	Number of times the BCU-CPU restarted due to a failure
	Board	clock	Clock frequency of the BCU-CPU	--
		memory	Amount of memory installed on the BCU-CPU	--
PA	--		PA information	active: Running fault: Failed initialize: Initializing
	Boot		Startup time of the PA	yyyy/mm/dd hh:mm:ss timezone year/month/day hour:minute:second time zone
			Cause of PA startup	power on: Startup by the power switch operation restart: Restart by a command ACH switch restart: Restart by the system switching switch fatal error restart: Restart due to a failure RESET switch restart: Restart by the RESET button default restart: Restart due to a default restart auto restart: Automatic restart by software
			Number of times the PA automatically recovered#5	Number of times the PA restarted due to a failure
	Board	clock	Clock frequency of the PA	--
		memory	Amount of memory installed on the PA	--
Lamp	--		LED information	--
	STATUS LED		LED indicating the operating status of the BCU	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.
	ACTIVE LED		LED indicating the BCU redundant operation status	green: The LED is on and green. light off: The LED is off.
	SYSTEM1 LED		LED indicating device status	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.

Item <sup>#1</sup>		Displayed information	Displayed detailed information <sup>#2</sup>
	SYSTEM2 LED	LED indicating the status of SYSTEM2 LED	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.
System operation panel	--	Information displayed on the system operation panel	--
	Event level <sup>#6</sup>	Event level	--
	Message kind <sup>#6</sup>	Message type	--
	Message identifier <sup>#6</sup>	Message ID	--
	Message kind description <sup>#6</sup>	Detailed message type information	--
Management port	--	Management port status	active up: Active (normal operating state) down: Active (A line failure occurred.) initialize: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating). fault: Failed inactive: Operation has been stopped by the inactivate bcu standby command. disable: Operation has been stopped by the shutdown configuration command. unused: The interface mgmt0 configuration command is not set, or the BCU is in a standby system.
		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 1000BASE-T full (auto): 1000BASE-T full duplex -: Unknown line speed (when auto-negotiation is set and the port status is not active up, or the port status is initialize or fault)
		<MAC address>	MAC address of the management port -: The status of the management port is unused.
Temperature <sup>#7</sup>	--	Operating condition level (intake temperature)	normal: Normal caution: Caution critical: Warning fault: Abnormal
Flash <sup>#8</sup>	--	Internal flash memory status	enabled: Accessible -----: Unknown

Item# <sup>1</sup>		Displayed information	Displayed detailed information# <sup>2</sup>
		Total capacity	Total of capacity being used and capacity not being used for the file system in the internal flash memory
MC	--	Memory card status	enabled: Accessible notconnect: Not installed write_protect: Write protected state -----: Unknown
		Total capacity# <sup>9</sup>	Total of capacity being used and capacity not being used for the memory card file system

#1: Items to be displayed depend on the operating status. For details, see *Table 10-14: Operating statuses and corresponding display items (BCU)*.

#2: - is displayed if no information can be obtained.

#3: configuration discord and software version discord might occur at the same time. In this case, the BCU operating status is displayed on multiple lines.

<Display example>

```
BCU1: standby(configuration discord
              software version discord)
```

#4: This status is displayed when a hardware failure occurs or the `reload stop` command is executed. This status is also displayed temporarily when this command is executed immediately after the standby BCU is started or operation of the standby BCU is stopped. If the standby BCU remains in this status without switching the status, this item indicates that an abnormality is detected by the hardware diagnostics.

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

#6: This item is not displayed if `no_error` is displayed on the system operation panel. In addition, if multiple failures occur, failure information with the smallest event level value is displayed.

#7: If the sensor detects a temperature of 65 degrees Celsius or higher, the software stops. However, if the `no-stop` parameter is set for the `system high-temperature-action` configuration command, the software does not stop even if the sensor detects a temperature of 65 degrees Celsius or higher.

#8: If the Device booted from the memory card or information about the internal flash memory cannot be obtained, ----- is displayed. In this case, the total capacity is not displayed.

#9: This item is displayed when the memory card status is `enabled` or `write_protect`.

Table 10-10: Information displayed for SFU

Item <sup>#1</sup>		Displayed information	Displayed detailed information <sup>#2</sup>
SFU< <i>sfu no.</i> >	--	Operating status of the SFU	< <i>sfu no.</i> >: Indicates the SFU number. active: Operating as an active unit fault: Failed initialize: Initializing inactive: Operation has been stopped by the <code>inactivate</code> command. notsupport: Operation has been stopped because an unsupported board is installed. disable: Operation has been stopped by the <code>no power enable</code> configuration command. notconnect: Not installed
		(Update state of the SFU) <sup>#3</sup>	( <code>update executing</code> ): The HDC is being updated. ( <code>restart required</code> ): The SFU needs to be restarted to apply the HDC. ( <code>update failed</code> ): An attempt to update the HDC failed.
		Number of times the SFU automatically recovered <sup>#4</sup>	Number of times the SFU restarted due to a failure
Elapsed time	--	Elapsed time	Time elapsed since the SFU started (in <i>days hours:minutes</i> )
Lamp	--	LED information	--
	STATUS LED	LED indicating the operating status of the SFU	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.
	ACTIVE LED	LED indicating the SFU operation status	green: The LED is on and green. light off: The LED is off.

#1: Items to be displayed depend on the operating status. For details, see Table 10-15: *Operating statuses and corresponding display items (SFU)*.

#2: - is displayed if no information can be obtained.

#3: This information is not displayed if the HDC has not been updated.

#4: The number of restarts due to a failure is initialized once every hour. It is initialized when operation is stopped by the `inactivate` command or the `no power enable` configuration command, or when the SFU is removed.

Table 10-11: Information displayed for PRU

Item# <sup>1</sup>		Displayed information	Displayed detailed information# <sup>2</sup>
PRU<pru no.>	--	Operating status of the PRU	<pru no.>: Indicates the PRU number. active: Operating as an active unit fault: Failed initialize: Initializing inactive: Operation has been stopped by the inactivate command. notsupport: Operation has been stopped because an unsupported board is installed. power shortage: Operation has been stopped because of a power shortage disable: Operation has been stopped by the no power enable configuration command. notconnect: Not installed
		(Update state of the PRU)# <sup>3</sup>	(update executing): The HDC is being updated. (restart required): The PRU needs to be restarted to apply the HDC or change the configuration. (update failed): An attempt to update the HDC failed.
		Number of times the PRU automatically recovered# <sup>4</sup>	Number of times the PRU restarted due to a failure
Elapsed time	--	Elapsed time	Time elapsed since the PRU started (in <i>days hours:minutes</i> )
Boot	--	Startup time of the PRU-CPU	<i>yyyy/mm/dd hh:mm:ss timezone</i> year/month/day hour:minute:second time zone
Board	clock	Clock frequency of the PRU-CPU	--
	memory	Amount of memory installed on the PRU	--
Lamp	--	LED information	--
	STATUS LED	LED indicating the operating status of the PRU	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.
Forwarding database management	--	Routing information	--
	Forwarding-table allocation	Route allocation pattern	This item displays the settings specified by the configuration command and the operating state. default: Allocation pattern for a mix of all routes and entries ipv4-uni: Allocation pattern for IPv4 unicast routes, MAC addresses, and ARP entries only ipv6-uni: Allocation pattern for IPv6 unicast routes, MAC addresses, ARP entries, and NDP entries only

Item <sup>#1</sup>		Displayed information	Displayed detailed information <sup>#2</sup>
Flow database management	--	Filters and QoS flow information	--
	Flow-table allocation	Flow allocation pattern	This item displays the settings specified by the configuration command and the operating state. <code>default</code> : Allocation pattern that focuses on filters and QoS flow equally <code>filter</code> : Allocation pattern that focuses on filters <code>filter-only</code> : Allocation pattern for filters only <code>qos</code> : Allocation pattern that focuses on QoS flow <code>qos-only</code> : Allocation pattern for QoS flow only
	Flow detection mode	Flow detection mode	This item displays the settings specified by the configuration command and the operating state. <code>condition-oriented</code> : Mode focused on the number of detection conditions <code>quantity-oriented</code> : Mode focused on the number of entries

#1: Items to be displayed depend on the operating status. For details, see *Table 10-16: Operating statuses and corresponding display items (PRU)*.

#2: - is displayed if no information can be obtained.

#3: This information is not displayed if the HDC has not been updated or there are no requests for restarting the PRU due to the configuration change. In addition, the two update statuses might be displayed at the same time as follows:

<Display example: When the HDC is being updated and a PRU restart request has been made>  
 (update executing, restart required)

<Display example: When an attempt to update the HDC failed and a PRU restart request has been made>  
 (update failed, restart required)

If (update executing) and (restart required) are displayed at the same time, wait until the HDC is updated, and then restart the PRU.

#4: The number of restarts due to a failure is initialized once every hour. It is initialized when operation is stopped by the `inactivate` command or the `no power enable` configuration command, or when the PRU is removed.

Table 10-12: Information displayed for NIF

Item# <sup>1</sup>		Displayed information	Displayed detailed information# <sup>2</sup>
NIF<nif no.>	--	Operating status of the NIF	<nif no.>: Indicates the NIF number. active: Operating as an active unit fault: Failed initialize: Initializing inactive: Operation has been stopped by the <code>inactivate</code> command. notsupport: Operation has been stopped because an unsupported board is installed. power shortage: Operation has been stopped because of a power shortage disable: Operation has been stopped by the <code>no power enable</code> configuration command. notconnect: Not installed or not used (when a single-size NIF is installed, the NIF number to which 2 is added is displayed like this).
		(Update state of the NIF)# <sup>3</sup>	(update executing): The HDC is being updated. (restart required): The NIF needs to be restarted to apply the HDC. (update failed): An attempt to update the HDC failed.
		Number of times the NIF automatically recovered# <sup>4</sup>	Number of times the NIF restarted due to a failure
Elapsed time	--	Elapsed time	Time elapsed since the NIF started (in <i>days hours:minutes</i> )
Lamp	--	LED information	--
	STATUS LED	LED indicating the operating status of the NIF	green: The LED is on and green. green blink: The LED is green and blinking. red: The LED is on and red. light off: The LED is off.

#1: Items to be displayed depend on the operating status. For details, see *Table 10-17: Operating statuses and corresponding display items (NIF)*.

#2: - is displayed if no information can be obtained.

#3: This information is not displayed if the HDC has not been updated.

#4: The number of restarts due to a failure is initialized once every hour. It is initialized when operation is stopped by the `inactivate` command or the `no power enable` configuration command, or when the NIF is removed.

#### ■ Operating statuses and corresponding display items

Table 10-13: Operating statuses and corresponding display items (fan)

Operating status	Elapsed time	LED information
active	Y	Y
fault	N	Y
notsupport	N	N
notconnect	N	N

Legend Y: Displayed, N: Not displayed

*Table 10-14: Operating statuses and corresponding display items (BCU)*

Operating status	Elapsed time	Boot device	BCU-CP U information	PA information	LED information	Additional Information
active	Y	Y	Y	Y	Y	Y
standby	Y	Y	Y	Y	Y	Y
fault	N	Y	N	N	Y	N
initialize	Y	Y	Y	Y	Y	N
inactive	N	N	N	N	N	N
notsupport	N	N	N	N	N	N
notconnect	N	N	N	N	N	N

Legend Y: Displayed, N: Not displayed

*Table 10-15: Operating statuses and corresponding display items (SFU)*

Operating status	Update status	Number of automatic recoveries	Elapsed time	LED information
active	Y	Y	Y	Y
fault	N	Y	N	Y
initialize	Y	Y	N	Y
inactive	N	N	N	N
notsupport	N	N	N	N
disable	N	N	N	N
notconnect	N	N	N	N

Legend Y: Displayed, N: Not displayed

*Table 10-16: Operating statuses and corresponding display items (PRU)*

Operating status	Update status	Number of automatic recoveries	Elapsed time	LED information	Additional Information
active	Y	Y	Y	Y	Y
fault	N	Y	N	Y	N
initialize	Y	Y	N	Y	N
inactive	N	N	N	N	N
notsupport	N	N	N	N	N
power shortage	N	N	N	N	N
disable	N	N	N	N	N
notconnect	N	N	N	N	N

Legend Y: Displayed, N: Not displayed



*Table 10-17: Operating statuses and corresponding display items (NIF)*

Operating status	Update status	Number of automatic recoveries	Elapsed time	LED information
active	Y	Y	Y	Y
fault	N	Y	N	Y
initialize	Y	Y	N	Y
inactive	N	N	N	N
notsupport	N	N	N	N
power shortage	N	N	N	N
disable	N	N	N	N
notconnect	N	N	N	N

Legend Y: Displayed, N: Not displayed

### Impact on communication

None

### Response messages

*Table 10-18: List of response messages for the show system command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

---

## show environment

---

Displays the environment information of the device.

### Syntax

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

### Input mode

User mode and administrator mode

### Parameters

temperature-logging

Displays the intake temperature history collected by the device for up to two years.

Operation when this parameter is omitted:

Displays the environment information of the device.

### Example 1

*Figure 10-6: Displaying environment information of the device*

```
> show environment
Date 20XX/03/27 06:16:38 UTC

FAN environment
  FAN1: active, Speed = 2600
  FAN2: active, Speed = high
  FAN3: active, Speed = 2600
  FAN4: active, Speed = high
  FAN5: fault
  FAN6: active, Speed = high
  Mode: 1 (normal)

Power environment
  Input voltage: AC200-240V
  Power redundancy mode: 2 (Power Supply + Input Source)
  Power supply redundancy status
    Power supply: active = 4, required = 1 (Redundant)
    Input source: active = 2(from A) 2(from B), required = 1 (Redundant)
  PS1: active
  PS2: active
  PS3: active
  PS4: active

Power usage
  Total power capacity: 10168.00 W
  Input source A: 5084.00 W
  Input source B: 5084.00 W
  Total power allocated: 1477.00 W
  Total power available for additional boards: 8691.00 W
  Power available (Power supply unit redundant case): 6149.00 W
  Power available (Input source redundant case)
    Input source A: 3607.00 W
    Input source B: 3607.00 W

Inlet temperature
  BCU1: normal (36 degree C)
  BCU2: normal (36 degree C)

Board temperature
  BCU1: normal
  BCU2: normal
  SFU1: normal
```

```

SFU2: notconnect
SFU3: notconnect
SFU4: notconnect
PRU1: normal
PRU2: notconnect
PRU3: notconnect
PRU4: notconnect
NIF1: normal
NIF2: notconnect
:
NIF16: notconnect

```

#### Accumulated running time

	total	caution		critical	
BCU1	2 days 16 hours	1 day	1 hour	0 days	0 hours
BCU2	2 days 16 hours	1 day	1 hour	0 days	0 hours
SFU1	2 days 16 hours	1 day	1 hour	0 days	0 hours
SFU2	notconnect				
SFU3	notconnect				
SFU4	notconnect				
PRU1	2 days 16 hours	1 day	1 hour	0 days	0 hours
PRU2	notconnect				
PRU3	notconnect				
PRU4	notconnect				
NIF1	2 days 16 hours	1 day	1 hour	0 days	0 hours
NIF2	notconnect				
:					
NIF16	notconnect				
PS1	2 days 16 hours	1 day	1 hour	0 days	0 hours
PS2	2 days 16 hours	1 day	1 hour	0 days	0 hours
PS3	2 days 16 hours	1 day	1 hour	0 days	0 hours
PS4	2 days 16 hours	1 day	1 hour	0 days	0 hours
FAN1	2 days 16 hours	1 day	1 hour	0 days	0 hours
FAN2	2 days 16 hours	1 day	1 hour	0 days	0 hours
:					
FAN6	2 days 16 hours	1 day	1 hour	0 days	0 hours

&gt;

## Display items 1

Table 10-19: Displayed environment information of the device

Item		Displayed information	Displayed detailed information <sup>#1</sup>
FAN environment	--	Fan information	--
	FAN< <i>fan unit no.</i> >	Fan operating status	< <i>fan unit no.</i> >: Indicates the fan unit number. active: Running fault: A fan failure has occurred. notsupport: Operation has been stopped because an unsupported fan unit is installed. notconnect: Not installed
	Speed <sup>#2</sup>	The rotational speed of the fan	This is displayed in rpm. high: High-speed rotation
	Mode	Fan operating mode	1 (normal): Normal setting 2 (cool): Keeping the device cool takes priority.
Power environment	--	Power supply unit information	--
	Input voltage	Rated input voltage	AC100-120V: 100 V AC system AC200-240V: 200 V AC system DC-48V: -48 V DC system

Item		Displayed information	Displayed detailed information <sup>#1</sup>
	Power redundancy mode	Power redundancy monitoring mode	Power redundancy monitoring mode set in the configuration <sup>#3</sup> 1 (Power Supply): Redundant power supply units 2 (Power Supply + Input Source): Redundant power supply units and redundant power feeds
	Power supply redundancy status <sup>#4</sup>	Status of each power redundancy	--
	Power supply <sup>#4</sup>	Status of redundant power supply units	active: Number of power supply units that supply power to the device required: Number of power supply units required to operate the device (Redundant): Redundant power supply units are in use (Non-Redundant): Redundant power supply units are not in use
	Input source <sup>#5</sup>	Status of redundant power feeds	active: Number of power supply units that supply power from power feeds from: Power feeds from which power is supplied required: Number of power supply units required for each power feed (Redundant): Redundant power feeds are in use (Non-Redundant): Redundant power feeds are not in use
	PS<ps no.>	Installation status of the input power supply unit	<ps no.>: Indicates the power supply unit number. active: Supplied normally connect: No power is being supplied. fault: There is an abnormal voltage. notsupport: Operation has been stopped because an unsupported power supply unit is installed. notconnect: Not installed
Power usage	--	Power usage	--
	Total power capacity	Amount of power that can be supplied	--
	Input source A	Amount of power that can be supplied by power feed A	--
	Input source B	Amount of power that can be supplied by power feed B	--
	Total power allocated	Amount of power required by the device	Total amount of power required when the maximum number of fans, BCUs, and SFUs are installed, and power required for the installed PRUs and NIFs The value does not include the amount of power required for the PRUs and NIFs that have been disabled by the <code>no power enable</code> configuration command.

Item		Displayed information	Displayed detailed information <sup>#1</sup>
	Total power available for additional boards	Surplus power of the device	Extra power that can be used in the device This value is displayed as a negative value if the amount of power that can be supplied is insufficient.
	Power available (Power supply unit redundant case)	Surplus power of the device when redundant power supply units are configured	Extra power that can be used while redundant power supply units are provided This value is displayed as a negative value if redundant power supply units are not configured.
	Power available (Input source redundant case)	Surplus power of each power feed when redundant power feeds are configured	--
	Input source A	Surplus power of power feed A	Extra power that can be used in power feed A This value is displayed as a negative value if redundant power feeds are not configured.
	Input source B	Surplus power of power feed B	Extra power that can be used in the power feed B This value is displayed as a negative value if redundant power feeds are not configured.
Inlet temperature <sup>#6</sup>	--	Intake temperature	--
	BCU<bcu no.>	Operating condition level of the BCU (intake temperature)	<bcu no.>: Indicates the BCU number. normal: Normal caution: Caution (High or low temperature) critical: Warning fault: Abnormal notconnect: Not installed
Board temperature	--	Temperature status of the board	--
	BCU<bcu no.>	Temperature status of the BCU	<bcu no.>: Indicates the BCU number. normal: Normal critical: Warning fault: Abnormal notconnect: Not installed
	SFU<sfu no.>	Temperature status of the SFU	<sfu no.>: Indicates the SFU number. normal: Normal critical: Warning fault: Abnormal notconnect: Not installed
	PRU<pru no.>	Temperature status of the PRU	<pru no.>: Indicates the PRU number. normal: Normal critical: Warning fault: Abnormal notconnect: Not installed
	NIF<nif no.>	Temperature status of the NIF	<nif no.>: Indicates the NIF number. normal: Normal critical: Warning fault: Abnormal notconnect: Not installed

Item		Displayed information	Displayed detailed information <sup>#1</sup>
Accumulated running time <sup>#7#8</sup>	--	Cumulative operating time	--
	total	The cumulative operating time since the power of the device is turned on	--
	caution	The cumulative operating time of the high-temperature caution state or the high-temperature warning state	--
	critical	The cumulative operating time of the high-temperature warning state	--

#1: - is displayed if no information can be obtained.

#2: This item is not displayed if the operating status of the fan is not `active`.

#3: This item is not displayed if the corresponding configuration has not been set.

#4: This item is not displayed if 1 (redundant power supply units) or 2 (redundant power supply units and redundant power feeds) has not been set by the `power redundancy-mode` configuration command.

#5: This item is not displayed if 2 (redundant power supply units and redundant power feeds) has not been set by the `power redundancy-mode` configuration command.

#6: The operating condition level varies depending on the change in intake temperature. The following table describes the correspondence between intake temperature and operating condition level.

*Table 10-20: Correspondence between intake temperature and operating condition level*

Intake temperature	Operating condition level
Drops to two degrees Celsius or lower.	caution
Rises to five degrees Celsius or higher.	normal
Drops to 40 degrees Celsius or lower.	normal
Rises to 43 degrees Celsius or higher.	caution
Drops to 50 Celsius or lower.	caution
Rises to 53 degrees Celsius or higher.	critical
Rises to 65 degrees Celsius or higher.	fault

#7: The cumulative operating time is updated for each board every six hours after the power is turned on. Therefore, the exact operating time is not displayed if the operation time is less than six hours.

#8: `notconnect` is displayed if no board is installed.

## Example 2

*Figure 10-7: Displaying intake temperature history information*

```
> show environment temperature-logging
```

```

Date 20XX/04/01 01:44:40 UTC
BCU1
Date      0:00   6:00  12:00  18:00
20XX/04/01 32.9
20XX/03/31 33.0  33.0  33.0   33.0
20XX/03/30 33.0  33.0  33.0   33.0
20XX/03/29   -    -   33.7   33.0

BCU2
Date      0:00   6:00  12:00  18:00
20XX/04/01 32.9
20XX/03/31 33.0  33.0  33.0   33.0
20XX/03/30 33.0  33.0  33.0   33.0
20XX/03/29   -    -   33.7   33.0
>

```

## Display items 2

Table 10-21: Displayed intake temperature history information

Item	Displayed information	Displayed detailed information
Date	Date	--
0:00	Average intake temperature of the time period	Average intake temperature of the period from 18:00 (previous day) to 0:00
6:00		Average intake temperature of the period from 0:00 to 6:00
12:00		Average intake temperature of the period from 6:00 to 12:00
18:00		Average intake temperature of the period from 12:00 to 18:00
"_"	Hyphen (-)	The device 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 10-22: List of response messages for the show environment command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. The intake temperature history display is refreshed at the fixed times (0:00, 6:00, 12:00, and 18:00) to which the time zone is applied. The times might slightly change depending on the environment of the device.
2. If the system time of the device is changed, the change is applied at 0:00 on the next day. If the system time is changed to an earlier time than that before the change, multiple records of the same date might be displayed because intake temperature history information is displayed in the order it was collected. In addition, if the time is changed to a later time than that before

the change, some dates might not be displayed.

3. Intake temperature history information is retained for each BCU board. Therefore, if a board is replaced, the information about the previous board is not used by the replacement board.
4. If the power supplied to the device is insufficient, check the installation status of power supply units.
5. This command can check the following power information:
  - Maximum power used by the device
  - Excess and deficiency of the power currently being supplied
  - Whether the power redundancy mode is used?

Use the `show power` command to check the power usage of each board.



---

## reload

---

Restarts the BSU or the device.

### Syntax

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

### Input mode

User mode and administrator mode

### Parameters

{stop | no-dump-image | dump-image}

stop

Stops without restarting. Disables the collection of BCU memory dump information.

no-dump-image

Disables the collection of BCU memory dump information.

dump-image

Enables the collection of BCU memory dump information.

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

standby

Restarts the standby BCU.

Operation when this parameter is omitted:

Restarts the entire device.

Operation when all parameters are omitted:

Collects a BCU memory dump in the active and standby systems, and restarts the entire device.

### Example

*Figure 10-8: Collecting a BCU memory dump and restarting the device*

```
>reload
The dump information will be extracted. Do you want to continue? (y/n):y
active: The old dump file(bcu01.000 20XX/08/01 11:26 UTC) will be deleted. Do
you want to continue? (y/n):y
```

```
standby: The old dump file(bcu02.000 20XX/08/01 11:28 UTC) will be deleted. Do
you want to continue? (y/n):y
Are you sure you want to restart? (y/n):y
```

## Display items

None

## Impact on communication

During the restart of the active BCU, communication is suspended.

## Response messages

Table 10-23: List of response messages for the reload command

Message	Description
The command cannot be executed because standby BCU is booting or fault.	The command cannot be executed because the standby BCU is starting or there is a fault with the BCU.
The command cannot be executed because standby BCU is inactivated or notconnected.	The command cannot be executed because the standby BCU is inactive or is not installed.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. The device boots from the memory card if a memory card that contains the software image file `k.img` is mounted. If the device boots from a memory card, the account and configuration information reverts to the factory defaults and you cannot save your own settings. Do not boot the device from a memory card under normal circumstances.
2. To execute this command in the standby BCU, you need to specify `standby` for the `<system>` parameter.
3. The following table describes the result of executing this command for each state of the standby BCU.

Table 10-24: Execution results for each state of the standby BCU

Executed command	Status of the standby BCU		
	standby (normal)	inactivate (stopped) or notconnect (not installed)	booting (starting up) or fault (failed)
reload	The entire device is restarted. <sup>#1</sup>	Only the active BCU is restarted.	The command cannot be executed. <sup>#2#3</sup>
reload active	Only the active BCU is restarted. <sup>#4</sup>	Only the active BCU is restarted.	Only the active BCU is restarted.
reload standby	Only the standby BCU is restarted.	The command cannot be executed.	The command cannot be executed. <sup>#2</sup>
reload stop	The entire device is stopped.	Only the active BCU is stopped.	The command cannot be executed. <sup>#2#3</sup>

Executed command	Status of the standby BCU		
	standby (normal)	inactivate (stopped) or notconnect (not installed)	booting (starting up) or fault (failed)
reload stop active	Only the active BCU is stopped. <sup>#4</sup>	Only the active BCU is stopped.	Only the active BCU is stopped.
reload stop standby	Only the standby BCU is stopped.	The command cannot be executed.	The command cannot be executed. <sup>#2</sup>

#1: If an attempt to restart the standby BCU failed, only the active BCU is restarted.

#2: If the BCU-CPU status displayed by the `show system` command is `active`, the standby BCU operates as if it is in `standby` state even if it is in `booting` state.

#3: To restart or stop the device when the standby BCU status is `booting` or `fault`, specify `active` for the `<system>` parameter.

#4: The system is switched when the command is executed, and the standby BCU changes to the new active BCU.

4. Do not abort this command while it is executing. The processing continues even if the command is aborted.

---

## show tech-support

---

Collects hardware and software status information required for technical support.

### Syntax

```
show tech-support [ftp] [page] [password <password>] [no-config] [basic]
```

### Input mode

User mode and administrator mode

### Parameters

#### ftp

Saves a text file of collected information, and the dump file and core file from the internal flash memory to a remote FTP server. The dump file and core file are combined into one binary file. Collected information is not displayed on the console terminal screen.

When executing the command, enter connection information for the FTP server as per the prompts.

Operation when this parameter is omitted:

Collected information is displayed on the console terminal screen.

#### 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 if the `ftp` parameter is also specified.

Operation when this parameter is omitted:

Information is displayed without a pause at each page displayed.

#### password <password>

Enters the password if the password for administrator mode is specified. If the password includes a special character, the password must be enclosed in double quotation marks (" "). This parameter can be omitted if the password for administrator mode has not been set.

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.

Note that, if the command is executed with this parameter specified, password information is recorded in operation logs.

Operation when this parameter is omitted:

No password is specified. If this parameter is omitted when the password for administrator mode has been set, a prompt requesting the password appears.

#### no-config

The configuration is not collected.

Operation when this parameter is omitted:

The configuration is collected.

#### basic

Collects only basic information and statistics about the device.

Operation when this parameter is omitted:

Collects all information.I

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

## Example

In this example, the command collects all information that shows the hardware and software status.

*Figure 10-9: Displaying collected information on the console terminal screen*

```
> show tech-support
##### Tech-Support Log #####
Wed Apr 10 05:07:20 UTC 20XX

##### show version #####
Date 20XX/04/10 05:07:20 UTC
Model: AX-8600-R16 [AX8616R, AB086AA30000R0001CBK04A]
BCU1: AX-F8600-31R [BCU-1R, AA086AB01000R8001C7Y019]
      AX-P8600-R2, OS-RE, Ver.12.1
      BCU-CPU: Ver.12.1
      BCU-CPU Boot ROM: Ver.0.0.2
      PA: Ver.12.1
      PA Boot ROM: Ver.2.1.12
      HDC: Ver.0.3
BCU2: notconnect

      :
      :
      :

##### End of show version #####

      :
      :
      :

Wed Apr 10 05:06:35 UTC 20XX
##### End of Tech-Support Log #####
>
```

*Figure 10-10: Saving the collected information, and the dump file and core file from the internal flash memory to the FTP server with the file name "support"*

```
> show tech-support ftp
Enter the host name of the FTP server. : ftpserver.example.com
Enter the user name for the FTP server connection. : user1
Enter the password for the FTP server connection. : <password>
Enter the path name of the FTP server. : /usr/home/user1
Enter the file name for the log and dump files. : support
Do you want to check and extract dump files on the standby system? (y/n): y
Mon Dec 31 12:00:00 UTC 20XX
Transferred support.txt .
Executing.....
File transfer ended successfully.
##### Dump files' Information #####
**** ls -l /dump0 ****
total 4568
-rwxrwxrwx 1 root wheel 4677464 Dec 18 21:16:16 20XX bcu01.000
**** ls -l /usr/var/hardware ****
total 1368
-rwxrwxrwx 1 root wheel 1002811 Dec 27 11:56:16 20XX nif05.000
**** ls -l /standby/dump0 ****
**** ls -l /standby/usr/var/hardware/ ****
##### 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...
File transfer ended successfully.
>

```

## Display items

Table 10-25: Information displayed by the show tech-support command

Item	Displayed information
##### <information type> #####	A separator indicating the beginning of each type of collected information. <information type>: Information type The following describes the contents of information type: <ul style="list-style-type: none"> <li>• Dump files' Information: List of existing dump files</li> <li>• Core files' Information: List of existing core files</li> <li>• Tech-Support Log: All information that shows the hardware and software status.</li> <li>• Tech-Support Basic Log: Basic information and statistics about the device</li> </ul>
##### End of <information type> #####	A separator indicating the end of each type of collected information. <information type>: Information type
##### <command name> #####	A separator indicating the beginning of the result of a command that was executed to collect the information. <command name>: Command name
##### End of <command name> #####	A separator indicating the end of the result of a command that was executed to collect the information. <command name>: Command name

## Impact on communication

None

## Response messages

Table 10-26: List of response messages for the show tech-support command

Message	Description
Another user is using the 'show tech-support' command. Wait a while, and then try again.	Another user is executing the show tech-support command.
Do you want to check and extract dump files on the standby system? (y/n):	Do you want to check and extract dump files on the standby system? When <i>y</i> is selected, the presence of dump files and core files for the standby system is checked, and then the files are saved to the FTP server. When <i>n</i> is selected, only dump files and core files for the active system are saved to the FTP server.
Do you want to retype a password? (y/n):	Do you want to re-enter the password for administrator mode? If you select <i>y</i> , you can re-enter the password. If you select <i>n</i> , the command execution continues assuming that an incorrect password was entered.

Message	Description
Enter the file name for the log and dump files. :	Enter the file name common to the log and dump files. Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the file name. Note that file names which end with a period cannot be specified. If the entered file name contains a space or tab character, you will be prompted to re-enter the file name. If a file name is not specified, a 14-digit number using the command execution date and time is used as the file name. Log files and dump files are saved to the FTP server by using a file name created by appending .txt or .tgz to the specified file name, respectively. Dump files are packaged into one file and then saved.
Enter the host name of the FTP server. :	Enter the host name, or the IPv4 or IPv6 address. For a host name, alphabetic characters can be used for the first character, and alphanumeric characters, hyphens (-), and periods (.) can be used for the second and subsequent characters. If the entered host name contains a space or tab character, you will be prompted to re-enter the host name. For an IPv6 address, only IPv6 global addresses can be used.
Enter the password for the administrator mode. :	Enter the password for administrator mode.
Enter the password for the FTP server connection. :	Enter the password of the login user specified for the response message Enter the user name for the FTP server connection. :. Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the password.
Enter the path name of the FTP server. :	Enter the path name of the storage destination for log files and dump files. Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the path name. To specify the home directory of the login user, enter just one period.
Enter the user name for the FTP server connection. :	Enter the login user name. Alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the login user name. If the entered login user name contains a space or tab character, you will be prompted to re-enter the login user name.
File transfer ended successfully.	The file transfer ended normally.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The file transfer failed.	An attempt to transfer the file failed. Check the free capacity of the destination and the state of the communication line.
The password for the administrator mode is invalid.	The password for administrator mode specified in the <password> parameter is incorrect.

If the `ftp` parameter is specified, the same messages as for the `ftp` command are displayed. For details about the messages, see *Response messages* for the `ftp` command.

## Notes

1. 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.
2. 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 power

---

Displays the elapsed time for the device, and the amount of power consumption and cumulative power consumption of each board.

### Syntax

```
show power
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 10-11: Results of executing the show power command*

```
> show power
Date 20XX/04/01 00:36:15 UTC
Elapsed time 2 days 15:15
System power used: 397.76 W
Hardware Actual usage    Accumulated
FAN1          5.58 W      0.36 kWh
FAN2          5.43 W      0.37 kWh
FAN3          5.43 W      0.34 kWh
FAN4          5.58 W      0.41 kWh
FAN5          5.58 W      0.56 kWh
FAN6          5.58 W      0.43 kWh
BCU1         121.22 W      7.86 kWh
BCU2          0.00 W      0.00 kWh
SFU1          43.17 W      2.80 kWh
SFU2          0.00 W      0.00 kWh
SFU3          0.00 W      0.00 kWh
SFU4          0.00 W      0.00 kWh
PRU1         193.86 W     12.29 kWh
PRU2          0.00 W      0.00 kWh
PRU3          0.00 W      0.00 kWh
PRU4          0.00 W      0.00 kWh
NIF1          6.33 W      0.19 kWh
NIF2          0.00 W      0.00 kWh
:
:
NIF16         0.00 W      0.00 kWh
>
```

### Display items

*Table 10-27: Information displayed by the show power command*

Item	Displayed information	Displayed detailed information
System power used	Power consumption of the device	Displays the estimated power consumption per device.
Elapsed time	Elapsed time	If the <code>clear power</code> command was not executed, the time elapsed since the device started is displayed. If the <code>clear power</code> command was executed, the time elapsed since the <code>clear power</code> command was executed is displayed. The time is displayed in <i>days hours:minutes</i> .
Hardware	Location	Displays the device and all boards that can be installed on the device.

Item	Displayed information	Displayed detailed information
Actual usage	Power consumption	Displays the estimated power consumption. This is displayed in W. #1#2#3 -: The information cannot be obtained.
Accumulated	Amount of cumulative power consumption	Displays the estimated cumulative power consumption. This is displayed in kWh. #2

#1: This estimated value is different from the actual power consumption. To measure an accurate value, use a measuring instrument.

#2: 0.00 is displayed if the operating status of the board is other than active, standby, or fault.

#3: Use the `show environment` command to check the maximum power required for normal operation of the device (power requirements).

## Impact on communication

None

## Response messages

Table 10-28: List of response messages for the show power command

Message	Description
The command cannot be executed because another user is executing 'clear power' command. Wait a while, and then try again.	Another user is executing the <code>clear power</code> command. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

- The value of cumulative power consumption is cleared when the device is restarted.
- The amount of power consumption and cumulative power consumption for the installation location are cleared at the following times:
  - When the board is removed
  - When the board is restarted
  - When operation of the board is stopped

---

## clear power

---

Clears the elapsed time of the device, and the amount of cumulative power consumption of each board.

### Syntax

```
clear power
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 10-12:* Results of executing the clear power command

```
> clear power
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 10-29:* List of response messages for the clear power command

Message	Description
The command cannot be executed because another user is executing 'show power' command. Wait a while, and then try again.	Another user is executing the <code>show power</code> command. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

1. Even if you use this command to clear the amount of cumulative power consumption, the value of the MIB information obtained by using SNMP is not cleared to zero.

---

## show pru resources

---

Displays the operation status of the PRU and information about resources in use by the PRU.

### Syntax

```
show pru resources [<pru no.>]
```

### Input mode

User mode and administrator mode

### Parameters

<pru no.>

Displays the operation status of the specified PRU and information about resources in use by the specified PRU. For the specifiable range of PRU numbers, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the operation status of all PRUs installed on the Device and information about resources in use by the PRUs.

### Example

*Figure 10-13: Display example when a PRU number is specified*

```
> show pru resources 1
Date 20XX/04/01 12:00:00 UTC
PRU1   :   PRU-1A       active(restart required)
Forwarding Database Management
  Forwarding-table allocation
    Configuration = ipv4-uni
    Current       = default
  Inbound
    IPv4 Unicast resources Used/Max      :          5/      1015808
    IPv4 Multicast resources Used/Max    :          0/         8000
    IPv6 Unicast resources Used/Max      :          3/      425984
    IPv6 Multicast resources Used/Max    :          0/         8000
    Shared resources Used/Max bytes      :          0/     24117248
  Outbound
    Outbound forwarding resources Used/Max :          0/         262144
    Destination resources Used/Max bytes  :          0/     33554432
Flow Database Management
  Flow-table allocation
    Configuration = default
    Current       = default
  Flow detection mode
    Configuration = quantity-oriented
    Current       = quantity-oriented
  Filter resources Used/Max              :        1856/      64000
    MAC                                                  :          239
    IPv4                                                  :        1046
    IPv6                                                  :          571
    Advance                                              :           0
  QoS resources Used/Max                  :        1206/      64000
    MAC                                                  :           18
    IPv4                                                  :         814
    IPv6                                                  :         374
    Advance                                              :           0
  Policer resources
    Inbound Used/Max                                  :        300/      64000
    Outbound Used/Max                                :        300/      64000
>
```

## Display items

Table 10-30: Information displayed by the show pru resources command

Item	Displayed information	Displayed detailed information <sup>#1</sup>
PRU<pru no.>:<pru type> <pru status>	PRU number	--
	PRU type <sup>#2</sup>	- is displayed if the PRU type cannot be identified.
	Operating status of the PRU	active: Operating as an active unit fault: Failed inactive: Operation has been stopped by the inactivate command. notsupport: Operation has been stopped because an unsupported board is installed. power shortage: Operation has been stopped because of a power shortage notconnect: Not installed initialize: Initializing disable: Operation has been stopped by the no power enable configuration command.
	(Update state of the PRU) <sup>#3#4</sup>	(update executing): The HDC is being updated. (restart required): The PRU board needs to be restarted to apply the HDC or change the configuration. (update failed): An attempt to update the HDC failed.
Forwarding Database Management	Routing entry information	--
Forwarding-table allocation	Information about allocation pattern for routing entries on which the PRU is running	--
Configuration = <configuration>	Allocation pattern for routing entries set by a configuration command <sup>#5</sup>	default: Allocation for a mix of all entry types ipv4-uni: Allocation mainly for IPv4 unicast, without multicast and IPv6 ipv6-uni: Allocation mainly for IPv6 unicast, without multicast
Current = <current>	Allocation pattern for routing entries on which the PRU is running <sup>#5</sup>	default: Allocation for a mix of all entry types ipv4-uni: Allocation mainly for IPv4 unicast, without multicast and IPv6 ipv6-uni: Allocation mainly for IPv6 unicast, without multicast
Inbound	Specifications on the inbound side	--

Item	Displayed information	Displayed detailed information <sup>#1</sup>
IPv4 Unicast resources Used/Max	Number of entries in use by the IPv4 unicast route table and maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
IPv4 Multicast resources Used/Max	Number of entries in use by the IPv4 multicast route table and maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
IPv6 Unicast resources Used/Max	Number of entries in use by the IPv6 unicast route table and maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
IPv6 Multicast resources Used/Max	Number of entries in use by the IPv6 multicast route table and maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
Shared resources Used/Max	Used capacity and maximum capacity that can be used in the entry information used for PRU forwarding <sup>#6</sup>	This item is displayed in bytes. <Used>: Used capacity <Max>: Maximum capacity that can be used
Outbound	Specifications on the outbound side	--
Outbound forwarding resources Used/Max	Number of entries in use by the Outbound forwarding resources table and maximum number of entries that can be used <sup>#7</sup>	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
Destination resources Used/Max	Used capacity and maximum capacity that can be used in the destination location information used for PRU forwarding <sup>#6</sup>	This item is displayed in bytes. <Used>: Used capacity <Max>: Maximum capacity that can be used
Flow Database Management	Flow entry information	--
Flow-table allocation	Information about allocation pattern for flow entries	--
Configuration = <configuration>	Allocation pattern for flow entries set by a configuration command <sup>#8</sup>	default: Allocation that focuses equally on filters and QoS flow filter-only: Allocation for filters only qos-only: Allocation for QoS flow only filter: Allocation that focuses on filters qos: Allocation that focuses on QoS flow

Item	Displayed information	Displayed detailed information <sup>#1</sup>
Current = <i>&lt;current&gt;</i>	Allocation pattern for flow entries on which the PRU is running <sup>#8</sup>	default: Allocation that focuses equally on filters and QoS flow filter-only: Allocation for filters only qos-only: Allocation for QoS flow only filter: Allocation that focuses on filters qos: Allocation that focuses on QoS flow
Flow detection mode	Flow detection mode for filters and QoS flow	--
Configuration = <i>&lt;configuration&gt;</i>	Flow detection mode for filters and QoS flow set by a configuration command <sup>#9</sup>	condition-oriented: Mode focused on the number of detection conditions quantity-oriented: Mode focused on the number of entries
Current = <i>&lt;current&gt;</i>	Flow detection mode for filters and QoS flow on which the PRU is running <sup>#9</sup>	condition-oriented: Mode focused on the number of detection conditions quantity-oriented: Mode focused on the number of entries
Filter resources Used/Max	Number of entries for which filter functionality is enabled, and maximum number of entries that can be used	<i>&lt;Used&gt;</i> : Number of entries in use <i>&lt;Max&gt;</i> : Maximum number of entries that can be used
MAC	Number of filter entries for the MAC access list for which filter functionality is enabled	--
IPv4	Number of filter entries for the IPv4 access list for which filter functionality is enabled	--
IPv6	Number of filter entries for the IPv6 access list for which filter functionality is enabled	--
Advance	Number of filter entries for the Advance access list for which filter functionality is enabled	--
QoS resources Used/Max	Number of entries for which QoS functionality is enabled, and maximum number of entries that can be used	<i>&lt;Used&gt;</i> : Number of entries in use <i>&lt;Max&gt;</i> : Maximum number of entries that can be used
MAC	Number of QoS flow entries for the MAC QoS flow list for which QoS functionality is enabled	--
IPv4	Number of QoS flow entries for the IPv4 QoS flow list for which QoS functionality is enabled	--

Item	Displayed information	Displayed detailed information <sup>#1</sup>
IPv6	Number of QoS flow entries for the IPv6 QoS flow list for which QoS functionality is enabled	--
Advance	Number of QoS flow entries for the Advance QoS flow list for which QoS functionality is enabled	--
Policer resources	Number of entries for the Policer	--
Inbound Used/Max	Number of entries for the Policer that is enabled on the inbound side and the maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used
Outbound Used/Max	Number of entries for the Policer that is enabled on the outbound side and the maximum number of entries that can be used	<Used>: Number of entries in use <Max>: Maximum number of entries that can be used

#1: - is displayed if no information can be obtained.

#2: If the PRU status is `notconnect` or an unsupported board is installed, the PRU type cannot be identified.

#3: `(restart required)` is displayed if the PRU board needs to be restarted to apply the allocation pattern set by a configuration to the hardware.

#4: This information is not displayed if the HDC has not been updated or there are no requests for restarting the PRU due to the configuration change.

#5: If the allocation pattern for routing entries on which the PRU is running and the allocation pattern for routing entries set by a configuration command do not match, restart the relevant PRU. When the restart is completed, the allocation pattern for routing entries set by a configuration command is enabled.

#6: The capacity of entries that cannot be used by users (for example, the capacity of entries reserved in the device) is included.

#7: The number of ARP, NDP, IPv4 multicast, and IPv6 multicast entries is included. The number of entries that cannot be used by users (for example, the number of entries reserved in the device) is also included.

#8: If the allocation pattern for flow entries on which the PRU is running and the allocation pattern for flow entries set by a configuration command do not match, restart the relevant PRU. When the restart is completed, the allocation pattern for flow entries set by a configuration command is enabled.

#9: If the flow detection mode on which the PRU is running and the flow detection mode set by a configuration command do not match, restart the relevant PRU. When the restart is complete, the flow detection mode set by a configuration command is enabled.

## Impact on communication

None

## Response messages

Table 10-31: List of response messages for the `show pru resources` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.



Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**Notes**

None

---

## update software (ppupdate)

---

Updates the current software in flash memory with new software, which is downloaded via FTP or a similar method.

### Syntax

```
update software [test] [no-display] [-f] [no-reload] <file name> {active | standby}
```

#: update software can be abbreviated as ppupdate. The specifiable parameters are the same.

### Input mode

Administrator mode

### Parameters

test

Performs a check by simulating command execution. The software is not updated.

Operation when this parameter is omitted:

Updates the software.

no-display

Does not display the message output when the command is executed.

Operation when this parameter is omitted:

Displays the message output when the command is executed.

-f

Forces the processing without displaying confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

no-reload

When the update is complete, the BCU is not automatically restarted. Instead, the BCU starts up with the new software next time the BCU is restarted.

Operation when this parameter is omitted:

When the update is complete, the BCU is automatically restarted.

<file name>

Specifies the update file name.

{active | standby}

Specifies the system in which the software is to be updated.

active

Executes the command in the active BCU.

standby

Executes the command in the standby BCU.

### Example

*Figure 10-14: Updating the software*

```
# update software k.img active
```

```

Current version : Ver. XX.XX
New version    : Ver. XX.XX
Update software
  PRU3
    PRU-CPU      : Ver. XX.XX ( Ver. XX.XX )
  NIF1
    HDC          : Ver. XX.XX ( Ver. XX.XX )
  NIF3
    HDC          : Ver. XX.XX ( Ver. XX.XX )

```

Are you sure you want to update? (y/n):y

```

Software update start.
Executing.....

```

```

  PRU3
    PRU-CPU      : Update done.
  NIF1
    HDC          : Update done.
  NIF3
    HDC          : Update done.
Software is updated.

```

#

## Display items

*Table 10-32:* Information displayed by the update software (ppupdate) command

Item	Display format	Displayed information
Current version	Ver. XX.XX	Version of the installed software
New version	Ver. XX.XX	Version of the software in the update file
Update software <sup>#</sup>	Ver. XX.XX ( Ver. XX.XX )	Version after update The value in parentheses is the installed version.

#: Only the software versions to be updated are displayed.

## Impact on communication

If the `test` parameter or the `no-reload` parameter is not specified, the BCU is automatically restarted after the update finishes. Therefore, in a BCU simplex configuration, communication is temporarily suspended. In a BCU duplex configuration, updating the standby BCU has no effect on communication, but updating the active BCU causes system switching and communication might be temporarily suspended.

## Response messages

*Table 10-33:* List of response messages for the update software (ppupdate) command

Message	Description
An update is not needed because the versions are the same.	An update is not needed because the versions are the same.
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The file could not be opened.	The specified file could not be opened. Specify the correct file name.

Message	Description
The file is invalid.	The contents of the specified file are invalid. Specify a valid file.
The file is not applicable to this system.	The specified file is not applicable to this system. Specify a valid file.
The file system of the standby system does not have enough free capacity.	There is not enough free space on the file system of the standby BCU.
The standby system is not ready.	The standby BCU is not ready.
The update is incomplete. Try again.	An attempt to update the file failed. Try again.
Update failed. Try again.	Updating has failed. Try again.
Update is undergoing now.	The command cannot be executed because an update is being performed.

## Notes

1. When the 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, unsupported configuration commands are not inherited. Therefore, the startup and running configurations become unmatched, and a prompt indicating that the configuration has not been saved is displayed until you save it.
2. If many configurations are set and software is updated, device startup might take some time because the configurations are inherited to the new version.
3. If a device is restarted while a memory card that contains the software image file `k.img` is mounted on the device, the device boots from the memory card. If the device boots from the memory card, the configuration information reverts to the factory defaults and you cannot save your own settings. Do not boot from the memory card under normal circumstances.

---

## backup

---

Saves device information and information about active applications to a memory card or remote FTP server. The device information includes the configuration. This command can be executed in the active system only.

### Syntax

```
backup [-f] {mc | ftp <ftp server> [vrf <vrf id>]} <file name> [no-software]
```

### Input mode

Administrator mode

### Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

{mc | ftp <ftp server> [vrf <vrf id>]}

Specifies the backup destination.

mc

Specifies the memory card as the backup destination.

ftp <ftp server> [vrf <vrf id>]

Specifies the remote FTP server as the backup destination. For <ftp server>, specify the IP address or the host name of the FTP server. If you specify an IPv6 address, you can use an IPv6 global address only. If you specify vrf <vrf id>, you can specify the IP address only, and cannot specify the host name.

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

If vrf <vrf id> is omitted, the global network is connected.

<file name>

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.

Operation when all parameters are omitted:

Outputs a confirmation message, and then backs up data, including software information.

### Example

*Figure 10-15:* Saving the current device information to the MCBBackup.dat file on the memory card

```
> enable
# backup mc MCBakup.dat
Are you sure you want to backup information to MCBakup.dat? (y/n): y
Backup information to MC (MCBakup.dat).
Copy file to MC...
Backup information success!
```

*Figure 10-16: Saving the current device information to the FTPBackup.dat file on the FTP server*

```
> enable
# backup ftp ftpserver FTPBackup.dat
Are you sure you want to backup information to FTPBackup.dat? (y/n): y
Backup information to FTPBackup.dat in FTP(ftpserver).
Input username: guest
Input password:
ftp transfer succeeded.
Backup information success!
```

*Figure 10-17: Specifying the VRF and saving the current device information to the FTPBackup.dat file on the FTP server*

```
> enable
# backup ftp 192.0.2.1 vrf 1 FTPBackup.dat
Are you sure you want to backup information to FTPBackup.dat? (y/n): y
Backup information to FTPBackup.dat in FTP(192.0.2.1) (VRF 1).
Input username: guest
Input password:
ftp transfer succeeded.
Backup information success!
```

*Figure 10-18: Saving the current device information (excluding software information) to the MCBakup.dat file on the memory card*

```
> enable
# backup mc MCBakup.dat no-software
Are you sure you want to backup information to MCBakup.dat? (y/n): y
Backup information to MC (MCBakup.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 10-34: List of response messages for the backup command*

Message	Description
A host name and VRF cannot be specified at the same time.	A host name and VRF cannot be specified at the same time.
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then retry the operation.
The memory card is write-protected by the physical Lock switch.	Make sure the memory card's protect switch is not set to <code>Lock</code> . If the switch is set to <code>Lock</code> , 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.
The memory card was 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.
The specified memory card file name is invalid.	A file with the specified name could not be created on a memory card. Specify another file name.
The specified VRF does not exist. (VRF ID = <code>&lt;vrf id&gt;</code> )	The specified VRF does not exist. <code>&lt;vrf id&gt;</code> : Indicates the VRF ID.
This command can be executed only when the device is booted from the internal flash memory.	This command can be executed only when the device is booted from the internal flash memory.
Transfer of device information failed.	An attempt to transfer the device information by using the <code>backup ftp</code> command failed.
Writing to a memory card file failed. (file = <code>&lt;file name&gt;</code> )	Writing to the memory card failed. <code>&lt;file name&gt;</code> : File name
Writing to the memory card failed.	Writing to the memory card failed. There might not be enough free space on the memory card. Delete unnecessary files and then try again.

When backing up the information to a remote FTP server, the same messages as those for the `ftp` command are displayed. For details about the messages, see *Response messages* for the `ftp` command.

## Notes

1. Make sure that the target memory card or FTP server has about 50 MB of free space.
2. The files under `/usr/home/` are not backed up.
3. The device information saved by this command can be restored to the Device by using the `restore` command.
4. Perform backup and restoration between the same models and configurations.
5. Make sure that other users do not log in while this command is being executed.
6. Do not remove or insert the memory card while the `backup mc` command is backing up data to the memory card.
7. If a file with the same name exists at the copy destination, the file is overwritten.

---

## restore

---

Restores the device information saved to a memory card or remote FTP server to the Device. This command can be executed in the active system only.

### Syntax

```
restore [-f] {mc | ftp <ftp server> [vrf <vrf id>]} <file name> [no-software]
```

### Input mode

Administrator mode

### Parameters

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

{mc | ftp <ftp server> [vrf <vrf id>]}

Specifies the location where the image is stored.

mc

Specifies the memory card as the location where the image is stored.

ftp <ftp server> [vrf <vrf id>]

Specifies the remote FTP server as the location where the image is stored. For <ftp server>, specify the IP address or the host name of the FTP server. If you specify an IPv6 address, you can use an IPv6 global address only. If you specify vrf <vrf id>, you can specify the IP address only, and cannot specify the host name.

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

If vrf <vrf id> is omitted, the global network is connected.

<file name>

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.

Operation when all parameters are omitted:

Outputs a confirmation message, and then restores all the backup data.

### Example

*Figure 10-19:* Restoring the device information from the MCBBackup.dat file saved on the memory card

```
> enable
# restore mc MCBBackup.dat
Are you sure you want to restore information from MCBBackup.dat? (y/n): y
Restore information from MC (MCBackup.dat).
Copy file from MC...
Restore software.
```



*Figure 10-20:* Restoring the device information from the FTPBackup.dat file saved on the FTP server

```
> enable
# restore ftp ftpserver FTPBackup.dat
Are you sure you want to restore information from FTPBackup.dat? (y/n): y
Restore information from FTP(ftpserver) (FTPBackup.dat).
Input username: guest
Input password:
ftp transfer succeeded.
Restore software.
```

*Figure 10-21:* Specifying the VRF and restoring the device information from the FTPBackup.dat file on the FTP server

```
> enable
# restore ftp 192.0.2.1 vrf 1 FTPBackup.dat
Are you sure you want to restore information from FTPBackup.dat? (y/n): y
Restore information from FTP(192.0.2.1) (VRF 1) (FTPBackup.dat).
Input username: guest
Input password:
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.

## Response messages

*Table 10-35:* List of response messages for the restore command

Message	Description
A host name and VRF cannot be specified at the same time.	A host name and VRF cannot be specified at the same time.
The command cannot be executed because another user is performing a restore.	The command cannot be executed because another user is performing a restore.
The command cannot be executed because you are in user mode.	The command cannot be executed because you are in user mode.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The memory card is busy.	Another process is accessing the memory card. Wait a while, and then retry the operation.
The memory card was 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.
The restore operation failed. Free disk space on the device might be insufficient.	An attempt to restore the device information failed. There might not be enough free space on the disk of the Device. Delete unnecessary files and then try again.

Message	Description
The specified file does not exist.	The specified file does not exist.
The specified VRF does not exist. (VRF ID = <i>&lt;vrfid&gt;</i> )	The specified VRF does not exist. <i>&lt;vrfid&gt;</i> : Indicates the VRF ID.
This command can be executed only when the device is booted from the internal flash memory.	This command can be executed only when the device is booted from the internal flash memory.

When restoring the information from a remote FTP server, the same messages as those for the `ftp` command are displayed. For details about the messages, see *Response messages* for the `ftp` command.

## Notes

1. When the device information has been restored, the device restarts automatically. During the restart, communication is temporarily suspended.
2. Make sure that other users do not log in while this command is being executed.
3. Do not remove or insert the memory card while the `restore mc` command is restoring data from the memory card.
4. Perform backup and restoration between the same models and configurations.
5. User accounts that do not exist in the copy source configuration are deleted after the device restarts. Save the necessary files in `/usr/home/share` or back up them to an external medium because the home directory of the deleted users are also deleted.
6. Do not update the startup configuration while this command is being executed.

## Chapter

---

# 11. SFU/PRU/NIF Management

---

```
show nif
clear counters nif
activate sfu
inactivate sfu
activate pru
inactivate pru
activate nif
inactivate nif
```

---

## show nif

---

Displays 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 Device are the target for the command.

### Example

*Figure 11-1: Result of executing the command with the NIF number specified*

```
>show nif 1
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 12-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
      :
      :
      :
>
```

### Display Items

*Table 11-1: Displayed NIF information*

Item	Displayed information	Displayed detailed information
NIF	NIF number	

Item	Displayed information	Displayed detailed information
NIF status <sup>#1</sup>	active	Operating as an active unit
	initialize	Currently initializing
	fault	Failed
	inactive	<ul style="list-style-type: none"> <li>Operation has been stopped by the <code>inactivate</code> command.</li> <li>The NIF is not running.</li> </ul>
	notconnect	<ul style="list-style-type: none"> <li>Not installed</li> <li>Not used (If a single-size NIF is installed, the NIF number to which 2 is added is displayed like this).</li> </ul>
	disable	Operation has been stopped by the <code>no power enable</code> configuration command.
	power shortage	Operation has been stopped because of a power shortage.
	notsupport	Operation has been stopped because an unsupported NIF is installed.
(Update state of the NIF) <sup>#2</sup>	update executing	HDC is being updated.
	restart required	The NIF needs to be restarted to apply the HDC.
	update failed	An attempt to update the HDC failed. Replace the NIF because it might have failed.
NIF type	12-port 10BASE-T/100BASE-TX/1000BASE-T	12 10BASE-T, 100BASE-TX, or 1000BASE-T lines
	12-port 1000BASE-X(SFP)	12 1000BASE-X (SFP) lines
	6-port 10GBASE-R(SFP+)	Six 10GBASE-R (SFP+) lines
	1-port 100GBASE-R(CFP)	One 100GBASE-R (CFP) line
	-	The NIF type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>No NIFs are installed.</li> <li>An unsupported NIF is installed.</li> </ul>
retry	Number of times the NIF restarted due to a failure <sup>#3</sup>	
Average	Displays the average bandwidth 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 less than 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	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time ( <i>hour:minute:second</i> ). 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 less than 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: - is displayed if no information can be obtained.

#2: This information is not displayed if the update has not been performed.

#3: The number of times the NIF restarted due to a failure is initialized once every hour.

Table 11-2: Displayed port information

Item	Displayed information	Displayed detailed information
Port	Port number	
Port status	active up	Active (normal operating state)
	active down	Active (A line failure occurred.)
	initialize	Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating).
	fault	Failed
	inactive	Operation has been stopped by the <code>inactivate</code> command.
	disable	Operation has been stopped by using the <code>shutdown</code> configuration command.
	standby	Operation is in a standby state because of the standby link functionality of link aggregation.
	suspend	Port startup is suppressed due to the following reasons: <ul style="list-style-type: none"> <li>The number of operating SFUs is insufficient.</li> <li>The PRU is being initialized.</li> </ul>
	unused	unused (no configuration)
	mismatch	The installed NIF and the configuration do not match.
Line type	For details about line types, see <code>&lt;line type&gt;</code> in the <code>Display item</code> column of the tables in each <code>show interfaces</code> command.	
MAC address	MAC address of the line	
Type of transceiver <sup>#</sup>	SFP	SFP
	SFP+	SFP+
	CFP	CFP
Status of the transceiver <sup>#</sup>	connect	Implemented
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>The port status is <code>suspend</code>.</li> <li>The port status is <code>initialize</code>.</li> <li>The port status is <code>fault</code>.</li> </ul>
Bandwidth	Displays the bandwidth of the line in kbps. If the <code>bandwidth</code> configuration command is not set, the line speed of the port is displayed. If the <code>bandwidth</code> configuration command is set, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	

Item	Displayed information	Displayed detailed information
Average out	Displays the average bandwidth 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 less than 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	Displays the average bandwidth 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 less than 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	Displays the contents of the <code>description</code> configuration. The <code>description</code> configuration can be used to set comments, such as a comment about the purpose of the line. This item is not displayed if the <code>description</code> 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 11-3: List of response messages for the show nif command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the 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 Device are the target for the command.

### Example

None

### Display items

None

### Impact on communication

None

### Response messages

Table 11-4: List of response messages for the clear counters nif command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the 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.



3. All display items are cleared in the following cases:
- When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status

## activate sfu

Returns the status of the SFU (made inactive by the `inactivate sfu` command) from the inactive to the active status.

### Syntax

```
activate sfu <sfu no.>
```

### Input mode

User mode and administrator mode

### Parameters

<sfu no.>

Specifies the number of the SFU to be returned to the `active` status. For the specifiable range of values for the SFU number, see *Specifiable values for parameters*.

### Example

*Figure 11-2: Returning the status of the SFU whose SFU number is 1 to the active status*

```
> activate sfu 1
```

### Display items

None

### Impact on communication

Communication using the relevant SFU resumes.

### Response messages

*Table 11-5: List of response messages for the activate sfu command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The SFU number is invalid. (SFU number = <sfu no.>)	The SFU number is outside the valid range. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.
The specified SFU failed. (SFU = <sfu no.>)	The specified SFU has failed. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.
The specified SFU is already active. (SFU = <sfu no.>)	The specified SFU is already <code>active</code> . The command does not need to be executed if you correctly specified the SFU. <sfu no.>: Indicates the SFU number.
The specified SFU is already being initialized. (SFU = <sfu no.>)	The specified SFU is already being initialized. The command does not need to be executed if you correctly specified the SFU. <sfu no.>: Indicates the SFU number.
The specified SFU is disabled. (SFU = <sfu no.>)	The specified SFU is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.

Message	Description
The specified SFU is not connected. (SFU = < <i>sfu no.</i> >)	The specified SFU is not installed or not used. Make sure the specified parameter is correct. < <i>sfu no.</i> >: Indicates the SFU number.
The specified SFU is not supported. (SFU = < <i>sfu no.</i> >)	The specified SFU is not supported. Make sure the specified parameter is correct. < <i>sfu no.</i> >: Indicates the SFU number.

## Notes

None

## inactivate sfu

Changes the status of an SFU from the `active` to the `inactive` status. This setting also turns off the power supplied to the SFU.

### Syntax

```
inactivate [-f] sfu <sfu no.>
```

### 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.

<sfu no.>

Specifies the number of the SFU to be changed to the `inactive` status. For the specifiable range of values for the SFU number, see *Specifiable values for parameters*.

### Example

1. In this example, the command changes the SFU board whose SFU number is 1 to the `inactive` status.  

```
> inactivate sfu 1
```
2. A confirmation message appears.  

```
Do you want to inactivate sfu 1? (y/n):
```

If `y` is entered, the SFU whose SFU number is 1 is changed to the `inactive` status.

### Display items

None

### Impact on communication

Communication using the relevant SFU becomes unavailable.

### Response messages

Table 11-6: List of response messages for the `inactivate sfu` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The SFU number is invalid. (SFU number = <sfu no.>)	The SFU number is outside the valid range. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.
The specified SFU is already inactive. (SFU = <sfu no.>)	The specified SFU is already <code>inactive</code> . The command does not need to be executed if you correctly specified the SFU. <sfu no.>: Indicates the SFU number.

Message	Description
The specified SFU is disabled. (SFU = <sfu no.>)	The specified SFU is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.
The specified SFU is not connected. (SFU = <sfu no.>)	The specified SFU is not installed or is not used. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.
The specified SFU is not supported. (SFU = <sfu no.>)	The specified SFU is not supported. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.

## Notes

None

## activate pru

Returns the status of the PRU (made inactive by the `inactivate pru` command) from the inactive to the active status.

### Syntax

```
activate pru <pru no.>
```

### Input mode

User mode and administrator mode

### Parameters

<pru no.>

Specifies the number of the PRU to be returned to `active` status. For the specifiable range of values for the PRU number, see *Specifiable values for parameters*.

### Example

*Figure 11-3:* Returning the status of the PRU whose PRU number is 1 to the active status

```
> activate pru 1
```

### Display items

None

### Impact on communication

Communication using the relevant PRU resumes.

### Response messages

*Table 11-7:* List of response messages for the `activate pru` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The PRU number is invalid. (PRU number = <pru no.>)	The PRU number is outside the valid range. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
The specified PRU failed. (PRU = <pru no.>)	The specified PRU has failed. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
The specified PRU is already active. (PRU = <pru no.>)	The specified PRU is already <code>active</code> . The command does not need to be executed if you correctly specified the PRU. <pru no.>: Indicates the PRU number.
The specified PRU is already being initialized. (PRU = <pru no.>)	The specified PRU is already being initialized. The command does not need to be executed if you correctly specified the PRU. <pru no.>: Indicates the PRU number.
The specified PRU is disabled. (PRU = <pru no.>)	The specified PRU is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.

Message	Description
The specified PRU is not connected. (PRU = < <i>pru no.</i> >)	The specified PRU is not installed or is not used. Make sure the specified parameter is correct. < <i>pru no.</i> >: Indicates the PRU number.
The specified PRU is not supported. (PRU = < <i>pru no.</i> >)	The specified PRU is not supported. Make sure the specified parameter is correct. < <i>pru no.</i> >: Indicates the PRU number.

## Notes

None

## inactivate pru

Changes the status of a PRU from the `active` to the `inactive` status. This setting also turns off the power supplied to the PRU.

### Syntax

```
inactivate [-f] pru <pru no.>
```

### 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.

<pru no.>

Specifies the number of the PRU to be changed to the `inactive` status. For the specifiable range of values for the PRU number, see *Specifiable values for parameters*.

### Example

1. In this example, the command changes the PRU board whose PRU number is 1 to the `inactive` status.  

```
> inactivate pru 1
```
2. A confirmation message appears.  

```
Do you want to inactivate pru 1? (y/n):
```

If `y` is entered, the PRU whose PRU number is 1 is changed to the `inactive` status.

### Display items

None

### Impact on communication

Communication using the relevant PRU becomes unavailable.

### Response messages

Table 11-8: List of response messages for the `inactivate pru` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The PRU number is invalid. (PRU number = <pru no.>)	The PRU number is outside the valid range. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
The specified PRU is already inactive. (PRU = <pru no.>)	The specified PRU is already <code>inactive</code> . The command does not need to be executed if you correctly specified the PRU. <pru no.>: Indicates the PRU number.



Message	Description
The specified PRU is disabled. (PRU = <pru no.>)	The specified PRU is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
The specified PRU is not connected. (PRU = <pru no.>)	The specified PRU is not installed or is not used. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
The specified PRU is not supported. (PRU = <pru no.>)	The specified PRU is not supported. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.
There is not enough power supply for the specified PRU.(PRU = <pru no.>)	There is not enough power supply for the specified PRU. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.

## Notes

None

## activate nif

Returns the status of the NIF (made inactive by the `inactivate nif` command) from the `inactive` to the `active` status.

### Syntax

```
activate nif <nif no.>
```

### Input mode

User mode and administrator mode

### Parameters

<nif no.>

Specifies the number of the NIF to be returned to the `active` status. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

### Example

*Figure 11-4:* Returning the status of the NIF whose NIF number is 1 to the active status

```
> activate nif 1
```

### Display items

None

### Impact on communication

Communication using the relevant NIF resumes.

### Response messages

*Table 11-9:* List of response messages for the `activate nif` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The PRU that controls the specified NIF is not active. (NIF = <nif no.>)	The PRU that controls the specified NIF is not <code>active</code> . Change the status of the PRU to <code>active</code> . <nif no.>: Indicates the NIF number.
The specified NIF failed. (NIF = <nif no.>)	The specified NIF has failed. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified NIF is already active. (NIF = <nif no.>)	The specified NIF is already <code>active</code> . The command does not need to be executed if you correctly specified the NIF. <nif no.>: Indicates the NIF number.
The specified NIF is already being initialized. (NIF = <nif no.>)	The specified NIF is already being initialized. The command does not need to be executed if you correctly specified the NIF. <nif no.>: Indicates the NIF number.

Message	Description
The specified NIF is disabled. (NIF = <nif no.>)	The specified NIF is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified NIF is not connected. (NIF = <nif no.>)	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified NIF is not supported. (NIF = <nif no.>)	The specified NIF is not supported. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.

## Notes

1. If the status of the NIF is returned from the `inactive` to the `active` status, the status of the ports on the NIF is also changed to `active`.

## inactivate nif

Changes the status of a NIF from the `active` to the `inactive` status. This setting also turns off the power supplied to the NIF.

### Syntax

```
inactivate [-f] nif <nif no.>
```

### 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.

<nif no.>

Specifies the number of the NIF to be changed to the `inactive` status. For the specifiable range of values for the NIF number, see *Specifiable values for parameters*.

### Example

1. In this example, the command changes the NIF board whose NIF number is 1 to the `inactive` status.  

```
> inactivate nif 1
```
2. A confirmation message appears.  

```
Do you want to inactivate nif 1? (y/n):
```

If `y` is entered, the NIF whose NIF number is 1 is changed to the `inactive` status.

### Display items

None

### Impact on communication

Communication using the relevant NIF becomes unavailable.

### Response messages

Table 11-10: List of response messages for the `inactivate nif` command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The PRU that controls the specified NIF is not active. (NIF = <nif no.>)	The PRU that controls the specified NIF is not active. Change the status of the PRU to <code>active</code> . <nif no.>: Indicates the NIF number.

Message	Description
The specified NIF is already inactive. (NIF = <nif no.>)	The specified NIF is already <i>inactive</i> . The command does not need to be executed if you correctly specified the NIF. <nif no.>: Indicates the NIF number.
The specified NIF is disabled. (NIF = <nif no.>)	The specified NIF is in <i>disable</i> status due to the configuration. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified NIF is not connected. (NIF = <nif no.>)	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified NIF is not supported. (NIF = <nif no.>)	The specified NIF is not supported. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
There is not enough power supply for the specified NIF.(NIF = <nif no.>)	There is not enough power supply for the specified NIF. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.

## Notes

1. If the device is restarted after the execution of this command, the *inactive* status is canceled.
2. After this command changes a NIF to the *inactive* status, you can use the *activate* command to return the status to the *active* status.
3. If the status of a NIF is changed to *inactive*, the status of the ports on the NIF is also changed to *inactive*.



## Chapter

---

# 12. Checking Internal Memory and Memory Cards

---

```
show mc  
format mc  
show flash
```

show mc

Displays the memory card usage.

Syntax

show mc

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 12-1: Displaying the memory card usage

```
> show mc
Date 20XX/04/01 07:20:11 UTC
BCU1 MC: enabled
CID: 00c7000910d06b224734304653415001
used:      189,792KB
free:      3,680,928KB
total:     3,870,720KB
BCU2 MC: -----
>
```

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. -----: Unknown <sup>#1</sup>
	CID	CID information of the memory card <sup>#2</sup>	--
	used	Used capacity <sup>#2</sup>	Capacity in use in the memory card file system
	free	Unused capacity <sup>#2</sup>	Capacity not in use in the memory card file system
	total	Total capacity <sup>#2</sup>	Total of capacity in use and capacity not in use for the memory card file system

#1: Check the implementation status of the memory card, and then re-execute the command.

#2: These 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
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. This command shows both the used and the unused capacity for the file system on the memory card.

---

## format mc

---

Formats the memory card for use by the Device.

### 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

*Figure 12-2: Formatting the memory card*

```
> format mc
The MC will be initialized. Do you want to continue? (y/n):y
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 12-3: List of response messages for the format mc command*

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The MC is not installed, or an attempt to access it failed.	The memory card is not installed, or an attempt to access the memory card failed.
The MC is write protected. Change the MC to write-enabled mode, and then try again.	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 try again.

### Notes

1. Executing this command deletes all the data on the memory card.

## show flash

Displays internal flash memory usage.

### Syntax

```
show flash
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 12-3: Displaying the internal flash memory usage*

```
> show flash
Date 20XX/04/01 07:09:21 UTC
BCU1 Flash: enabled
  area          used          free          total
  user          185,394KB      2,832,550KB      3,017,944KB
  config        1,682KB       1,601,538KB       1,603,220KB
  dump0         2,816KB       326,416KB         329,232KB
  dump1         998KB         1,064,674KB       1,065,672KB
  log           11KB          137,207KB         137,218KB
  total         190,901KB      5,962,385KB       6,153,286KB
BCU2 Flash: enabled
  area          used          free          total
  user          185,394KB      2,832,550KB      3,017,944KB
  config        1,682KB       1,601,538KB       1,603,220KB
  dump0         2,816KB       326,416KB         329,232KB
  dump1         998KB         1,064,674KB       1,065,672KB
  log           11KB          137,207KB         137,218KB
  total         190,901KB      5,962,385KB       6,153,286KB
>
```

### Display items

*Table 12-4: Information displayed by the show flash command*

Item		Displayed information	Displayed detailed information
Flash	--	Internal flash memory status	enabled: Accessible notconnect: The BCU is not installed. -----: Unknown <sup>#1</sup>
	area	Internal flash memory area <sup>#2</sup>	user: User area config: Configuration area dump0: BCU OS dump area dump1: Application dump area log: Log area total: Total of the above areas
	used	Used capacity <sup>#2#3#4</sup>	Capacity in use for the file system in the area specified by area
	free	Used capacity <sup>#2#3#4</sup>	Capacity not in use for the file system in the area specified by area
	total	Total capacity <sup>#2#3#4</sup>	Total of capacity in use and capacity not in use for the file system in the area specified by area

#1: Information about the internal flash memory cannot be obtained. Check the status of the relevant BCU, and then re-execute the command. This is also indicated when the memory card starts up.

#2: These items are displayed when the internal flash memory status is `enabled`.

#3: If used capacity exceeds 95 percent of the total capacity, unused capacity might be displayed as a negative value. If this happens, delete user files so as to free up enough unused capacity.

#4: - is displayed if no information can be obtained.

### Impact on communication

None

### Response messages

*Table 12-5: List of response messages for the show flash command*

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

None

## Chapter

---

# 13. Resource Information

---

show cpu  
show processes  
show memory  
df  
du

---

## show cpu

---

Displays CPU usage.

### Syntax

```
show cpu {bcu | pa | pru [<pru no.>]} [<period>] [<period>] [<period>] [<period>]
[detail]
```

### Input mode

User mode and administrator mode

### Parameters

{bcu | pa | pru [<pru no.>]}

bcu

Displays the CPU usage of the BCU-CPU.

pa

Displays the CPU usage of the PA.

pru [<pru no.>]

Displays the CPU usage of the PRU-CPU.

If <pru no.> is specified, the CPU usage for the specified PRU number is displayed. For the specifiable range of values for the PRU number, see *Specifiable values for parameters*.

If <pru no.> is omitted, the CPU usage for all PRUs is displayed.

<period>

Displays statistics for the specified unit of time. A maximum of four units can be specified. However, the same parameter can be specified only once.

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.

seconds

Displays statistics collected by the second. Statistics for the past 60 seconds are displayed.

Operation when each 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. However, if you omit all of the parameters, statistics for all the units are displayed.

detail

Displays statistics for each CPU core.

Operation when this parameter is omitted:

Displays statistics for a single CPU by handling all CPU cores as one CPU.

## Example

*Figure 13-1: Displaying the CPU usage for the BCU-CPU per day*

```
> show cpu bcu days
Date 20XX/04/01 00:34:12 UTC
CPU: BCU-CPU
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59    15
20XX/03/30    00:00:00-23:59:59    18
20XX/03/31    00:00:00-23:59:59    18
>
```

*Figure 13-2: Displaying the CPU usage for each BCU-CPU core per day*

```
> show cpu bcu days detail
Date 20XX/04/01 00:34:42 UTC
BCU-CPU[0]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59    42
20XX/03/30    00:00:00-23:59:59    46
20XX/03/31    00:00:00-23:59:59    52

BCU-CPU[1]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59     0
20XX/03/30    00:00:00-23:59:59     0
20XX/03/31    00:00:00-23:59:59     0

BCU-CPU[2]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59     0
20XX/03/30    00:00:00-23:59:59     0
20XX/03/31    00:00:00-23:59:59     0

BCU-CPU[3]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59     0
20XX/03/30    00:00:00-23:59:59     0
20XX/03/31    00:00:00-23:59:59     0

BCU-CPU[4]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59     0
20XX/03/30    00:00:00-23:59:59     0
20XX/03/31    00:00:00-23:59:59     3

BCU-CPU[5]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59    68
20XX/03/30    00:00:00-23:59:59    74
20XX/03/31    00:00:00-23:59:59     0

BCU-CPU[6]
*** day ***
date          time          CPU average
20XX/03/29    09:20:18-23:59:59     0
```

```

20XX/03/30  00:00:00-23:59:59    25
20XX/03/31  00:00:00-23:59:59    95

BCU-CPU[7]
*** day ***
date        time                CPU average
20XX/03/29  09:20:18-23:59:59    16
20XX/03/30  00:00:00-23:59:59     0
20XX/03/31  00:00:00-23:59:59     0
>

```

## Display items

*Table 13-1:* Information displayed by the show cpu command

Item	Displayed information
date time	Time range during which average CPU usage was calculated <sup>#</sup>
CPU average	Average CPU usage

<sup>#</sup>: This item is displayed in the time zone used when the line is output.

## Impact on communication

None

## Response messages

*Table 13-2:* List of response messages for the show cpu command

Message	Description
The command cannot be executed because the specified PRU is not active.	The command cannot be executed because the specified PRU is not active.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified PRU number is invalid. (PRU number = <pru no.>)	The specified PRU number is invalid. Make sure the specified parameter is correct, and then try again. <pru no.>: Indicates the PRU number.

## Notes

1. If the time of the device varies more than five seconds, the CPU usage data collected up to that time is discarded.



---

## show processes

---

Displays information about processes being executed by the device.

### Syntax

```
show processes memory {bcu | pa | pru [<pru no.>]}
show processes cpu {bcu | pa | pru [<pru no.>]}
```

### Input mode

User mode and administrator mode

### Parameters

memory

Displays the memory usage of processes being executed by the device.

cpu

Displays the CPU usage of processes being executed by the device.

{bcu | pa | pru [<pru no.>]}

bcu

Displays information about processes being executed by the BCU-CPU.

pa

Displays information about processes being executed by the PA.

pru [<pru no.>]

Displays information about processes being executed by the PRU-CPU.

If <pru no.> is specified, information about processes for the specified PRU number is displayed. For the specifiable range of values for the PRU number, see *Specifiable values for parameters*.

If <pru no.> is omitted, information about processes for all PRUs is displayed.

### Example

*Figure 13-3: Displaying the memory usage of BCU-CPU processes*

```
> show processes memory bcu
Date 20XX/01/01 12:00:00 UTC
PID From                               Text Static Alloc Stack Real Process
875 console                           3828   304  1056   44  2292 cli
949 ??                                172   144  1056   16  1012 flowinfod
996 console                           124    24  1056   16   992 sh
1457 console                           16     4  1056   20   824 process
```

*Figure 13-4: Displaying the memory usage of PA processes*

```
> show processes memory pa
Date 20XX/01/01 12:00:00 UTC
PID      VSZ    %MEM  CPU  Process
967      30640   5.9   0    [paaed]
969      30444   5.9   0    [pacomd]
972      22188   4.3   1    [paassistd]
977      13916   2.7   0    [pasysprcd]
```

*Figure 13-5: Displaying the memory usage of PRU-CPU processes*

```
> show processes memory pru
```

```

Date 20XX/01/01 12:00:00 UTC
PRU : 1
  PID          VSZ    %MEM  CPU  Process
1095          218972    5.8    0  /usr/local/ppuapl/ppuifd
1098          434640   11.5    0  /usr/local/ppuapl/ppuhwd
1101           4288    0.1    0  /usr/local/ppuapl/swupd
1104           4252    0.1    0  /usr/local/ppuapl/dmpd

```

*Figure 13-6: Displaying the CPU usage of BCU-CPU processes*

```

> show processes cpu bcu
Date 20XX/01/01 12:00:00 UTC
  PID  LWP  CPU   5Sec   1Min   5Min  Runtime(ms)  Process(lwp)
  0     1   0     3%     2%     0%           1 system(swapper)
  0     2   0     0%     0%     0%           0 system(idle/0)
  0     3   0     0%     0%     0%           0 system(softnet/0)
  0     4   0     0%     0%     0%           0 system(softbio/0)

```

*Figure 13-7: Displaying the CPU usage of PA processes*

```

> show processes cpu pa
Date 20XX/01/01 12:00:00 UTC
  PID      %CPU   CPU  Process
  1         0.0%   1  [init]
  2         0.0%   0  [kthreadd]
  3         2.0%   0  [migration/0]
  4         0.0%   0  [ksoftirqd/0]

```

*Figure 13-8: Displaying the CPU usage of PRU-CPU processes*

```

> show processes cpu pru
Date 20XX/01/01 12:00:00 UTC
PRU : 1
  PID      %CPU   CPU  Process
  1         0.0%   1  init
  2         2.0%   0  [kthreadd]
  3         0.0%   0  [migration/0]
  4         0.0%   0  [ksoftirqd/0]

```

## Display items

*Table 13-3: Information displayed by the show processes command*

Item	Displayed information	Displayed detailed information
PRU	PRU number	--
PID	Process number	Displays the process management number for each process.
From	Input terminal	console: Management terminal connected to the serial port on the device IP address: IP address of a remotely connected terminal -: No terminal associated with this process
Text	Text size	Displays the text size of each running process in KB.
Static	Static data size	Displays the size of static data area for each running process in KB.
Alloc	Dynamic data size	Displays the size of dynamic data area for each running process in KB.
Stack	Stack size	Displays the amount of stack usage for each running process in KB.
Real	Real memory usage amount	Displays the size of real memory usage for each running process in KB.

Item	Displayed information	Displayed detailed information
Process	Function name	Displays the function name of each running process.
VSZ	Virtual memory usage amount	Displays the size of virtual memory usage for each running process in KB.
%MEM	Real memory usage rate	Displays the real memory usage for each running process in percentages.
CPU	Core number	Displays the core number on which each running process is running
5Sec	CPU usage for the past five seconds	Displays the CPU usage of each running process for the past five seconds in percentages.
1Min	CPU usage for the past minute	Displays the CPU usage of each running process for the past minute in percentages.
5Min	CPU usage for the past five minute	Displays the CPU usage of each running process for the past five minutes in percentages.
Runtime	Actual run time of CPU	Displays actual CPU run time for each running process in milliseconds.
%CPU	CPU utilization	Displays the CPU usage of each running process in percentages.

### Impact on communication

None

### Response messages

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

Message	Description
The command cannot be executed because the specified PRU is not active.	The command cannot be executed because the specified PRU is not active.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified PRU number is invalid. (PRU number = <pru no.>)	The specified PRU number is invalid. Make sure the specified parameter is correct, and then try again. <pru no.>: Indicates the PRU number.

### Notes

None

---

## show memory

---

Displays the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the device.

### Syntax

```
show memory {bcu | pa | pru [<pru no.>]}
```

### Input mode

User mode and administrator mode

### Parameters

```
{bcu | pa | pru [<pru no.>]}
```

bcu

Displays the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the BCU-CPU.

pa

Displays the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the PA.

pru [<pru no.>]

Displays the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the PRU-CPU.

If <pru no.> is specified, the amount of physical memory, the amount of used memory, and the amount of available (free) memory for the specified PRU number are displayed. For the specifiable range of values for the PRU number, see *Specifiable values for parameters*.

If <pru no.> is specified, the amount of physical memory, the amount of used memory, and the amount of available (free) memory for all PRUs are displayed.

### Example

*Figure 13-9: Displaying the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the BCU-CPU*

```
> show memory bcu
Date 20XX/01/01 12:00:00 UTC
physical memory = 16,777,216KB (16,384MB)
used      memory =  5,001,876KB ( 4,884MB)
free      memory = 11,775,340KB (11,499MB)
```

*Figure 13-10: Displaying the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the PA*

```
> show memory pa
Date 20XX/01/01 12:00:00 UTC
physical memory =  2,097,152KB ( 2,048MB)
used      memory =  1,611,208KB ( 1,573MB)
free      memory =   485,944KB (  474MB)
```

*Figure 13-11: Displaying the amount of physical memory, the amount of used memory, and the amount of available (free) memory of the PRU-CPU*

```
> show memory pru
Date 20XX/01/01 12:00:00 UTC
PRU : 1
```

```

physical memory = 4,194,304KB ( 4,096MB)
used      memory =   709,408KB (   692MB)
free      memory = 3,484,896KB ( 3,403MB)

```

## Display items

*Table 13-5:* Information displayed by the show memory command

Item	Displayed information
PRU	Displays the PRU number.
physical memory	Displays the amount of physical memory in KB.
used memory	Displays the amount of used memory in KB.
free memory	Displays the amount of available (free) memory in KB.

## Impact on communication

None

## Response messages

*Table 13-6:* List of response messages for the show memory command

Message	Description
The command cannot be executed because the specified PRU is not active.	The command cannot be executed because the specified PRU is not active.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified PRU number is invalid. (PRU number = <pru no.>)	The specified PRU number is invalid. Make sure the specified parameter is correct, and then try again. <pru no.>: Indicates the PRU number.

## Notes

None

df

Displays the available space of the internal flash memory.

Syntax

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

Input mode

User mode and administrator mode

Parameters

<option>

-t: Specifies the type of file system.

Operation when this parameter is omitted:

Displays all types of file systems.

<file name>

Displays the file system in which the specified file or directory exists.

Operation when this parameter is omitted:

Displays file systems in the device.

Operation when all parameters are omitted:

Displays all types of file systems in the device.

Example

Figure 13-12: Displaying all types of file systems in the device

```
> df
Filesystem 1K-blocks    Used   Avail Capacity  Mounted on
/dev/md0a      83531   67442   16089     80%    /
/dev/md1a      3807     694    2922     19%    /var
/dev/fld1h    96207   85441   5955     93%    /mc0
/dev/fld1e   18888    100   18788      0%    /dump0
/dev/fld0a   17775     167   16719      0%    /config
standbyfs:0         1         1         0   100%    /standby
>
```

Display items

Table 13-7: Information displayed by the df command

Item	Displayed information
Filesystem	Displays the file system name.
1K-blocks	Displays the space per KB.
Used	Displays the used space.
Avail	Displays the free space.
Capacity	Displays the usage of allocated space.
Mounted on	Displays the mounting destination.

Impact on communication

None

## Response messages

*Table 13-8:* List of response messages for the df command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

None

---

**du**

---

Displays 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 the specified file or directory.

**Example**

None

**Display items**

None

**Impact on communication**

None

**Response messages**

*Table 13-9:* List of response messages for the du command

Message	Description
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

**Notes**

None



## Chapter

---

# 14. Dump Information

---

dump pa  
dump sfu  
dump pru  
dump nif  
erase dumpfile  
show dumpfile

---

## dump pa

---

Collects memory dump information for PA.

The collected memory dump file is stored with the file name `pa01.cmd` (if the collection is performed in BCU1) or `pa02.cmd` (if the collection is performed in BCU2) on a disk in the system where the command was executed. For details about how to collect the information, see the *Troubleshooting Guide*.

### Syntax

```
dump [-f] pa [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.

`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 a tilde (~) at the beginning or use an absolute path. The number of characters for specifying a tilde is calculated by adding the number of characters obtained by replacing the tilde part with an absolute path to the number of characters of the directory path below the tilde.

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

In this example, the command collects a PA memory dump in the internal memory of the device.

```
>dump pa
Are you sure you want to delete old dump file(pa01.cmd)? (y/n):y
The dump-collection command was accepted.
>
```

1. If the same PA memory dump file already exists in the specified directory, the following message is displayed:  
Are you sure you want to delete old dump file(pa01.cmd)? (y/n):
2. If `y` is entered, the existing memory dump is deleted. When the collection processing of the PA memory dump is accepted, the execution result is displayed.  
The dump-collection command was accepted.
3. When the collection of the memory dump is complete, the message `The PA online dump command was executed.` is displayed in the system where the memory dump was collected.

The collected memory dump file is stored with the file name `pa01.cmd` (if the collection is performed in BCU1) or `pa02.cmd` (if the collection is performed in BCU2) on a disk in the system where the command was executed.

## Display items

None

## Impact on communication

None

## Response messages

*Table 14-1:* List of response messages for the dump pa command

Message	Description
Permission is required to access a specified directory. (directory = <i>&lt;directory&gt;</i> )	You do not have access permission for the specified directory. Change the specified directory. <i>&lt;directory&gt;</i> Directory name
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dump command failed because dump processing is in progress on the PA. Wait a while, and then try again.	The PA is collecting a dump. Wait a while, and then retry the operation.
The dump command failed. The amount of free disk space on the device might be insufficient. Delete unnecessary files, and then try again.	There might not be enough free space on the disk of the Device. Delete unnecessary files and then try again.
The dump-collection command was accepted.	The dump collection was accepted normally.
The specified directory does not exist. (directory = <i>&lt;directory&gt;</i> )	The specified directory does not exist. Specify the correct directory name. <i>&lt;directory&gt;</i> Directory name
The specified path is invalid. The path must be under the user home directory. (path = <i>&lt;directory&gt;</i> , user home directory = <i>&lt;user home directory&gt;</i> )	The specified path is invalid. Specify a path under the home directory. <i>&lt;directory&gt;</i> Directory name <i>&lt;user home directory&gt;</i> User home directory name
The specified path is too long.	The length of the specified path exceeds 280 characters. Shorten the specified path.

## Notes

None

---

## dump sfu

---

Collects a memory dump of the SFU.

The collected memory dump file is stored on the disk of the active BCU, with the file name `sfu**.cmd`. The specified SFU number is displayed in `**`. For details about how to collect the information, see the *Troubleshooting Guide*.

Note that you can collect a maximum total of 10 memory dumps for SFU, PRU, and NIF.

### Syntax

```
dump [-f] [-r] sfu <sfu 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 SFU and collects a memory dump. Note that if the command is executed in a state where the operating status of SFU is other than `active`, a memory dump is collected without restarting the SFU.

Operation when this parameter is omitted:

Collects a memory dump without a restart.

`<sfu no.>`

Specify the number of the SFU whose memory dump is to be collected. For the specifiable range of values for the SFU 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 a tilde (`~`) at the beginning or use an absolute path. The number of characters for specifying a tilde is calculated by adding the number of characters obtained by replacing the tilde part with an absolute path to the number of characters of the directory path below the tilde.

Operation when this parameter is omitted:

The memory dump file is stored in `/usr/var/hardware` in the active BCU.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

### Example

In this example, the command collects a memory dump of the SFU whose SFU number is 1 in the internal memory of the device.

```
>dump -r sfu 1
Are you sure you want to restart sfu 1? (y/n):y
Are you sure you want to delete old dump file(sfu01.cmd)? (y/n):y
The dump-collection command was accepted.
```

&gt;

1. An SFU dump confirmation message is displayed.  
Are you sure you want to restart sfu 1? (y/n) :
2. If y is entered, the memory dump of SFU is collected. If the same SFU memory dump file already exists in the specified directory, the following message is displayed:  
Are you sure you want to delete old dump file(sfu01.cmd)? (y/n) :
3. If y is entered, the existing memory dump is deleted. When the collection processing of the SFU memory dump is accepted, the execution result is displayed.  
The dump-collection command was accepted.
4. When the collection of the memory dump is complete, the message The SFU offline dump command was executed. is displayed in the system where the memory dump was collected. The collected memory dump file is stored on the disk of the active BCU with the file name sfu0\*.cmd. The specified SFU number is displayed in \*.

## Display items

None

## Impact on communication

While a dump is being collected with a restart parameter specified, communication via the SFU cannot be performed.

## Response messages

Table 14-2: List of response messages for the dump sfu command

Message	Description
Permission is required to access a specified directory. (directory = <directory>)	You do not have access permission for the specified directory. Change the specified directory. <directory> Directory name
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dump command failed because dump processing is in progress on the specified SFU. Wait a while, and then try again.	The specified SFU is collecting a dump. Wait a while, and then retry the operation.
The dump command failed because number of the dump processing is upper limit. Wait a while, and then try again.	The command cannot be executed because the number of dumps collected at the same time has already reached the upper limit. Wait a while, and then retry the operation.
The dump command failed. The amount of free disk space on the device might be insufficient. Delete unnecessary files, and then try again.	There might not be enough free space on the disk of the Device. Delete unnecessary files and then try again.
The dump-collection command was accepted.	The dump collection was accepted normally.
The SFU number is invalid. (SFU number = <sfu no.>)	The SFU number is outside the valid range. Make sure the specified parameter is correct. <sfu no.>: Indicates the SFU number.

Message	Description
The specified directory does not exist. (directory = <i>&lt;directory&gt;</i> )	The specified directory does not exist. Specify the correct directory name. <i>&lt;directory&gt;</i> Directory name
The specified path is invalid. The path must be under the user home directory. (path = <i>&lt;directory&gt;</i> , user home directory = <i>&lt;user home directory&gt;</i> )	The specified path is invalid. Specify a path under the home directory. <i>&lt;directory&gt;</i> Directory name <i>&lt;user home directory&gt;</i> User home directory name
The specified path is too long.	The length of the specified path exceeds 280 characters. Shorten the specified path.

## Notes

1. While a dump is being collected with a restart parameter specified, the SFU stops operation. Accordingly, communication via the SFU cannot be performed.

---

## dump pru

---

Collects a memory dump of the PRU.

The collected memory dump file is stored on the disk of the active BCU, with the file name `pru**.cmd`. The specified PRU number is displayed in `**`. For details about how to collect the information, see the *Troubleshooting Guide*.

Note that you can collect a maximum total of 10 memory dumps for SFU, PRU, and NIF.

### Syntax

```
dump [-f] [-r] pru <pru 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 PRU and collects a memory dump. Note that if the command is executed in a state where the operating status of PRU is other than `active`, a memory dump is collected without restarting the PRU.

Operation when this parameter is omitted:

Collects a memory dump without a restart.

**<pru no.>**

Specify the number of the PRU whose memory dump is to be collected. For the specifiable range of values for the PRU 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 a tilde (~) at the beginning or use an absolute path. The number of characters for specifying a tilde is calculated by adding the number of characters obtained by replacing the tilde part with an absolute path to the number of characters of the directory path below the tilde.

Operation when this parameter is omitted:

The memory dump file is stored in `/usr/var/hardware` in the active BCU.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

### Example

In this example, the command collects a memory dump of the PRU whose PRU number is 1 in the internal memory of the device.

```
>dump -r pru 1
Are you sure you want to restart pru 1? (y/n):y
Are you sure you want to delete old dump file(pru01.cmd)? (y/n):y
The dump-collection command was accepted.
```

&gt;

1. A PRU dump confirmation message is displayed.  
Are you sure you want to restart pru 1? (y/n) :
2. If y is entered, the memory dump of PRU is collected. If the same PRU memory dump file already exists in the specified directory, the following message is displayed:  
Are you sure you want to delete old dump file(pru01.cmd)? (y/n) :
3. If y is entered, the existing memory dump is deleted. When the collection processing of the PRU memory dump is accepted, the execution result is displayed.  
The dump-collection command was accepted.
4. When the collection of the memory dump is complete, the message The PRU offline dump command was executed. is displayed in the system where the memory dump was collected. The collected memory dump file is stored on the disk of the active BCU with the file name pru0\*.cmd. The specified PRU number is displayed in \*.

## Display items

None

## Impact on communication

While a dump is being collected with a restart parameter specified, communication via the PRU cannot be performed.

## Response messages

Table 14-3: List of response messages for the dump pru command

Message	Description
Permission is required to access a specified directory. (directory = <directory>)	You do not have access permission for the specified directory. Change the specified directory. <directory> Directory name
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dump command failed because dump processing is in progress on the specified PRU. Wait a while, and then try again.	The specified PRU is collecting a dump. Wait a while, and then retry the operation.
The dump command failed because number of the dump processing is upper limit. Wait a while, and then try again.	The command cannot be executed because the number of dumps collected at the same time has already reached the upper limit. Wait a while, and then retry the operation.
The dump command failed. The amount of free disk space on the device might be insufficient. Delete unnecessary files, and then try again.	There might not be enough free space on the disk of the Device. Delete unnecessary files and then try again.
The dump-collection command was accepted.	The dump collection was accepted normally.
The PRU number is invalid. (PRU number = <pru no.>)	The PRU number is outside the valid range. Make sure the specified parameter is correct. <pru no.>: Indicates the PRU number.



Message	Description
The specified directory does not exist. (directory = <i>&lt;directory&gt;</i> )	The specified directory does not exist. Specify the correct directory name. <i>&lt;directory&gt;</i> Directory name
The specified path is invalid. The path must be under the user home directory. (path = <i>&lt;directory&gt;</i> , user home directory = <i>&lt;user home directory&gt;</i> )	The specified path is invalid. Specify a path under the home directory. <i>&lt;directory&gt;</i> Directory name <i>&lt;user home directory&gt;</i> User home directory name
The specified path is too long.	The length of the specified path exceeds 280 characters. Shorten the specified path.

## Notes

1. While a dump is being collected with a restart parameter specified, the PRU stops operation. Accordingly, communication via the PRU cannot be performed.
2. While a NIF dump is being collected, if this command is executed on the PRU that handles that NIF with a restart parameter specified, the NIF dump might not be collected because the NIF also restarts when the PRU restarts.

---

## dump nif

---

Collects a memory dump on the NIF.

The collected memory dump file is stored on the disk of the active BCU, 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*.

Note that you can collect a maximum total of 10 memory dumps for SFU, PRU, and NIF.

### 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 a restart.

`<nif no.>`

Specify the number of the 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 a tilde (`~`) at the beginning or use an absolute path. The number of characters for specifying a tilde is calculated by adding the number of characters obtained by replacing the tilde part with an absolute path to the number of characters of the directory path below the tilde.

Operation when this parameter is omitted:

The memory dump file is stored in `/usr/var/hardware` in the active BCU.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

### Example

In this example, the command collects a memory dump of the NIF whose SFU number is 1 in the internal memory of the device.

```
>dump -r nif 1
Are you sure you want to restart nif 1? (y/n):y
Are you sure you want to delete old dump file(nif01.cmd)? (y/n):y
The dump-collection command was accepted.
```

&gt;

1. A NIF dump confirmation message is displayed.  
Are you sure you want to restart nif 1? (y/n) :
2. If y is entered, the memory dump of NIF is collected. If the same NIF memory dump file already exists in the specified directory, the following message is displayed:  
Are you sure you want to delete old dump file(nif01.cmd)? (y/n) :
3. If y is entered, the existing memory dump is deleted. When the collection processing of the NIF memory dump is accepted, the execution result is displayed.  
The dump-collection command was accepted.
4. When the collection of the memory dump is complete, the message The NIF offline dump command was executed. is displayed in the system where the memory dump was collected. The collected memory dump file is stored on the disk of the active BCU with the file name nif\*\*.cmd. The specified NIF number is displayed in \*\*.

## Display items

None

## Impact on communication

While a dump is being collected with a restart parameter specified, communication via the NIF cannot be performed.

## Response messages

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

Message	Description
Permission is required to access a specified directory. (directory = <directory>)	You do not have access permission for the specified directory. Change the specified directory. <directory> Directory name
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dump command failed because dump processing is in progress on the specified NIF. Wait a while, and then try again.	The specified NIF is collecting a dump. Wait a while, and then retry the operation.
The dump command failed because number of the dump processing is upper limit. Wait a while, and then try again.	The command cannot be executed because the number of dumps collected at the same time has already reached the upper limit. Wait a while, and then retry the operation.
The dump command failed. The amount of free disk space on the device might be insufficient. Delete unnecessary files, and then try again.	There might not be enough free space on the disk of the Device. Delete unnecessary files and then try again.
The dump-collection command was accepted.	The dump collection was accepted normally.
The NIF number is invalid. (NIF number = <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
The specified directory does not exist. (directory = <i>&lt;directory&gt;</i> )	The specified directory does not exist. Specify the correct directory name. <i>&lt;directory&gt;</i> Directory name
The specified path is invalid. The path must be under the user home directory. (path = <i>&lt;directory&gt;</i> , user home directory = <i>&lt;user home directory&gt;</i> )	The specified path is invalid. Specify a path under the home directory. <i>&lt;directory&gt;</i> Directory name <i>&lt;user home directory&gt;</i> User home directory name
The specified path is too long.	The length of the specified path exceeds 280 characters. Shorten the specified path.

## Notes

1. While a dump is being collected with a restart parameter specified, the NIF stops operation. Accordingly, communication via the NIF cannot be performed.

---

## erase dumpfile

---

Deletes dump files stored in the dump file storage directory, or core files stored in the core file storage directory.

Files in the dump file storage directories `/dump0` and `/usr/var/hardware`, and the core file storage directory `/usr/var/core` can be deleted.

### Syntax

```
erase dumpfile [<system>] {all | <file name>} [-f]
```

### Input mode

User mode and administrator mode

### Parameters

<system>

active

Deletes dump files or core files in the active BCU.

standby

Deletes dump files or core files in the standby BCU.

Operation when this parameter is omitted:

Deletes dump files or core files in both the active and standby BCUs.

{all | <file name>}

all

Deletes all dump files or core files.

<file name>

Specify the name of the file to be deleted. The permissible format of the file name is as follows. *XX* and *YYY* represent a number in the range from 0 to 9, and *xxxx* represents an arbitrary character string. Use the `show dumpfile` command to check the file names.

- `bcuXX.000`: BCU dump file
- `paXX.YYY`: PA failure dump file
- `sfuXX.YYY`: SFU failure dump file
- `pruXX.YYY`: PRU failure dump file
- `nifXX.YYY`: NIF failure dump file
- `psXX.000`: PS failure dump file
- `fanXX.000`: FAN failure dump file
- `paXX.cmd`: PA command dump file
- `sfuXX.cmd`: SFU command dump file
- `pruXX.cmd`: PRU command dump file
- `nifXX.cmd`: NIF command dump file
- `xxxx.core`: Core file

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Operation when all parameters are omitted:

Operation proceeds as described for each *Operation when this parameter is omitted* section.

## Example

*Figure 14-1: Deleting all dump files or core files in the active and standby BCUs*

```
> erase dumpfile all
All dump files will be erased. Do you want to continue? (y/n):y
```

*Figure 14-2: Deleting the BCU dump file in the active BCU*

```
> erase dumpfile active bcuXX.000
The specified dump file will be erased. Do you want to continue? (y/n):y
```

## Display items

None

## Impact on communication

None

## Response messages

*Table 14-5: List of response messages for the erase dumpfile command*

Message	Description
An attempt to access the standby BCU failed. Check the status of the standby BCU.	An attempt to access the standby BCU failed. Check the status of the standby BCU.
One or more files could not be erased.	One or more files could not be erased.
The command cannot be executed because another user is executing 'show dumpfile' command. Wait a while, and then try again.	Another user is executing the <code>show dumpfile</code> command. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified file does not exist or is not a dump or core file.	The specified file does not exist or is not a dump or core file.

## Notes

1. If you execute this command in the standby BCU, specify `standby` for the `<system>` parameter.

---

## show dumpfile

---

Lists the dump files stored in the dump file storage directory, or the core files stored in the core file directory.

### Syntax

```
show dumpfile [<system>]
```

### Input mode

User mode and administrator mode

### Parameters

<system>

active

Displays dump files or core files of the active BCU.

standby

Displays dump files or core files of the standby BCU.

Operation when this parameter is omitted:

Displays dump files or core files of both the active and standby BCUs.

### Example

*Figure 14-3: Displaying dump files and core files of the active and standby BCUs*

```
> show dumpfile
Date 20XX/02/22 10:10:34 UTC
BCU1(active):
[/dump0]
File name:          bcu01.000
Collect date:       20XX/02/21 16:52:27 UTC
Version:            12.1
Serial information: AA086AB01000R8001C7Y019
Factor:             User operation
[/usr/var/hardware]
File name:          fan01.000
Collect date:       20XX/02/21 04:56:37 UTC
Version:            OS-RE 12.1
Serial information: IC086AJ01000T0001D2EB17
Factor:             01213002 FAN:1

File name:          pa01.cmd
Collect date:       20XX/02/21 17:32:32 UTC
Version:            OS-RE 12.1
Serial information: AA086AB01000R8001C7Y019
Factor:             User operation

File name:          nif01.cmd
Collect date:       20XX/02/21 18:22:17 UTC
Version:            OS-RE 12.1
Serial information: AA086AE11000CA001C9C276
Factor:             User operation
[/usr/var/core]
File name:          pad.core
Collect Date:       20XX/02/22 09:06:00 UTC
BCU2(standby):
[/standby/dump0]
File name:          bcu02.000
Collect date:       20XX/02/21 16:32:27 UTC
Version:            12.1
```

```

Serial information: AA086AB01000R8001C7Y019
Factor:              User operation
[/standby/usr/var/hardware] No dump file.
[/standby /usr/var/core] No core file.

```

&gt;

## Display items

Table 14-6: Information displayed by the show dumpfile command

Item		Displayed information	Displayed detailed information
File storage directory		Directory name	[/dump0]: Storage directory for BCU dump files [/usr/var/hardware]: Storage directory for dump files for SFU, PRU, NIF, PS, and FAN [/usr/var/core]: Core file storage directory
File information <sup>#1#2#3#4</sup>	File name	File name <sup>#5</sup>	bcuXX.000: BCU dump file paXX.YYY: PA failure dump file sfuXX.YYY: SFU failure dump file pruXX.YYY: PRU failure dump file nifXX.YYY: NIF failure dump file psXX.000: PS failure dump file fanXX.000: FAN failure dump file paXX.cmd: PA command dump file sfuXX.cmd: SFU command dump file pruXX.cmd: PRU command dump file nifXX.cmd: NIF command dump file xxx.core: Core file
	Collect date	Dump collection date and time	Date and time the dump file was collected
	Version	Version information	Software type and version <sup>#6</sup>
	Serial information	Serial information	--
	Factor	Reason for collecting dump	xx xxxxxxx: A dump is collected due to a failure. <sup>#7</sup> User operation: A dump is collected by user operation.

#1: If there is no dump file or no core file in the storage directory, No dump file. or No core file. is displayed, and file information is not displayed.

#2: If there is no dump file storage directory, No such directory. is displayed, and file information is not displayed.

#3: If a standby BCU is not installed, or an attempt to access a standby BCU failed, standby BCU is not ready. is displayed, and file information is not displayed.

#4: If the file contents are invalid, only the file name is displayed, and any other file information is not displayed.

#5: XX represents the unit number, YYY represents the serial number, and xxxx represents an arbitrary character string.

#6: If the BCU dump was collected before activation of the device OS, software type of the BCU dump is not displayed.

#7: When a BCU dump file is collected due to a failure, only the message identifier indicating the contents of the failure is displayed. For other dump files, the message identifier and the details of message type are displayed.



## Impact on communication

None

## Response messages

*Table 14-7:* List of response messages for the show dumpfile command

Message	Description
An attempt to access the standby BCU failed. Check the status of the standby BCU.	An attempt to access the standby BCU failed. Check the status of the standby BCU.
The command cannot be executed because another user is executing 'erase dumpfile' command. Wait a while, and then try again.	Another user is executing the <code>erase dumpfile</code> command. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. If you execute this command in the standby BCU, specify `standby` for the `<system>` parameter.



## Chapter

---

# 15. Device Redundancy

---

inactivate bcu standby  
activate bcu standby  
redundancy force-switchover  
synchronize

---

## inactivate bcu standby

---

Changes the status of a standby BCU from the `active` to the `inactive` status.

By executing this command, you can replace a standby BCU without turning off the device. In addition, the standby BCU log is applied to the internal flash memory.

After this command changes a standby BCU to the `inactive` status, you can use the `activate bcu standby` command to return the status to the `active` status.

### Syntax

```
inactivate [-f] bcu standby
```

### 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

*Figure 15-1: Inactivating a standby BCU*

```
> inactivate bcu standby
Are you sure you want to inactivate the standby BCU? (y/n): y
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 15-1: List of response messages for the inactivate bcu standby command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The standby BCU is already inactive.	The standby BCU has already been inactivated.
The standby BCU is not connected.	The standby BCU is not installed.

### Notes

1. If you execute this command and restart the Device when the standby BCU is inactivated, the `inactive` status of the standby BCU is retained.
2. When you execute the `update software (ppupdate)` command to update the HDC (Hardware Dependent Code) of an active BCU, if you use the `inactivate bcu standby`

command to inactivate the standby BCU, the `inactive` status of the standby BCU is canceled and is changed to the `active` status.

---

## activate bcu standby

---

When a standby BCU is inactivated or after the Device is restarted, if this command is executed while the standby BCU is installed, the standby BCU is set to the `active` status.

### Syntax

```
activate bcu standby
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 15-2: Setting the standby BCU to the active status*

```
> activate bcu standby
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 15-2: List of response messages for the activate bcu standby command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The standby BCU is not connected.	The standby BCU is not installed.
The standby BCU is not inactive.	The standby BCU is not inactivated.

### Notes

1. It takes a few seconds for this command to re-display the prompt.

## redundancy force-switchover

Switches between the active BCU and the standby BCU in a BCU duplex configuration.

### Syntax

```
redundancy force-switchover [-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

*Figure 15-3:* Switching between the active BCU and the standby BCU in a BCU duplex configuration

```
> redundancy force-switchover
Are you sure you want to switch over? (y/n): y
>
```

### Display items

None

### Impact on communication

For functionalities that support Non-Stop Communication at system switchover, continuous communication is ensured after a system switchover because the functionalities continue operating without stopping during system switchover. For functionalities that do not support Non-Stop Communication at system switchover, communication stops until the network information is reconfigured because the functionalities perform relearning.

### Response messages

*Table 15-3:* List of response messages for the redundancy force-switchover command

Message	Description
A switchover is in progress.	A switchover is in progress.
Command execution failed because the active and standby configurations do not match.	Configurations for the active devices and for the standby devices do not match.
Command execution failed because the configuration file was being edited.	This command cannot be executed because another user is editing the configuration.
Command execution failed because the configuration file was being saved.	This command cannot be executed because the configuration is being saved.
The command cannot be executed because another user is executing 'synchronize' command. Wait a while, and then try again.	Another user is executing the <code>synchronize</code> command. Wait a while, and then retry the operation.
The command cannot be executed because information is being synchronized between BCUs. Wait a while, and then try again.	This command cannot be executed because information is being synchronized between duplicated BCUs. Wait a while, and then retry the operation.

Message	Description
The command cannot be executed because the BCU is configuring devices after a switchover. Wait a while, and then try again.	The command cannot be executed because the BCU is re-configuring devices after a system switchover. Wait a while, and then retry the operation.
The command cannot be executed because the system is not in a duplex state.	The command cannot be executed because the system is not in a duplex state.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. If you switch between the active and standby BCUs by using this command, allow an interval of approximately 30 seconds before re-executing this command.



## synchronize

Copies the following contents stored in the internal flash memory of the active BCU to the standby BCU:

- Configuration
- Files created under the home directory

### Syntax

```
synchronize [{userfile | diff}]
```

### Input mode

Administrator mode

### Parameters

{userfile | diff}

userfile

Also copies the files created under the home directory.

diff

Displays the synchronization status between the active BCU and the standby BCU. Specify this parameter to decide whether synchronization is required.

Operation when all parameters are omitted:

Files other than files created under home directories are copied.

### Example

*Figure 15-4: Copying the contents stored in the internal flash memory of the active BCU to the standby BCU*

```
# synchronize
Do you want to synchronize? (y/n): y
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 15-4: List of response messages for the synchronize command*

Message	Description
A switchover is in progress.	The command cannot be executed because a switchover is in progress.
Command execution failed because the configuration file was being edited.	This command cannot be executed because another user is editing the configuration.
Copying of files to be synchronized failed. Try again.	An attempt to open the file to be synchronized failed. Try again.
Copying of files to be synchronized failed. Wait a while, and then try again.	An attempt to copy the file to be synchronized failed. Wait a while, and then try again. Note, however, that if this message is output with the <code>No space left on device</code> message, follow the step 6 in <i>Notes</i> below to try again.

Message	Description
Some items do not match.	Some items do not match.
The command cannot be executed because the software versions do not match.	The command cannot be executed because the versions of software do not match.
The command cannot be executed because the system is now in simplex mode.	The command cannot be executed because the system is in simplex mode.
The command cannot be executed because you are in user mode.	This command cannot be executed in user mode.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

## Notes

1. When executing this command, do not allow another user to log in, log out, or execute a command. Otherwise, the command might not be terminated correctly.
2. This command cannot be executed if the versions of software for the active BCU and the standby BCU do not match.
3. Depending on the size of the configuration file or the number of files in the home directory, it might take time to execute the command.
4. If the `diff` parameter is specified, the `.clihistory` file in the home directory is also compared. Therefore, `NG` might be displayed for the `home directory files` item.
5. If you are logged in to the standby BCU, log out first, and then execute this command.
6. If there is a file that exceeds the internal flash memory capacity in the standby BCU, copying a file might fail. If the copying of the files to be synchronized failed, delete the files in the user area of the active and standby BCUs before re-executing the command.

## Chapter

---

# 16. Log Management

---

show logging  
clear logging

---

## show logging

---

Displays the log entries recorded by the Device and the minimum number of stored log entries.

### Syntax

```
show logging [message-type <message type>] [count <count>] [day <day>]
[event-level <event level>] [millisecond] [csv] [-h] [standby]
show logging reference [-h] [standby]
show logging save-count [message-type <message type>]
```

### Input mode

User mode and administrator mode

### Parameters

message-type <message type>

Displays operation log entries of the specified message type. For details about message types that can be specified for <message type>, see *1.2.2 Message types* in the manual *Message and Log Reference For Version 12.1*.

Operation when this parameter is omitted:

Displays operation log entries of all message types.

count <count>

Displays operation log entries for the specified number of entries from the latest entry. The range of values that can be specified for <count> is from 1 to 10000000.

Operation when this parameter is omitted:

Displays 3000 operation log entries from the latest entry.

day <day>

Displays operation log entries for the specified number of days from the time when the command is executed. The range of values that can be specified for <day> is from 1 to 100000.

Operation when this parameter is omitted:

Displays operation log entries without limiting the time.

event-level <event level>

Displays operation log entries whose event level is equal to or higher than the specified one. The range of values that can be specified for <event level> is from 0 to 7.

Operation when this parameter is omitted:

Displays operation log entries of all event levels.

millisecond

Displays the time of operation log entries in milliseconds.

Operation when this parameter is omitted:

Displays the time of operation log entries in seconds.

csv

Displays operation log entries in CSV format. The command execution time and header information (System information) is not displayed.

Operation when this parameter is omitted:

Displays operation log entries in a normal format.

-h

Does not display header information (System information) for log entries.

Operation when this parameter is omitted:

Displays header information (System information) for log entries.

standby

Displays the log entries of the standby BCU.

Operation when this parameter is omitted:

Displays the log entries of the active BCU.

reference

Displays reference log entries.

save-count

Displays the minimum number of stored operation log entries. If the `message-type` parameter is specified, the minimum number of stored log entries for the corresponding message type is displayed.

Use the `logging save-count` command to set the minimum number of stored log entries.

Operation when all parameters are omitted:

Displays the latest 3000 operation log entries of the active BCU.

## Example

*Figure 16-1: Displaying the latest 3000 operation log entries of the active BCU (no parameter is specified)*

```
> show logging
Date 20XX/11/07 15:54:12 UTC
System information
  AX8616R, OS-RE, Ver.12.1, BCU1(active)
Logging information
20XX/11/07 15:54:12 UTC 1-1(A) S6 KEY operator(tty00): > show logging
20XX/11/07 15:53:45 UTC 1-1(A) S6 BCU 01101001 00 023902000000 Initialization is
complete.
20XX/11/07 15:49:34 UTC 1-1(A) S3 PS 01202020 00 0aec02000000 The power supply
is insufficient.
      :
      :
>
```

*Figure 16-2: Displaying statistics log entries (the reference parameter is specified)*

```
> show logging reference
Date 20XX/11/07 15:55:50 UTC
System information
  AX8616R, OS-RE, Ver.12.1, BCU1(active)
Logging information
1-1(A) S6 BCU 01101001 00 023902000000
  20XX/11/04 10:00:01 UTC 20XX/11/07 15:53:45 UTC 15
      :
      :
>
```

*Figure 16-3: Displaying operation log entries in CSV format (the csv parameter is specified)*

```
> show logging csv
20XX/11/07,15:54:12,UTC,1-1(A),S6,KEY,,,,,"operator(ttyp0): > show logging"
```

```

20XX/11/07,15:53:45,UTC,1-1(A),S6,BCU,,01101001,00,023902000000,"
Initialization is complete."
20XX/11/07,15:49:34,UTC,1-1(A),S3,PS,,01202020,00,0aec02000000,"The power
supply is insufficient."
:
:
>

```

**Figure 16-4:** Displaying the minimum number of stored operation log entries (the save-count parameter is specified)

```

> show logging save-count
Date 20XX/11/08 11:39:23 UTC
Total Save Count:      25000 /   100000
Message Type          Save Count
BCU                    5000
PRU                     800
SFU                     2000
NIF                     3000
PORT                   2000
PS                      100
FAN                     100
SOFTWARE               2000
VRRP                   10000
>

```

## Display items

**Table 16-1:** Displayed log information

Item	Displayed information
System information	Device model Software information (OS name, version) BCU information (BCU number, whether the status is active or standby)
Logging information	Operation log or statistics log <sup>#</sup>

<sup>#</sup>: For details about the log, see *1.1.3 Format of operation logs* in the manual *Message and Log Reference For Version 12.1* and *1.1.4 Format of statistics logs* in the manual *Message and Log Reference For Version 12.1*.

**Table 16-2:** Items displayed for the minimum number of stored log entries

Item	Displayed information
Total Save Count	Total minimum number of stored log entries/Total number of log entries that can be specified
Message Type	Message type
Save Count	Minimum number of stored log entries for each log type

## Impact on communication

None

## Response messages

*Table 16-3:* List of response messages for the show logging command

Message	Description
The command cannot be executed because another user is executing 'clear logging' command. Wait a while, and then try again.	Another user is executing the <code>clear logging</code> command. Wait a while, and then retry the operation.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The log command cannot be executed because the standby system cannot be accessed.	The standby BCU is not installed, or an attempt to access the standby BCU failed. Check the status of the standby BCU.

## Notes

1. The operation log entries are displayed in reverse chronological order from the latest message or operation (the latest information is displayed at the top).
2. Even if the current time or time zone is changed by using an operation command or configuration command, the order in which log entries is displayed does not change.
3. The statistics log entries are collected in the order in which the events occurred. However, the entries might be displayed in a different order because the collected information is grouped by the same event.

---

## clear logging

---

Clears the log entries recorded by the Device.

### Syntax

```
clear logging [message-type <message type>] [-f] [standby]
clear logging reference [-f] [standby]
```

### Input mode

User mode and administrator mode

### Parameters

message-type <message type>

Clears operation log entries of the specified message type. For details about message types that can be specified for <message type>, see *1.2.2 Message types* in the manual *Message and Log Reference For Version 12.1*.

Operation when this parameter is omitted:

Clears operation log entries of all message types.

-f

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

standby

Clears the log entries of the standby BCU.

Operation when this parameter is omitted:

Clears the log entries of the active BCU.

reference

Clears statistics log entries.

Operation when all parameters are omitted:

Clears all the operation log entries of the active BCU.

### Example

*Figure 16-5: Clearing all the operation log entries of the active BCU*

```
> clear logging
Do you want to clear the operation log? (y/n): y
>
```

*Figure 16-6: Clearing the operation log entries of the specified message type (the message-type parameter is specified)*

```
> clear logging message-type BCU
Do you want to clear the operation log of BCU? (y/n): y
>
```

*Figure 16-7: Clearing statistics log entries (the reference parameter is specified)*

```
> clear logging reference
Do you want to clear the reference log? (y/n): y
>
```



**Display items**

None

**Impact on communication**

None

**Response messages***Table 16-4:* List of response messages for the clear logging command

Message	Description
The command cannot be executed because another user is executing 'show logging' command. Wait a while, and then try again.	Another user is executing the <code>show logging</code> command. Wait a while, and then retry the operation.
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The log command cannot be executed because the standby system cannot be accessed.	The standby BCU is not installed, or an attempt to access the standby BCU failed. Check the status of the standby BCU.

**Notes**

1. The log entries stored in the device are applied to the internal flash memory when the BCU is restarted or stopped. Therefore, clearing of log entries is applied to the internal flash memory at the same timing.



## Chapter

---

# 17. SNMP

---

show snmp  
show snmp pending  
snmp lookup  
snmp get  
snmp getnext  
snmp walk  
snmp getif  
snmp getroute  
snmp getarp  
snmp getforward  
snmp rget  
snmp rgetnext  
snmp rwalk  
snmp rgetroute  
snmp rgetarp

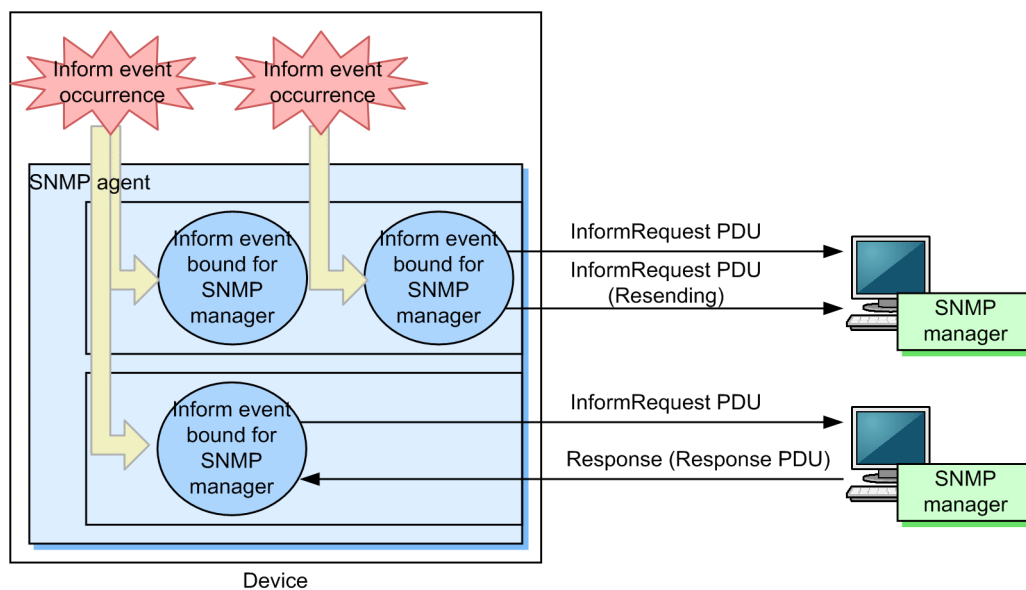
## show snmp

Displays SNMP information.

For inform requests, information is displayed for each of the following units:

- Inform event
- Inform event bound for the SNMP manager
- InformRequest PDU

Figure 17-1: InformRequest information



### Syntax

```
show snmp
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

Figure 17-2: Example of executing the show snmp command

```
> show snmp
Date 20XX/03/18 13:34:17 UTC
Contact: snmp@example.com
Location: Japan
SNMP packets input : 149346 (get:186696 set:0)
  Get-request PDUs : 1992
  Get-next PDUs : 147354
  Get-bulk PDUs : 0
  Set-request PDUs : 0
  Response PDUs : 0 (with error 0)
  Error PDUs : 0
  Bad SNMP version errors: 0
  Unknown community name : 0
  Illegal operation : 0
  Encoding errors : 0
```

```

SNMP packets output : 149475
  Trap PDUs          : 125
  Inform-request PDUs : 4
  Response PDUs      : 149346      (with error 499)
    No errors         : 148847
    Too big errors    : 0
    No such name errors : 499
    Bad values errors : 0
    General errors    : 0
  Timeouts           : 1
  Drops              : 0

[TRAP]
  Host: 192.168.0.65, sent:3
  Host: 192.168.0.210, sent:61

[INFORM]
  Timeout(sec)       : 30
  Retry              : 3
  Pending informs    : 2/25 (current/max)
  Host: 192.168.0.1
    sent      :2          retries:1
    response:0          pending:2          failed:0          dropped:0
  Host: 2001:db8::10
    sent      :1          retries:0
    response:0          pending:1          failed:0          dropped:0

```

## Display items

*Table 17-1:* Information displayed by the show snmp command

Item	Displayed information	Displayed detailed information
Contact	Indicates the contact information of the Device.	Value set by the <code>snmp-server contact</code> configuration command
Location	Indicates the name of the location where the Device is installed.	Value set by the <code>snmp-server location</code> configuration command
SNMP packets input	Indicates the <code>snmpInPkts</code> value (total number of received SNMP messages).	
get	Indicates the <code>snmpInTotalReqVars</code> value (total number of MIB objects for which a MIB was successfully collected).	--
set	Indicates the <code>snmpInTotalSetVars</code> value (total number of MIB objects for which a MIB was successfully configured).	--
Get-request PDUs	Indicates the <code>snmpInGetRequests</code> value (total number of received <code>GetRequestPDUs</code> ).	--
Get-next PDUs	Indicates the <code>snmpInGetNexts</code> value (total number of received <code>GetNextRequest PDUs</code> ).	--
Get-bulk PDUs	Indicates the total number of received <code>GetBulkRequest PDUs</code> .	0 to 4294967295
Set-request PDUs	Indicates the <code>snmpInSetRequests</code> value (total number of received <code>SetRequest PDUs</code> ).	--
Response PDUs	Indicates the <code>snmpInGetResponses</code> value (total number of received <code>GetResponse PDUs</code> ).	--

Item	Displayed information	Displayed detailed information
with error	Indicates the number of PDUs of the received GetResponse PDUs whose error status is not <code>noError</code> .	0 to 4294967295
Error PDUs	Indicates the total number of errors that occurred in PDU reception processing.	0 to 4294967295
Bad SNMP version errors	Indicates the <code>snmpInBadVersions</code> value (total number of received messages whose version is not supported).	--
Unknown community name	Indicates the <code>snmpInBadCommunityNames</code> value (total number of received SNMP messages from unknown communities).	--
Illegal operation	Indicates the <code>snmpInBadCommunityUses</code> value (total number of received messages that indicate operations that are not permitted by the specified community).	--
Encoding errors	Indicates the <code>snmpInASNParseErrs</code> value (total number of ASN.1 error messages).	--
SNMP packets output	Indicates the <code>snmpOutPkts</code> value (total number of sent SNMP messages).	
Trap PDUs	Indicates the <code>snmpOutTraps</code> value (total number of sent Trap PDUs).	--
Inform-request PDUs	Indicates the total number of sent Inform-request PDUs.	0 to 4294967295
Response PDUs	Indicates the <code>snmpOutGetResponses</code> value (total number of sent GetResponse PDUs).	--
with error	Indicates the number of PDUs of the sent GetResponse PDUs whose error status is not <code>noError</code> .	0 to 4294967295
No errors	Indicates the total number of sent PDUs whose error status is <code>noError</code> .	0 to 4294967295
Too big errors	Indicates the <code>snmpOutTooBigs</code> value (total number of sent PDUs whose error status is <code>tooBig</code> ).	--
No such name errors	Indicates the <code>snmpOutNoSuchNames</code> value (total number of sent PDUs whose error status is <code>noSuchName</code> ).	--
Bad values errors	Indicates the <code>snmpOutBadValues</code> value (total number of sent PDUs whose error status is <code>badValue</code> ).	--
General errors	Indicates the <code>snmpOutGenErrs</code> value (total number of sent PDUs whose error status is <code>genErr</code> ).	--
Timeouts	Indicates the total number of InformRequest PDUs for which a timeout occurred.	0 to 4294967295
Drops	Indicates the total number of inform events that were bound for the SNMP manager but were discarded because, for example, the maximum number of inform events that can wait for a response was exceeded.	0 to 4294967295
[TRAP]	Indicates trap information.	

Item	Displayed information	Displayed detailed information
Host	Indicates the host for which the trap is issued.	Value set by the <code>&lt;manager address&gt;</code> parameter of the <code>snmp-server host</code> configuration command
VRF	Indicates the VRF ID.	Value set by the <code>vrf</code> parameter of the <code>snmp-server host</code> configuration command
sent	Indicates the number of times a trap was sent.	0 to 4294967295
[INFORM]	Indicates inform event information.	
Timeout(sec)	Indicates the timeout value (in seconds).	Value set by the <code>timeout</code> parameter of the <code>snmp-server informs</code> configuration command
Retry	Indicates the number of resending attempts that has been set.	Value set by the <code>retries</code> parameter of the <code>snmp-server informs</code> configuration command
Pending informs: <code>&lt;current&gt;/&lt;max&gt;</code>	Indicates the number of inform events that are held and the maximum number of inform events that can be held. If the SNMP manager does not respond, an inform event is held.	<code>&lt;current&gt;</code> : The number of inform events that are currently held. <code>&lt;max&gt;</code> : Value set by the <code>pending</code> parameter of the <code>snmp-server informs</code> configuration command.
Host	Indicates the inform event destination.	Value set by the <code>&lt;manager address&gt;</code> parameter of the <code>snmp-server host</code> configuration command
VRF	Indicates the VRF ID.	Value set by the <code>vrf</code> parameter of the <code>snmp-server host</code> configuration command
sent	Indicates the number of inform events bound for the SNMP manager that sent InformRequest PDUs.	0 to 4294967295
retries	Indicates the number of resent InformRequest PDUs.	0 to 4294967295
response	Indicates the number of responses from the SNMP manager for inform events bound for the SNMP manager.	0 to 4294967295
pending	Indicates the number of inform events bound for the SNMP manager that is waiting for a response from another SNMP manager.	0 to 80000
failed	Indicates the number of times sending of an inform event bound for the SNMP manager failed. Sending fails if there is no response after repeated resend attempts.	0 to 4294967295
dropped	Indicates the number of inform events that were bound for the SNMP manager but were discarded because, for example, the maximum number of inform events that can wait for a response was exceeded.	0 to 4294967295

### Impact on communication

None

## Response messages

*Table 17-2:* List of response messages for the show snmp command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The connection with the SNMP program failed. Retry the command.	Communication with the SNMP program failed. Retry the command.

## Notes

1. The Device support the snmp operation commands that have the functionality equivalent to the SNMP agent and the SNMP manager. The statistics displayed by this command pertain to only the SNMP agent, and do not pertain to SNMP operation commands.
2. In the statistics displayed by this command, the number of messages and PDUs are counted in the same way as when MIBs are acquired from a network SNMP manager. This is true even when MIBs are acquired by using SNMP operation commands.
3. If inform events bound for the SNMP manager occur after a `coldStart` inform event is issued when the Device starts, issuance of inform events for the SNMP manager is suppressed until the response to the `coldStart` inform event is received. The inform events that are bound for SNMP manager and that have not yet been issued are temporarily counted as `sent` and `pending` events.



## show snmp pending

Displays inform events bound for the SNMP manager that is waiting for a response from another SNMP manager.

### Syntax

```
show snmp pending
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 17-3: Example of executing the show snmp pending command*

```
> show snmp pending
Date 20XX/03/18 13:43:09 UTC
Req ID: 31, Host: 2001:db8::11, Remaining Retry: 3, Expires in seconds: 23
Req ID: 32, Host: 192.168.0.1, Remaining Retry: 2, Expires in seconds: 29
Req ID: 33, Host: 2001:db8::10, Remaining Retry: 2, Expires in seconds: 29
Req ID: 34, Host: 192.168.0.2, Remaining Retry: 2, Expires in seconds: 29
```

### Display items

*Table 17-3: Information displayed by the show snmp pending command*

Item	Displayed information	Displayed detailed information
Req ID	Request ID	--
Host	Destination SNMP manager	Value set by the <i>&lt;manager address&gt;</i> parameter of the <code>snmp-server host</code> configuration command
VRF	VRF ID of the SNMP manager	Value set by the <i>&lt;vrf id&gt;</i> parameter of the <code>snmp-server host</code> configuration command
Remaining Retry	Remaining number of retries	0 to 100 If the value of this item is 0, whether a response is made is checked, but no resend attempts are performed.
Expires in seconds	Remaining time before the session times out	0 to 21474835 (seconds)

### Impact on communication

None

### Response messages

*Table 17-4: List of response messages for the show snmp pending command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

Message	Description
The connection with the SNMP program failed. Retry the command.	Communication with the SNMP program failed. Retry the command.
There are no inform events for the SNMP manager.	There are no inform events bound for the SNMP manager.

## Notes

1. If this command is executed when inform events bound for the SNMP manager time out simultaneously, the command might display 0 for all sessions as the remaining time before a timeout (as shown in the following example).

### Example

```
> show snmp pending
Date 20XX/12/27 17:06:10 UTC
Req ID: 88, Host: 192.168.0.1, Remaining Retry: 0, Expires in seconds: 0
Req ID: 89, Host: 192.168.0.2, Remaining Retry: 0, Expires in seconds: 0
Req ID: 90, Host: 192.168.0.3, Remaining Retry: 0, Expires in seconds: 0
```

## snmp lookup

Displays supported MIB object names and object IDs.

### Syntax

```
snmp lookup [<variable name>]
```

### Input mode

User mode and administrator mode

### Parameters

<variable name>

Specify an object name or an object in dot notation.

A list of object names that follow the specified object or objects in dot notation are displayed.

Operation when this parameter is omitted:

All object names are listed in dot notation.

### Example

Figure 17-4: Example of executing the snmp lookup command

```
> snmp lookup sysDescr
sysDescr                                = 1.3.6.1.2.1.1.1

> snmp lookup 1.3.6.1.2.1.1.1
sysDescr                                = 1.3.6.1.2.1.1.1

> snmp lookup
iso                                     = 1
member-body                             = 1.2
us                                       = 1.2.840
ieee802dot3                             = 1.2.840.10006
snmpmibs                                = 1.2.840.10006.300
```

### Display items

Supported MIB object names and object IDs are displayed in the <object name> = <object ID> format.

### Impact on communication

None

### Response messages

Table 17-5: List of response messages for the snmp lookup command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The corresponding MIB object is not found. (object = <object name or object id>)	The corresponding MIB object was not found. <object name or object id>: Object name or object ID

### Notes

None

---

## snmp get

---

Displays the specified MIB value.

### Syntax

```
snmp get <variable name>
```

### Input mode

User mode and administrator mode

### Parameters

<variable name>

Specify an object name or an object in dot notation.

Searches for and displays management information for the specified object instance.

### Example

*Figure 17-5: Example of executing the snmp get command*

```
> snmp get sysUpTime.0
Name: sysUpTime.0
Value: 508495

> snmp get 1.3.6.1.2.1.1.3.0
Name: sysUpTime.0
Value: 508495
```

### Display items

*Table 17-6: Information displayed by the snmp get command*

Item	Displayed information	Displayed detailed information
Name	Object instance	--
Value	Object instance value	--

### Impact on communication

None

### Response messages

*Table 17-7: List of response messages for the snmp get command*

Message	Description
A MIB object name is invalid. (object = <object name or object id>)	A MIB object name is invalid. <object name or object id>: Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <code>)	A received SNMP packet includes an invalid status code. <code>: Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.

Message	Description
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number (for example, 1 is first, 2 is second)
An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. (# <i>&lt;number&gt;</i> object ID)	An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. The object ID specified at position <i>&lt;number&gt;</i> did not match anything. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.
2. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of `ifPhysAddress` is `0x41 0x42 0x43 0x44 0x45 0x46, ABCDEF` is output.

---

## snmp getnext

---

Displays the MIB value following the specified one.

### Syntax

```
snmp getnext <variable name>
```

### Input mode

User mode and administrator mode

### Parameters

<variable name>

Specify an object name or an object in dot notation.

Searches for and displays the management information following the specified object instance.

### Example

*Figure 17-6:* Example of executing the snmp getnext command

```
> snmp getnext sysObjectID.0
Name: sysUpTime.0
Value: 45300

> snmp getnext 1.3.6.1.2.1.1.2.0
Name: sysUpTime.0
Value: 47300
```

### Display items

*Table 17-8:* Information displayed by the snmp getnext command

Item	Displayed information	Displayed detailed information
Name	Object instance following the specified one	--
Value	Object instance value following the specified one	--

### Impact on communication

None

### Response messages

*Table 17-9:* List of response messages for the snmp getnext command

Message	Description
A MIB object name is invalid. (object = <object name or object id>)	A MIB object name is invalid. <object name or object id>: Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <code>)	A received SNMP packet includes an invalid status code. <code>: Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.

Message	Description
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. (# <i>&lt;number&gt;</i> object ID)	An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. The object ID specified at position <i>&lt;number&gt;</i> did not match anything. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.
2. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of `ifPhysAddress` is `0x41 0x42 0x43 0x44 0x45 0x46, ABCDEF` is output.

---

## snmp walk

---

Displays the specified MIB tree.

### Syntax

`snmp walk <variable name>`

### Input mode

User mode and administrator mode

### Parameters

*<variable name>*

Specify an object name or an object in dot notation.

Searches the management information following the specified object instance, and then displays all instances of the applicable object.

### Example

*Figure 17-7: Example of executing the snmp walk command*

```
> snmp walk interfaces

Name: ifNumber.0
Value: 32

Name: ifIndex.1
Value: 1

Name: ifIndex.1000
Value: 1000

Name: ifIndex.6010
Value: 6010

Name: ifIndex.10101
Value: 10101

Name: ifIndex.10102
Value: 10102

Name: ifIndex.10103
Value: 10103
      :
      :
>

> snmp walk 1.3.6.1.2.1.2

Name: ifNumber.0
Value: 32

Name: ifIndex.1
Value: 1

Name: ifIndex.1000
Value: 1000

Name: ifIndex.6010
Value: 6010

Name: ifIndex.10101
Value: 10101
```



```
Name: ifIndex.10102
Value: 10102
```

```
Name: ifIndex.10103
Value: 10103
```

```
:
:
```

```
>
```

## Display items

Table 17-10: Information displayed by the snmp walk command

Item	Displayed information	Displayed detailed information
Name	Object instance	--
Value	Object instance value	--

## Impact on communication

None

## Response messages

Table 17-11: List of response messages for the snmp walk command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.

Message	Description
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If there are too many interfaces on a Device, it takes time to search IP-related MIB information, and a timeout might occur. If that happens, use the `snmp get` command to acquire the information, or use the `snmp getnext` command to specify the index values in order and then acquire the information.
2. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.
3. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of `ifPhysAddress` is `0x41 0x42 0x43 0x44 0x45 0x46`, `ABCDEF` is output.

## snmp getif

Searches management information for the interface group and then displays interface information.

### Syntax

```
snmp getif
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 17-8: Example of executing the snmp getif command*

```
> snmp getif
Index:1
      Type      :ethernetCsmacd          PhysAddr :0012.e286.8801
      Adm       :up                      Opr       :up
      InOctets: 28755                    OutOctets: 6498
      InPkts   : 375                     OutPkts  : 80
Index:1000
      Type      :softwareLoopback        PhysAddr :-
      Adm       :up                      Opr       :up
      InOctets: 1928                    OutOctets: 1928
      InPkts   : 19                     OutPkts  : 19
```

### Display items

*Table 17-12: Information displayed by the snmp getif command*

Item	Displayed information	Displayed detailed information
Index	Indicates the ifIndex number.	--
Type	Indicates the interface type (ifType).	ethernetCsmacd
		ppp
		softwareLoopback (loopback interface)
		l2vlan
		ieee8023adLag
PhysAddr	Indicates a physical address of an interface (ifPhysAddress).	- is displayed if there is no information.
Adm	Indicates the interface status of the configuration (ifAdminStatus).	up (enabled)
		down (disabled)
Opr	Indicates the current interface status (ifOperStatus).	up (enabled)
		down (disabled)
		lowerLayerDown (The lower-layer interface has gone down.)
InOctets	Indicates the number of octets received on an interface (ifInOctets).	--

Item	Displayed information	Displayed detailed information
OutOctets	Indicates the number of octets sent from an interface (ifOutOctets).	--
InPkts	Indicates the number of packets received on an interface (ifInUcastPkts+ifInNUcastPkts).	--
OutPkts	Indicates the number of packets sent from an interface (ifOutUcastPkts+ifOutNUcastPkts).	--

## Impact on communication

None

## Response messages

Table 17-13: List of response messages for the snmp getif command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.

## snmp getroute

Searches management information for ipRouteTable and then displays routing information.

### Syntax

snmp getroute

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 17-9: Example of executing the snmp getroute command*

```
> snmp getroute
      Index Destination      NextHop      Metric1 Type      Proto      Age
      1 192.168.0.0          192.168.0.56      0 direct    local      34324
      1 192.168.0.56          192.168.0.56      0 direct    local      34324
```

### Display items

*Table 17-14: Information displayed by the snmp getroute command*

Item	Displayed information	Displayed detailed information
Index	Indicates the interface number used for reaching the next hop on this route (ipRouteIfIndex).	--
Destination	Indicates the destination IP address on this route (ipRouteDest).	--
NextHop	Indicates the IP address of the next hop for the destination of this route (ipRouteNextHop).	--
Metric1	Indicates the primary routing metric for this route (ipRouteMetric1).	--
Type	Indicate the type of this route (ipRouteType).	direct (direct route) indirect (indirect route) invalid (invalid route) other (others)
Proto	Indicates the routing protocol (ipRouteProto).	rip (RIP) ospf (OSPF) bgp (BGP) local (static routing) other (others)
Age	Indicates the number of seconds elapsed after this route was last updated or confirmed (ipRouteAge).	--

### Impact on communication

None

## Response messages

Table 17-15: List of response messages for the snmp getroute command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address
There is no routing table entry.	There is no routing table entry.

## Notes

1. If there are too many interfaces on a Device, it takes time to search MIB information for ipRouteTable, and a timeout might occur. If that happens, use the `snmp getnext` command to acquire the ipRouteTable information.
2. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.

## snmp getarp

Searches management information for ipNetToMediaTable and then displays ARP information.

### Syntax

```
snmp getarp
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 17-10:* Example of executing the snmp getarp command

```
> snmp getarp
Index      Network Address      Physical Address      Type
  1         192.168.0.1         0012.e264.eb02       dynamic
  1         192.168.0.209      0012.e23e.3e8f       dynamic
  1         192.168.0.210      0012.e2c9.6ba6       dynamic
```

### Display items

*Table 17-16:* Information displayed by the snmp getarp command

Item	Displayed information	Displayed detailed information
Index	Indicates the interface number that has this ARP information (ipNetToMediaIfIndex).	--
Network Address	Indicates the IP address corresponding to a physical address (ipNetToMediaNetAddress).	--
Physical Address	Indicates a physical address (ipNetToMediaPhysAddress).	--
Type	Indicates the type of mapping (ipNetToMediaType).	other (Mapping other than the following types)
		invalid (invalid mapping)
		dynamic (dynamic mapping)
		static (static mapping)

### Impact on communication

None

### Response messages

*Table 17-17:* List of response messages for the snmp getarp command

Message	Description
A MIB object name is invalid. (object = <object name or object id>)	A MIB object name is invalid. <object name or object id>: Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <code>)	A received SNMP packet includes an invalid status code. <code>: Status code

Message	Description
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address
There is no ARP table entry.	There is no ARP table entry.

## Notes

1. If there are too many interfaces on a Device, it takes time to search MIB information for ipNetToMediaTable, and a timeout might occur. If that happens, use the `snmp getnext` command to acquire the ipNetToMediaTable information.
2. If the `snmp-server community` configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.



## snmp getforward

Searches management information for ipForwardTable and axsVrfIpForwardTable, and then displays forwarding information.

### Syntax

snmp getforward

### Input mode

User mode and administrator mode

### Parameters

None

### Example

Figure 17-11: Example of executing the snmp getforward command

```
> snmp getforward
      Index Destination      NextHop      Metric1 Type   Proto   Age   NH-AS
      1 192.168.0.0/24      192.168.0.1      0 local   local  1514   0
      1 192.168.0.1/32      192.168.0.1      0 local   local  1514   0
    10101 192.168.1.0/24      192.168.1.1      0 local   local  1072   0
    10101 192.168.1.1/32      192.168.1.1      0 local   local  1072   0
VRF 123
      Index Destination      NextHop      Metric1 Type   Proto   Age   NH-AS
    10103 192.168.3.0/24      192.168.3.1      0 local   local  1074   0
    10103 192.168.3.1/32      192.168.3.1      0 local   local  1074   0
```

### Display items

Table 17-18: Information displayed by the snmp getforward command

Item	Displayed information	Displayed detailed information
Index	Indicates the identifier of the local interface connected to the next hop on this route (ipForwardIfIndex).	--
Destination	Indicates the destination address of this route (ipForwardDest) and the mask for logical conjunction with the destination (ipForwardMask) displayed in mask length.	--
NextHop	Indicates the address of the next hop on the route (ipForwardNextHop).	--
Metric1	Indicates the metric for this route (ipForwardMetric1).	--
Type	Indicates the type of the route (ipForwardType).	local (local) remote (remote) invalid (invalid) other (others)

Item	Displayed information	Displayed detailed information
Proto	Indicates the protocol that learned this route (ipForwardProto).	rip (RIP)
		ospf (OSPF)
		bgp (BGP)
		local (static routing)
		netmgmt (static routing)
		other (others)
Age	Indicates the time (in seconds) elapsed since this route was learned or updated (ipForwardAge).	--
NH-AS	Indicates the AS number of the next hop (ipForwardNextHopAS).	--

Table 17-19: Information displayed by the snmp getforward command (by VRF)

Item	Displayed information	Displayed detailed information
VRF	Indicates the VRF index (axVrfIpFwVRFIndex).	--
Index	Indicates the identifier of the local interface connected to the next hop on this route (axVrfIpFwIfIndex).	--
Destination	Indicates the destination address of this route (axVrfIpFwDest) and the mask for ANDing with the destination (axVrfIpFwMask) displayed as a mask length.	--
NextHop	Indicates the address of the next hop on the route (axVrfIpFwNextHop).	--
Metric1	Indicates the metric for this route (axVrfIpFwMetric1).	--
Type	Indicates the type of the route (axVrfIpFwType).	local (local)
		remote (remote)
		invalid (invalid)
		other (others)
Proto	Indicates the protocol that learned this route (axVrfIpFwProto).	rip (RIP)
		ospf (OSPF)
		bgp (BGP)
		local (static routing)
		netmgmt (static routing)
		other (others)
Age	Indicates the time (in seconds) elapsed since this route was learned or updated (axVrfIpFwAge).	--
NH-AS	Indicates the AS number of the next hop (axVrfIpFwNextHopAS).	--

## Impact on communication

None

## Response messages

Table 17-20: List of response messages for the snmp getforward command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. (# <i>&lt;number&gt;</i> object ID)	An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. The object ID specified at position <i>&lt;number&gt;</i> did not match anything. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address
There was no forwarding table entry.	There is no forwarding table entry.

## Notes

1. If there are too many interfaces on a Device, it takes time to search MIB information for ipForwardTable, and a timeout might occur. If that happens, use the snmp getNext command to acquire the ipForwardTable information.
2. If the snmp-server community configuration command is not set, a response message indicating that there is no response from the SNMP agent is output.

---

## snmp rget

---

Remotely accesses an SNMP agent and displays management information of the specified object instance.

### Syntax

```
snmp rget [version { 1 | 2 }] <ip address> <community> <variable name>
```

### Input mode

User mode and administrator mode

### Parameters

version { 1 | 2 }

Specify the SNMP version.

Operation when this parameter is omitted:

1 is specified.

<ip address>

Specify the IP address of the device which is remotely accessed. Only an IPv4 address can be specified.

<community>

Specify the community name of the remote device.

<variable name>

Specify an object name of MIB or an object in dot notation.

### Example

*Figure 17-12: Example of executing the snmp rget command*

```
> snmp rget version 2 192.0.2.1 public sysUpTime.0
```

```
Name: sysUpTime.0
```

```
Value: 508495
```

```
> snmp rget version 2 192.0.2.1 public 1.3.6.1.2.1.1.3.0
```

```
Name: sysUpTime.0
```

```
Value: 508495
```

### Display items

*Table 17-21: Information displayed by the snmp rget command*

Item	Displayed information	Displayed detailed information
Name	Object instance	--
Value	Object instance value	--

### Impact on communication

None

## Response messages

Table 17-22: List of response messages for the snmp rget command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. (# <i>&lt;number&gt;</i> object ID)	An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. The object ID specified at position <i>&lt;number&gt;</i> did not match anything. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of ifPhysAddress is 0x41 0x42 0x43 0x44 0x45 0x46, ABCDEF is output.

---

## snmp rgetnext

---

Remotely accesses an SNMP agent and displays the management information following the specified object instance.

### Syntax

```
snmp rgetnext [version { 1 | 2 }] <ip address> <community> <variable name>
```

### Input mode

User mode and administrator mode

### Parameters

version { 1 | 2 }

Specify the SNMP version.

Operation when this parameter is omitted:

1 is specified.

<ip address>

Specify the IP address of the device which is remotely accessed. Only an IPv4 address can be specified.

<community>

Specify the community name of the remote device.

<variable name>

Specify an object name of MIB or an object in dot notation.

### Example

*Figure 17-13: Example of executing the snmp rgetnext command*

```
> snmp rgetnext version 2 192.0.2.1 public sysObjectID.0
```

```
Name: sysUpTime.0
```

```
Value: 27603450
```

```
> snmp rgetnext version 2 192.0.2.1 public 1.3.6.1.2.1.1.2.0
```

```
Name: sysUpTime.0
```

```
Value: 27603450
```

### Display items

*Table 17-23: Information displayed by the snmp rgetnext command*

Item	Displayed information	Displayed detailed information
Name	Object instance following the specified one	--
Value	Object instance value following the specified one	--

### Impact on communication

None

## Response messages

Table 17-24: List of response messages for the snmp rgetnext command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. (# <i>&lt;number&gt;</i> object ID)	An error code in a packet from the SNMP agent indicates that a specified object ID does not match any variable. The object ID specified at position <i>&lt;number&gt;</i> did not match anything. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of ifPhysAddress is 0x41 0x42 0x43 0x44 0x45 0x46, ABCDEF is output.

---

## snmp rwalk

---

Remotely accesses an SNMP agent and displays all instances of the applicable object from the management information following the specified object instance.

### Syntax

```
snmp rwalk [version { 1 | 2 }] <ip address> <community> <variable name>
```

### Input mode

User mode and administrator mode

### Parameters

version { 1 | 2 }

Specify the SNMP version.

Operation when this parameter is omitted:

1 is specified.

<ip address>

Specify the IP address of the device which is remotely accessed. Only an IPv4 address can be specified.

<community>

Specify the community name of the remote device.

<variable name>

Specify an object name of MIB or an object in dot notation.

### Example

*Figure 17-14: Example of executing the snmp rwalk command*

```
> snmp rwalk version 2 192.0.2.1 public ifDescr

Name: ifDescr.1
Value: MGMT0

Name: ifDescr.1000
Value: loopback

Name: ifDescr.6001
Value: channel-group 1

Name: ifDescr.10101
Value: GigabitEthernet 1/1
      :
      :
>

> snmp rwalk version 2 192.0.2.1 public 1.3.6.1.2.1.2.2.1.2

Name: ifDescr.1
Value: MGMT0

Name: ifDescr.1000
Value: loopback

Name: ifDescr.6001
Value: channel-group 1

Name: ifDescr.10101
```



```

Value: GigabitEther 1/1
      :
      :
>

```

## Display items

Table 17-25: Information displayed by the snmp rwalk command

Item	Displayed information	Displayed detailed information
Name	Object instance following the specified one	--
Value	Object instance value following the specified one	--

## Impact on communication

None

## Response messages

Table 17-26: List of response messages for the snmp rwalk command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The dot syntax for the specified object ID (make_obj_id_from_dot) is invalid because it includes the character x, y, or z.	An object ID specified in dot notation contains invalid characters, such as x, y, and z.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.

Message	Description
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

## Notes

1. If there are too many interfaces on the target device, it takes time to search IP-related MIB information, and a timeout might occur. If that happens, use the `snmp rget` command to acquire the information, or use the `snmp rgetnext` command to specify the index values in order and then acquire the information.
2. If the MIB value has SYNTAX that outputs a character string, and the value consists of only the characters that can be encoded in ASCII (in the range of 0x20 to 0x7e, 0x0a, and 0x0d), the character string encoded in ASCII is output. For example, if the MIB value of `ifPhysAddress` is 0x41 0x42 0x43 0x44 0x45 0x46, ABCDEF is output.

## snmp rgetroute

Remotely accesses an SNMP agent and displays routing information from management information of ipRouteTable.

### Syntax

```
snmp rgetroute <ip address> <community>
```

### Input mode

User mode and administrator mode

### Parameters

<ip address>

Specify the IP address of the device which is remotely accessed. Only an IPv4 address can be specified.

<community>

Specify the community name of the remote device.

### Example

Figure 17-15: Example of executing the snmp rgetroute command

```
> snmp rgetroute 192.0.2.1 public
Index Destination      NextHop          Metric1 Type      Proto      Age
  1 192.168.0.0        192.168.0.56          0 direct   local     34324
  1 192.168.0.56      192.168.0.56          0 direct   local     34324
```

### Display items

Table 17-27: Information displayed by the snmp rgetroute command

Item	Displayed information	Displayed detailed information
Index	Indicates the interface number used for reaching the next hop on this route (ipRouteIfIndex).	--
Destination	Indicates the destination IP address on this route (ipRouteDest).	--
NextHop	Indicates the IP address of the next hop for the destination of this route (ipRouteNextHop).	--
Metric1	Indicates the primary routing metric for this route (ipRouteMetric1).	--
Type	Indicate the type of this route (ipRouteType).	direct (direct route)
		indirect (indirect route)
		invalid (invalid route)
		other (others)

Item	Displayed information	Displayed detailed information
Proto	Indicates the routing protocol (ipRouteProto).	rip (RIP)
		ospf (OSPF)
		bgp (BGP)
		local (static routing)
		other (others)
Age	Indicates the number of seconds elapsed after this route was last updated or confirmed (ipRouteAge).	--

## Impact on communication

None

## Response messages

Table 17-28: List of response messages for the snmp rgetroute command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address

Message	Description
There is no routing table entry.	There is no routing table entry.

**Notes**

1. If there are too many interfaces on the target device, it takes time to search MIB information for ipRouteTable, and a timeout might occur. If that happens, use the `snmp rgetnext` command to acquire the ipRouteTable information.

---

## snmp rgetarp

---

Remotely accesses an SNMP agent and displays ARP information from management information of ipNetToMediaTable.

### Syntax

```
snmp rgetarp <ip address> <community>
```

### Input mode

User mode and administrator mode

### Parameters

<ip address>

Specify the IP address of the device which is remotely accessed. Only an IPv4 address can be specified.

<community>

Specify the community name of the remote device.

### Example

*Figure 17-16: Example of executing the snmp rgetarp command*

```
> snmp rgetarp 192.0.2.1 public
Index      Network Address      Physical Address      Type
  1         192.168.0.1         0012.e264.eb02      dynamic
  1         192.168.0.209        0012.e23e.3e8f      dynamic
  1         192.168.0.210        0012.e2c9.6ba6      dynamic
```

### Display items

*Table 17-29: Information displayed by the snmp rgetarp command*

Item	Displayed information	Displayed detailed information
Index	Indicates the interface number that has this ARP information (ipNetToMediaIfIndex).	--
Network Address	Indicates the IP address corresponding to a physical address (ipNetToMediaNetAddress).	--
Physical Address	Indicates a physical address (ipNetToMediaPhysAddress).	--
Type	Indicates the type of mapping (ipNetToMediaType).	other (Mapping other than the following types)
		invalid (invalid mapping)
		dynamic (dynamic mapping)
		static (static mapping)

### Impact on communication

None

## Response messages

Table 17-30: List of response messages for the snmp rgetarp command

Message	Description
A MIB object name is invalid. (object = <i>&lt;object name or object id&gt;</i> )	A MIB object name is invalid. <i>&lt;object name or object id&gt;</i> : Object name or object ID
A receive error occurred.	A receive error occurred.
A received SNMP packet includes an invalid status code. (code = <i>&lt;code&gt;</i> )	A received SNMP packet includes an invalid status code. <i>&lt;code&gt;</i> : Status code
An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum.	An error code in a packet from the SNMP agent indicates that a MIB value exceeds the maximum allowed size.
An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID is not obtained. (ID of non-acquired object = <i>&lt;number&gt;</i> )	An error code in a packet from the SNMP agent indicates that a MIB value for a specified object ID was not obtained. The object ID specified at position <i>&lt;number&gt;</i> could not be obtained. <i>&lt;number&gt;</i> : The specified order number
Sending of an SNMP packet failed.	Sending of an SNMP packet failed.
SNMP packet request IDs do not match. (received = <i>&lt;id1&gt;</i> , expected = <i>&lt;id2&gt;</i> )	An SNMP packet whose ID number is <i>&lt;id2&gt;</i> was requested, but an SNMP packet whose ID number is <i>&lt;id1&gt;</i> was received. Alternatively, a timeout occurred while searching the MIB. <i>&lt;id1&gt;</i> : Identification number <i>&lt;id2&gt;</i> : Identification number
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The format of a received SNMP packet is invalid.	An SNMP packet in an invalid format was received.
The format of a received SNMP PDU is invalid.	An SNMP PDU in an invalid format was received.
The SNMP agent is not responding. The operation will be retried.	The command is being retried because there were no responses from the applicable SNMP agent.
The SNMP agent is not responding. Try again.	There is no response from the applicable SNMP agent. Try again.
The specified SNMP agent address is invalid. (address = <i>&lt;snmp agent ip address&gt;</i> )	The specified SNMP agent address is invalid. <i>&lt;snmp agent ip address&gt;</i> : SNMP agent address
There is no ARP table entry.	There is no ARP table entry.

## Notes

1. If there are too many interfaces on the target device, it takes time to search MIB information for ipNetToMediaTable, and a timeout might occur. If that happens, use the `snmp rgetnext` command to acquire the ipNetToMediaTable information.





## Chapter

---

# 18. Ethernet

---

```
show interfaces (10BASE-T/100BASE-TX/1000BASE-T)
show interfaces (1000BASE-X)
show interfaces (10GBASE-R)
show interfaces (100GBASE-R)
clear counters
show port
activate
inactivate
restart interface-manager
```

---

## show interfaces (10BASE-T/100BASE-TX/1000BASE-T)

---

Displays Ethernet information.

### Syntax

```
show interfaces gigabitethernet <nif no.>/<port no.> [detail]
```

### Input mode

User mode and administrator mode

### Parameters

gigabitethernet

Specifies 10BASE-T, 100BASE-TX, or 1000BASE-T.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

detail

Displays detailed statistics.

Operation when this parameter is omitted:

Normal statistics are displayed.

### Example

*Figure 18-1: Execution results when 10BASE-T/100BASE-TX/1000BASE-T is specified*

```
> show interfaces gigabitethernet 1/1
Date 20XX/04/01 12:00:00 UTC
NIF1 : active(restart required) 12-port 10BASE-T/100BASE-TX/1000BASE-T
retry:0
    Average:700Mbps/24Gbps  Peak:750Mbps at 08:10:30
Port1: active up 1000BASE-T full(auto) 0012.e240.0a04
    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:290.0Mbps  340pps
    Input rate:290.0Mbps  340pps
    Flow control send :on
    Flow control receive:on
    TPID:8100
    Frame size:1518 Octets  retry:1  Interface name:ge1/1
    description:test lab area network
    [Out octets/packets counter]
    Octets : 0
    Unicast packets : 0
    Multicast packets : 0
    Broadcast packets : 0
    Pause packets : 0
    [In octets/packets counter]
    Octets : 0
    Unicast packets : 0
    Multicast packets : 0
    Broadcast packets : 0
    Pause packets : 0
    [Out line error counter]
    Late collision : 0
    Single collision : 0
    Multiple collisions : 0
    Excessive collisions : 0
```

```

Carrier sense lost           : 0
Defer indication            : 0
Excessive deferral          : 0
Underrun                    : 0
Error frames                : 0
[In line error counter]
CRC errors                  : 0
Alignment                   : 0
Fragments                   : 0
Jabber                      : 0
Symbol errors               : 0
Short frames                : 0
Long frames                 : 0
Error frames                : 0
[Line fault counter]
MDI cross over changed      : 0
Link down                   : 0
Link down in operational state : 0
>

```

*Figure 18-2:* Execution results for the specification of 10BASE-T/100BASE-TX/1000BASE-T detailed statistics

```

> show interfaces gigabitethernet 1/1 detail
Date 20XX/04/01 12:00:00 UTC
NIF1 : active(restart required) 12-port 10BASE-T/100BASE-TX/1000BASE-T
retry:0
Average:700Mbps/24Gbps Peak:750Mbps at 08:10:30
Port1: active up 1000BASE-T full(auto) 0012.e240.0a04
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:290.0Mbps 340pps
Input rate:290.0Mbps 340pps
Flow control send :on
Flow control receive:on
TPID:8100
Frame size:1518 Octets retry:1 Interface name:ge1/1
description:test lab area network
[Out octets/packets counter]
Octets : 0
Unicast packets : 0
Multicast packets : 0
Broadcast packets : 0
Pause packets : 0
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
64 packets : 0
65-127 packets : 0
128-255 packets : 0
256-511 packets : 0
512-1023 packets : 0
1024-1518 packets : 0
:
:
:
>

```

## Display items

Table 18-1: Information displayed for a 10BASE-T/100BASE-TX/1000BASE-T NIF

Item	Displayed information	Displayed detailed information
NIF	NIF number	
NIF status	active	Operating as an active unit
	initialize	Currently initializing
	fault	Failed
	inactive	<ul style="list-style-type: none"> <li>Operation has been stopped by the <code>inactivate</code> command.</li> <li>The NIF is not running.</li> </ul>
	notconnect	<ul style="list-style-type: none"> <li>Not installed</li> <li>Not used (If a single-size NIF is installed, the NIF number to which +2 is added is displayed like this.)</li> </ul>
	disable	Operation has been stopped by the <code>no power enable</code> configuration command.
	power shortage	Operation has been stopped because of a power shortage
	notsupport	Operation has been stopped because an unsupported NIF is installed.
(Update state of the NIF) <sup>#1</sup>	update executing	HDC is being updated.
	restart required	The NIF needs to be restarted to apply the HDC.
	update failed	An attempt to update the HDC failed. Replace the NIF because it might have failed.
NIF type	12-port 10BASE-T/100BASE-TX/1000BASE-T	12 10BASE-T, 100BASE-TX, or 1000BASE-T lines
	-	The NIF type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>No NIFs are installed.</li> <li>An unsupported NIF is installed.</li> </ul>
retry	Number of times the NIF restarted due to a failure <sup>#2</sup>	
Average	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#1: This information is not displayed if the update has not been performed.

#2: The number of times the NIF restarted due to a failure is initialized once every hour.

Table 18-2: Information displayed for a 10BASE-T/100BASE-TX/1000BASE-T port

Item	Displayed information	Displayed detailed information
Port	Port number	
Port status	active up	Active (normal operating state)
	active down	Active (A line failure occurred.)
	initialize	Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating).
	fault	Failed
	inactive	Operation has been stopped by the <code>inactivate</code> command.
	disable	Operation has been stopped by the <code>shutdown</code> configuration command.
	standby	Operation is in a standby state by the standby link functionality of link aggregation.
	suspend	The start of the port is suppressed due to the following reasons: <ul style="list-style-type: none"> <li>• The number of operating SFUs is insufficient.</li> <li>• The PRU is being initialized.</li> </ul>
	unused	unused (no configuration)
	mismatch	The installed NIF and the configuration do not match.
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. This is indicated in the following cases: <ul style="list-style-type: none"> <li>• Auto-negotiation is enabled but the port status is not <code>active up</code>.</li> <li>• The port status is <code>initialize</code>.</li> <li>• The port status is <code>fault</code>.</li> </ul>
MAC address	MAC address of the port	

Item	Displayed information	Displayed detailed information
Time-since-last-status-change	Displays the elapsed time since the last change in status. <i>hh:mm:ss</i> (when the elapsed time is 24 hours or less: <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) <i>dd.hh:mm:ss</i> (when the elapsed time is more than 24 hours: <i>dd</i> = number of days, <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) Over 100 days (when the elapsed time is more than 100 days)	
Bandwidth	Displays the bandwidth of the line in kbps. If the <code>bandwidth</code> configuration command has not been executed, the line speed of the port is displayed. If the <code>bandwidth</code> configuration command is set, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate <sup>#1</sup>	Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate <sup>#1</sup>	Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send <sup>#2</sup>	on	Pause packets are sent.
	off	Pause packets are not sent.
Flow control receive <sup>#2</sup>	on	Pause packets are received.
	off	Pause packets are not received.
TPID	Displays a TagProtocolIdentifier value that is used on the port to identify the VLAN.	

Item	Displayed information	Displayed detailed information
Frame size <sup>#3</sup>	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.	
retry	Displays the number of times the port was reactivated due to a fault. <sup>#4</sup>	
Interface name	Displays the name assigned to a port.	
description	Displays the contents of the <code>description</code> configuration. The <code>description</code> configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the <code>description</code> configuration has not been set.	

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the display unit varies depending on the displayed value, as follows:

- If the displayed value is 10000 or larger, the unit is k.
- If the displayed value is 10000 k or larger, the unit is M.

In the above cases, one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is `active up`.

#3: This item is always - except when the status of the port is `active up`.

#4: The number of times the port was reactivated due to a fault is initialized once every hour.

Table 18-3: Displayed 10BASE-T/100BASE-TX/1000BASE-T statistics

Item	Displayed information
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 Send and receive error statistics are not included.
	Multicast packets Number of multicast packets Send and receive error statistics are not included. Note that the value increments when pause packets are sent and received.
	Broadcast packets Number of broadcast packets Send and receive error statistics are not included.
	Pause packets Number of pause packets
	64 packets The number of packets whose frame length is 64 octets. <sup>#1</sup> The value includes send and receive error statistics.

Item		Displayed information
	65-127 packets	The number of packets whose frame length is from 65 to 127 octets. <sup>#1</sup> The value includes send and receive error statistics.
	128-255 packets	The number of packets whose frame length is from 128 to 255 octets. <sup>#1</sup> The value includes send and receive error statistics.
	256-511 packets	The number of packets whose frame length is from 256 to 511 octets. <sup>#1</sup> The value includes send and receive error statistics.
	512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets. <sup>#1</sup> The value includes send and receive error statistics.
	1024-1518 packets	The number of packets whose frame length is 1024 or more octets. <sup>#1</sup> The value includes send and receive error statistics (Jabber and Long frames are excluded).
Detailed statistical items for send errors	Late collision	The number of collisions detected after the 512-bit time has elapsed
	Single collision	The number of transmissions that were successful after one collision
	Multiple collisions	The number of transmissions that were successful after two or more collisions
	Excessive collisions	The number of transfer failures due to excessive collisions (16 collisions)
	Carrier sense lost	The number of no-carrier errors that occurred during transmission
	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
	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 collisions, Carrier sense lost, Excessive deferral, 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 <sup>#1#2</sup>
	Alignment	The number of times the frame length was invalid and an error was detected by the FCS check <sup>#1#2</sup>
	Fragments	The number of times a short frame (whose length was shorter than 64 octets) was received and an FCS error or an alignment error occurred <sup>#1#2</sup>
	Jabber	The number of times a long frame (whose length exceeded the max frame length) was received and an FCS error or an alignment error occurred <sup>#1#2</sup>
	Symbol errors	The number of symbol errors that occurred



Item		Displayed information
	Short frames	The number of received packets that are shorter than the frame length <sup>#1</sup>
	Long frames	The number of received packets that exceed the frame length <sup>#1</sup>
	Error frames	The total number of frames discarded due to errors (total value of the following items: CRC errors, Fragments, Jabber, Symbol errors, Short frames, Long frames)
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
	Link down in operational state	The number of link failures that occurred during communication (a link was not established)

#1: The frame length indicates the length starting from the MAC header and ending with the FCS field.

#2: For NL1G-12T, this value might also be counted when the port comes up.

### Impact on communication

None

### Response messages

Table 18-4: List of response messages for the show interfaces (10BASE-T/100BASE-TX/1000BASE-T) (Ethernet) command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The NIF that controls the specified port is not supported. (NIF/port = <nif no.>/<port no.>)	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The port number is invalid. (port number = <port no.>)	The port number is outside the valid range. Make sure the specified parameter is correct. <port no.>: Indicates the port number.
The specified NIF is not connected. (NIF = <nif no.>)	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified port is not a gigabit Ethernet port. (NIF/port = <nif no.>/<port no.>)	The specified port is not a 10BASE-T, 100BASE-TX, or 1000BASE-T port. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.

Message	Description
There is no operational port.	There are no available ports. Make sure the specified parameter is correct.

## Notes

- The counters of average used bandwidth, maximum used bandwidth, and statistics are cleared in the following cases:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status
- If the `clear counters` command is executed, the statistics counter is cleared.

---

# show interfaces (1000BASE-X)

---

Displays Ethernet information.

## Syntax

show interfaces gigabitethernet <nif no.>/<port no.> [detail]

## Input mode

User mode and administrator mode

## Parameters

gigabitethernet

Specifies 1000BASE-X.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

detail

Displays detailed statistics.

Operation when this parameter is omitted:

Normal statistics are displayed.

## Example

*Figure 18-3: Execution results when 1000BASE-X is specified*

```
>show interfaces gigabitethernet 1/1
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 12-port 1000BASE-X(SFP) retry:0
      Average:700Mbps/24Gbps Peak:750Mbps at 08:10:30
Port1: active up 1000BASE-SX full(auto) 0012.e240.0a04
      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:290.0Mbps 340pps
      Input rate:290.0Mbps 340pps
      Flow control send :on
      Flow control receive:on
      TPID:8100
      Frame size:1518 Octets retry:0 Interface name:gehl1/1
      description:test lab area network
      [Out octets/packets counter]
      Octets : 0
      Unicast packets : 0
      Multicast packets : 0
      Broadcast packets : 0
      Pause packets : 0
      [In octets/packets counter]
      Octets : 0
      Unicast packets : 0
      Multicast packets : 0
      Broadcast packets : 0
      Pause packets : 0
      [Out line error counter]
      Underrun : 0
      Error frames : 0
      [In line error counter]
      CRC errors : 0
```

```

Alignment                : 0
Fragments                : 0
Jabber                   : 0
Symbol errors            : 0
Short frames             : 0
Long frames              : 0
Overrun                  : 0
Error frames             : 0
[Line fault counter]
Link down                : 0
Signal detect errors     : 0
Transceiver notconnect   : 0
Link down in operational state : 0
Signal detect errors in operational state : 0
Transceiver notconnect in operational state : 0
>

```

*Figure 18-4: Execution results for the specification of 1000BASE-X detailed statistics*

```

>show interfaces gigabitethernet 1/1 detail
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 12-port 1000BASE-X(SFP) retry:0
    Average:700Mbps/24Gbps Peak:750Mbps at 08:10:30
Port1: active up 1000BASE-SX full(auto) 0012.e240.0a04
    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:290.0Mbps 340pps
    Input rate:290.0Mbps 340pps
    Flow control send :on
    Flow control receive:on
    TPID:8100
    Frame size:1518 Octets retry:0 Interface name:ge1/1
    description:test lab area network
    [Out octets/packets counter]
    Octets                : 0
    Unicast packets       : 0
    Multicast packets     : 0
    Broadcast packets     : 0
    Pause packets        : 0
    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
    64 packets           : 0
    65-127 packets       : 0
    128-255 packets      : 0
    256-511 packets      : 0
    512-1023 packets     : 0
    1024-1518 packets    : 0
    :                     :
    :                     :
    :                     :
>

```

## Display items

Table 18-5: Information displayed for a 1000BASE-X NIF

Item	Displayed information	Displayed detailed information
NIF	NIF number	
NIF status	active	Operating as an active unit
	initialize	Currently initializing
	fault	Failed
	inactive	<ul style="list-style-type: none"> <li>Operation has been stopped by the <code>inactivate</code> command.</li> <li>The NIF is not running.</li> </ul>
	notconnect	<ul style="list-style-type: none"> <li>Not installed</li> <li>Not used (If a single-size NIF is installed, the NIF number to which +2 is added is displayed like this.)</li> </ul>
	disable	Operation has been stopped by the <code>no power enable</code> configuration command.
	power shortage	Operation has been stopped because of a power shortage
	notsupport	Operation has been stopped because an unsupported NIF is installed.
(Update state of the NIF) <sup>#1</sup>	update executing	HDC is being updated.
	restart required	The NIF needs to be restarted to apply the HDC.
	update failed	An attempt to update the HDC failed. Replace the NIF because it might have failed.
NIF type	12-port 1000BASE-X(SFP)	12 1000BASE-X (SFP) lines
	-	The NIF type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>No NIFs are installed.</li> <li>An unsupported NIF is installed.</li> </ul>
retry	Number of times the NIF restarted due to a failure <sup>#2</sup>	
Average	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time (hour:minute:second). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#1: This information is not displayed if the update has not been performed.

#2: The number of times the NIF restarted due to a failure is initialized once every hour.

Table 18-6: Information displayed for a 1000BASE-X port

Item	Displayed information	Displayed detailed information
Port	Port number	
Port status	active up	Active (normal operating state)
	active down	Active (A line failure occurred.)
	initialize	Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating).
	fault	Failed
	inactive	Operation has been stopped by the <code>inactivate</code> command.
	disable	Operation has been stopped by the <code>shutdown</code> configuration command.
	standby	Operation is in a standby state by the standby link functionality of link aggregation.
	suspend	The start of the port is suppressed due to the following reasons: <ul style="list-style-type: none"> <li>• The number of operating SFUs is insufficient.</li> <li>• The PRU is being initialized.</li> </ul>
	unused	unused (no configuration)
	mismatch	The installed NIF and the configuration do not match.
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 (10 km) full duplex
	1000BASE-BX10-U full	1000BASE-BX-U (10 km) full duplex
	1000BASE-BX40-D full	1000BASE-BX-D (40 km) full duplex
	1000BASE-BX40-U full	1000BASE-BX-U (40 km) 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 (10 km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX10-U full(auto)	1000BASE-BX-U (10 km) full duplex (Line type determined by auto-negotiation.)

Item	Displayed information	Displayed detailed information
	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.)
	-	The line type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>The port status is <code>initialize</code>.</li> <li>The port status is <code>fault</code>.</li> <li>The transceiver status is <code>not connect</code>.</li> </ul>
MAC address	MAC address of the port	
Type of transceiver	SFP	SFP
Status of the transceiver	connect	Implemented
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>The port status is <code>suspend</code>.</li> <li>The port status is <code>initialize</code>.</li> <li>The port status is <code>fault</code>.</li> </ul>
Time-since-last-status-change	Displays the elapsed time since the last change in status. <i>hh:mm:ss</i> (when the elapsed time is 24 hours or less: <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) <i>dd.hh:mm:ss</i> (when the elapsed time is more than 24 hours: <i>dd</i> = number of days, <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) Over 100 days (when the elapsed time is more than 100 days)	
Bandwidth	Displays the bandwidth of the line in kbps. If the <code>bandwidth</code> configuration command has not been executed, the line speed of the port is displayed. If the <code>bandwidth</code> configuration command is set, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

Item	Displayed information	Displayed detailed information
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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate <sup>#1</sup>	Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate <sup>#1</sup>	Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send <sup>#2</sup>	on	Pause packets are sent.
	off	Pause packets are not sent.
Flow control receive <sup>#2</sup>	on	Pause packets are received.
	off	Pause packets are not received.
TPID	Displays a TagProtocolIdentifier value that is used on the port to identify the VLAN.	
Frame size <sup>#3</sup>	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.	
retry	Displays the number of times the port was reactivated due to a fault. <sup>#4</sup>	
Interface name	Displays the name assigned to a port.	
description	Displays the contents of the <code>description</code> configuration. The <code>description</code> configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the <code>description</code> configuration has not been set.	

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the display unit varies depending on the displayed value, as follows:

- If the displayed value is 10000 or larger, the unit is k.
- If the displayed value is 10000 k or larger, the unit is M.

In the above cases, one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is `active up`.

#3: This item is always - except when the status of the port is `active up`.

#4: The number of times the port was reactivated due to a fault is initialized once every hour.

Table 18-7: Displayed 1000BASE-X statistics

Item	Displayed information
Category	[Out octets/packets counter]
	[In octets/packets counter]



Item		Displayed information
	[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 Send and receive error statistics are not included. Note that the value increments when pause packets are sent and received.
	Broadcast packets	Number of broadcast packets Send and receive error statistics are not included.
	Pause packets	Number of pause packets
	64 packets	The number of packets whose frame length is 64 octets. <sup>#1</sup> The value includes send and receive error statistics.
	65-127 packets	The number of packets whose frame length is from 65 to 127 octets. <sup>#1</sup> The value includes send and receive error statistics.
	128-255 packets	The number of packets whose frame length is from 128 to 255 octets. <sup>#1</sup> The value includes send and receive error statistics.
	256-511 packets	The number of packets whose frame length is from 256 to 511 octets. <sup>#1</sup> The value includes send and receive error statistics.
	512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets. <sup>#1</sup> The value includes send and receive error statistics.
	1024-1518 packets	The number of packets whose frame length is 1024 or more octets. <sup>#1</sup> The value includes send and receive error statistics (Jabber and Long frames are excluded).
Detailed statistical items for send errors	Underrun	The number of underrun errors that occurred
	Error frames	The 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 <sup>#1#2</sup>
	Alignment	The number of times the frame length was invalid and an error was detected by the FCS check <sup>#1#2</sup>

Item		Displayed information
	Fragments	The number of times a short frame (whose length was shorter than 64 octets) was received and an FCS error or an alignment error occurred <sup>#1#2</sup>
	Jabber	The number of times a long frame (whose length exceeded the max frame length) was received and an FCS error or an alignment error occurred <sup>#1#2</sup>
	Symbol errors	The number of symbol errors that occurred
	Short frames	The number of received packets that are shorter than the frame length <sup>#1</sup>
	Long frames	The number of received packets that exceed the frame length <sup>#1</sup>
	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: CRC errors, Fragments, Jabber, Symbol errors, Short frames, Long frames, 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 removed
	Link down in operational state	The number of link failures that occurred during communication (a link was not established)
	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: The frame length indicates the length starting from the MAC header and ending with the FCS field.

#2: For NL1G-12S, this value might also be counted when the port comes up.

## Impact on communication

None

## Response messages

*Table 18-8:* List of response messages for the show interfaces (1000BASE-X) (Ethernet) command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <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
The NIF that controls the specified port is not supported. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The port number is invalid. (port number = <i>&lt;port no.&gt;</i> )	The port number is outside the valid range. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified NIF is not connected. (NIF = <i>&lt;nif no.&gt;</i> )	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number.
The specified port is not a gigabit Ethernet port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 1000BASE-X port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
There is no operational port.	There are no available ports. Make sure the specified parameter is correct.

## Notes

- The counters of average used bandwidth, maximum used bandwidth, and statistics are cleared in the following cases:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status
- If the `clear counters` command is executed, the statistics counter is cleared.

---

## show interfaces (10GBASE-R)

---

Displays Ethernet information.

### Syntax

```
show interfaces tengigabitethernet <nif no.>/<port no.> [detail]
```

### Input mode

User mode and administrator mode

### Parameters

tengigabitethernet

Specifies 10GBASE-R.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

detail

Displays detailed statistics.

Operation when this parameter is omitted:

Normal statistics are displayed.

### Example

*Figure 18-5: Execution results when 10GBASE-R is specified*

```
>show interfaces tengigabitethernet 1/1
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 6-port 10GBASE-R(SFP+) retry:0
      Average:7000Mbps/120Gbps Peak:7500Mbps at 08:10:30
Port1: active up 10GBASE-LR 0012.e240.0a04
      SFP+ 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:2900.0Mbps 3400pps
      Input rate:2900.0Mbps 3400pps
      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
      [In octets/packets counter]
      Octets : 0
      Unicast packets : 0
      Multicast packets : 0
      Broadcast packets : 0
      Pause packets : 0
      [Out line error counter]
      Underrun/Overrun : 0
      Error frames : 0
      [In line error counter]
      CRC errors : 0
```

```

Alignment                : 0
Fragments                : 0
Jabber                   : 0
Underrun/Overrun         : 0
Symbol errors            : 0
Short frames             : 0
Long frames              : 0
Error frames             : 0
[Line fault counter]
Signal detect errors      : 0
Transceiver notconnect   : 0
LOS of sync              : 0
HI_BER                   : 0
LF                        : 0
RF                        : 0
Signal detect errors in operational state : 0
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
>

```

*Figure 18-6: Execution results for the specification of 10GBASE-R detailed statistics*

```

>show interfaces tengigabitethernet 1/1 detail
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 6-port 10GBASE-R(SFP+) retry:0
      Average:7000Mbps/120Gbps Peak:7500Mbps at 08:10:30
Port1: active up 10GBASE-LR 0012.e240.0a04
      SFP+ 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:2900.0Mbps 3400pps
      Input rate:2900.0Mbps 3400pps
      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
      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
      64 packets             : 0
      65-127 packets         : 0
      128-255 packets        : 0
      256-511 packets        : 0
      512-1023 packets       : 0
      1024-1518 packets      : 0
      :
      :
      :

```

&gt;

## Display items

Table 18-9: Information displayed for a 10GBASE-R NIF

Item	Displayed information	Displayed detailed information
NIF	NIF number	
NIF status	active	Operating as an active unit
	initialize	Currently initializing
	fault	Failed
	inactive	<ul style="list-style-type: none"> <li>Operation has been stopped by the <code>inactivate</code> command.</li> <li>The NIF is not running.</li> </ul>
	notconnect	<ul style="list-style-type: none"> <li>Not installed</li> <li>Not used (If a single-size NIF is installed, the NIF number to which +2 is added is displayed like this.)</li> </ul>
	disable	Operation has been stopped by the <code>no power enable</code> configuration command.
	power shortage	Operation has been stopped because of a power shortage
	notsupport	Operation has been stopped because an unsupported NIF is installed.
(Update state of the NIF) <sup>#1</sup>	update executing	HDC is being updated.
	restart required	The NIF needs to be restarted to apply the HDC.
	update failed	An attempt to update the HDC failed. Replace the NIF because it might have failed.
NIF type	6-port 10GBASE-R(SFP+)	Six 10GBASE-R (SFP+) lines
	-	The NIF type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>No NIFs are installed.</li> <li>An unsupported NIF is installed.</li> </ul>
retry	Number of times the NIF restarted due to a failure <sup>#2</sup>	
Average	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak	Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time (hour:minute:second). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

#1: This information is not displayed if the update has not been performed.

#2: The number of times the NIF restarted due to a failure is initialized once every hour.

Table 18-10: Information displayed for a 10GBASE-R port

Item	Displayed information	Displayed detailed information
Port	Port number	
Port status	active up	Active (normal operating state)
	active down	Active (A line failure occurred.)
	initialize	Currently initializing
	fault	Failed
	inactive	Operation has been stopped by the <code>inactivate</code> command.
	disable	Operation has been stopped by the <code>shutdown</code> configuration command.
	standby	Operation is in a standby state by the standby link functionality of link aggregation.
	suspend	The start of the port is suppressed due to the following reasons: <ul style="list-style-type: none"> <li>• The number of operating SFUs is insufficient.</li> <li>• The PRU is being initialized.</li> </ul>
	unused	unused (no configuration)
	mismatch	The installed NIF and the configuration do not match.
Line type	10GBASE-SR	10GBASE-SR
	10GBASE-LR	10GBASE-LR
	10GBASE-ER	10GBASE-ER
	-	The line type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>• The port status is <code>initialize</code>.</li> <li>• The port status is <code>fault</code>.</li> <li>• The transceiver status is <code>not connect</code>.</li> </ul>
MAC address	MAC address of the port	
Type of transceiver	SFP+	SFP+
Status of the transceiver	connect	Implemented
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>• The port status is <code>suspend</code>.</li> <li>• The port status is <code>initialize</code>.</li> <li>• The port status is <code>fault</code>.</li> </ul>

Item	Displayed information	Displayed detailed information
Time-since-last-status-change	Displays the elapsed time since the last change in status. <i>hh:mm:ss</i> (when the elapsed time is 24 hours or less: <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) <i>dd.hh:mm:ss</i> (when the elapsed time is more than 24 hours: <i>dd</i> = number of days, <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) Over 100 days (when the elapsed time is more than 100 days)	
Bandwidth	Displays the bandwidth of the line in kbps. If the <code>bandwidth</code> configuration command has not been executed, the line speed of the port is displayed. If the <code>bandwidth</code> configuration command is set, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate <sup>#1</sup>	Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate <sup>#1</sup>	Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send <sup>#2</sup>	on	Pause packets are sent.
	off	Pause packets are not sent.
Flow control receive <sup>#2</sup>	on	Pause packets are received.
	off	Pause packets are not received.



Item	Displayed information	Displayed detailed information
TPID	Displays a <code>TagProtocolIdentifier</code> value that is used on the port to identify the VLAN.	
Frame size <sup>#3</sup>	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.	
retry	Displays the number of times the port was reactivated due to a fault. <sup>#4</sup>	
Interface name	Displays the name assigned to a port.	
description	Displays the contents of the <code>description</code> configuration. The <code>description</code> configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the <code>description</code> configuration has not been set.	

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the display unit varies depending on the displayed value, as follows:

- If the displayed value is 10000 or larger, the unit is k.
- If the displayed value is 10000 k or larger, the unit is M.
- If the displayed value is 10000 M or larger, the unit is G.

In the above cases, one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is `active up`.

#3: This item is always - except when the status of the port is `active up`.

#4: The number of times the port was reactivated due to a fault is initialized once every hour.

Table 18-11: Displayed 10GBASE-R statistics

Item		Displayed information
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 Send and receive error statistics are not included.
	Multicast packets	Number of multicast packets Send and receive error statistics are not included. Note that the value increments when pause packets are sent and received.
	Broadcast packets	Number of broadcast packets Send and receive error statistics are not included.

Item		Displayed information
	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.
	64 packets	The number of packets whose frame length is 64 octets. <sup>#</sup> The value includes send and receive error statistics.
	65-127 packets	The number of packets whose frame length is from 65 to 127 octets. <sup>#</sup> The value includes send and receive error statistics.
	128-255 packets	The number of packets whose frame length is from 128 to 255 octets. <sup>#</sup> The value includes send and receive error statistics.
	256-511 packets	The number of packets whose frame length is from 256 to 511 octets. <sup>#</sup> The value includes send and receive error statistics.
	512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets. <sup>#</sup> The value includes send and receive error statistics.
	1024-1518 packets	The number of packets whose frame length is 1024 or more octets. <sup>#</sup> The value 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 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 <sup>#</sup>
	Alignment	The number of times the frame length was invalid and an error was detected by the FCS check <sup>#</sup>
	Fragments	The number of times a short frame (whose length was shorter than 64 octets) was received and an FCS error or an alignment error occurred <sup>#</sup>
	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 <sup>#</sup>
	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 <sup>#</sup>
	Long frames	The number of received packets that exceed the frame length <sup>#</sup>
	Error frames	The total number of frames discarded due to errors (total value of the following items: CRC errors, Fragments, Jabber, Underrun/Overrun, Symbol errors, Short frames, Long frames)

Item		Displayed information
Detailed statistical items for errors	Signal detect errors	The number of times a signal line could not be detected
	Transceiver notconnect	The number of times a transceiver was removed
	LOS of sync	The number of synchronization errors that occurred
	HI_BER	The number of HI_BER (High Bit Error Rate) errors that occurred
	LF	The number of LF (Local Fault) 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

#: The frame length indicates the length from the MAC header to the FCS field.

## Impact on communication

None

## Response messages

Table 18-12: List of response messages for the show interfaces (10GBASE-R) (Ethernet) command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The NIF that controls the specified port is not supported. (NIF/port = <nif no.>/<port no.>)	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The port number is invalid. (port number = <port no.>)	The port number is outside the valid range. Make sure the specified parameter is correct. <port no.>: Indicates the port number.

Message	Description
The specified NIF is not connected. (NIF = <i>&lt;nif no.&gt;</i> )	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number.
The specified port is not a 10GBASE-R port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
There is no operational port.	There are no available ports. Make sure the specified parameter is correct.

## Notes

- The counters of average used bandwidth, maximum used bandwidth, and statistics are cleared in the following cases:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status
- If the `clear counters` command is executed, the statistics counter is cleared.

---

# show interfaces (100GBASE-R)

---

Displays Ethernet information.

## Syntax

show interfaces hundredgigabitethernet <nif no.>/<port no.> [detail]

## Input mode

User mode and administrator mode

## Parameters

hundredgigabitethernet

Specifies 100GBASE-R.

<nif no.>/<port no.>

Specifies the NIF number and the port number. For the specifiable range of values, see *Specifiable values for parameters*.

detail

Displays detailed statistics.

Operation when this parameter is omitted:

Normal statistics are displayed.

## Example

*Figure 18-7: Execution results when 100GBASE-R is specified*

```
>show interfaces hundredgigabitethernet 1/1
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 1-port 100GBASE-R(CFP) retry:0
      Average:70Gbps/200Gbps Peak:75Gbps at 08:10:30
Port1: active up 100GBASE-LR4 0012.e240.0a04
      CFP connect
      Time-since-last-status-change:10:30:30
      Bandwidth:100000000kbps Average out:35Gbps Average in:35Gbps
      Peak out:38Gbps at 08:10:30 Peak in:37Gbps at 08:10:30
      Output rate:29.0Gbps 34.0kpps
      Input rate:29.0Gbps 34.0kpps
      Flow control send :on
      Flow control receive:on
      TPID:8100
      Frame size:1518 Octets retry:0 Interface name: hndgeth1/1
      description:test lab area network
      [Out octets/packets counter]
      Octets : 0
      Unicast packets : 0
      Multicast packets : 0
      Broadcast packets : 0
      Pause packets : 0
      [In octets/packets counter]
      Octets : 0
      Unicast packets : 0
      Multicast packets : 0
      Broadcast packets : 0
      Pause packets : 0
      [Out line error counter]
      Underrun/Overrun : 0
      Error frames : 0
      [In line error counter]
      CRC errors : 0
```

```

Alignment                               : 0
Fragments                               : 0
Jabber                                  : 0
Underrun/Overrun                        : 0
Symbol errors                           : 0
Short frames                            : 0
Long frames                             : 0
Error frames                            : 0
[Line fault counter]
Signal detect errors                     : 0
Transceiver notconnect                   : 0
LOS of sync                             : 0
LOS of alignment                         : 0
HI_BER                                  : 0
LF                                       : 0
RF                                       : 0
Signal detect errors in operational state : 0
Transceiver notconnect in operational state : 0
LOS of sync in operational state         : 0
LOS of alignment in operational state     : 0
HI_BER in operational state              : 0
LF in operational state                  : 0
RF in operational state                  : 0
>

```

*Figure 18-8: Execution results for the specification of 100GBASE-R detailed statistics*

```

>show interfaces hundredgigabitethernet 1/1 detail
Date 20XX/04/01 12:00:00 UTC
NIF1: active(restart required) 1-port 100GBASE-R(CFP) retry:0
    Average:70Gbps/200Gbps Peak:75Gbps at 08:10:30
Port1: active up 100GBASE-LR4 0012.e240.0a04
    CFP connect
    Time-since-last-status-change:10:30:30
    Bandwidth:100000000kbps Average out:35Gbps Average in:35Gbps
    Peak out:38Gbps at 08:10:30 Peak in:37Gbps at 08:10:30
    Output rate:29.0Gbps 34.0kpps
    Input rate:29.0Gbps 34.0kpps
    Flow control send :on
    Flow control receive:on
    TPID:8100
    Frame size:1518 Octets retry:0 Interface name: hndgeth1/1
    Lane mapping:0001020304050607080910111213141516171819
    description:test lab area network
    [Out octets/packets counter]
    Octets                               : 0
    Unicast packets                       : 0
    Multicast packets                     : 0
    Broadcast packets                     : 0
    Pause packets                         : 0
    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
    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
Error frames              : 0
[In line error counter]
CRC errors                : 0
Alignment                 : 0
Fragments                 : 0
Jabber                    : 0
Underrun/Overrun          : 0
Symbol errors             : 0
Short frames              : 0
Long frames               : 0
Error frames              : 0
[Line fault counter]
Signal detect errors      : 0
Transceiver notconnect    : 0
LOS of sync               : 0
LOS of alignment          : 0
HI_BER                    : 0
LF                        : 0
RF                        : 0
Signal detect errors in operational state : 0
Transceiver notconnect in operational state : 0
LOS of sync in operational state : 0
LOS of alignment in operational state : 0
HI_BER in operational state : 0
LF in operational state   : 0
RF in operational state   : 0
Lane 0-3 BIP error : 0 : 0 : 0 : 0
Lane 4-7 BIP error : 0 : 0 : 0 : 0
Lane 8-11 BIP error : 0 : 0 : 0 : 0
Lane 12-15 BIP error : 0 : 0 : 0 : 0
Lane 16-19 BIP error : 0 : 0 : 0 : 0

```

&gt;

## Display items

Table 18-13: Information displayed for a 100GBASE-R NIF

Item	Displayed information	Displayed detailed information
NIF	NIF number	
NIF status	active	Operating as an active unit
	initialize	Currently initializing
	fault	Failed
	inactive	<ul style="list-style-type: none"> <li>Operation has been stopped by the <code>inactivate</code> command.</li> <li>The NIF is not running.</li> </ul>
	notconnect	<ul style="list-style-type: none"> <li>Not installed</li> <li>Not used (If a single-size NIF is installed, the NIF number to which +2 is added is displayed like this.)</li> </ul>
	disable	Operation has been stopped by the <code>no power enable</code> configuration command.
	power shortage	Operation has been stopped because of a power shortage
	notsupport	Operation has been stopped because an unsupported NIF is installed.

Item	Displayed information	Displayed detailed information
(Update state of the NIF) <sup>#1</sup>	update executing	HDC is being updated.
	restart required	The NIF needs to be restarted to apply the HDC.
	update failed	An attempt to update the HDC failed. Replace the NIF because it might have failed.
NIF type	1-port 100GBASE-R(CFP)	One 100GBASE-R (CFP) line
	-	The NIF type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>• No NIFs are installed.</li> <li>• An unsupported NIF is installed.</li> </ul>
retry	Number of times the NIF restarted due to a failure <sup>#2</sup>	
Average	<p>Displays the average bandwidth used per NIF for the one minute interval before the command was executed. (line bandwidth used per NIF / maximum bandwidth per NIF)</p> <p>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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps.</p> <p>The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.</p>	
Peak	<p>Displays the peak line bandwidth used per NIF for the last 24 hours before the command was executed, and the relevant time (<i>hour:minute:second</i>).</p> <p>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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps.</p> <p>The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.</p>	

#1: This information is not displayed if the update has not been performed.

#2: The number of times the NIF restarted due to a failure is initialized once every hour.

Table 18-14: Information displayed for a 100GBASE-R port

Item	Displayed information	Displayed detailed information
Port	Port number	
Port status	active up	Active (normal operating state)
	active down	Active (A line failure occurred.)
	initialize	Currently initializing
	fault	Failed
	inactive	Operation has been stopped by the <code>inactivate</code> command.
	disable	Operation has been stopped by the <code>shutdown</code> configuration command.
	standby	Operation is in a standby state by the standby link functionality of link aggregation.
	suspend	The start of the port is suppressed due to the following reasons: <ul style="list-style-type: none"> <li>• The number of operating SFUs is insufficient.</li> <li>• The PRU is being initialized.</li> </ul>
	unused	unused (no configuration)



Item	Displayed information	Displayed detailed information
	mismatch	The installed NIF and the configuration do not match.
Line type	100GBASE-LR4	100GBASE-LR4
	-	The line type is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>The port status is <code>initialize</code>.</li> <li>The port status is <code>fault</code>.</li> <li>The transceiver status is <code>not connect</code>.</li> </ul>
MAC address	MAC address of the port	
Type of transceiver	CFP	CFP
Status of the transceiver	connect	Implemented
	notconnect	Not installed
	not support	An unsupported transceiver is installed.
	fault	Failed
	-	The transceiver status is unknown. This is indicated in the following cases: <ul style="list-style-type: none"> <li>The port status is <code>suspend</code>.</li> <li>The port status is <code>initialize</code>.</li> <li>The port status is <code>fault</code>.</li> </ul>
Time-since-last-status-change	Displays the elapsed time since the last change in status. <i>hh:mm:ss</i> (when the elapsed time is 24 hours or less: <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) <i>dd.hh:mm:ss</i> (when the elapsed time is more than 24 hours: <i>dd</i> = number of days, <i>hh</i> = hours, <i>mm</i> = minutes, <i>ss</i> = seconds) Over 100 days (when the elapsed time is more than 100 days)	
Bandwidth	Displays the bandwidth of the line in kbps. If the <code>bandwidth</code> configuration command has not been executed, the line speed of the port is displayed. If the <code>bandwidth</code> configuration command is set, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in	Displays the average bandwidth 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

Item	Displayed information	Displayed detailed information
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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. 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 ( <i>hour:minute:second</i> ). 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 less than 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to the nearest whole number. If the value is 10000 Mbps or more, it is displayed in Gbps. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate <sup>#1</sup>	Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate <sup>#1</sup>	Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send <sup>#2</sup>	on	Pause packets are sent.
	off	Pause packets are not sent.
Flow control receive <sup>#2</sup>	on	Pause packets are received.
	off	Pause packets are not received.
TPID	Displays a TagProtocolIdentifier value that is used on the port to identify the VLAN.	
Frame size <sup>#3</sup>	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.	
retry	Displays the number of times the port was reactivated due to a fault. <sup>#4</sup>	
Interface name	Displays the name assigned to a port.	
Lane mapping	Displays the mapping of PCS lane numbers.	
description	Displays the contents of the <code>description</code> configuration. The <code>description</code> configuration can be used to set comments, such as a comment about the purpose of the port. This item is not displayed if the <code>description</code> configuration has not been set.	

#1: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the display unit varies depending on the displayed value, as follows:

- If the displayed value is 10000 or larger, the unit is k.
- If the displayed value is 10000 k or larger, the unit is M.
- If the displayed value is 10000 M or larger, the unit is G.

In the above cases, one digit is displayed below the decimal point.

#2: This item is always `off` except when the status of the port is `active up`.

#3: This item is always `-` except when the status of the port is `active up`.

#4: The number of times the port was reactivated due to a fault is initialized once every hour.

Table 18-15: Displayed 100GBASE-R statistics

	Item	Displayed information
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 Send and receive error statistics are not included. Note that the value increments when pause packets are sent and received.
	Broadcast packets	Number of broadcast packets Send and receive error statistics are not included.
	Pause packets	Number of pause packets
	64 packets	The number of packets whose frame length is 64 octets. <sup>#1</sup> The value includes send and receive error statistics.
	65-127 packets	The number of packets whose frame length is from 65 to 127 octets. <sup>#1</sup> The value includes send and receive error statistics.
	128-255 packets	The number of packets whose frame length is from 128 to 255 octets. <sup>#1</sup> The value includes send and receive error statistics.
	256-511 packets	The number of packets whose frame length is from 256 to 511 octets. <sup>#1</sup> The value includes send and receive error statistics.
	512-1023 packets	The number of packets whose frame length is from 512 to 1023 octets. <sup>#1</sup> The value includes send and receive error statistics.
	1024-1518 packets	The number of packets whose frame length is 1024 or more octets. <sup>#1</sup> The value 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

Item		Displayed information
Detailed statistical items for receive errors	Error frames	The number of frames discarded due to errors
	CRC errors	The number of times the frame length was valid but an error was detected by the FCS check <sup>#1</sup>
	Alignment	The number of times the frame length was invalid and an error was detected by the FCS check <sup>#1</sup>
	Fragments	The number of times a short frame (whose length was shorter than 64 octets) was received and an FCS error or an alignment error occurred <sup>#1</sup>
	Jabber	The number of times a long frame (whose length exceeded the max frame length) was received and an FCS error or an alignment error occurred <sup>#1</sup>
	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 <sup>#1</sup>
	Long frames	The number of received packets that exceed the frame length <sup>#1</sup>
Detailed statistical items for errors	Error frames	The total number of frames discarded due to errors (total value of the following items: CRC errors, Fragments, Jabber, Underrun/Overrun, Symbol errors, Short frames, Long frames)
	Signal detect errors	The number of times a signal line could not be detected
	Transceiver notconnect	The number of times a transceiver was removed
	LOS of sync	The number of synchronization errors that occurred
	LOS of alignment	The number of alignment losses that occurred
	HI_BER	The number of HI_BER (High Bit Error Rate) errors that occurred
	LF	The number of LF (Local Fault) 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
	LOS of alignment in operational state	The number of failures (alignment losses) 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

Item		Displayed information
	RF in operational state	The number of failures (RF errors) that occurred during communication
	Lane 0 - 19 BIP error	The number of times Lane0-19 BIP errors were detected <sup>#2</sup>

#1: The frame length indicates the length starting from the MAC header and ending with the FCS field.

#2: This value might be counted when the cable is connected or disconnected.

## Impact on communication

None

## Response messages

*Table 18-16:* List of response messages for the show interfaces (100GBASE-R) (Ethernet) command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <nif no.>)	The NIF number is outside the valid range. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The NIF that controls the specified port is not supported. (NIF/port = <nif no.>/<port no.>)	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The port number is invalid. (port number = <port no.>)	The port number is outside the valid range. Make sure the specified parameter is correct. <port no.>: Indicates the port number.
The specified NIF is not connected. (NIF = <nif no.>)	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number.
The specified port is not a 100GBASE-R port. (NIF/port = <nif no.>/<port no.>)	The specified port is not a 100GBASE-R port. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
There is no operational port.	There are no available ports. Make sure the specified parameter is correct.

## Notes

- The counters of average used bandwidth, maximum used bandwidth, and statistics are cleared in the following cases:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status

- When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status
2. If the `clear counters` command is executed, the statistics counter is cleared.

---

## clear counters

---

Clears the Ethernet statistics counters to zero.

### Syntax

```
clear counters
clear counters {gigabitethernet | tengigabitethernet | hundredgigabitethernet}
<nif no.> / <port no.>
```

### Input mode

User mode and administrator mode

### Parameters

{gigabitethernet | tengigabitethernet | hundredgigabitethernet}

gigabitethernet

Specifies 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X.

tengigabitethernet

Specifies 10GBASE-R.

hundredgigabitethernet

Specifies 100GBASE-R.

<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

None

### Display items

None

### Impact on communication

None

### Response messages

Table 18-17: List of response messages for the clear counters (Ethernet) command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <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
The NIF that controls the specified port is not supported. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The port number is invalid. (port number = <i>&lt;port no.&gt;</i> )	The port number is outside the valid range. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified NIF is not connected. (NIF = <i>&lt;nif no.&gt;</i> )	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number.
The specified port is not a 100GBASE-R port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 100GBASE-R port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not a 10GBASE-R port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not a gigabit Ethernet port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not operational. (port = <i>&lt;port no.&gt;</i> )	The specified port is not in a state in which commands can be executed. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.

## 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:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status



- When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status

---

## show port

---

Lists information about the Ethernet ports implemented on the device.

### Syntax

```
show port [<port list>]
show port statistics [<port list>] [{ up | down }] [discard]
show port transceiver [<port list>] [detail]
```

### 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.

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.
- fault: A fault has occurred.
- inact: Operation has been stopped by the `inactivate` command.
- dis: Operation has been stopped by the `shutdown` configuration command.
- standby: Operation is in a standby state by the standby link functionality of link aggregation.
- suspend: Activation of ports is suppressed because the number of operating SFUs is insufficient or the PRU is being initialized.
- unused: Not used (The configuration is not set.)
- mismatch: The installed NIF and the configuration do not match.

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, and provides type and identification information.

This parameter allows you to check the identification information of each transceiver.

detail

Displays detailed information about transceivers.

Operation when this parameter is omitted:

Normal information about transceivers is displayed.

Operation when all parameters are omitted:

Lists information for all implemented Ethernet ports.

## Example 1

*Figure 18-9: Example of listing link information for ports*

```
> show port
Date 20XX/04/01 12:00:00 UTC
Port Counts: 12
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            down    1000BASE-SX     full(auto) -   -    -/-
1/6  geth1/6            up      1000BASE-SX     full(auto) off  9596  10/up
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  11/down
1/11 geth1/11           up      1000BASE-SX     full(auto) off  1518  11/down
1/12 geth1/12           up      1000BASE-SX     full(auto) off  1518  12/dis
>
```

## Display items in Example 1

*Table 18-18: Information displayed in the link information list for ports*

Item	Displayed information	Displayed detailed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Name	Port name	Displays the name assigned to a port.

Item	Displayed information	Displayed detailed information
Status	Port status	<p>up: Active (normal operating state)</p> <p>down: Active (A line failure occurred.)</p> <p>init: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating).</p> <p>fault: Failed</p> <p>inact: Operation has been stopped by the <code>inactivate</code> command.</p> <p>Operation has been stopped by the <code>shutdown</code> configuration command.</p> <p>standby: Operation is in a standby state by the standby link functionality of link aggregation.</p> <p>suspend: Activation of the port is suppressed because the number of operating SFUs is insufficient or the PRU is being initialized.</p> <p>unused: Not used (The configuration is not set.)</p> <p>mismatch: The installed NIF and the configuration do not match.</p>
Speed	Line speed	<p>10BASE-T: 10BASE-T</p> <p>100BASE-TX: 100BASE-TX</p> <p>1000BASE-T: 1000BASE-T</p> <p>1000BASE-LX: 1000BASE-LX</p> <p>1000BASE-SX: 1000BASE-SX</p> <p>1000BASE-SX2: 1000BASE-SX2</p> <p>1000BASE-LH: 1000BASE-LH</p> <p>1000BASE-BX10-D: 1000BASE-BX10-D</p> <p>1000BASE-BX10-U: 1000BASE-BX10-U</p> <p>1000BASE-BX40-D: 1000BASE-BX40-D</p> <p>1000BASE-BX40-U: 1000BASE-BX40-U</p> <p>10GBASE-SR: 10GBASE-SR</p> <p>10GBASE-LR: 10GBASE-LR</p> <p>10GBASE-ER: 10GBASE-ER</p> <p>100GBASE-LR4: 100GBASE-LR4</p> <p>-: The speed is unknown (If auto-negotiation is enabled for a 10BASE-T/100BASE-TX/1000BASE-T port and <code>Status</code> is not up, if <code>Status</code> is <code>init</code> or <code>fault</code>, or if the transceiver status is not <code>connect</code>, - is displayed.)</p>
Duplex	Full duplex/half duplex	<p>full: Full duplex</p> <p>full (auto): Full duplex (resulting from auto-negotiation)</p> <p>half: Half duplex</p> <p>half (auto): Half duplex (resulting from auto-negotiation)</p> <p>-: The duplex mode is unknown (If auto-negotiation is enabled for a 10BASE-T/100BASE-TX/1000BASE-T port and <code>Status</code> is not up, if <code>Status</code> is <code>init</code> or <code>fault</code>, or if the transceiver status is not <code>connect</code>, - is displayed.)</p>
FCtl	Flow control	<p>on: Flow control is enabled.</p> <p>off: Flow control is disabled.</p> <p>-: <code>Status</code> is not up.</p>
FrLen	Maximum frame length	<p>Displays the maximum frame length of a port in octets.</p> <p>The maximum frame length is calculated starting from the MAC header and ending with the DATA and PAD fields.</p> <p>-: <code>Status</code> is not up.</p>

Item	Displayed information	Displayed detailed information
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 18-10:* Example of displaying the number of sent, received, and discarded packets for ports

```
> show port statistics
Date 20XX/04/01 12:00:00 UTC
Port Counts: 12
```

Port	Name	Status	Packets	Tx	Rx
1/1	geth1/1	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/2	geth1/2	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/3	geth1/3	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/4	geth1/4	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/5	geth1/5	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/6	geth1/6	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/7	geth1/7	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/8	geth1/8	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/9	geth1/9	down	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/10	geth1/10	inact	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/11	geth1/11	dis	Ucast	0	0
			Mcast	0	0
			Bcast	0	0
			Discard	0	0
1/12	geth1/12	inact	Ucast	0	0
			Mcast	0	0
			Bcast	0	0

Discard

0

0

&gt;

## Display items in Example 2

Table 18-19: Display of the number of sent, received, and discarded packets for ports

Item	Displayed information	Displayed detailed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Name	Port name	Displays the name assigned to a port.
Status	Port status	<p>up: Active (normal operating state)</p> <p>down: Active (A line failure occurred.)</p> <p>init: Currently initializing or waiting for establishment of negotiation (auto-negotiation is operating).</p> <p>fault: Failed</p> <p>inact: Operation has been stopped by the <code>inactivate</code> command.</p> <p>Operation has been stopped by the <code>shutdown</code> configuration command.</p> <p>standby: Operation is in a standby state by the <code>standby</code> link functionality of link aggregation.</p> <p>suspend: Activation of the port is suppressed because the number of operating SFUs is insufficient or the PRU is being initialized.</p> <p>unused: Not used (The configuration is not set.)</p> <p>mismatch: The installed NIF and the configuration do not match.</p>
Packets	Packet information	Ucast: Number of unicast packets (including discarded packets)
		Mcast: Number of multicast packets (excluding discarded packets) Note that the value increments when pause packets are sent and received.
		Bcast: Number of broadcast packets (excluding discarded packets)
		Discard: Number of discarded packets
Tx	Sending	--
Rx	Receiving	--

## Example 3

Figure 18-11: Example of listing transceiver information

```
> show port transceiver
Date 20XX/04/01 12:00:00 UTC
Port Counts: 16
Port: 1/1  Status:connect  Type:SFP  Speed:1000BASE-SX
          Vendor name:xxxxxxxxxxxxxxxxx  Vendor SN :xxxxxxxxxxxxxxxxx
          Vendor PN  :xxxxxxxxxxxxxxxxx  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:xxxxxxxxxxxxxxxxx  Vendor SN :xxxxxxxxxxxxxxxxx
```

```

Vendor PN :xxxxxxxxxxxxxxxxx      Vendor rev:xxxx
:
:
:
>

```

#### Example 4

Figure 18-12: Example of listing detailed transceiver information

```

> show port transceiver detail
Date 20XX/04/01 12:00:00 UTC
Port Counts: 16
Port: 1/1 Status:connect Type:SFP Speed:1000BASE-SX
Vendor name:xxxxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxxxx
Vendor PN :xxxxxxxxxxxxxxxxx      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:xxxxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxxxx
Vendor PN :xxxxxxxxxxxxxxxxx      Vendor rev:xxxx
Tx power :-4.7dBm                  Rx power :-40.0dBm
Port: 2/1 Status:connect Type:CFP Speed:10GBASE-LR4
Vendor name:xxxxxxxxxxxxxxxxx      Vendor SN :xxxxxxxxxxxxxxxxx
Vendor PN :xxxxxxxxxxxxxxxxx      Vendor rev:xxxx
Tx1 power :-4.7dBm                 Rx1 power :-40.0dBm
Tx2 power :-4.7dBm                 Rx2 power :-40.0dBm
Tx3 power :-4.7dBm                 Rx3 power :-40.0dBm
Tx4 power :-4.7dBm                 Rx4 power :-40.0dBm
:
:
:
>

```

#### Display items in Example 3 and 4

Table 18-20: Information displayed in the transceiver information list

Item	Displayed information	Displayed detailed information
Port Counts	Number of target ports	--
Port	Port	NIF number/port number
Status	Status of the transceiver	connect: 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 does not support transceivers, or if the port status is suspend, init or fault.
Type	Type of transceiver	SFP: SFP SFP+: SFP+ CFP: CFP -: The type of the transceiver is unknown (- is displayed if the transceiver status is -).

Item	Displayed information	Displayed detailed 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 10GBASE-SR: 10GBASE-SR 10GBASE-LR: 10GBASE-LR 10GBASE-ER: 10GBASE-ER 100GBASE-LR4: 100GBASE-LR4 -: Unknown line speed (- is displayed if the port status is init or fault, or if the transceiver status is not connect).
Vendor name	Vendor name	Displays the vendor's name. <sup>#1#2</sup>
Vendor SN	Vendor serial number	Displays the serial number added by the vendor. <sup>#1#2</sup>
Vendor PN	Vendor part number	Displays the part number added by the vendor. <sup>#1#2</sup>
Vendor rev	Vendor revision	Displays a part number revision added by the vendor. <sup>#1#2</sup>
Tx power	Sending optical power	Displays the sending optical power in dBm. <sup>#1#2#3#4#5</sup>
Rx power	Receiving optical power	Displays the receiving optical power in dBm. <sup>#1#2#3#4#5</sup>
Tx1 power	Lane 1 sending optical power	Displays the sending optical power of Lane 1 in dBm. <sup>#1#2#3#4#6</sup>
Rx1 power	Lane 1 receiving optical power	Displays the receiving optical power of Lane 1 in dBm. <sup>#1#2#3#4#6</sup>
Tx2 power	Lane 2 sending optical power	Displays the sending optical power of Lane 2 in dBm. <sup>#1#2#3#4#6</sup>
Rx2 power	Lane 2 receiving optical power	Displays the receiving optical power of Lane 2 in dBm. <sup>#1#2#3#4#6</sup>
Tx3 power	Lane 3 sending optical power	Displays the sending optical power of Lane 3 in dBm. <sup>#1#2#3#4#6</sup>
Rx3 power	Lane 3 receiving optical power	Displays the receiving optical power of Lane 3 in dBm. <sup>#1#2#3#4#6</sup>
Tx4 power	Lane 4 sending optical power	Displays the sending optical power of Lane 4 in dBm. <sup>#1#2#3#4#6</sup>
Rx4 power	Lane 4 receiving optical power	Displays the receiving optical power of Lane 4 in dBm. <sup>#1#2#3#4#6</sup>

#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 `connect` or `fault`. Information is displayed when you re-execute the command. If transceiver information could not be loaded, - is displayed.

#3: If the optical power is outside the range from -40 to 8.2 dBm, - is displayed.

#4: An error might arise depending on the environmental requirements. To check the correct value, use an optical power meter.

#5: This item is displayed only for 1000BASE-X and 10GBASE-R ports.

#6: This item is displayed only for 100GBASE-LR4 ports.



## Impact on communication

None

## Response messages

*Table 18-21:* List of response messages for the show port command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
There is no operational port.	There are no available ports. Make sure the specified parameter is correct.

## Notes

1. The displayed number of discarded packets is the total of the values for the items listed in the following table.

*Table 18-22:* 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

2. The statistics counter is cleared in the following cases:
  - When the PRU starts up
  - When a PRU hardware failure occurs
  - When the `inactivate pru` command is issued to the PRU to set the `inactive` status
  - When the `no power enable` configuration command is issued to the PRU to set the `disable` status
  - When the NIF starts up
  - When a NIF hardware failure occurs
  - When the `inactivate nif` command is issued to the NIF to set the `inactive` status, and then the `activate nif` command is issued to the NIF to clear the `inactive` status
  - When the `no power enable` configuration command is issued to the NIF to set the `disable` status, and then the `power enable` configuration command is issued to the NIF to clear the `disable` status
  - When the `clear counters` command is executed
3. 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 (made inactive by the `inactivate` command) from the inactive to the active status.

### Syntax

```
activate {gigabitethernet | tengigabitethernet | hundredgigabitethernet} <nif
no.> / <port no.>
```

### Input mode

User mode and administrator mode

### Parameters

{gigabitethernet | tengigabitethernet | hundredgigabitethernet}

gigabitethernet

Specifies 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X.

tengigabitethernet

Specifies 10GBASE-R.

hundredgigabitethernet

Specifies 100GBASE-R.

<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 this example, the command returns the status of the port whose NIF number is 1 and port number is 1 to the active status.

```
activate gigabitethernet 1/1
```

### Display items

None

### Impact on communication

Communication using the relevant Ethernet interface resumes.

### Response messages

Table 18-23: List of response messages for the activate command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <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
The NIF that controls the specified port failed. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port has failed. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port has insufficient power. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The power of the NIF that controls the specified port is insufficient. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is being initialized. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is being initialized. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is disabled. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is inactive. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is in the <code>inactive</code> status. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is not supported. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The port number is invalid. (port number = <i>&lt;port no.&gt;</i> )	The port number is outside the valid range. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified NIF is not connected. (NIF = <i>&lt;nif no.&gt;</i> )	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number.
The specified port does not match with configuration. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port does not match the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port failed. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port has failed. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is already active. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is already <code>active</code> . The command does not need to be executed if you correctly specified the port. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is already being initialized. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is already being initialized. The command does not need to be executed if you correctly specified the port. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is disabled. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.

Message	Description
The specified port is not a 100GBASE-R port. (NIF/port = <nif no.>/<port no.>)	The specified port is not a 100GBASE-R port. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The specified port is not a 10GBASE-R port. (NIF/port = <nif no.>/<port no.>)	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.
The specified port is not a gigabit Ethernet port. (NIF/port = <nif no.>/<port no.>)	The specified port is not a 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X port. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The specified port is not 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.
The specified port is not used. (NIF/port = <nif no.>/<port no.>)	The specified port is not used. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The specified port is on standby. (NIF/port = <nif no.>/<port no.>)	The specified port is in a standby state. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.
The specified port is suspended. (NIF/port = <nif no.>/<port no.>)	The specified port has stopped. Make sure the specified parameter is correct. <nif no.>: Indicates the NIF number. <port no.>: Indicates the port number.

## Notes

1. Executing this command does not change the configuration.

---

## inactivate

---

Changes the status of an Ethernet port from the `active` to the `inactive` status without changing the configuration. This setting also turns off the power supplied to the port.

### Syntax

```
inactivate {gigabitethernet | tengigabitethernet | hundredgigabitethernet} <nif
no.> / <port no.>
```

### Input mode

User mode and administrator mode

### Parameters

{gigabitethernet | tengigabitethernet | hundredgigabitethernet}

gigabitethernet

Specifies 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X.

tengigabitethernet

Specifies 10GBASE-R.

hundredgigabitethernet

Specifies 100GBASE-R.

<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 this example, the command changes the status of the port whose NIF number is 1 and port number is 1 to the `inactive` status.

```
inactivate gigabitethernet 1/1
```

### Display items

None

### Impact on communication

Communication using the relevant Ethernet interface becomes unavailable.

### Response messages

Table 18-24: List of response messages for the inactivate command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The NIF number is invalid. (NIF number = <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
The NIF that controls the specified port failed. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port has failed. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port has insufficient power. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The power of the NIF that controls the specified port is insufficient. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is being initialized. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is being initialized. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is disabled. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is inactive. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is in <code>inactive</code> status. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The NIF that controls the specified port is not supported. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The NIF that controls the specified port is not supported. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The port number is invalid. (port number = <i>&lt;port no.&gt;</i> )	The port number is outside the valid range. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified NIF is not connected. (NIF = <i>&lt;nif no.&gt;</i> )	The specified NIF is not installed or is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number.
The specified port does not match with configuration. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port does not match the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is already inactive. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is already <code>inactive</code> . The command does not need to be executed if you correctly specified the port. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is disabled. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is in <code>disable</code> status due to the configuration. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not a 100GBASE-R port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 100GBASE-R port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not a 10GBASE-R port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 10GBASE-R port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.

Message	Description
The specified port is not a gigabit Ethernet port. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not a 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X port. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not operational. (port = <i>&lt;port no.&gt;</i> )	The specified port is not in a state in which commands can be executed. Make sure the specified parameter is correct. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is not used. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port is not used. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.
The specified port is suspended. (NIF/port = <i>&lt;nif no.&gt;/&lt;port no.&gt;</i> )	The specified port has stopped. Make sure the specified parameter is correct. <i>&lt;nif no.&gt;</i> : Indicates the NIF number. <i>&lt;port no.&gt;</i> : Indicates the port number.

## Notes

1. Executing this command does not change the configuration.
2. If the device is restarted after the execution of this command, the `inactive` status is canceled.
3. After this command changes an Ethernet port to the `inactive` status, you can use the `activate` command to return the status to the `active` status.



---

## restart interface-manager

---

Restarts the network interface management program and BCU.

### Syntax

```
restart interface-manager [-f] [core-file]
```

### Input mode

User mode and administrator mode

### Parameters

-f

Restarts the network interface management program and BCU without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the core file of the network interface management 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 network interface management program and BCU after displaying a confirmation message.

### Example

*Figure 18-13:* Restarting the network interface management program and BCU

```
> restart interface-manager
Are you sure you want to restart interface management program? (y/n): y
>
```

### Display items

None

### Impact on communication

Communication is interrupted while the active BCU is being restarted

### Response messages

*Table 18-25:* List of response messages for the restart interface-manager command

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.

### Notes

1. If the core file already exists, the existing file is overwritten unconditionally. Therefore, if the existing file is necessary, back it up in advance. The output destination and the name of the file are as follows:

- Directory: `/usr/var/core/`
  - File name: `nimd.core`
2. If this command is executed in the active BCU, the system is switched when the active BCU is restarted, and the standby BCU becomes the active BCU.
  3. If this command is executed in the standby BCU, the standby BCU is restarted.

## Chapter

---

# 19. Link Aggregation

---

```
show channel-group
show channel-group statistics
clear channel-group statistics lacp
clear channel-group non-revertive
restart lacp
dump protocols lacp
```

---

## show channel-group

---

Displays link aggregation information.

### Syntax

```
show channel-group [{ [<channel group number list>] [{detail | load-balance}] |
summary}]
```

### Input mode

User mode and administrator mode

### Parameters

```
{ [<channel group number list>] [{detail | load-balance}] | summary}
```

*<channel group number list>*

Displays link aggregation information for the channel group numbers specified in list format. For details about how to specify *<channel group number list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays all link aggregation information.

detail

Displays detailed information about link aggregation.

Operation when this parameter is omitted:

Displays link aggregation information.

load-balance

Displays the distribution method for link aggregation.

Operation when this parameter is omitted:

Displays link aggregation information.

summary

Displays summary information about link aggregation.

Operation when this parameter is omitted:

Displays all link aggregation information.

### Example 1

*Figure 19-1: Displaying link aggregation information*

```
>show channel-group
Date 20XX/04/01 12:00:00 UTC
ChGr:1      Mode:LACP
  CH Status:Up      Elapsed Time:10:10:39      Bandwidth:3000000kbps
  Multi Speed:Off   Load Balance:frame
  Non Revertive:On
  Max Active Port:16
  Max Detach Port:15
  Description:4 ports aggregated.
  MAC address:0012.e2ac.8301
  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 (4)          :1/1-4
Up Port (3)       :1/1-3
Down Port (1)     :1/4
ChGr:101          Mode:Static
CH Status:Up      Elapsed Time:160.11:45:10      Bandwidth:2000000kbps
Multi Speed:On    Load Balance:vlan
Non Revertive:Off
Max Active Port:16
Max Detach Port:15
MAC address:0012.e2ac.8365
Port (4)          :3/1-4
Up Port (2)       :3/1-2
Down Port (2)     :3/3-4
>

```

## Display items in Example 1

Table 19-1: Displayed link aggregation information

Item	Displayed information	Displayed detailed information
ChGr	Channel group number	Channel group number
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 can be sent and received. (For a standby link in no-link-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) -: Indicates that the channel group status is not Up.
Bandwidth	Bandwidth of the channel group	This item displays the sum of the line speed (in kbps) for ports that can be used for sending and receiving, and which belong to the channel group. If the channel group is down, this item displays the sum of the line speed for all ports that belong to the channel group. <sup>#</sup> If there is no board belonging to the channel group, 1000000kbps is displayed.
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.
Load Balance	Distribution method	frame: Distributes traffic based on the information in frames. vlan: Distributes traffic on a VLAN tag basis.

Item	Displayed information	Displayed detailed information
Non Revertive	Switch back suppression	<p>Off: Switch back suppression is disabled.</p> <p>Waiting(&lt;second&gt;sec): The device is in the period during which switch back suppression is disabled. (&lt;second&gt;: 1 to 86400. Remaining time of the period during which switch back suppression is disabled.)</p> <p>Off (Low System Priority): The LACP system priority is lower than the partner device.</p> <p>On: Switch back suppression is enabled.</p>
Max Active Port	Maximum number of ports used by link aggregation	<p>1 to 16 (16 is displayed as the initial value.)</p> <p>-: Link aggregation mode is not set.</p>
	Standby link mode	<p>Standby link link-down mode</p> <p>(link-down mode): Link-down mode</p> <p>(no-link-down mode): Link-not-down mode</p>
Max Detach Port	Restriction on the number of detached ports	<p>0 to 15 (15 is displayed as the initial value.)</p> <p>-: Link aggregation mode is not set.</p>
Description	Supplementary explanation regarding the channel group	This item is displayed only when a supplementary explanation has been set in the configuration.
MAC address	MAC address	The MAC address of the channel group
Periodic Timer	Sending interval for LACPDU	<p>Short: The sending interval is 1 second.</p> <p>Long: The sending interval is 30 seconds.</p> <p>This item is displayed only when LACP mode is enabled.</p>
Actor information	Information about the actor system	<p>Information about the actor system.</p> <p>This item is displayed only when LACP mode is enabled.</p>
System Priority	System priority	Priority of the LACP system ID 1 to 65535 (1 indicates the highest priority.)
MAC	MAC address	The MAC address of the LACP system ID
KEY	Group key	<p>Group key</p> <p>This value is the same as the channel group number.</p>
Partner information	Information about the partner system	<p>Information about the partner system.</p> <p>-: Indicates that the partner system is not defined for LACP.</p> <p>This item is displayed only when LACP mode is enabled.</p>
System Priority	System priority	Priority of the LACP system ID 0 to 65535 (0 indicates the highest priority.)
MAC	MAC address	MAC address
KEY	Group key	0 to 65535
Port( <i>n</i> )	Port information of a channel group	<p><i>n</i>: Number of ports</p> <p>NIF number/port number of the channel group</p>
Up Port( <i>n</i> )	Information about ports that can be used for sending or receiving in the channel group	<p><i>n</i>: Number of ports that can be used for sending and receiving</p> <p>NIF number/port number of a port that can be used for sending or receiving</p>

Item	Displayed information	Displayed detailed information
Down Port( <i>n</i> )	Information about ports that cannot be used for sending or receiving in a channel group	<i>n</i> : 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 no-link-down mode, sending is impossible but receiving is possible.)
Standby Port( <i>n</i> )	Information about standby ports in the channel group	<i>n</i> : Number of standby ports NIF number/port number of a port in a standby state

#: For a NIF that has multiple line speeds, the maximum speed value is used. (For example, if the line speeds of the NIF are 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s, 1000 Mbit/s is used).

## Example 2

Figure 19-2: Displaying detailed information about link aggregation

```
>show channel-group detail
Date 20XX/04/01 12:00:00 UTC
ChGr:1      Mode:LACP
  CH Status:Up      Elapsed Time:10:10:39      Bandwidth:3000000kbps
  Multi Speed:Off   Load Balance:frame
  Non Revertive:On
  Max Active Port:16
  Max Detach Port:15
  Description:4 ports aggregated.
  MAC address:0012.e2ac.8301
  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:1/1      Status:Up      Reason:-
                  Speed:1G      Duplex:Full      LACP Activity:Active
                  Actor Priority:128      Partner Priority:100
  Port:1/2      Status:Up      Reason:-
                  Speed:1G      Duplex:Full      LACP Activity:Active
                  Actor Priority:128      Partner Priority:100
  Port:1/3      Status:Up      Reason:-
                  Speed:1G      Duplex:Full      LACP Activity:Active
                  Actor Priority:128      Partner Priority:100
  Port:1/4      Status:Down     Reason:Non Revertive
                  Speed:1G      Duplex:Full      LACP Activity:Active
                  Actor Priority:128      Partner Priority:100
ChGr:101     Mode:Static
  CH Status:Up      Elapsed Time:160.11:45:10      Bandwidth:2000000kbps
  Multi Speed:On     Load Balance:vlan
  Non Revertive:Off
  Max Active Port:16
  Max Detach Port:15
  MAC address:0012.e2ac.8365
  Port:3/1      Status:Up      Reason:-
                  Speed:1G      Duplex:Full      Priority:128
  Port:3/2      Status:Up      Reason:-
                  Speed:1G      Duplex:Full      Priority:128
  Port:3/3      Status:Down     Reason:Port Down
                  Speed:-       Duplex:-       Priority:128
  Port:3/4      Status:Down     Reason:Port Down
                  Speed:-       Duplex:-       Priority:128
>
```

## Display items in Example 2

Table 19-2: Displayed detailed information about link aggregation

Item	Displayed information	Displayed detailed information
ChGr	Channel group number	Channel group number
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 can be sent and received. (For a standby link in no-link-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) -: Indicates that the channel group status is not Up.
Bandwidth	Bandwidth of the channel group	This item displays the sum of the line speed (in kbps) for ports that can be used for sending and receiving and belong to the channel group. If the channel group is down, this item displays the sum of the line speed for all ports that belong to the channel group. <sup>#</sup> If there is no board belonging to the channel group, 1000000kbps is displayed.
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.
Load Balance	Distribution method	frame: Distributes traffic based on the information in frames. vlan: Distributes traffic on a VLAN tag basis.
Non Revertive	Switch back suppression	Off: Switch back suppression is disabled. Waiting(<second>sec): The device is in the period during which switch back suppression is disabled. (<second>: 1 to 86400. Remaining time of the period during which switch back suppression is disabled) Off (Low System Priority): The LACP system priority is lower than the partner device. On: Switch back suppression is enabled.
Max Active Port	Maximum number of ports used by link aggregation	1 to 16 (16 is displayed as the initial value.) -: 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 to 15 (15 is displayed as the initial value.) -: Link aggregation mode is not set.
Description	Supplementary explanation regarding the channel group	This item is displayed only when a supplementary explanation has been set in the configuration.



Item	Displayed information	Displayed detailed information
MAC address	MAC address	The MAC address of the channel group
Periodic Timer	Sending interval for LACPDU	Short: The sending interval is 1 second. Long: The sending interval is 30 seconds. This item is displayed only when LACP mode is enabled.
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 (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.
Partner information	Information about the partner system	Information about the partner system. - : Indicates that the partner system is not defined for LACP. This item is displayed only when LACP mode is enabled.
System Priority	System priority	Priority of the LACP system ID 0 to 65535 (0 indicates the highest priority.)
MAC	MAC address	MAC address
KEY	Group key	0 to 65535
Port	Port	NIF 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.

Item	Displayed information	Displayed detailed information
Reason	Cause of the failure	<p>-: Status is Up.</p> <p>Standby: The ports in the local channel group are in the standby state.</p> <p>CH Disabled: The status of the local channel group is Disabled.</p> <p>Port Down: The ports in the local channel group are in the down state.</p> <p>Port Speed Unmatch: Ports in the local channel group do not use the same line speed.</p> <p>Duplex Half: The ports in the local channel group are in half duplex mode.</p> <p>Port Selecting: A port aggregation condition check is being conducted on the local channel group.</p> <p>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.</p> <p>LACPDU Expired: The valid time period of the LACPDU received from the connected port expired.</p> <p>Partner System ID Unmatch: The partner system ID received from the connected port is different from the partner system ID of the group. Unmatched Partner System ID is also displayed.</p> <p>Partner Key Unmatch: The key received from the connected port is different from the partner key of the group. Unmatched Partner Key is also displayed.</p> <p>Partner Aggregation Individual: The connected port cannot be a member of link aggregation.</p> <p>Partner Synchronization OUT_OF_SYNC: The port connected to the local port cannot synchronize with the local port.</p> <p>Port Moved: A port moved in the channel group.</p> <p>Operation of Detach Port Limit: The maximum number of ports that can be detached is limited.</p> <p>Non Revertive: Switch back is suppressed.</p>
Speed	Line speed	<p>10M: 10 Mbit/s</p> <p>100M: 100 Mbit/s</p> <p>1G: 1 Gbit/s</p> <p>10G: 10 Gbit/s</p> <p>100G: 100 Gbit/s</p> <p>-: The port is down.</p>
Duplex	Duplex mode	<p>Full: Full duplex</p> <p>Half: Half duplex</p> <p>-: The port is down.</p>
LACP Activity	LACP activation method	<p>Active: LACPDU are always sent.</p> <p>Passive: An LACPDU is sent after an LACPDU is received.</p> <p>This item is displayed only when LACP mode is enabled.</p>
Actor Priority	Priority of the actor system port	<p>0 to 65535 (0 indicates the highest priority.)</p> <p>This item is displayed only when LACP mode is enabled.</p>

Item	Displayed information	Displayed detailed information
Partner Priority	Priority of the partner system port	0 to 65535 (0 indicates the highest priority.) - : Indicates that the partner system is not defined for LACP. This item is displayed only when LACP mode is enabled.
Priority	Priority of the actor system port	0 to 65535 (0 indicates the highest priority.) This item is displayed only in static mode.
Unmatched Partner Key	Partner key that is unmatched	0 to 65535 This item is displayed only when Status is Down and Reason is Unmatched Partner System ID.
Unmatched Partner System ID	Partner system ID that is unmatched	This item is displayed only when Status is Down and Reason is Partner System ID Unmatch.
Priority	System priority	0 to 65535 (0 indicates the highest priority.) This item is displayed only when Status is Down and Reason is Partner System ID Unmatch.
MAC	MAC address	The MAC address for the system ID This item is displayed only when Status is Down and Reason is Partner System ID Unmatch.

#: For a NIF that has multiple line speeds, the maximum speed value is used. (For example, if the line speeds of the NIF are 10 Mbit/s, 100 Mbit/s, and 1000 Mbit/s, 1000 Mbit/s is used).

### Example 3

Figure 19-3: Displaying load-balance information about link aggregation

```
>show channel-group load-balance
Date 20XX/04/01 12:00:00 UTC
ChGr:1          Load Balance:frame          Port:1/1-4
ChGr:101        Load Balance:vlan          Port:3/1-4
VLAN:400-403
>
```

### Display items in Example 3

Table 19-3: Displayed load-balance information about link aggregation

Item	Displayed information	Displayed detailed information
ChGr	Channel group number	Channel group number
Load Balance	Distribution method	frame: Distributes traffic based on the information in frames. vlan: Distributes traffic on a VLAN tag basis.
Port	Ports in the channel group	NIF number/port number of a channel group
VLAN	VLAN ID list	List of the tag values used for Tag-VLAN linkage on a port channel subinterface This item is displayed only when Tag-VLAN linkage is used. Untagged: When used as untagged VLAN 1 to 4095: Indicates a VLAN ID.

### Example 4

Figure 19-4: Displaying summary information about link aggregation

```
>show channel-group summary
Date 20XX/04/01 12:00:00 UTC
```

```

CH Status      :ChGr ID
Up(2)          :1,101
Down(0)        :
Disabled(0)    :
>

```

## Display items in Example 4

*Table 19-4:* Displayed summary information about link aggregation

Item	Displayed information	Displayed detailed information
Up( <i>n</i> )	Information about link aggregations in Up status	<i>n</i> : Number of link aggregations IDs of link aggregations in Up status
Down( <i>n</i> )	Information about link aggregations in Down status	<i>n</i> : Number of link aggregations IDs of link aggregations in Down status
Disabled( <i>n</i> )	Information about link aggregations in Disabled status	<i>n</i> : Number of link aggregations IDs of link aggregations in Disabled status

## Impact on communication

None

## Response messages

*Table 19-5:* List of response messages for the show channel-group command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not configured. Check the configuration.

## Notes

None

---

## show channel-group statistics

---

Displays link aggregation statistics.

### Syntax

```
show channel-group statistics [lacp] [<channel group number 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.

Operation when this parameter is omitted:

Displays statistics for sent and received data packets in link aggregation.

<channel group number list>

Displays link aggregation statistics for the channel group numbers specified in list format. For details about how to specify <channel group number list>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays statistics for all link aggregations.

Operation when all parameters are omitted:

Displays statistics for sent and received data packets (for each port) in all link aggregations.

### Example 1

*Figure 19-5: Displaying statistics for sent and received data packets in link aggregation*

```
>show channel-group statistics
Date 20XX/04/01 12:00:00 UTC
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
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
>

```

## Display items in Example 1

Table 19-6: Displayed statistics for sent and received data packets related to link aggregation

Item	Displayed information	Displayed detailed 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 and 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 18-22: Statistical items used for calculating the number of discarded packets.

## Example 2

Figure 19-6: Displaying statistics for sent and received LACPDUs in link aggregation

```

>show channel-group statistics lacp
Date 20XX/04/01 12:00:00 UTC
ChGr:1
  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
>

```

## Display items in Example 2

Table 19-7: Displayed statistics for sent and received LACPDUs in link aggregation

Item	Displayed information	Displayed detailed information
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	--

Item	Displayed information	Displayed detailed information
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 19-8:* List of response messages for the show channel-group statistics command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not 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` (Ethernet)
  - 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:
  - `show interfaces` (Ethernet)
  - `clear counters` (Ethernet)

---

## clear channel-group statistics lacp

---

Clears the statistics for sent and received LACPDU in link aggregation.

### Syntax

```
clear channel-group statistics lacp [<channel group number list>]
```

### Input mode

User mode and administrator mode

### Parameters

<channel group number list>

Clears LACPDU statistics for the channel group numbers specified in list format. For details about how to specify <channel group number list>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Clears the statistics on the sent and received LACPDU for all channel groups.

### Example

*Figure 19-7: Clearing statistics on sent and received LACPDU for link aggregation*

```
>clear channel-group statistics lacp
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 19-9: List of response messages for the clear channel-group statistics lacp command*

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not configured. Check the configuration.

### Notes

1. 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.
2. Even if statistics are cleared, the value for the MIB information obtained by using SNMP is not cleared.
3. If deletion or addition is performed in the configuration, the relevant LACPDU statistics are cleared to zero.



---

## clear channel-group non-revertive

---

Clears the switch back suppression status of link aggregation.

### Syntax

```
clear channel-group non-revertive [{port <port list> | channel-group-number
<channel group number list>}] [-f]
```

### Input mode

User mode and administrator mode

### Parameters

{port <port list> | channel-group-number <channel group number list>}

port <port list>

Clears the switch back suppression status of link aggregation for the ports 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 number list>

Clears the switch back suppression status for the channel group numbers specified in list format. For details about how to specify <channel group number list>, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Clears the switch back suppression status for all channel groups.

-f

Clears the switch back suppression status of link aggregation without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Operation when all parameters are omitted:

Clears the switch back suppression status for all channel groups after displaying a confirmation message.

### Example

*Figure 19-8: Clearing the switch back suppression status of link aggregation*

```
>clear channel-group non-revertive channel-group-number 1
Are you sure you want to make the channel-group revertive? (y/n) :y
>
```

### Display items

None

### Impact on communication

If this command is executed on a channel group or port for which switch back suppression is enabled, the suppression is disabled and a switch back operation is performed, and then the port for sending frames is changed.

## Response messages

*Table 19-10:* List of response messages for the clear channel-group non-revertive command

Message	Description
The command cannot be executed in the standby system.	This command cannot be executed in the standby system.
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not configured. Check the configuration.
The specified port is not configured.	The port is not configured. Check the configuration.

## Notes

1. Executing this command does not change the configuration.

---

## restart lacp

---

Restarts the link aggregation program.

### Syntax

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

### Input mode

User mode and administrator mode

### Parameters

-f

Restarts the link aggregation program without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

core-file

Outputs the link aggregation program's core file (`lacpd.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:

Restarts the link aggregation program after displaying a confirmation message.

### Example

*Figure 19-9: Restarting the link aggregation program*

```
> restart lacp
Are you sure you want to restart the LACP program? (y/n):y
>
```

### Display items

None

### Impact on communication

Ports for which LACP-based link aggregation is enabled temporarily become unable to send or receive data.

### Response messages

*Table 19-11: List of response messages for the restart lacp command*

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not configured. Check the configuration.

### Notes

1. If the core file already exists, the existing file is overwritten unconditionally. Therefore, if the existing file is necessary, back it up in advance. The output destination and the name of the

file are as follows:

- Directory: `/usr/var/core/`
- File name: `lacpd.core`

---

## dump protocols lacp

---

Outputs to a file the control information collected by the link aggregation program.

### Syntax

```
dump protocols lacp
```

### Input mode

User mode and administrator mode

### Parameters

None

### Example

*Figure 19-10:* Obtaining a link aggregation dump

```
> dump protocols lacp
>
```

### Display items

None

### Impact on communication

None

### Response messages

*Table 19-12:* List of response messages for the dump protocols lacp command

Message	Description
The command cannot be executed. Try again.	The command cannot be executed. Try again.
The command is not authorized by the RADIUS/TACACS+ server or the configuration.	This command is not authorized by the RADIUS server, the TACACS+ server, or the configuration.
The specified channel group is not configured.	The channel group is not configured. Check the configuration.

### Notes

1. If the specified file already exists, the existing file is overwritten unconditionally. Therefore, if the existing file is necessary, back it up in advance. The output destination and the name of the file are as follows:
  - Directory: /usr/var/lacp/
  - File name: lacpd\_dump.tgz



---

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---

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