AX2200S/AX1250S/AX1240S Software Manual

Operation Command Reference

For Version 2.4

AX1240S-S004X-60

Relevant products
This manual applies to the models in the AX2200S, AX1250S, and AX1240S series of switches. The manual describes the functionality of software version 2.4 for the AX2200S, AX1250S, and AX1240S switches that is supported by the software OS-LT4, OS-LT3, OS-LT2, and optional licenses.

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Reading and storing this manual

Before you use the equipment, carefully read the manual and make sure that you understand all safety precautions. After reading the manual, keep it in a convenient place for easy reference.

Notes

Information in this document is subject to change without notice.

Editions history

July 2012 (Edition 7) AX1240S-S004X-60

History of Amendments

Ver. 2.4 (Edition 7)

Summary of amendments

Location and title	Changes
Addition of series	● A description of the AX2200S series switches was added.

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

Ver. 2.3 (Edition 6)

Summary of amendments

Location and title	Changes
Ethernet	The descriptions of the following command were changed: ● show port
Ring Protocol	The descriptions of the following command were changed: ● show axrp
Web Authentication	The list of operation log messages was modified: ● show web-authentication logging

Location and title	Changes
MAC-based Authentication	The list of operation log messages was modified: ● show mac-authentication logging

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

Ver. 2.3 (Edition 5)

Summary of amendments

Location and title	Changes
Time Settings and NTP	The example of the following command was changed: ● set clock The following command was added: ● show clock
Checking Software Versions and Device Statuses	The descriptions of the following command were changed: ● show environment
Log	A parameter was added to the following command: ● show logging
Common to Layer 2 Authentication	A parameter was added to the following command: ● show authentication logging
Web Authentication	The descriptions of the following command were changed: ● show web-authentication
MAC-based Authentication	The descriptions of the following command were changed: ● show mac-authentication

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

Ver. 2.2 (Edition 4)

Summary of amendments

Location and title	Changes
Addition of series	A description of AX1250S was added.
Reading the Manual	A description of AX1250S was added.
Checking Software Versions and Device Statuses	A description of AX1250S was added. ● show version ● show environment ● backup The descriptions of the following command were changed: ● show tech-support
Software update	The descriptions of the following command were changed: ● ppupdate

Location and title	Changes
Ethernet	The descriptions of the following commands were changed: ● show interfaces ● clear counters ● show port ● activate ● inactivate
Link aggregation	The descriptions of the following command were changed: ● show channel-group
DHCP snooping	A description of AX1250S was added. ● show ip arp inspection statistics
IPv4, ARP, and ICMP	A description of AX1250S was added. ● show ip interface
Uplink redundancy	The descriptions of the following commands were changed: ● show switchport backup ● show switchport backup mac-address-table update

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

Ver. 2.2 (Edition 3)

Summary of amendments

Location and title	Changes
Configurations and File Operations	Parameters were added to the following command: ● copy
Login Security and RADIUS	The descriptions of the following command were changed: ● show radius-server Parameters were added to the following commands: ● clear radius-server ● show radius-server statistics The following command was deleted: ● show radius-server summary
Time Settings and NTP	The input format of the following command was changed: ● set clock
Checking Software Versions and Device Statuses	The descriptions of the following command were changed: ● show environment
Ethernet	The descriptions of the following command were changed: ● show port
VLAN	The descriptions of the following command were changed: ● show vlan The input format of the following command was changed: ● show vlan mac-vlan

Location and title	Changes
Spanning Tree Protocol	The descriptions of the following command were changed: ● show spanning-tree statistics
Ring Protocol	This chapter was added.
Filters	The input format of the following command was changed: ● show access-filter
QoS	The input formats of the following commands were changed: ● show qos-flow ● show qos queueing
Common to Layer 2 Authentication	The descriptions of the following command were changed: ● show authentication logging
IEEE802.1X	The descriptions of the following command were changed: ● show dot1x The display of the operation log message was changed: ● show dot1x logging
Web Authentication	The list of operation log messages was modified: ● show web-authentication logging The descriptions of the following commands were changed: ● show web-authentication login ● show web-authentication login select-option ● show web-authentication ● show web-authentication statistics ● show web-authentication html-files Parameters were added to the following commands: ● set web-authentication html-files ● store web-authentication html-files ● clear web-authentication html-files
MAC-based Authentication	The list of operation log messages was modified: ● show mac-authentication logging The input format of the following command was changed: ● clear mac-authentication auth-state The descriptions of the following commands were changed: ● show mac-authentication ● show mac-authentication statistics
Multistep authentication	The descriptions of the following command were changed: ● show authentication multi-step
CFM	This chapter was added.

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

Ver. 2.1 (Edition 2)

Summary of amendments

Location and title	Changes
Terminals and Remote Operations	The following command was added: ● ftp
Login Security and RADIUS	The following command was added: ● show radius-server Parameters were added to the following command: ● clear radius-server The descriptions of the following commands were changed: ● show radius-server summary ● show radius-server statistics ● clear radius-server statistics
Time Settings and NTP	The descriptions of the following commands were changed: ● set clock ● set clock ntp
Checking Software Versions and Device Statuses	The descriptions of the following commands were changed: ● show system ● show environment
Power Saving Functionality	This chapter was added.
Resource Information	This chapter was added.
MAC Address Table	The descriptions of the following command were changed: ● show mac-address-table
VLAN	The descriptions of the following command were changed: ● show vlan
DHCP snooping	The descriptions of the following command were changed: ● show ip dhcp snooping binding
IGMP/MLD snooping	Parameters were added to the following commands: ● show igmp-snooping ● show mld-snooping
Common to Layer 2 Authentication	This chapter was added.
IEEE802.1X	The descriptions of the following commands were changed: ● show dot1x ● show dot1x logging
Web Authentication	The descriptions of the following commands were changed: ● show web-authentication login ● show web-authentication logging ● show web-authentication ● show ip dhcp server statistics Parameters were added to the following command: ● show web-authentication login select-option

Location and title	Changes
MAC-based Authentication	The descriptions of the following commands were changed: ● show mac-authentication auth-state ● show mac-authentication auth-state select-option ● show mac-authentication logging ● show mac-authentication
Multistep authentication	This chapter was added.
Uplink redundancy	The following commands were added: ● show switchport backup mac-address-table update ● show switchport backup mac-address-table update statistics ● clear switchport backup mac-address-table update statistics
Storm Control	This chapter was added.

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

Preface

Applicable products and software versions

This manual applies to the AX2200S, AX1250S, and AX1240S series of switches. The manual describes the functionality of software version 2.4 for the AX2200S, AX1250S, and AX1240S series switches supported by the OS-LT4, OS-LT3, and OS-LT2 and optional licenses.

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

Unless otherwise noted, this manual describes the functionality applicable commonly to AX2200S, AX1250S, and AX1240S series switches. The functionalities specific to each model are indicated as follows:

[AX2200S]:

The description applies to the AX2200S Switch.

[AX1250S]:

The description applies to the AX1250S Switch.

[AX1240S]:

The description applies to the AX1240S Switch.

In addition, unless otherwise noted, this manual describes the functionality applicable to OS-LT4, OS-LT3, and OS-LT2. The functionality supported by option licenses are indicated as follows:

[OP-WOL]:

The description applies to the OP-WOL optional license.

[OP-OTP]:

The description applies to the OP-OTP optional license.

Corrections to the manual

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

Intended readers

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

Readers must have an understanding of the following:

- The basics of network system management

Manual URL

You can view this manual on our website at:

http://www.alaxala.com/en/

Reading sequence of the manuals

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

- Details on basic settings at initial installation, hardware requirements, and instructions for handling the switch

  AX2200S/AX1250S/AX1240S Hardware Instruction Manual (AX1240S-H001X)

- Software functionality, configuration, and operation commands

  Configuration Guide Vol. 1 (AX1240S-S001X)
  Vol. 2 (AX1240S-S002X)

- Proper syntax for configuration commands and details on parameters

  Configuration Command Reference (AX1240S-S003X)

- Proper syntax for operation commands and details on parameters

  Operation Command Reference (AX1240S-S004X)

- Details on messages and logs

  Message Log Reference (AX1240S-S005X)

- Details on MIBs

  MIB Reference (AX1240S-S006X)

- Handling problems

  Troubleshooting Guide (AX1240S-T001X)

Abbreviations used in the manual

AC	Alternating Current
ACK	ACKnowledge
ADSL	Asymmetric Digital Subscriber Line
ALG	Application Level Gateway
ANSI	American National Standards Institute
ARP	Address Resolution Protocol
AS	Autonomous System
AUX	Auxiliary
BGP	Border Gateway Protocol
BGP4	Border Gateway Protocol - version 4
BGP4+	Multiprotocol Extensions for Border Gateway Protocol - version 4
bit/s	Bits per second (can also appear as bps)
BPDU	Bridge Protocol Data Unit
BRI	Basic Rate Interface
CC	Continuity Check
CDP	Cisco Discovery Protocol
CFM	Connectivity Fault Management

CIDR	Classless Inter-Domain Routing
CIR	Committed Information Rate
CIST	Common and Internal Spanning Tree
CLNP	ConnectionLess Network Protocol
CLNS	ConnectionLess Network System
CONS	Connection Oriented Network System
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSNP	Complete Sequence Numbers PDU
CST	Common Spanning Tree
DA	Destination Address
DC	Direct Current
DCE	Data Circuit terminating Equipment
DHCP	Dynamic Host Configuration Protocol
DIS	Draft International Standard/Designated Intermediate System
DNS	Domain Name System
DR	Designated Router
DSAP	Destination Service Access Point
DSCP	Differentiated Services Code Point
DTE	Data Terminal Equipment
DVMRP	Distance Vector Multicast Routing Protocol
E-Mail	Electronic Mail
EAP	Extensible Authentication Protocol
EAPOL	EAP Over LAN
EFM	Ethernet in the First Mile
ES	End System
FAN	Fan Unit
FCS	Frame Check Sequence
FDB	Filtering DataBase
FQDN	Fully Qualified Domain Name
FTTH	Fiber To The Home
GBIC	GigaBit Interface Converter
GSRP	Gigabit Switch Redundancy Protocol
HMAC	Keyed-Hashing for Message Authentication
IANA	Internet Assigned Numbers Authority
ICMP	Internet Control Message Protocol
ICMPv6	Internet Control Message Protocol version 6
ID	Identifier
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IETF	the Internet Engineering Task Force
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPCP	IP Control Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IPV6CP	IP Version 6 Control Protocol
IPX	Internetwork Packet Exchange
ISO	International Organization for Standardization
ISP	Internet Service Provider
IST	Internal Spanning Tree
L2LD	Layer 2 Loop Detection
LAN	Local Area Network
LCP	Link Control Protocol
LED	Light Emitting Diode
LLC	Logical Link Control
LLDP	Link Layer Discovery Protocol
LLQ+3WFQ	Low Latency Queueing + 3 Weighted Fair Queueing
LSP	Label Switched Path
LSP	Link State PDU
LSR	Label Switched Router
MA	Maintenance Association
MAC	Media Access Control

MC	Memory Card
MD5	Message Digest 5
MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface crossover
MEP	Maintenance association End Point
MIB	Management Information Base
MIP	Maintenance domain Intermediate Point
MRU	Maximum Receive Unit
MSTI	Multiple Spanning Tree Instance
MSTP	Multiple Spanning Tree Protocol
MTU	Maximum Transfer Unit
NAK	Not AcKnowledge
NAS	Network Access Server
NAT	Network Address Translation
NCP	Network Control Protocol
NDP	Neighbor Discovery Protocol
NET	Network Entity Title
NLA ID	Next-Level Aggregation Identifier
NPDU	Network Protocol Data Unit
NSAP	Network Service Access Point
NSSA	Not So Stubby Area
NTP	Network Time Protocol
OADP	Octpower Auto Discovery Protocol
OAM	Operations, Administration, and Maintenance
OSPF	Open Shortest Path First
OUI	Organizationally Unique Identifier
packet/s	packets per second (can also appear as pps)
PAD	PADding
PAE	Port Access Entity
PC	Personal Computer
PCI	Protocol Control Information
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PID	Protocol IDentifier
PIM	Protocol Independent Multicast
PIM-DM	Protocol Independent Multicast-Dense Mode
PIM-SM	Protocol Independent Multicast-Sparse Mode
PIM-SSM	Protocol Independent Multicast-Source Specific Multicast
PoE	Power over Ethernet
PRI	Primary Rate Interface
PS	Power Supply
PSNP	Partial Sequence Numbers PDU
QoS	Quality of Service
RA	Router Advertisement
RADIUS	Remote Authentication Dial In User Service
RDI	Remote Defect Indication
REJ	REJect
RFC	Request For Comments
RIP	Routing Information Protocol
RIPng	Routing Information Protocol next generation
RMON	Remote Network Monitoring MIB
RPF	Reverse Path Forwarding
RQ	ReQuest
RSTP	Rapid Spanning Tree Protocol
SA	Source Address
SD	Secure Digital
SDH	Synchronous Digital Hierarchy
SDU	Service Data Unit
SEL	NSAP SELector
SFD	Start Frame Delimiter
SFP	Small Form factor Pluggable
SMTP	Simple Mail Transfer Protocol
SNAP	Sub-Network Access Protocol

SNMP	Simple Network Management Protocol
SNP	Sequence Numbers PDU
SNPA	Subnetwork Point of Attachment
SPF	Shortest Path First
SSAP	Source Service Access Point
STP	Spanning Tree Protocol
TA	Terminal Adapter
TACACS+	Terminal Access Controller Access Control System Plus
TCP/IP	Transmission Control Protocol/Internet Protocol
TLA ID	Top-Level Aggregation Identifier
TLV	Type, Length, and Value
TOS	Type Of Service
TPID	Tag Protocol Identifier
TTL	Time To Live
UDLD	Uni-Directional Link Detection
UDP	User Datagram Protocol
ULR	Uplink Redundant
UPC	Usage Parameter Control
UPC-RED	Usage Parameter Control - Random Early Detection
VAA	VLAN Access Agent
VLAN	Virtual LAN
VRRP	Virtual Router Redundancy Protocol
WAN	Wide Area Network
WDM	Wavelength Division Multiplexing
WFQ	Weighted Fair Queueing
WRED	Weighted Random Early Detection
WS	Work Station
WWW	World-Wide Web
XFP	10 gigabit small Form factor Pluggable

Conventions: KB, MB, GB, and TB

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

Conventions: The terms "Switch" and "switch"

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

- AX2200S series switch
- AX1250S series switch
- AX1240S series switch

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

Contents

1. Reading the Manual

Command description format
Specifiable values for parameters
List of character codes
Messages displayed by the entry-error detection function

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 about the parameter input format, see *Specifiable values for parameters*.

Input mode

Indicates the input mode (administrator mode, user mode, or administrator mode) that can be used for 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 item 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

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 the error messages displayed by entry-error detection function are not described here. For these messages, see *36. Error Messages Displayed When Editing the Configuration* in the manual *Configuration Command Reference*.

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 1-2 Specifiable values for parameters

Parameter type	Description	Input example
Any character string	See List of character codes.	`hostname K0_LITE_1`
Access list name QoS flow list name	See List of character codes. Alphabetic characters can be used for the first character, and alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the other characters. Any other characters can be entered, but specify the above type characters. Do not specify the character string, resequence, or the character strings beginning with resequence.	`mac access-list extended list101`
QoS queue list name DHCP address pool name	See List of character codes. Alphabetic characters can be used for the first character, and alphanumeric characters, hyphens (-), underscores (_), and periods (.) can be used for the other characters. Any other characters can be entered, but specify the above type characters.	`ip dhcp pool floorA`
File name#1	You can use alphanumeric characters, hyphens (-), underscores (_), and periods (.). See also The file names used on the RAMDISK or on the memory card.	`backup mc backup.cnf`
File name	Specify a file name or a file name with the path name#2. You can use a forward slash (/) as the path delimiter.	`backup mc my_dir/backup.cnf`
Directory name#3	Specify a directory name or a directory name with the path name#2. You can use a forward slash (/) as the path delimiter.	`mkdir my_dir`
Base name	Specify only the file name. You cannot use a forward slash (/).	`rename mc my_dir/backup.cnf bup.cnf`
MAC address, MAC address mask	Specify these items in hexadecimal format, separating 2-byte hexadecimal values by periods (.).	`1234.5607.08ef` `0000.00ff.ffff`
IPv4 address, IPv4 subnet mask	Specify these items in decimal format, separating 1-byte decimal values by periods (.).	`192.168.0.14` `255.255.255.0`
IPv6 address	Specify this item in hexadecimal format, separating 2-byte hexadecimal values by colons (:).	`3ffe:501:811:ff03:87ff:fed0:c7e0`

#1: When you specify a file name (for example, when using the `copy` command), add the

file extension.

(Example: *xx*`.dat`, *xx*`.txt`)

If you do not use a file extension when specifying a file name, a command execution error might occur.

#2: A forward slash is used as the path delimiter. A path name beginning with a forward slash is not allowed.

Also, a path name meeting any of the following conditions is not allowed:

- The path name contains two successive periods (..).
- The path name contains a period (.). The only exception is a path name that consists only of one period.
- The path name contains successive forward slashes.

  (Example: `foo//baa`)
- The path name ends with a forward slash.

  (Example: `foo/`)

#3: If the total number of characters in a directory name and its subordinate file name exceeds 64 characters, the character string will not be displayed correctly by some commands (for example, `show mc-file` or `show ramdisk-file`).

Therefore, specify a directory name in which the total number of characters, including the subordinate file name, does not exceed the maximum allowed number of characters. Keep this in mind especially when using the `mkdir` command to create a directory.

<IF#> Parameter range

Specify the *<IF#>* parameter in the format *NIF-No./Port-No.* (include the last period). *NIF-No.* of the Switch is fixed at zero.

The following tables list the range of *<IF#>* values.

Table 1-3 Range of <IF#> values for AX2200S series switches

#	Model	Interface type	Range of values
1	AX2230S-24T	gigabitethernet	0/1 to 0/28
2	AX2230S-24P	gigabitethernet	0/1 to 0/28

Table 1-4 Range of <IF#> values for AX1250S series switches

#	Model	Interface type	Range of values
1	AX1250S-24T2C	fastethernet	0/1 to 0/24
		gigabitethernet	0/25 to 0/26

Table 1-5 Range of <IF#> values for AX1240S series switches

#	Model	Interface type	Range of values
1	AX1240S-24T2C/AX1240S-24P2C	fastethernet	0/1 to 0/24
		gigabitethernet	0/25 to 0/26

#	Model	Interface type	Range of values
2	AX1240S-48T2C	fastethernet	0/1 to 0/48
		gigabitethernet	0/49 to 0/50

How to specify *<IF# list> <Port# list>* and the range of the specifiable values

If *<IF# list> <Port# list>* is written in parameter input format, use a hyphen (`-`) or commas (`,`) in the *<IF#>* format to specify multiple ports. You can also specify one port, as when *<IF#>* is written as the parameter input format. The range of specifiable values is the same as the range of *<IF#>* values in the above table.

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

```
0/1-3,0/5
```

How to specify *<VLAN ID list>*

If *<VLAN ID list>* is written in parameter input format, use a hyphen (`-`) or commas (`,`) to specify multiple VLAN IDs. You can also specify one VLAN ID, as when *<VLAN ID>* is written as the parameter input format. The range of permitted values is VLAN ID=1 (VLAN ID for the default VLAN) and other VLAN IDs set by the configuration command.

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

```
1-3,5,10
```

How to specify *<Channel group# list>*

If *<Channel group# list>* is written in parameter input format, use a hyphen (`-`) or commas (`,`) to specify multiple channel group numbers. You can also specify one channel group number. The range of permitted values for the channel group number is all the channel group numbers set by the configuration command.

Example of a range specification that uses "`-`" or "`,`":

```
1-3,5
```

The file names used on the RAMDISK or on the memory card

For details about the parameter range specifiable for each command, see the description for each command or *Specifiable values for parameters*.

The following limitations exist for parameters outside the specifiable range for parameters:

- The file names are not case sensitive.
- A file name or a directory name ended with a period (`.`) cannot be used.

The file names used on the FTP servers

For details about the parameter range specifiable for each command, see the description for each command or *Specifiable values for parameters*.

Some server-dependent limitations other than the specifiable range for parameters might exist. For details, see the specifications of the server.

When using the Switch as an FTP server, the descriptions in *The file names used on the RAMDISK or on the memory card* above are applied.

List of character codes

Character codes are listed in the following table.

Table 1-6 List of character codes

Character	Code	Character	Code	Character	Code	Character	Code	Character	Code	Character	Code
Space	0x20[#1]	0	0x30	@	0x40	P	0x50	`	0x60	p	0x70
!	0x21	1	0x31	A	0x41	Q	0x51	a	0x61	q	0x71
"	0x22[#2]	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[#1]	O	0x4F	_	0x5F	o	0x6F	---	---

#1: To enter this character as part of a character string, you must enclose the entire character string in double quotation marks (").

#2: This character is used to enclose an entire character string. You cannot enter it as part of a character string.

Messages displayed by the entry-error detection functionality

For error messages output by the entry-error detection function (see *5.2.3 Entry-error detection functionality* in the *Configuration Guide Vol. 1*), see *36. Error Messages Displayed When Editing the Configuration* in the manual *Configuration Command Reference*.

2. Switching the Command Input Mode

enable
disable
exit
logout
configure

enable

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

Syntax

```
enable
```

Input mode

User mode

Parameters

None

Example

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

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

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

Display items

None

Impact on communication

None

Response messages

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

Message	Description
Sorry.	The mode cannot be changed to administrator mode because a password entry error occurred.

Notes

- Initially, no password is set. To ensure better security, we recommend that you use the `password` command to set the password.
- Help for this command is also displayed in administrator mode. Although you enter this command in administrator mode, the command input mode will not change.

disable

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

Syntax

```
disable
```

Input mode

Administrator mode

Parameters

None

Example

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

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

Display items

None

Impact on communication

None

Response messages

None

Notes

None

exit

Ends the current command input mode as follows:

1. If you are in user mode or administrator mode, you are logged out from the device.
2. Ends configuration command mode and returns you to administrator mode.

Syntax

```
exit
```

Input mode

User mode and administrator mode

Parameters

None

Example

1. Ends administrator mode and logs out from the device.

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

2. End the configuration command mode.

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

Display items

None

Impact on communication

None

Response messages

None

Notes

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

logout

Logs out from the device.

Syntax

```
logout
```

Input mode

User mode and administrator mode

Parameters

None

Example

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

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

Display items

None

Impact on communication

None

Response messages

None

Notes

None

configure

Changes the command input mode from administrator mode to configuration command mode when the command input mode is administrator mode, and initiates configuration editing.

Syntax

```
configure [terminal]
```

Input mode

Administrator mode

Parameters

`terminal`

Enables editing of the running configuration during operation.

Example

Change the command input mode from administrator mode to configuration command mode.

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

Display items

None

Impact on communication

None

Response messages

None

Notes

The device starts operation at power up based on the settings in the startup configuration file. To change the settings, you can use this configuration command, which immediately applies a settings change. If you do not save the settings configured by using the configuration command to the startup configuration file, the configuration settings will be lost when the device is restarted. Care is therefore necessary. We recommend that you execute the `save` configuration command or the `copy` operation command to save the settings to the startup configuration file.

3. Terminals and Remote Operations

set exec-timeout
set terminal pager
telnet
ftp
line console speed
trace-monitor

set exec-timeout

Sets the idle time (in minutes) for auto-logout (see *4.3 (3) Auto-logout* in the *Configuration Guide Vol. 1*).

Syntax

```
set exec-timeout <Minutes> [save]
```

Input mode

User mode and administrator mode

Parameters

<Minutes>

Specifies the time for auto-logout in minutes.

Specifiable values

0-60 (If 0 is specified, auto logout is not performed.)

`save`

Saves the setting of the auto-logout time to the internal flash memory.

Operation when this parameter is omitted:

The new setting is not saved to the internal flash memory. If you either log out from or restart the device, the old auto-logout time setting is used.

Operation when this command is not used:

The auto-logout time is set to 30 minutes.

Example

- Set the auto-logout value to 10 minutes, and then save the setting.

```
> set exec-timeout 10 save    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

- When the `set terminal pager` command has been executed with the `enable` parameter specified, if "`Press any key to continue (Q to quit)`" is displayed and the display halts temporarily, you will be returned to the prompt after the set time elapses and thereafter be logged out from the device.
- The following shows the objects that are the target of the auto-logout functionality.

Target	set exec-timeout	Default logout time
Console	Y (0-60 minutes)	30 minutes
Telnet server	Y (0-60 minutes)	30 minutes
FTP server	N	30 minutes

Legend Y: Supported; N: Not supported

- Executing the `show running-config` command does not display this command setting. Executing the `show system` command will display the saved setting in the `System Setting` item.

set terminal pager

Specifies whether to perform paging (see *5.2.6 Paging* in the *Configuration Guide Vol. 1*).

Syntax

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

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:

This parameter cannot be omitted.

`save`

Saves the paging setting to the internal flash memory.

Operation when this parameter is omitted:

The new setting is not saved to the internal flash memory. If you either log out from or restart the device, the old paging setting is used.

Operation when this command is not used:

Paging is performed.

Example

- Set so that paging will not be performed and the setting will not be saved.

```
> set terminal pager disable      Press the Enter key.
```

- Set so that paging will be performed and the setting will be saved.

```
> set terminal pager enable save    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

Executing the `show running-config` command does not display this command setting.
Executing the `show system` command will display the saved setting in the `System Setting` item.

telnet

Connects via Telnet, as a Telnet client, to the remote host that has the specified IP address.

Syntax

```
telnet <IP address>
```

Input mode

User mode and administrator mode

Parameters

<IP address>

Specifies an IP address.

Operation when this parameter is omitted:

This parameter cannot be omitted.

Example

1. Access the remote host whose IP address is `192.168.0.1` via Telnet.

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

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

```
Trying 192.168.0.1 ...
```

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

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

Display items

None

Impact on communication

None

Response messages

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

Message	Description
Trying *<host>*...	Trying to connect to *<host>*. *<host>*: Remote host

Notes

- To interrupt the processing while `Trying...` is displayed, press the **Ctrl**+**Shift**+**6** keys and then the **X** key.

- To break the attempted connection, press the **Ctrl**+**Shift**+**6** keys and then the **B** key. Other escape sequences are not supported.
- This command sends the input key codes to the login destination host without making any modifications. Therefore, the key code used on the terminal on which this command is entered must be the same as the key code recognized by the destination host. If they are different, the command will not operate correctly. For example, as the input key code for the **Enter** key, some terminals generate only **CR**, whereas other terminals generate **CR** and **LF**. Also, when a destination device recognizes the **Enter** key, some devices only recognize **CR**, whereas other devices recognize **CR** and **LF**. Check the settings of the input terminal and the login destination device beforehand.

ftp

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

Syntax

```
ftp <IP address>
```

Input mode

User mode and administrator mode

Parameters

<IP address>

Specifies the IP address of the remote operation terminal.

Operation when this parameter is omitted:

This parameter cannot be omitted.

Example

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

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

After the `ftp` command is executed, wait for the connection to the remote operation terminal to be established. When the connection is established, the input prompt (see steps 1 and 2 below) is displayed. If a connection is not established, the mode returns to operation command mode.

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 following table describes the parameters that can be specified for file transfer.

Parameter type	Description	Number of characters
<Local file>	You can use alphanumeric characters, hyphens (`-`), underscores (_), and periods (`.`). See *Base name* under *File name* in *Specifiable values for parameters*.	1 to 64 characters

Parameter type	Description	Number of characters
<Local files> `mget` *<Remote files>*	You can use alphanumeric characters, hyphens (`-`), underscores (_), periods (`.`), asterisks (`*`), and question marks (`?`). If the character string includes a question mark (`?`), enclose the entire character string in double quotation marks (`"`). See *Base name* under *File name* in *Specifiable values for parameters*.	1 to 64 characters
<Remote file> `mdelete` *<Remote files>* *<From name>* *<To name>* *<Remote directory>* *<Directory name>*	See *Any character string* in *Specifiable values for parameters*.	1 to 1024 characters
<Mode>	See *Any character string* in *Specifiable values for parameters*.	1 to 64 characters

#: File names that end with a period (`.`) cannot be used.

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

`get` *<Remote file>* `[`*<Local file>*`]`

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

If *<Remote file>* does not meet the input conditions for *<Local file>* (number of characters and character type), make sure you specify *<Local file>*.

`mget` *<Remote files>*

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

`put` *<Local file>* `[`*<Remote file>*`]`

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

`mput` *<Local files>*

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

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

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

ascii

Sets ASCII as the transfer format of the file.

binary

Sets binary as the transfer format of the file.

[bye | quit | exit]

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

`cd` *<Remote directory>*

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

`chmod` *<Mode>* *<Remote file>*

Changes the attribute of the file specified for *<Remote file>* on the remote operation terminal to the attribute specified for *<Mode>*.

`delete` *<Remote file>*

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

`help [`*<Command>*`]`

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

`lols`

Lists the contents of the RAMDISK on the Switch.

`ls [`*<Remote directory>*`]`

Lists the contents of *<Remote directory>* (current directory if *<Remote directory>* is not specified) on the remote operation terminal.

`mdelete [`*<Remote files>*`]`

Deletes *<Remote files>* on the remote operation terminal. Use this command when multiple files must be deleted. Enter the command in the format `mdelete *.txt`.

`mkdir` *<Directory name>*

Creates a directory on the remote operation terminal.

passive

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

prompt

Enables (on) or disables (off) interactive mode for the `mget`, `mput`, and `mdelete` commands.

If this mode is enabled (on), files can be selected separately.

The following table shows the display format and describes the options.

<Command name> *<File name>* `[y/n/a/q/?]?`

Display	Description
y	Executes the file.
n	Skips the file.
a	Executes all subsequent files.
q	Ends command execution.
?	Displays Help.

If the mode is off, all files are transferred or deleted unconditionally.

The default is enabled (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 display of the detailed response information from the FTP server. The default is enabled (on).

Display items

None

Impact on communication

None

Response messages

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

Message	Description
Connecting...	Connection to the FTP server is in progress.
Error: Ambiguous command.	The command can be interpreted in two or more ways and therefore cannot be identified uniquely.
Error: Bad command.	The command was not entered correctly.
Error: Can't get file names.	A file list could not be acquired when the `mget`, `mput`, or `mdelete` command was executed.
Error: Can't open "*<File name>*".	A file could not be opened. *<File name>*:The specified file name
Error: Command send failed.	A communication error occurred.
Error: Connect failed.	An attempt to connect to the FTP server failed.
Error: Data accept failed.	A communication error occurred.
Error: Data connect failed.	A communication error occurred.
Error: Data receive failed.	A communication error occurred.
Error: Data send failed.	A communication error occurred.
Error: File not found "*<File name>*".	The specified file could not be found. *<File name>*:The specified file name
Error: File read failed.	A file could not be read.
Error: File write failed.	Writing to a file failed.

Message	Description
Error: Invalid file name "*<File name>*".	The file name is invalid (for example, an invalid character string was used). *<File name>*:The specified file name
Error: Invalid parameter.	An entered parameter was invalid.
Error: Is a directory "*<File name>*".	The specified *<File name>* is a directory. *<File name>*:The specified file name
Error: Missing parameter.	A parameter is missing.
Error: Reply receive failed.	A communication error occurred.
Error: String must be more than 0 characters.	The character string must have one or more characters.
Error: String too long.	The character string is too long.
Error: The command execution failed, because "*xxx*" is executing.	The command is being executed by another user. Wait a while and then try again, or else check whether another user is running the command. *xxx*:Information regarding another user (for example, `console`, `vty0`, `vty1` is displayed.)
Error: Too long file name.	The file name is too long. (In the file name list of the `mput`, `mget`, or `mdelete` command)
Error: Too many parameters.	There are too many parameters.
Error: Too much file entries.	There are too many files. (In the file name list of the `mput`, `mget`, or `mdelete` command)
Passive: off	Passive mode has been disabled.
Passive: on	Passive mode has been enabled.
Prompting: off	Interactive mode for the `mput`, `mget`, or `mdelete` command has been disabled.
Prompting: on	Interactive mode for the `mput`, `mget`, or `mdelete` command has been enabled.
Type: ascii	The type for sending and receiving files has been set to ASCII.
Type: binary	The type for sending and receiving files has been set to binary.
Verbose: off	Display of a detailed response has been disabled.
Verbose: on	Display of a detailed response has been enabled.

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 **Ctrl**+**C** and exit.

3. A local directory on the Switch can be moved only to `/ramdisk`.
4. A local file on the Switch can be sent to or received from `/ramdisk` only.
5. If the default file transfer format is ASCII, you will need to execute the `binary` command to enable the transfer of binary files.
6. If you press **Ctrl**+**C** while a file is being transferred with a `get` or `put` command, the file transfer is immediately interrupted. The interruption is reported to the remote operation terminal and a response is waited for. Therefore, if some communication failures occur between the Switch and the remote operation terminal, you might not see any `ftp` prompts even if you press **Ctrl**+**C**. In this case, press **Ctrl**+**C** again.

line console speed

Specifies the communication speed of CONSOLE (RS-232C). If a user has already logged in from CONSOLE (RS-232C) when the communication speed is changed, the speed changes immediately. If the communication speed is changed from a remote operation terminal while login authentication for a user who is trying to log in from CONSOLE (RS-232C) is in progress, the authentication might fail.

Syntax

```
line console speed <Transmission rate> [save]
```

Input mode

User mode and administrator mode

Parameters

<Transmission rate>

Specifies the communication speed of CONSOLE (RS-232C).

Specifiable communication speeds:

`1200`, `2400`, `4800`, `9600`, `19200`

Operation when this parameter is omitted:

This parameter cannot be omitted.

`save`

Saves the new communication speed setting to the internal flash memory.

Operation when this parameter is omitted:

The new communication speed setting is not saved to the internal flash memory. If you restart the device, the old communication speed setting is used.

Operation when this command is not used:

CONSOLE (RS-232C) operates at 9600 bps.

Example

- Change and save the communication speed.

```
> line console speed 19200 save    Press the Enter key.
Do you wish to continue? (y/n): y
```

Display items

None

Impact on communication

None

Response messages

None

Notes

- Using this command to change the communication speed immediately changes the speed. If the communication speed is changed from a remote operation terminal

while login authentication for a user who is trying to log in from CONSOLE (RS-232C) is in progress, the authentication might fail.

- For login to the Switch from CONSOLE (RS-232C) and via Telnet, if the Telnet side changes the communication speed with this command and then logs out, the CONSOLE (RS-232C) communication speed also changes, disabling communication from CONSOLE (RS-232C).
- Executing the `show running-config` command does not display this command setting. Executing the `show system` command will display the saved setting in the `System Setting` item.

trace-monitor

Specifies whether to display the operation log on the monitor. When this command is entered with the `enable` parameter specified, the operation log is displayed on the console whenever necessary each time an event occurs.

Syntax

```
trace-monitor {enable | disable} [save]
```

Input mode

User mode and administrator mode

Parameters

`{ enable | disable }`

`enable`

The operation log is displayed on the monitor.

`disable`

The operation log is not displayed on the monitor.

Operation when this parameter is omitted:

This parameter cannot be omitted.

`save`

The new setting is saved to the internal flash memory.

Operation when this parameter is omitted:

The new setting is not saved to the internal flash memory. If you restart the device, the old monitor display setting is used.

Operation when this command is not used:

The operation log is displayed on the monitor.

Example

- Do not display the operation log on the monitor, or save the setting.

```
> trace-monitor disable    Press the Enter key.
```

- Display the operation log on the monitor, and save the setting.

```
> trace-monitor enable save    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

None

Notes

- Executing the `show running-config` command does not display this command setting. Executing the `show system` command will display the saved setting in the

`System Setting` item.

- After execution of the `trace-monitor enable` command, if an operation log is too large to be displayed on the monitor, the message `WARNING !! There are too many messages to output.` appears.

4. Configurations and File Operations

show running-config
show startup-config
copy
erase startup-config
rename
del
mkdir
rmdir

show running-config

Displays the running configuration.

Syntax

```
show running-config
```

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 command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CAUTION!!! This configuration list is too big!!! (*xxxxxxx* byte) *x*:Indicates the size of running-config.	The `running-config` list is too large. The `running-config` list exceeds 1 MB, so it cannot be saved to `startup-config`. Review the configuration.

Notes

If there are many items in the running configuration, command execution might take some time.

show startup-config

Displays the startup configuration file 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

None

Notes

None

copy

Copies the specified file or directory.

Syntax

```
copy startup-config ramdisk {<File name> | <Directory name>}
copy running-config startup-config
copy running-config mc {<File name> | <Directory name>}
copy mc {<File name> | <Directory name>} mc {<File name> | <Directory name>}
copy mc {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}
copy ramdisk <File name> startup-config
copy ramdisk {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}
copy ramdisk {<File name> | <Directory name>} mc {<File name> | <Directory name>}
copy auto-log mc {<File name> | <Directory name>}
copy auto-log ramdisk {<File name> | <Directory name>}
```

Input mode

User mode and administrator mode for the following commands

```
copy mc {<File name> | <Directory name>} mc {<File name> | <Directory name>}
copy mc {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}
copy ramdisk {<File name> | <Directory name>} mc {<File name> | <Directory name>}
copy ramdisk {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}
```

For all other commands, only administrator mode is available.

Parameters

`startup-config`: Startup configuration file

`running-config`: Running configuration

`auto-log`:The device status information collected automatically after the device starts

`{<File name> | <Directory name>}`

<File name>

Specifies the name of a file at the copy source or copy destination.

Specify the file name with 64 or fewer characters. The file name is not case sensitive.

For the characters that can be specified, see *Specifiable values for parameters*.

<Directory Name>

Specifies the directory name at the copy source or copy destination.

Specify the directory name so that the total number of characters used in the directory name and its subordinate file name is no more than 64. The file name is not case sensitive.

For the characters that can be specified, see *Specifiable values for parameters*.

`startup-config ramdisk {<File name> | <Directory name>}`

Copies the startup configuration file to the RAMDISK.

`running-config startup-config`

Copy the running configuration to the startup configuration file.

`running-config mc {<File name> | <Directory name>}`

Copies the running configuration to the memory card.

`mc {<File name> | <Directory name>} mc {<File name> | <Directory name>}`

Copies a file or directory on the memory card to the memory card.

`mc {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}`

Copies a file or directory on the memory card to the RAMDISK.

`ramdisk <File name> startup-config`

Copies a file on the RAMDISK to the startup configuration file.

A directory on the RAMDISK cannot be specified.

`ramdisk {<File name> | <Directory name>} mc {<File name> | <Directory name>}`

Copies a file or directory on the RAMDISK to the memory card.

`ramdisk {<File name> | <Directory name>} ramdisk {<File name> | <Directory name>}`

Copies a file or directory on the RAMDISK to the RAMDISK.

`auto-log mc {<File name> | <Directory name>}`

Copies the auto-log information to the memory card.

`auto-log ramdisk {<File name> | <Directory name>}`

Copies the auto-log information to the RAMDISK

Example

- Copy the running configuration to the startup configuration file. (If the copy destination is the startup configuration file, a confirmation message is displayed.)

```
# copy running-config startup-config
Do you wish to copy from running-config to startup-config? (y/n): y
```

- Copy a file on the RAMDISK to the startup configuration file. (If the copy destination is the startup configuration file, a confirmation message is displayed.)

```
# copy ramdisk config1.txt startup-config
Do you wish to copy from RAMDISK to startup-config? (y/n): y
```

Display items

None

Impact on communication

If a file on the RAMDISK is copied to the startup configuration file, you must restart the device to apply the file to the running configuration. Restart the device by executing the `reload` operation command, or by turning it off and then on again.

Response messages

Table 4-2 List of response messages for the copy command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command. The possible causes are as follows: - The file name is incorrect. - The file was not found. - The memory card might be damaged. - The file system might be damaged.

Message	Description
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, 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.
Can't copy subdirectory.	Subdirectories cannot be copied.
File name length exceeds the limit.	The file name or the directory, including its path name, exceeds 64 characters.
MC is not inserted.	A memory card was not inserted.
Not enough space on device.	Capacity at the write destination is insufficient.
Source and destination are identical.	The source and destination files for a transfer exist at the same location.

Notes

- Editing the startup configuration file has no effect on the running configuration or communication.
- If a file on the RAMDISK is copied to the startup configuration file, you must restart the device to apply the file to the running configuration. Restart the device by executing the `reload` command, or by turning it off and then on again.
- If the copy destination is the startup configuration file, the copy processing is performed even if there is an error in the specified configuration file. After the device is restarted, execute the `show logging` command to make sure the operation log does not indicate an inconsistent configuration.
- If there is insufficient free space for storing files, a configuration cannot be copied. Use the `show mc` command and the `show ramdisk` command to check the unused capacity. The necessary space required for copying a configuration is the total size of the new configuration in the copy source and the existing configuration in the copy destination. About 1MB of free capacity is required for a maximum-size configuration file.
- If a file on the memory card is specified, the command can be executed only when the memory card is inserted.
- If a file on the memory card is specified, the ACC LED on the device is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.
- Note that the file copied to the RAMDISK will be deleted when the device restarts.
- Specify the file name with 64 or fewer characters. If the file name is too long, it will not be displayed correctly when the `show mc-file` or `show ramdisk-file` command is executed.
- If you create the configuration file on your PC and save it to the memory card used for operation, specify the file name with 64 or fewer characters.
- You cannot view the `auto-log` file because it is a binary file that the manufacturer uses for failure analysis.
- If the source and destination files for a copy operation are the same, an error occurs as follows:

  When both the copy source and the copy destination are the memory card and the

file names (including their path names) are the same

When both the copy source and the copy destination are the RAMDISK and the file names (including their path names) are the same

Example: When the mc <*File name*> mc <*File name*> command is executed:

```
copy mc aaa mc aaa Not allowed
copy mc bbb/xxx mc bbb/xxx Not allowed
copy mc bbb/xxx mc bbb/yyy OK
```

- If there are any subdirectories in the copy source directory, an error occurs.
- If the name of a directory at the copy destination is the same as the name of the source directory, the source file is copied to that directory or overwrites a file in that directory.

erase startup-config

Deletes the contents of the startup configuration file.

Syntax

```
erase startup-config
```

Input mode

Administrator mode

Parameters

None

Example

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

Display items

None

Impact on communication

None

Response messages

None

Notes

If you restart the device after executing this command, the contents of the startup configuration file will be deleted. In such cases, you will not be able to log in via the network.

rename

Renames a file on the memory card or the RAMDISK.

Syntax

```
rename {mc | ramdisk} {<File name> | <Directory name>} <Base name>
```

Input mode

User mode and administrator mode

Parameters

{mc | ramdisk}

mc

Specifies a file on the memory card.

ramdisk

Specifies a file on the RAMDISK.

Operation when this parameter is omitted:

This parameter cannot be omitted.

{*<File name>* | *<Directory name>*}

<File name>

Specifies the old file name.

Specify the file name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

<Directory name>

Specifies the old directory name.

Specify the directory name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

This parameter cannot be omitted.

<Base name>

Specifies the new file name or directory name.

Specify the name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

Example

- Rename a file on the memory card.

```
# rename mc abc/showtech.txt shotech_01.txt    Press the Enter key.
```

- Rename a directory on the memory card.

```
# rename mc abc efg    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-3 List of response messages for the rename command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command. The possible causes are as follows: - The file name is incorrect. - The file was not found. - The memory card might be damaged. - The file system might be damaged.
MC is not inserted.	A memory card was not inserted.
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, 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.
Resultant name exceeds the maximum length.	The new file name or directory, including its path name, exceeds 64 characters. If the old file name or directory name includes a path name, specify *<Base name>* with no more characters than the value of 64 minus the number of characters in the path name.

Notes

- If a file on the memory card is specified, the command can be executed only when the memory card is inserted.
- If a file on the memory card is specified, the ACC LED on the device is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.
- This command cannot move a file from a directory to another directory.
- When you rename a directory, you can specify a maximum of 64 characters. However, if you do so, you might not be able to use a long name in the `show` and `copy` commands as shown by the following example:

  Example:

  Old directory name: *short-dir* (20 characters)

  Old file name: *long-file* (40 characters)

  New directory name: *long-dir* (30 characters)

  `rename ramdisk` *short-dir long-dir*

  In this case, the total number of characters for the directory name and the file name becomes 70, which exceeds the limit of 64. Therefore, you cannot use these names in the `show` and `copy` commands.

del

Deletes a file on the memory card or the RAMDISK.

Syntax

```
del {mc | ramdisk} <File name>
```

Input mode

User mode and administrator mode

Parameters

`{mc | ramdisk}`

`mc`

Specifies a file on the memory card.

`ramdisk`

Specifies a file on the RAMDISK.

Operation when this parameter is omitted:

This parameter cannot be omitted.

<File name>

Specifies the name of the file to be deleted.

Example

- Delete the file `showtech_01` on the memory card.

```
> del mc abc/showtech_01.txt    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-4 List of response messages for the del command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command. The possible causes are as follows: - The file name is incorrect. - The file was not found. - The memory card might be damaged. - The file system might be damaged. - The specified name is the name of a directory.
MC is not inserted.	A memory card was not inserted.

Message	Description
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, 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.

Notes

- If a file on the memory card is specified, the command can be executed only when the memory card is inserted.
- If a file on the memory card is specified, the ACC LED on the device is on while the command is being executed. Do not remove or insert the memory card while the ACC LED is on.
- Even if this command is not executed, all files on the RAMDISK are deleted when the device restarts.
- Attempting to delete a directory by using this command results in error. For details about deleting a directory, see the description of the *rmdir* command.

mkdir

Creates a new directory.

Syntax

```
mkdir {mc-dir | ramdisk} <Directory name>
```

Input mode

User mode and administrator mode

Parameters

`{mc-dir | ramdisk}`

`mc-dir`

Creates a directory on a memory card.

`ramdisk`

Creates a directory on the RAMDISK.

<Directory name>

Specifies the name of the directory to be created.

Specify the directory name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

Example

- Create the directory `newdir` on the memory card.

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

- Create the directory `newdir` on the RAMDISK.

```
> mkdir ramdisk newdir    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-5 List of response messages for the mkdir command

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

Message	Description
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC is not inserted.	A memory card was not inserted.

Notes

- The `mc-dir` parameter cannot be used when a memory card is not inserted.
- 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.
- You can specify a maximum of 64 characters for a directory name, but if you do so, you might not be able to use a long name in the `show` and `copy` commands.

rmdir

Deletes a specified empty directory.

Syntax

```
rmdir {mc-dir | ramdisk} <Directory name>
```

Input mode

User mode and administrator mode

Parameters

`{mc-dir | ramdisk}`

`mc-dir`

Deletes a directory on the memory card.

`ramdisk`

Deletes a directory on the RAMDISK.

<Directory name>

Specifies the name of the directory to be deleted.

Example

- Delete the directory `deldir` on the memory card.

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

- Delete the directory `deldir` on the RAMDISK.

```
> rmdir ramdisk deldir    Press the Enter key.
```

Display items

None

Impact on communication

None

Response messages

Table 4-6 List of response messages for the rmdir command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, and then insert the memory card again. Make sure there is no dust in the memory card slot. If there is dust, remove it with a dry cloth and then insert the memory card again.
MC is not inserted.	A memory card was not inserted.

Notes

- The `mc-dir` parameter cannot be used when a memory card is not inserted.
- 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.
- If there is a file in the specified directory, an error occurs. For details about deleting a file, see the description of the *del* command.

5. Login Security and RADIUS

password
clear password
show sessions(who)
rename user
show radius-server
clear radius-server
show radius-server statistics
clear radius-server statistics

password

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

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

Syntax

```
password
password enable-mode
```

Input mode

User mode and administrator mode

Parameters

`enable-mode`

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

Operation when this parameter is omitted:

Only the password of the logged-in user can be changed.

Example

- Change the login user password in administrator mode.

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

- Change the login user password in user mode.

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

Display items

None

Impact on communication

None

Response messages

Table 5-1 List of response messages for the password command

Message	Description
Mismatch; try again.	The new password and the re-entered password are not the same. Re-enter both passwords.
Password unchanged.	The password change was canceled.
Password: Permission denied.	The password change is not allowed.
Please don't use an all-lower case password. Unusual capitalization, control characters or digits are suggested.	We recommend that upper-case alphabetic characters, symbols, or numbers be used in addition to lower-case alphabetic characters.
Please enter a longer password.	We recommend that the password have from 6 to 16 characters.

Notes

- When a password is changed in administrator mode, the old password is not displayed. Start the procedure by entering the new password at the prompt (`New password:`).
- We recommend that you use at least six characters for a password. If fewer than six characters are entered, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted. Also, the maximum number of characters that can be used for a password is 16. If 17 or more characters are entered, only the first 16 characters are registered as the password. We recommend that you use upper-case alphabetic characters, numbers, and symbols in addition to lower-case alphabetic characters. If a password consists of only lower-case alphabetic characters, an error is displayed. Note, however, that if you re-enter the same password, it will be accepted.

clear password

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

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

Syntax

```
clear password
clear password enable-mode
```

Input mode

User mode and administrator mode

Parameters

`enable-mode`

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

If the `enable-mode` parameter is not specified, only the login user password is deleted.

Example

- Delete the login user password in administrator mode.

```
# clear password
Changing local password for xxxxxxx --- The login user name is displayed.
Password cleared.
#
```

- Delete the password of a login user.

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

Display items

None

Impact on communication

None

Response messages

Table 5-2 List of response messages for the clear password command

Message	Description
Password unchanged.	The password deletion was canceled.
Permission denied.	Deletion of the password is not allowed.

Notes

When a password is deleted in administrator mode, the old password is not displayed.

show sessions(who)

Display the users currently logged in to the Switch.

Syntax

```
show sessions
who
```

Input mode

User mode and administrator mode

Parameters

None

Example

Display the users currently logged in to the Switch.

```
> show sessions

Date 2008/11/25 13:42:29 UTC
 Username   Type     Login                Source
*operator   console  2008/11/22 00:44:23  -
 web0010    vty0     2008/11/25 13:36:09  192.168.10.201

>
```

Display items

Table 5-3 Information displayed for logged-in users

Item	Meaning	Displayed information
Username	User name	An asterisk (`*`) precedes the name of the user who is executing the command.
Type	Connection type	`console`, `vty0`, `vty1`, or `ftp`
Login	Login time	The time the user successfully logged in.
Source	IP address	IP address of the device on which the Telnet or FTP client is running. A hyphen (`-`) is always displayed for `console`.

Impact on communication

None

Response messages

None

Notes

None

rename user

Changes the initial user name `operator` to another name.

Syntax

```
rename user
```

Input mode

Administrator mode

Parameters

None

Example

Initial user name `operator`

```
# rename user
Changing username.--- The login user name is displayed.
Old username:operator --- Enter the current user name.
New username:ax12-1   --- Enter a new user name.
#
```

Display items

None

Impact on communication

None

Response messages

Table 5-4 List of response messages for the rename user command

Message	Description
Invalid user name.	The specified user name is not registered.
User name unchanged.	The user name change was canceled.
User name change error.	An attempt to register the user name failed.
User name write error.	An attempt to register the user name failed.

Notes

- User names can only be changed in administrator mode.
- Set 1 to 8 characters for the user name.

show radius-server

Displays the effective RADIUS server information set on the Switch.

Syntax

```
show radius-server
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 5-2 Displaying the RADIUS server information

```
> show radius-server

Date 2009/10/29 05:13:12 UTC
 <common>
   [Authentication]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.0.251     1812        5      3       -
      192.168.0.252     1812        5      3       -
      192.168.0.253     1812        5      3       -
      192.168.0.254     1812        5      3       -
      192.168.11.1      1812       10      5       -
   [Accounting]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.0.251     1813        5      3       -
      192.168.0.252     1813        5      3       -
      192.168.0.253     1813        5      3       -
      192.168.0.254     1813        5      3       -
      192.168.11.1      1813       10      5       -
 <dot1x>
   [Authentication]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.11.1      1812       10      5       -
   [Accounting]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.11.1      1813       10      5       -
 <mac-auth>
   [Authentication]
      IP address        Port  Timeout  Retry  Remain
      192.168.11.1      1812       10      5       -
    * hold down                                     8
   [Accounting]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.11.1      1813       10      5       -
 <web-auth>
   [Authentication]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.0.254     1812        5      3       -
   [Accounting]
      IP address        Port  Timeout  Retry  Remain
    * 192.168.0.254     1813        5      3       -
 <ra-group-1>
   [Authentication]
```

```
  IP address        Port  Timeout  Retry  Remain
  192.168.0.251     1812        5      3       -
  192.168.0.252     1812        5      3       -
  192.168.0.253     1812        5      3       -
* 192.168.0.254     1812        5      3     541

>
```

Display items

Table 5-5 Information displayed for the RADIUS server

Item	Meaning	Displayed information
<Server>	Server type	`common`: General-use RADIUS server `dot1x`: RADIUS server using IEEE 802.1X authentication only `mac-auth`: RADIUS server using MAC-based authentication only `Web-auth`: RADIUS server using Web authentication only A group name: RADIUS server group
[Authentication]	Authentication information	--
IP address	IPv4 address	--
Port	Authentication port number	--
Timeout	Timeout period (in minutes)	--
Retry	Number of re-transmissions	--
Remain	Time remaining until automatic restoration (in seconds)	A hyphen (`-`) is displayed if not applicable.
* hold down	All servers are unavailable.	Displayed only when all servers are unavailable.
[Accounting]	Accounting information	--
IP address	IPv4 address	--
Port	Accounting port number	--
Timeout	Timeout period (in minutes)	--
Retry	Number of re-transmissions	--
Remain	Time remaining until automatic restoration (in seconds)	A hyphen (`-`) is displayed if not applicable.
* hold down	All servers are unavailable.	Displayed only when all servers are unavailable.

Impact on communication

None

Response messages

Table 5-6 List of response messages for the show radius-server command

Message	Description
RADIUS Server is not configured.	A RADIUS server has not been configured.

Notes

- An asterisk (`*`) indicates the RADIUS server to which the next request will be submitted.

  A request to the RADIUS server is submitted in the order that hosts are set in `radius-server`.

  If no response is received from the first RADIUS server, a request is submitted to the next RADIUS server. This operation is repeated, and an asterisk (`*`) precedes the name of the RADIUS server that finally responds.

  If no response is received from all RADIUS servers, `* hold down` is displayed.

  If you want to submit a request to the first RADIUS server, execute the `clear radius-server` command.

clear radius-server

Restores the primary RADIUS server as the RADIUS server to which the Switch submits a request.

Syntax

```
clear radius-server [{common | dot1x | mac-authentication | web-authentication | group <Group name>}] [-f]
```

Input mode

User mode and administrator mode

Parameters

`{common | dot1x | mac-authentication | web-authentication | group` *<Group name>*`}`

`common`

Only a general-use RADIUS server can be restored as the primary RADIUS server.

`dot1x`

Only a RADIUS server used for IEEE 802.1X authentication only is restored as the primary RADIUS server.

`mac-authentication`

Only a RADIUS server used for only MAC-based authentication is restored as the primary RADIUS server.

`web-authentication`

Only a RADIUS server used for only Web authentication is restored as the primary RADIUS server.

`group` *<Group name>*

Only a RADIUS server in the specified RADIUS group is restored as the primary RADIUS server.

Operation when this parameter is omitted:

All the RADIUS servers restored as the primary RADIUS server by server type.

`-f`

A return to the primary RADIUS server is done without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Figure 5-3 Example of the display when returning to the primary RADIUS server

- When a confirmation message is displayed:

```
> clear radius-server
Do you wish to clear priority of RADIUS server? (y/n): y

>
```

- When a confirmation message is not displayed:

```
> clear radius-server -f


>
```

Display items

None

Impact on communication

None

Response messages

Table 5-7 List of response messages for the clear radius-server command

Message	Description
RADIUS Server is not configured.	A RADIUS server has not been configured.

Notes

- Executing this command does not clear statistics. To clear statistics, use the command `clear radius-server statistics`.
- Executing this command restores the primary RADIUS server as the RADIUS server to which an authentication request is submitted and accounting information is sent.

show radius-server statistics

Displays statistics about the effective RADIUS server set on the Switch.

Syntax

```
show radius-server statistics [summary]
```

Input mode

User mode and administrator mode

Parameters

summary

Displays summary information about the RADIUS server.

Operation when this parameter is omitted:

Statistics about the RADIUS server are displayed.

Example 1

Figure 5-4 Displaying statistics about the RADIUS server

```
> show radius-server statistics

Date 2009/10/29 04:47:02 UTC
  IP address: 192.168.0.254
   [Authentication]     Current Request:          0
    [Tx] Request  :         12  Error  :          1
         Retry    :          2  Timeout:          2
    [Rx] Accept   :         10  Reject :          2  Challenge  :          0
         Malformed:          0  BadAuth:          0  UnknownType:          0
   [Accounting]         Current Request:          0
    [Tx] Request  :         19  Error  :          1
         Retry    :          0  Timeout:          0
    [Rx] Responses:         19
         Malformed:          0  BadAuth:          0  UnknownType:          0
  IP address: 192.168.11.1
   [Authentication]     Current Request:          0
    [Tx] Request  :         14  Error  :          1
         Retry    :          2  Timeout:          2
    [Rx] Accept   :         12  Reject :          2  Challenge  :          0
         Malformed:          0  BadAuth:          0  UnknownType:          0
   [Accounting]         Current Request:          0
    [Tx] Request  :         23  Error  :          1
         Retry    :          0  Timeout:          0
    [Rx] Responses:         23
         Malformed:          0  BadAuth:          0  UnknownType:          0

>
```

Display items in Example 1

Table 5-8 Statistics displayed for the RADIUS server

Item	Meaning	Displayed information
IP address	IPv4 address of the RADIUS server	--

Item	Meaning	Displayed information
[Authentication]	Authentication information	--
Current Request	Number of authentication requests being submitted	--
[Tx]	Information on sent requests	--
Request	Total number of sent Access-Request packets	Retries are excluded.
Error	Number of errors during sending	Most of these occur when the port used to connect to the RADIUS server is down
Retry	Total number of Access-Request retries	--
Timeout	Number of timeouts	--
[Rx]	Information about received responses	--
Accept	Total number of received Access-Accept packets	--
Reject	Total number of received Access-Reject packets	--
Challenge	Total number of received Access-Challenge packets	--
Malformed	Number of received invalid data format replies	--
BadAuth	Number of received replies with invalid authenticators	--
UnknownType	Number of invalid packet types received	--
[Accounting]	Accounting information	--
Current Request	Number of accounting requests	--
[Tx]	Information on sent requests	--
Request	Total number of sent Accounting-Request packets	Retries are excluded.
Error	Number of errors during sending	Most of these occur when the port used to connect to the RADIUS server is down
Retry	Total number of Accounting-Request retries	--
Timeout	Number of timeouts	--
[Rx]	Information about received	--

Item	Meaning	Displayed information
	responses	
Responses	Number of sent and received Accounting-Response packets	--
Malformed	Number of received invalid data format replies	--
BadAuth	Number of received replies with invalid authenticators	--
UnknownType	Number of invalid packet types received	--

Example 2

Figure 5-5 Displaying a summary of the RADIUS server

```
> show radius-server statistics summary

Date 2009/10/29 04:49:05 UTC
  IP address:192.168.0.254 [Tx] Timeout:2 [Rx] Accept:10, Reject:2
  IP address:192.168.11.1 [Tx] Timeout:2 [Rx] Accept:12, Reject:2

>
```

Display items in Example 2

Table 5-9 Display of the RADIUS server summary

Item	Meaning	Displayed information
IP address	IPv4 address of the RADIUS server	--
[Tx]	Information on sent requests	--
Timeout	Number of timeouts	--
[Rx]	Information about received responses	--
Accept	Total number of received Access-Accept packets	--
Reject	Total number of received Access-Reject packets	--

Impact on communication

None

Response messages

Table 5-10 List of response messages for the show radius-server statistics command

Message	Description
RADIUS Server is not configured.	A RADIUS server has not been configured.

Notes

None

clear radius-server statistics

Clears the RADIUS server statistics.

Syntax

```
clear radius-server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 5-6 Clearing the RADIUS server statistics

```
> clear radius-server statistics

>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

clear radius-server statistics

6. Time Settings and NTP

set clock
show clock
set clock ntp
show ntp-client

set clock

Displays and sets the date and time.

Syntax

```
set clock <[[[[YY]MM]DD]HH]MM[.SS]>
```

Input mode

User mode and administrator mode

Parameters

YY

Specifies the last two digits of the year in the range from 00 to 38 (for example, 00 for the year 2000).

MM

Specifies the month in the range from 01 to 12.

DD

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

HH

Specifies the hour in the range from 00 to 23.

MM

Specifies the minute in the range from 00 to 59.

SS

Specifies the second in the range from 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

To set the date and time as 22.02.11 at 15:30, enter the following command:

```
> set clock 1102221530
Tue Feb 22 15:30:00 UTC 2011
>
```

Impact on communication

None

Response messages

Table 6-1 List of response messages for the set clock command

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

Notes

- The specification range is from January 1, 2000, at 00:00:00 to January 17, 2038, at

23:59:59.

- If you change the Switch's clock, in the statistics on CPU usage collected by the Switch, only the data displayed in seconds will be cleared to zero.

show clock

Displays the current date and time.

Syntax

```
show clock
```

Input mode

User mode and administrator mode

Parameters

None

Displays the current time.

Example

Enter the following command to display the current time.

```
> show clock    Press the Enter key.
Tue Feb 22 15:30:00 UTC 2011
>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

set clock ntp

Manually obtains the time from the NTP server.

Syntax

```
set clock ntp [<Server IP>]
```

Input mode

User mode and administrator mode

Parameters

<Server IP>

Specifies the NTP server address.

Operation when this parameter is omitted:

The NTP server address that is set by using the `ntp client server` configuration command (primary address) is used. If the time cannot be obtained by using the primary address, the secondary address that is set by using the `ntp client server` command is used.

Example

```
> set clock ntp
  Executed > Please check a result by 'show ntp-client'.

>
```

Impact on communication

None

Response messages

Table 6-2 List of response messages for the set clock ntp command

Message	Description
Failure > Please specify a NTP server address.	Set the NTP server address.
Failure > Busy.	The command is already being executed. Wait a while, and then retry the operation.
Can't execute.	The command could not be executed. Re-execute the command.
Executed > Please check a result by 'show ntp-client'.	To check the execution result, execute the `show ntp-client` command.

Notes

- You can execute this command even if the `ntp client server` configuration command has not been set. If the `ntp client server` command has not been set, use this command to specify the NTP server address.
- The result is displayed within about 30 seconds after execution of this command.

show ntp-client

Displays the NTP client information.

Syntax

```
show ntp-client
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 6-2 Displaying the NTP client information

```
> show ntp-client

Date 2009/02/23 11:38:05 UTC
 Last NTP Status
  NTP-Server : 192.168.7.1, Source-Address : ---
  Mode : Multicast, Lapsed time : 14(s), Offset : 1(s)

 Activate NTP Client
  NTP-Server : ---, Source-Address : ---
  Mode : Multicast

 NTP Execute History(Max 10 entry)
  NTP-Server      Source-Address  Mode      Set-NTP-Time          Status
  192.168.7.1     ---             Multicast 2009/02/23 11:37:51        1
  192.168.7.1     ---             Multicast 2009/02/23 11:36:51        1
  192.168.7.1     ---             Multicast 2009/02/23 11:35:51        1
  192.168.7.2     ---             Command   2009/02/23 11:35:24  Timeout
  192.168.7.1     ---             Multicast 2009/02/23 11:34:51        1
  192.168.7.2     ---             Command   2009/02/23 11:34:15  Timeout
  192.168.7.1     ---             Multicast 2009/02/23 11:33:51        1
  192.168.7.1     ---             Multicast 2009/02/23 11:32:51        1
  192.168.7.1     ---             Multicast 2009/02/23 11:31:51        1
  192.168.7.1     ---             Multicast 2009/02/23 11:30:51        0

>
```

Display items

Table 6-3 Information displayed by the show ntp-client command

Item	Displayed information	Displayed information
Last NTP Status	The last information when it was possible to obtain the time from the NTP server	--
NTP-Server	The last accessed NTP server address	--
Source-Address	The specified source IP address	This item is displayed in unicast mode, but `---` is always displayed because the source IP address is not specified.

Item	Displayed information	Displayed information
Mode	NTP client acquisition mode	`Unicast`, `Multicast`, `Broadcast`, or `Command`
Lapsed time	The amount of time that has elapsed since the time was obtained from the NTP server	From 0 to 4294967295 (seconds)
Offset	Time lag with the NTP server	The range of values is from -2147483648 to 2147483647 (seconds).
Activate NTP Client	Information about the mode of the currently operating NTP client	--
NTP-Server	NTP server address	This item is displayed only in unicast mode.
Source-Address	The specified source IP address	This item is displayed in unicast mode, but `---` is always displayed because the source IP address is not specified.
Mode	NTP client acquisition mode	`Unicast`, `Multicast`, or `Broadcast`
Interval	The value registered by using the `ntp interval` command	If nothing is registered, `3600` is displayed by default. This item is displayed only in unicast mode. The range of values is from 120 to 604800 (seconds).
NTP Execute History(Max 10 entry)	History information on the executed NTP client operations	A maximum of 10 histories, which are the latest, are displayed.
NTP-Server	NTP server address	`Unicast`: Values set by configuration `Multicast`, `Broadcast`: NTP server address of the acquisition source `Command`:`---` is displayed if the command has not been configured.
Source-Address	The specified source IP address	This item is displayed in unicast mode, but `---` is always displayed because the source IP address is not specified.
Mode	NTP client acquisition mode	`Unicast`, `Multicast`, `Broadcast`, or `Command`
Set-NTP-Time	Set NTP time	If a timeout occurs or if the time cannot be acquired, the current time on the Switch is displayed.
Status	Offset value or status	Offset value: From -2147483648 to 2147483647 (seconds) If the time has been obtained normally, the offset value is displayed. For all other cases, see *Status display*[#1].

#1 Status display

#	Display	Status	Unicast	Multicast	Broadcast	Operation commands
1	offset-value	Time has been updated normally.	Y	Y	Y	Y
2	Timeout	Timeout	Y	--	--	Y
3	Cancel	An operation command was executed while the time was being obtained.	Y	--	--	--
4	30sRule	The time was changed again within 30 seconds of the previous change.	Y	Y	Y	Y
5	Error	An error occurs due to a condition other than the above.	Y	--	--	Y

Impact on communication

None

Response messages

None

Notes

1. The following assumptions apply to the NTP client:

- The obtained time is basically used for the setting time. However, if an attempt is made to update the time within 30 seconds of the last update, the time will not be updated. (An exception occurs when the `set clock ntp` operation command is executed.)
- When a broadcast or multicast is received, the NTP version information is not checked. (Versions 1 to 3 are all received.)
- When a broadcast or multicast is received, NTP authentication is not checked. (Data sent from the server must not be authenticated.)

7. Checking Software Versions and Device Statuses

show version
show system
show environment
reload
show tech-support
backup
restore

show version

Displays the software version and hardware revision installed on the Switch.

Syntax

```
show version
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 7-1 Example of the result of executing the show version command

```
> show version

Date 2012/06/14 08:23:12 UTC
Model: AX2230S-24T
S/W: OS-LT4 Ver. 2.4 (Build:yy)
H/W: AX-2230-24T-B [SSSSSSSSSSSSSSSSSSSSS:R]

>
```

Display items

Table 7-1 Information displayed by the show version command

Item	Display format	Meaning
Model	Device model	Displays the device model. For AX2200S ● AX2230S-24T ● AX2230S-24P For AX1250S ● AX1250S-24T2C For AX1240SY ● AX1240S-24T2C ● AX1240S-24P2C ● AX1240S-48T2C
S/W	Software information	Displays software information. For AX2200S ● OS-LT4 Ver. *x.x*(Build:*yy*) For AX1250S ● OS-LT3 Ver. *x.x*(Build:*yy*) For AX1240SY ● OS-LT2 Ver. *x.x*(Build:*yy*) *x.x*: Software version *yy*: Build

Item	Display format	Meaning
H/W	Hardware information	Displays hardware information. For AX2200S ● `AX-2230-hhhhh [SSS....SSS:R]` For AX1250S ● `AX-1250-hhhhh [SSS....SSS:R]` For AX1240SY ● `AX-1240-hhhhh [SSS....SSS:R]` *hhhhh*: Hardware model *SSS....SSS*: Serial information *R*: Hardware revision

Impact on communication

None

Response messages

None

Notes

None

show system

Displays operating status.

Syntax

```
show system
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 7-2 Example of the information displayed for normal operation

```
> show system

Date 2012/07/06 10:11:19 UTC
System: AX1240S-48T2C Ver. 2.4 (Build:yy)
    Name         : AX1240S-48T225
    Contact      : -
    Locate       : Minatomirai Business Square 11F
    Machine ID   : 0012.e210.0001
    Boot Date    : 2012/07/05 21:38:07
    Elapsed time : 0 days 12:33:12
    LED
       ST1 LED   : Green
       Brightness mode : normal

Environment
    Fan          : active
    Temperature  : normal
    Accumulated running time
       total     : 808 days and 0 hours
       critical  : 0 days and 0 hours

File System
    < RAMDISK information >
       used     9,079,808 byte
       free     3,503,104 byte
       total   12,582,912 byte
    < RAMDISK files >
    File Date               Size Name
    2012/07/05 21:38       1,024 oan/
    2012/07/06 10:08   9,011,200 work.img
    2012/07/05 21:38       1,024 oan/wa_files/
    < MC information >
    MC : not connect

System Setting
    set terminal pager : disabled  (save: disabled)
    line console speed : 9600      (save: 9600)
    trace-monitor      : enabled   (save: enabled)
    set exec-timeout   : 0         (save: 0)

Device Resources
    IP Routing Entry(static)    :    5(max entry=128)
```

```
IP Routing Entry(connected) :    4(max entry=128)
IP Interface Entry          :    4(max entry=128)
IP ARP Entry                :    3(max entry=2048)
MAC-address Table Entry     :   16(max entry=16384)

System Layer2 Table Mode  : 1
Flow detection mode : layer2-2
  Used resources for filter(Used/Max)
                          MAC      IPv4
    Port 0/1-50    :       -     0/128
    VLAN           :       -     0/128
  Used resources for QoS(Used/Max)
                          MAC      IPv4
    Port 0/1-50    :       -      0/64
    VLAN           :       -      0/64

>
```

Display items

Table 7-2 Information displayed by the show system command

Item	Displayed information	Displayed information
System	Device model	Device model name
	Software information	Version
Name	System name	Identification name set by the user
Contact	Contact information	Contact information set by the user
Locate	Installation location	Installation location set by the user
Machine ID	Switch MAC addresses	--
Boot Data	Startup date and time	--
Elapsed time	Operating time	--
LED	LED status	`Light off`: The LED is off. `Green blink`: The LED is green and blinking. `Green`: The LED is on and green. `Red blink`: The LED is red and blinking. `Red`: The LED is on and red.
Brightness mode	LED brightness status	`normal`: Normal brightness `economy`[#1]: Power saving brightness `off`: The LED is off. `auto(`*xxx*`)`: Automatic brightness adjustment *xxx*: `normal`, `economy`, or `off`
Environment	Environment display	--
Fan	Fan operating status	`-`: No fan `active`: Running `fault`: A fault has occurred. `inactive`: Stopping due to the cooling fan monitoring and controlling functionality (only

Item	Displayed information	Displayed information
		for the AX1240S-48T2C model)
Temperature	Temperature environment status	`normal`: Normal `caution`: Outside the normal range For details about the temperature value, see the description of the *show environment* command.
Accumulated running time	Cumulative operating time of the device	`total`: Total device run time since startup `critical`: Run time in the `caution` state
File System	File system	--
RAMDISK Information	RAMDISK status	--
used	Used capacity	Capacity being used by the RAMDISK file system
free	Unused capacity	Capacity not being used by the RAMDISK file system
total	Total capacity	Total capacity being used and not being used by the RAMDISK file system
RAMDISK files	List of files saved on the RAMDISK	Timestamp, size, and name of each file
MC information	Memory card status	--
MC	Memory card status	`enabled`: The memory card can be accessed. `not connect`: The memory card is not installed. `write protect`: Writing to the memory card is not allowed.
Manufacture ID	Type[#2]	Memory card production ID number
used	Used capacity[#2]	Capacity in use in the memory card file system
free	Unused capacity[#2]	Capacity not in use in the memory card file system
total	Total capacity[#2]	Total of capacity in use and capacity not in use for the memory card file system
MC files	List of files saved on the memory card	Timestamp, size, and name of each file
System Setting	System settings	--

Item	Displayed information	Displayed information
set terminal pager	Operating status of the `set terminal pager` command	`enabled`: Enabled `disabled`: Disabled The saved setting is displayed in parentheses.
line console speed	Operating status of the `line console speed` command	`1200`, `2400`, `4800`, `9600`, or `19200` The saved setting is displayed in parentheses.
trace-monitor	Operating status of the `trace-monitor` command	`enabled`: Enabled `disabled`: Disabled The saved setting is displayed in parentheses.
set exec-timeout	Time specified in the `set exec-timeout` command	0-60 (in minutes) The saved setting is displayed in parentheses.
Device Resources	Device resource	--
IP Routing Entry(static)	Number of IP routing entries (static settings interface)	--
IP Routing Entry(connected)	Number of IP routing entries (direct-connection interface)	--
IP Interface Entry	Number of IP interface entries	--
IP ARP Entry	Number of ARP entries	--
MAC-address Table Entry	Number of MAC address table entries	--
System Layer2 Table Mode	Search method for the Layer 2 hardware table	Displays the search method set by the `system l2-table mode` configuration command. (If nothing is set, `1` is displayed.) ● `auto(mode=` *`y`*`)` Automatic selection setting The table search method determined by automatic selection is displayed in parentheses. ● x Fixed value setting (For details about the `system l2-table mode` configuration command, see *6. Device Management* in the manual *Configuration Command Reference*.)
Flow detection mode	Flow detection mode	For details, see *18. Flow Detection Mode* in the manual *Configuration Command Reference*.
Used resources for filter(Used/Max)	Number of entries currently registered as filter conditions on the target interface, and the maximum number of specifiable entries	The total of the implicit discard entries and the filtering condition entries set during configuration is displayed as the number of setting entries.

Item	Displayed information	Displayed information
Used resources for QoS(Used/Max)	The number of entries for QoS flow detection conditions and the operating information that are currently registered on the target interface, and the maximum number of specifiable entries	--

#1: AX2200S series switches do not support this functionality.

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

Impact on communication

None

Response messages

None

Notes

None

show environment

Displays the fan status, the power unit status, the status of the temperature in the chassis, and the cumulative operating time.

Syntax

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

Input mode

User mode and administrator mode

Parameters

`temperature-logging`

Displays the temperature history of the target switch.

Operation when this parameter is omitted:

The environmental status of the switch is displayed.

Example 1

The following shows an example of displaying the operating status.

Figure 7-3 Example showing the result of executing the show environment command

```
> show environment

Date 2012/07/06 10:10:45 UTC
Fan environment
    Fan   : active
    Mode  : 1 (silent)

Temperature environment
    Main          : 30  degrees C
    Warning level : normal

    Temperature-warning-level current status : 30/40 degrees C
    Temperature-warning-level average status : 27/35 degrees C period 30 day(s)

Accumulated running time
    total    : 808 days and 0 hours
    critical : 0 days and 0 hours

>
```

Display items in Example 1

Table 7-3 Information displayed by the show environment command

Item	Displayed information	Displayed information
Fan environment	Fan environment display	--
Fan	Fan operating status	`-`: No fan `active`: Running `fault`: A fault has occurred. `inactive`: Stopping due to the cooling fan monitoring and controlling functionality (only for the AX1240S-48T2C model)

Item	Displayed information	Displayed information
Mode	Fan operation mode	`-`: No fan `1 (silent)`: Reducing switch noise takes priority. `2 (cool)`: Keeping the switch cool takes priority.
Temperature environment	Temperature environment display	--
Main[#1]	Intake temperature information	Converted value of the internal temperature Note, however, it shows `-` for 60 minutes after the Switch starts.
Warning level[#2]	Operating condition level	`normal`: Normal `caution`: Outside the normal range
Temperature-warning-level current status[#3]	Information of the temperature for outputting operation messages	*mm*`/`*nn* `degree C` *mm*: Current intake temperature (converted value of the internal temperature) *nn*: Temperature that is set with the `system temperature-warning-level` configuration command
Temperature-warning-level average status[#4]	Information of the average temperature for outputting operation messages	*mm*`/`*nn* `degrees C period` *xx* `day(s)` *mm*: Current intake average temperature (converted value of the internal average temperature) *nn*: Temperature that is set with the `system temperature-warning-level average` configuration command *xx*: Time period of calculating the average temperature[#5]
Accumulated running time	Cumulative operating time[#6]	`total`: Total device run time since startup `critical`: Run time in the `caution` state

#1

The intake temperature is a converted value of the internal temperature. Therefore, the intake temperature might be quite different from the actual ambient temperature depending on the installation environment of the device, the number of the used ports, or the SFP type. When using the cooling fan monitoring and controlling functionality on the AX1240S-48T2C, the intake temperature might also be quite different from the actual ambient temperature depending on the ON or OFF status of the FAN.

#2

`Warning level` is displayed as a result of evaluating the changes in internal temperature.

Figure 7-4 Operating condition level and temperature [AX2200S]

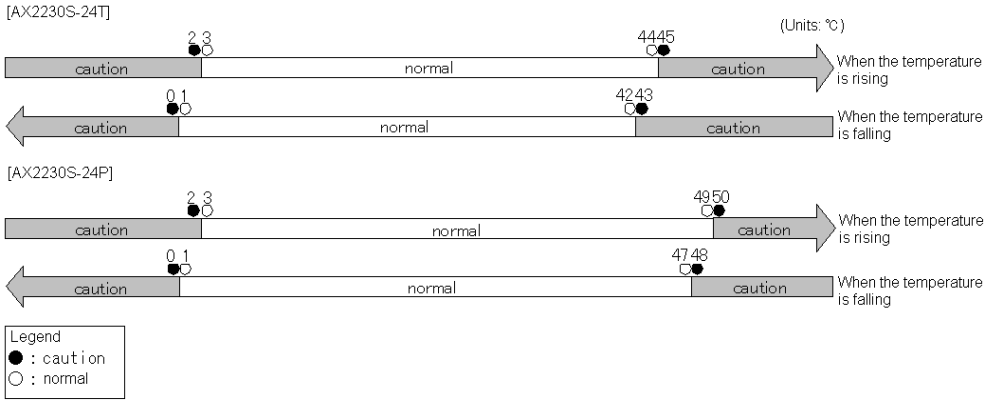


Figure 7-5 Operating condition level and temperature [AX1250]

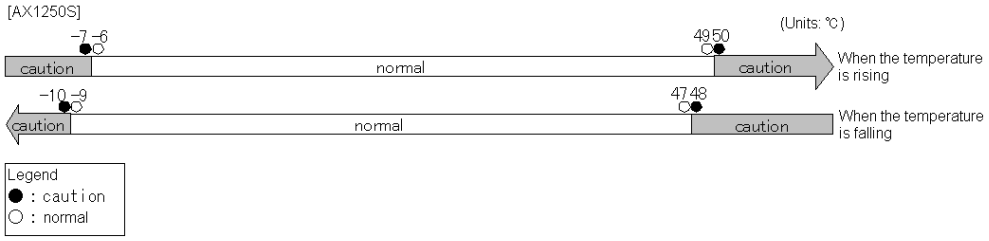
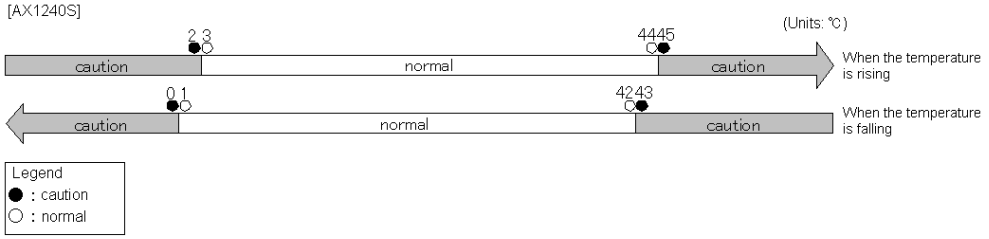


Figure 7-6 Operating condition level and temperature [AX1240]



#3

When the configuration has not been set up yet, or when the temperature monitoring functionality does not work about 60 minutes after the device started, `-/-` appears.

#4

If the *<temperature>* parameter setting is omitted, the default average temperature appears.

When the configuration has not been set up yet, or the temperature logging data has not been collected for a day long, the following is displayed:

```
Temperature-warning-level average status : -/- degrees C period - day(s)
```

#5

When it is less than the number of days set, the number of days used for the calculation is displayed.

`-` is displayed in any of the following cases.

#6

The cumulative operating time information in internal flash memory is updated every six hours. Therefore, if the operating time is less than six hours, the information in internal flash memory is not updated and the operating time recorded in internal flash memory will not be correct.

At power-up (cumulative operating time = 0)

4 hours later (cumulative operating time = 4 hours, time written in the internal flash memory = 0 hours)

8 hours later (cumulative operating time = 8 hours, time written in the internal flash memory = 6 hours)

13 hours later (cumulative operating time = 13 hours, time written in the internal flash memory = 12 hours)

Example 2

The following shows an example of displaying the temperature history information.

Figure 7-7 Example of the temperature history information

```
> show environment temperature-logging

Date 2011/02/16 21:54:23 UTC
Date         0:00  6:00 12:00 18:00
2011/02/16   30.0  30.3  28.0  27.8
2011/02/15   31.0  32.0  29.8  31.1
2011/02/14      -     -  29.2  30.0

>
```

Display items in Example 2

Table 7-4 Information displayed by the show environment temperature-logging

Item	Displayed information	Displayed information
Data	Date	--
0:00	Average temperature of the time period	Average temperature of the period from 18:00 (previous day) to 0:00
6:00		Average temperature of the period from 0:00 to 6:00
12:00		Average temperature of the period from 6:00 to 12:00
18:00		Average temperature of the period from 12:00 to 18:00
'-'	Hyphen (-)	The switch was not running. (Power was off or in sleep mode, 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

None

Notes

- The temperature history display is refreshed at the fixed times (0:00, 6:00, 12:00, and 18:00). The times might slightly change depending on the environment of the switch.

- For the display of temperature history, if the date of the switch is changed, the change is applied at 0:00 on the next day. Because the information items are displayed in the order they are collected, they are not displayed chronologically.
- The average temperature displayed with this command is calculated using an intake temperature that is converted from the internal temperature, so it might be different from the actual ambient temperature depending on the connection port configurations or the surrounding environment.

reload

Restarts the switch.

Syntax

```
reload [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

1. Restarts the switch.

   ```
   > reload    Press the Enter key.
   ```

2. Display a confirmation message when the `reload` command is started.

   ```
   Restart OK?(y/n):_
   ```

   If `y` is entered, the device is restarted. If `n` is entered, restarting is canceled.

Display items

None

Impact on communication

Communication is interrupted while the device is being restarted

Response messages

Table 7-5 List of response messages for the reload command

Message	Description
CAUTION!!! "running-config" is not saved!!!	Caution: The `running-config` setting was not saved.
CAUTION!!! "line console speed" is not saved!!!	Caution: The `line console speed` setting was not saved.
CAUTION!!! "trace-monitor" is not saved!!!	Caution: The `trace-monitor` setting was not saved.
CAUTION!!! "set terminal pager" is not saved!!!	Caution: The `set terminal pager` setting was not saved.
CAUTION!!! "set exec-timeout" is not saved!!!	Caution: The `set exec-timeout` setting was not saved.

Notes

- If the memory card has been installed, remove it before restarting the device.

show tech-support

Collects hardware and software status information required for technical support.

Syntax

```
show tech-support [{ page | ramdisk }]
```

Input mode

Administrator mode

Parameters

`{ page | ramdisk }`

`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.

`ramdisk`

Directly save the information to the RAMDISK without displaying it on the console screen.

The file `showtech.txt` is created on the RAMDISK for the saved information.

Operation when this parameter is omitted:

All information is displayed without being stopped partway. The information is not saved to the RAMDISK.

Example

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

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

Figure 7-8 Example of displaying the collected information on the screen

```
# show tech-support

########## Tech-Support Log ##########
Date 2008/11/25 14:06:14 UTC
  :                          :
  :         (omitted)
  :                          :
Date 2008/11/25 14:18:32 UTC
########## End of Tech-Support Log ##########
```

Display items

Table 7-6 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>* indicates the type of information.
########## End of *<Information Type>* ##########	A separator indicating the end of each type of collected information.*<Information Type>* indicates the type of information.

Item	Displayed information
########## *<Command Name>* ##########	*<Command Name>* indicates the name of the command executed to collect the information. The execution result of the indicated command is displayed after this separator.
########## End of*<Command Name>* ##########	A separator that indicates the end of the execution result of the indicated command.*<Command Name>* indicates the name of the command executed to collect the information.

Impact on communication

None

Response messages

Table 7-7 Information displayed by the show tech-support command

Message	Description
Can't execute.	The command could not be executed. After deleting directories and files on the RAMDISK, execute the command again.
Can't execute for the maintenance mode. Please remove "page" and "ramdisk" option.	The `page` or `ramdisk` option cannot be used because the automatic restoration is disabled. Re-execute the command without specifying those options.
Executing.	Please wait a few minutes. Wait for several minutes because the Tech-Support log is being written to the RAMDISK.
Not enough space on device.	Capacity at the write destination is insufficient.

Notes

- Before executing the `show tech-support ramdisk` command, make sure there are no directories or files on the RAMDISK. If there are any directories or files on the RAMDISK, we recommend that you delete those files before executing this command.
- If `showtech.txt` already exists on the RAMDISK, it is overwritten and saved.
- This command operates regardless of the setting of the `set terminal pager` command.
- If the automatic restoration is disabled, the collected information cannot be stored on the RAMDISK. Also, you cannot use the `page` option to display the information page by page. In this case, use the capture function of the console terminal or another method to check the information on the screen.

backup

Saves information about the running software and device to the memory card. The device information includes password information and the startup configuration file.

Syntax

```
backup mc <File name> [no-software] [AX2200S]
backup mc <File name> [no-software] [AX1230] [AX1250S] [AX1240S]
```

Input mode

Administrator mode

Parameters

`mc`

Specifies the memory card as the backup destination.

<File name>

Specifies the name of a file at the copy source or copy destination.

Specify the file name with 64 or fewer characters. The file name is not case sensitive. If a file with the same name already exists at the copy destination, it will be overwritten.

For the characters that can be specified, see *Specifiable values for parameters*.

`no-software`

No software is backed up.

Operation when this parameter is omitted:

Backup, including software information, is performed.

`AX1230` [AX1250S][AX1240S]

A backup file that is compatible with AX1230S series switches is created. (The information that is backed up is device information other than software information.)

For the compatibility of operating information among AX1250S, AX1240S, and AX1230S series switches, see *10. Device Management* in the *Configuration Guide Vol. 1*.

Operation when this parameter is omitted:

A backup file is created in AX1250S series switch and AX1240S series switch file format.

Example 1

Save the current device information to the `MCBackup.dat` file on the memory card.

```
> enable    Press the Enter key.
# backup mc MCBackup.dat    Press the Enter key.
Backup information to MC (MCBackup.dat).
Copy file to MC...
Backup information success!
```

Example 2

Save the current device information (excluding software information) to the `MCBackup.dat` file on the memory card.

```
> enable    Press the Enter key.
# backup mc MCBackup.dat no-software    Press the Enter key.
Backup information to MC (MCBackup.dat).
```

```
Copy file to MC...
Backup information success!
```

Example 3 [AX1250S][AX1240S]

Save the current device information in AX1230 series switch file format to the `MCBackup.dat` file on the memory card.

```
> enable    Press the Enter key.
# backup mc MCBackup.dat no-software AX1230    Press the Enter key.
Backup information to MC (MCBackup.dat).
Copy file to MC...
Backup information success!
```

Display items

None

Impact on communication

None

Response messages

Table 7-8 List of response messages for the backup command

Message	Description
Backup information success!	Backup processing ended successfully.
Backup operation failed.	Backup processing failed.
MC is not inserted.	A memory card was not inserted.
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, 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.
Not enough space on device.	The memory card or RAMDISK# capacity is insufficient. #: When the command is executed, the RAMDISK is used as a temporary save area. Make sure the RAMDISK is empty. After deleting directories and files on the RAMDISK, execute the command again.

Notes

- The device information saved by this command can be restored to the Switch by using the `restore` command.
- Do not allow other users to log in while this command is being executed.
- For a backup, the destination memory card must have free capacity of at least 20 MB.
- Do not remove or insert the memory card while the `backup mc` command is backing up data to the memory card.
- Before backing up the running configuration, use the `copy` command to copy it to the startup configuration file.
- Specify the file name with 64 or fewer characters. If the file name is too long, it will

not be displayed correctly when the `show mc-file` or `show ramdisk-file` command is executed.

- If you execute the `backup` command with the `no-software` parameter specified, also specify the `no-software` parameter when you execute the `restore` command.

restore

Restores the device information saved on the memory card to the Switch.

Syntax

```
restore mc <File name> [no-software]
```

Input mode

Administrator mode

Parameters

`mc`

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

<File name>

Specifies the name of a file at the copy source or copy destination.

Specify the file name with 64 or fewer characters. The file name is not case sensitive. If a file with the same name already exists at the copy destination, it will be overwritten.

For the characters that can be specified, see *Specifiable values for parameters*.

`no-software`

No software is restored.

Operation when this parameter is omitted:

Restores all the backup data.

Example 1

Restore the device information from the file `MCBackup.dat` saved on the memory card.

```
> enable    Press the Enter key.
# restore mc MCBackup.dat    Press the Enter key.
Restore information from MC (MCBackup.dat).
Copy file from MC...
Restore software.
```

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 7-9 List of response messages for the restore command

Message	Description
Restore software.	The restoration ended (when `no-software` not specified).
Restore finished.	The restoration ended.

Message	Description
Can't open (<*File name*>).	The specified file could not be opened. Specify the correct file name.
MC is not inserted.	A memory card was not inserted.
Restore operation failed.	An attempt to restore the device information failed. After execution of the backup command with `no-software` specified, execution of the `restore` command might cause this message to be displayed. Also execute the `restore` command with `no-software` specified.
Not enough space on device.	RAMDISK# capacity is insufficient. #: When the command is executed, the RAMDISK is used as a temporary save area. Make sure the RAMDISK is empty. After deleting directories and files on the RAMDISK, execute the command again.

Notes

- Do not allow other users to log in while this command is being executed.
- Do not remove or insert the memory card while the `restore mc` command is restoring data from the memory card.
- Specify the file name with 64 or fewer characters. If the file name is too long, it will not be displayed correctly when the `show mc-file` or `show ramdisk-file` command is executed.
- For the compatibility of device information between AX2200S and AX1200S series switches, see *10. Device Management* in the *Configuration Guide Vol. 1*.

8. Power Saving Functionality

set power-control schedule
show power-control port
show power-control schedule

set power-control schedule

Sets the startup mode for power saving schedule.

Syntax

```
set power-control schedule {enable | disable}
```

Input mode

User mode and administrator mode

Parameters

```
{ enable | disable }
```

Sets the startup mode for power saving schedule.

`enable`

Sets schedule-enabled mode.

`disable`

Sets schedule-disabled mode.

Operation when this parameter is omitted:

This parameter cannot be omitted.

Example

Set schedule-disabled mode.

```
> set power-control schedule disable
>
```

Display items

None

Impact on communication

None

Response messages

Table 8-1 List of response messages output by the set power-control schedule command

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

Notes

None

show power-control port

Displays the operating status of the port power saving functionality.

Syntax

```
show power-control port
```

Input mode

User mode and administrator mode

Parameters

None

Example

Display the status of port power saving control.

```
> show power-control port

Date 2009/03/24 22:55:17 UTC
Port  status  cool-standby
 0/1  up      -
 0/2  down    applied
 0/3  up      -
 0/4  up      -
 0/5  up      -
 0/6  up      -
 0/7  up      -
 0/8  up      -
 0/9  down    applied
 0/10 down    applied
 0/11 down    applied
 0/12 down    applied
 0/13 down    applied
 0/14 up      -
 0/15 up      -
 0/16 down    applied
 0/17 up      -
 0/18 up      -
 0/19 down    applied
 0/20 down    applied
 0/21 down    applied
 0/22 down    applied
 0/23 down    applied
 0/24 up      -
 0/25 down    applied
 0/26 down    applied

>
```

Display items

Table 8-2 Information displayed for the status of port power saving control

Item	Meaning	Displayed information
Port	Port	Interface port number

Item	Meaning	Displayed information
status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `inact`: The port is inactive#1 The following can cause a port to become inactive: ● Operation stopped by the `inactivate` command. ● Due to standby link function of link aggregation ● Due to the BPDU guard functionality of the Spanning Tree Protocol ● The storm control functionality ● Detection of a unidirectional link failure by the UDLD functionality ● The L2 loop detection functionality `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown interface` configuration command.
cool-standby	Port power saving functionality operating status	`applied`: The port power saving functionality is operating because of a port in the link-down status or an inactive port. `enhanced`: The gigabit Ethernet port extended power saving functionality is operating (only for an RJ45 gigabit Ethernet port). [AX1250S] [AX1240S] `--` is displayed in the following cases: ● The port power saving functionality is not operating. ● The port is in the link-up status.

#1: `inact` is cleared in the following conditions:

- The port is restored by execution of the `activate` command.

  Due to the BPDU guard functionality of the Spanning Tree Protocol

  The storm control functionality

  Detection of a unidirectional link failure by the UDLD functionality

  The L2 loop detection functionality.(The automatic restoration functionality can be also used for recovery.)

- The standby link functionality of link aggregation makes the standby port the active port.

Impact on communication

None

Response messages

None

Notes

None

show power-control schedule

Display the current status of the power saving schedule and the dates and times the power saving schedule has been enabled.

Syntax

```
show power-control schedule [<YYMMDD>] [count <Count>]
```

Input mode

User mode and administrator mode

Parameters

<YYMMDD>

The scheduled date and time is displayed from midnight of the day specified here. The specifiable range of values is from January 1, 2000 to January 17, 2038.

YY

Specify the last two digits of the year in the range from 00 to 38.

For example, 00 means the year 2000.

MM

Specify the month in the range from 01 to 12.

DD

Specify the day of the month in the range from 01 to 31.

Operation when this parameter is omitted:

The scheduled date and time from the time of command execution is displayed.

`count` *<Count>*

Scheduled dates and times equivalent to the number of specified schedules are displayed. The specifiable range of schedules is from 1 to 50.

Operation when this parameter is omitted:

The scheduled dates and times for 10 schedules are displayed.

Operation when all parameters are omitted:

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

Example

Display the current status of the power saving schedule and the dates and times the power saving schedule has been enabled.

```
> show power-control schedule 090501

Date 2009/04/01(Wed) 20:30:01 UTC
Current Schedule Status : Enable   <- Current status
Schedule Power Control Date :      <- Schedules from the specified date is displayed.
  2009/05/01(Fri) 00:00 UTC  -  2009/05/01(Fri) 06:00 UTC
  2009/05/01(Fri) 20:00 UTC  -  2009/05/04(Mon) 06:00 UTC
  2009/05/04(Mon) 20:00 UTC  -  2009/05/05(Tue) 06:00 UTC
  2009/05/05(Tue) 20:00 UTC  -  2009/05/06(Wed) 06:00 UTC
  2009/05/06(Wed) 20:00 UTC  -  2009/05/07(Thu) 06:00 UTC
  2009/05/07(Thu) 20:00 UTC  -  2009/05/08(Fri) 06:00 UTC

>
```

Display items

Table 8-3 Information displayed for the operating status of the scheduling functionality

Item	Meaning	Displayed information
Current Schedule Status :	Power saving schedule status	`Enable`: Power saving is in effect as scheduled. `Enable (force disabled)`:Same as above, except that power saving has been disabled as scheduled. `Disable`: Normal power control is in effect. `Disable (force disabled)`: Same as above, except that power saving is disabled as scheduled.
Schedule Power Control Date :	Scheduled date and time that the power saving schedule is enabled	*<Date and time of power saving schedule starts> - <Date and time of power saving schedule ends>*

Impact on communication

None

Response messages

None

Notes

- If the end time of power saving schedule is January 18, 2038, 18:00:00 or later (including when it continues forever), `2038/01/18(Mon) 00:00` is displayed.
- If this command is executed with no date specified during power saving scheduling, the command execution time will become the start time of the schedule.

9. Checking Internal Memory and Memory Cards

format mc
format flash
show mc
show mc-file
show ramdisk
show ramdisk-file

format mc

Initializes formats the memory card for use by the Switch.

Syntax

```
format mc [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Executes the command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

1. Insert the memory card to be initialized into the slot, and then enter the following command:

   ```
   > format mc    Press the Enter key.
   ```

2. Display the message asking for confirmation at the start of `format` command execution.

   ```
   Do you wish to initialize memory card? (y/n): _
   ```

   If `y` is entered, the memory card will be initialized.

   If an error occurs, an error message is displayed.

   If `n` is entered, the memory card will not be initialized, and you will be returned to administrator mode.

Display items

None

Impact on communication

None

Response messages

Table 9-1 List of response messages for the format mc command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Can't gain access to MC.	An attempt to access the memory card failed.
MC is not inserted.	A memory card was not inserted.

Message	Description
Can't access to MC by write protection.	Make sure the memory card's protect switch is not set to ▼Lock. If the switch is set to ▼Lock, move it to the opposite side, 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.

Notes

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

format flash

Initializes the internal flash memory file system.

Syntax

```
format flash [-f]
```

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.

Example

1. Enter the following command:

   ```
   # format flash    Press the Enter key.
   ```

2. Display the message asking for confirmation at the start of `format` command execution.

   ```
   Do you wish to initialize flash memory?  (y/n): _
   ```

   If `y` is entered, the internal flash memory file system will be initialized.

   If an error occurs, an error message is displayed.

   If `n` is entered, the internal flash memory file system will not be initialized, and you will be returned to administrator mode.

Display items

None

Impact on communication

None

Response messages

Table 9-2 List of response messages for the format flash command

Message	Description
Flash format complete.	Initialization of the internal flash memory file system was completed successfully.
Flash format task not ended. detail=*xxxx*	Initialization of the internal flash memory file system was not completed. `detail=`*xxxx*: Detailed reason

Message	Description
Flash format system error(1). detail=*xxxx*	A system error occurred during initialization of the internal flash memory file system. `detail=`*xxxx*: Detailed reason
Flash format system error(2). detail=*xxxx*	A system error occurred during initialization of the internal flash memory file system. `detail=`*xxxx*: Detailed reason
Flash format error. detail=*xxxx*	Initialization of the internal flash memory file system failed. `detail=`*xxxx*: Detailed reason

Notes

- Executing this command deletes all the data in the internal flash memory file system.
- When this command is executed, log information is collected even when execution has been successful.

show mc

Displays the memory card format and card usage.

Syntax

```
show mc
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
> show mc

Date 2008/11/13 10:19:51 UTC
    MC : enable
    Manufacture ID : 00000003
       used     5,750,272 byte
       free   120,160,256 byte
       total  125,910,528 byte

>
```

Display items

Table 9-3 Information displayed by the show mc command

Item	Displayed information	Displayed information
MC	Memory card status	`enabled`: The memory card can be accessed. `not connect`: The memory card is not installed. `write protect`: Writing to the memory card is not allowed.
Manufacture ID	Type#1	Memory card production ID number
used	Used capacity#1	Capacity in use in the memory card file system
free	Unused capacity#1	Capacity not in use in the memory card file system
total	Total capacity#1	Total of capacity in use and capacity not in use for the memory card file system

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

Impact on communication

None

Response messages

Table 9-4 List of response messages for the show mc command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
MC : not connect	There is no memory card.

Notes

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

show mc-file

Displays the names and sizes of the files on the memory card.

Syntax

```
show mc-file [<Directory name>]
```

Input mode

User mode and administrator mode

Parameters

<Directory name>

Displays the contents of the specified directory.

If a period (.) is specified as the directory name, the contents of the current directory are displayed.

Example

- Displaying memory card information

```
> show mc-file

Date 2008/11/13 10:19:53 UTC
    File Date              Size Name
    2008/11/13 10:01   5,636,448 K.IMG
    2008/11/13 10:04      16,384 Config_File/
    2008/11/13 10:03       5,033 Test_Config.txt
    2008/11/13 10:04       5,033 Config_File/5Floor_Config.txt

>
```

- Specifying a directory name

```
> show mc-file Config_File

Date 2008/11/13 10:21:02 UTC
    File Date              Size Name
    2008/11/13 10:04       5,033 Config_File/5Floor_Config.txt

>
```

Display items

Table 9-5 Information displayed by the show mc-file command

Item	Displayed information	Displayed information
File Date	Last update date	--
Size	File size	--
Name	File name	No more than 64 characters.

Impact on communication

None

Response messages

Table 9-6 List of response messages for the show mc-file command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command. The directory could not be found. Check the directory.
There is no file. (MC)	There are no files on the memory card.
MC is not inserted.	A memory card was not inserted.
Some files are not listed due to resource limits.	Some files cannot be displayed due to resource limits.

Notes

- Specify the file name with 64 or fewer characters. If the file name is too long, it will not be displayed correctly when the `show mc-file` or `show ramdisk-file` command is executed.
- If you create the configuration file on your PC and save it to the memory card used for operation, specify the file name with 64 or fewer characters.
- If a file name or a directory name (including a path name) exceeds 64 characters, only the fact that the file or directory exists is displayed.
- If the number of the files to be displayed exceeds 512, only 512 files, randomly chosen, are displayed.

show ramdisk

Displays the RAMDISK format and usage.

Syntax

```
show ramdisk
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
> show ramdisk

Date 2008/11/13 10:25:11 UTC
       used        77,824 byte
       free    12,505,088 byte
       total   12,582,912 byte

>
```

Display items

Table 9-7 Information displayed by the show ramdisk command

Item	Displayed information	Displayed information
used	Used capacity	Capacity being used by the RAMDISK file system
free	Unused capacity	Capacity not being used by the RAMDISK file system
total	Total capacity	Total capacity being used and not being used by the RAMDISK file system

Impact on communication

None

Response messages

Table 9-8 List of response messages for the show ramdisk command

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

Notes

None

show ramdisk-file

Displays the names and sizes of the files on the RAMDISK.

Syntax

```
show ramdisk-file [<Directory name>]
```

Input mode

User mode and administrator mode

Parameters

<Directory name>

Displays the contents of the specified directory.

If a period (.) is specified as the directory name, the contents of the current directory are displayed.

Example

- Displaying the RAMDISK information

```
> show ramdisk-file

Date 2008/11/13 10:25:13 UTC
    File Date              Size Name
    2008/11/13 10:25      1,024 Config_File/
    2008/11/13 10:21      5,033 test_config.txt
    2008/11/13 10:25      5,033 Config_File/5Floor_Config.txt

>
```

- Specifying a directory name

```
> show ramdisk-file Config_File

Date 2008/11/13 10:25:27 UTC
    File Date              Size Name
    2008/11/13 10:25      5,033 Config_File/5Floor_Config.txt

>
```

Display items

Table 9-9 Information displayed by the show ramdisk-file command

Item	Displayed information	Displayed information
File Date	Last update date	--
Size	File size	--
Name	File name	No more than 64 characters.

Impact on communication

None

Response messages

Table 9-10 List of response messages for the show ramdisk-file command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command. The directory could not be found. Check the directory.
There is no file. (RAMDISK)	There is no file on the RAMDISK.
Some files are not listed due to resource limits.	Some files cannot be displayed due to resource limits.

Notes

- Specify the file name with 64 or fewer characters. If the file name is too long, it will not be displayed correctly when the `show mc-file` or `show ramdisk-file` command is executed.
- If a file name or a directory name (including a path name) exceeds 64 characters, only the fact that the file or directory exists is displayed.
- If the number of the files to be displayed exceeds 512, only 512 files, randomly chosen, are displayed.

10. Log

show logging
clear logging
show critical-logging
show critical-logging summary
clear critical-logging

show logging

Displays the time operation log entries and messages were acquired. All acquired entries are displayed in reverse chronological order.

Syntax

```
show logging [<command classification>] [search <string>]
```

Input mode

User mode and administrator mode

Parameters

<command classification>

`-h`

Displays log entries with no header information (`System Information`). `System Information` indicates the device model and software information.

Operation when this parameter is omitted:

Log entries with header information (`System Information`) are displayed.

`search` *<string>*

Specifies the search string.

If you specify this parameter, the operation or reference log messages that include the search string are displayed.

Specify the string with 1 to 64 characters. The characters are case sensitive. For details, see *Any character string* in *Specifiable values for parameters*.

Operation when this parameter is omitted:

All the operation log messages are displayed.

Operation when all parameters are omitted:

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

Example

Figure 10-1 Displayed operation log (when the parameters are omitted)

```
> show logging

Date 2011/03/22 15:49:09 UTC
System Information
    AX1240S-48T2C, OS-LT2, Ver. 2.3 (Build:yy)#
Logging Information
Total Entry : 15
KEY INFO  11/03/22 15:49:09 console:show logging
EVT INFO  11/03/22 15:49:04 PORT Port 0/10 activated.
KEY INFO  11/03/22 15:49:04 console:activate fastethernet 0/10
RSP INFO  11/03/22 15:48:59 console: 0/5 is already active.
KEY INFO  11/03/22 15:48:59 console:activate fastethernet 0/5
EVT INFO  11/03/22 15:48:45 VLAN VLAN (1) Status is Down.
EVT INFO  11/03/22 15:48:45 PORT FastEthernet 0/11 Link Down

           :

>
```

Figure 10-2 Displayed operation log (when "activate" is specified as a parameter)

```
> show logging search activate

Date 2011/03/22 15:49:34 UTC
System Information
    AX1240S-48T2C, OS-LT2, Ver. 2.3 (Build:yy)#
Logging Information
Total Entry : 15
KEY INFO  11/03/22 15:49:34 console:show logging search activate
EVT INFO  11/03/22 15:49:04 PORT Port 0/10 activated.
KEY INFO  11/03/22 15:49:04 console:activate fastethernet 0/10
KEY INFO  11/03/22 15:48:59 console:activate fastethernet 0/5

 4 events matched.

>
```

#: x.x: Software version, yy: Build

Display items

Table 10-1 Information displayed by the show logging command

Item	Meaning	Displayed information
System Information	Header information	Device model and software information
Logging Information	Operation log information	--
Total Entry	Total number of acquired operation log entries	--
Kind	Event type	KEY, EVT, RSP, or ERR
Level	Event level	CRITC, ERROR, WARN, or INFO
Data Time	Date and time log entry acquired	*year*/*month*/*day* *hour*:*minute*:*second*
Func	Interface ID	This item is not displayed for KEY and RSP.
Message	Message	If the message exceeds one line, it continues on subsequent lines.

Impact on communication

None

Response messages

Table 10-2 List of response messages for the show logging command

Message	Description
There is no logging data.	There is no log data.
There is no log data to match.	Log data matching the specified character string could not be found.

Notes

Log information is acquired in UTC immediately after the device is started.

The operation log entries are displayed in reverse chronological order from the latest message or operation (the latest information is displayed at the top). If several log entries are generated at the same time, those log entries might not be displayed in reverse chronological order.

If you execute this command with the `search` parameter set and if information that matches the specified character string is found, the number of matched logs is displayed at the end.

Example: 3 events matched.

clear logging

Clears the operation log entries recorded by the Switch.

Syntax

```
clear logging [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Executes the command without displaying a confirmation message.
Operation when this parameter is omitted:
A confirmation message is displayed.

Example

1. Clear the operation log entries.

```
> clear logging    Press the Enter key.
```

2. A confirmation message is displayed.

```
Do you wish to clear logging? (y/n): _
```

If y is entered, the operation log entries are cleared.

If n is entered, the operation log entries are not cleared.

Display items

None

Impact on communication

None

Response messages

None

Notes

None

show critical-logging

Displays the detailed information regarding device failure log data as log records.

Syntax

```
show critical-logging [<Log#>] [ramdisk]
```

Input mode

User mode and administrator mode

Parameters

<Log#>

Specifies the number of the log record at which display of the detailed information begins.

Operation when this parameter is omitted:

Log records starting from log number 1 are displayed.

`ramdisk`

Directly save the information to the RAMDISK without displaying it on the console screen.

The file `log.txt` is created for the information saved on the RAMDISK

Operation when this parameter is omitted:

Information is displayed on the screen, but is not saved to the RAMDISK.

Example

Figure 10-3 Displaying device failure log entries

```
>show critical-logging

Date 2008/09/11 17:07:15 UTC
Total Entry : 9

 *** Detailed Log Display : Record Num.= 1 : Ref-Code = 0x08220032 ***
  Time Stamp = 2008/09/11-17:05:51 : SysUpTime = 00:01:16
 *** Log Text Data ***
Internal error occurred. (code=23)

 *** Log Binary Data ***
      :+0        +4        +8        +C               ASCII
 +000 :                              00000000              ....
 +010 : 00000000  00000000  00000000  00000000  ................
 +020 : 00000000  00000000  00000000  00000000  ................
 +030 : 00000000  00000000  00000000  00000000  ................
 +040 : 00000000  00000000  00000000  00000000  ................
 +050 : 00000000  00000000  00000000  00000000  ................
 +060 : 00000000  00000000  00000000  00000000  ................
 +070 : 00000000  00000000  00000000  00000000  ................
 +080 : 00000000  00000000  00000000  00000000  ................
 +090 : 00000000  00000000  00000000  00000000  ................
 +0A0 : 00000000  00000000  00000000  00000000  ................
 +0B0 : 00000000  00000000  00000000  00000000  ................
 +0C0 : 00000000  00000000  00000000  00000000  ................
 +0D0 : 00000000  00000000  00000000  00000000  ................
 +0E0 : 00000000  00000080  44C23480  F70B9800  ........D.4.....
 +0F0 : 00000000  00000000  00000000  00000000  ................
 +100 : 00000000  00001080  5B85F000  00000084  ........[.......
```

```
 +110 : AFF0F000  00000000  00000000  00000100  ................
 +120 : 00000200  00000000  00000200  00010000  ................
 +130 : 00000100  00000300  00003C00  00003C00  ..........<...<.
 +140 : 00001E00  00001E81  16F4A881  16E7B884  ................
 +150 : 19B94081  16C80084  19C06084  19BB7084  ..@.......`...p.
 +160 : 19C06080  903FD880  09229C00  0000312E  ..`..?..."....1.
 +170 : 395F3134  20536570  20313020  32303038  9_14 Sep 10 2008
 +180 : 2C203231  3A35363A  33332031  2E392028  , 21:56:33 1.x (
 +190 : 4275696C  643A3134  29205468  65726D6F  Build:yy) Thermo
 +1A0 : 3D33302E  352C3431  2E352C35  302E3000  =30.5,41.5,50.0.
        :
>
```

Display items

Table 10-3 Information displayed by the show critical-logging command

Item	Meaning	Displayed information
Total Entry	Total number of acquired log records	--
Record Num.	Record number specified for display	--
Ref-Code	Log reference code	--
Time Stamp	Date and time the log record was acquired	*year*/*month*/*day* - *hour*:*minute*:*second*
SysUpTime	`SysUpTime` when the log record was acquired	`SysUpTime`: The elapsed time since the device started up. (If it is within 24 hours) *time*:*minute*:*second* (If it exceeds 24 hours)*number-of-days* - *hour*:*minute*:*second*
*** Log Text Data ***	Log information displayed as text	`*** No Text Data ***` is displayed if there is no text information.
*** Log Binary Data ***	Log information displayed as binary data	`*** No Binary Data ***` is displayed if there is no binary information.

Impact on communication

None

Response messages

Table 10-4 List of response messages for the show critical-logging command

Message	Description
Can't execute.	The command could not be executed. After deleting directories and files on the RAMDISK, execute the command again.
No Log data.	There is no log information.
Not enough space on device.	Capacity at the write destination is insufficient.

Notes

Before executing the `show critical-logging ramdisk` command, make sure there are no directories and files on the RAMDISK. If there are any directories or files on the RAMDISK, we recommend that you delete those files before executing this command.

show critical-logging summary

Displays a list of device failure log entries in reference code format.

Syntax

```
show critical-logging summary
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 10-4 Displaying a list of device failure log references

```
> show critical-logging summary

Date 2008/09/11 17:07:08 UTC
Total Entry : 9

 Reference Code  Time Stamp(log number)
 xxxx-xxxx   cccccccc-dddddd(x)    cccccccc-dddddd(x)    cccccccc-dddddd(x)
 0822-0032   20080911-170551(1)    20080911-170552(2)    20080911-170554(3)
             20080911-170555(4)    20080911-170556(5)    20080911-170557(6)
             20080911-170558(7)    20080911-170559(8)    20080911-170601(9)

>
```

Display items

Table 10-5 Information displayed by the show critical-logging summary command

Item	Meaning	Displayed information
Total Entry	Total number of acquired log records	--
xxxx-xxxx	Device failure log code	Hexadecimal number *x*:Log code
cccccccc-dddddd	Time device failure log data acquired	*year-month-day - hour-minute-second*
(*xxx*)	Log record number	(*xxx*): Log record number

Impact on communication

None

Response messages

Table 10-6 List of response messages for the show critical-logging summary command

Message	Description
No Log data.	There is no log information.

Notes

Log information is acquired in UTC immediately after the device is started.

clear critical-logging

Clears the device failure log entries recorded by the Switch.

Syntax

```
clear critical-logging [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Executes the command without displaying a confirmation message.
Operation when this parameter is omitted:
A confirmation message is displayed.

Example

1. Clear the device failure log entries.

```
> clear critical-logging    Press the Enter key.
```

2. A confirmation message is displayed.

```
Do you wish to clear critical-logging? (y/n): _
```

If y is entered, the device failure log entries are cleared.

If n is entered, the device failure log entries are not cleared.

Display items

None

Impact on communication

None

Response messages

None

Notes

None

clear critical-logging

11. Software Update

ppupdate

ppupdate

Updates flash memory with new software that is copied from the memory card to the RAMDISK, or that is downloaded via FTP or a similar method.

Syntax

```
ppupdate [test][no-display][-f] [no-reload] [ramdisk <File name>]
```

Input mode

Administrator mode

Parameters

`test`

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

`no-display`

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

`-f`

Forces the processing without displaying confirmation messages when the command is executed.

Operation when this parameter is omitted:

A confirmation message is displayed.

`no-reload`

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

`ramdisk <File name>`

Specifies the update file name.

Specify the file name with 64 or fewer characters. The file name is not case sensitive.

For the characters that can be specified, see *Specifiable values for parameters*.

Example

List the current software version and the new software version, and display a confirmation message.

```
# ppupdate ramdisk k.img

Software update start

*******************************************
** UPDATE IS STARTED.                    **
*******************************************

old version a.a (Build:xx)   <- Displays the old version.
new version b.b (Build:yy)   <- Displays the new version.


Automatic reboot process will be run after installation process.
Do you wish to continue? (y/n): _

If you enter y, the update processing starts, and after it finishes, the device is
restarted automatically.
If you enter n, the update processing does not start, and you are returned to
```

`administrator mode.`

Display items

None

Impact on communication

If the `no-reload` option is not specified, the device is automatically restarted when the update finishes. During the restart, communication is temporarily suspended.

Response messages

Table 11-1 List of response messages for the ppupdate command

Message	Description
Can't apply this image file.	The specified file cannot be used because it is intended for a different device.
Can't execute.	The command could not be executed. Re-execute the command.
Can't open (<*File name*>).	The specified file could not be opened. Specify the correct file name.
Invalid file (<*File name*>).	The contents of the specified file are invalid. Specify a valid file.
There is not OS File.	There is no OS file (when the `ramdisk` <*File name*> parameter is omitted).
Can't update software. [Hardware rev.x]	Check the hardware revision number of the target device by using the `show version` command.
Flash memory write failed.	Writing to flash memory failed.

Notes

- When updating is performed, the configuration in effect before the update is inherited. However, only the configuration commands that can be recognized by the new software version can be skipped or inherited. The skipped configuration commands are output to the operation log. For details, see *2.1 Configuration* in the manual *Message Log Reference*.
- Before executing the `ppupdate` command, make sure the memory card is not inserted into the Switch. If the memory card is inserted, remove it, and then execute the `ppupdate` command.

12. Resource Information

show cpu
show memory summary

show cpu

Shows CPU usage.

Syntax

```
show cpu [days][hours][minutes][seconds]
```

Input mode

User mode and administrator mode

Parameters

`days`

Displays statistics collected daily.Statistics for the past 31 days are displayed.

`hours`

Displays statistics collected hourly. Statistics for the past day are displayed.

`minutes`

Displays statistics collected by the minute. Statistics for the past hour are displayed.

`seconds`

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

Operation when a parameter is omitted

This command displays only the information that meets the condition of the specified parameters. If you do not specify a parameter, information for the conditions specified by the parameter will not be displayed.

Operation when all parameters are omitted:

Displays statistics collected for a 5-second period.Statistics are overwritten every 5 seconds.

Example

Figure 12-1 Display example when all the parameters are specified

```
> show cpu days hours minutes seconds

Date 2009/03/12 09:31:56 UTC
*** Days ***
                                          0   25   50   75  100[%]
Date  Time              CPU average CPU peak +----+----+----+----+
03/03 11:26:22-23:59:59          12      100  ***                P
03/04 00:00:00-23:59:59          18      100  ****               P
  :
03/10 00:00:00-23:59:59          12      100  ***                P
03/11 00:00:00-23:59:59          12      100  ***                P

*** Hours ***
                                          0   25   50   75  100[%]
Date  Time              CPU average CPU peak +----+----+----+----+
03/11 09:00:00-09:59:59          12      100  ***                P
03/11 10:00:00-10:59:59          12      100  ***                P
  :
03/12 07:00:00-07:59:59          12      100  ***                P
03/12 08:00:00-08:59:59          12      100  ***                P
Date  Time              CPU average CPU peak +----+----+----+----+

*** Minutes ***
```

```
                                        0   25   50   75  100[%]
Date  Time              CPU average CPU peak +----+----+----+----+
03/12 08:31:00-08:31:59          12       94  ***               P
03/12 08:32:00-08:32:59          10       89  **               P
  :
03/12 09:29:00-09:29:59          12       84  ***             P
03/12 09:30:00-09:30:59          11       57  ***        P
Date  Time              CPU average CPU peak +----+----+----+----+

*** Seconds ***
Date  Time              CPU average
03/12 09:30:56-09:31:05   0   0  11   5  26   5  11   5   0  21
03/12 09:31:06-09:31:15  16  10   5   5   0  31   5   5   5   5
03/12 09:31:16-09:31:25  31   5   5   0   0  26   5  68  84   5
03/12 09:31:26-09:31:35  44  31   5   5   5   5  31   5   0   0
03/12 09:31:36-09:31:45  21  78  22  10  15  15  27  15   5   5
03/12 09:31:46-09:31:55   5   5  31   5   5   0   0  31   5  10

>
```

Figure 12-2 Display example when all the parameters are omitted

```
> show cpu

Date 2009/03/12 09:32:25 UTC
*** Current ***
                                   0   25   50   75  100[%]
Date  Time              CPU average +----+----+----+----+
03/12 09:32:34-09:32:38          33   *******      <- Overwritten every 5 seconds.

>
```

To end command execution, press the **Ctrl** + **C** key combination.

Display items

Table 12-1 CPU usage display items

Item	Meaning	Displayed information
CPU average	Average CPU utilization	The average CPU utilization, expressed as a percentage, within the time range indicated under `Time`. # If `seconds` is specified, CPU utilization by the second is displayed.
CPU peak	Peak CPU utilization	Peak CPU utilization, expressed as a percentage, within the time range indicated under `Time`.
Graph display of CPU utilization		
*	Average CPU utilization	The average CPU utilization is displayed in a graph. Utilization is displayed in 5% increments (a value less than 5% is rounded up to 5%).
P	Peak CPU utilization	Peak CPU utilization is displayed in a graph.

Impact on communication

None

Response messages

None

Notes

- Statistics are cleared if the device is restarted, the time zone is changed, or the device enters sleep mode.
- If the time is changed by using the `set clock` command or the NTP client, only the statistics collected by the second and every 5 seconds are cleared.

show memory summary

Displays the installed capacity, used capacity, and free capacity of the device's physical memory.

Syntax

```
show memory summary
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 12-3 Example of displaying memory information

```
> show memory summary

Date 2009/03/12 09:32:18 UTC

    Physical memory = 131072KB(128.00MB)
    Used     memory = 100039KB( 97.69MB)
    Free     memory =  31032KB( 30.31MB)

>
```

Display items

Table 12-2 Display items of memory information

Item	Displayed information
Physical memory	Displays the installed capacity of physical memory.
Used memory	Displays the used capacity of physical memory.
Free memory	Displays the free capacity of physical memory.

Impact on communication

None

Response messages

None

Notes

None

show memory summary

13. Ethernet

show interfaces
clear counters
show port
activate
inactivate
show power inline
activate power inline
inactivate power inline

show interfaces

Displays information about an Ethernet interface.

Syntax

```
show interfaces gigabitethernet <IF#> [detail] [AX2200S]
show interfaces {fastethernet | gigabitethernet} <IF#> [detail] [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X interface.

`{fastethernet | gigabitethernet}` [AX1250S][AX1240S]

`fastethernet`

Specify a 10BASE-T or 100BASE-TX interface.

`gigabitethernet`

Specify a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface.

<IF#>

Specify an interface port number. For the specifiable range of values, see *Specifiable values for parameters*.

`detail`

Specifies that detailed statistics be displayed.

Operation when this parameter is omitted:

Detailed statistics are not displayed.

Example 1 [AX1250S][AX1240S]

The following shows an example of displaying the 10BASE-T/100BASE-TX interface information and the detailed port information.

Figure 13-1 Execution result when 10BASE-T/100BASE-TX is specified

```
> show interfaces fastethernet 0/13

Date 2008/11/17 11:50:46 UTC
Port 0/13 : active up  100BASE-TX full(auto)  00ed.f201.010d                <-1
        PoE status: on        Class: 2       Priority: high                 ⎫
        Time-since-last-status-change: 00:00:26                             |
        Bandwidth: 100000kbps  Average out: 1Mbps  Average in: 1Mbps        |
        Peak out: 1Mbps at 11:50:46  Peak in: 1Mbps at 11:50:31             |
        Output rate:        1.3kbps           2pps                          |
        Input  rate:           0bps           0pps                          |2
        Flow control send   : off                                           |
        Flow control receive: off                                           |
        TPID: 8100                                                          |
        Frame size: 1518 Octets   Interface name: fastether0/13             |
        Description:                                                        ⎭
       <Out octets/packets counter>       <In octets/packets counter>       ⎫
        Octets      :               4490  Octets      :                1624|
        All packets :                 36  All packets :                  16|3
        Multicast packets     :        3  Multicast packets     :         1|
        Broadcast packets     :       30  Broadcast packets     :        15|
        Pause packets         :        0  Pause packets         :         0⎭
```

```
        <Out line error counter>                                          ┐
         Late collision        :         0  Defer indication      :       0|
         Single collision      :         0  Excessive deferral    :       0|4
         Multiple collisions   :         0  Excessive collisions  :       0|
         Error frames          :         0                                 ┘
        <In line error counter>                                           ┐
         CRC errors            :         0  Symbol errors         :       0|
         Alignment             :         0  Fragments             :       0|5
         Short frames          :         0  Jabber                :       0|
         Long frames           :         0  Error frames          :       0┘
        <Line fault counter>                                               6┐
         Link down             :         0                                 ┘
        <Uplink redundant>                                                ┐
         Switchport backup pairs                      Preemption    Flush   |7
         Primary    Status      Secondary  Status      Delay Limit   VLAN    |
         Port 0/13  Forwarding  Port 0/14  Blocking       30     -     11    ┘

>
```

1. Summary port information
2. Detailed port information
3. Send and receive statistics
4. Send error statistics
5. Receive error statistics
6. Failure statistics
7. Uplink redundancy statistics

Example 2 [AX1250S][AX1240S]

The following shows an example of displaying the 10BASE-T/100BASE-TX interface information, the detailed port information, and the detailed statistics.

Figure 13-2 Execution result when the detailed statistics for 10BASE-T/100BASE-TX is specified

```
> show interfaces fastethernet 0/13 detail

Date 2008/11/17 11:50:51 UTC
Port 0/13 : active up  100BASE-TX full(auto)  00ed.f201.010d                <-1
        PoE status: on        Class: 2       Priority: high                  ┐
        Time-since-last-status-change: 00:00:31                              |
        Bandwidth: 100000kbps  Average out: 1Mbps  Average in: 1Mbps         |
        Peak out: 1Mbps at 11:50:50  Peak in: 1Mbps at 11:50:31              |
        Output rate:        5.5kbps           3pps                           |
        Input  rate:          0bps            0pps                           |2
        Flow control send   : off                                            |
        Flow control receive: off                                            |
        TPID: 8100                                                           |
        Frame size: 1518 Octets   Interface name: fastether0/13              |
        Description:                                                         ┘
       <Out octets/packets counter>       <In octets/packets counter>        ┐
        Octets      :               5712  Octets      :               1624   |
        All packets :                 44  All packets :                 16   |
        Multicast packets     :        3  Multicast packets     :        1   |
        Broadcast packets     :       38  Broadcast packets     :       15   |
        Pause packets         :        0  Pause packets         :        0   |3
        64 packets            :        8  64 packets            :        4   |
        65-127 packets        :       25  65-127 packets        :       12   |
        128-255 packets       :       11  128-255 packets       :        0   |
        256-511 packets       :        0  256-511 packets       :        0   |
        512-1023 packets      :        0  512-1023 packets      :        0   |
```

```
 1024-1518 packets     :         0  1024-1518 packets     :         0
<Out line error counter>
 Late collision        :         0  Defer indication      :         0
 Single collision      :         0  Excessive deferral    :         0
 Multiple collisions   :         0  Excessive collisions  :         0
 Error frames          :         0
<In line error counter>
 CRC errors            :         0  Symbol errors         :         0
 Alignment             :         0  Fragments             :         0
 Short frames          :         0  Jabber                :         0
 Long frames           :         0  Error frames          :         0
<Line fault counter>
 Link down             :         0
<Uplink redundant>
 Switchport backup pairs                        Preemption    Flush
 Primary    Status      Secondary  Status      Delay Limit   VLAN
 Port 0/13  Forwarding  Port 0/14  Blocking       30     -     11
```

>

1. Summary port information
2. Detailed port information
3. Send and receive statistics
4. Send error statistics
5. Receive error statistics
6. Failure statistics
7. Uplink redundancy statistics

Display items in Examples 1 and 2 [AX1250S][AX1240S]

The following table describes the display items for the detailed information and statistics for 10BASE-T/100BASE-TX.

Table 13-1 Display of summary information for 10BASE-T/100BASE-TX

Item	Displayed information	
	Detailed information	**Meaning**
Port*<IF#>*	Port number	
<port status>	`active up`	Running
	`active down`	Stopped
	`inactive`#1	The port is in the inactive status. The following can cause a port to become inactive: ● Operation stopped by the `inactivate` command. ● Due to standby link function of link aggregation ● Due to the BPDU guard functionality of the Spanning Tree Protocol ● The storm control functionality ● Detection of a unidirectional link failure by the UDLD functionality ● The L2 loop detection functionality

Item	Displayed information	
	Detailed information	**Meaning**
	`disable`	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown interface` configuration command.
<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.)
	`-`	The line type is unknown. A dash is displayed in the following cases: ● The port status is not `active up`.
<MAC address>	MAC address of the port	

Table 13-2 Display of detailed information and statistics for 10BASE-T/100BASE-TX

Item	Displayed information	
	Detailed information	**Meaning**
PoE status[#2]	Displays the PoE status of a port.	
	`on`	Power is being supplied.
	`off`	Power is not being supplied.
	`faulty`	Power cannot be supplied to the connected device.
	`denied`	Power is not being supplied because there is not enough power.

Item	Displayed information	
	Detailed information	**Meaning**
	`inact`	The supply of power has been stopped by an operation command.
Class[#2]	Displays the current power-class conforming to IEEE 802.3af and IEEE 802.3at standards, or the manual power-allocation.	
	`0`	Class0 (15.4 W)
	`1`	Class1 (4.0 W)
	`2`	Class2 (7.0 W)
	`3`	Class3 (15.4 W)
	`4`	Class4 (30.0 W)
	`manual`	Manual power-supply allocation
	`-`	`-`: Disabled
Priority[#2]	Displays the priority of the power supply that has been set.	
	`critical`	The port priority setting is enabled, and power is guaranteed because the port has the highest importance.
	`high`	The port priority setting is enabled, and power is supplied at a high priority.
	`low`	The port priority setting is enabled, and power is supplied at a low priority.
	`-`	The port priority setting is disabled, and power is supplied.
	`never`	The PoE functionality is disabled.
Time-since-last-status-change	Displays the elapsed time since the last change in status. *hh*`:`*mm*`:`*ss* (when the elapsed time is 24 hours or less: *hh* = hours, *mm* = minutes, *ss* = seconds) *d*`.`*hh*`:`*mm*`:`*ss* (when the elapsed time is more than 24 hours:*d* = number of days, *hh* = hours, *mm* = minutes, *ss* = seconds) `Over 100 days` (when the elapsed time is more than 100 days)	
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out:<*average-bandwidth-used-on-sending-side*>bps	Displays the average bandwidth (in bps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from	

Item	Displayed information	
	Detailed information	**Meaning**
	1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in:<*average-bandwidth-used-on-receiving-side*>bps	Displays the average bandwidth (in bps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak out	Displays the maximum bandwidth used on the sending side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The relevant time is the last time the bandwidth reached its maximum value. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak in	Displays the maximum bandwidth used on the receiving side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The relevant time is the last time the bandwidth reached its maximum value. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Output rate[#3]	Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate[#3]	Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to two decimal places. The bps value is calculated starting from the MAC header and ending with the FCS field of the frame.	
Flow control send[#4]	`on`	A pause packet is sent.
	`off`	A pause packet is not sent.
Flow control receive[#4]	`on`	A pause packet is received.
	`off`	A pause packet is not received.
TPID	Displays a `TagProtocolIDentifier` value that is used on the port to identify the VLAN. (8100 fixed)	

Item		Displayed information	
		Detailed information	**Meaning**
Frame size[#5]		Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA/PAD field. For details about frame formats, see the description of frame formats in *13.1.3 Control on the MAC and LLC sublayers* in the *Configuration Guide Vol. 1*.	
Interface name		Displays the name of the interface assigned to the port.	
Description:*<Supplementary explanation>*		Displays the contents of the `Description` configuration. The `Description` configuration can be used to set comments, such as a comment about the purpose of the port.	
Statistics	Category	`<Out octets/packets counter>`	Send statistics
		`<In octets/packets counter>`	Receive statistics
		`<Out line error counter>`	Send error statistics
		`<In line error counter>`	Receive error statistics
		`<Line fault counter>`	Failure statistics
		`<Uplink redundant>`	Statistics for uplink redundancy[#8]
	Detailed statistical items for sending and receiving	`Octets`	The number of octets
		`All packets`	Number of packets (including error packets)
		`Multicast packets`	Number of multicast packets
		`Broadcast packets`	Number of broadcast packets
		`Pause packets`	Number of pause packets
		`64 packets`	Number of 64-octet packets[#6]
		`65-127 packets`	Number of 65-to-127-octet packets[#6]
		`128-255 packets`	Number of 128-to-255-octet packets[#6]
		`256-511 packets`	Number of 256-to-511-octet packets[#6]
		`512-1023 packets`	Number of 512-to-1023-octet packets[#6]
		`1024-1518 packets`	Number of 1024-to-1518-octet packets[#6]
	Detailed statistical	`Late collision`	The number of collisions detected after the 512-bit time has elapsed

Item		Displayed information	
		Detailed information	**Meaning**
	items for send errors	`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
		`Defer indication`	The number of times the initial transmission was delayed because the transmit line was busy
		`Excessive deferral`	The number of times an excessive delay occurred
		`Excessive collisions`	The number of transfer failures due to excessive collisions (16 collisions)
		`Error frames`	The total number of frames for which an error occurred
	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[#7]
		`Alignment`	The number of times the frame length was invalid and an error was detected by the FCS check[#7]
		`Fragments`	The number of times a short frame (whose length is shorter than 64 octets) is received and an FCS error or an alignment error occurred[#7]
		`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[#7]
		`Symbol errors`	The number of symbol errors
		`Short frames`	The number of received packets that are shorter than the frame length[#7]
		`Long frames`	The number of received packets that exceed the frame length[#7]
		`Error frames`	The total number of frames for which an error occurred
	Detailed statistical items for errors	`Link down`	The number of times a link was not established

Item		Displayed information		
		Detailed information		Meaning
	Statistical items for uplink redundancy[#8]	`Startup active port selection`		Setting of the functionality that permanently assigns the active port at device startup `primary only`: The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
		`Switchport backup pairs`	`Primary`	The number of the primary port or the channel group If an asterisk (`*`) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.
			`Status`	Status of the primary port `Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
			`Secondary`	The number of the secondary port or the channel group
			`Status`	Status of the secondary port `Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
		`Preemption`	`Delay`	The time value (in seconds) for automatic or timer switch-back `-` is displayed when this item is not set.
			`Limit`	The time remaining until a timer switch-back (in seconds) `-` is displayed when this item is not set.
		`Flush`	`VLAN`	VLAN to which flush control frames are sent `1` to `4094`: Indicates a VLAN ID. `untag`: No VLAN is specified. `-`: Send setting is not set.

#1: `inactive` is cleared in the following conditions:

- The port is restored by execution of the `activate` command.

  Due to the BPDU guard functionality of the Spanning Tree Protocol

  The storm control functionality

  Detection of a unidirectional link failure by the UDLD functionality

  The L2 loop detection functionality.(The automatic restoration functionality can be

also used for recovery.)

- The standby link functionality of link aggregation makes the standby port the active port.

#2: Only the PoE model displays this item.

#3: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the unit is K and one digit is displayed below the decimal point. If the displayed value is 10000 K or larger, the unit is M and one digit is displayed below the decimal point.

#4: This item is always `off` except when the status of the port is `active up`.

#5: This item is always `-` except when the status of the port is `active up`.

#6: This item is displayed only when the command is executed with `detail` specified.

#7: The frame length indicates the length starting from the MAC header and ending with the FCS field.

For details about frame formats, see the description of frame formats in *13.1.3 Control on the MAC and LLC sublayers* in the *Configuration Guide Vol. 1*.

#8: This item is displayed only when uplink redundancy is set in the configuration.

Example 3

The following shows an example of displaying the 1000BASE-T/100BASE-FX/1000BASE-X interface information and the detailed port information.

Figure 13-3 Execution result when 100BASE-FX/1000BASE-X is specified

```
> show interfaces gigabitethernet 0/25

Date 2008/11/17 11:50:30 UTC
Port 0/25 : active up  1000BASE-LX full(auto)  00ed.f010.0131             <-1
        SFP connect                                                        ⎫
        Time-since-last-status-change: 00:00:04                            |
        Bandwidth: 1000000kbps  Average out: 0Mbps  Average in: 1Mbps      |
        Peak out: 1Mbps at 11:49:25  Peak in: 1Mbps at 11:50:28            |
        Output rate:           0bps           0pps                         |
        Input  rate:           0bps           0pps                         |2
        Flow control send   : off                                          |
        Flow control receive: off                                          |
        TPID: 8100                                                         |
        Frame size: 1518 Octets   Interface name: gigaether0/25            |
        Description:                                                       ⎭
       <Out octets/packets counter>       <In octets/packets counter>      ⎫
        Octets      :                332  Octets      :               5696|
        All packets :                  5  All packets :                 89|3
        Multicast packets     :        3  Multicast packets     :        89|
        Broadcast packets     :        2  Broadcast packets     :         0|
        Pause packets         :        0  Pause packets         :         0⎭
       <In line error counter>                                             ⎫
        CRC errors            :        0  Symbol errors         :         0|
        Fragments             :        0  Short frames          :         0|5
        Jabber                :        0  Long frames           :         0|
        Error frames          :        0                                   ⎭
       <Line fault counter>                                                ⎫6
        Link down             :        2                                   ⎭
       <Uplink redundant>                                                  ⎫
        Switchport backup pairs                      Preemption    Flush   |7
        Primary    Status      Secondary  Status      Delay Limit   VLAN    |
        Port 0/25  Blocking    Port 0/3   Forwarding     60    54     10    ⎭

>
```

Figure 13-4 Result of executing the command for displaying detailed information about the 1000BASE-T interface

```
> show interfaces gigabitethernet 0/26

Date 2008/11/17 13:13:17 UTC
Port 0/26 : active up  1000BASE-T full(auto)  00ed.f010.0132              <-1
        Time-since-last-status-change: 00:00:10                            ]
        Bandwidth: 1000000kbps  Average out: 0Mbps  Average in: 1Mbps      |
        Peak out: 0Mbps at 00:00:00  Peak in: 1Mbps at 13:13:16            |
        Output rate:           0bps           0pps                         |
        Input  rate:         501bps           1pps                         |2
        Flow control send   : off                                          |
        Flow control receive: off                                          |
        TPID: 8100                                                         |
        Frame size: 1518 Octets   Interface name: gigaether0/26            |
        Description:                                                       ]
       <Out octets/packets counter>       <In octets/packets counter>      ]
        Octets      :                  0  Octets      :              153152|
        All packets :                  0  All packets :                2393|3
        Multicast packets     :        0  Multicast packets     :      2393|
        Broadcast packets     :        0  Broadcast packets     :         0|
        Pause packets         :        0  Pause packets         :         0]
       <Out line error counter>                                            ]
        Late collision        :        0  Defer indication      :         0|
        Single collision      :        0  Excessive deferral    :         0|4
        Multiple collisions   :        0  Excessive collisions  :         0|
        Error frames          :        0                                    ]
       <In line error counter>                                             ]
        CRC errors            :        0  Symbol errors         :         0|
        Alignment             :        0  Fragments             :         0|5
        Short frames          :        0  Jabber                :         0|
        Long frames           :        0  Error frames          :         0]
       <Line fault counter>                                               ]6
        Link down             :        1                                   ]
       <Uplink redundant>                                                  ]
        Switchport backup pairs                       Preemption    Flush   |7
        Primary    Status      Secondary  Status      Delay Limit   VLAN    |
        Port 0/26  Blocking    Port 0/10  Forwarding    100    88      -    ]

>
```

1. Summary port information
2. Detailed port information
3. Send and receive statistics
4. Send error statistics
5. Receive error statistics
6. Failure statistics
7. Uplink redundancy statistics

Example 4

The following shows an example of displaying the 100BASE-FX/1000BASE-X interface information, the detailed port information, and detailed statistics.

Figure 13-5 Execution result when detailed statistics for 100BASE-FX/1000BASE-X are specified

```
> show interfaces gigabitethernet 0/25 detail

Date 2008/11/17 11:50:43 UTC
Port 0/25 : active up  1000BASE-LX full(auto)  00ed.f010.0131              <-1
```

```
 SFP connect                                                          ┐
 Time-since-last-status-change: 00:00:17                              |
 Bandwidth: 1000000kbps  Average out: 0Mbps  Average in: 1Mbps        |
 Peak out: 1Mbps at 11:49:25  Peak in: 1Mbps at 11:50:42              |
 Output rate:           0bps           0pps                           |
 Input  rate:         501bps           1pps                           |2
 Flow control send   : off                                           |
 Flow control receive: off                                           |
 TPID: 8100                                                          |
 Frame size: 1518 Octets   Interface name: gigaether0/25             |
 Description:                                                        ┘
<Out octets/packets counter>       <In octets/packets counter>       ┐
 Octets      :                332  Octets      :                6144|
 All packets :                  5  All packets :                  96|
 Multicast packets     :        3  Multicast packets     :        96|
 Broadcast packets     :        2  Broadcast packets     :         0|
 Pause packets         :        0  Pause packets         :         0|
 64 packets            :        2  64 packets            :        96|3
 65-127 packets        :        3  65-127 packets        :         0|
 128-255 packets       :        0  128-255 packets       :         0|
 256-511 packets       :        0  256-511 packets       :         0|
 512-1023 packets      :        0  512-1023 packets      :         0|
 1024-1518 packets     :        0  1024-1518 packets     :         0┘
<In line error counter>                                              ┐
 CRC errors            :        0  Symbol errors         :         0|
 Fragments             :        0  Short frames          :         0|4
 Jabber                :        0  Long frames           :         0|
 Error frames          :        0                                    ┘
<Line fault counter>                                                 ┐5
 Link down             :        2                                    ┘
<Uplink redundant>                                                   ┐
 Switchport backup pairs                      Preemption    Flush   |6
 Primary    Status      Secondary  Status      Delay Limit   VLAN    |
 Port 0/25  Blocking    Port 0/3   Forwarding     60    41     10    ┘

>
```

1. Summary port information
2. Detailed port information
3. Send and receive statistics
4. Receive error statistics
5. Failure statistics
6. Uplink redundancy statistics

Display items in Example 3 and 4

The following shows an example of displaying the 1000BASE-T/100BASE-FX/1000BASE-X interface information, the detailed port information, and detailed statistics.

Table 13-3 Display of summary information for 1000BASE-T/100BASE-FX/1000BASE-X

Item	**Displayed information**	
	Detailed information	**Meaning**
Port*<IF#>*	Port number	

Item	Displayed information	
	Detailed information	**Meaning**
<port status>	`active up`	Running
	`active down`	Stopped
	`inactive`[#1]	The port is in the inactive status. The following can cause a port to become inactive: ● Operation stopped by the `inactivate` command. ● Due to standby link function of link aggregation ● Due to the BPDU guard functionality of the Spanning Tree Protocol ● The storm control functionality ● Detection of a unidirectional link failure by the UDLD functionality ● The L2 loop detection functionality
	`disable`	Operation was stopped by using the `shutdown` or `schedule-power-control shutdown interface` configuration command.
<line type>	`1000BASE-T full(auto)`	100BASE-T full duplex (Line type determined by auto-negotiation.)
	`100BASE-FX full` [AX1250S]	100BASE-FX full duplex
	`100BASE-FX full(auto)` [AX1250S][#2]	100BASE-FX full duplex
	`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-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.)

Item	Displayed information	
	Detailed information	**Meaning**
	1000BASE-LH full(auto)	1000BASE-LH full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX10-D full	1000BASE-BX-D (10km) full duplex
	1000BASE-BX10-U full	1000BASE-BX-U (10km) full duplex
	1000BASE-BX40-D full	1000BASE-BX-D (40km) full duplex
	1000BASE-BX40-U full	1000BASE-BX-U (40km) full duplex
	1000BASE-BX10-D full(auto)	1000BASE-BX-D (10km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX10-U full(auto)	1000BASE-BX-U (10km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX40-D full(auto)	1000BASE-BX-D (40km) full duplex (Line type determined by auto-negotiation.)
	1000BASE-BX40-U full(auto)	1000BASE-BX-U (40km) full duplex (Line type determined by auto-negotiation.)
	-	The line type is unknown. A dash is displayed in the following cases: ● The port status is not active up. ● media-type is SFP and SFP is not SFP connect.
<MAC address>	MAC address of the port	
<type of transceiver>	SFP	SFP
<transceiver status>	connect	Installed
	not connect	Not installed
	not support	An unsupported transceiver is installed.

Table 13-4 Display of the detailed information and statistics for a 1000BASE-T/100BASE-FX/1000BASE-X port

Item	Displayed information	
	Detailed information	**Meaning**
Time-since-last-status-change	Displays the elapsed time since the last change in status. *hh*`:`*mm*`:`*ss* (when the elapsed time is 24 hours or less: *hh* = hours, *mm* = minutes, *ss* = seconds) *d*`.`*hh*`:`*mm*`:`*ss* (when the elapsed time is more than 24 hours: *d* = number of days, *hh* = hours, *mm* = minutes, *ss* = seconds) `Over 100 days` (when the elapsed time is more than 100 days)	
Bandwidth:<*bandwidth of line*>kbps	Displays the bandwidth of the line in kbps. If the `bandwidth` configuration command has not been executed, the line speed of the port is displayed. If the `bandwidth` configuration command has been executed, the setting value is displayed. Note that this setting does not control the bandwidth of the port.	
Average out:<*average-bandwidth-used-on-sending-side*>bps	Displays the average bandwidth (in bps) used on the sending side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Average in:<*average-bandwidth-used-on-receiving-side*>bps	Displays the average bandwidth (in bps) used on the receiving side of the line for the one minute interval before the command was executed. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak out	Displays the maximum bandwidth used on the sending side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The relevant time is the last time the bandwidth reached its maximum value. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Peak in	Displays the maximum bandwidth used on the receiving side of the line for the 24-hour interval before the command was executed, and the relevant time. `0 Mbps` is displayed if there is no communication (when not even 1 bit of data is transferred). `1 Mbps` is displayed if the range of the transferred data is from 1 bit to 1.5 Mbit. If the transferred data is 1.5 Mbit or more, the displayed value is rounded to one decimal place. The relevant time is the last time the bandwidth reached its maximum value. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	

Item		Displayed information	
		Detailed information	**Meaning**
Output rate[#3]		Displays the send throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Input rate[#3]		Displays the receive throughput of the line (in bps and pps) for the one second interval before the command was executed, rounded to two decimal places. The frame length used to calculate bps value starts from the MAC header and ends with the FCS field.	
Flow control send[#4]		`on`	A pause packet is sent.
		`off`	A pause packet is not sent.
Flow control receive[#4]		`on`	A pause packet is received.
		`off`	A pause packet is not received.
TPID		Displays a `TagProtocolIDentifier` value that is used on the port to identify the VLAN. (8100 fixed)	
Frame size[#5]		Displays the maximum frame length of a port in octets. The maximum frame length is calculated starting from the MAC header and ending with the DATA/PAD field. For details about frame formats, see the description of frame formats in *13.1.3 Control on the MAC and LLC sublayers* in the *Configuration Guide Vol. 1*.	
Interface name		Displays the name of the interface assigned to the port.	
Description:*<Supplementary explanation>*		Displays the contents of the `Description` configuration. The `Description` configuration can be used to set comments, such as a comment about the purpose of the port.	
Statistics	Category	`<Out octets/packets counter>`	Send statistics
		`<In octets/packets counter>`	Receive statistics
		`<Out line error counter>`	Send error statistics[#7]
		`<In line error counter>`	Receive error statistics
		`<Line fault counter>`	Failure statistics
		`<Uplink redundant>`	Statistics for uplink redundancy[#9]
	Detailed statistical items for sending and	`Octets`	The number of octets
		`All packets`	Number of packets (including error packets)

Item		Displayed information	
		Detailed information	Meaning
	receiving	Multicast packets	Number of multicast packets
		Broadcast packets	Number of broadcast packets
		Pause packets	Number of pause packets
		64 packets	Number of 64-octet packets#6
		65-127 packets	Number of 65-to-127-octet packets#6
		128-255 packets	Number of 128-to-255-octet packets#6
		256-511 packets	Number of 256-to-511-octet packets#6
		512-1023 packets	Number of 512-to-1023-octet packets#6
		1024-1518 packets	Number of 1024-to-1518-octet packets#6
	Detailed statistical items for send error #7	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
		Defer indication	The number of times the initial transmission was delayed because the transmit line was busy
		Excessive deferral	The number of times an excessive delay occurred
		Excessive collisions	The number of transfer failures due to excessive collisions (16 collisions)
		Error frames	The total number of frames for which an error occurred
	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#8
		Alignment	The number of times the frame length was invalid and an error was detected by the FCS check#7#8
		Symbol errors	The number of symbol errors

Item		Displayed information		
		Detailed information		Meaning
		Fragments		The number of times a short frame (whose length is shorter than 64 octets) is received and an FCS error or an alignment error occurred[#8]
		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[#8]
		Short frames		The number of received packets that are shorter than the frame length[#8]
		Long frames		The number of received packets that exceed the frame length[#8]
		Error frames		The total number of frames for which an error occurred
	Detailed statistical items for errors	Link down		The number of times a link was not established
	Statistical items for uplink redundancy[#9]	Startup active port selection		Setting of the functionality that permanently assigns the active port at device startup primary only:The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
		Switchport backup pairs	Primary	The number of the primary port or the channel group If an asterisk (*) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.
			Status	Status of the primary port Forwarding: Forwarding Blocking: Blocking Down: Link down
			Secondary	The number of the secondary port or the channel group
			Status	Status of the secondary port Forwarding: Forwarding Blocking: Blocking Down: Link down

Item		Displayed information		
		Detailed information		Meaning
		Preemption	Delay	The time value (in seconds) for automatic or timer switch-back - is displayed when this item is not set.
			Limit	The time remaining until a timer switch-back (in seconds) - is displayed when this item is not set.
		Flush	VLAN	VLAN to which flush control frames are sent 1 to 4094: Indicates a VLAN ID. untag: No VLAN is specified. -: Send setting is not set.

#1: inactive is cleared in the following conditions:

- The port is restored by execution of the activate command.

  Due to the BPDU guard functionality of the Spanning Tree Protocol

  The storm control functionality

  Detection of a unidirectional link failure by the UDLD functionality

  The L2 loop detection functionality.(The automatic restoration functionality can be also used for recovery.)

- The standby link functionality of link aggregation makes the standby port the active port.

#2: The configuration setting is invalid. Check the setting.

#3: If the displayed value is smaller than 10000, the decimal point is not displayed.

If the displayed value is 10000 or larger, the unit is K and one digit is displayed below the decimal point. If the displayed value is 10000 K or larger, the unit is M and one digit is displayed below the decimal point.

#4: This item is always off except when the status of the port is active up.

#5: This item is always - except when the status of the port is active up.

#6: This item is displayed only when the command is executed with detail specified.

#7: This item is displayed only for 1000BASE-T.

#8: The frame length indicates the length starting from the MAC header and ending with the FCS field.

For details about frame formats, see the description of frame formats in *13.1.3 Control on the MAC and LLC sublayers* in the *Configuration Guide Vol. 1*.

#9: This item is displayed only when uplink redundancy is set in the configuration.

Impact on communication

None

Response messages

None

Notes

- All display items are cleared in the following cases:

When the Switch starts up

When the `clear counters` command is executed

When a device hardware failure occurs

- For notes on uplink redundancy, see the description of the *show switchport backup* command.

clear counters

Clears the statistics counter of an Ethernet interface to zero.

Syntax

```
clear counters [ gigabitethernet <IF#> ] [AX2200S]
clear counters [{fastethernet <IF#> | gigabitethernet <IF#>}] [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X interface.

`{fastethernet` *<IF#>* `| gigabitethernet` *<IF#>*`}` [AX1250S][AX1240S]

`fastethernet`

Specify a 10BASE-T or 100BASE-TX interface.

`gigabitethernet`

Specify a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface.

<IF#>

Specify an interface port number. For the specifiable range of values, see *Specifiable values for parameters*.

Operation when all parameters are omitted:

Clears the statistics counter of all Ethernet interfaces to zero.

Example

None

Display items

None

Impact on communication

None

Response messages

None

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
- The `clear counters` command also clears the port's statistics counter displayed by

the `show port statistics` or `show channel-group statistics` command to zero.

show port

Lists information about the Ethernet ports implemented on the device.

Syntax

```
show port {[<Port# list>] | protocol [<Port# list>] | statistics [<Port# list>]
          [{up | down}] [discard] | transceiver [<Port# list>]}
```

Input mode

User mode and administrator mode

Parameters

`[<Port# list>] | protocol [<Port# list>] | statistics [<Port# list>] [{up | down}] [discard] | transceiver [<Port# list>]`

<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:

Information is listed without any qualifications regarding ports.

`protocol`

Displays the protocol information of the port.

`statistics`

Displays the number of sent, received, and discarded packets for ports implemented on the device.

`{ up | down }`

`up`

Displays information for ports whose status is `up`.

`down`

Displays information for ports whose status is not `up`.

Operation when this parameter is omitted:

Information is listed without any qualifications regarding ports.

`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 listed with no conditions applied.

`transceiver`

Lists information about whether transceivers are installed on ports that can use removable transceivers and provides type and identification information.

This command allows you to check the identification information of each transceiver.

Even if `rj45` is specified when the `media-type` command is executed, information about the 100BASE-FX/1000BASE-X (SFP) port is displayed. [AX1250S] [AX1240S]

Operation when all parameters are omitted:

Lists information for all implemented Ethernet ports.

Example 1

Figure 13-6 Example of listing link information for ports

```
> show port

Date 2009/10/29 11:33:29 UTC
Port Counts: 26
Port  Name           Status  Speed          Duplex     FCtl FrLen  ChGr/Status
 0/1  fastether0/1   up      100BASE-TX     full(auto) off   9234  -/-
 0/2  fastether0/2   down    -              -          -        -  -/-
 0/3  fastether0/3   down    -              -          -        -  -/-
 0/4  fastether0/4   down    -              -          -        -  -/-
 0/5  fastether0/5   up      100BASE-TX     full(auto) off   9234  -/-
 0/6  fastether0/6   down    -              -          -        -  -/-
 0/7  fastether0/7   down    -              -          -        -  -/-
 0/8  fastether0/8   down    -              -          -        -  -/-
 0/9  fastether0/9   down    -              -          -        -  -/-
 0/10 fastether0/10  down    -              -          -        -  -/-
 0/11 fastether0/11  up      100BASE-TX     full(auto) off   9234  -/-
 0/12 fastether0/12  down    -              -          -        -  -/-
 0/13 fastether0/13  down    -              -          -        -  -/-
 0/14 fastether0/14  down    -              -          -        -  -/-
 0/15 fastether0/15  down    -              -          -        -  -/-
 0/16 fastether0/16  down    -              -          -        -  -/-
 0/17 fastether0/17  down    -              -          -        -  8/up
 0/18 fastether0/18  down    -              -          -        -  8/up
 0/19 fastether0/19  down    -              -          -        -  8/up
 0/20 fastether0/20  down    -              -          -        -  8/up
 0/21 fastether0/21  down    -              -          -        -  8/up
 0/22 fastether0/22  down    -              -          -        -  8/up
 0/23 fastether0/23  down    -              -          -        -  8/up
 0/24 fastether0/24  up      100BASE-TX     full(auto) off   9234  8/up
 0/25 gigaether0/25  up      1000BASE-T     full(auto) off   9234  -/-
 0/26 gigaether0/26  down    -              -          -        -  -/-

>
```

Display items in Example 1

Table 13-5 Explanation of the display of the link information list for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	Interface port number
Name	Port name	Displays the name assigned to a port.

Item	Meaning	Displayed information
Status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `inact`: The port is inactive[#1] The following can cause a port to become inactive: - The `inactivate` command, which stops operation - The standby link functionality of link aggregation - The BPDU guard functionality of a Spanning Tree Protocol - The storm control functionality - Detection of a unidirectional link failure by the UDLD functionality - The L2 loop detection functionality `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown interface` configuration command.
Speed	Line speed	10BASE-T: 10BASE-T 100BASE-TX: 100BASE-TX 1000BASE-T: 1000BASE-T 100BASE-FX: 100BASE-FX [AX1250S] 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 `-`: Speed is unknown (Appears when `Status` is not `up`.)
Duplex	Full duplex/half duplex	`full`: Full duplex `full(auto)`:Full duplex (resulting from auto-negotiation)[#2] `half`: Half duplex `half(auto)`: Half duplex (resulting from auto-negotiation) `-`: Duplex is unknown (Appears when `Status` is not `up`.)
FCtl	Flow control	`on`: Flow control is enabled. `off`: Flow control is disabled. `-`: `Status` is not `up`.
FrLen	Maximum frame length	Displays the maximum frame length of a port in octets. `-`: `Status` is not `up`.
ChGr /Status	Channel group and status	The channel group to which the port belongs and the status. Link aggregation 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.

#1: `inact` is cleared in the following conditions:

- The port is restored by execution of the `activate` command.

  Due to the BPDU guard functionality of the Spanning Tree Protocol

  The storm control functionality

  Detection of a unidirectional link failure by the UDLD functionality

  The L2 loop detection functionality.(The automatic restoration functionality can be also used for recovery.)

- The standby link functionality of link aggregation makes the standby port the active port.

#2: If `full(auto)` is displayed for 100BASE-FX, the configuration setting is invalid. Check the setting.

Example 2

Figure 13-7 Example of listing protocol information for ports

```
> show port protocol

Date 2009/10/29 11:33:37 UTC
Port Counts: 26
Port  Name           Type        VLAN  STP    QoS   Filter MACTbl    Ext.
 0/1  fastether0/1   Trunk          8    0   0(0)     0(0)      1    - - - -
 0/2  fastether0/2   Access         1    0   0(0)     0(0)      0    - - - -
 0/3  fastether0/3   Access         1    0   0(0)     0(0)      0    - - - -
 0/4  fastether0/4   Access         1    0   0(0)     0(0)      0    - - - -
 0/5  fastether0/5   Access         1    0   0(0)     0(0)      1    - - L -
 0/6  fastether0/6   Access         1    0   0(0)     0(0)      0    - - - -
 0/7  fastether0/7   Access         1    0   0(0)     0(0)      0    - - - -
 0/8  fastether0/8   Access         1    0   0(0)     0(0)      0    - - - -
 0/9  fastether0/9   Access         1    0   0(0)     0(0)      0    - - - -
 0/10 fastether0/10  Access         1    0   0(0)     0(0)      0    - - - -
 0/11 fastether0/11  MAC            6    0   0(0)     0(0)      0    - - - -
 0/12 fastether0/12  Access         0    0   0(0)     0(0)      0    - - - -
 0/13 fastether0/13  Access         1    0   0(0)     0(0)      0    - - - -
 0/14 fastether0/14  Access         1    0   0(0)     0(0)      0    - - - -
 0/15 fastether0/15  Access         1    0   0(0)     0(0)      0    - - - -
 0/16 fastether0/16  Access         1    0   0(0)     0(0)      0    - - - -
 0/17 fastether0/17  Trunk         10    0   0(0)     0(0)      3    - - - A
 0/18 fastether0/18  Trunk         10    0   0(0)     0(0)      3    - - - A
 0/19 fastether0/19  Trunk         10    0   0(0)     0(0)      3    - - - A
 0/20 fastether0/20  Trunk         10    0   0(0)     0(0)      3    - - - A
 0/21 fastether0/21  Trunk         10    0   0(0)     0(0)      3    - - L A
 0/22 fastether0/22  Trunk         10    0   0(0)     0(0)      3    - - L A
 0/23 fastether0/23  Trunk         10    0   0(0)     0(0)      3    - - L A
 0/24 fastether0/24  Trunk         10    0   0(0)     0(0)      3    - - L A
 0/25 gigaether0/25  Trunk         10    0   0(0)     0(0)      9    - - - A
 0/26 gigaether0/26  Access         1    0   0(0)     0(0)      0    - - - -
   I: Isolation setting  S: Storm control setting
   L: LLDP setting       A: Ring Protocol setting

>
```

Display items in Example 2

Table 13-6 Explanation of the display of the protocol information list for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	Interface port number
Name	Port name	Displays the name assigned to a port.
Type	Port type	`Protocol`: Protocol port `Trunk`: Trunk port `Access`: Access port `MAC`: MAC port
VLAN	Number of VLANs that share the port	Number of VLANs that share the port (including the default VLAN and VLANs in `suspend` status.)
STP	The number used in the Spanning Tree topology calculation	When `single` is used: 1 When `pvst+` is used: The number of VLANs set by `pvst+` When `mstp` is used: The number of instances (When `single` and `pvst+` are mixed, the number of VLANs set by `pvst+` + 1)
QoS	The number of QoS flow lists	Displays the number of QoS flow lists set for the port. This number includes the number of QoS flow lists set for the VLAN to which the port belongs. The number of QoS flow lists set for the VLAN to which the port belongs is displayed enclosed in parentheses.
Filter	The number of access lists	Displays the number of access lists set for the port. This number includes the number of access lists set for the VLAN to which the port belongs. The number of access lists set for the VLAN to which the port belongs is displayed enclosed in parentheses.
MACTbl	The number of dynamically learned entries in the MAC address table	Displays the number of dynamically learned MAC address table entries.
Ext.	Extended functionality information	`I`:Indicates that relay blocking information is set. `S`: Indicates that storm control information is set. `L`: Indicates that LLDP is running. `A`: Indicates that the Ring Protocol is running. `-` is displayed if the relevant extended functionality is not set or is not running.

Example 3

Figure 13-8 Example of displaying the number of sent, received, and discarded packets for ports

```
> show port statistics

Date 2009/10/29 11:33:48 UTC
Port Counts: 26
```

```
Port  Name          Status  T/R  All packets   Multicast   Broadcast    Discard
 0/1  fastether0/1  up      Tx    5524886868       18456  5524868306          0
                            Rx          6433          6334          99          0
 0/2  fastether0/2  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/3  fastether0/3  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/4  fastether0/4  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/5  fastether0/5  up      Tx         18392          4458         178          0
                            Rx         19172            25        1271          0
 0/6  fastether0/6  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/7  fastether0/7  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/8  fastether0/8  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/9  fastether0/9  down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/10 fastether0/10 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/11 fastether0/11 up      Tx    5524863989          2914  5524861075          0
                            Rx           106             5         101          0
 0/12 fastether0/12 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/13 fastether0/13 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/14 fastether0/14 down    Tx           218            78           0          0
                            Rx          1398             0           0          0
 0/15 fastether0/15 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/16 fastether0/16 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/17 fastether0/17 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/18 fastether0/18 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/19 fastether0/19 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/20 fastether0/20 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/21 fastether0/21 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/22 fastether0/22 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/23 fastether0/23 down    Tx             0             0           0          0
                            Rx             0             0           0          0
 0/24 fastether0/24 up      Tx    5451984880        362173  5451618446          0
                            Rx      73280899        369947    72907951
0
 0/25 gigaether0/25 up      Tx        411494        350329       39604          0
                            Rx   10895153398        346285  10894781342
0
 0/26 gigaether0/26 down    Tx             0             0           0          0
                            Rx             0             0           0          0

>
```

Display items in Example 3

Table 13-7 Display of the number of sent, received, and discarded packets for ports

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	Interface port number
Name	Port name	Displays the name assigned to a port.
Status	Port state	`up`: Active (normal operating state). `down`: Active (a line failure has occurred). `inact`: The port is inactive# The following can cause a port to become inactive: - The `inactivate` command, which stops operation - The standby link functionality of link aggregation - The BPDU guard functionality of a Spanning Tree Protocol - The storm control functionality - Detection of a unidirectional link failure by the UDLD functionality - The L2 loop detection functionality `dis`: Operation has been stopped by using the `shutdown` or `schedule-power-control shutdown interface` configuration command.
T/R	Receiving/sending	`Tx`: Sending `Rx`: Receiving
All packets	Number of all packets (including error packets)	
Multicast	Number of multicast packets	
Broadcast	Number of broadcast packets	
Discard	Number of discarded packets	

#: `inact` is cleared in the following conditions:

- The port is restored by execution of the `activate` command.

  Due to the BPDU guard functionality of the Spanning Tree Protocol

  The storm control functionality

  Detection of a unidirectional link failure by the UDLD functionality

  The L2 loop detection functionality.(The automatic restoration functionality can be also used for recovery.)

- The standby link functionality of link aggregation makes the standby port the active port.

Example 4

Figure 13-9 Example of listing transceiver information

```
> show port transceiver

Date 2011/09/20 13:10:17 UTC
```

```
Port Counts: 2
Port: 0/25 Status: connect      Type: SFP  Speed: 1000BASE-SX
           Vendor name: FINISAR CORP.          Vendor SN : UA12BX3
           Vendor PN  : FTLF8519P2BNL          Vendor rev: A
           Tx power   : -4.5dBm                Rx power  : -5.3 dBm
Port: 0/26 Status: not connect  Type: SFP  Speed: -
           Vendor name: -                      Vendor SN : -
           Vendor PN  : -                      Vendor rev: -
           Tx power   : -                      Rx power  : -

>
```

Display items in Example 4

Table 13-8 Display of the transceiver information list

Item	Meaning	Displayed information
Port Counts	Number of target ports	--
Port	Port	Interface port number
Status	Status of the transceiver	`connect`: A transceiver is installed. `not connect`: A transceiver is not installed. `not support`: An unsupported transceiver is installed. `-`: Unknown transceiver status (for example, the transceiver is not connected correctly)#1
Type	Type of transceiver	`SFP`:SFP
Speed	Line speed	`100BASE-FX`: 100BASE-FX [AX1250S] `1000BASE-SX`: 1000BASE-SX `1000BASE-SX2`: 1000BASE-SX2 `1000BASE-LX`: 1000BASE-LX `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 `-`: Unknown line speed
Vendor name	Vendor name	Displays the vendor's name.#2
Vendor SN	Vendor serial number	Displays the serial number added by the vendor.#2
Vendor PN	Vendor part number	Displays the part number added by the vendor.#2
Vendor rev	Vendor revision	Displays a part number revision added by the vendor.#2
Tx Power	Sending optical power	Displays the sending optical power in dBm.#2, #3, #4
Rx Power	Receiving optical power	Displays the receiving optical power in dBm. #2, #3, #4

#1: If a hyphen (-) is displayed, reconnect the cable.

#2: A hyphen (-) is displayed if the status of the transceiver is not `connect` or `not support`. If a hyphen (-) is displayed while the transceiver is being connected, re-execute the command, or reconnect the cable. Information is displayed when you re-execute the command.

#3: If the optical power is outside the range from −40 to 82 dBm, a hyphen (-) is displayed.

#4: An error might arise depending on the ambient conditions. For checking the correct value, use an optical power meter.

Impact on communication

None

Response messages

None

Notes

- The displayed number of discarded packets is the total of the values for the items listed in the following table.

Table 13-9 Statistical items used for calculating the number of discarded packets

Port	Statistical item	
	Sending	**Receiving**
Ethernet	Late collision Excessive collisions Excessive deferral	CRC errors Alignment Fragments Jabber Symbol errors Short frames Long frames

- The statistic counter is cleared in the following cases:
  - When the `clear counters` command is executed
  - When a device hardware failure occurs
- If you insert an unsupported transceiver in the Switch, operation is not guaranteed.

activate

Returns the status of the Ethernet interface to `active` from `inactive` when the `inactivate` command has been used to set `inactive`.

Syntax

```
activate gigabitethernet <IF#> [AX2200S]
activate {fastethernet <IF#> | gigabitethernet <IF#>} [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X interface.

`{fastethernet <IF#> | gigabitethernet <IF#>}` [AX1250S][AX1240S]

`fastethernet`

Specify a 10BASE-T or 100BASE-TX interface.

`gigabitethernet`

Specify a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface.

<IF#>

Specify an interface port number. For the specifiable range of values, see *Specifiable values for parameters*.

Example

Return the status of interface port 0/1 to `active`.

```
> activate fastethernet 0/1
```

Display items

None

Impact on communication

Yes

Response messages

Table 13-10 List of response messages for the activate command

Message	Description
<IF#> is already active.	The specified port is already `active`. The command does not need to be executed if you correctly specified the port. *<IF#>*:Interface port number
<IF#> is disabled.	The specified port is in `disable` status due to the configuration. Make sure the specified parameter is correct, and then try again. *<IF#>*:Interface port number
Can't execute.	The command could not be executed. Re-execute the

Message	Description
	command.

Notes

Using this command does not change the startup configuration file that was stored on the internal flash memory.

inactivate

Returns the status of the Ethernet interface to `inactive` from `active` without changing the startup configuration file stored in internal flash memory.

Syntax

```
inactivate gigabitethernet <IF#> [AX2200S]
inactivate {fastethernet <IF#> | gigabitethernet <IF#>} [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X interface.

`{fastethernet <IF#> | gigabitethernet <IF#>}` [AX1250S][AX1240S]

`fastethernet`

Specify a 10BASE-T or 100BASE-TX interface.

`gigabitethernet`

Specify a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface.

<IF#>

Specify an interface port number. For the specifiable range of values, see *Specifiable values for parameters*.

Example

Return the status of interface port 0/1 to `inactive`.

```
> inactivate fastethernet 0/1
```

Display items

None

Impact on communication

Yes

Response messages

Table 13-11 List of response messages for the inactivate command

Message	Description
<IF#> is already inactive.	The specified port is already `inactive`. The command does not need to be executed if you correctly specified the port. *<IF#>*:Interface port number
<IF#> is disabled.	The specified port is in `disable` status due to the configuration. Make sure the specified parameter is correct, and then try again. *<IF#>*:Interface port number
Can't execute.	The command could not be executed. Re-execute the

Message	Description
	command.

Notes

- Using this command does not change the startup configuration file that was stored on the internal flash memory.
- If the device is restarted after command execution, the inactive status is canceled.
- To re-activate an Ethernet port that has been inactivated by this command, use the `activate` command.

show power inline [AX2200S][AX1240S]

Displays the usage of the device and the PoE information for each port so that PoE power can be controlled.

Syntax

```
show power inline [<Port# list>] [{on | off | faulty | denied | inact}] [{critical | high | low | never}]
```

Input mode

User mode and administrator mode

Parameters

<Port# list>

Lists the PoE information for the port numbers specified in a list format. The range of specifiable values for *<Port# list>* is `0/1` to `0/24`. For details about how to specify this parameter, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The PoE information for all ports that support PoE is listed.

`{on | off | faulty | denied | inact}`

`on`

Displays information about a port that is supplying power (the power status is `on`).

`off`

Displays information about a port that is not supplying power (the power status is `off`).

`faulty`

Displays information about a port that is not supplying power because of a failure on the connected device (the power status is `faulty`).

`denied`

Displays information about a port that is not supplying power because of a power shortage (the power status is `denied`).

`inact`

Displays information about a port whose supply of power has been stopped by an operation command (the power status is `inact`).

`{critical | high | low | never}`

`critical`

Displays information about a port whose priority setting for supplying power is set to `critical`.

`high`

Displays information about a port whose priority setting for supplying power is set to `high`.

`low`

Displays information about a port whose priority setting for supplying power is set to `low`.

`never`

Displays information about a port for which the PoE functionality is set to `never`.

Note on setting parameters

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

Operation when all parameters are omitted:

The PoE information for all ports that support PoE is listed.

Example 1 [AX2200S]

Display the power usage of the device and the PoE information of all ports that support PoE.

```
> show power inline
Please wait a little.

Date 2012/07/03 20:46:06 UTC
System Wattage       :   370.0
Priority Control     :  enable

                       < 0/1-4> <0/5-24>
Threshold(W)         :   240.0    130.0
Total Allocate(W)    :   240.0     60.8
Total Power(W)       :   210.3      2.0

Port Counts          :      24
 Port Status Priority Class  Alloc(mW) Power(mW) Vol(V) Cur(mA) Description
 0/1  on     low      manual     60000     54400   53.6    1014
 0/2  on     high     manual     60000     48600   53.7     900
 0/3  on     critical manual     60000     51200   53.9     949
 0/4  on     high     manual     60000     56100   53.9    1047
 0/5  on     critical manual     30000       700   53.9      14
 0/6  on     low      0          15400       700   53.9      14
 0/7  off    high     -              0         0    0.0       0
 0/8  off    high     -              0         0    0.0       0
 0/9  off    high     -              0         0    0.0       0
 0/10 off    high     -              0         0    0.0       0
 0/11 off    high     -              0         0    0.0       0
 0/12 off    high     -              0         0    0.0       0
 0/13 off    high     -              0         0    0.0       0
 0/14 off    high     -              0         0    0.0       0
 0/15 off    high     -              0         0    0.0       0
 0/16 off    high     -              0         0    0.0       0
 0/17 off    high     -              0         0    0.0       0
 0/18 off    high     -              0         0    0.0       0
 0/19 off    high     -              0         0    0.0       0
 0/20 off    high     -              0         0    0.0       0
 0/21 off    high     -              0         0    0.0       0
 0/22 off    high     -              0         0    0.0       0
 0/23 off    high     -              0         0    0.0       0
 0/24 on     high     0          15400       600   53.8      13

>
```

Display items in Example 1

Table 13-12 Display of the power usage of the entire device

Item	Meaning	Displayed information
System Wattage	Power used by the entire	370.0 (fixed)

Item	Meaning	Displayed information
	device	
Priority Control	Status of priority setting for supplying power to the device	`enable`: Enabled `disable`: Disabled

Table 13-13 Display of the power usage and port information by power supply system

Item	Meaning	Displayed information
Threshold(W)	Threshold for guaranteeing power controlled by each power supply system	The threshold for guaranteeing power of each power supply system is displayed to the tenths place. If an attempt is made to supply power to a new port when the power usage exceeds the threshold value, the power supply for the ports of the power supply system stops according to status of priority setting. Displays either of the following for the threshold for guaranteeing power of each power supply system: Power supply 1: `<0/1-4>` - When `power inline system-allocation limit` is not set: 61.6 W - When `power inline system-allocation limit` is set: Setting value for *<Threshold>* Power supply 2: `<0/5-24>` - 370.0 W minus "*<Threshold>* of the power supply 1"
Total Allocate(W)	Total power assigned to the ports of each power supply system	Displays the total power assigned to the ports of each power supply system to the tenths place. The power assigned to each port is calculated according to the following values: When `power inline allocation auto` is set: - Class0: 15.4 W - Class1: 4.0 W - Class2: 7.0 W - Class3: 15.4 W - Class4: 30.0 W When `power inline allocation limit` is set: - Threshold value
Total Power(W)	Power consumption amount for each power supply system	Displays the total power consumption for each power supply system to the tenths place.
Port Counts	Number of ports	Displays the total number of the ports that meet the conditions.
Port	Port	Interface port number

Item	Meaning	Displayed information
Status	Power supply status	Displays the PoE status of a port. on: Power is being supplied. off: Power is not being supplied. faulty: Power cannot be supplied to the connected device. denied: Power is not being supplied because there is not enough power. inact: The supply of power has been stopped by an operation command.
Priority	Priority for supplying power	If the port priority setting is enabled: - critical: Power is guaranteed because the port has the greatest importance. - high: The priority for supplying power is high. - low: The priority for supplying power is low. If the port priority setting is disabled: - -: Power is supplied. never: The PoE functionality is disabled regardless of the port priority setting.
Class	Power class	If class-based setting is performed: - 0: Power class Class 0 (15.4 W), which conforms to IEEE 802.3af - 1: Power class Class 1 (4.0 W), which conforms to IEEE 802.3af - 2: Power class Class 2 (7.0 W), which conforms to IEEE 802.3af - 3: Power class Class 3 (15.4 W), which conforms to IEEE 802.3af - 4: Power class Class 4 (30.0 W), which conforms to IEEE 802.3at If manual setting is performed: - manual: The amount of power supplied is assigned manually. -: Disabled
Alloc(mW)	Assigned power	The power assigned to each port
Power(mW)	Power consumption	The power consumed by each port
Vol(V)	Voltage	The voltage used by each port
Cur(mA)	Current	The current used by each port
Description	Port name	Displays the contents of the Description configuration.

Example 2 [AX1240S]

Display the power usage of the device and the PoE information of all ports that support PoE.

```
> show power inline
Please wait a little.

Date 2008/11/07 14:18:40 UTC
System Wattage:
```

```
Threshold(W)         :   370.0
Total Allocate(W)    :   146.6
Total Power(W)       :    87.1
Priority Control     :  enable
Port Counts          :      24
 Port Status Priority  Class  Alloc(mW) Power(mW) Vol(V) Cur(mA) Description
 0/1  on     high      0          15400      5400   51.3     107 IPphone(1001)
 0/2  on     high      0          15400      5200   51.1     102 IPphone(1002)
 0/3  on     high      0          15400      5100   50.9     101 IPphone(1003)
 0/4  inact  high      -              0         0    0.0       0 IPphone(1004)
 0/5  on     critical  4          30000     25900   50.9     510 PRINTER
 0/6  off    high      -              0         0    0.0       0
 0/7  off    never     -              0         0    0.0       0
 0/8  on     high      3          15400     12400   50.9     244
 0/9  on     low       1           4000      2100   51.0      43
 0/10 off    high      -              0         0    0.0       0
 0/11 on     critical  manual     30000     18000   51.1     353 wirelessAP
 0/12 off    high      -              0         0    0.0       0
 0/13 off    high      -              0         0    0.0       0
 0/14 on     high      2           7000      5900   51.0     117
 0/15 off    low       -              0         0    0.0       0
 0/16 off    high      -              0         0    0.0       0
 0/17 off    high      -              0         0    0.0       0
 0/18 off    never     -              0         0    0.0       0
 0/19 off    high      -              0         0    0.0       0
 0/20 on     high      2           7000      3800   51.1      76
 0/21 off    high      -              0         0    0.0       0
 0/22 off    high      -              0         0    0.0       0
 0/23 on     high      2           7000      3300   50.9      66
 0/24 off    high      -              0         0    0.0       0

>
```

Display items in Example 2 [AX1240S]

Table 13-14 Display of the power usage of the entire device

Item	Meaning	Displayed information
System Wattage	Power used by the entire device	--
Threshold(W)	The threshold for guaranteeing power to the entire device.	The threshold for guaranteeing power is displayed to the tenths place. If an attempt is made to supply power to a new port when the entire power usage exceeds the threshold value, the supply of power stops.
Total Allocate(W)	Power assigned to PoE.	Displays the power assigned to PoE on the device to the tenths place. The power assigned to each port is calculated according to the following values: When `power inline allocation auto` is set: - Class0: 15.4 W - Class1: 4.0 W - Class2: 7.0 W - Class3: 15.4 W - Class4: 30.0 W When `power inline allocation limit` is set:

Item	Meaning	Displayed information
		- Threshold value
Total Power(W)	Total power for the entire device	Displays the total power for the entire device to the tenths place.
Priority Control	Status of priority setting for supplying power to the device	`enable`: Enabled `disable`: Disabled

Table 13-15 Display of the PoE information for ports

Item	Meaning	Displayed information
Port Counts	Number of ports	Displays the total number of the ports that meet the conditions.
Port	Port	Interface port number
Status	Power supply status	Displays the PoE status of a port. `on`: Power is being supplied. `off`: Power is not being supplied. `faulty`: Power cannot be supplied to the connected device. `denied`: Power is not being supplied because there is not enough power. inact: The supply of power has been stopped by an operation command.
Priority	Priority for supplying power	If the port priority setting is enabled: - `critical`: Power is guaranteed because the port has the greatest importance. - `high`: The priority for supplying power is high. - `low`: The priority for supplying power is low. If the port priority setting is disabled: - `-`: Power is supplied. `never`: The PoE functionality is disabled regardless of the port priority setting.
Class	Power class	If class-based setting is performed: - `0`: Power class Class 0 (15.4 W), which conforms to IEEE 802.3af - `1`: Power class Class 1 (4.0 W), which conforms to IEEE 802.3af - `2`: Power class Class 2 (7.0 W), which conforms to IEEE 802.3af - `3`: Power class Class 3 (15.4 W), which conforms to IEEE 802.3af

Item	Meaning	Displayed information
		- 4: Power class Class 4 (30.0 W), which conforms to IEEE 802.3at If manual setting is performed: - manual: The amount of power supplied is assigned manually. -: Disabled
Alloc(mW)	Assigned power	The power assigned to each port
Power(mW)	Power consumption	The power consumed by each port
Vol(V)	Voltage	The voltage used by each port
Cur(mA)	Current	The current used by each port
Description	Port name	Displays the contents of the Description configuration.

Impact on communication

None

Response messages

Table 13-16 List of response messages for the show power inline command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
This model does not support PoE.	The model does not support PoE.
There is no information.(power inline)	The specified information does not exist.

Notes

- Values displayed for `Total Allocate` and `Power` for each port

  For `Power`, information is collected port by port, resulting in a time lag in the collection of data for port 1 and port 24. Therefore, if the power to the ports varies, the total power displayed for `Power` might exceed 370 W. (The `Total Allocate` value does not have this problem. Also, there is no problem with the priority setting because it is based on the values in `Total Allocate`.)

- There will be a small amount of time before the execution result of the command is displayed.
- Each power is actually assigned slightly more than the shown value. Therefore, the actual power consumption might exceed the assigned power in the display. [AX2200S]

activate power inline [AX2200S][AX1240S]

Manually resumes the supply of power.

Syntax

```
activate power inline gigabitethernet <IF#> [AX2200S]
activate power inline fastethernet <IF#> [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T interface.

`fastethernet` [AX1240S]

Specify a 10BASE-T or 100BASE-TX interface.

<IF#>

Specify an interface port number. The specifiable values are from `0/1` to `0/24`.

Example

```
> activate power inline fastethernet 0/5
```

Display items

None

Impact on communication

Yes

Response messages

Table 13-17 List of response messages for the activate power inline command

Message	Description
This model does not support PoE.	This model does not support PoE. Make sure the model supports PoE.
<IF#> is disabled.	The command could not be executed because the port was in the shutdown state or the port does not supply power. *<IF#>*:Interface port number

Notes

- This command is ignored if it is executed when the port is in the shutdown state.
- Power is not supplied if this command is executed for a port set by the `power inline never` configuration command.
- The `shutdown` or `no shutdown` configuration command overwrites the status set by this command. However, if the `shutdown` or `no shutdown` configuration command does not change the status, the status is not overwritten.

inactivate power inline [AX2200S][AX1240S]

Manually stops the supply of power.

Syntax

```
inactivate power inline gigabitethernet <IF#> [AX2200S]
inactivate power inline fastethernet <IF#> [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`gigabitethernet` [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T interface.

`fastethernet` [AX1240S]

Specify a 10BASE-T or 100BASE-TX interface.

<IF#>

Specify an interface port number. The specifiable values are from `0/1` to `0/24`.

Example

```
> inactivate power inline fastethernet 0/5
```

Display items

None

Impact on communication

Yes

Response messages

Table 13-18 List of response messages for the inactivate power inline command

Message	Description
This model does not support PoE.	This model does not support PoE. Make sure the model supports PoE.
<IF#> is disabled.	The command could not be executed because the port was in the shutdown state or the port does not supply power. *<IF#>*:Interface port number

Notes

- This command is ignored if it is executed when the port is in the shutdown state.
- The `shutdown` or `no shutdown` configuration command overwrites the status set by this command. However, if the `shutdown` or `no shutdown` configuration command does not change the status, the status is not overwritten.

14. Link Aggregation

show channel-group
show channel-group statistics
clear channel-group statistics lacp

show channel-group

Link aggregation information is displayed.

Syntax

```
show channel-group [{[[channel-group-number] <Channel group# list>] [detail] | summary}]
```

Input mode

User mode and administrator mode

Parameters

`{[[channel-group-number]` *<Channel group# list>*`] [detail] | summary}`

`channel-group-number` *<Channel group# list>*

Displays link aggregation information for the channel group numbers specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All link aggregation information is displayed.

`detail`

Displays detailed link aggregation information.

Operation when this parameter is omitted:

Link aggregation information is displayed.

`summary`

Displays summary information about link aggregation.

Operation when this parameter is omitted:

All link aggregation information is displayed.

Example 1

Figure 14-1 Displaying link aggregation information

```
> show channel-group

Date 2008/11/13 10:54:15 UTC
ChGr: 1   Mode: static
  CH Status      : Up      Elapsed Time: 00:18:45
  Max Active Port: 4
  MAC address    : 00ed.f031.0114  VLAN ID: 4000-4050
  Port Information
    0/20  Up    State: Distributing
    0/21  Up    State: Distributing
    0/22  Up    State: Distributing
    0/23  Up    State: Distributing
ChGr: 8   Mode: LACP
  CH Status      : Up      Elapsed Time: 00:00:06
  Max Active Port: 8
  MAC address    : 00ed.f031.0101  VLAN ID: 100
  Actor System   : Priority: 128    MAC: 00ed.f031.0001  Key: 8
  Partner System : Priority: 128    MAC: 0012.e214.ff99  Key: 8
  Port Information
    0/1   Up    State: Distributing
    0/2   Up    State: Distributing
    0/3   Up    State: Distributing
```

```
    0/4   Up    State: Distributing
    0/5   Down  State: Detached
    0/6   Down  State: Detached
    0/7   Down  State: Detached
    0/8   Down  State: Detached
  Uplink redundant
    Switchport backup pairs                        Preemption    Flush
    Primary    Status      Secondary  Status      Delay Limit   VLAN
    ChGr 8     Blocking    Port 0/24  Forwarding     60    53      -

>
```

Figure 14-2 Example of displaying the link aggregation information for a specific channel group number

```
> show channel-group 8

Date 2008/11/13 10:54:25 UTC
ChGr: 8   Mode: LACP
  CH Status      : Up      Elapsed Time: 00:00:16
  Max Active Port: 8
  MAC address    : 00ed.f031.0101  VLAN ID: 100
  Actor System   : Priority: 128    MAC: 00ed.f031.0001  Key: 8
  Partner System : Priority: 128    MAC: 0012.e214.ff99  Key: 8
  Port Information
    0/1   Up    State: Distributing
    0/2   Up    State: Distributing
    0/3   Up    State: Distributing
    0/4   Up    State: Distributing
    0/5   Down  State: Detached
    0/6   Down  State: Detached
    0/7   Down  State: Detached
    0/8   Down  State: Detached
  Uplink redundant
    Switchport backup pairs                        Preemption    Flush
    Primary    Status      Secondary  Status      Delay Limit   VLAN
    ChGr 8     Blocking    Port 0/24  Forwarding     60    43      -

>
```

Display items in Example 1

Table 14-1 Link aggregation information display items

Item	Meaning	Displayed 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 cannot be sent or received.
		`Disabled`: Link aggregation is disabled.

Item	Meaning	Displayed information
Elapsed Time	Time the channel group has been up	*hh*:*mm*:*ss* (when the elapsed time is less than 24 hours) *ddd*.*hh*:*mm*:*ss* (when the elapsed time exceeds 24 hours) Over 1000 days (when the elapsed time is more than 1000 days) - is displayed when the channel group status is not Up.
Max Active Port	Maximum number of ports used by link aggregation	1 to 8
	Standby link mode	Standby link link-down mode (link-down mode): Link-down mode (no-link-down mode): Link-not-down mode This item is displayed only when there are standby ports.
Description	Supplementary explanation regarding the channel group	This item is not displayed if a supplementary explanation has not been set in the configuration.
MAC address	Channel group MAC address	The MAC address of the group. One of the MAC addresses of the ports that belong to the group is used. - is displayed when the channel group status is not Up.
VLAN ID	VLAN ID to which the channel group belongs	VLAN ID
Periodic Time	Sending interval for LACPDU	This item is displayed only when LACP mode is enabled. Short: The sending interval is 1 second. Long: The sending interval is 30 seconds. This item is not displayed if it has not been set.
Actor System	Information about the actor system	Information about the actor system. This item is displayed only when LACP mode is enabled.
Priority	System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address	The MAC address of the LACP system ID
Key	Group key	Group key This value is the same as the channel group number. 0 to 65535
Partner System	Information about the partner system	Information about the partner system. This item is displayed only when LACP mode is enabled. - is displayed if the partner system is not

Item		Meaning	Displayed information
			defined for LACP.
Priority		System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC		MAC address	MAC address
Key		Group key	0 to 65535
Port Information		Information about the ports managed by the channel group is displayed.	--
<IF#>		Port number	Number of the port whose information is to be displayed
Up		Link status of the port (up)	--
Down		Link status of the port (down)	--
State		Aggregation status of the port	`Detached`: The port is reserved, a port speed mismatch occurred, or half-duplex mode is set. `Attached`: The port is in a transition state or is negotiating. `Collecting`: The port is in a transition state or is negotiating (data can be received). `Distributing`: Data can be sent and received. If the status of the port is `Down`, `Detached` is displayed.
Uplink redundant[#1]		Displays uplink redundancy information.	--
Startup active port selection		Setting of the functionality that permanently assigns the active port at device startup	`primary only`: The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
Switchport backup pairs	Primary	The number of the primary port or the channel group	If an asterisk (`*`) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.
	Status	Status of the primary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
	Secondary	The number of the secondary port or the channel group	--

Item		Meaning	Displayed information
	Status	Status of the secondary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
Preemption	Delay	The time value (in seconds) for automatic or timer switch-back	`-` is displayed when this item is not set.
	Limit	The time remaining until a timer switch-back (in seconds)	`-` is displayed when this item is not set.
Flush	VLAN	VLAN to which flush control frames are sent	`1` to `4094`: Indicates a VLAN ID. `untag`: No VLAN is specified. `-`: Send setting is not set.

#1: This item is displayed only when uplink redundancy is set in the configuration.

Example 2

Figure 14-3 Example of displaying detailed information about link aggregation

```
> show channel-group detail

Date 2008/11/13 10:54:50 UTC
ChGr: 1   Mode: static
  CH Status      : Up      Elapsed Time: 00:19:21
  Max Active Port: 4
  MAC address    : 00ed.f031.0114  VLAN ID: 4000-4050
  Port Information
  Port: 0/20  Up
    State: Distributing  Speed: 100M   Duplex: Full
  Port: 0/21  Up
    State: Distributing  Speed: 100M   Duplex: Full
  Port: 0/22  Up
    State: Distributing  Speed: 100M   Duplex: Full
  Port: 0/23  Up
    State: Distributing  Speed: 100M   Duplex: Full
ChGr: 8   Mode: LACP
  CH Status      : Up      Elapsed Time: 00:00:42
  Max Active Port: 8
  MAC address    : 00ed.f031.0101  VLAN ID: 100
  Actor System   : Priority: 128    MAC: 00ed.f031.0001  Key: 8
  Partner System : Priority: 128    MAC: 0012.e214.ff99  Key: 8
  Port Information
  Port: 0/1   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 22
  Port: 0/2   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 21
  Port: 0/3   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 24
  Port: 0/4   Up
    State: Distributing  Speed: 100M   Duplex: Full
```

```
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 23
  Port: 0/5   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Port: 0/6   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Port: 0/7   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Port: 0/8   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Uplink redundant
    Switchport backup pairs                        Preemption    Flush
    Primary    Status      Secondary  Status      Delay Limit   VLAN
    ChGr 8     Blocking    Port 0/24  Forwarding     60    15      -

>
```

Figure 14-4 Example of displaying the detailed link aggregation information for a specific channel group number

```
> show channel-group 8 detail

Date 2008/11/13 10:55:01 UTC
ChGr: 8   Mode: LACP
  CH Status      : Up      Elapsed Time: 00:00:52
  Max Active Port: 8
  MAC address    : 00ed.f031.0101  VLAN ID: 100
  Actor System   : Priority: 128    MAC: 00ed.f031.0001  Key: 8
  Partner System : Priority: 128    MAC: 0012.e214.ff99  Key: 8
  Port Information
  Port: 0/1   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 22
  Port: 0/2   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 21
  Port: 0/3   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 24
  Port: 0/4   Up
    State: Distributing  Speed: 100M   Duplex: Full
    Actor   Port  : Priority: 128
    Partner System: Priority: 128    MAC: 0012.e214.ff99  Key: 8
    Partner Port  : Priority: 128    Number: 23
  Port: 0/5   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Port: 0/6   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Port: 0/7   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
```

```
  Port: 0/8   Down
    State: Detached      Speed: -      Duplex: -
    Actor   Port  : Priority: 128
  Uplink redundant
    Switchport backup pairs                        Preemption    Flush
    Primary    Status      Secondary  Status      Delay Limit   VLAN
    ChGr 8     Blocking    Port 0/24  Forwarding     60     5      -

>
```

Display items in Example 2

Table 14-2 Display items for the detailed link aggregation information

Item	Meaning	Displayed 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 cannot be sent or received.
		`Disabled`: Link aggregation is disabled.
Elapsed Time	Time the channel group has been up	*hh*`:`*mm*`:`*ss* (when the elapsed time is less than 24 hours) *ddd*`.`*hh*`:`*mm*`:`*ss* (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days) `-` is displayed when the channel group status is not Up.
Max Active Port	Maximum number of ports used by link aggregation	1 to 8
	Standby link mode	Standby link link-down mode `(link-down mode)`: Link-down mode `(no-link-down mode)`: Link-not-down mode This item is displayed only when there are standby ports.
Description	Supplementary explanation regarding the channel group	This item is not displayed if a supplementary explanation has not been set in the configuration.
MAC address	Channel group MAC address	The MAC address of the group. One of the MAC addresses of the ports that belong to the group is used. `-` is displayed when the channel group status is not Up.

Item	Meaning	Displayed information
VLAN ID	VLAN ID to which the channel group belongs	VLAN ID
Periodic Time	Sending interval for LACPDU	This item is displayed only when LACP mode is enabled. `Short`: The sending interval is 1 second. `Long`: The sending interval is 30 seconds. This item is not displayed if it has not been set.
Actor System	Information about the actor system	Information about the actor system. This item is displayed only when LACP mode is enabled.
Priority	System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address	The MAC address of the LACP system ID
Key	Group key	Group key This value is the same as the channel group number. 0 to 65535
Partner System	Information about the partner system	Information about the partner system. This item is displayed only when LACP mode is enabled. `-` is displayed if the partner system is not defined for LACP.
Priority	System priority	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address	MAC address
Key	Group key	0 to 65535
Port Information	Information about the ports managed by the channel group is displayed.	--
<IF#>	Port number	Number of the port whose information is to be displayed
Up	Link status of the port (up)	--
Down	Link status of the port (down)	--
State	Aggregation status of the port	`Detached`: The port went down or is reserved, a port speed mismatch occurred, or half-duplex mode is set. `Attached`: The port is in a transition state or is negotiating. `Collecting`: The port is in a transition state or is negotiating (data can be received).

Item	Meaning	Displayed information
		`Distributing`: Data can be sent and received. If the status of the port is `Down`, `Detached` is displayed.
Speed	Line speed	`10M`: 10 Mbit/s
		`100M`: 100 Mbit/s
		`1G`: 1 Gbit/s
		`--` is displayed if the port status is `Down`.
Duplex	Duplex mode	`Full`: Full duplex
		`Half`: Half duplex
		`--` is displayed if the port status is `Down`.
Priority	Priority of the actor system port	0 to 65535 can be specified as the priority value (0 indicates the highest priority). This item is displayed only when a static standby link has been set.
Actor Port	Actor system port information	This item is displayed only when LACP mode is enabled.
Priority	Priority of the actor system port	0 to 65535 can be specified as the priority value (0 indicates the highest priority).
Partner System	Information about the partner system	This item is displayed only when LACP mode is used for connection.
Priority	System priority of the partner system	Priority of the LACP system ID 1 to 65535 can be specified as the priority value (1 indicates the highest priority).
MAC	MAC address of the partner system	--
Key	Partner system key	0 to 65535
Partner Port	Information about the partner system port	This item is displayed only when LACP mode is used for connection.
Priority	System priority of the partner system	0 to 65535 can be specified as the priority value (0 indicates the highest priority).
Number	Port number of the partner system	--
Uplink redundant[#1]	Displays uplink redundancy information.	--

Item		Meaning	Displayed information
Startup active port selection		Setting of the functionality that permanently assigns the active port at device startup	`primary only`: The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
Switchport backup pairs	Primary	The number of the primary port or the channel group	If an asterisk (`*`) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.
	Status	Status of the primary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
	Secondary	The number of the secondary port or the channel group	--
	Status	Status of the secondary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
Preemption	Delay	The time value (in seconds) for automatic or timer switch-back	`-` is displayed when this item is not set.
	Limit	The time remaining until a timer switch-back (in seconds)	`-` is displayed when this item is not set.
Flush	VLAN	VLAN to which MAC address table flush control frames are sent	`1` to `4094`: Indicates a VLAN ID. `untag`: No VLAN is specified. `-`: Send setting is not set.

#1: This item is displayed only when uplink redundancy is set in the configuration.

Example 3

Figure 14-5 Example of displaying summary information about link aggregation

```
> show channel-group summary

Date 2008/11/13 10:54:44 UTC
ChGr CH Status  Port
 1   Up         0/20-23
 8   Up         0/1-8

>
```

Display items in Example 3

Table 14-3 Display items for the summary information about link aggregation

Item	Meaning	Displayed information
ChGr	Channel group number	Channel group number
CH Status	Channel group status	`Up`: Data packets can be sent and received.

Item	Meaning	Displayed information
		`Down`: Data packets cannot be sent or received.
		`Disabled`: Link aggregation is disabled.
Port	Port list of the channel group	`--` is displayed if the port has not been set.

Impact on communication

None

Response messages

Table 14-4 List of response messages for the show channel-group command

Message	Description
There is no information. (channel-group)	There is no `channel-group` information.

Notes

For notes on uplink redundancy, see the description of the *show switchport backup* command.

show channel-group statistics

Displays link aggregation statistics.

Syntax

```
show channel-group statistics [lacp] [<Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`lacp`

Displays for each port the statistics for sent and received LACPDUs in link aggregation. Information is not displayed if static link aggregation mode is enabled or link aggregation mode has not been set.

<Channel group# list>

Displays link aggregation statistics for the channel group numbers specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all link aggregations are displayed.

Operation when all parameters are omitted:

Statistics for sent and received data packets (for each port) in all link aggregations are displayed.

Example 1

Figure 14-6 Example of displaying statistics on sent and received data packets for link aggregation (by port)

```
> show channel-group statistics

Date 2008/11/13 10:54:32 UTC
channel-group counts: 2
ChGr: 1(Up)
 Total:      Octets    Tx:              37208  Rx:            2038024
             Frames    Tx:                575  Rx:              28306
             Discards  Tx:                  0  Rx:                  0
 Port: 0/20  Octets    Tx:              11928  Rx:              22032
             Frames    Tx:                180  Rx:                306
             Discards  Tx:                  0  Rx:                  0
 Port: 0/21  Octets    Tx:               8512  Rx:            1924192
             Frames    Tx:                133  Rx:              26725
             Discards  Tx:                  0  Rx:                  0
 Port: 0/22  Octets    Tx:               8256  Rx:              91800
             Frames    Tx:                129  Rx:               1275
             Discards  Tx:                  0  Rx:                  0
 Port: 0/23  Octets    Tx:               8512  Rx:                  0
             Frames    Tx:                133  Rx:                  0
             Discards  Tx:                  0  Rx:                  0
ChGr: 8(Up)
 Total:      Octets    Tx:              28864  Rx:              59008
             Frames    Tx:                285  Rx:                744
             Discards  Tx:                  0  Rx:                  0
 Port: 0/1   Octets    Tx:               5568  Rx:               6144
             Frames    Tx:                 44  Rx:                 53
```

```
             Discards  Tx:                0  Rx:                0
 Port: 0/2   Octets    Tx:             4992  Rx:             4992
             Frames    Tx:               39  Rx:               39
             Discards  Tx:                0  Rx:                0
 Port: 0/3   Octets    Tx:             5376  Rx:            40960
             Frames    Tx:               42  Rx:              597
             Discards  Tx:                0  Rx:                0
 Port: 0/4   Octets    Tx:             5376  Rx:             5632
             Frames    Tx:               42  Rx:               45
             Discards  Tx:                0  Rx:                0
 Port: 0/5   Octets    Tx:                0  Rx:                0
             Frames    Tx:                0  Rx:                0
             Discards  Tx:                0  Rx:                0
 Port: 0/6   Octets    Tx:             7552  Rx:             1280
             Frames    Tx:              118  Rx:               10
             Discards  Tx:                0  Rx:                0
 Port: 0/7   Octets    Tx:                0  Rx:                0
             Frames    Tx:                0  Rx:                0
             Discards  Tx:                0  Rx:                0
 Port: 0/8   Octets    Tx:                0  Rx:                0
             Frames    Tx:                0  Rx:                0
             Discards  Tx:                0  Rx:                0

>
```

Figure 14-7 Example of displaying statistics on sent and received data packets for a specific channel group number (by port)

```
> show channel-group statistics 8

Date 2008/11/13 11:20:17 UTC
channel-group counts: 1
ChGr: 8(Up)
 Total:      Octets    Tx:          102307556  Rx:           135296
             Frames    Tx:            1598165  Rx:             1715
             Discards  Tx:                  0  Rx:                0
 Port: 0/1   Octets    Tx:          102262144  Rx:            13312
             Frames    Tx:            1597747  Rx:              109
             Discards  Tx:                  0  Rx:                0
 Port: 0/2   Octets    Tx:              12160  Rx:            12032
             Frames    Tx:                 95  Rx:               94
             Discards  Tx:                  0  Rx:                0
 Port: 0/3   Octets    Tx:              12544  Rx:            95808
             Frames    Tx:                 98  Rx:             1399
             Discards  Tx:                  0  Rx:                0
 Port: 0/4   Octets    Tx:              13156  Rx:            12864
             Frames    Tx:                107  Rx:              103
             Discards  Tx:                  0  Rx:                0
 Port: 0/5   Octets    Tx:                  0  Rx:                0
             Frames    Tx:                  0  Rx:                0
             Discards  Tx:                  0  Rx:                0
 Port: 0/6   Octets    Tx:               7552  Rx:             1280
             Frames    Tx:                118  Rx:               10
             Discards  Tx:                  0  Rx:                0
 Port: 0/7   Octets    Tx:                  0  Rx:                0
             Frames    Tx:                  0  Rx:                0
             Discards  Tx:                  0  Rx:                0
 Port: 0/8   Octets    Tx:                  0  Rx:                0
             Frames    Tx:                  0  Rx:                0
             Discards  Tx:                  0  Rx:                0

>
```

Display items in Example 1

Table 14-5 Display items for the statistics for sent and received data packets related to link aggregation

Item	Meaning	Displayed information
channel-group counts	Number of channel groups to be displayed	Number of channel groups
ChGr	Channel group number. The status of the channel group is displayed enclosed in parentheses.	Channel group number `Up`: Data packets can be sent and received. `Down`: Data packets cannot be sent or received. `Disabled`: Link aggregation is disabled.
Total	Total statistics	Statistics are displayed for each channel group.
Port	Interface 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

Example 2

Figure 14-8 Displaying statistics for sent and received LACPDUs in link aggregation

```
> show channel-group statistics lacp

Date 2008/11/13 11:21:16 UTC
channel-group counts: 1
ChGr: 8  Port Counts: 8
  Port: 0/1
    TxLACPDUs           :        101   RxLACPDUs   :         99
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          2   RxUnknowns  :          0
  Port: 0/2
    TxLACPDUs           :         97   RxLACPDUs   :         95
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          1   RxUnknowns  :          0
  Port: 0/3
    TxLACPDUs           :        100   RxLACPDUs   :         98
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          2   RxUnknowns  :          0
  Port: 0/4
    TxLACPDUs           :        100   RxLACPDUs   :         99
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          1   RxUnknowns  :          0
  Port: 0/5
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0
  Port: 0/6
    TxLACPDUs           :          0   RxLACPDUs   :          0
```

```
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          9   RxUnknowns  :          0
  Port: 0/7
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0
  Port: 0/8
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0

>
```

Figure 14-9 Displaying statistics for sent and received LACPDUs for the specified channel group

```
> show channel-group statistics 8 lacp

Date 2008/11/13 11:21:42 UTC
channel-group counts: 1
ChGr: 8  Port Counts: 8
  Port: 0/1
    TxLACPDUs           :        102   RxLACPDUs   :        100
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          2   RxUnknowns  :          0
  Port: 0/2
    TxLACPDUs           :         98   RxLACPDUs   :         96
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          1   RxUnknowns  :          0
  Port: 0/3
    TxLACPDUs           :        101   RxLACPDUs   :         99
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          2   RxUnknowns  :          0
  Port: 0/4
    TxLACPDUs           :        101   RxLACPDUs   :        100
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          1   RxUnknowns  :          0
  Port: 0/5
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0
  Port: 0/6
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          9   RxUnknowns  :          0
  Port: 0/7
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0
  Port: 0/8
    TxLACPDUs           :          0   RxLACPDUs   :          0
    TxMarkerResponsePDUs:          0   RxMarkerPDUs:          0
    RxIllegals          :          0   RxUnknowns  :          0

>
```

Display items in Example 2

Table 14-6 Display items for the statistics for sent and received LACPDUs in link aggregation

Item	Meaning	Displayed information
channel-group counts	Number of channel groups to be displayed	Number of channel groups
ChGr	Channel group number	Channel group number
Port Counts	Number of ports to be displayed	Number of ports
Port	Interface port number	--
TxLACPDUs	Number of sent LACPDUs	--
RxLACPDUs	Number of received LACPDUs	--
Tx MarkerResponsePDUs	Number of sent marker response PDUs	--
RxMarkerPDUs	Number of received marker PDUs	--
RxIllegals	Number of discarded received PDUs	Invalid PDUs
RxUnknowns	Number of discarded received PDUs	Unknown PDUs

Impact on communication

None

Response messages

Table 14-7 List of response messages for the show channel-group statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (channel-group statistics)	There is no `channel-group statistics` information.

Notes

- Statistics are cleared when the device starts up or when the following commands are executed:

  Statistics for sent and received data packets: `clear counters`

  Information about sent and received LACPs: `clear channel-group statistics lacp`

- The statistics for the sent and received data packets displayed by this command are the sum of the statistics on the Ethernet lines for each channel group. To clear the statistics for sent and received data packets, use a command that clears Ethernet lines. The following are related commands:

  Related commands: `show interfaces`

show channel-group statistics

clear counters

clear channel-group statistics lacp

Clears the statistics for sent and received LACPDUs in link aggregation.

Syntax

```
clear channel-group statistics lacp
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 14-10 Clearing statistics on sent and received LACPDUs for link aggregation

```
> clear channel-group statistics lacp

>
```

Display items

None

Impact on communication

None

Response messages

Table 14-8 List of response messages for the clear channel-group statistics lacp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (channel-group statistics)	There is no `channel-group statistics` information.

Notes

- This command clears only LACPDU statistics. It cannot clear the statistics for the data packets for each channel group. Also see *Notes* for the `show channel-group statistics` command.
- Even if statistics are cleared to zero, the value for the MIB information obtained by using SNMP is not cleared to zero.
- If deletion or addition is performed in the configuration, the relevant LACPDU statistics are cleared to zero.

15. MAC Address Table

show mac-address-table
clear mac-address-table

show mac-address-table

Displays information stored in the MAC address table.

Syntax

```
show mac-address-table [mac <MAC>] [vlan <VLAN ID list>] [port <Port# list>]
     [channel-group-number <Channel group# list>]
     [{static | dynamic | snoop | dot1x | wa | macauth}]
show mac-address-table learning-counter [port <Port# list>]
     [channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`mac` *<MAC>*

Displays the information in the MAC address table for the specified MAC address.

`vlan` *<VLAN ID list>*

Displays the information in the MAC address table for the VLAN IDs specified in list format.

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the information in the MAC address table for all VLANs.

`[port` *<Port# list>*`] [channel-group-number` *<Channel group# list>*`]`

Displays the information in the MAC address table for the specified ports or the specified link aggregation groups. Ports and link aggregation groups cannot be specified at the same time.

`port` *<Port# list>*

Displays the information in the MAC address table for the ports specified in list format. The mac-address-table entries that include at least one of the ports specified in the list are displayed. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays the information in the MAC address table for the channel groups specified in list format in the specified link aggregation. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Even if the command is executed with this parameter set, information about the MAC address table is displayed in port-list format.

Operation when this parameter is omitted:

The information in the MAC address table for all ports and link aggregation groups is displayed.

`{ static | dynamic | snoop | dot1x | wa | macauth }`

Displays the information in the MAC address table that was registered under the specified condition.

`static`

Displays the information in the MAC address table registered by the `mac-address-table static` configuration command.

`dynamic`

Displays the information in the MAC address table registered dynamically through MAC address learning.

`snoop`

Displays the information in the MAC address table registered by using the IGMP snooping or MLD snooping functionality.

`dot1x`

Displays the information in the MAC address table registered by using the IEEE 802.1X functionality.

`wa`

Displays the information in the MAC address table registered by using the Web authentication functionality.

`macauth`

Displays the information in the MAC address table registered by using the MAC-based authentication functionality.

`learning-counter`

Displays the number of learned addresses in the MAC address table for each port.

Note on setting parameters

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

Operation when all parameters are omitted:

All information in the MAC address table is displayed.

Example 1

Figure 15-1 Displaying all information in a MAC address table

```
> show mac-address-table

Date 2009/03/16 23:24:47 UTC
Aging time : 300
MAC address        VLAN    Type     Port-list
0000.0088.7701        2    Dynamic  0/49-50
000b.972f.e22b        2    Dot1x    0/35
0000.ef01.34f4     1000    Static   0/30
0000.ef01.3d17     1000    Static   0/30
000b.9727.ee41     1024    WebAuth  0/28
0010.c6ce.e1c6     1024    MacAuth  0/29
0012.e284.c703     1024    Dynamic  0/49-50
001b.7887.a492     1024    Dynamic  0/49-50
0100.5e00.00fc     1024    Snoop    0/49-50

>
```

Display items in Example 1

Table 15-1 Display items for the information in the MAC address table

Item	Meaning	Displayed information
show mac-address-table	Aging time in the MAC address table	`Infinity` is displayed if aging is not performed.

Item	Meaning	Displayed information
MAC address	MAC address	--
VLAN	VLAN ID	--
Type	Type of MAC address table entry	`Dynamic`: Entry registered dynamically `Snoop`: Entry registered by using the IGP snooping or MLD snooping functionality `Static`: Entry registered statically `Dot1x`: Entry registered after authentication by the IEEE 802.1X functionality (port-based authentication) `WebAuth`: Entry registered after authentication by Web authentication `MacAuth`: Entry registered after authentication by MAC-based authentication
Port-list	Port (Interface port number)	Displays the ports (port list) to which the MAC address belongs. When there is no port to which the MAC address belongs, a hyphen (`-`) is displayed.

Example 2

Figure 15-2 Displaying the status of learning in the MAC address table

```
> show mac-address-table learning-counter

Date 2008/11/17 15:02:38 UTC
 Port Count
 0/1               7
 0/2               0
 0/3               0
 0/4             124
 0/5               0
 0/6               2
 0/7               0
 0/8               0
 0/9               0
 0/10              0

      :

>
```

Display items in Example 2

Table 15-2 Display items for the status of learning in the MAC address table

Item	Meaning	Displayed information
Port	Port (Interface port number)	--
Count	Number of learnt entries in the current MAC address table	--

Impact on communication

None

Response messages

Table 15-3 List of response messages for the show mac-address-table command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (mac-address-table)	There is no information in the MAC address table.

Notes

This command does not display information for undefined channel group numbers.

clear mac-address-table

Clears the information in the MAC address table registered dynamically through MAC address learning.

Syntax

```
clear mac-address-table [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Clears information in the MAC address table without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Figure 15-3 Clearing information in the MAC address table

```
> clear mac-address-table
Do you wish to clear mac-address-table? (y/n): y

>

If y is entered, the information in the MAC address table is cleared.
If n is entered, the information in the MAC address table is not cleared.
```

Display items

None

Impact on communication

Frames are flooded until learning is completed again. Execute this command at a time when flooding will have a minimal impact.

Response messages

Table 15-4 List of response messages for the clear mac-address-table command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (mac-address-table)	There is no information in the MAC address table.

Notes

This command clears all information in the MAC address table with the exception of static entries. During clear processing, learning is not performed for the MAC address table. Processing by this command might take as much as 10 seconds or more.

16. VLANs

show vlan
show vlan mac-vlan

show vlan

Displays various VLAN statuses and the status of accommodated lines.

Syntax

```
show vlan [{[id] <VLAN ID list> | port <Port# list> | channel-group-number
          <Channel group# list>}][{summary | detail | list}]
```

Input mode

User mode and administrator mode

Parameters

`{ [id]` *<VLAN ID list>* `| port` *<Port# list>* `| channel-group-number<` *Channel group# list>*`}`

`[id]` *<VLAN ID list>*

Displays the VLAN information for the VLAN IDs specified in list format. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

`port` *<Port# list>*

Displays the VLAN information for the port numbers specified in list format. All the VLAN information that includes one or more ports specified in the list is displayed. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays VLAN information for the channel groups specified in list format in the specified link aggregation. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All VLAN information is displayed according to the `summary`, `detail`, or `list` option specified.

`{summary | detail | list}`

`summary`

Displays the VLAN summary information.

`detail`

Displays detailed information about VLANs.

`list`

Displays VLAN information with the information for one VLAN being displayed on one line.

Operation when this parameter is omitted:

Displays VLAN information.

Operation when all parameters are omitted:

Displays all VLAN information.

Example 1

The following shows an example of displaying the statuses of all configured VLANs and the status of accommodated ports.

Figure 16-1 Example of displaying VLAN information

```
> show vlan
```

```
Date 2009/10/28 16:32:45 UTC
VLAN counts: 5
VLAN ID: 7     Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN0007
  IP Address:
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN0007
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:1
  IGMP snooping:      MLD snooping:
  Untagged(0)   :
  Tagged(10)    : 0/1,0/17-25
VLAN ID: 10    Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN0010
  IP Address:
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN0010
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:Control-VLAN
  IGMP snooping:      MLD snooping:
  Untagged(0)   :
  Tagged(9)     : 0/17-25
VLAN ID: 30    Type: Protocol based  Status: Down
  Protocol VLAN Information  Name: "IPV4"
  EtherType: 0800,0806 LLC:  Snap-EtherType:
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN0030
  IP Address:
  Source MAC address: 0012.e294.aadc(System)
  Description: PROT-VLAN0030
  Spanning Tree: None(-)
  AXRP RING ID:       AXRP VLAN group:
  IGMP snooping:      MLD snooping:
  Untagged(0)   :
  Tagged(0)     :
VLAN ID: 51    Type: MAC based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN0051
  IP Address:
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN0051
  Spanning Tree: None(-)
  AXRP RING ID:       AXRP VLAN group:
  IGMP snooping:      MLD snooping:
  Untagged(1)   : 0/11
  Tagged(0)     :
VLAN ID: 4094  Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN4094
  IP Address: 192.168.0.150/24
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN4094
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:2
  IGMP snooping:      MLD snooping:
```

```
  Untagged(1)    : 0/14
  Tagged(10)     : 0/1,0/17-25

>
```

Figure 16-2 Example of displaying VLAN information for a specific port

```
> show vlan port 0/14

Date 2009/10/28 16:40:45 UTC
VLAN counts: 1
VLAN ID: 4094  Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN4094
  IP Address: 192.168.0.150/24
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN4094
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:2
  IGMP snooping:      MLD snooping:
  Untagged(1)    : 0/14
  Tagged(10)     : 0/1,0/17-25

>
```

Display items in Example 1

Table 16-1 Basic display items for VLANs

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
VLAN ID	VLAN information	VLAN ID
Type	VLAN type	`Port based`: Port VLAN `Protocol based`: Protocol VLAN `Mac based`: MAC VLAN
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disabled`:Disabled status
Protocol VLAN Information	Protocol VLAN information	This item is displayed only for a protocol VLAN.
Name	Protocol name	--
EtherType	EtherType value of Ethernet V2 frames	Displayed as 4-digit hexadecimal number
LLC	LLC value of 802.3 frames	Displayed as 4-digit hexadecimal number
Snap-EtherType	EtherType value of 802.3 SNAP frames	Displayed as 4-digit hexadecimal number
Learning	MAC address learning status	`On`: MAC address learning is enabled; `Off`: MAC address learning is disabled.

Item	Meaning	Displayed information
BPDU Forwarding	BPDU forwarding	Blank: No IP address has been set. `On`: BPDU forwarding functionality is being used.
EAPOL Forwarding	EAPOL forwarding	Blank: The setting for this item does not exist. `On`: EAPOL forwarding functionality is being used.
Router Interface Name	Interface name	Displays the name of the interface assign to the VLAN.
IP Address	IP address (/mask)	Blank: No IP address has been set.
Source MAC address	Source MAC address used during Layer 3 communication	`System`: The MAC address for the device is used.
Description	Description	The character string set for the VLAN name is displayed.`VLAN`*xxxx* is displayed if this item is not set. (*xxxx*: VLAN ID)
Spanning Tree	Spanning Tree Protocol being used	`Single (802.1D)`: IEEE 802.1D is used for the entire Switch. `Single (802.1w)`:IEEE 802.1w (for the switch) `PVST+ (802.1D)`: IEEE 802.1D is used for the VLAN. `PVST+ (802.1w)`:IEEE 802.1w (for the VLAN) `MSTP (802.1s)`:Multiple Spanning Tree Protocol `None (--)`:Displayed when this item is not set.
AXRP RING ID	Ring Protocol ring ID	Blank: No IP address has been set. (Information about a maximum of 4 IDs is displayed.)
AXRP VLAN group	ID of the VLAN group using the Ring Protocol functionality or the control VLAN	Blank: No IP address has been set. `1` or `2`: ID of the assigned VLAN group `Control-VLAN`: The control VLAN is assigned.
IGMP Snooping	Setting status of IGMP snooping	Blank: No IP address has been set. `On`: IGMP snooping is being used.
MLD Snooping	Setting status of MLD snooping	Blank: No IP address has been set. `On`: MLD snooping is being used.
Untagged(*n*)	Untagged port	*n*: Number of applicable ports Port list This item includes ports that automatically participate in the VLAN through automatic VLAN assignment.
Tagged(*n*)	Tagged port	*n*: Number of applicable ports Port list

Example 2

The following shows an example of displaying summary information about all configured VLANs.

Figure 16-3 Example of displaying VLAN summary information

```
> show vlan summary

Date 2009/10/28 16:32:16 UTC
Total(5)           : 7,10,30,51,4094
Port based(3)      : 7,10,4094
Protocol based(1)  : 30
MAC based(1)       : 51

>
```

Display items in Example 2

Table 16-2 Display items of VLAN summary

Item	Meaning	Displayed information
Total(*n*)	Applicable VLAN information	*n*: Number of applicable VLANs *n*=0: Blank VLAN ID list
Port based(*n*)	Port VLAN information	*n*: Number of applicable VLANs *n*=0: Blank VLAN ID list
Protocol based(*n*)	Protocol VLAN information	*n*: Number of applicable VLANs *n*=0: Blank VLAN ID list
MAC based(*n*)	MAC VLAN information	*n*: Number of applicable VLANs *n*=0: Blank VLAN ID list

Example 3

The following shows an example of displaying VLAN detailed information when a VLAN ID is specified.

Figure 16-4 Example of displaying VLAN detailed information for a specific VLAN ID

```
 show vlan 10,4094 detail

Date 2009/10/28 16:32:49 UTC
VLAN counts: 2
VLAN ID: 10    Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN0010
  IP Address:
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN0010
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:Control-VLAN
  IGMP snooping:      MLD snooping:
  Port Information
   0/17(ChGr:8)  Down -              Tagged
   0/18(ChGr:8)  Down -              Tagged
   0/19(ChGr:8)  Down -              Tagged
   0/20(ChGr:8)  Down -              Tagged
   0/21(ChGr:8)  Down -              Tagged
   0/22(ChGr:8)  Down -              Tagged
```

```
    0/23(ChGr:8)  Down -              Tagged
    0/24(ChGr:8)  Up   Forwarding     Tagged
    0/25          Up   Forwarding     Tagged
VLAN ID: 4094  Type: Port based  Status: Up
  Learning: On
  BPDU Forwarding:        EAPOL Forwarding:
  Router Interface Name: VLAN4094
  IP Address: 192.168.0.150/24
  Source MAC address: 0012.e294.aadc(System)
  Description: VLAN4094
  Spanning Tree: None(-)
  AXRP RING ID:200    AXRP VLAN group:2
  IGMP snooping:      MLD snooping:
  Port Information
    0/1          Up   Forwarding      Tagged
    0/14          Down -              Untagged
    0/17(ChGr:8)  Down -              Tagged
    0/18(ChGr:8)  Down -              Tagged
    0/19(ChGr:8)  Down -              Tagged
    0/20(ChGr:8)  Down -              Tagged
    0/21(ChGr:8)  Down -              Tagged
    0/22(ChGr:8)  Down -              Tagged
    0/23(ChGr:8)  Down -              Tagged
    0/24(ChGr:8)  Up   Forwarding     Tagged
    0/25          Up   Forwarding     Tagged

>
```

Display items in Example 3

Table 16-3 Display items of detailed VLAN information

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
VLAN ID	VLAN information	VLAN ID
Type	VLAN type	`Port based`: Port VLAN `Protocol based`: Protocol VLAN `Mac based`: MAC VLAN
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disabled`: Disabled status
Protocol VLAN Information	Protocol VLAN information	This item is displayed only for a protocol VLAN.
Name	Protocol name	--
EtherType	EtherType value of Ethernet V2 frames	Displayed as 4-digit hexadecimal number
LLC	LLC value of 802.3 frames	Displayed as 4-digit hexadecimal number
Snap-EtherType	EtherType value of 802.3 SNAP frames	Displayed as 4-digit hexadecimal number
Learning	MAC address learning status	`On`: MAC address learning is enabled; `Off`: MAC

Item	Meaning	Displayed information
		address learning is disabled.
BPDU Forwarding	BPDU forwarding	Blank: No IP address has been set. `On`: BPDU forwarding functionality is being used.
EAPOL Forwarding	EAPOL forwarding	Blank: No IP address has been set. `On`: EAPOL forwarding functionality is being used.
Router Interface Name	Interface name	Displays the name of the interface assign to the VLAN.
IP Address	IP address (/mask)	Blank: No IP address has been set.
Source MAC address	Source MAC address used during Layer 3 communication	`System`: The MAC address for the device is used.
Description	Description	The character string set for the VLAN name is displayed. `VLAN`*xxxx* is displayed if this item is not set. (*xxxx*: VLAN ID)
Spanning Tree	Spanning Tree Protocol being used	`Single (802.1D)`: IEEE 802.1D is used for the entire Switch. `Single (802.1W)`: IEEE 802.1w (for the switch) `PVST+ (802.1D)`: IEEE 802.1D is used for the VLAN. `PVST+ (802.1W)`: IEEE 802.1w (for the VLAN) `MSTP (802.1S)`: Multiple Spanning Tree Protocol `None (-)`: Displayed when this item is not set.
AXRP RING ID	Ring Protocol ring ID	Blank: No IP address has been set. (Information about a maximum of 4 IDs is displayed.)
AXRP VLAN group	ID of the VLAN group using the Ring Protocol functionality or the control VLAN	Blank: No IP address has been set. `1` or `2`: ID of the assigned VLAN group `Control-VLAN`: The control VLAN is assigned.
IGMP Snooping	Setting status of IGMP snooping	Blank: No IP address has been set. `On`: IGMP snooping is being used.
MLD Snooping	Setting status of MLD snooping	Blank: No IP address has been set. `On`: MLD snooping is being used.
Port Information	Port information (Interface port number)	`No Port` is displayed if there is no port information for the VLAN. This item includes ports that automatically participate in the VLAN through automatic VLAN assignment.
ChGr	Channel group number	1 to 8 This item is not displayed for the ports that do not belong to the channel group.
<line status>	Port state	`Up`: Indicates that the port status is Up. `Down`: Indicates that the port status is Down.

Item	Meaning	Displayed information
<data forwarding status>	Data forwarding status	`Forwarding`: Data is being forwarded. `Blocking`: Data forwarding is blocked. `(VLAN)`: The VLAN is disabled. `(CH)`: Data forwarding has been stopped by link aggregation. `(STP)`: Data forwarding has been stopped by STP. `(dot1x)`:Data transfer has been stopped by the IEEE 802.1x functionality. `(ULR)`:Data transfer has been stopped by ULR. `(AXRP)`: Forwarding has been suspended by the Ring Protocol. `-`: The port status is Down.
Tag	Tag setting status	`Untagged`: Untagged port `Tagged`: Tagged port

Example 4

The following shows an example of displaying VLAN information in list format.

Figure 16-5 Example of displaying VLAN information in list format

```
> show vlan list

Date 2009/10/28 16:31:47 UTC
VLAN counts: 5
  ID Status   Fwd/Up /Cfg Name            Type  Protocol       Ext. IP
   7 Up         3/  3/ 10 VLAN0007         Port  AXRP (-)       -    -
  10 Up         2/  2/  9 VLAN0010         Port  AXRP (C)       -    -
  30 Down       0/  0/  0 PROT-VLAN0030    Proto -              -    -
  51 Up         1/  1/  1 VLAN0051         MAC   -              -    -
4094 Up         3/  3/ 11 VLAN4094         Port  AXRP (-)       -    4
     AXRP (C:Control-VLAN)
     S:IGMP/MLD snooping
     4:IPv4 address configured

>
```

Display items in Example 4

Table 16-4 Display items for VLAN information in list format

Item	Meaning	Displayed information
VLAN counts	Number of applicable VLANs	--
ID	VLAN ID	VLAN ID
Status	VLAN status	`Up`: Indicates Up status. `Down`: Indicates Down status. `Disabled`: Disabled status
Fwd	Number of ports in `Forward` status	The number of ports belonging to the VLAN that are in `Forward` status This item includes ports that automatically participate in the VLAN through automatic VLAN

Item	Meaning	Displayed information
		assignment.
Up	Number of ports in Up status	The number of ports belonging to the VLAN that are in Up status This item includes ports that automatically participate in the VLAN through automatic VLAN assignment.
Cfg	Number of VLAN ports	The number of ports belonging to the VLAN This item includes ports that automatically participate in the VLAN through automatic VLAN assignment.
Name	VLAN name	The first 14 characters of the character string set for the VLAN name are displayed. VLAN*xxxx* is displayed if this item is not set. (*xxxx*: VLAN ID)
Type	VLAN type	Port: Port VLAN Proto: Protocol VLAN Mac: MAC VLAN
Protocol	STP information, Ring Protocol information	For STP: STP <*type*>:<*protocol*> <*type*>: Single, PVST+, or MSTP <*Protocol*>:802.1D, 802.1W, or 802.1S For the Ring Protocol: AXRP (C): Indicates that the control VLAN is assigned, (-) is displayed if the control VLAN is not assigned). If nothing is specified:-- is displayed.
Ext.	Extended functionality information	S: Indicates that IGMP snooping or MLD snooping is set. -: Indicates that the relevant functionality is not set.
IP	IP address setting information	4: Indicates that an IPv4 address is set. -: Indicates that an IP address is not set for the VLAN.

Impact on communication

None

Response messages

Table 16-5 List of response messages for the show vlan command

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

Message	Description
There is no information. (vlan)	No information was found.

Notes

None

show vlan mac-vlan

Displays the MAC addresses registered for MAC VLANs.

Syntax

```
show vlan mac-vlan [<VLAN ID list>] [{static | dynamic}]
show vlan mac-vlan <MAC>
show vlan mac-vlan [[id] <VLAN ID list>] [{static | dynamic}]
show vlan mac-vlan mac <MAC>
```

Input mode

User mode and administrator mode

Parameters

<VLAN ID list>

`[id]` *<VLAN ID list>*

Displays the MAC VLAN information for the VLAN IDs specified in list format.

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays the MAC VLAN information for all VLANs.

`{ static | dynamic }`

`static`

Displays the MAC address information registered in the configuration.

The MAC address information disabled by hardware conditions is also displayed.

`dynamic`

Displays the MAC address information registered by using Layer 2 authentication.

Operation when this parameter is omitted:

Displays the MAC address information registered for `static` and `dynamic`.

<MAC>

`mac` *<MAC>*

Displays VLANs for which the specified MAC address is registered.

The MAC address information in the configuration disabled by hardware conditions is also displayed.

Operation when all parameters are omitted:

Displays all MAC VLAN information.

Example

The following shows an example of displaying information related to MAC VLANs from the information for all configured VLANs.

Figure 16-6 Example of displaying MAC VLAN information

```
> show vlan mac-vlan

Date 2008/11/17 06:12:04 UTC
VLAN counts: 1    Total MAC Counts: 3
VLAN ID: 100         MAC Counts: 3
```

```
    0000.e22b.ffdd(mac-auth)   000b.972f.e22b(mac-auth)
    0050.daba.4fc8(mac-auth)

>
```

Display items

Table 16-6 Display items of MAC VLANs

Item	Meaning	Displayed information
VLAN counts	Number of displayed MAC VLANs	--
Total MAC Counts	Number of displayed MAC addresses	Number of displayed MAC addresses. The total number of MAC addresses that include valid entries already assigned to the hardware (an asterisk (*) does not appear next to the displayed MAC address) and invalid entries that have not been assigned to the hardware (an asterisk (*) appears next to the displayed MAC address).
VLAN ID	VLAN information	VLAN ID
MAC Counts	Number of displayed MAC addresses for each VLAN	Number of MAC addresses displayed for the applicable VLAN
<MAC-address> (*type*)	Registered MAC address	*type*: Indicates which functionality registered the address. `static`: Indicates that the address was registered by configuration. `dot1x`: Indicates that the address was registered by the IEEE 802.1X functionality. `web-auth`: Indicates that the address was registered by the Web authentication functionality. `mac-auth`: Indicates that the address was registered by the MAC-based authentication functionality. `*`: Indicates that the entry has not been registered in the hardware due to capacity limits.

Impact on communication

None

Response messages

Table 16-7 List of response messages for the show vlan mac-vlan command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (vlan mac-vlan)	No MAC VLAN information was found.

Notes

None

17. Spanning Tree Protocols

show spanning-tree
show spanning-tree statistics
clear spanning-tree statistics
clear spanning-tree detected-protocol
show spanning-tree port-count

show spanning-tree

Displays Spanning Tree information.

Syntax

```
show spanning-tree [{vlan [ <VLAN ID list>] | single | mst [ instance <MSTI ID list>]} [port
<Port# list>] [channel-group-number <Channel group# list>]] [detail] [active]
```

Input mode

User mode and administrator mode

Parameters

`{vlan [`*<VLAN ID list>*`] | single | mst [ instance `*<MSTI ID list>*`]}`

`vlan`

Displays PVST+ Spanning Tree information.

<VLAN ID list>

Displays PVST+ Spanning Tree information for the VLAN IDs specified in list format.

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all VLANs for which PVST+ is operating are displayed.

`single`

Displays information about Single Spanning Tree.

`mst`

Displays information about Multiple Spanning Tree.

`instance` *<MSTI ID list>*

Displays information about Multiple Spanning Tree for the MST instance IDs specified in list format. Specifiable values for MST instance ID are in the range from 0 to 4095.

If `0` is specified as the MST instance ID, CIST is subject to display.

Operation when this parameter is omitted:

All MST instances are subject to display.

`port` *<Port# list>*

Displays Spanning Tree information for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays Spanning Tree information for the channel groups specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Note on setting parameters

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

`detail`

Displays detailed information about Spanning Tree Protocols.

Operation when this parameter is omitted:

Displays Spanning Tree information.

`active`

Displays port information for only those ports in the `Up` status.

Operation when this parameter is omitted:

Displays information for all ports.

Operation when all parameters are omitted:

Displays Spanning Tree information for Single Spanning Tree, PVST+ Spanning Tree Protocols, and Multiple Spanning Tree.

Example 1

Figure 17-1 Example of displaying PVST+ Spanning Tree information

```
> show spanning-tree vlan 1-4094

Date 2008/11/14 11:22:22 UTC
VLAN 1  PVST+ Spanning Tree:Enabled   Mode:PVST+
  Bridge ID       Priority: 32769     MAC Address: 00ed.f010.0001
    Bridge Status: Designated
  Root Bridge ID  Priority: 32769     MAC Address: 0012.e2c4.2772
    Root Cost: 19
    Root Port: 0/24
  Port Information
    0/14      Down Status:Disabled    Role:-            PortFast
    0/16      Down Status:Disabled    Role:-            PortFast
    0/23      Down Status:Disabled    Role:-            -
    0/24      Up   Status:Forwarding  Role:Root         -
    0/25      Down Status:Disabled    Role:-            LoopGuard
    0/26      Down Status:Disabled    Role:-            LoopGuard
VLAN 2  PVST+ Spanning Tree:Enabled   Mode:PVST+
  Bridge ID       Priority: 32770     MAC Address: 00ed.f010.0001
    Bridge Status: Designated
  Root Bridge ID  Priority: 32770     MAC Address: 0012.e2c4.2772
    Root Cost: 19
    Root Port: 0/12
  Port Information
    0/1       Up   Status:Blocking    Role:Designated   RootGuard
    0/2       Down Status:Disabled    Role:-            RootGuard
    0/3       Down Status:Disabled    Role:-            -
    0/4       Down Status:Disabled    Role:-            -
    0/5       Down Status:Disabled    Role:-            -
    0/6       Down Status:Disabled    Role:-            -
    0/7       Down Status:Disabled    Role:-            RootGuard
    0/8       Down Status:Disabled    Role:-            RootGuard
    0/11      Down Status:Disabled    Role:-            LoopGuard
    0/12      Up   Status:Forwarding  Role:Root         LoopGuard
    ChGr:1    Up   Status:Blocking    Role:Designated   RootGuard
VLAN 4094  PVST+ Spanning Tree:Enabled   Mode:PVST+
  Bridge ID       Priority: 36862     MAC Address: 00ed.f010.0001
    Bridge Status: Designated
  Root Bridge ID  Priority: 36862     MAC Address: 0012.e2c4.2772
    Root Cost: 19
    Root Port: 0/20
  Port Information
    0/17      Down Status:Disabled    Role:-            LoopGuard
    0/18      Down Status:Disabled    Role:-            LoopGuard
    0/19      Down Status:Disabled    Role:-            LoopGuard
```

```
          0/20      Up   Status:Forwarding  Role:Root         PortFast
          0/21      Down Status:Disabled    Role:-            -
          0/22      Up   Status:Blocking    Role:Alternate    -
          ChGr:8    Down Status:Disabled    Role:-            RootGuard

     >
```

Display items in Example 1

Item	Meaning	Displayed information
VLAN	VLAN ID	ID of the VLAN on which PVST+ Spanning Tree Protocol is operating. `(Disabled)` is displayed if the VLAN is not running.
PVST+ Spanning Tree:	Operating status of the PVST+ Spanning Tree Protocol	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`PVST+`: The protocol type is set to PVST+ mode. `Rapid PVST+`: The protocol type is set to Rapid PVST+ mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Port Information	Displays information about the ports managed by the PVST+ Spanning Tree Protocol.	
IF#	Interface port number	Number of the interface port whose information is displayed.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.

Item	Meaning	Displayed information
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Status	Port state	If `Mode` is `PVST+`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled If `Mode` is `Rapid PVST+`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are commonly used when `Mode` is `PVST+` or `Rapid PVST+`.
PortFast	PortFast	Indicates that the port is a PortFast port.
PortFast(BPDU Guard)	PortFast (BPDU guard functionality is applied)	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied.
BPDU Filter	BPDU filter	Indicates that the BPDU filter functionality is applied.
LoopGuard	Loop guard	Indicates that the port applies the loop guard functionality.
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode when `Mode` for the Spanning Tree Protocol is `Rapid PVST+`. Ports operating in compatible mode do not perform rapid status transitions.

Example 2

Figure 17-2 Example of displaying information about Single Spanning Tree

```
> show spanning-tree single

Date 2008/11/14 11:38:40 UTC
Single Spanning Tree:Enabled   Mode:STP
  Bridge ID       Priority: 32768     MAC Address: 00ed.f010.0001
    Bridge Status: Root
```

```
Root Bridge ID  Priority: 32768     MAC Address: 00ed.f010.0001
  Root Cost: 0
  Root Port: -
Port Information
  0/1       Up   Status:Learning    Role:Designated   RootGuard
  0/2       Down Status:Disabled    Role:-            RootGuard
  0/3       Down Status:Disabled    Role:-            -
  0/4       Down Status:Disabled    Role:-            -
  0/5       Down Status:Disabled    Role:-            -
  0/6       Down Status:Disabled    Role:-            -
  0/7       Down Status:Disabled    Role:-            RootGuard
  0/8       Down Status:Disabled    Role:-            RootGuard
  0/11      Down Status:Disabled    Role:-            LoopGuard
  0/12      Up   Status:Blocking    Role:Alternate    LoopGuard
  0/14      Down Status:Disabled    Role:-            PortFast
  0/16      Down Status:Disabled    Role:-            PortFast
  0/17      Down Status:Disabled    Role:-            LoopGuard
  0/18      Down Status:Disabled    Role:-            LoopGuard
  0/19      Down Status:Disabled    Role:-            LoopGuard
  0/20      Up   Status:Forwarding  Role:Designated   PortFast
  0/21      Down Status:Disabled    Role:-            -
  0/22      Up   Status:Learning    Role:Designated   -
  0/23      Down Status:Disabled    Role:-            -
  0/24      Up   Status:Learning    Role:Designated   -
  0/25      Down Status:Disabled    Role:-            LoopGuard
  0/26      Down Status:Disabled    Role:-            LoopGuard
  ChGr:1    Up   Status:Learning    Role:Designated   RootGuard
  ChGr:8    Down Status:Disabled    Role:-            RootGuard

>
```

Display items in Example 2

Item	Meaning	Displayed information
Single Spanning Tree:	Operating status of the protocol (Single Spanning Tree)	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`STP`: The protocol type is set to STP mode. `Rapid STP`: The protocol type is set to Rapid STP mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.

Item	Meaning	Displayed information
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Port Information	Displays information about the ports managed by Single Spanning Tree.	
IF#	Interface port number	Number of the interface port whose information is to be displayed
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Status	Port state	If `Mode` is `STP`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled If `Mode` is `Rapid STP`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are commonly used when `Mode` is `STP` or `Rapid STP`.
PortFast	PortFast	Indicates that the port is a PortFast port.
PortFast(BPDU Guard)	PortFast (BPDU guard functionality is applied)	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied.
BPDU Filter	BPDU filter	Indicates that the BPDU filter functionality is applied.
LoopGuard	Loop guard	Indicates that the port applies the loop guard functionality.

Item	Meaning	Displayed information
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode when `Mode` for the Spanning Tree Protocol is `Rapid STP`. Ports operating in compatible mode do not perform rapid status transitions.

Example 3

Figure 17-3 Example of displaying information about Multiple Spanning Tree

```
> show spanning-tree mst instance 1-4095

Date 2008/11/14 13:04:05 UTC
Multiple Spanning Tree: Enabled
Revision Level: 0      Configuration Name:
MST Instance 1
  VLAN Mapped: 2
  Regional Root  Priority: 32769       MAC      : 00ed.f010.0001
  Internal Root Cost     : 0           Root Port: -
  Bridge ID      Priority: 32769       MAC      : 00ed.f010.0001
  Regional Bridge Status : Root
  Port Information
    0/1       Up   Status:Forwarding  Role:Designated   RootGuard
    0/2       Down Status:Disabled    Role:-            RootGuard
    0/3       Down Status:Disabled    Role:-            -
    0/4       Down Status:Disabled    Role:-            -
    0/5       Down Status:Disabled    Role:-            -
    0/6       Down Status:Disabled    Role:-            -
    0/7       Down Status:Disabled    Role:-            RootGuard
    0/8       Down Status:Disabled    Role:-            RootGuard
    0/11      Down Status:Disabled    Role:-            -
    0/12      Up   Status:Forwarding  Role:Designated   -
    ChGr:1    Up   Status:Forwarding  Role:Designated   RootGuard
MST Instance 4095
  VLAN Mapped: 4094
  Regional Root  Priority: 36863       MAC      : 00ed.f010.0001
  Internal Root Cost     : 0           Root Port: -
  Bridge ID      Priority: 36863       MAC      : 00ed.f010.0001
  Regional Bridge Status : Root
  Port Information
    0/17      Down Status:Disabled    Role:-            -
    0/18      Down Status:Disabled    Role:-            -
    0/19      Down Status:Disabled    Role:-            -
    0/20      Up   Status:Forwarding  Role:Designated   PortFast
    0/21      Down Status:Disabled    Role:-            -
    0/22      Up   Status:Forwarding  Role:Designated   -
    ChGr:8    Down Status:Disabled    Role:-            RootGuard

>
```

Display items in Example 3

Item	Meaning	Displayed information
Multiple Spanning Tree	Operating status of the protocol (Multiple Spanning Tree)	`Enabled`: Running `Disabled`: Disabled
Revision Level	Revision level	Displays the revision level that is set in the configuration. 0 to 65535
Configuration Name	Region name	Displays the region name that is set in the configuration. 0 to 32 characters
CIST Information	CIST Spanning Tree information	CIST Spanning Tree information
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to MST instance 0 (IST). A hyphen (`-`) is displayed if no VLANs are allocated. The Switch supports 1 to 4094 VLAN IDs, although according to the standard, 1 to 4095 VLAN IDs are used for region configuration. VLAN IDs from `1` to `4095` are clearly displayed so that you can determine which instance each VLAN ID supported by the standard belongs to.
CIST Root	Bridge ID for the CIST root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the CIST root bridge
External Root Cost	External root path cost	Path cost value from the Switch's CIST internal bridge to the CIST root bridge. `0` is displayed if the Switch is the CIST root bridge.
Root Port	Root port	Displays the port number of the CIST root port. If the CIST root port is a link aggregation port, the link aggregation port list and the channel group number are displayed. A hyphen (`-`) is displayed if the Switch is the CIST root bridge.
Regional Root	Bridge ID for the regional root bridge of MST instance 0 (IST)	Displays information about the regional root bridge of MST instance 0 (IST).
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of MST instance 0 (IST)

Item	Meaning	Displayed information
Internal Root Cost	Internal root path cost for MST instance 0 (IST)	Path cost value from the Switch to the regional root bridge of MST instance 0 (IST). `0` is displayed if the Switch is the regional root bridge of MST instance 0 (IST). A hyphen (`-`) is displayed if Multiple Spanning Tree is disabled.
Bridge ID	Bridge ID for MST instance 0 (IST) of the Switch	Displays information about the bridge of MST instance 0 (IST) of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for MST instance 0 (IST) of the Switch	`Root`: Root bridge `Designated`: Designated bridge
MST Instance	MST instance ID	Displays the MST instance ID and information about the instance.
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to the MST instance. A hyphen (`-`) is displayed if no VLANs are allocated.
Regional Root	ID for the regional root bridge of the MST instance	Displays information about the regional root bridge of the MST instance.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of the MST instance
Internal Root Cost	Internal root path cost for the MST instance	Path cost value from the Switch to the regional root bridge of MST instance. `0` is displayed if the Switch is the regional root bridge of the MST instance.
Root Port	Root port of the MST instance	Displays the port number of the root port of the MST instance. If the root port of the MST instance is a link aggregation port, the link aggregation port list and the channel group number are displayed. A hyphen (`-`) is displayed if the Switch is the regional root bridge of the MST instance.
Bridge ID	Bridge ID for the MST instance of the Switch	Displays information about the bridge of the MST instance of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for the MST instance of the Switch	`Root`: Root bridge `Designated`: Designated bridge

Item	Meaning	Displayed information
Port Information	Information about the ports of the MST instance	Displays information about the ports managed by Multiple Spanning Tree. If no VLANs are allocated to the MST instance, a response message is displayed because there are no ports.
IF#	Interface port number	Number of the interface port whose information is to be displayed
ChGr	Channel group number	Displays the number of the channel group for which information is displayed. This item is displayed if a port list is not specified or if a port belonging to a channel group is specified in the port list.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Status	Port state	`Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port `Master`: Master port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations.
Boundary	Boundary port	Indicates that the port is the boundary port for the region. If the role of the partner device port is alternate port or backup port, the boundary port might never receive BPDUs. In such cases, the port is not displayed as the boundary port.
PortFast	PortFast	Indicates that the port is a PortFast port. `(Received)`: Indicates that the port is subject to the Spanning Tree topology calculations because BPDUs are received while `PortFast` is being applied.
BPDUGuard	Application of the BPDU guard functionality for PortFast	Indicates that the port is a PortFast port, and that the BPDU guard functionality is applied. `(Received)`: Indicates that the port is down because BPDUs are received while `PortFast` is being applied.
BPDUFilter	BPDU filter	Indicates that the BPDU filter functionality is

Item	Meaning	Displayed information
		applied.
RootGuard	Root guard	Indicates that the port applies the root guard functionality.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode for an MSTP Spanning Tree Protocol. Ports operating in compatible mode do not perform rapid status transitions.

Example 4

Figure 17-4 Example of displaying detailed PVST+ Spanning Tree information

```
> show spanning-tree vlan 2,4094 port 0/10-11,0/16-17,0/20 detail

Date 2008/11/14 11:26:46 UTC
VLAN 2  PVST+ Spanning Tree:Enabled   Mode:PVST+
  Bridge ID
    Priority:32770                MAC Address:00ed.f010.0001
    Bridge Status:Designated      Path Cost Method:Short
    Max Age:20                    Hello Time:2
    Forward Delay:15
  Root Bridge ID
    Priority:32770                MAC Address:0012.e2c4.2772
    Root Cost:19
    Root Port:0/12
    Max Age:20                    Hello Time:2
    Forward Delay:15
  Port Information
  Port:0/11 Down
    Status:Disabled               Role:-
    Priority:128                  Cost:-
    Link Type:-                   Compatible Mode:-
    Loop Guard:ON(Blocking)       PortFast:OFF
    BPDUFilter:OFF                RootGuard:OFF
  Port:ChGr:1 Up
    Status:Blocking               Role:Designated
    Priority:128                  Cost:19
    Link Type:-                   Compatible Mode:-
    Loop Guard:OFF                PortFast:OFF
    BPDUFilter:OFF                RootGuard:ON(Blocking)
    BPDU Parameters(2008/11/14 11:26:45):
      Designated Root
        Priority:32770            MAC address:0012.e2c4.2772
      Designated Bridge
        Priority:32770            MAC address:0012.e2c4.2772
        Root Cost:0
      Port ID
        Priority:128              Number:66
      Message Age Timer:1(0)/20
VLAN 4094  PVST+ Spanning Tree:Enabled   Mode:PVST+
  Bridge ID
    Priority:36862                MAC Address:00ed.f010.0001
    Bridge Status:Designated      Path Cost Method:Short
    Max Age:20                    Hello Time:2
    Forward Delay:15
  Root Bridge ID
    Priority:36862                MAC Address:0012.e2c4.2772
```

```
    Root Cost:19
    Root Port:0/20
    Max Age:20                      Hello Time:2
    Forward Delay:15
  Port Information
  Port:0/17 Down
    Status:Disabled                 Role:-
    Priority:128                    Cost:-
    Link Type:-                     Compatible Mode:-
    Loop Guard:ON(Blocking)         PortFast:OFF
    BPDUFilter:OFF                  RootGuard:OFF
  Port:0/20 Up
    Status:Forwarding               Role:Root
    Priority:128                    Cost:19
    Link Type:-                     Compatible Mode:-
    Loop Guard:OFF                  PortFast:ON(BPDU received)
    BPDUFilter:OFF                  RootGuard:OFF
    BPDU Parameters(2008/11/14 11:26:47):
      Designated Root
        Priority:36862              MAC address:0012.e2c4.2772
      Designated Bridge
        Priority:36862              MAC address:0012.e2c4.2772
        Root Cost:0
      Port ID
        Priority:128                Number:20
      Message Age Timer:2(0)/20

>
```

Display items in Example 4

Item	Meaning	Displayed information
VLAN	VLAN ID	ID of the VLAN on which PVST+ Spanning Tree Protocol is operating. `(Disabled)` is displayed if the VLAN is not running.
PVST+ Spanning Tree:	Operating status of the protocol (PVST+ Spanning Tree)	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`PVST+`: The protocol type is set to PVST+ mode. `Rapid PVST+`: The protocol type is set to Rapid PVST+ mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value. `Short`: 16-bit values are used for the path cost value.
Max Age	Maximum valid time of	Maximum valid time of BPDUs sent from the Switch

Item	Meaning	Displayed information
	BPDUs	
Hello Time	Interval for sending BPDUs	Interval for sending BPDUs that are regularly sent from the Switch
Forward Delay	Time required for a state transition of the port	Time required for a state transition when the state transition is triggered by the timer
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Max Age	Maximum valid time of BPDUs sent from the root bridge	Maximum valid time of BPDUs sent from the root bridge
Hello Time	Interval for sending BPDUs sent from the root bridge	Interval for sending BPDUs that are regularly sent from the root bridge
Forward Delay	Time required for a state transition of the root bridge port	Time required for a state transition when the state transition in the root bridge is triggered by the timer
Port	Port number or channel group number	The number of the port for which information is displayed or the channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.

Item	Meaning	Displayed information
Status	Port state	If `Mode` is `PVST+`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unmatched)`: Disabled. A configuration mismatch was detected because a BPDU with an IEEE 802.1Q tag was received when the port was disabled. If `Mode` is `Rapid PVST+`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unmatched)`: Disabled. A configuration mismatch was detected because a BPDU with an IEEE 802.1Q tag was received when the port was disabled.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are commonly used by `STP` and `Rapid STP`.
Priority	Port priority	Value set for the priority of the port on the Switch If the port is in the `Down` status, a hyphen (`-`) is displayed.
Cost	Port cost	Value set for the port cost of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `PVST+` or when the port is in the `Down` status.
Compatible Mode	Compatible mode	`ON`: Operation is in progress in compatible mode. A hyphen (`-`) is displayed when operation is in progress in normal mode (non-compatible mode) or when the port is in the `Down` status. Ports operating in compatible mode do not perform rapid status transitions.
Loop Guard	Loop guard functionality	`ON`: The loop guard functionality is being applied. `ON(Blocking)`: The loop guard functionality is running and the port is blocked. `OFF`: The loop guard functionality is not being used.

Item	Meaning	Displayed information
PortFast	The PortFast status. The receive status of BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. ● `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) ● `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: The root guard functionality is running and the port is blocked. `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed in parentheses.	Displays information about the BPDUs received on the port. This item is not displayed if BPDUs are not received. If the port is blocked by the root guard functionality, this item displays information about the BPDUs that caused the port to be blocked.
Designated Root	Root bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Designated Bridge	Information about the bridge that sent the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Root path cost of the bridge that sent the BPDU
Port ID	Information about the port that sent the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 897

Item	Meaning	Displayed information
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (-) is displayed if this period has expired. <*current-time*>(<*time-BPDU-received*>)/<*maximum-time*> <*current-time*>: The time at which the BPDU is received plus the time that has elapsed <*time-BPDU-received*>: The time that has elapsed when the BPDU is received (Message Age of the received BPDU) <*maximum-time*>: Valid time (Max Age of the received BPDU)

Example 5

Figure 17-5 Example of displaying detailed information about Single Spanning Tree

```
> show spanning-tree single detail

Date 2008/11/14 11:42:35 UTC
Single Spanning Tree:Enabled   Mode:STP
  Bridge ID
    Priority:32768                MAC Address:00ed.f010.0001
    Bridge Status:Root            Path Cost Method:Short
    Max Age:20                    Hello Time:2
    Forward Delay:15
  Root Bridge ID
    Priority:32768                MAC Address:00ed.f010.0001
    Root Cost:0
    Root Port:-
    Max Age:20                    Hello Time:2
    Forward Delay:15
  Port Information
  Port:0/1 Up
    Status:Forwarding             Role:Designated
    Priority:128                  Cost:19
    Link Type:-                   Compatible Mode:-
    Loop Guard:OFF                PortFast:OFF
    BPDUFilter:OFF                RootGuard:ON
  Port:0/2 Down
    Status:Disabled               Role:-
    Priority:128                  Cost:-
    Link Type:-                   Compatible Mode:-
    Loop Guard:OFF                PortFast:OFF
    BPDUFilter:OFF                RootGuard:ON

       :

  Port:ChGr:1 Up
    Status:Forwarding             Role:Designated
    Priority:128                  Cost:19
    Link Type:-                   Compatible Mode:-
    Loop Guard:OFF                PortFast:OFF
    BPDUFilter:OFF                RootGuard:ON
  Port:ChGr:8 Down
    Status:Disabled               Role:-
    Priority:128                  Cost:-
    Link Type:-                   Compatible Mode:-
```

```
            Loop Guard:OFF                PortFast:OFF
            BPDUFilter:OFF                RootGuard:ON

        >
```

Display items in Example 5

Item	Meaning	Displayed information
Single Spanning Tree:	Operating status of the protocol (Single Spanning Tree)	`Enabled`: The Spanning Tree Protocol is running. `Disabled`: The Spanning Tree Protocol is not running.
Mode	Configured protocol type	`STP`: The protocol type is set to STP mode. `Rapid STP`: The protocol type is set to Rapid STP mode.
Bridge ID	Bridge ID on the Switch	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address of the Switch
Bridge Status	Status of the Switch	`Root`: Root bridge `Designated`: Designated bridge
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value. `Short`: 16-bit values are used for the path cost value.
Max Age	Maximum valid time of BPDUs	Maximum valid time of BPDUs sent from the Switch
Hello Time	Interval for sending BPDUs	Interval for sending BPDUs that are regularly sent from the Switch
Forward Delay	Time required for a state transition of the port	Time required for a state transition when the state transition is triggered by the timer
Root Bridge ID	Bridge ID for the root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Path cost value from the Switch to the root bridge `0` is displayed if the Switch is the root bridge.
Root Port	Root port	Displays the port number of the root port. If the root port is a link aggregation port, the port list for the channel group and the channel group number (ChGr) are displayed. A hyphen (`-`) is displayed if the Switch is the root bridge.
Max Age	Maximum valid time of BPDUs sent from the root	Maximum valid time of BPDUs sent from the root bridge

Item	Meaning	Displayed information
	bridge	
Hello Time	Interval for sending BPDUs sent from the root bridge	Interval for sending BPDUs that are regularly sent from the root bridge
Forward Delay	Time required for a state transition of the root bridge port	Time required for a state transition when the state transition in the root bridge is triggered by the timer
Port	Port number or channel group number	The number of the port for which information is displayed or the channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Status	Port state	If `Mode` is `STP`: `Blocking`: Blocking `Listening`: Listening `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unavailable)`: Disabled. Single Spanning Tree cannot be used because PVST+ is enabled for the port. If `Mode` is `Rapid STP`: `Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled. This status is displayed when the port is in the `Down` status. `Disabled(unavailable)`: Disabled. Single Spanning Tree cannot be used because PVST+ is enabled for the port.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations. These parameters are used by both `STP` and `Rapid STP`.
Priority	Port priority	Value set for the priority of the port on the Switch If the port is in the `Down` status, a hyphen (`-`) is displayed.

Item	Meaning	Displayed information
Cost	Port cost	Value set for the port cost of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `PVST+` or when the port is in the `Down` status.
Compatible Mode	Compatible mode	`ON`: Operation is in progress in compatible mode. A hyphen (`-`) is displayed when operation is in progress in normal mode (non-compatible mode) or when the port is in the `Down` status. Ports operating in compatible mode do not perform rapid status transitions.
Loop Guard	Loop guard functionality	`ON`: The loop guard functionality is being applied. `ON(Blocking)`: The loop guard functionality is running and the port is blocked. `OFF`: The loop guard functionality is not being used.
PortFast	The PortFast status. The receive status of BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. ● `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) ● `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: Displayed when root guard functionality is running and the port is blocked. `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed in parentheses.	Displays information about the BPDUs received on the port. This item is not displayed if BPDUs are not received. If the port is blocked by the root guard functionality, this item displays information about the BPDUs that caused the port to be blocked.
Designated Root	Root bridge information stored in the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge

Item	Meaning	Displayed information
Designated Bridge	Information about the bridge that sent the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC Address	MAC address	MAC address for root bridge
Root Cost	Root path cost	Root path cost of the bridge that sent the BPDU
Port ID	Information about the port that sent the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 897
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (-) is displayed if this period has expired. *<current-time>*(*<time-BPDU-received>*)/*<maximum-time>* *<current-time>*: The time at which the BPDU is received plus the time that has elapsed *<time-BPDU-received>*: The time that has elapsed when the BPDU is received (Message Age of the received BPDU) *<maximum-time>*: Valid time (Max Age of the received BPDU)

Example 6

Figure 17-6 Example of displaying detailed information about Multiple Spanning Tree

```
> show spanning-tree mst detail

Date 2008/11/14 13:07:18 UTC
Multiple Spanning Tree: Enabled
Revision Level: 0      Configuration Name:
CIST Information           Time Since Topology Change: 1:15:35
  VLAN Mapped: 1,3-4093,4095
  CIST Root      Priority: 32768       MAC           : 00ed.f010.0001
  External Root Cost     : 0           Root Port     : -
  Max Age                : 20
  Forward Delay          : 15
  Regional Root  Priority: 32768       MAC           : 00ed.f010.0001
  Internal Root Cost     : 0
  Remaining Hops         : 20
  Bridge ID      Priority: 32768       MAC           : 00ed.f010.0001
  Regional Bridge Status : Root        Path Cost Method: Long
  Max Age                : 20          Hello Time    : 2
  Forward Delay          : 15          Max Hops      : 20
  Port Information
  Port:0/1  Up
    Status    : Forwarding       Role      : Designated
```

```
    Priority  : 128              Cost      : 1
    Link Type : point-to-point   PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON
  Port:0/2  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON

       :

  Port:ChGr:8  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON
MST Instance 1             Time Since Topology Change: 0:3:45
  VLAN Mapped: 2
  Regional Root  Priority: 32769       MAC           : 00ed.f010.0001
  Internal Root Cost     : 0           Root Port     : -
  Remaining Hops         : 20
  Bridge ID      Priority: 32769       MAC           : 00ed.f010.0001
  Regional Bridge Status : Root
  Max Age                : 20          Hello Time    : 2
  Forward Delay          : 15          Max Hops      : 20
  Port Information
  Port:0/1  Up
    Status    : Forwarding       Role      : Designated
    Priority  : 128              Cost      : 1
    Link Type : point-to-point   PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON
  Port:0/2  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON

       :

  Port:ChGr:1  Up
    Status    : Forwarding       Role      : Designated
    Priority  : 128              Cost      : 1
    Link Type : point-to-point   PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : ON
MST Instance 4095          Time Since Topology Change: 0:3:34
  VLAN Mapped: 4094
  Regional Root  Priority: 36863       MAC           : 00ed.f010.0001
  Internal Root Cost     : 0           Root Port     : -
  Remaining Hops         : 20
  Bridge ID      Priority: 36863       MAC           : 00ed.f010.0001
  Regional Bridge Status : Root
  Max Age                : 20          Hello Time    : 2
  Forward Delay          : 15          Max Hops      : 20
  Port Information
  Port:0/17  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
```

```
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : OFF
  Port:0/18  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : OFF
  Port:0/19  Down
    Status    : Disabled         Role      : -
    Priority  : 128              Cost      : -
    Link Type : -                PortFast  : OFF
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : OFF
  Port:0/20  Up
    Status    : Forwarding       Role      : Designated
    Priority  : 128              Cost      : 4095
    Link Type : point-to-point   PortFast  : ON(BPDU not received)
    BPDUFilter: OFF              Hello Time: 2
    RootGuard : OFF

      :

>
```

Display items in Example 6

Item	Meaning	Displayed information
Multiple Spanning Tree	Operating status of the protocol (Multiple Spanning Tree)	`Enabled`: Running `Disabled`: Disabled
Revision Level	Revision level	Displays the revision level that is set in the configuration. 0 to 65535
Configuration Name	Region name	Displays the region name that is set in the configuration. 0 to 32 characters
CIST Information	CIST Spanning Tree information	CIST Spanning Tree information
Time Since Topology Change	Time since a topology change was detected	*hh*`:`*mm*`:`*ss* (when the elapsed time is less than 24 hours) *ddd*`.`*hh*`:`*mm*`:`*ss* (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days)
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to MST instance 0 (IST). A hyphen (`-`) is displayed if no VLANs are allocated. The Switch supports 1 to 4094 VLAN IDs, although according to the standard, 1 to 4095 VLAN IDs are used for region configuration. VLAN IDs from `1` to `4095` are clearly displayed so that you can determine which instance each VLAN ID supported by the standard belongs to.

Item	Meaning	Displayed information
CIST Root	Bridge ID for the CIST root bridge	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the CIST root bridge
External Root Cost	External root path cost	Path cost value from the Switch's CIST internal bridge to the CIST root bridge. `0` is displayed if the Switch is the CIST root bridge.
Root Port	Root port	Displays the port number of the CIST root port. If the CIST root port is a link aggregation port, the link aggregation port list and the channel group number are displayed. A hyphen (`-`) is displayed if the Switch is the CIST root bridge.
Max Age	Maximum valid time of BPDUs sent from the CIST root bridge	Displays the maximum valid time of BPDUs sent from the CIST root bridge.
Forward Delay	Time required for a state transition of the CIST root bridge port	Displays the time required for a state transition when the state transition in the CIST root bridge is triggered by the timer
Regional Root	Bridge ID for the regional root bridge of MST instance 0 (IST)	Displays information about the regional root bridge of MST instance 0 (IST).
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of MST instance 0 (IST)
Internal Root Cost	Internal root path cost for MST instance 0 (IST)	Path cost value from the Switch to the regional root bridge of MST instance 0 (IST). `0` is displayed if the Switch is the regional root bridge of MST instance 0 (IST).
Remaining Hops	Number of remaining hops	0 to 40 Displays the remaining number of hops for BPDUs that the regional root bridge of MST instance 0 (IST) sends.
Bridge ID	Bridge ID for MST instance 0 (IST) of the Switch	Displays information about the bridge of MST instance 0 (IST) of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for MST instance 0 (IST) of	Root: Root bridge Designated: Designated bridge

Item	Meaning	Displayed information
	the Switch	
Path Cost Method	Path cost length mode	`Long`: 32-bit values are used for the path cost value.
Max Age	Maximum valid time for BPDUs sent from the MST instance 0 (IST) of the Switch	Displays the maximum valid time for BPDUs sent from the MST instance 0 (IST) bridge of the Switch.
Hello Time	Interval for sending the BPDUs of MST instance 0 (IST) of the Switch	Displays the interval for sending BPDUs that are regularly sent from the MST instance 0 (IST) bridge of the Switch.
Forward Delay	Time required for a state transition of the MSI instance 0 (IST) port on the Switch	Displays the time required for a state transition when the state transition in the bridge of MSI instance 0 (IST) on the Switch is triggered by the timer.
Max Hops	Maximum number of hops in MST instance 0 (IST) of the Switch	2 to 40 Displays the maximum number of hops for BPDUs sent from the MST instance 0 (IST) bridge of the Switch.
MST Instance	MST instance ID	Displays the MST instance ID and information about the instance.
Time Since Topology Change	Time since a topology change was detected	*hh*`:`*mm*`:`*ss* (when the elapsed time is less than 24 hours) *ddd*`.`*hh*`:`*mm*`:`*ss* (when the elapsed time exceeds 24 hours) `Over 1000 days` (when the elapsed time is more than 1000 days)
VLAN Mapped	Instance mapping VLAN	Lists the VLANs allocated to the MST instance. A hyphen (`-`) is displayed if no VLANs are allocated.
Regional Root	Bridge ID for the regional root bridge of the MST instance	Displays information about the regional root bridge of the MST instance.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address for the regional root bridge of the MST instance
Internal Root Cost	Internal root path cost for the MST instance	Path cost value from the Switch to the regional root bridge of MST instance. `0` is displayed if the Switch is the regional root bridge of the MST instance.

Item	Meaning	Displayed information
Root Port	Root port of the MST instance	Displays the port number of the root port of the MST instance. If the root port of the MST instance is a link aggregation port, the link aggregation port list and the channel group number are displayed. A hyphen (-) is displayed if the Switch is the regional root bridge of the MST instance.
Remaining Hops	Number of remaining hops	0 to 40 Displays the remaining number of hops for BPDUs that the regional root bridge of the MST instance sends.
Bridge ID	Bridge ID for the MST instance of the Switch	Displays information about the bridge of the MST instance of the Switch.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the Switch
Regional Bridge Status	Status of the bridge for the MST instance of the Switch	Root: Root bridge Designated: Designated bridge
Max Age	Maximum valid time of BPDUs sent from the MST instance of the Switch	Displays the maximum valid time of BPDUs sent from the MST instance bridge of the Switch.
Hello Time	Interval for sending BPDUs sent from the MST instance of the Switch	Displays the interval for sending BPDUs that are regularly sent from the MST instance bridge of the Switch.
Forward Delay	Time required for a state transition of the MST instance port on the Switch	Displays the time required for a state transition when the state transition in the bridge of the MST instance on the Switch is triggered by the timer.
Max Hops	Maximum number of hops in the MST instance of the Switch	2 to 40 Displays the maximum number of hops for BPDUs sent from the MST instance bridge of the Switch.
Port Information	Information about the ports of the MST instance	Displays information about the ports managed by Multiple Spanning Tree. If no VLANs are allocated to the MST instance, a response message is displayed because there are no ports.
IF#	Interface port number	Number of the interface port whose information is to be displayed
ChGr	Channel group number	Displays the number of the channel group for which information is displayed. This item is displayed if a port list is not specified or if a port belonging to a channel group is specified in the port list.
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.

Item	Meaning	Displayed information
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Boundary	Boundary port	Indicates that the port is the boundary port for the region. If the role of the partner device port is alternate port or backup port, the boundary port might never receive BPDUs. In such cases, the port is not displayed as the boundary port.
Compatible	Compatible mode	Indicates that the port is operating in compatible mode for an MSTP Spanning Tree Protocol. Ports operating in compatible mode do not perform rapid status transitions.
Status	Port state	`Discarding`: Discarding `Learning`: Learning `Forwarding`: Indicates Forwarding status. `Disabled`: Disabled This parameter becomes `Disabled` if the port is in the `Down` status.
Role	The role of the port	`Root`: Root port `Designated`: Designated port `Alternate`: Alternate port `Backup`: Backup port `Master`: Master port If the port is in the `Down` status, a hyphen (`-`) is displayed, because ports in this status are not included in the topology calculations.
Priority	Port priority	Displays the value of the port priority setting for the MST instance of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Cost	Port cost	Displays the value of the port cost setting for the MST instance of the Switch. If the port is in the `Down` status, a hyphen (`-`) is displayed.
Link Type	Link type of the line	`point-to-point`: The line is a 1-to-1 connection. `shared`: The line is a shared connection. A hyphen (`-`) is displayed when `Mode` is `STP` or when the port is in the `Down` status.
PortFast	The PortFast status. The status of receive BPDUs is displayed enclosed in parentheses.	`OFF`: PortFast is not operating. `ON`: PortFast is operating. `BPDU Guard`: The BPDU guard functionality is being applied to PortFast. The receive status of BPDUs is displayed when this item is `On` or `BPDU Guard`. ● `BPDU received` (when `PortFast` is `On`: The port is included in the calculations of the Spanning Tree topology, when `PortFast` is `BPDU Guard`: The port is down) ● `BPDU not received` (the port is not included in the calculations of the Spanning Tree topology)

Item	Meaning	Displayed information
BpduFilter	BPDU filter	`ON`: The BPDU filter functionality is being applied. `OFF`: The BPDU filter functionality is not being used.
Hello Time	Interval for sending and receiving BPDUs on the port	For the root port, alternate port, and backup port, the value on the partner device is displayed. For the designated port, the value on the Switch is displayed.
Root Guard	Root guard functionality	`ON`: The root guard functionality is being applied. `ON(Blocking)`: Displayed when root guard functionality is running and the port is blocked. (All MSTIs on the applicable ports change to blocking status.) `OFF`: The root guard functionality is not being used.
BPDU Parameters	Information about received BPDUs on the port. The last time a BPDU was received is displayed enclosed with parentheses.	Displays information about the BPDUs received at the CIST or MST instance port. This item is not displayed if BPDUs are not received. The BPDU information whose `Mode Version` is `STP` or `Rapid STP` is displayed only by CIST.
Protocol Version	Protocol versions	Displays the protocol version of the received BPDUs. `STP(IEEE802.1D)`: Indicates that BPDUs in which the protocol version is set to STP (IEEE 802.1D) were received from neighboring devices. `Rapid STP(IEEE802.1w)`: Indicates that BPDUs in which the protocol version is set to RSTP (IEEE 802.1W) were received from neighboring devices. `MSTP(IEEE802.1s)`: Indicates that BPDUs in which the protocol version is set to MSTP (IEEE 802.1s) were received from neighboring devices.
Root	Root bridge information stored in the BPDU	If `Protocol Version` is `MSTP`, information about the CIST root bridge is displayed. This item is not displayed for MST instance 1 or later instances. If `Mode Version` is `STP` or `Rapid STP`, information about the root bridge is displayed.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the root bridge that sent BPDUs
External Root Cost	External root path cost	If `Protocol Version` is `MSTP`, information about the CIST root path cost is displayed. This item is not displayed for MST instance 1 or later instances. If `Mode Version` is `STP` or `Rapid STP`, information about the root path cost is displayed.

Item	Meaning	Displayed information
Regional Root	Regional root bridge information stored in the BPDU	If `Protocol Version` is `MSTP`, information about the CIST and MSTI regional root bridge is displayed. If `Mode Version` is `STP` or `Rapid STP`, this information is not displayed.
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the regional root bridge that sent BPDUs
Internal Root Cost	Internal root path cost	If `Protocol Version` is `MSTP`, the internal root path cost is displayed. If `Mode Version` is `STP` or `Rapid STP`, this information is not displayed.
Designated Bridge	Information about the neighboring bridge that sent the BPDU	--
Priority	Bridge priority	0 to 65535 The lower the value, the higher the priority.
MAC	MAC address	MAC address of the bridge that sent BPDUs
Port ID	Information about the port that sent the BPDU	--
Priority	Port priority	0 to 255 The lower the value, the higher the priority.
Number	Port number	0 to 892
Message Age Timer	Valid time of the received BPDUs	Indicates how long received BPDUs are valid. A hyphen (`-`) is displayed if this period has expired. *<current-time>*(*<time-BPDU-received>*)/*<maximum-time>* *<current-time>*: The time at which the BPDU is received plus the time that has elapsed *<time-BPDU-received>*: The time that has already elapsed when the BPDU is received (Message Age of the received BPDU) *<maximum-time>*: Valid time (Max Age of the received BPDU)
Remaining Hops	Number of remaining hops	0 to 40 Displays the number of remaining hops for BPDUs that the MST bridge sends. A hyphen (`-`) is displayed if `Mode Version` is `STP` or `Rapid STP`.

Impact on communication

None

Response messages

Table 17-1 List of response messages for the show spanning-tree command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Spanning Tree is not configured.	The Spanning Tree Protocol has not been configured. Check the configuration.
Specified Spanning Tree is not configured.	The specified Spanning Tree Protocol has not been configured. Check the configuration.

Notes

None

show spanning-tree statistics

Displays statistics about Spanning Tree Protocols.

Syntax

```
show spanning-tree statistics [ {vlan [ <VLAN ID list> ] | single | mst [ instance <MSTI ID list> ]} [ port <Port# list> ] [channel-group-number <Channel group# list>] ]
```

Input mode

User mode and administrator mode

Parameters

`{vlan [ <VLAN ID list> ] | single | mst [ instance <MSTI ID list> ]}`

`vlan`

Displays PVST+ statistics.

<VLAN ID list>

Displays PVST+ Spanning Tree statistics for the VLAN IDs specified in list format.

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Statistics for all VLANs for which PVST+ is operating are displayed.

`single`

Displays statistics about Single Spanning Tree.

`mst`

Displays statistics about Multiple Spanning Tree.

`instance` *<MSTI ID list>*

Displays statistics about the Multiple Spanning Tree for the MST instance IDs specified in list format. Specifiable values for MST instance ID are in the range from 0 to 4095.

If `0` is specified as the MST instance ID, CIST is subject to display.

Operation when this parameter is omitted:

All MST instances are subject to display.

`port` *<Port# list>*

Displays Spanning Tree statistics for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays Spanning Tree statistics for the channel groups specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when all parameters are omitted:

Displays statistics about Single Spanning Tree, PVST+, and Multiple Spanning Tree.

Example 1

Figure 17-7 Example of displaying PVST+ Spanning Tree statistics

```
> show spanning-tree statistics vlan 1,4094
```

```
Date 2008/11/14 11:28:22 UTC
VLAN 1
Time Since Topology Change:0 day 0 hour 15 minute 59 second
Topology Change Times: 1
 Port:0/14  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/16  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/23  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/24  Up
   TxBPDUs              :         2  RxBPDUs        :       498
   Forward Transit Times:         1  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/25  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/26  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
VLAN 4094
Time Since Topology Change:0 day 0 hour 10 minute 46 second
Topology Change Times: 2
 Port:0/17  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/18  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/19  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/20  Up
```

```
   TxBPDUs              :         2  RxBPDUs        :       506
   Forward Transit Times:         2  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/21  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/22  Up
   TxBPDUs              :         1  RxBPDUs        :       504
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 ChGr:8  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0

>
```

Figure 17-8 Example of displaying Single Spanning Tree statistics

```
> show spanning-tree statistics single

Date 2008/11/14 11:44:38 UTC
Time Since Topology Change:0 day 0 hour 5 minute 43 second
Topology Change Times: 4
 Port:0/1  Up
   TxBPDUs              :       187  RxBPDUs        :         0
   Forward Transit Times:         1  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 Port:0/2  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0

       :

ChGr:1  Up
   TxBPDUs              :       187  RxBPDUs        :         0
   Forward Transit Times:         1  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0
 ChGr:8  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  RxDiscard BPDUs:         0
   Discard BPDUs by reason
         Timeout        :         0  Invalid        :         0
         Not Support    :         0  Other          :         0

>
```

Display items in Example 1

Item	Meaning	Displayed information
VLAN	VLAN ID subject to PVST+	Displayed only when `vlan` is specified.
Time Since Topology Change	Time since a topology change was detected	*n* `day`: Days *n* `hour`: Hours *n* `minute`: Minutes *n* `second`: Seconds For `Rapid STP` or `Rapid PVST+`, this item shows the time that has elapsed since Spanning Tree Protocol operation started.
Topology ChangeTimes	Number of detecting topology changes	--
Port	Port number	--
ChGr	Channel group number	--
Up	The port is in Up status.	Indicates that the port is in Up status. This indicates that the channel group in link aggregation is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. This indicates that the channel group in link aggregation is in the `Down` status.
Forward Transit Times	Number of transitions to the forwarding state	--
TxBPDUs	Number of sent BPDUs	--
RxBPDUs	Number of received BPDUs	--
RxDiscardsBPDUs	Number of discarded received BPDUs	--
Timeout	Number of BPDUs whose valid time expired	Number of received BPDUs whose valid time (which is set in the BPDUs) expired
Invalid	Number of invalid BPDUs	Number of received BPDUs whose format was invalid
Not Support	Number of unsupported BPDUs	Number of received BPDUs that included unsupported parameters
Other	Number of BPDUs discarded for another reason	Displays the number of discarded received BPDUs when BPDU discard has been configured. - When a BPDU filter has been set - When the root guard functionality is operating

Example 2

Figure 17-9 Example of displaying Multiple Spanning Tree statistics

```
> show spanning-tree statistics mst instance 1,4095
```

```
Date 2008/11/14 13:09:55 UTC
MST Instance ID: 1  Topology Change Times: 7
 Port:0/1  Up
   TxBPDUs              :       203  RxBPDUs        :         0
   Forward Transit Times:         1  Discard Message:         0
   Exceeded Hop         :         0
 Port:0/2  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  Discard Message:         0
   Exceeded Hop         :         0

      :

ChGr:1  Up
   TxBPDUs              :       203  RxBPDUs        :         0
   Forward Transit Times:         1  Discard Message:         0
   Exceeded Hop         :         0
MST Instance ID: 4095  Topology Change Times: 1
 Port:0/17  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  Discard Message:         0
   Exceeded Hop         :         0
 Port:0/18  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  Discard Message:         0
   Exceeded Hop         :         0
 Port:0/19  Down
   TxBPDUs              :         0  RxBPDUs        :         0
   Forward Transit Times:         0  Discard Message:         0
   Exceeded Hop         :         0
 Port:0/20  Up
   TxBPDUs              :         1  RxBPDUs        :         0
   Forward Transit Times:         1  Discard Message:         0
   Exceeded Hop         :         0

      :

>
```

Display items in Example 2

Item	Meaning	Displayed information
MST Instance ID	Instance ID subject to MST	--
Topology ChangeTimes	Number of detecting topology changes	--
Port	Port number	--
ChGr	Channel group number	--
Up	The port is in Up status.	Indicates that the port is in Up status. This indicates that the channel group in link aggregation is in the `Up` status.
Down	The port is in Down status.	Indicates that the port is in Down status. This indicates that the channel group in link aggregation is in the `Down` status.

Item	Meaning	Displayed information
TxBPDUs	Number of sent BPDUs	--
RxBPDUs	Number of received BPDUs	--
Forward Transit Times	Number of transitions to the forwarding state	--
RxDiscard BPDUs	Number of discarded received BPDUs	-- (Displayed only for MST instance 0.)
Discard BPDUs by reason	Number of discarded received BPDUs	-- (Displayed only for MST instance 0.)
Timeout	Number of BPDUs whose valid time expired	Displays the number of received BPDUs whose valid time (which is set in the BPDUs) expired. (Displayed only for MST Instance ID:0)
Invalid	Number of invalid BPDUs	Displays the number of received BPDUs whose format is invalid (this item is displayed only for MST instance 0). When the length of the configured BPDU is less than 35 octets When the length of the TCN BPDU is less than 4 octets When the length of the RST BPDU is less than 36 octets When the length of the MST BPDU is less than 35 octets When the Version 3 Length value of the MST BPDU is less than 64
Not Support	Number of unsupported BPDUs	Displays the number of received BPDUs that include unsupported parameters (this item is displayed only for MST instance 0). When the BPDU type value is other than 0x00, 0x02, or 0x80
Other	Number of BPDUs discarded for another reason	Displays the number of discarded received BPDUs when PVST+ BPDUs are received or when BPDU discard has been configured. - When BPDU filtering has been configured - When the root guard functionality is operating (Displayed only for MST Instance ID:0)
Discard Message	MSTI configuration message when the received BPDUs are discarded	Displays the number of MSTI configuration messages when BPDU discard has set by the following functionality: - When the root guard functionality is set (Displayed only for MST instances 1 to 4095.)
Ver3Length Invalid	Number of received BPDUs whose Version 3 Length value is invalid	Displays the number of received BPDUs whose Version 3 Length value is invalid. - When the value is less than 64 - When the value is 1089 or more - When the value is not a multiple of 16

Item	Meaning	Displayed information
		(Displayed only for MST Instance ID:0)
Exceeded Hop	Number of discarded MST configuration messages whose remaining hop value is 0	--

Impact on communication

None

Response messages

Table 17-2 List of response messages for the show spanning-tree statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Spanning Tree is not configured.	The Spanning Tree Protocol has not been configured. Check the configuration.
Specified Spanning Tree is not configured.	The specified Spanning Tree Protocol has not been configured. Check the configuration.

Notes

None

clear spanning-tree statistics

Clears statistics about Spanning Tree Protocols.

Syntax

```
clear spanning-tree statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 17-10 Clearing the statistics for all Spanning Tree Protocols

```
> clear spanning-tree statistics

>
```

Display items

None

Impact on communication

None

Response messages

Table 17-3 List of response messages for the clear spanning-tree statistics command

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

Notes

- Even if statistics are cleared to zero, the value for the MIB information obtained by using SNMP is not cleared to zero.
- If deletion or addition is performed by configuring it, the target statistics are cleared to zero.

clear spanning-tree detected-protocol

Forces recovery of STP compatible mode for Spanning Tree Protocols.

Syntax

```
clear spanning-tree detected-protocol [{vlan [<VLAN ID list>] | single
 | mst}] [port <Port# list>] [channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`{vlan [ <VLAN ID list>] | single | mst}`

`vlan`

Forces recovery of STP compatible mode for PVST+.

<VLAN ID list>

Forces recovery of STP compatible mode for PVST+ for the VLAN IDs specified in list format. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

All VLANs on which PVST+ is running are subject to a forced recovery of STP compatible mode.

`single`

Forces recovery of STP compatible mode for Single Spanning Tree.

`mst`

Forces recovery of STP compatible mode for Multiple Spanning Tree.

`port` *<Port# list>*

Forces recovery of STP compatible mode for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Forces recovery of STP compatible mode for the channel groups specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when all parameters are omitted:

STP compatible mode is forcibly recovered for the ports of all Spanning Tree Protocols.

Example

The following shows an example of forcing recovery of STP compatible mode for Spanning Tree Protocols.

Figure 17-11 Example of forcibly recovering STP compatible mode for Spanning Tree Protocols

```
> clear spanning-tree detected-protocol

>
```

Display items

None

Impact on communication

None

Response messages

Table 17-4 List of response messages for the clear spanning-tree detected-protocol command

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

Notes

This command is valid only for rapid PVST+, rapid Spanning Tree Protocols, and Multiple Spanning Tree.

show spanning-tree port-count

Displays the number of accommodated Spanning Tree Protocols.

Syntax

```
show spanning-tree port-count [{vlan | single | mst}]
```

Input mode

User mode and administrator mode

Parameters

```
{vlan | single | mst}
```

`vlan`

Displays the number of accommodated PVST+ Spanning Trees.

`single`

Displays the number of accommodated Single Spanning Tree.

`mst`

Displays the number of accommodated Multiple Spanning Tree.

Operation when this parameter is omitted:

The number of accommodated Spanning Tree Protocols that have been configured is displayed.

Example 1

The following shows an example of displaying the number of accommodated PVST+ Spanning Tree Protocols.

Figure 17-12 Example of displaying the number of accommodated PVST+ Spanning Tree protocols

```
> show spanning-tree port-count vlan

Date 2008/11/14 11:29:39 UTC
PVST+    VLAN Counts:    3          VLAN Port Counts:      26

>
```

Display items in Example 1

Item	Meaning	Displayed information
PVST+ VLAN Counts	Number of VLANs	Number of VLANs subject to PVST+
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for all VLANs subject to PVST+

Example 2

The following shows an example of displaying the number of accommodated Single Spanning Tree.

Figure 17-13 Example of displaying the number of accommodated Single Spanning Tree

```
> show spanning-tree port-count single
```

```
Date 2008/11/14 11:48:21 UTC
Single   VLAN Counts:    1          VLAN Port Counts:       6

>
```

Display items in Example 2

Item	Meaning	Displayed information
Single VLAN Counts	Number of VLANs	Number of VLANs subject to Single Spanning Tree
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for all VLANs subject to Single Spanning Tree

Example 3

The following shows an example of displaying the number of accommodated Multiple Spanning Tree.

Figure 17-14 Example of displaying the number of accommodated Multiple Spanning Tree

```
> show spanning-tree port-count mst

Date 2008/11/14 13:12:48 UTC
CIST     VLAN Counts: 4093          VLAN Port Counts:       6
MST    1 VLAN Counts:    1          VLAN Port Counts:      12
MST 4095 VLAN Counts:    1          VLAN Port Counts:       8

>
```

Display items in Example 3

Item	Meaning	Displayed information
CIST VLAN Counts	Number of VLANs	Number of CIST instance VLANs
MST VLAN Counts	Number of VLANs	Number of MSTI instance VLANs
VLAN Port Counts	Number of VLAN ports	Total number of ports configured for the applicable instance VLANs among existing VLANs

Impact on communication

None

Response messages

Table 17-5 List of response messages for the show spanning-tree port-count command

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

Message	Description
Spanning Tree is not configured.	The Spanning Tree Protocol has not been configured. Check the configuration.
Specified Spanning Tree is not configured.	The specified Spanning Tree Protocol has not been configured. Check the configuration.

Notes

- The number of PVST+ and Single Spanning Tree VLANs does not include the number of VLANs in the `suspend` status.
- The number of PVST+, Single Spanning Tree, and Multiple Spanning Tree VLAN ports does not include the ports of VLANs in the `suspend` status.

18. Ring Protocol

show axrp

show axrp

Displays Ring Protocol information.

Syntax

```
show axrp [<Ring ID list>] [detail]
```

Input mode

User mode and administrator mode

Parameters

<Ring ID list>

Specify a list of ring IDs for which you want to display information. If you specify multiple ring IDs, you can specify a range.

[Specifying a range by using "-" or ","]

All rings defined by the range are specified. The specifiable values are from 1 to 65535.

`detail`

Displays detailed Ring Protocol information.

Operation when all parameters are omitted:

All summary information about the Ring Protocol is displayed.

Example 1

The following shows an example of displaying summary information about the Ring Protocol.

Figure 18-1 Example of displaying summary information about the Ring Protocol

```
> show axrp

Date 2011/09/01 15:34:11 UTC
Total Ring Counts:1

Ring ID:2
 Name:O-Ring
 Oper State:enable           Mode:Transit

 VLAN Group ID  Ring Port  Role/State           Ring Port  Role/State
 1              0/25       -/forwarding         0/26       -/forwarding
 2              -          -/-                  -          -/-

>
```

Display items in Example 1

Table 18-1 Display contents of summary information about Ring Protocol

Item	Meaning	Displayed information
Total Ring Counts	Number of rings	1 to 4
Ring ID	Ring ID	1 to 65535
Name	Ring identification name	--

Item	Meaning	Displayed information
Oper State	Whether the ring is enabled or disabled	`enable`: Enabled `disable`: Disabled `Not Operating`: The Ring Protocol functionality for a ring ID is not operating for a reason such as an improper configuration (`--` is displayed if the necessary configuration for operating the Ring Protocol functionality has not been set).
Mode	Operating mode	`Transit`: Transit node (fixed)
Shared Port	Shared-link port number for the transit node on the shared link	Physical port number (interface port number) or channel group number (ChGr)
VLAN Group ID	Data transfer VLAN group ID	1 to 2
Ring Port	Ring port number	Physical port number (interface port number) or channel group number (ChGr) `-` is displayed when this item is not set.
Role	The role of the ring port	`--` is always displayed.
State	Ring port state	`Forwarding`: Forwarding `Blocking`: Blocking `down`: The port or channel group is down. (If the Ring Protocol functionality of the applicable ring ID is not enabled, or if the port is a shared port in a shared-link non-monitoring ring, `--` is displayed.)

Example 2

The following shows an example of displaying detailed Ring Protocol information.

Figure 18-2 Example of displaying detailed Ring Protocol information

```
> show axrp detail

Date 2011/09/01 15:35:15 UTC
Total Ring Counts:1

Ring ID:2
 Name:O-Ring
 Oper State:enable           Mode:Transit
 Control VLAN ID:20
 Forwarding Shift Time (sec):15
 Last Forwarding:flush request receive

 VLAN Group ID:1
  VLAN ID:200
  Ring Port:0/25        Role:-            State:forwarding
  Ring Port:0/26        Role:-            State:forwarding

 VLAN Group ID:2
  VLAN ID:-
  Ring Port:-           Role:-            State:-
  Ring Port:-           Role:-            State:-

 Multi Fault Detection State:-
```

```
    Mode:transport
    Control VLAN ID:1000

>
```

Display items in Example 2

Table 18-2 Description of displayed items (detailed Ring Protocol information)

Item	Meaning	Displayed information
Total Ring Counts	Number of rings	1 to 4
Ring ID	Ring ID	1 to 65535
Name	Ring identification name	--
Oper State	Whether the ring is enabled or disabled	`enable`: Enabled `disable`: Disabled `Not Operating`: The Ring Protocol functionality for a ring ID is not operating for a reason such as an improper configuration (`--` is displayed if the necessary configuration for operating the Ring Protocol functionality has not been set).
Mode	Operating mode	`Transit`: Transit node (fixed)
Shared Port	Shared-link port number for the transit node on the shared link	Physical port number (interface port number) or channel group number (ChGr)
Control VLAN ID	Control VLAN ID	2 to 4094
Forwarding Delay Time	Timer value of the forwarding shift time for the control VLAN	1 to 65535 (seconds)
Forwarding Shift Time	Timer value of the forwarding shift time	1 to 65535 (seconds), or `infinity`.
Last Forwarding	Reason of why the ring port was set for forwarding lately	`flush request receive`: Flash control frames were received. `forwarding shift time out`: The forwarding shift time expired. `--` is displayed for another reason.
VLAN Group ID	Data transfer VLAN group ID	1 to 2
VLAN ID	Data transfer VLAN ID	1 to 4094
Ring Port	Ring port number	Physical port number (interface port number) or channel group number (ChGr) `-` is displayed when this item is not set.
Role	The role of the ring port	`--` is always displayed.

Item	Meaning	Displayed information
State	Ring port state	`Forwarding`: Forwarding `Blocking`: Blocking `down`: The port or channel group is down. (If the Ring Protocol functionality of the applicable ring ID is not enabled, or if the port is a shared port in a shared-link non-monitoring ring, `--` is displayed.)
Multi Fault Detection State	Multi-fault monitoring is enabled	`-`: This is displayed when the `multi-fault-detection mode` or `multi-fault-detection vlan` configuration command is set. For other cases, nothing is displayed.
Mode	Operation mode of multi-fault monitoring	`transport`: transport mode This item is displayed if the multi-fault monitoring mode is set. `-` is displayed when this item is not set.
Control VLAN ID	ID of the VLAN used for multi-fault monitoring	2 to 4094 This item is displayed if the multi-fault monitoring VLAN is set. `-` is displayed when this item is not set.

Impact on communication

None

Response messages

Table 18-3 List of response messages for the show axrp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Ring Protocol is not configured.	The Ring Protocol has not been configured. Check the configuration.
Specified Ring ID is not configured.	The specified ring ID has not been configured.

Notes

None

19. DHCP Snooping

show ip dhcp snooping
show ip dhcp snooping binding
clear ip dhcp snooping binding
show ip dhcp snooping statistics
clear ip dhcp snooping statistics
show ip arp inspection statistics
clear ip arp inspection statistics

show ip dhcp snooping

Displays DHCP snooping information.

Syntax

```
show ip dhcp snooping
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 19-1 Example of displaying DHCP snooping information

```
> show ip dhcp snooping

Date 2008/11/13 16:34:10 UTC
Switch DHCP snooping is Enable
Option allow untrusted: off,  Verify mac-address: on
DHCP snooping is configured on the following VLANs:
  1,10,100,1000
Interface             Trusted Verify source  Rate limit(pps)
fastethernet    0/1   no      off            unlimited
fastethernet    0/2   yes     off            unlimited
fastethernet    0/3   no      off            1
  :           :
gigabitethernet 0/25  no      off            300
gigabitethernet 0/26  yes     off            unlimited
port-channel    1     no      off            200
port-channel    2     yes     off            unlimited

>
```

Display items

Table 19-1 Information displayed by executing the show ip dhcp snooping command

Item	Meaning	Displayed information
Switch DHCP snooping is	The status of DHCP snooping	`Enable`: Enabled `Disable`: Disabled
Option allow untrusted	Permission to receive option 82	`on`: Receiving the option is permitted. `off`: Receiving the option is not permitted.
Verify mac-address	Verification of the MAC address from which DHCP packets are sent	`on`: The source MAC address is checked. `off`: The source MAC address is not checked.
VLANs	List of VLANs on which DHCP snooping is operating	`nothing` is displayed if there is no VLANs.
Interface	Interface name	--

Item	Meaning	Displayed information
Trusted	--	`yes`: Trusted port `no`: Untrusted port
Verify source	Terminal filter setting	`off`: No filtering `on`: Filtering by IP address `mac-only`: Filtering by MAC address `port-security`: Filtering by IP address and MAC address
Rate limit(pps)	Limit on the reception rate for each port	Displays the limit value set for the reception rate of DHCP packets. `1` to `300`: (pps) `unlimited`: There is no limit.

Impact on communication

None

Response messages

None

Notes

None

show ip dhcp snooping binding

Displays information about the DHCP snooping binding database.

Syntax

```
show ip dhcp snooping binding[ip <IP address>][mac <MAC>][vlan <VLAN ID>]  [port <Port# list>][channel-group-number <Channel group# list>] [{static|dynamic}]
```

Input mode

User mode and administrator mode

Parameters

`ip` *<IP address>*

Displays the entries for the specified IP address.

`mac` *<MAC>*

Displays the entries for the specified MAC address.

`vlan` *<VLAN ID>*

Displays the entries for the specified VLAN interface.

For *<VLAN ID>*, specify the VLAN ID set by the `ip dhcp snooping vlan` command.

`port` *<Port# list>*

Displays information about the DHCP snooping binding database 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# list>*

Displays information about the DHCP snooping binding database for the channel groups specified in list format in the specified link aggregation. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

`{static|dynamic}`

`static`

Displays the static entries.

`dynamic`

Displays the dynamic entries.

Note on setting parameters

This command can display only information relevant to the condition applied by a parameter that has been set. If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, the information that meets all the specified conditions is displayed (if the `port` or `channel-group-number` parameter is specified, information that meets any of the conditions is displayed).

Example

Figure 19-2 Displaying the DHCP snooping binding database information

```
> show ip dhcp snooping binding

Date 2008/11/13 13:09:31 UTC

Agent URL: flash
Last succeeded time: 2008/11/13 13:07:34 UTC
```

```
Total Bindings: 5
MAC Address     IP Address      Expire(min) Type     VLAN  Interface
0000.0087.0001  192.168.0.201   -           static   1     port-channel    1
0000.0087.0002  192.168.0.202   -           static   1     port-channel    2
0000.0087.0003  192.168.0.203   -           static   1     port-channel    3
0000.0087.0004  192.168.0.204   -           static   1     port-channel    4
000d.0bbe.b0fb  192.168.100.11  59          dynamic  1     fastethernet    0/1

>
```

Display items

Table 19-2 Information displayed by executing the show ip dhcp snooping binding command

Item	Meaning	Displayed information
Agent URL	Save location for the binding database	Displays the configuration information. `flash`: Indicates internal flash memory. `mc`: Indicates a memory card. `-`: Not specified
Last succeeded time	Date and time the device last saved information to the database[#1]	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* *time-zone* Date and time information was saved to the save location. `-` is displayed for the following cases:[#2] ● The agent URL is not specified. ● The database has never been saved. ● The number of the binding entries for database restoration is zero.
	Total number	--
MAC Address	Terminal MAC address.	--
IP Address	Terminal IP address	--
Expire(min)	Aging time (in minutes)	If `Type` is `static` or there is no aging time limit, `-` is displayed.
Type	Entry type	`static`: Indicates a static entry. `dynamic`: Indicates a dynamic entry.
VLAN	The number of the VLAN connected to the terminal	--
Interface	Name of the interface connected to the terminal	--

#1: If the binding database has been restored for reasons such as a device restart, the time that the restore information was saved is displayed.

#2: If this command is executed when either of the following conditions is met, `Last succeeded time` is displayed, and the `No binding entry.` message might be displayed.

- There are no static entries.
- An aging timeout occurred for all dynamic entries.

  (Or the `clear ip dhcp snooping binding` command is executed)

Impact on communication

None

Response messages

Table 19-3 List of response messages for the show ip dhcp snooping binding command

Message	Description
DHCP Snooping is not configured.	The command could not be executed because DHCP snooping had not been configured.
No binding entry.	There is no information to be displayed.

Notes

None

clear ip dhcp snooping binding

Clears information in the DHCP snooping binding database. This command clears only the entries that have been registered dynamically.

Syntax

```
clear ip dhcp snooping binding[ip <IP address>][mac <MAC>][vlan <VLAN ID>] [port <Port# list>][channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`ip` *<IP address>*

Clears the entries for the specified IP address.

`mac` *<MAC>*

Clears the entries for the specified MAC address.

`vlan` *<VLAN ID>*

Clears the entries for the specified VLAN interface.

For *<VLAN ID>*, specify the VLAN ID set by the `ip dhcp snooping vlan` command.

`port` *<Port# list>*

Clears information about the DHCP snooping binding database 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# list>*

Clears information about the DHCP snooping binding database for the channel groups specified in list format in the specified link aggregation. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Note on setting parameters

This command can clear only the information that meets the conditions specified by the parameter. If no parameter is specified, information is cleared without being limited by any conditions. If multiple parameters are specified, information that meets all conditions will be cleared. (If the port or channel-group-number parameter is specified, information that meets any of the conditions is cleared.)

Example

Figure 19-3 Clearing information by executing the clear ip dhcp snooping binding command

```
> clear ip dhcp snooping binding

>
```

Display items

None

Impact on communication

Terminal filtering remains enabled until the address is reassigned.

Response messages

Table 19-4 List of response messages for the clear ip dhcp snooping binding command

Message	Description
DHCP Snooping is not configured.	The command could not be executed because DHCP snooping had not been configured.
No binding entry.	There is no information to be cleared.

Notes

None

show ip dhcp snooping statistics

Displays statistics about DHCP snooping.

Syntax

```
show ip dhcp snooping statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 19-4 Displaying statistics about DHCP snooping

```
> show ip dhcp snooping statistics

Date 2008/11/13 18:19:28 UTC
Database Exceeded: 0
Total DHCP Packets: 8995
Interface                    Recv      Filter   Rate over
fastethernet    0/1           170         170           0
fastethernet    0/3          1789          10        1779

  :         :

gigabitethernet 0/25            0           0           0
port-channel    1            3646        2457        1189

>
```

Display items

Table 19-5 Information displayed by executing the show ip dhcp snooping statistics command

Item	Meaning	Displayed information
Database Exceeded	Number of times database entries exceeded the maximum allowed number	--
Total DHCP Packets	Total number of DHCP packets processed on untrusted ports in DHCP snooping	--
Interface	Interface name for the untrusted port	--
Recv	Number of DHCP packets received on untrusted ports for DHCP snooping	The number of discarded packets displayed in `Filter` and `Rate over` are included.
Filter	Of the DHCP packets received (Recv) on the untrusted port for DHCP snooping, the number of DHCP packets discarded as invalid packets	The number of discarded packets displayed in `Rate over` is not included.

Item	Meaning	Displayed information
Rate over	Of the DHCP packets received (Recv) on the untrusted port for DHCP snooping, the number of DHCP packets discarded when an exceeded rate limit was detected	The number of discarded packets displayed in `Filter` is not included. # A rate check precedes an invalid packet check.

Impact on communication

None

Response messages

Table 19-6 List of response messages for the show ip dhcp snooping statistics command

Message	Description
DHCP Snooping is not configured.	The command could not be executed because DHCP snooping had not been configured.

Notes

None

clear ip dhcp snooping statistics

Clears the DHCP snooping statistics.

Syntax

```
clear ip dhcp snooping statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 19-5 Clearing information by executing the clear ip dhcp snooping statistics command

```
> clear ip dhcp snooping statistics

>
```

Display items

None

Impact on communication

None

Response messages

Table 19-7 List of response messages for the clear ip dhcp snooping statistics command

Message	Description
DHCP Snooping is not configured.	The command could not be executed because DHCP snooping had not been configured.

Notes

None

show ip arp inspection statistics

The following figure shows an example of displaying statistics for dynamic ARP inspection.

Syntax

```
show ip arp inspection statistics
```

Input mode

Administrator mode

Parameters

None

Example

Figure 19-6 Displaying statistics about ARP inspection

```
> show ip arp inspection statistics

Date 2008/11/14 13:09:52 UTC
 Port   VLAN   Forwarded      Dropped (  Rate over  DB unmatch     Invalid )
 0/1      11           0           15 (          0          15           0 )
 0/2      11         584          883 (          0         883           0 )
 0/3      11           0            0 (          0           0           0 )

  :         :

 ChGr2    11         170           53 (          0          53           0 )

>
```

Display items

Table 19-8 Information displayed by executing the show ip arp inspection statistics command

Item	Meaning	Displayed information
Port	Port number or channel group number	When the interface is fastethernet [AX1250S] [AX1240S] or gigabitethernet, the interface number is displayed. For port-channel, the following value is displayed: ● `ChGr1` to `ChGr8`
VLAN	VLAN ID	--
Forwarded	Number of forwarded ARP packets	--
Dropped	Total number of discarded ARP packets	Total of the numbers displayed in `Rate over`, `DB unmatch`, and `Invalid`
Rate over	Number of ARP packets discarded because of exceeded reception rate limits	--

Item	Meaning	Displayed information
DB unmatch	Number of ARP packets discarded because they did not match the information in the binding database	--
Invalid	Number of ARP packets discarded because of invalid binding information	--

Impact on communication

None

Response messages

Table 19-9 List of response messages for the show ip arp inspection statistics command

Message	Description
ARP Inspection is not configured.	The command could not be executed because dynamic ARP inspection had not been configured.
There is no information. (ip arp inspection statistics)	There is no statistics on dynamic ARP inspection.

Notes

None

clear ip arp inspection statistics

The following figure shows an example of clearing dynamic ARP inspection statistics.

Syntax

```
clear ip arp inspection statistics
```

Input mode

Administrator mode

Parameters

None

Example

Figure 19-7 Clearing statistics by executing the clear ip arp inspection statistics command

```
# clear ip arp inspection statistics

#
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

20. IGMP/MLD Snooping

show igmp-snooping
clear igmp-snooping
show mld-snooping
clear mld-snooping

show igmp-snooping

Displays IGMP snooping information. The following information is displayed for each VLAN:

- Whether the querier functionality is set, the IGMP querier address, and multicast router ports
- Subscription multicast group information for each VLAN or port, and learned MAC addresses
- Statistics (number of IGMP packets sent and received)

Syntax

```
show igmp-snooping [<VLAN ID list>]
show igmp-snooping {group [<VLAN ID list>] | port <Port# list> | channel-group-number <Channel group# list>}
show igmp-snooping statistics [<VLAN ID list>]
```

Input mode

User mode and administrator mode

Parameters

<VLAN ID list>

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

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays information about IGMP snooping for all VLANs.

`{group [`*<VLAN ID list>*`] | port` *<Port# list>* `| channel-group-number` *<Channel group# list>*`}`

`group`

Displays the subscription multicast group addresses for the VLANs.

`port` *<Port# list>*

Displays the subscription multicast group addresses for the specified ports. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays the subscription multicast group addresses for the specified channel groups. For details about how to specify *<Channel group# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`statistics`

Displays statistics.

Example 1

Figure 20-1 Example of displaying IGMP snooping information

```
> show igmp-snooping

Date 2008/11/14 15:56:12 UTC
VLAN counts: 3
VLAN 3253:
  IP Address: 192.168.53.100/24   Querier: enable
  IGMP querying system: 192.168.53.100
```

```
  Port (4): 0/13-16
  Mrouter-port: 0/13-16
  Group counts: 5
VLAN 3254:
  IP Address: 192.168.54.100/24   Querier: disable
  IGMP querying system:
  Port (4): 0/17-20
  Mrouter-port: 0/17-20
  Group counts: 5
VLAN 3255:
  IP Address: 192.168.55.100/24   Querier: disable
  IGMP querying system:
  Port (4): 0/21-24
  Mrouter-port: 0/21-24
  Group counts: 5

>


> show igmp-snooping 3253

Date 2008/11/14 15:59:14 UTC
VLAN counts: 3
VLAN 3253:
  IP Address: 192.168.53.100/24   Querier: enable
  IGMP querying system: 192.168.53.100
  Port (4): 0/13-16
  Mrouter-port: 0/13-16
  Group counts: 5

>
```

Display items in Example 1

Item	Meaning	Displayed information
VLAN counts	Number of VLANs on which IGMP snooping is enabled	--
VLAN	VLAN information	--
IP Address	IP address	Blank: No IP address has been set.
Querier	Whether the querier functionality has been set	`enable`: The functionality has been set. `disable`: The functionality has not been set.
IGMP querying system	IGMP querier in the VLAN	Blank: There is no IGMP querier.
Port(n)	Port numbers of the ports subscribing to the VLAN	*n*: Number of applicable ports
Mrouter-port	Multicast router ports	--
Group counts	Number of multicast groups in the VLAN	--

Example 2

Figure 20-2 Example of displaying IGMP group information for each VLAN

```
> show igmp-snooping group

Date 2008/11/14 15:59:41 UTCTotal Groups: 15
VLAN counts: 3
VLAN 3253 Group counts: 5
  Group Address    MAC Address
   230.0.0.11        0100.5e00.000b
     Port-list: 0/13
   230.0.0.10        0100.5e00.000a
     Port-list: 0/13
   230.0.0.14        0100.5e00.000e
     Port-list: 0/13
   230.0.0.13        0100.5e00.000d
     Port-list: 0/13
   230.0.0.12        0100.5e00.000c
     Port-list: 0/13
VLAN 3254 Group counts: 5
  Group Address    MAC Address
   230.0.0.34        0100.5e00.0022
     Port-list: 0/18
   230.0.0.33        0100.5e00.0021
     Port-list: 0/18
   230.0.0.32        0100.5e00.0020
     Port-list: 0/18
   230.0.0.31        0100.5e00.001f
     Port-list: 0/18
   230.0.0.30        0100.5e00.001e
     Port-list: 0/18
VLAN 3255 Group counts: 5
  Group Address    MAC Address
   230.0.0.24        0100.5e00.0018
     Port-list: 0/21
   230.0.0.23        0100.5e00.0017
     Port-list: 0/21
   230.0.0.22        0100.5e00.0016
     Port-list: 0/21
   230.0.0.21        0100.5e00.0015
     Port-list: 0/21
   230.0.0.20        0100.5e00.0014
     Port-list: 0/21

>


> show igmp-snooping group 3253

Date 2008/11/14 16:02:03 UTC
Total Groups: 15
VLAN counts: 3
VLAN 3253 Group counts: 5
  Group Address    MAC Address
   230.0.0.11        0100.5e00.000b
     Port-list: 0/13
   230.0.0.10        0100.5e00.000a
     Port-list: 0/13
   230.0.0.14        0100.5e00.000e
     Port-list: 0/13
   230.0.0.13        0100.5e00.000d
     Port-list: 0/13
   230.0.0.12        0100.5e00.000c
```

```
     Port-list: 0/13

>
```

Display items in Example 2

Item	Meaning	Displayed information
Total Groups	Number of participating groups on the device	--
VLAN counts	Number of VLANs on which IGMP snooping is enabled	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups in the VLAN	--
Group Address	Subscription group addresses	--
MAC Address	Learned MAC addresses	--
Port-list	Forwarding port number (interface port number)	--

Example 3

Figure 20-3 Example of displaying IGMP group information for each port

```
> show igmp-snooping port 0/13

Date 2008/11/14 16:03:28 UTC
Port 0/13  VLAN counts: 1
  VLAN 3253 Group counts: 5
    Group Address     Last Reporter      Uptime     Expires
     230.0.0.11        192.168.53.17      19:20      04:19
     230.0.0.10        192.168.53.16      19:20      04:20
     230.0.0.14        192.168.53.20      19:20      04:19
     230.0.0.13        192.168.53.19      19:20      04:19
     230.0.0.12        192.168.53.18      19:20      04:19

>
```

Display items in Example 3

Item	Meaning	Displayed information
Port	Applicable port	--
VLAN counts	Number of VLANs to which the specified port belongs	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups for the specified port	--
Group Address	Subscription multicast group addresses	--

Item	Meaning	Displayed information
Last Reporter	IP address that last subscribed to the group	--
Uptime	Time elapsed since the group information was generated	*xx*:*yy* *xx* (minutes), *yy* (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	*xx*:*yy* *xx* (minutes), *yy* (seconds)

Example 4

Figure 20-4 Example of displaying IGMP snooping statistics

```
> show igmp-snooping statistics

Date 2008/11/14 16:04:03 UTC
VLAN 3253
  Port 0/13  Rx:  Query              0     Tx:  Query         12
                  Report(V1)     11945
                  Report(V2)         0
                  Leave              0
                  Error              0
  Port 0/14  Rx:  Query              0     Tx:  Query          0
                  Report(V1)         0
                  Report(V2)         0
                  Leave              0
                  Error              0
  Port 0/15  Rx:  Query              0     Tx:  Query          0
                  Report(V1)         0
                  Report(V2)         0
                  Leave              0
                  Error              0
  Port 0/16  Rx:  Query              0     Tx:  Query          0
                  Report(V1)       194
                  Report(V2)         0
                  Leave              0
                  Error              0

                :         :

>
```

Display items in Example 4

Item	Meaning	Displayed information
VLAN	VLAN information	--
Port	Applicable port in the VLAN	--
Rx	Number of received IGMP packets	--
Tx	Number of sent IGMP packets.	--

Item	Meaning	Displayed information
Query	Query messages	--
Report(V1)	IGMP Version 1 Report messages	--
Report(V2)	IGMP Version 2 Report messages	--
Leave	Leave messages	--
Error	Error packets	--

Impact on communication

None

Response messages

Table 20-1 List of response messages for the show igmp-snooping command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (IGMP snooping)	There is no IGMP-snooping information.

Notes

None

clear igmp-snooping

Clears all IGMP snooping information.

Syntax

```
clear igmp-snooping [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Clears statistics without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Figure 20-5 Clearing all IGMP snooping information

```
> clear igmp-snooping
Do you wish to clear IGMP or MLD snooping data? (y/n): y

>
```

If `y` is entered, IGMP snooping information is cleared.

If `n` is entered, IGMP snooping information is not cleared.

Display items

None

Impact on communication

Note that when the `clear igmp-snooping` command is executed, multicast communication temporarily stops.

Response messages

Table 20-2 List of response messages for the clear igmp-snooping command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (IGMP snooping)	There is no IGMP-snooping information.

Notes

None

show mld-snooping

Displays MLD snooping information. The following information is displayed for each VLAN:

- Whether the querier functionality is set, the MLD querier address, and the multicast router ports
- Subscription multicast group information for each VLAN or port, and learned MAC addresses
- Statistics (number of MLD packets sent and received)

Syntax

```
show mld-snooping [<VLAN ID list>]
show mld-snooping {group [<VLAN ID list>] | port <Port# list> | channel-group-number <Channel group# list>}
show mld-snooping statistics [<VLAN ID list>]
```

Input mode

User mode and administrator mode

Parameters

<VLAN ID list>

Displays information about MLD snooping for the VLAN IDs specified in list format.

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays information about MLD snooping for all VLANs.

`{group [`*<VLAN ID list>*`] | port` *<Port# list>* `| channel-group-number` *<Channel group# list>*`}`

`group`

Displays the subscription multicast group addresses for the VLANs.

`port` *<Port# list>*

Displays the subscription multicast group addresses for the specified ports. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays the subscription multicast group addresses for the specified channel groups. For details about how to specify *<Channel group# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`statistics`

Displays statistics.

Example 1

Figure 20-6 Example of displaying MLD snooping information

```
> show mld-snooping

Date 2008/11/14 17:21:37 UTC
VLAN counts: 3
VLAN 3001:
  IP Address:   Querier: enable
  MLD querying system:
  Querier version: v1
```

```
  Port (1): 0/12
  Mrouter-port: 0/12
  Group counts: 1
VLAN 3002:
  IP Address:   Querier: enable
  MLD querying system:
  Querier version: v1
  Port (1): 0/12
  Mrouter-port: 0/12
  Group counts: 1
VLAN 3003:
  IP Address:   Querier: enable
  MLD querying system:
  Querier version: v1
  Port (1): 0/12
  Mrouter-port: 0/12
  Group counts: 1

>


>show mld-snooping 3001

Date 2008/11/14 17:21:51 UTC
VLAN counts: 3
VLAN 3001:
  IP Address:   Querier: enable
  MLD querying system:
  Querier version: v1
  Port (1): 0/12
  Mrouter-port: 0/12
  Group counts: 1

>
```

Display items in Example 1

Item	Meaning	Displayed information
VLAN counts	Number of VLANs on which MLD snooping is enabled	--
VLAN	VLAN information	--
IP Address	IP address	Blank: No IP address has been set.
Querier	Whether the querier functionality has been set	`enable`: The functionality has been set. `disable`: The functionality has not been set.
MLD querying system	MLD querier in the VLAN	Blank: There is no MLD querier.
Querier version	MLD version of the querier	`v1`: version1 `v2`: version2
Port(*n*)	Port numbers of the ports subscribing to the VLAN	*n*: Number of applicable ports
Mrouter-port	Multicast router ports	--

Item	Meaning	Displayed information
Group counts	Number of subscription multicast groups in the VLAN	--

Example 2

Figure 20-7 Example of displaying MLD group information for each VLAN

```
> show mld-snooping group

Date 2008/11/14 17:22:05 UTC
Total Groups: 3
VLAN counts: 3
VLAN 3001 Group counts: 1
  Group Address                          MAC Address      Version   Mode
   ff80:0:0:0:0:0:99:a0a                 3333.0099.0a0a   v1        -
     Port-list: 0/12
VLAN 3002 Group counts: 1
  Group Address                          MAC Address      Version   Mode
   ff80:0:0:0:0:0:99:a0a                 3333.0099.0a0a   v1        -
     Port-list: 0/12
VLAN 3003 Group counts: 1
  Group Address                          MAC Address      Version   Mode
   ff80:0:0:0:0:0:99:a0a                 3333.0099.0a0a   v1        -
     Port-list: 0/12

>


> show mld-snooping group 3001

Date 2008/11/14 17:22:10 UTC
Total Groups: 3
VLAN counts: 3
VLAN 3001 Group counts: 1
  Group Address                          MAC Address      Version   Mode
   ff80:0:0:0:0:0:99:a0a                 3333.0099.0a0a   v1        -
     Port-list: 0/12

>
```

Display items in Example 2

Item	Meaning	Displayed information
Total Groups	Number of participating groups on the device	--
VLAN counts	Number of VLANs on which MLD snooping is enabled	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups in the VLAN	--
Group Address	Subscription group addresses	--

Item	Meaning	Displayed information
MAC Address	Learned MAC addresses	--
Version	MLD version information	`v1`: MLD version 1 `v2`: MLD version 2 `v1, v2`: MLD version 1 and version 2 mixed
Mode	Group mode	`INCLUDE`: INCLUDE mode `EXCLUDE`: EXCLUDE mode (`--` is displayed if the MLD version information is `v1`.)
Port-list	Forwarding port number (interface port number)	--

Example 3

Figure 20-8 Example of displaying MLD group information for each port

```
> show mld-snooping port 0/12

Date 2008/11/14 17:22:45 UTC
Port 0/12  VLAN counts: 3
  VLAN 3001 Group counts: 1
    Group Address              Last Reporter              Uptime    Expires
    ff80:0:0:0:0:0:99:a0a      fe:80:0:0:0:0:0:fe00       07:10     04:20
  VLAN 3002 Group counts: 1
    Group Address              Last Reporter              Uptime    Expires
    ff80:0:0:0:0:0:99:a0a      fe:80:0:0:0:0:0:fe00       05:02     04:20
  VLAN 3003 Group counts: 1
    Group Address              Last Reporter              Uptime    Expires
    ff80:0:0:0:0:0:99:a0a      fe:80:0:0:0:0:0:fe00       05:02     04:20

>
```

Display items in Example 3

Item	Meaning	Displayed information
Port	Applicable port	--
VLAN counts	Number of VLANs to which the specified port belongs	--
VLAN	VLAN information	--
Group counts	Number of subscription multicast groups for the specified port	--
Group Address	Subscription multicast group addresses	--
Last Reporter	IP address that last subscribed to the group	--

Item	Meaning	Displayed information
Uptime	Time elapsed since the group information was generated	*xx*:*yy* *xx* (minutes), *yy* (seconds) "1hour", "2hours", ... are displayed if the time is 60 minutes or more. "1day", "2days", ... are displayed if the time is 24 hours or more.
Expires	Group information aging (remaining time)	*xx*:*yy* *xx* (minutes), *yy* (seconds)

Example 4

Figure 20-9 Example of displaying MLD snooping statistics

```
> show mld-snooping statistics

Date 2008/11/14 17:23:08 UTC
VLAN 3001
  Port 0/12  Rx:  Query(V1)           0    Tx:  Query(V1)           0
                  Query(V2)           0         Query(V2)           0
                  Report(V1)     142435
                  Report(V2)          0
                  Done                0
                  Error               0
VLAN 3002
  Port 0/12  Rx:  Query(V1)           0    Tx:  Query(V1)           0
                  Query(V2)           0         Query(V2)           0
                  Report(V1)      64969
                  Report(V2)          0
                  Done                0
                  Error               0
VLAN 3003
  Port 0/12  Rx:  Query(V1)           0    Tx:  Query(V1)           0
                  Query(V2)           0         Query(V2)           0
                  Report(V1)      64741
                  Report(V2)          0
                  Done                0
                  Error               0

>
```

Display items in Example 4

Item	Meaning	Displayed information
VLAN	VLAN information	--
Port	Applicable port in the VLAN	--
Rx	Number of received MLD packets	--
Tx	Number of sent MLD packets.	--
Query(v1)	MLD Version 1 Query messages	--
Query(v2)	MLD Version 2 Query messages	--

Item	Meaning	Displayed information
Report(v1)	MLD Version 1 Report messages	--
Report(v2)	MLD Version 2 Report messages	--
Done	Done messages	--
Error	Error packets	--

Impact on communication

None

Response messages

Table 20-3 List of response messages for the show mld-snooping command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (MLD snooping)	There is no MLD-snooping information.

Notes

None

clear mld-snooping

Clears all MLD snooping information.

Syntax

```
clear mld-snooping [-f]
```

Input mode

User mode and administrator mode

Parameters

`-f`

Clears statistics without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Figure 20-10 Clearing all MLD snooping information

```
> clear mld-snooping
Do you wish to clear IGMP or MLD snooping data? (y/n): y

>
```

If `y` is entered, MLD snooping information is cleared.

If `n` is entered, MLD snooping information is not cleared.

Display items

None

Impact on communication

Note that when the `clear mld-snooping` command is executed, multicast communication temporarily stops.

Response messages

Table 20-4 List of response messages for the clear mld-snooping command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (MLD snooping)	There is no MLD-snooping information.

Notes

None

21. IPv4, ARP, and ICMP

show ip interface
show ip arp
show ip route
ping
traceroute

show ip interface

Displays the status of IPv4 interfaces.

Syntax

```
show ip interface [{summary | up | down | vlan <VLAN ID>}]
```

Input mode

User mode and administrator mode

Parameters

`{summary | up | down | vlan` *<VLAN ID>*`}`

`summary`

Displays a summary of the status of all interfaces.

`up`

Displays detailed information about interfaces in the `Up` status.

`down`

Displays detailed information about interfaces in the `Down` status.

`vlan` *<VLAN ID>*

For *<VLAN ID>*, specify the VLAN ID set by the `interface vlan` configuration command.

Operation when all parameters are omitted:

Displays the detailed status of all interfaces.

Example 1

This example shows how to display a summary of the status of all interfaces.

```
> show ip interface summary    Press the Enter key.
```

Figure 21-1 Example of displaying a summary of all interfaces

```
> show ip interface summary

Date 2008/11/14 17:47:34 UTC
VLAN0001: Up   192.168.0.100/24
VLAN0010: Down 192.168.10.100/24
VLAN3005: Up   192.168.5.10/24
VLAN3253: Down 192.168.53.100/24
VLAN3254: Up   192.168.54.100/24
VLAN3255: Up   192.168.55.100/24
VLAN3256: Down 192.168.56.100/24
VLAN4094: Up   192.168.4.10/24

>
```

Display items in Example 1

Table 21-1 Information displayed in a summary of all interfaces

Item	Meaning	Displayed information
VLAN*xxxx*	Interface name	--
Up/Down	Status of the interface	--

Item	Meaning	Displayed information
Dot notation	IP address/subnet mask length	--

Example 2

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

  ```
  > show ip interface up    Press the Enter key.
  ```

- Display the detailed status of an interface.

  ```
  > show ip interface vlan 3005    Press the Enter key.
  ```

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

Figure 21-2 Example of executing the command with an interface specified

```
> show ip interface vlan 3005

Date 2008/11/14 17:50:06 UTC
VLAN3005: Up
mtu 1500
  inet 192.168.5.10/24               broadcast 192.168.5.255
    Port 0/4 : Down media -                      00ed.f010.0001
    Port 0/5 : Up   media 100BASE-TX full(auto)  00ed.f010.0001 ChGr:7(Up)
    Port 0/7 : Down media -                      00ed.f010.0001 ChGr:7(Up)
  Time-since-last-status-change: 0day 00:03:23
  Last down at: 2008/11/14 17:33:07
  VLAN: 3005

>
```

Display items in Example 2

Table 21-2 Contents of the displayed detailed information

Item	Meaning	Displayed information
VLAN*xxxx*	Interface name	--
Up/Down	Status of the interface	--
mtu	MTU for the interface	--
inet	IP address/subnet mask length	--
broadcast	Broadcast address	--
Port	Port number that belongs to the applicable VLAN	--
Up/Down	Port status	`Up`: In operation (normal operating state) `Down`: In operation (line has failed), or not in operation
media	Line type	For details about the line type, see the display item *<Line type>* of the `show interfaces` command.

Item	Meaning	Displayed information
xxxx.xxxx.xxxx	MAC address	The MAC address used by packets sent from the interface.
ChGr	Channel group number and channel status	Displayed for a link aggregation line. `Up`: Indicates that the channel status is Up. `Down`: Indicates that the channel status is Down.
Time-since-last-status-change	Time elapsed since the status changed to `Up` or `Down`.	Time elapsed since the status of the VLAN interface last changed. The display format is *hour*`:`*minute*`:`*second* or *number-of-days*`,` *hour*`:`*minute*`:`*second*. `Over 100 days` is displayed if the number of days exceeds 100. `-----` is displayed if there has never been an `Up`/`Down` status change. This is not cleared by adding, deleting, or changing IP addresses.
Last down at	Status of the interface	Time the VLAN interface last went down. The display format is *year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second*. `-----` is displayed if the interface has never gone down. This is not cleared by adding, deleting, or changing IP addresses.
VLAN	VLAN ID	1 to 4094

Example 3

The following shows an example of the detailed information displayed for the IP address status.

Figure 21-3 Detailed information displayed for IP addresses

```
> show ip interface

Date 2008/11/14 17:47:06 UTC
VLAN0001: Up
mtu 1500
  inet 192.168.0.100/24               broadcast 192.168.0.255
    Port 0/1 : Up   media 100BASE-TX full(auto)  00ed.f010.0001
    Port 0/3 : Down media -                      00ed.f010.0001
    Port 0/6 : Down media -                      00ed.f010.0001
    Port 0/8 : Down media -                      00ed.f010.0001
    Port 0/9 : Down media -                      00ed.f010.0001
    Port 0/10: Down media -                      00ed.f010.0001
    Port 0/11: Down media -                      00ed.f010.0001
    Port 0/25: Down media -                      00ed.f010.0001
    Port 0/26: Down media -                      00ed.f010.0001
  Time-since-last-status-change: 0day 00:48:41
  Last down at: 2008/11/14 15:01:46
  VLAN: 1
VLAN0010: Down
mtu 1500
  inet 192.168.10.100/24              broadcast 192.168.10.255
  Time-since-last-status-change: 0day 02:13:23
  Last down at: 2008/11/14 15:33:42
  VLAN: 10
VLAN3005: Up
mtu 1500
  inet 192.168.5.10/24                broadcast 192.168.5.255
```

```
  Port 0/4 : Down media -                      00ed.f010.0001
  Port 0/5 : Up   media 100BASE-TX full(auto)  00ed.f010.0001 ChGr:7(Up)
  Port 0/7 : Down media -                      00ed.f010.0001 ChGr:7(Up)
Time-since-last-status-change: 0day 00:00:23
Last down at: 2008/11/14 17:33:07

                     :

>
```

Display items in Example 3

This is the same as in *Display items in Example 2*. See *Table 21-2 Contents of the displayed detailed information*.

Impact on communication

None

Response messages

Table 21-3 List of response messages for the show ip interface command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (ip interface)	There is no IP interface information.

Notes

None

show ip arp

Displays ARP information.

Syntax

```
show ip arp [{interface vlan <VLAN ID> | ip <IP address>}]
```

Input mode

User mode and administrator mode

Parameters

`{interface vlan` *<VLAN ID>* `|` `ip` *<IP address>*`}`

`interface vlan` *<VLAN ID>*

Specifies a VLAN ID.

For *<VLAN ID>*, specify the VLAN ID set by the `interface vlan` configuration command.

`ip` *<IP address>*

Specifies an IP address.

Operation when all parameters are omitted:

Displays the ARP information registered on all interfaces.

Example

Figure 21-4 Execution result when a VLAN interface is specified

```
> show ip arp interface vlan 2048

Date 2008/11/14 22:05:43 UTC
Total: 6
IP Address      Linklayer Address  Interface  Expire     Type
10.0.0.55       0013.20ad.0155     VLAN2048   20min      arpa
10.0.0.56       0013.20ad.0156     VLAN2048   20min      arpa
10.0.0.57       0013.20ad.0157     VLAN2048   20min      arpa
10.0.0.58       0013.20ad.0158     VLAN2048   20min      arpa
10.0.0.59       0013.20ad.0159     VLAN2048   20min      arpa
10.10.10.1      incomplete         VLAN2048   --         arpa

>
```

Figure 21-5 Execution result when all ARP information is displayed

```
> show ip arp

Date 2008/11/14 22:04:23 UTC
Total: 8
IP Address      Linklayer Address  Interface  Expire     Type
10.0.0.55       0013.20ad.0155     VLAN2048   20min      arpa
10.0.0.56       0013.20ad.0156     VLAN2048   20min      arpa
10.0.0.57       0013.20ad.0157     VLAN2048   20min      arpa
10.0.0.58       0013.20ad.0158     VLAN2048   20min      arpa
10.0.0.59       0013.20ad.0159     VLAN2048   20min      arpa
10.10.10.1      incomplete         VLAN2048   --         arpa
192.20.0.2      0080.452d.9701     VLAN2000   12min      arpa
192.168.0.200   incomplete         VLAN3333   --         arpa

>
```

Figure 21-6 Execution result when an IP address is specified

```
> show ip arp ip 192.20.0.2

Date 2008/11/14 22:06:20 UTC
Total: 1
IP Address      Linklayer Address  Interface  Expire     Type
192.20.0.2      0080.452d.9701     VLAN2000   10min      arpa

>
```

Display items

Table 21-4 Contents of the displayed ARP information

Item	Meaning	Displayed information
Total	Number of ARP entries	Number of used ARP table entries
IP Address	Next Hop IP address	--
Linklayer Address	Next Hop MAC address	`incomplete`: The address has not been resolved by ARP. --
Interface	Interface name	VLAN*xxxx* is displayed. *xxxx*: VLAN ID
Expire	The remaining aging time is displayed in minutes.	The address has not been resolved by ARP.
Type	Type	`arpa`: Fixed (always the Ethernet interface)

Impact on communication

None

Response messages

Table 21-5 List of response messages for the show ip arp command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (ip arp)	There is no ARP information.

Notes

The entries that are created after learning from other devices are not displayed in the following cases:

- There has been no communication since the interface started up.
- The aging time since registration in the ARP cache table has been exceeded.

show ip route

Displays the IPv4 routing table.

Syntax

```
show ip route
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 21-7 Execution result of displaying IP route information

```
> show ip route

Date 2008/11/14 17:32:39 UTC
Total: 5
Destination         Nexthop           Interface    Protocol
192.168.0.0/24      192.168.0.100     VLAN0001     Connected
192.168.4.0/24      192.168.4.10      VLAN4094     Connected
192.168.5.0/24      192.168.5.10      VLAN3005     Connected
192.168.54.0/24     192.168.54.100    VLAN3254     Connected
192.168.55.0/24     192.168.55.100    VLAN3255     Connected

>
```

Display items

Table 21-6 Contents of the displayed IP route information

Item	Meaning	Displayed information
Total	Number of registered routes	--
Destination	Destination network (IP address/mask)	--
Next Hop	Next Hop IP address	--
Interface	Interface name	`VLAN`*xxxx* is displayed. *xxxx*: VLAN ID
Protocol	Protocol	`Static`: Interface with static entries, `Connected`: Directly connected interface

Impact on communication

None

Response messages

Table 21-7 List of response messages for the show ip route command

Message	Description
There is no information. (ip route)	There is no IP route information.

Notes

None

ping

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

Syntax

```
ping [{-t | -n <Count>}] [-l <Size>] [-w <Timeout>] <IP address>
```

Input mode

User mode and administrator mode

Parameters

`{-t | -n <Count>}`

`-t`

Issues an unlimited number of ping transmissions. To interrupt the processing, press **Ctrl**+**C**.

Operation when this parameter is omitted:

The number of ping transmissions is the value specified for *<Count>*.

`-n <Count>`

Sends packets for the number of times specified for *<Count>*, and then finishes the processing. The specifiable values are from 1 to 99999.

Operation when this parameter is omitted:

Packets are sent four times.

`-l <Size>`

Specifies how many bytes of data are to be sent. The specifiable values are from 46 to 1500.

Operation when this parameter is omitted:

The size of the data to be sent is 46 bytes.

`-w <Timeout>`

Waits for an Echo reply for the packets for the number of seconds specified for *<Timeout>*. Specify a number of seconds from 1 to 60.

Operation when this parameter is omitted:

The wait time for an Echo reply is 6 seconds.

<IP address>

Specifies the destination IP address.

Operation when this parameter is omitted:

This parameter cannot be omitted.

Operation when all parameters are omitted:

The same as described in *Operation when this parameter is omitted* for each parameter.

Example

- Execute an echo test by using the default values (4 attempts, data size of 46 bytes, and an Echo reply wait time of 6 seconds).

```
> ping 192.168.0.1    Press the Enter key.
Pinging 192.168.0.1 with 46 bytes of data:
```

```
Reply from 192.168.0.1: count=1. bytes=46
Reply from 192.168.0.1: count=2. bytes=46
Reply from 192.168.0.1: count=3. bytes=46
Reply from 192.168.0.1: count=4. bytes=46

---- 192.168.0.1 Ping statistics ----
  Packet: sent 4, received 4, lost 0 (0% loss)
>
```

- Execute an echo test by specifying the following conditions:10 attempts, data size of 1500 bytes, and a reply wait time of 2 seconds.

  ```
  > ping -n 10 -l 1500 -w 2 192.168.0.1    Press the Enter key.
  ```

- Execute an unlimited number of echo tests by using the default values (data size of 46 bytes and a reply wait time of 6 seconds).

  ```
  > ping -t 192.168.0.1    Press the Enter key.
  ```

Display items

None

Impact on communication

None

Response messages

Table 21-8 List of response messages for the ping command

Message	Description
Reply from *x.x.x.x*: count=*xx*. bytes=*yy*	A reply from the destination IP address has been received. `from x.x.x.x` IP address `count=xx` Number of times the data sent `bytes=yy` Length of the sent data
Request timed out.	There was no reply from the destination IP address.

Notes

To halt execution of the `ping` command, press **Ctrl** + **C**.

traceroute

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

Syntax

```
traceroute [-m <Max hops>] [-w <Timeout>] <IP address>
```

Input mode

User mode and administrator mode

Parameters

`-m` *<Max hops>*

Specifies the maximum number of hops permitted to the destination IP address. The specifiable values are from 1 to 255.

Operation when this parameter is omitted:

The maximum number of hops is 30.

`-w` *<Timeout>*

Specifies the timeout time for replies from relay gateways. Specify a number of seconds from 1 to 60.

Operation when this parameter is omitted:

The reply timeout time is 5 seconds.

<IP address>

The host IP address of the test destination.

Operation when all parameters are omitted:

The same as described in *Operation when this parameter is omitted* for each parameter.

Example

Figure 21-8 Normal end

```
> traceroute -m 2 -w 1 192.168.0.10
1  <10ms  <10ms  <10ms 192.168.0.10
Trace complete.

>
```

Figure 21-9 Destination in the same subnet

```
> traceroute -m 2 -w 1 192.168.0.5
traceroute to 192.168.0.5, over a maximum of 2 hops,
1   *      *      *    Request timed out.
2   *      *      *    Request timed out.
Trace complete.

>
```

Figure 21-10 Destination in another subnet

```
> traceroute -m 2 -w 1 192.168.2.2
traceroute to 192.168.2.2, over a maximum of 2 hops,
1 reports: Destination host Unreachable.
Trace complete.

>
```

Display items

None

Impact on communication

None

Response messages

Table 21-9 List of response messages for the traceroute command

Message	Description
Destination host Unreachable.	The sent data was unable to reach the specified destination IP address.
traceroute to *x.x.x.x*, over a maximum of *yy* hops.	The `traceroute` command is being executed. `to` *x.x.x.x* Destination IP address *yy* `hops` Maximum number of hops
Trace complete.	Processing by the traceroute command has finished.
Request timed out.	The sent data was unable to reach the specified destination IP address, or no reply was received.

Notes

- The following shows the conditions that end execution of the `traceroute` command:

  (1) `ICMP echo reply` is received from the specified IP address.
  (2) `ICMP` *xxx* `unreachable` is received.
  (3) TTL reaches the maximum number of hops before either (1) or (2) occurs.
  (4) The **Ctrl**+**C** key combination is pressed on the console, forcing a disconnection.

22. Filters

show access-filter
clear access-filter

show access-filter

Displays the filter conditions applied on the Ethernet interface or VLAN interface by the access group commands (`mac access-group` and `ip access-group`), the number of packets that meet the filter conditions, and the number of packets discarded because they did not match any filter conditions in the access list.

Syntax

```
show access-filter [{<IF#> | interface vlan <VLAN ID>}[<ACL ID>]]
show access-filter [interface {gigabitethernet <IF#> | vlan <VLAN ID> }[<ACL ID>]]
[AX2200S]
show access-filter [interface {fastethernet <IF#> | gigabitethernet <IF#> | vlan <VLAN
ID>}[<ACL ID>]] [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`{<IF#> | interface vlan <VLAN ID>}[<ACL ID>]`

`interface {gigabitethernet <IF#> | vlan <VLAN ID>}[<ACL ID>]` [AX2200S]

`interface {fastethernet <IF#> | gigabitethernet <IF#> | vlan <VLAN ID>}[<ACL ID>]` [AX1250S][AX1240S]

<IF#>

Displays statistics for the specified Ethernet interface. For the specifiable range of *<IF#>* values, see *Specifiable values for parameters*.

`interface vlan <VLAN ID>`

`vlan <VLAN ID>`

Displays statistics for the specified VLAN interface.

For *<VLAN ID>*, specify the VLAN ID set by the `interface vlan` command.

<ACL ID>

<ACL ID>:Specifies the ID.

Displays statistics for the specified ID for the specified interface.

Operation when this parameter is omitted:

Displays statistics for all access lists applied to the specified interface.

Operation when all parameters are omitted:

Displays statistics for all interfaces.

Example

Figure 22-1 Result of displaying the extended MAC access list

```
> show access-filter 0/3 acl-mac

Date 2008/09/19 15:11:57 UTC
Using Port: interface fastethernet 0/3 in
Extended MAC access-list: acl-mac
  remark "permit of mac access-list extended"
  10 permit host 001b.7888.1ffa any
    matched packets         :          5
  implicitly denied packets :         15

>
```

Figure 22-2 Result of displaying the standard IP access list

```
> show access-filter 0/2 acl-std

Date 2008/09/18 12:56:43 UTC
Using Port: interface fastethernet 0/2 in
Standard IP access-list: acl-std
  remark "permit of ip access-list standard"
  10 permit 172.16.1.12 0.0.0.255
    matched packets         :          5
  implicitly denied packets :         15

>
```

Figure 22-3 Result of displaying the extended IP access list

```
> show access-filter 0/1 acl-ext

Date 2008/09/18 12:56:28 UTC
Using Port: interface fastethernet 0/1 in
Extended IP access-list: acl-ext
  remark "permit of ip access-list extended"
  10 permit tcp 172.16.89.29 0.0.0.255 any
    matched packets         :          5
  implicitly denied packets :         15

>
```

Display items

Table 22-1 Statistical items for the access list

Item	Displayed information	
	Detailed information	**Meaning**
Interface information	Using Port: interface fastethernet*<IF#>* in	[AX1250S] [AX1240S] Information about a 10BASE-T or 100BASE-TX interface to which an access list is applied
	Using Port: interface gigabitethernet*<IF#>* in	[AX2200S] Information about a 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X interface to which an access list is applied
		[AX1250S] [AX1240S] Information about a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface to which an access list is applied
	Using Port: interface vlan*<VLAN ID>* in	Information about a VLAN interface to which an access list is applied.
Access list ID	Extended MAC access-list: *<ACL ID>*	Extended MAC access list ID
	Standard IP access-list: *<ACL ID>*	Standard IP access list ID
	Extended IP access-list: *<ACL ID>*	Extended IP access list ID
Access list information	Displays the supplementary explanation and the filter conditions that have been set by the access list command (see *19. Access Lists* in the manual *Configuration Command Reference*).	

Item	Displayed information	
	Detailed information	**Meaning**
Statistics	matched packets:*<packets>*	Number of packets that meet the filter conditions in the access list
	implicitly denied packets:*<packets>*	Number of packets that were discarded because they did not meet any of the filter conditions in the access list

Impact on communication

None

Response messages

Table 22-2 List of response messages for the show access-filter command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	No access group was set for the Ethernet interface or VLAN interface. Make sure the specified parameter or access-group setting is correct, and then try again.
No such ID.	No access group was set for the access group for the specified ID *<ACL ID>*. Make sure the specified parameter is correct, and then try again.
No such interface.	The specified VLAN interface has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

- Some packets are not supported by the filtering functionality, however, they might be counted only by the counter displayed by this command (including `deny`). For details, see *1. Filters* in the *Configuration Guide Vol. 2*.
- Packets with a reception error (such as an FCS error) are discarded, however they might be counted on the counter displayed by this command.

clear access-filter

For the access list information displayed by the `show access-filter` command, this command resets the number of packets that met the filter conditions (indicated in `matched packets`) and the number of packets discarded because they did not meet the filter conditions (indicated in `implicitly denied packets`).

Syntax

```
clear access-filter
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 22-4 Result of resetting the access list statistics

```
> clear access-filter

>
```

Display items

None

Impact on communication

None

Response messages

Table 22-3 List of response messages for the clear access-filter command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	No access group was set for the Ethernet interface or VLAN interface. Make sure the access group setting is correct, and then try again.

Notes

None

23. QoS

show qos-flow
clear qos-flow
show qos queueing
clear qos queueing

show qos-flow

Displays the flow detection conditions and operations to be performed in the QoS flow list applied on the Ethernet interface or VLAN interface by the QoS flow group command (`ip qos-flow-group` and `mac qos-flow-group`), and the number of packets that meet the flow detection conditions.

Syntax

```
show qos-flow [{<IF#> | interface vlan <VLAN ID>} [<QoS ID>]]
show qos-flow [interface {gigabitethernet <IF#> | vlan <VLAN ID>}[<QoS ID>]] [AX2200S]
show qos-flow [interface {fastethernet <IF#> | gigabitethernet <IF#> | vlan <VLAN
ID>}[<QoS ID>]] [AX1250S] [AX1240S]
```

Input mode

User mode and administrator mode

Parameters

`{<IF#> | interface vlan <VLAN ID>} [<QoS ID>]`

`interface {gigabitethernet <IF#> | vlan <VLAN ID>}[<QoS ID>]` [AX2200S]

`interface {fastethernet <IF#> | gigabitethernet <IF#> | vlan <VLAN ID>}[<QoS ID>]` [AX1250S][AX1240S]

<IF#>

Displays statistics for the specified Ethernet interface. For the specifiable range of *<IF#>* values, see *Specifiable values for parameters*.

`intereface vlan <VLAN ID>`

`vlan <VLAN ID>`

Displays statistics for the specified VLAN interface.

For *<VLAN ID>*, specify the VLAN ID set by the `interface vlan` command.

<QoS ID>

<QoS ID>:QoS flow list name

Displays statistics for the specified QoS flow list of the specified interface.

Operation when this parameter is omitted:

Displays statistics for all QoS flow lists applied to the specified interface.

Operation when all parameters are omitted:

Displays statistics for all interfaces.

Example

- The following shows an example of displaying QoS flow list information.

Figure 23-1 Result of displaying MAC QoS flow list information

```
> show qos-flow 0/1 "apple-talk-qos"

Date 2008/09/18 18:51:40 UTC
Using Port: interface fastethernet 0/1 in
MAC qos-flow-list: apple-talk-qos
  remark "cos 5"
  10 qos any any appletalk action cos 5
    matched packets         :          0

>
```

Figure 23-2 Result of displaying IP QoS flow list information

```
> show qos-flow 0/25 "http-qos"

Date 2008/09/18 18:47:48 UTC
Using Port: interface gigabitethernet 0/25 in
IP qos-flow-list: http-qos
  remark "cos 4"
  10 qos tcp any host 10.10.10.2 eq 80 action cos 4
    matched packets         :          0

>
```

Display items

Table 23-1 Display of statistics on the QoS flow list

Item	Displayed information	
	Detailed information	**Meaning**
Interface information	`Using Port: interface fastethernet <IF#> in`	[AX1250S] [AX1240S] Information about a 10BASE-T or 100BASE-TX interface to which a QoS flow list is applied
	`Using Port: interface gigabitethernet <IF#> in`	[AX2200S] Information about a 10BASE-T, 100BASE-TX, 1000BASE-T, or 1000BASE-X interface to which an QoS flow list is applied
	`Using Port: interface gigabitethernet <IF#> in`	[AX1250S] [AX1240S] Information about a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface to which an QoS flow list is applied
	`Using Port: interface vlan <VLAN ID> in`	Information about a VLAN interface to which a QoS flow list is applied.
QoS flow list name	`MAC qos-flow-list:<QoS ID>`	MAC QoS flow list name
	`IP qos-flow-list:<QoS ID>`	IP QoS flow list name
QoS flow list information	Displays the supplementary explanation and the flow detection conditions that are set by the QoS flow list command (See *20. QoS* in the manual *Configuration Command Reference*).	
Statistics	matched packets:*<packets>*	Number of packets that meet the flow detection conditions in the QoS flow list

Impact on communication

None

Response messages

Table 23-2 List of response messages for the show qos-flow command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	No QoS flow group was set for the Ethernet interface or VLAN interface. Make sure the specified parameter or QoS flow group setting is correct, and then try again.
No such ID.	No QoS flow group that is specified with the QoS flow list name *<QoS ID>* was applied to the interface. Make sure the specified parameter is correct, and then try again.
No such interface.	The specified VLAN interface has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

- Some packets are not supported by the QoS functionality, however they might be counted only by the counter displayed by this command. For details, see *3. Flow Control* in the *Configuration Guide Vol. 2*.
- Packets with a reception error (such as an FCS error) are discarded, however they might be counted on the counter displayed by this command.

clear qos-flow

Clears the number of packets (indicated by `matched packets`) that met the flow detection conditions in the QoS flow list, which is displayed by the `show qos-flow` command.

Syntax

```
clear qos-flow
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 23-3 Result of clearing information

```
> clear qos-flow

>
```

Display items

None

Impact on communication

None

Response messages

Table 23-3 List of response messages for the clear qos-flow command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No configuration.	No QoS flow group was set for the Ethernet interface or VLAN interface. Make sure the QoS flow group setting is correct, and then try again.

Notes

None

show qos queueing

Displays information about the send queue of the port.

The send queue length, the maximum queue length, and the number of packets discarded without being accumulated in the send queue are displayed to enable monitoring of the traffic status.

Syntax

```
show qos queueing [<IF#>]
show qos queueing [interface gigabitethernet <IF#>] [AX2200S]
show qos queueing [interface {fastethernet <IF#> | gigabitethernet <IF#>}] [AX1250S]
[AX1240S]
```

Input mode

User mode and administrator mode

Parameters

<IF#>

`interface gigabitethernet` *<IF#>* [AX2200S]

`interface {fastethernet` *<IF#>* `|` `gigabitethernet` *<IF#>*`}` [AX1250S][AX1240S]

<IF#>

Displays information about the send queue of the specified port. For the specifiable range of *<IF#>* values, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

Displays information about the send queues of all ports implemented on the device, the send queues for traffic from the ports to the CPU, and the send queues for traffic among the internal LSIs (for the AX1240S-48T2C only).

Example

Figure 23-4 Result of displaying information about all send queues

```
> show qos queueing

Date 2008/10/23 09:51:07 UTC
To-CPU (outbound)
 Max_Queue=8
  Queue 1: Qlen=    0, Limit_Qlen=   64
  Queue 2: Qlen=    0, Limit_Qlen=   64
  Queue 3: Qlen=    0, Limit_Qlen=   64
  Queue 4: Qlen=    0, Limit_Qlen=   64
  Queue 5: Qlen=    0, Limit_Qlen=   64
  Queue 6: Qlen=    0, Limit_Qlen=   64
  Queue 7: Qlen=    0, Limit_Qlen=   64
  Queue 8: Qlen=    0, Limit_Qlen=  256
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0

SW (outbound)
 Max_Queue=32
  Queue 1: Qlen=    0, Limit_Qlen=   32
  Queue 2: Qlen=    0, Limit_Qlen=   32
  Queue 3: Qlen=    0, Limit_Qlen=   32
  Queue 4: Qlen=    0, Limit_Qlen=   32
  Queue 5: Qlen=    0, Limit_Qlen=   32
  Queue 6: Qlen=    0, Limit_Qlen=   32
```

```
  Queue 7: Qlen=    0, Limit_Qlen=   32
  Queue 8: Qlen=    0, Limit_Qlen=   32
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0
  Queue 9: Qlen=    0, Limit_Qlen=   32
  Queue10: Qlen=    0, Limit_Qlen=   32
  Queue11: Qlen=    0, Limit_Qlen=   32
  Queue12: Qlen=    0, Limit_Qlen=   32
  Queue13: Qlen=    0, Limit_Qlen=   32
  Queue14: Qlen=    0, Limit_Qlen=   32
  Queue15: Qlen=    0, Limit_Qlen=   32
  Queue16: Qlen=    0, Limit_Qlen=   32
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0
  Queue17: Qlen=    0, Limit_Qlen=   32
  Queue18: Qlen=    0, Limit_Qlen=   32
  Queue19: Qlen=    0, Limit_Qlen=   32
  Queue20: Qlen=    0, Limit_Qlen=   32
  Queue21: Qlen=    0, Limit_Qlen=   32
  Queue22: Qlen=    0, Limit_Qlen=   32
  Queue23: Qlen=    0, Limit_Qlen=   32
  Queue24: Qlen=    0, Limit_Qlen=   32
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0
  Queue25: Qlen=    0, Limit_Qlen=   32
  Queue26: Qlen=    0, Limit_Qlen=   32
  Queue27: Qlen=    0, Limit_Qlen=   32
  Queue28: Qlen=    0, Limit_Qlen=   32
  Queue29: Qlen=    0, Limit_Qlen=   32
  Queue30: Qlen=    0, Limit_Qlen=   32
  Queue31: Qlen=    0, Limit_Qlen=   32
  Queue32: Qlen=    0, Limit_Qlen=   32
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0

Port 0/1 (outbound)
 Status : Active
 Max_Queue=8, Rate_limit= -, Qmode=pq/tail_drop
  Queue 1: Qlen=    0, Limit_Qlen=   32
  Queue 2: Qlen=    0, Limit_Qlen=   32
  Queue 3: Qlen=    0, Limit_Qlen=   32
  Queue 4: Qlen=    0, Limit_Qlen=   32
  Queue 5: Qlen=    0, Limit_Qlen=   32
  Queue 6: Qlen=    0, Limit_Qlen=   32
  Queue 7: Qlen=    0, Limit_Qlen=   32
  Queue 8: Qlen=    0, Limit_Qlen=   32
   discard packets
    HOL1=         0, HOL2=         0, Tail_drop=         0

         :

Port 0/50 (outbound)
 Status : Active
 Max_Queue=8, Rate_limit=100000kbit/s, Qmode=pq/tail_drop
  Queue 1: Qlen=    0, Limit_Qlen=   32
  Queue 2: Qlen=    0, Limit_Qlen=   32
  Queue 3: Qlen=    0, Limit_Qlen=   32
  Queue 4: Qlen=    0, Limit_Qlen=   32
  Queue 5: Qlen=    0, Limit_Qlen=   32
  Queue 6: Qlen=    0, Limit_Qlen=   32
  Queue 7: Qlen=    0, Limit_Qlen=   32
  Queue 8: Qlen=    0, Limit_Qlen=   32
   discard packets
```

```
                HOL1=         0, HOL2=         0, Tail_drop=         0

              >
```

Display items

Table 23-4 Display items of statistics

Item	Displayed information	
	Detailed information	**Meaning**
Interface information	Port*<IF#>* (outbound)	Port send queues
	To-CPU (outbound)	Send queues for traffic from the ports to the CPU
	SW (outbound)	Send queues for traffic among internal LSIs (This item is displayed only for the AX1240S-48T2C.)
QoS information	Status	Operating status of the port ● `Active`: Normal operation. ● `Inactive (The port is half duplex.)`: Unable to operate normally (The port is half duplex.) ● `Inactive (The shaping rate exceeds it.)`: Unable to operate normally (The shaping rate exceeds the line speed.) ● `Inactive (Two or more causes exist.)`: Unable to operate normally.(There are multiple causes.)
	Max_Queue=*<No.>*	Number of send queues
	Rate_limit=*<Rate>*	Bandwidth set for the port ● When auto-negotiation is unresolved (including when processing is in progress): `--` is displayed. ● When auto-negotiation has been resolved or the port bandwidth control is specified for the specified speed: The specified bandwidth is displayed. ● When auto-negotiation has been resolved or the port bandwidth control is not specified for the specified speed: The line speed is displayed.
	Qmode=*<schedule_name>/<drop_name>*	Scheduling (`pq`, `wrr`, `wfq`, `2pq+6drr`) / drop control mode (`tail_drop`) For details about the scheduling, see the `qos-queue-list` configuration command in *20. QoS* in the manual *Configuration Command Reference*.
Queue information	Queue*<No.>*	Send queue number
	Qlen=*<length>*	Number of packet buffers used by the send

Item	Displayed information	
	Detailed information	**Meaning**
		queue
	Limit_Qlen=*<length>*	Maximum number of send queues
Port statistics	discard packets	Number of packets discarded without being accumulated in the send queue
	HOL1=*<packets>*	Number of packets discarded because the send queue or the packet buffer of the send port was full at the time of determination of the destination port after the packets were received. HOL is an abbreviation for head of line blocking.
	HOL2=*<packets>*	Number of packets discarded because there was no space for storing received packets in the send port packet buffer at the time of determination of the destination port after the packets were received.
	Tail_drop=*<packets>*	Number of packets discarded because the send queue was full when packets were to be queued in the send queue of the destination port at the time the packets were sent.

Impact on communication

None

Response messages

Table 23-5 List of response messages for the show qos queueing command

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

Notes

None

clear qos queueing

For the information displayed by the `show qos queueing` command, this command clears to 0 the number of packets (`HOL1`, `HOL2`, and `Tail_drop`) that were not placed in the send queue and were discarded.

Syntax

```
clear qos queueing
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 23-5 Result of clearing statistics for a port

```
> clear qos queueing

>
```

Display items

None

Impact on communication

None

Response messages

Table 23-6 List of response messages for the clear qos queueing command

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

Notes

None

24. Common to Layer 2 Authentication

show authentication fail-list
clear authentication fail-list
show authentication logging
clear authentication logging

show authentication fail-list

Displays information related to terminals that failed to be authenticated by Layer 2 authentication in ascending order of MAC address.

Syntax

```
show authentication fail-list [mac <MAC>]
```

Input mode

Administrator mode

Parameters

`mac` *<MAC>*

Displays information related to terminals that failed to be authenticated for the specified MAC address.

Operation when this parameter is omitted:

Displays all information related to terminals that failed to be authenticated.

Example

Figure 24-1 Displaying information related to terminals that failed to be authenticated

```
# show authentication fail-list

Date 2009/03/16 13:30:17 UTC
Fail list total entry :   3
  No MAC address    Port VLAN First fail time     Last fail time          Count
   1 0000.e227.6812 0/15  400 2009/03/16 13:29:20 2009/03/16 13:29:20         1
   2 0013.20a5.3e1a 0/13  400 2009/03/16 13:29:20 2009/03/16 13:29:20         1
   3 00bb.cc01.0202 0/17  400 2009/03/16 13:29:20 2009/03/16 13:29:20         1

#
```

Display items

Table 24-1 Display items for the information related to terminals that failed to be authenticated

Item	Meaning	Displayed information
Fail list total entry	Total number of entries related to terminals failing to be authenticated	Maximum of 256 entries
#	Entry number	--
MAC address	MAC address	--
Port	Port number or channel group number	`--` is displayed when this item is not set.
VLAN	VLAN ID	`1` to `4094`: Indicates a VLAN ID. `--` is displayed when this item is not set.
First fail time	Date and time first authentication attempt failed	*year*/*month*/*day* *hour*:*minute*:*second*

Item	Meaning	Displayed information
Last fail time	Date and time last authentication attempt failed	*year*/*month*/*day* *hour*:*minute*:*second*
Count	Number of authentication failures	--

Impact on communication

None

Response messages

Table 24-2 List of response messages for the show authentication fail-list command

Message	Description
There is no information.	There is no information about terminals that failed to be authenticated.
Authentication is not configured.	The authentication functionality has not been configured. Check the configuration.

Notes

If the number of entries related to terminals that failed to be authenticated is 256 or more, the oldest entries are overwritten first.

clear authentication fail-list

Clears information related to terminals that failed to be authenticated by Layer 2 authentication.

Syntax

```
clear authentication fail-list
```

Input mode

Administrator mode

None

Parameters

None

Example

The following shows an example of clearing information related to terminals that failed to be authenticated by Layer 2 authentication.

```
# clear authentication fail-list

#
```

Display items

None

Impact on communication

None

Response messages

Table 24-3 List of response messages for the clear authentication fail-list command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Authentication is not configured.	The authentication functionality has not been configured. Check the configuration.

Notes

None

show authentication logging

Displays operational log messages logged for each type of Layer 2 authentication in chronological order.

Syntax

```
show authentication logging [search <string>]
```

Input mode

Administrator mode

Parameters

`search` *<string>*

Specifies the search string.

If you specify this parameter, operation log messages that include the search string will be displayed.

Specify the string with 1 to 64 characters. The characters are case sensitive. For details, see *Any character string* in *Specifiable values for parameters*.

Operation when this parameter is omitted:

All the operation log messages are displayed.

Example

Figure 24-2 Displayed operation log (when the parameter is omitted)

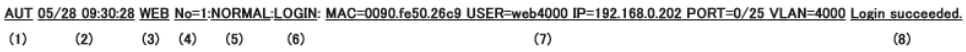
```
# show authentication logging

Date 2011/02/23 06:30:24 UTC
AUT 02/23 06:30:19 WEB No=84:NORMAL:SYSTEM: Accepted commit command.
AUT 02/23 06:30:06 MAC No=1:NORMAL:LOGIN: MAC=0013.20a5.3e2e PORT=0/22 VLAN=40 Login
succeeded.
AUT 02/23 06:30:06 MAC No=270:NOTICE:SYSTEM: MAC=0013.20a5.3e2e PORT=0/22 MAC address
was force-authorized.
AUT 02/23 06:30:06 MAC No=265:NORMAL:SYSTEM: MAC=0013.20a5.3e2e Start authenticating
for MAC address.
AUT 02/23 06:29:30 1X  No=1:NORMAL:LOGIN: MAC=18a9.051d.4931 PORT=0/5 VLAN=4 Login
succeeded. ; New Supplicant Auth Success.

#
```

Figure 24-3 Displayed operation log (when "SYSTEM" is specified as a parameter)

```
# show authentication logging search SYSTEM

Date 2011/02/23 06:30:42 UTC
AUT 02/23 06:30:19 WEB No=84:NORMAL:SYSTEM: Accepted commit command.
AUT 02/23 06:30:06 MAC No=270:NOTICE:SYSTEM: MAC=0013.20a5.3e2e PORT=0/22 MAC address
was force-authorized.
AUT 02/23 06:30:06 MAC No=265:NORMAL:SYSTEM: MAC=0013.20a5.3e2e Start authenticating
for MAC address.

 3 events matched.

#
```

Display items

The following shows the display format of a message. (Example: Web authentication)



(1) Log functionality type: Indicates the type of authentication functionality. (Fixed at `AUT`.)

(2) Date and time: Indicates the date and time (*month*`/`*date hour*`:`*minute*`:`*second*) an event occurred.

(3) Authentication ID: Indicates the type of Layer 2 authentication.

- `1X`: IEEE 802.1X
- `Web`: Web authentication
- `MAC`: MAC-based authentication

For the meaning of (4), (5), (6), (7), and (8) in the example message, see the following:

IEEE 802.1X:command

Web authentication: `show web-authentication logging` command

MAC-based authentication: `show mac-authentication logging` command

Impact on communication

None

Response messages

Table 24-4 List of response messages for the show authentication logging command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no logging data.	There is no log data.
There is no log data to match.	Log data matching the specified character string could not be found.
There is no memory.	There is not enough memory to collect data.

Notes

If you execute this command with the `search` parameter set and if information that matches the specified character string exists, the number of matched operation log messages is displayed at the end.

Example: 3 events matched.

clear authentication logging

Clears the operation log information for each type of Layer 2 authentication.

Syntax

```
clear authentication logging
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of clearing operation log information for Layer 2 authentication.

```
# clear authentication logging

#
```

Display items

None

Impact on communication

None

Response messages

Table 24-5 List of response messages for the clear authentication logging command

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

Notes

None

25. IEEE802.1X

show dot1x statistics
show dot1x
clear dot1x statistics
clear dot1x auth-state
reauthenticate dot1x
show dot1x logging
clear dot1x logging

show dot1x statistics

Displays statistics about IEEE 802.1X authentication.

Syntax

```
show dot1x statistics [{port <Port# list> | channel-group-number <Channel group# list> | vlan dynamic}]
```

Input mode

User mode and administrator mode

Parameters

{port *<Port# list>* | channel-group-number *<Channel group# list>* | vlan dynamic}

port *<Port# list>*

Displays statistics for port-based authentication for the physical 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# list>*

Displays statistics for port-based authentication for the channel groups specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

vlan dynamic

Displays statistics for VLAN-based authentication (dynamic).

Operation when this parameter is omitted:

Statistics for all the above types are displayed.

Example

Figure 25-1 Displaying the statistics for each port that uses IEEE 802.1X port-based authentication (static)

```
> show dot1x statistics port 0/1

Date 2008/11/17 14:36:06 UTC
[EAPOL frames]
Port 0/1   TxTotal   :        39 TxReq/Id  :        20 TxReq     :         5
           TxSuccess :        10 TxFailure :         4 TxNotify  :         0
           RxTotal   :        22 RxStart   :         5 RxLogoff  :         0
           RxResp/Id :         7 RxResp    :         5 RxInvalid :         0
           RxLenErr  :         0

[EAPoverRADIUS frames]
Port 0/1   TxTotal   :        10 TxNakResp :         0 TxNoNakRsp:        10
           RxTotal   :        10 RxAccAccpt:         5 RxAccRejct:         0
           RxAccChllg:         5 RxInvalid :         0

>
```

Figure 25-2 Displaying the statistics for each port that uses IEEE 802.1X port-based authentication (dynamic)

```
> show dot1x statistics port 0/4

Date 2008/11/17 14:36:22 UTC
[EAPOL frames]
Port 0/4   TxTotal   :        45 TxReq/Id  :        24 TxReq     :         6
```

```
(Dynamic)  TxSuccess :        12 TxFailure :         3 TxNotify  :         0
           RxTotal   :        26 RxStart   :         6 RxLogoff  :         0
           RxResp/Id :         8 RxResp    :         6 RxInvalid :         0
           RxLenErr  :         0

[EAPoverRADIUS frames]
Port 0/4   TxTotal   :        12 TxNakResp :         0 TxNoNakRsp:        12
(Dynamic)  RxTotal   :        12 RxAccAccpt:         6 RxAccRejct:         0
           RxAccChllg:         6 RxInvalid :         0

>
```

Figure 25-3 Displaying statistics for each channel group that uses IEEE 802.1X port-based authentication

```
> show dot1x statistics channel-group-number 1

Date 2008/11/17 14:39:03 UTC
[EAPOL frames]
ChGr 1     TxTotal   :         7 TxReq/Id  :         4 TxReq     :         1
           TxSuccess :         1 TxFailure :         1 TxNotify  :         0
           RxTotal   :         4 RxStart   :         2 RxLogoff  :         0
           RxResp/Id :         1 RxResp    :         1 RxInvalid :         0
           RxLenErr  :         0

[EAPoverRADIUS frames]
ChGr 1     TxTotal   :         2 TxNakResp :         0 TxNoNakRsp:         2
           RxTotal   :         2 RxAccAccpt:         1 RxAccRejct:         0
           RxAccChllg:         1 RxInvalid :         0

>
```

Figure 25-4 Displaying statistics for IEEE 802.1X VLAN-based authentication (dynamic)

```
> show dot1x statistics vlan dynamic

Date 2008/11/17 14:37:46 UTC
[EAPOL frames]
VLAN       TxTotal   :       433 TxReq/Id  :       234 TxReq     :         3
(Dynamic)  TxSuccess :       192 TxFailure :         4 TxNotify  :         0
           RxTotal   :       201 RxStart   :         4 RxLogoff  :         0
           RxResp/Id :         5 RxResp    :         3 RxInvalid :         0
           RxLenErr  :         0

[EAPoverRADIUS frames]
VLAN       TxTotal   :         6 TxNakResp :         0 TxNoNakRsp:         6
(Dynamic)  RxTotal   :         6 RxAccAccpt:         3 RxAccRejct:         0
           RxAccChllg:         3 RxInvalid :         0

>
```

Figure 25-5 Displaying statistics for all types of IEEE 802.1X authentication (port-based authentication and VLAN-based authentication)

```
> show dot1x statistics

Date 2008/11/17 14:35:33 UTC
[EAPOL frames]
Port 0/1   TxTotal   :        38 TxReq/Id  :        19 TxReq     :         5
           TxSuccess :        10 TxFailure :         4 TxNotify  :         0
           RxTotal   :        22 RxStart   :         5 RxLogoff  :         0
           RxResp/Id :         7 RxResp    :         5 RxInvalid :         0
           RxLenErr  :         0
Port 0/4   TxTotal   :        38 TxReq/Id  :        21 TxReq     :         5
(Dynamic)  TxSuccess :         9 TxFailure :         3 TxNotify  :         0
           RxTotal   :        21 RxStart   :         5 RxLogoff  :         0
```

```
            RxResp/Id :         7 RxResp    :         5 RxInvalid :         0
            RxLenErr  :         0
ChGr 1      TxTotal   :       111 TxReq/Id  :        51 TxReq     :        19
            TxSuccess :        40 TxFailure :         1 TxNotify  :         0
            RxTotal   :        87 RxStart   :        18 RxLogoff  :         0
            RxResp/Id :        29 RxResp    :        19 RxInvalid :         0
            RxLenErr  :         0
VLAN        TxTotal   :       412 TxReq/Id  :       221 TxReq     :         2
(Dynamic)   TxSuccess :       185 TxFailure :         4 TxNotify  :         0
            RxTotal   :       191 RxStart   :         3 RxLogoff  :         0
            RxResp/Id :         3 RxResp    :         2 RxInvalid :         0
            RxLenErr  :         0

[EAPoverRADIUS frames]
Port 0/1    TxTotal   :        10 TxNakResp :         0 TxNoNakRsp:        10
            RxTotal   :        10 RxAccAccpt:         5 RxAccRejct:         0
            RxAccChllg:         5 RxInvalid :         0
Port 0/4    TxTotal   :        10 TxNakResp :         0 TxNoNakRsp:        10
(Dynamic)   RxTotal   :        10 RxAccAccpt:         5 RxAccRejct:         0
            RxAccChllg:         5 RxInvalid :         0
ChGr 1      TxTotal   :        38 TxNakResp :         0 TxNoNakRsp:        38
            RxTotal   :        38 RxAccAccpt:        19 RxAccRejct:         0
            RxAccChllg:        19 RxInvalid :         0
VLAN        TxTotal   :         4 TxNakResp :         0 TxNoNakRsp:         4
(Dynamic)   RxTotal   :         4 RxAccAccpt:         2 RxAccRejct:         0
            RxAccChllg:         2 RxInvalid :         0

>
```

Display items

Table 25-1 Display items for statistics concerning IEEE 802.1X authentication

Item	Meaning
Port/ChGr/VLAN(Dynamic)	Indicates the type of authentication. `Port` *IF#*: Indicates port-based authentication (static). `Port` *IF#*`(Dynamic)`: Indicates port-based authentication (dynamic). `ChGr` *<Channel Group number>*: Indicates the channel group for port-based authentication. `VLAN(Dynamic)`: Indicates VLAN-based authentication (dynamic).
[EAPOL frames]	Statistics for EAPOL frames. For details about the items, see the following.
TxTotal	The total number of EAPOL frames that have been sent
TxReq/Id	The number of EAPOL Request/Identity frames that have been sent
TxReq	The number of EAP Request frames (excluding Identify and Notification frames) that have been sent
TxSuccess	The number of EAP Success frames that have been sent
TxFailure	The number of EAP Failure frames that have been sent
TxNotify	The number of EAP Request/Notification frames that have been sent
RxTotal	The total number of EAPOL frames (excluding RxInvalid and RxLenErr frames) that have been received

Item	Meaning
RxStart	The number of EAPOL Start frames that have been received
RxLogoff	The number of EAPOL Logoff frames that have been received
RxResp/Id	The number of EAP Response/Identity frames that have been received
RxResp	The number of EAP Response frames (excluding Identity frames) that have been received
RxInvalid	The number of invalid EAPOL frames that have been received (the number of discarded frames)#
RxLenErr	The number of invalid-length EAPOL frames that have been received (the number of discarded frames)
[EAPoverRADIUS frames]	Statistics for EAPoverRADIUS frames. For details about the items, see the following.
TxTotal	The total number of EAPoverRADIUS frames that have been sent
TxNakResp	The number of AccessRequest/EAP Response/NAK frames that have been sent
TxNoNakRsp	The number of AccessRequest/EAP Response frames (excluding NAK frames) that have been sent
RxTotal	The total number of EAPoverRADIUS frames that have been received
RxAccAccpt	The number of AccessAccept/EAP Success frames that have been received
RxAccRejct	The number of AccessReject/EAP Failure frames that have been received
RxAccChllg	The number of AccessChallenge frames that have been received
RxInvalid	The number of invalid EAPoverRADIUS frames that have been received

#: If an EAPoL frame with a tag is received and discarded, it is not counted in the number of discarded frames.

Impact on communication

None

Response messages

Table 25-2 List of response messages for the show dot1x statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Dot1x doesn't seem to be running.	The IEEE 802.1X setting has not been enabled. Check the configuration.

Message	Description
No operational Channel Group.	There are no available channel groups. Check the authentication mode set by the configuration.
No operational Port.	There are no available ports. Check the authentication mode set by the configuration.
No operational VLAN(Dynamic).	VLAN-based authentication (dynamic) was not configured. Check the authentication mode set by the configuration.

Notes

None

show dot1x

Displays status information about IEEE 802.1X authentication.

Syntax

```
show dot1x [{port <Port# list> | channel-group-number <Channel group# list> | vlan dynamic
[<VLAN ID list>]}] [detail]
```

Input mode

User mode and administrator mode

Parameters

`{port` *<Port# list>* `|` `channel-group-number` *<Channel group# list>* `|` `vlan dynamic` `[`*<VLAN ID list>*`]` `}`

`port` *<Port# list>*

Displays status information about port-based authentication for the physical 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# list>*

Displays status information about port-based authentication for the channel groups specified in list format. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

`vlan dynamic` *<VLAN ID list>*

Displays status information about VLAN-based authentication (dynamic).

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

If *<VLAN ID list>* is omitted, status information about VLAN-based authentication (dynamic) for all VLANs is displayed.

`detail`

Displays detailed information. The status information about each supplicant (user) that has already been authenticated is displayed.

Operation when all parameters are omitted:

The status information for the entire switch is displayed.

Example

Figure 25-6 Displaying the status information for the IEEE 802.1X switch (summary)

```
> show dot1x

Date 2009/10/28 10:24:10 UTCSystem 802.1X : Enabled
   AAA Authentication Dot1x   : Enabled
       Authorization Network  : Disable
       Accounting Dot1x       : Enabled
                 Auto-logout  : Enabled

Authentication Default       : RADIUS
Authentication port-list-DDD : RADIUS ra-group-3
Accounting Default           : RADIUS

Port/ChGr/VLAN     AccessControl  PortControl        Status        Supplicants
Port 0/1           ---            Auto               Authorized    1
Port 0/4(Dynamic)  Multiple-Auth  Auto               ---           1
ChGr 1             Multiple-Auth  Auto               ---           0
```

```
>
```

Figure 25-7 Displaying the status information for all types of IEEE 802.1X authentication

```
> show dot1x detail

Date 2009/10/28 10:24:25 UTCSystem 802.1X : Enabled
   AAA Authentication Dot1x   : Enabled
       Authorization Network  : Disable
       Accounting Dot1x       : Enabled
                 Auto-logout  : Enabled

Authentication Default       : RADIUS
Authentication port-list-DDD : RADIUS ra-group-3
Accounting Default           : RADIUS

Port 0/1
AccessControl  : ---                        PortControl   : Auto
Status         : Authorized                 Last EAPOL    : 0013.20a5.24ab
Supplicants    : 1 / 1                      ReAuthMode    : Disable
TxTimer        : 30                         ReAuthTimer   : 3600
ReAuthSuccess  : 0                          ReAuthFail    : 2
KeepUnauth     : 3600
Authentication : port-list-DDD
VLAN(s): 4

 Supplicants MAC  F  Status         AuthState      BackEndState   ReAuthSuccess
                     SessionTime(s) Date/Time                     SubState
 [VLAN 4]            Port(Static)  Supplicants : 1
 0013.20a5.24ab      Authorized     Authenticated  Idle           0
                     56             2009/10/28 10:23:30           Full

Port 0/4 (Dynamic)
AccessControl  : Multiple-Auth              PortControl   : Auto
Status         : ---                        Last EAPOL    : 0013.20a5.3e4f
Supplicants    : 0 / 1 / 64                 ReAuthMode    : Disable
TxTimer        : 30                         ReAuthTimer   : 3600
ReAuthSuccess  : 0                          ReAuthFail    : 1
SuppDetection  : Auto
Authentication : port-list-DDD
VLAN(s): 4,40

 Supplicants MAC  F  Status         AuthState      BackEndState   ReAuthSuccess
                     SessionTime(s) Date/Time                     SubState
 [Unauthorized]      Port(Unknown) Supplicants : 1
 0013.20a5.3e4f      Unauthorized   Connecting     Idle           0
                     53             2009/10/28 10:23:34           ---

ChGr 1
AccessControl  : Multiple-Auth              PortControl   : Auto
Status         : ---                        Last EAPOL    : 0013.20a5.24ab
Supplicants    : 0 / 0 / 64                 ReAuthMode    : Disable
TxTimer        : 30                         ReAuthTimer   : 3600
ReAuthSuccess  : 0                          ReAuthFail    : 1
SuppDetection  : Auto

>
```

Display items

Table 25-3 Display items for the status information about IEEE 802.1X authentication

Item		Meaning	Displayed information
System 802.1X		Displays the operating status of IEEE 802.1X authentication.	`Enable`: Running `Disable`: Disabled
AAA	Authentication Dot1x	Displays the operating status of authentication requests to RADIUS.	`Enable`: Enabled `Disable`: Disabled
	Authorization Network	Displays the operating status of VLAN allocation from RADIUS when VLAN-based authentication (dynamic) is used.	`Enable`: Enabled `Disable`: Disabled
	Accounting Dot1x	Displays the operating status of the accounting functionality.	`Enable`: Enabled `Disable`: Disabled
Auto-logout		Displays the operating status of automatic cancellation of authentication when non-communication monitoring is used.	`Enable`: Enabled `Disable`: Disabled
Authentication Default		Displays the default authentication method for the device. This item is not displayed if it is not set.	`RADIUS`: Indicates RADIUS authentication
Authentication *<List name>*		Displays the list name and authentication method for the authentication method list. This item is not displayed if it is not set.	`RADIUS` *<Group name>*: RADIUS server group name `RADIUS` *<Group name>*`(Not defined)`: The RADIUS server group name is invalid.
Accounting Default		Displays the accounting server setting. This item is not displayed if it is not set.	`RADIUS`: General-use RADIUS server or RADIUS server dedicated to IEEE 802.1X authentication
Port/ChGr/VLAN(Dynamic)		Indicates the type of authentication. `Port` *IF#*:Port-based authentication (static) port `Port` *<IF#>*`(Dynamic)`: Port-based authentication (dynamic) port `ChGr` *<Channel Group number>*: The channel group for port-based authentication `VLAN(Dynamic)`: Indicates VLAN-based authentication (dynamic).	
AccessControl		Displays the authentication submode set for the relevant type of authentication.	`---`: Indicates single mode. `Multiple-Auth`: Indicates terminal authentication mode.
PortControl		Displays the authentication control setting.	`Auto`: Authentication control is applied. `Force-Authorized`: Communication is always authorized. `Force-Unauthorized`: Communication is never authorized.

Item	Meaning	Displayed information
Status	Displays the authentication status of the port.	`Authorized`: Already authenticated. `Unauthorized`: Not authenticated. `---`: Terminal authentication mode
Last EAPOL	Displays the source MAC address of the last received EAPOL. `----.----.----` is displayed when authentication has not been completed.	
Supplicants (summary)	Displays the number of supplicants that have already been authenticated or assigned for authentication. The number of supplicants to be authenticated is displayed.	
Supplicants (information other than the summary)	Displays the number of supplicants that have already been authenticated or assigned for authentication. Single mode: *<number of authenticated supplicants> / <number of supplicants to be authenticated>* For terminal authentication mode: *<number of authenticated supplicants> / <number of supplicants to be authenticated> / <maximum number of supplicants within an authentication type>*	
ReAuthMode	Displays the status of the self-issuance of EAPOL Request/ID re-authentication requests.	`Enable`: Enabled `Disable`: Disabled
TxTimer	Displays the interval for sending authentication requests EAPOL Request/ID prior to authentication. *<tx_period in seconds>*	
ReAuthTimer	Displays the interval for sending EAPOL Request/ID re-authentication requests after a successful authentication. *<reauth_period in seconds>*	
ReAuthSuccess	The number of times that re-authentication has been successful	
ReAuthFail	The number of times that re-authentication has failed	
KeepUnauth	The authentication status was changed to unauthenticated status because multiple terminals were detected on a single-mode port. The time is displayed in seconds, and indicates how long the terminal remained in this status waiting for authentication processing to become available again. *<keepunauth_period in seconds>*	
SuppDetection	(For terminal authentication mode only) This item displays the mode for detecting a new terminal.	`Disable`: The detection operation is stopped. `Shortcut`: Omission mode `Auto`: Automatic detection mode
Authentication	(For port-based authentication (static or dynamic) only) This item displays the name of the authentication method list for the by-port authentication method. This item is not displayed if it is not set.	*<List name>*: The name of the authentication method list *<List name>* `(Not defined)`: The name of the authentication method list is invalid.

Item	Meaning	Displayed information
VLAN(s)	(For VLAN-based authentication (dynamic) and port-based authentication (dynamic) only) This item displays the VLAN list. Note that the list does not include VLANs registered by automatic VLAN assignment.	
VLAN(Dynamic) Supplicants	(For VLAN-based authentication (dynamic) only) This item displays the number of supplicants already authenticated.	
VLAN(Unknown)Supplicants	(For VLAN-based authentication (dynamic) only) This item displays the number of supplicants not yet authenticated.	
Port(Dynamic)Supplicants	(For port-based authentication (dynamic) only) This item displays the number of supplicants already authenticated by dynamic VLAN assignment.	
Port(Static)Supplicants	(For VLAN-based authentication (dynamic) and port-based authentication (dynamic) only) This item displays the number of supplicants already authenticated by static VLAN assignment.	
Port(Unknown)Supplicants	(For VLAN-based authentication (dynamic) and port-based authentication (dynamic) only) This item displays the number of supplicants not yet authenticated.	
Supplicant MAC	The supplicant's MAC address.	
F	*: A terminal authenticated by the forced authentication functionality. When the authentication time is updated, a displayed asterisk (*) disappears if a request is sent to the RADIUS server and the RADIUS server accepts the request.	
Status	Displays the authentication status of the supplicants.	`Authorized`: Already authenticated. `Unauthorized`: Not authenticated.
AuthState	Displays the status of authentication processing for the supplicant.	`Connecting`: The supplicant is connecting. `Authenticating`: Authentication is in progress. `Authenticated`: Authentication has been completed. `Aborting`: Authentication processing has stopped. `Held`: The authentication request has been rejected.
BackEndState	Displays the status of authentication processing for the supplicant by the RADIUS server.	`Idle`: The supplicant is waiting for processing. `Response`: The supplicant is responding to the server. `Request`: A request is being sent to the supplicant. `Success`: Authentication processing has finished successfully. `Fail`: The authentication processing failed. `Timeout`: A timeout occurred during an attempt to connect to the server.
ReAuthSuccess	Displays the number of times re-authentication was successful.	

Item	Meaning	Displayed information
SessionTime	Displays the time (in seconds for each supplicant) required to establish a session after a successful authentication.	
Date/Time	Displays the first time that authentication of the supplicant was successful.	
SubState	(For port-based authentication (static or dynamic) only) This item displays the authentication sub-status of the supplicant.	`Full`: Full access is permitted (when `AuthState` is `Authenticated`) `Protection`: Limited access is permitted (when `AuthState` is `Authenticated`) # In multistep authentication, even if the first step of terminal authentication succeeds and user authentication is being awaited in the second step, `Protection` is displayed. `---`: There is no sub-status because authentication is not complete (`AuthState` is not `Authenticated`.)

Impact on communication

None

Response messages

Table 25-4 List of response messages for the show dot1x command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Dot1x doesn't seem to be running.	The IEEE 802.1X setting has not been enabled. Check the configuration.
No operational Channel Group.	There are no available channel groups. Check the authentication mode set by the configuration.
No operational Port.	There are no available ports. Check the authentication mode set by the configuration.
No operational VLAN(Dynamic).	VLAN-based authentication (dynamic) was not configured. Check the authentication mode set by the configuration.

Notes

Information about the supplicants for which VLAN dynamic assignment failed in VLAN-based authentication (dynamic) is not displayed.

clear dot1x statistics

Clears the IEEE 802.1X authentication statistics.

Syntax

```
clear dot1x statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 25-8 Clearing IEEE 802.1X authentication statistics

```
> clear dot1x statistics

>
```

Display items

None

Impact on communication

None

Response messages

Table 25-5 List of response messages for the clear dot1x statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Dot1x doesn't seem to be running.	The IEEE 802.1X setting has not been enabled. Check the configuration.

Notes

None

clear dot1x auth-state

Initializes the IEEE 802.1X authentication status.

Syntax

```
clear dot1x auth-state [{port <Port# list> | channel-group-number <Channel group# list> | vlan
dynamic [<VLAN ID list>] | supplicant-mac <MAC>}][-f]
```

Input mode

User mode and administrator mode

Parameters

`{port` *<Port# list>* `|` `channel-group-number` *<Channel group# list>* `|` `vlan dynamic` `[`*<VLAN ID list>*`]` `|` `supplicant-mac` *<MAC>*`}`

`port` *<Port# list>*

Initializes the authentication status for the ports specified in list format for port-based authentication. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Initializes the authentication status for the channel groups specified in list format for port-based authentication. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

`vlan dynamic` *<VLAN ID list>*

Initializes the authentication status of the VLANs specified in list format for VLAN-based authentication (dynamic).

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

If *<VLAN ID list>* is omitted, the authentication status of all VLANs in VLAN-based authentication (dynamic) is initialized.

`supplicant-mac` *<MAC>*

Initializes the authentication status for the specified MAC address.

`-f`

Initializes the authentication status without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Operation when all parameters are omitted:

After confirmation message for initialization is displayed, all IEEE 802.1X authentication statuses are initialized.

Example

Figure 25-9 Initializing all IEEE 802.1X authentication statuses on a Switch

```
> clear dot1x auth-state
Do you wish to initialize all 802.1X authentication information? (y/n) : y

>
```

Display items

None

Impact on communication

If initialization is performed, the IEEE 802.1X authentication status on the relevant ports or VLANs is initialized, and communication is lost. To restore communication, re-authentication is necessary.

Response messages

Table 25-6 List of response messages for the clear dot1x auth-state command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Dot1x doesn't seem to be running.	The IEEE 802.1X setting has not been enabled. Check the configuration.
No operational Channel Group.	There are no available channel groups. Check the authentication mode set by the configuration.
No operational Port.	There are no available ports. Check the authentication mode set by the configuration.
No operational VLAN(Dynamic).	VLAN-based authentication (dynamic) was not configured. Check the authentication mode set by the configuration.
No authenticated user.	The specified unit of authentication exists, but there is no authenticated user registered.

Notes

When authentication status is initialized, EAP-Req/Id might be sent according to the specified parameter.

- If the parameter is omitted, EAP-Req/Id is multicasted once to all units of IEEE 802.1X authentication in the device.
- If the parameter is `port` *<Port# list>*, `channel-group-number` *<Channel group# list>*, or `vlan dynamic`, EAP-Req/Id is multicasted once to the specified unit of IEEE 802.1X authentication.
- If the parameter is `supplicant-mac` *<MAC>*, and if there is no authentication terminal under the IEEE 802.1X authentication to which the specified authentication terminal belongs, EAP-Req/Id is multicasted once to the unit of IEEE 802.1X authentication to which the specified authentication terminal belongs.

reauthenticate dot1x

Re-authenticates the status of IEEE 802.1X authentication. Even if re-authentication timer (reauth-period) is 0 (disabled), re-authentication is forcibly performed.

Syntax

```
reauthenticate dot1x [{port <Port# list> | channel-group-number <Channel group# list> | vlan dynamic [<VLAN ID list>]} | supplicant-mac <MAC>}] [-f]
```

Input mode

User mode and administrator mode

Parameters

`{port` *<Port# list>* `|` `channel-group-number` *<Channel group# list>* `|` `dynamic [`*<VLAN ID list>*`]} | supplicant-mac` *<MAC>*`}`

`port` *<Port# list>*

Initiates re-authentication for the ports specified in list format for port-based authentication. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Initiates re-authentication for the channel groups specified in list format for port-based authentication. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

`vlan dynamic` *<VLAN ID list>*

Re-authenticates the authentication status of the VLANs specified in list format for VLAN-based authentication (dynamic).

For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

If *<VLAN ID list>* is omitted, re-authentication for all VLANs for VLAN-based authentication (dynamic) is initiated.

`supplicant-mac` *<MAC>*

Re-authenticates the authentication status of the specified MAC address.

`-f`

Initiates re-authentication without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Operation when all parameters are omitted:

After a confirmation message for re-authentication is displayed, re-authenticates all the IEEE 802.1X authentication statuses.

Example

Figure 25-10 Re-authentication for all IEEE 802.1X-authenticated ports and VLANs on a Switch

```
> reauthenticate dot1x
Do you wish to reauthenticate all 802.1X ports and VLANs? (y/n): y

>
```

Display items

None

Impact on communication

When re-authentication is initiated, no problems with communication arise if re-authentication is successful. If re-authentication fails, however, communication will be lost.

Response messages

Table 25-7 List of response messages for the reauthenticate dot1x command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Dot1x doesn't seem to be running.	The IEEE 802.1X setting has not been enabled. Check the configuration.
No operational Channel Group.	There are no available channel groups. Check the authentication mode set by the configuration.
No operational Port.	There are no available ports. Check the authentication mode set by the configuration.
No operational VLAN(Dynamic).	VLAN-based authentication (dynamic) was not configured. Check the authentication mode set by the configuration.
No authenticated user.	The specified unit of authentication exists, but there is no authenticated user registered.

Notes

None

show dot1x logging

Displays the operation log messages collected by IEEE 802.1X authentication.

Syntax

```
show dot1x logging [search <Search string>]
```

Input mode

User mode and administrator mode

Parameters

`search` *<Search string>*

Specifies the search string.

If you specify this parameter, only information that includes the search string will be displayed.

Specify the string with 1 to 64 characters. The characters are case sensitive.

Operation when all parameters are omitted:

Displays all the operation log messages output by IEEE 802.1X.

Example

- When the parameter is omitted:

```
> show dot1x logging


Date 2009/10/20 13:09:39 UTC
AUT 10/20 13:09:39 1X  No=11:NORMAL:LOGOUT: MAC=0090.99b9.f7e2 CHGR=2
VLAN=100 Force logout. ; "clear dot1x auth-state" command succeeded.
AUT 10/20 13:09:39 1X  No=11:NORMAL:LOGOUT: MAC=0013.20a5.24ab CHGR=2
VLAN=100 Force logout. ; "clear dot1x auth-state" command succeeded.
AUT 10/20 13:09:25 1X  No=1:NORMAL:LOGIN: MAC=0090.99b9.f7e2 CHGR=2
VLAN=100 Login succeeded. ; New Supplicant Auth Success.
AUT 10/20 13:09:13 1X  No=2:NORMAL:LOGIN: MAC=0013.20a5.24ab CHGR=2
VLAN=100 Login succeeded. ; Supplicant Re-Auth Success.
AUT 10/20 13:08:52 1X  No=1:NORMAL:LOGIN: MAC=0013.20a5.24ab CHGR=2
VLAN=100 Login succeeded. ; New Supplicant Auth Success.


>
```

- Specifying `LOGOUT` for the parameter

```
> show dot1x logging search LOGOUT


Date 2009/10/20 13:09:39 UTC
AUT 10/20 13:09:39 1X  No=11:NORMAL:LOGOUT: MAC=0090.99b9.f7e2 CHGR=2
VLAN=100 Force logout. ; "clear dot1x auth-state" command succeeded.
AUT 10/20 13:09:39 1X  No=11:NORMAL:LOGOUT: MAC=0013.20a5.24ab CHGR=2
VLAN=100 Force logout. ; "clear dot1x auth-state" command succeeded.


 2 events matched.
```

>

Display items

The following shows the display format of a message.

```
AUT 05/28 10:09:50 1X No=10:NORMAL:LOGOUT: MAC=0012.e200.0001 PORT=0/1 VLAN=3 Logout succeeded.
(1)       (2)      (3) (4)    (5)    (6)                    (7)                    (8)
```

(1) Log functionality type: Indicates the type of authentication functionality. (Fixed at AUT.)

(2) Date and time: Indicates the date and time (*month*/*date hour*:*minute*:*second*) an event occurred.

(3) Authentication ID: Indicates IEEE 802.1X.

(4) Message number: Indicates the number assigned to each message shown in *Table 25-10 List of operation log messages*.

(5) Log ID: Indicates the level of the operation log message.

(6) Log type: Indicates the type of operation that outputs the log message.

(7) Additional information: Indicates supplementary information provided in the message.

(8) Message body

Operation log messages show the following information:

- Log ID/type: See *Table 25-8 Log ID and type in operation log messages*.
- Additional information: See *Table 25-9 Added info*.
- Message list: See *Table 25-10 List of operation log messages*.

Table 25-8 Log ID and type in operation log messages

Log ID	**Log type**	Description
NORMAL	LOGIN	Indicates that authentication was successful.
	LOGOUT	Indicates that authentication was canceled.
	SYSTEM	Indicates a runtime notification.
NOTICE	LOGIN	Indicates that authentication failed.
	LOGOUT	Indicates that the attempt to cancel authentication failed.
WARNING	SYSTEM	Indicates an alternate operation when a communication failure occurs.
ERROR	SYSTEM	Indicates that a communication or operation failure of the IEEE 802.1X functionality occurred.

Table 25-9 Added info

Display format	Meaning
MAC=*xxxx.xxxx.xxxx*	Indicates the MAC address.
PORT=*xx*/*xx* CHGR=*x*	Indicates the port number or channel group number
VLAN=*xxxx*	Indicates the VLAN ID.
ServerIP=*xxx.xxx.xxx*	Indicates the server IP address.

Table 25-10 List of operation log messages

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
1	NORMAL	LOGIN	Login succeeded. ; New Supplicant Auth Success.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		A new supplicant was authenticated successfully. [Action] None
			MAC, PORT or CHGR, VLAN ID#
2	NORMAL	LOGIN	Login succeeded. ; Supplicant Re-Auth Success.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		A supplicant was re-authenticated successfully. [Action] None
			MAC, PORT or CHGR, VLAN ID#
3	NORMAL	LOGIN	Login succeeded. ; Limited by ACL.
	Port-based authentication (static)		A supplicant was authenticated, but a pre-authentication filter is enabled. [Action] Clear the quarantine conditions.
			MAC, PORT or CHGR, VLAN ID
10	NORMAL	LOGOUT	Logout succeeded.
	Port-based authentication (static) Port-based		Authentication has been canceled by a request from the supplicant or because the terminal was moved. [Action] None

	authentication (dynamic) VLAN-based authentication (dynamic)		MAC, PORT or CHGR, VLAN ID#
11	NORMAL	LOGOUT	Force logout. ; "clear dot1x auth-state" command succeeded.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication has been canceled by a command. [Action] None
			MAC, PORT or CHGR, VLAN ID#
12	NORMAL	LOGOUT	Force logout. ; The supplicant was cleared, because it was registered to MAC VLAN with the configuration.
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An attempt to authenticate the relevant suppliant was canceled because a MAC address was configured for the MAC VLAN. [Action] None
			MAC, PORT or CHGR, VLAN ID#
13	NORMAL	LOGOUT	Force logout. ; The supplicant was cleared, because it was registered to mac-address-table with the configuration.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An attempt to authenticate the relevant suppliant was canceled because a MAC address was configured for mac-address-table. [Action] None
			MAC, PORT or CHGR, VLAN ID#
14	NORMAL	LOGOUT	Force logout. ; The status of port was changed to Unauthorized, because another supplicant was detection in single mode.
	Port-based authentication (static) Port-based authentication (dynamic)		The authentication status has been changed to Unauthorized because multiple supplicants were detected on a single-mode port. [Action] None
			MAC, PORT or CHGR, VLAN ID#
15	NORMAL	LOGOUT	Force logout. ; Dot1x configuration deleted.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication has been canceled because the IEEE 802.1X authentication configuration was deleted. [Action] If you want to use IEEE 802.1X authentication, configure it.
			MAC, PORT or CHGR, VLAN ID#
16	NORMAL	LOGOUT	Force logout. ; Port link down.

	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication has been canceled because the port is in the link-down state. [Action] None
			MAC, PORT or CHGR, VLAN ID[#]
17	NORMAL	LOGOUT	Force logout. ; VLAN status down.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication has been canceled because the VLAN has gone down. [Action] None
			MAC, PORT or CHGR, VLAN ID[#]
18	NORMAL	LOGOUT	Force logout. ; Re-Auth failed.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Re-authentication processing failed. [Action] None
			MAC, PORT or CHGR, VLAN ID[#]
30	NOTICE	LOGIN	Login failed. ; RADIUS authentication failed.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication of a new supplicant failed. [Action] Correctly set the user ID and password to be sent from the supplicant and the user settings on the RADIUS server.
			MAC, PORT or CHGR, VLAN ID[#]
31	NOTICE	LOGIN	Login failed. ; RADIUS authentication failed. (Re-Auth)
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Re-authentication of a supplicant failed. This log is collected due to no response from a terminal or a RADIUS authentication failure. [Action] Correctly set the user ID and password to be sent from the supplicant and the user settings on the RADIUS server.
			MAC, PORT or CHGR, VLAN ID[#]
33	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: No Tunnel-Type Attribute.)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because there was no Tunnel-Type attribute. [Action] Set the Tunnel-Type attribute in the Accept packet to be sent by the RADIUS server.
			MAC, PORT or CHGR

34	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: Tunnel-Type Attribute is not VLAN(13).)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the value of the Tunnel-Type attribute was not VLAN(13). [Action] Set the Tunnel-Type attribute in the Accept packet to be sent by the RADIUS server to VLAN(13).
			MAC, PORT or CHGR
35	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: No Tunnel-Medium-Type Attribute.)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because there was no Tunnel-Medium-Type attribute. [Action] Set the Tunnel-Medium-Type attribute in the Accept packet to be sent by the RADIUS server.
			MAC, PORT or CHGR
36	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: Tunnel-Medium-Type Attribute is not IEEE802(6).)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the value of the Tunnel-Medium-Type attribute was not IEEE 802(6). [Action] Set the Tunnel-Medium-Type attribute in the Accept packet to be sent by the RADIUS server to IEEE 802(6).
			MAC, PORT or CHGR
37	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: No Tunnel-Private-Group-ID Attribute.)`
	VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because there was no Tunnel-Private-Group-ID attribute. [Action] Set the Tunnel-Private-Group-ID attribute in the Accept packet to be sent by the RADIUS server.
			MAC, PORT or CHGR
38	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: Invalid Tunnel-Private-Group-ID Attribute.)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment has failed because an invalid value was set for the Tunnel-Private-Group-ID attribute. [Action] Check the setting of the Tunnel-Private-Group-ID attribute in the Accept packet to be sent by the RADIUS server.
			MAC, PORT or CHGR

39	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: The VLAN ID is out of range.)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the VLAN ID was not in the normal range. [Action] Check the range of the VLAN IDs set for the Tunnel-Private-Group-ID attribute in the Accept packet to be sent by the RADIUS server.
			MAC, PORT or CHGR, VLAN ID#
40	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: The Port doesn't belong to VLAN.)`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the authentication port did not belong to the VLAN ID. [Action] Make sure the VLAN ID set for the Tunnel-Private-Group-ID attribute in the Accept packet to be sent by the RADIUS server is included in the VLAN IDs set for the authentication port by the `switchport mac vlan` configuration command.
			MAC, PORT or CHGR, VLAN ID#
41	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: The VLAN ID is not set to radius-vlan.)`
	VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the VLAN ID was not subject to VLAN-based authentication (dynamic). [Action] Make sure the VLAN ID set for the Tunnel-Private-Group-ID attribute in the Accept packet to be sent by the RADIUS server is included in the VLAN IDs set by the `dot1x vlan dynamic radius-vlan` configuration command.
			MAC, PORT or CHGR, VLAN ID#
42	NOTICE	LOGIN	`Login failed. ; Failed to assign VLAN. (Reason: The VLAN status is disabled.)`
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		VLAN dynamic assignment failed because the VLAN was disabled. [Action] Execute the `state` configuration command to set the status of the VLAN to be assigned to `active`.
			MAC, PORT or CHGR, VLAN ID#
43	NOTICE	LOGIN	Login failed. ; The number of supplicants on the switch is full.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication was not available because there were too many supplicants for the Switch. [Action] Attempt authentication again when the total number of authenticated supplicants is below the capacity limit.
			MAC, PORT or CHGR, VLAN ID#

44	NOTICE	LOGIN	Login failed. ; The number of supplicants on the interface is full.
	Port-based authentication (static) Port-based authentication (dynamic)		Authentication was not available because there were too many supplicants on the interface. [Action] Attempt authentication again when the number of authenticated supplicants on the interface is below the capacity limit.
			MAC, PORT or CHGR, VLAN ID#
45	NOTICE	LOGIN	`Login failed. ; Failed to authenticate the supplicant because it could not be registered to mac-address-table.`
	Port-based authentication (static) Port-based authentication (dynamic)		Authentication failed because registration of a supplicant in mac-address-table failed. [Action] Attempt authentication again when the total number of current authentications, including those of other authentication types, is below the capacity limit.
			MAC, PORT or CHGR, VLAN ID#
46	NOTICE	LOGIN	`Login failed. ; Failed to authenticate the supplicant because it could not be registered to MAC VLAN.`
	Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication failed because the registration of a supplicant in the MAC VLAN failed. [Action] Attempt authentication again when the total number of current authentications, including those of other authentication types, is below the capacity limit.
			MAC, PORT or CHGR, VLAN ID#
47	NOTICE	LOGIN	Login failed. ; Failed to connect to RADIUS server.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication failed because an attempt to connect to the RADIUS server failed. [Action] Confirm the following: ● The RADIUS server functionality is enabled. ● Communication between the Switch and the RADIUS server is available.
			MAC, PORT or CHGR, VLAN ID#
80	WARNING	SYSTEM	Invalid EAPOL frame received.
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An invalid EAPOL frame has been received. [Action] Check whether there is any problems with the following: ● The contents of EAPOL frames sent by the supplicant ● Transmission line quality
			--

81	WARNING	SYSTEM	**Invalid EAP over RADIUS frame received.**
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An invalid EAPoverRADIUS frame has been received. [Action] Check whether there is any problems with the following: ● The contents of packets sent by the RADIUS server ● Transmission line quality
			--
82	WARNING	SYSTEM	**Failed to connect to RADIUS server.**
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An attempt to connect to the RADIUS server failed. [Action] Confirm the following: ● Communication between the Switch and the RADIUS server is available. ● The RADIUS server functionality is enabled.
			ServerIP
84	WARNING	SYSTEM	**Failed to connect to Accounting server.**
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		An attempt to connect to the accounting server failed. [Action] Confirm the following: ● The accounting server functionality is enabled. ● Communication between the Switch and the accounting server is available.
			ServerIP
301	NORMAL	LOGIN	`New Supplicant force-Authorized.`
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		The client initiated forced authentication because of a failure between RADIUS servers. [Action] None
			MAC, PORT or CHGR, VLAN ID#
310	NORMAL	LOGOUT	`Force logout. ; The supplicant was cleared, because auto-logout.`
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication of the supplicant has been canceled because a timeout was detected by non-communication monitoring. [Action] None
			MAC, PORT or CHGR, VLAN ID#
311	NORMAL	LOGOUT	`Force logout. ; Multi-step finished.`

	Port-based authentication (static) Port-based authentication (dynamic)		Authentication has been canceled because multistep authentication either succeeded or failed. [Action] None
			MAC, PORT, VLAN ID#
330	NOTICE	LOGIN	`Login failed. ; Failed to authenticate the supplicant because MAC authentication reject.`
	Port-based authentication (static) Port-based authentication (dynamic)		Authentication was not performed because MAC-based authentication failed in multistep authentication. [Action] Set the MAC address to the RADIUS server.
			MAC, PORT, VLAN ID#
331	NOTICE	LOGIN	`Login failed. ; Failed to authenticate the supplicant because authentic mode intermingled.`
	VLAN-based authentication (dynamic)		VLAN-based authentication (dynamic) failed because there were multiple authentication modes. [Action] To register in IEEE 802.1X authentication, cancel registration of the other authentication mode, and then attempt authentication again.
			MAC, PORT, VLAN ID#
332	NOTICE	LOGIN	`Login failed. ; Failed to authenticate the supplicant because it is already registered by other method.`
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		Authentication failed because the terminal had already been registered for another type of authentication. [Action] To register in IEEE 802.1X authentication, cancel registration of the other authentication mode, and then attempt authentication again.
			MAC, PORT or CHGR, VLAN ID#
370	NORMAL	SYSTEM	Received RADIUS server message.[Message]
	Port-based authentication (static) Port-based authentication (dynamic) VLAN-based authentication (dynamic)		This Reply-Message Attribute message is sent from the RADIUS server (up to 80 characters are displayed). [Action] None
			Message

#: For port-based authentication (dynamic) or VLAN-based authentication (dynamic), the VLAN ID might not be displayed until the VLAN to be accommodated has been decided.

Impact on communication

None

Response messages

Table 25-11 List of response messages for the show dot1x logging command

Message	Description
There is no logging data.	There is no log data.
There is no log data to match.	Log data matching the specified character string could not be found.
There is no memory.	There is not enough memory to collect data.

Notes

If you execute this command with the `search` parameter set and if information that matches the specified character string is found, the number of matched events is displayed at the end.

Example:3 events matched.

clear dot1x logging

Clears the operation log messages collected by IEEE 802.1X authentication.

Syntax

```
clear dot1x logging
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 25-11 Clearing IEEE 802.1X operation log messages

```
> clear dot1x logging

>
```

Display items

None

Impact on communication

None

Response messages

Table 25-12 List of response messages for the clear dot1x logging command

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

Notes

None

26. Web Authentication

set web-authentication user
set web-authentication passwd
set web-authentication vlan
remove web-authentication user
show web-authentication user
show web-authentication login
show web-authentication login select-option
show web-authentication login summary
show web-authentication logging
clear web-authentication logging
show web-authentication
show web-authentication statistics
clear web-authentication statistics
commit web-authentication
store web-authentication
load web-authentication
clear web-authentication auth-state
set web-authentication html-files
store web-authentication html-files
show web-authentication html-files
clear web-authentication html-files
show ip dhcp binding
clear ip dhcp binding
show ip dhcp conflict
clear ip dhcp conflict
show ip dhcp server statistics
clear ip dhcp server statistics

For details such as a description of the authentication modes, see the *Configuration Guide Vol. 2*.

set web-authentication user

Adds a user for Web authentication. At this time, specify the VLAN to which the user belongs.

To apply the change to the authentication information, execute the `commit web-authentication` command.

Syntax

```
set web-authentication user <Web auth user name> <Password> <VLAN ID>
```

Input mode

Administrator mode

Parameters

<Web auth user name>

Specify a user name to be registered.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

<Password>

Specify a password.

Specify 1 to 32 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

<VLAN ID>

For details about the specifiable range of values, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

- When dynamic VLAN mode is used:

  Specify the VLAN ID of the VLAN to which the user will move after authentication.

- When fixed VLAN mode is used

  Specify the VLAN ID of the VLAN to which the user requesting authentication belongs.

Example

Adding `USER01` as the user name, `123456abcde` as the password, and `4094` as the VLAN ID:

```
# set web-authentication user USER01 123456abcde 4094

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-1 List of response messages for the set web-authentication user command

Message	Description
Already user '*<Web auth user name>*' exists.	The specified user has already been registered.
The number of users exceeds 300.	The number of users to be registered exceeds 300.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

- This command cannot be used concurrently by multiple users.
- The settings are available as authentication information only after the `commit web-authentication` command has been executed.

set web-authentication passwd

Changes the password of a Web-authenticated user.

To apply the change to the authentication information, execute the `commit web-authentication` command.

Syntax

```
set web-authentication passwd <Web auth user name> <Old password> <New password>
```

Input mode

Administrator mode

Parameters

<Web auth user name>

Specify the name of the user whose password is to be changed.

<Old password>

Specify the current password.

<New password>

Specify the new password.

Specify 1 to 32 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

Example

Changing the password for user `USER01`:

```
# set web-authentication passwd USER01 123456abcde 456789abcde

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-2 List of response messages for the set web-authentication passwd command

Message	Description
The old-password is different.	The old password for the specified user is incorrect.
Unknown user '*<Web auth user name>*'.	The specified user has not been registered.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

- This command cannot be used concurrently by multiple users.

- The settings are available as authentication information only after the `commit web-authentication` command has been executed.

set web-authentication vlan

Changes the VLAN to which a Web-authenticated user belongs.

To apply the change to the authentication information, execute the `commit web-authentication` command.

Syntax

```
set web-authentication vlan <Web auth user name> <VLAN ID>
```

Input mode

Administrator mode

Parameters

<Web auth user name>

Specify the name of the user for which the VLAN is being changed.

<VLAN ID>

Specify the VLAN that is to be changed. For *<VLAN ID>*, specify the VLAN ID set by the `interface vlan` command.

For details about the specifiable range of values, see *Specifiable values for parameters*. Note that the default VLAN (VLAN ID = 1) cannot be specified for this command.

Example

Changing the VLAN to which user `USER01` belongs to `2`:

```
# set web-authentication vlan USER01 2

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-3 List of response messages for the set web-authentication vlan command

Message	Description
Unknown user '*<Web auth user name>*'.	The specified user has not been registered.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

- This command cannot be used concurrently by multiple users.
- The settings are available as authentication information only after the `commit web-authentication` command has been executed.

remove web-authentication user

Deletes a user for Web authentication.

To apply the change to the authentication information, execute the `commit web-authentication` command.

Syntax

```
remove web-authentication user {<Web auth user name> | -all} [-f]
```

Input mode

Administrator mode

Parameters

`{<Web auth user name> | -all}`

<Web auth user name>

Deletes the specified user.

`-all`

Deletes all users.

`-f`

Deletes the user without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When deleting the user `USER01`:

```
# remove web-authentication user USER01
Remove web-authentication user.  Are you sure? (y/n): y


#
```

- When deleting all users registered in the local authentication data:

```
# remove web-authentication user -all
Remove all web-authentication user.  Are you sure? (y/n): y


#
```

Display items

None

Impact on communication

None

Response messages

Table 26-4 List of response messages for the remove web-authentication user command

Message	Description
Unknown user '<*Web auth user name*>'.	The specified user has not been registered. (when a single MAC address is specified).
User does not exist.	The user was not found (when the `-all` parameter is specified).
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

The settings are available as authentication information only after the `commit web-authentication` command has been executed.

show web-authentication user

Displays the user information registered on the Switch used for Web authentication. This command can also display user information that is being entered or edited by using the following commands:

- set web-authentication user command
- `set web-authentication passwd` command
- `set web-authentication Vlan` command
- remove web-authentication user command

User information is displayed in ascending order of user name.

Syntax

```
show web-authentication user {edit | commit}
```

Input mode

Administrator mode

Parameters

{edit | commit}

edit

Displays user information being edited.

commit

Displays operating user information.

Example

- When displaying the user information being edited:

```
# show web-authentication user edit

Date 2008/11/19 07:26:27 UTC
 Total user counts: 4
 No  VLAN User name
 1    999 123
 2   4094 USER02-honsha_floor10-test1@example.com
 3    200 admin
 4    100 operator

#
```

Display items

Table 26-5 Display items of users registered for Web authentication

Item	Meaning	Displayed information
Total user counts	Total number of registered users	The number of registered users

Item	Meaning	Displayed information
#	Entry number	--
VLAN	VLAN	The VLAN set for the registered user
User name	user name	A registered user name

Impact on communication

None

Response messages

Table 26-6 List of response messages for the show web-authentication user command

Message	Description
There is no information. (edit)	There was no information in the edit area of the internal Web authentication DB.
There is no information. (commit)	There was no information in the commit area of the internal Web authentication DB.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

show web-authentication login

Displays the users currently logged in (users that have already been authenticated) in ascending order by login date and time.

Syntax

```
show web-authentication login
```

Input mode

Administrator mode

Parameters

None

Example

```
# show web-authentication login

Date 2009/03/24 17:12:13 UTC
 Dynamic VLAN mode total login counts(Login/Max):   1 / 256
  Authenticating client counts :    1
  Port roaming : Disable
   No F User name                        Port VLAN Login time          Limit
    1 * USER20-all_floor@example.com     0/20  200 2009/03/24 17:09:15 00:57:02

 Static VLAN mode total login counts(Login/Max):    1 / 1024
  Authenticating client counts :    0
  Port roaming : Disable
   No F User name                        Port VLAN Login time          Limit
    1   USER10-all_floor@example.com     0/10   10 2009/03/24 17:08:25 00:56:12

#
```

Display items

Table 26-7 Information displayed for logged-in users

Item	Meaning	Displayed information
Dynamic VLAN mode total login counts	The number of users currently logged in	`(Login / Max)`: The number of users currently logged in / the maximum number of users set for the device If a maximum number of registered users has not been set, the default value is displayed.
Static VLAN mode total login counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: Web authentication entry in legacy mode

Item	Meaning	Displayed information
#	Entry number	The entry number for an authenticated, currently logged-in user. This is just the displayed number, which changes depending on such factors as the filter conditions.
F	Forced authentication indication	*: Indicates a user logged in by using the forced authentication functionality. When the authentication time is updated, a displayed asterisk (*) disappears if a request is sent to the RADIUS server and the RADIUS server accepts the request.
User name	user name	The name of the authenticated, currently logged-in user. Up to 32 characters are displayed. (If the name exceeds 32 characters, part of the name is replaced with three periods (...).) If the authentication method by user ID is enabled, the user name is displayed without *@authentication-method-list-name*. If the user is being switched by the user switching option functionality, the user name before the switch is displayed.
Port	Port number or channel group number	The port number or channel group number at the time the authenticated, currently logged-in user logged in (legacy mode only)
VLAN	VLAN	The VLAN ID of the VLAN that is accommodating the authenticated, currently logged-in user
Login time	Login date and time	The first time the authenticated, currently logged-in user logged in *year*/*month*/*day hour*:*minute*:*second*
Limit	Remaining login time	The remaining login time (*hours*:*minutes*:*seconds*) for the currently logged-in user. When a user is logged in, the remaining time might be displayed as 00:00:00 immediately before the user is logged out due to a timeout. When the maximum connection time is set to unlimited: infinity

Impact on communication

None

Response messages

Table 26-8 List of response messages for the show web-authentication login command

Message	Description
There is no information. (web-auth login user)	Information for a Web authentication login user was not found.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

show web-authentication login select-option

Extracts a portion of the authenticated users currently logged in based on selected items and displays those users in ascending order by login date and time.

If you execute the command with the `detail` option specified, the entries being authenticated are also displayed as the entries to be extracted.

Syntax

```
show web-authentication login select-option [mode {dynamic | static}]
[port <Port# list>] [vlan <VLAN ID list>] [user <Web auth user name>] [mac <MAC>] [type force]
[detail]
```

Input mode

Administrator mode

Parameters

When this command is executed, at least one parameter must be specified. Specify at least one of the parameters.

`mode {dynamic | static}`

`dynamic`

Displays information about authenticated users currently logged in to Web authentication dynamic VLAN mode.

`static`

Displays information about authenticated users currently logged in to Web authentication static VLAN mode.

Operation when this parameter is omitted:

Information about authenticated users currently logged in to dynamic VLAN mode and in to static VLAN mode is displayed.

`port` *<Port# list>*

Displays information about authenticated users currently logged in for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`vlan` *<VLAN-ID-list>*

Displays information about authenticated users currently logged in for the specified VLAN ID. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

`user` *<Web auth user name>*

Displays information about the authenticated, currently logged-in user specified by the user name in this parameter.

`mac` *<MAC>*

Displays information about the authenticated, currently logged-in user specified by the MAC address in this parameter.

`type force`

Displays information about the users that have been authenticated by forced authentication.

`detail`

Displays detailed information that includes the MAC addresses and IP addresses of user terminals that have already been authenticated and are currently logged in as well as user terminals in the process of being authenticated.

Example 1

Figure 26-2 Displaying information when specifying ports

```
# show web-authentication login select-option port 0/10

Date 2009/03/24 17:12:22 UTC
 Static VLAN mode total login counts(Login/Max):    1 / 1024
  Authenticating client counts :    0
  Port roaming : Disable
   No F User name                        Port VLAN Login time          Limit
    1   USER10-all_floor@example.com     0/10   10 2009/03/24 17:08:25 00:56:03

#
```

Display items 1

Table 26-9 Display items for authentication status for Web authentication

Item	Meaning	Displayed information
Dynamic VLAN mode total login counts	The number of users currently logged in	`(Login / Max)`: The number of users currently logged in / the maximum number of users set for the device If a maximum number of registered users has not been set, the default value is displayed.
Static VLAN mode total login counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: Web authentication entry in legacy mode
#	Entry number	The entry number for an authenticated, currently logged-in user. This is just the displayed number, which changes depending on such factors as the filter conditions.
F	Forced authentication indication	`*`: Indicates a user logged in by using the forced authentication functionality. When the authentication time is updated, a displayed asterisk (`*`) disappears if a request is sent to the RADIUS server and the RADIUS server accepts the request.
User name	user name	The name of the authenticated, currently logged-in user. Up to 32 characters are displayed. (If the name exceeds 32 characters, part of the name is replaced with three periods (`...`).) If the authentication method by user ID is enabled, the user name is displayed without *@authentication-method-list-name*. If the user is being switched by the user switching option functionality, the user name before the switch is displayed.
Port	Port number or channel group number	The port number or channel group number at the time the authenticated, currently logged-in user logged in (legacy

Item	Meaning	Displayed information
		mode only)
VLAN	VLAN	The VLAN ID of the VLAN that is accommodating the authenticated, currently logged-in user
Login time	Login date and time	The first time the authenticated, currently logged-in user logged in *year*/*month*/*day hour*:*minute*:*second*
Limit	Remaining login time	The remaining login time (*hours*:*minutes*:*seconds*) for the currently logged-in user. When a user is logged in, the remaining time might be displayed as `00:00:00` immediately before the user is logged out due to a timeout. When the maximum connection time is set to unlimited: infinity

Example 2

Figure 26-3 Displaying detailed information about the authentication status for Web authentication

```
# show web-authentication login select-option detail

Date 2009/03/24 17:12:32 UTC
 Dynamic VLAN mode total login counts(Login/Max):   1 / 256
  Authenticating client counts :    1
  Port roaming : Disable
   No F User name
    1 * USER20-all_floor@example.com
        - MAC address                   Port VLAN Login time          Limit
          00d0.5909.7121                0/20  200 2009/03/24 17:09:15 00:56:43
  Authenticating client list
   No   User name
    1   web400
        - MAC address                   Port      Status
          00d0.5909.7121                0/21      Authenticating

 Static VLAN mode total login counts(Login/Max):    1 / 1024
  Authenticating client counts :    0
  Port roaming : Disable
   No F User name
    1   USER10-all_floor@example.com
        - MAC address    IP address     Port VLAN Login time          Limit
          0000.e28c.4add 192.168.10.254 0/10   10 2009/03/24 17:08:25 00:55:53

#
```

Display items 2

Table 26-10 Advanced information displayed for the authentication status in Web authentication

Item	Meaning	Displayed information
Dynamic VLAN mode total login	The number of users currently logged in	`(Login / Max)`: The number of users currently logged in / the maximum number of users set for the device

Item	Meaning	Displayed information
counts		If a maximum number of registered users has not been set, the default value is displayed.
Static VLAN mode total login counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: Web authentication entry in legacy mode
#	Entry number	The entry number for an authenticated, currently logged-in user. This is just the displayed number, which changes depending on such factors as the filter conditions.
F	Forced authentication indication	`*`: Indicates a user logged in by using the forced authentication functionality. When the authentication time is updated, a displayed asterisk (`*`) disappears if a request is sent to the RADIUS server and the RADIUS server accepts the request.
User name	user name	The name of the authenticated, currently logged-in user. If the authentication method by user ID is enabled, the user name is displayed without *@authentication-method-list-name*. If the user is being switched by the user switching option functionality, the user name before the switch is displayed.
MAC address	MAC address	The MAC address of the authenticated, currently logged-in user
IP address	IP address	The IP address of the authenticated, currently logged-in user. (This item is displayed for fixed VLAN mode only.)
Port	Port number or channel group number	The port number or channel group number at the time the authenticated, currently logged-in user logged in (legacy mode only)
VLAN	VLAN	The VLAN ID of the VLAN that is accommodating the authenticated, currently logged-in user
Login time	Login date and time	The first time the authenticated, currently logged-in user logged in *year*`/`*month*`/`*day hour*`:`*minute*`:`*second*
Limit	Remaining login time	The remaining login time (*hours*`:`*minutes*`:`*seconds*) for the currently logged-in user. When a user is logged in, the remaining time might be displayed as `00:00:00` immediately before the user is logged out due to a timeout. When the maximum connection time is set to unlimited:

Item	Meaning	Displayed information
		infinity
Authenticating client list	List of terminals on which authentication is being processed	Information about terminals on which Web authentication is being processed
#	Entry number	The entry number of a user for which Web authentication is being processed. This is just the displayed number, which changes depending on such factors as the filter conditions.
User name	user name	The name of a user for which authentication is currently being processed If the authentication method by user ID is enabled, the user name is displayed without *@authentication-method-list-name*.
MAC address	MAC address	The MAC address of a user terminal on which authentication is currently being processed
Port	Port number	The port number or channel group number at the time the currently logged-in user logged in (legacy mode only)
Status	Status of a terminal for which authentication is being suspended	`Authenticating`: Authentication is in progress.

Impact on communication

None

Response messages

Table 26-11 List of response messages for the show web-authentication login select-option command

Message	Description
There is no information. (web-auth login user)	Information for a Web authentication login user was not found.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

show web-authentication login summary

Displays the number of authenticated, currently logged-in users by port or by VLAN.

Syntax

```
show web-authentication login summary
{port [<Port# list>] | vlan [<VLAN ID list>]}
```

Input mode

Administrator mode

Parameters

{port [*<Port# list>*] | vlan [*<VLAN ID list>*] }

port [*<Port# list>*]

Displays the number of authenticated, currently logged-in users for the specified port. 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:

The number of authenticated, currently logged-in users is displayed for all ports.

vlan [*<VLAN ID list>*]

Displays the number of authenticated, currently logged-in users for the specified VLAN ID. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The number of authenticated, currently logged-in users is displayed for all VLANs.

Example 1

Figure 26-4 Displaying information when specifying ports

```
# show web-authentication login summary port

Date 2009/03/24 17:15:42 UTC
 Dynamic VLAN mode total login counts(Login/Max):   1 / 256
  Port roaming : Disable
   No  Port  Login /  Max
    1  0/20      1 /  256

 Static VLAN mode total login counts(Login/Max):    1 / 1024
  Port roaming : Disable
   No  Port  Login /  Max
    1  0/10      1 / 1024

#
```

Display items 1

Table 26-12 Display items for each port

Item	Meaning	Displayed information
Dynamic VLAN mode total login counts	The number of users currently logged in	`(Login / Max)`: The number of users currently logged in / the maximum number of users set for the device If a maximum number of registered users has not been set, the default value is displayed.
Static VLAN mode total login counts		
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: Web authentication entry in legacy mode
#	Entry number	The entry number for an authenticated, currently logged-in user. This is just the displayed number, which changes depending on such factors as the filter conditions.
Port	Port number or channel group number	The port number or channel group number at the time the authenticated, currently logged-in user logged in (legacy mode only)
Login	The number of logins	The number of authenticated, currently logged-in users for the port
Max	The maximum number of registered users on the port	The maximum number of users set for the port

Example 2

Figure 26-5 Displaying information for VLANs

```
# show web-authentication login summary vlan

Date 2009/03/24 17:16:42 UTC
 Dynamic VLAN mode total login counts(Login/Max):   1 / 256
  Port roaming : Disable
   No  VLAN  Login
    1   200      1

 Static VLAN mode total login counts(Login/Max):    1 / 1024
  Port roaming : Disable
   No  VLAN  Login
    1    10      1

#
```

Display items 2

Table 26-13 Items displayed for a VLAN

Item	Meaning	Displayed information
Dynamic VLAN mode total login counts	The number of users currently logged in	`(Login / Max)`: The number of users currently logged in / the maximum number of users set for the device If a maximum number of registered users has not been set, the default value is displayed.
Static VLAN mode total login counts		
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
#	Entry number	The entry number for an authenticated, currently logged-in user. This is just the displayed number, which changes depending on such factors as the filter conditions.
VLAN	VLAN	The VLAN ID of the VLAN that is accommodating the authenticated, currently logged-in user
Login	The number of logins	The number of authenticated, currently logged-in users for the port

Impact on communication

None

Response messages

Table 26-14 List of response messages for the show web-authentication login summary command

Message	Description
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.
There is no information. (web-auth login user)	The specified VLAN ID was not set for the Switch, so there was no information about Web authentication login users.

Notes

None

show web-authentication logging

Displays the operation log messages collected by the Web authentication functionality.

Syntax

```
show web-authentication logging [search <Search string>]
```

Input mode

Administrator mode

Parameters

`search` *<Search string>*

Specifies the search string.

If you specify this parameter, only information that includes the search string will be displayed.

Specify the string with 1 to 64 characters. The characters are case sensitive.

Operation when this parameter is omitted:

All the operation log messages output by Web authentication are displayed.

Example

- When the parameter is omitted:

```
# show web-authentication logging


Date 2008/11/13 10:53:27 UTC
AUT 11/13 10:53:21 WEB No=1:NORMAL:LOGIN: MAC=0000.e22b.ffdd
USER=w-groupb IP=10.10.10.1 PORT=0/6 VLAN=200 Login succeeded.
AUT 11/13 10:53:21 WEB No=266:NORMAL:SYSTEM: Received RADIUS server
message. [Group_B-Network  VLAN200]
AUT 11/13 10:53:21 WEB No=264:NORMAL:SYSTEM: USER=w-groupb
IP=10.10.10.1 Received login request.
AUT 11/13 10:52:17 WEB No=2:NORMAL:LOGOUT: MAC=0000.e22b.ffdd
USER=w-groupa IP=192.168.100.5 PORT=0/2 VLAN=100 Logout succeeded.
AUT 11/13 10:52:17 WEB No=265:NORMAL:SYSTEM: IP=192.168.100.5 Received
logout request.


#
```

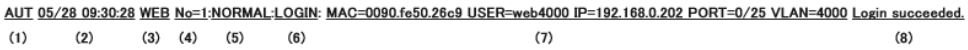
- Specifying `logout` for the parameter

```
# show web-authentication logging search "logout"


Date 2008/11/13 10:54:26 UTC
AUT 11/13 10:52:17 WEB No=265:NORMAL:SYSTEM: IP=192.168.100.5 Received
logout request.


 1 event matched.
```

```
#
```

Display items

The following shows the display format of a message.



(1) Log functionality type: Indicates the type of authentication functionality. (Fixed at AUT.)

(2) Date and time: Indicates the date and time (*month*/*date hour*:*minute*:*second*) an event occurred.

(3) Authentication ID: Indicates Web authentication.

(4) Message number: Indicates the number assigned to each message shown in *Table 26-17 List of operation log messages*.

(5) Log ID: Indicates the level of the operation log message.

(6) Log type: Indicates the type of operation that outputs the log message.

(7) Additional information: Indicates supplementary information provided in the message.

(8) Message body

Operation log messages show the following information:

- Log ID/type: See *Table 26-15 Log ID and type in operation log messages*.
- Additional information: See *Table 26-16 Added info*.
- Message list: See *Table 26-17 List of operation log messages*.

Table 26-15 Log ID and type in operation log messages

Log ID	**Log type**	Description
NORMAL	LOGIN	Indicates that login was successful.
	LOGOUT	Indicates that logout was successful.
	SYSTEM	Indicates a runtime notification.
NOTICE	LOGIN	Indicates that authentication failed.
	LOGOUT	Indicates that logout failed.
	SYSTEM	Indicates an alternate operation when a communication failure occurs.
ERROR	SYSTEM	Indicates a communication or operation failure in the Web authentication functionality occurred.

Table 26-16 Added info

Display format	**Meaning**
MAC=*xxxx.xxxx.xxxx*	Indicates the MAC address.

Display format	Meaning
USER=*xxxxxxxxxx*	Indicates the user ID.
IP=*xxx.xxx.xxx*	Indicates the IP address.
PORT=*xx*/*xx* CHGR=*x*	Indicates the port number or channel group number
VLAN=*xxxx*	Indicates the VLAN ID.

Table 26-17 List of operation log messages

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
1	NORMAL	LOGIN	`Login succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		The client was successfully authenticated. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
2	NORMAL	LOGOUT	`Logout succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		Client successfully canceled authentication. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
3	NORMAL	LOGIN	`Login update succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		The user's login time was successfully updated. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
4	NORMAL	LOGOUT	`Force logout ; clear web-authentication command succeeded.`
	Legacy Dynamic VLAN		Authentication was canceled by an operation command. [Action] None

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Fixed VLAN		MAC, USER, IP, PORT or CHGR, VLAN[#2]
5	NORMAL	LOGOUT	`Force logout ; Connection time was beyond a limit.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the maximum connection time was exceeded. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
6	NORMAL	LOGOUT	`Force logout ; mac-address-table aging.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because a MAC address was deleted due to MAC address table aging. [Action] The terminal is not in use. Check the terminal.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
7	NORMAL	LOGOUT	`Force logout ; VLAN deleted.`
	Legacy		Authentication was canceled because a VLAN for Web authentication was deleted. [Action] Check the VLAN configuration settings.
			MAC, USER
8	NORMAL	LOGOUT	`Force logout ; Authentic method changed (RADIUS <-> Local).`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the authentication method was switched. This log is collected when any of the following command settings are changed: ● `aaa authentication web-authentication` ● `web-authentication user-group` ● `web-authentication authentication` ● `aaa authentication web-authentication end-by-reject` [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
10	NOTICE	LOGIN	`Login failed ; User name not found to web authentication DB.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because the specified user ID was not registered in the internal Web authentication DB, or the number of characters for the user ID was out of range. [Action] Use the correct user ID to log in.
			USER
11	NOTICE	LOGIN	`Login failed ; Password not found to web authentication DB. [Password=[`*password*`]]`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because a password was not entered or the entered password was incorrect. [Action] Use the correct password to log in.
			USER, password
12	NOTICE	LOGIN	`Login failed ; ARP resolution.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because ARP resolution of the client PC's IP address failed. [Action] Log in again.
			USER, IP
13	NOTICE	LOGOUT	`Logout failed ; ARP resolution.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be canceled because ARP resolution of the client PC's IP address failed. [Action] Log out again.
			USER, IP
14	NOTICE	LOGIN	`Login failed ; Double login.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because another user ID had already logged in from the same client PC. [Action] Log in from another PC.
			MAC, USER
15	NOTICE	LOGIN	`Login failed ; Number of login was beyond limit.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because the number of logins exceeded the maximum allowable number. [Action] Log in again when the number of authenticated users drops low enough.
			MAC, USER
16	NOTICE	LOGIN	`Login failed ; The login failed because of hardware restriction.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because the MAC address could not be registered due to hardware limitations. There are no available hash entries. [Action] Log in from another PC.
			MAC, USER
17	NOTICE	LOGIN	`Login failed ; VLAN not specified.`
	Legacy Dynamic VLAN		Authentication could not be performed because the VLAN ID did not match the VLAN ID set for Web authentication. [Action] Set the correct VLAN ID in the configuration.
			MAC, USER, VLAN[#2]
18	NOTICE	LOGIN	`Login failed ; MAC address could not register.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because registration of the MAC address failed. [Action] Log in again.
			MAC, USER
20	NOTICE	LOGIN	`Login failed ; RADIUS authentication failed.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because RADIUS authentication failed. [Action] Use the correct user ID to log in.
			MAC, USER, IP, PORT or CHGR, VLAN[#1]
21	NOTICE	LOGIN	`Login failed ; Failed to connection to RADIUS server.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because an attempt to communicate with the RADIUS server failed. [Action] Check whether communication is possible between the Switch and the RADIUS server. After the Switch is able to communicate with the RADIUS server, log in again.
			MAC, USER, IP, PORT or CHGR, VLAN[#1]
25	NOTICE	LOGIN	`Login failed ; Double login. (L2MacManager)`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because a notification that could not be authenticated by the VLAN functionality was received. The cause is either of the following: ● The terminal for which Web authentication was performed had already been authenticated by IEEE 802.1X authentication. ● The MAC address for the terminal to be authenticated had already been registered by the `mac-address` configuration command. [Action] Use another terminal to log in.
			MAC, USER, VLAN[#2]
26	NORMAL	LOGOUT	`Force logout ; VLAN deleted.`
	Legacy Dynamic VLAN Fixed VLAN		● Legacy mode The MAC address of the user logged in to the VLAN was deleted because the VLAN set for the interface was deleted, or the VLAN mode was changed. ● Dynamic VLAN mode The MAC address of the user logged in to the VLAN was deleted because the VLAN set in the configuration was deleted. ● Fixed VLAN mode The MAC address of the user logged in to the VLAN was deleted because the VLAN set for the interface was deleted. [Action] Configure the VLAN again.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
28	NORMAL	LOGOUT	`Force logout ; Polling time out.`
	Fixed VLAN		Authentication was canceled because disconnection of an authenticated terminal was detected. [Action] None

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			MAC, USER, IP, PORT, VLAN
29	NORMAL	LOGOUT	`Force logout ; Client moved.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because it was detected that the port of an authenticated terminal was moved. [Action] Log in again.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
31	NORMAL	LOGOUT	`Force logout ; Port not specified.`
	Fixed VLAN		Authentication was canceled because the fixed VLAN mode setting was deleted from the port. [Action] Check the configuration.
			MAC, USER, IP, PORT, VLAN
32	NOTICE	LOGIN	`Login update failed.`
	Legacy Dynamic VLAN Fixed VLAN		The login time could not be updated because re-authentication of the user failed. [Action] Log in again using the correct user ID and password.
			MAC, USER, IP
33	NORMAL	LOGOUT	`Force logout ; Port link down.`
	Dynamic VLAN Fixed VLAN		The authentication of all users logged in for the port was canceled because the link for the applicable port was down. [Action] After confirming that the port status is link-up, log in again.
			MAC, USER, IP, PORT, VLAN[#2]
39	NOTICE	LOGIN	`Login failed ; VLAN not specified.`
	Fixed VLAN		Authentication could not be performed because the authentication request was sent from a VLAN that was not set for the interface. [Action] Set a correct configuration, and log in again.

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			MAC, USER, IP, PORT, VLAN
40	NORMAL	LOGOUT	`Force logout ; Ping packet accepted.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication of the user was canceled because a logout ping was received. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
41	NORMAL	LOGOUT	`Force logout ; Other authentication program.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because it was overwritten by another authentication operation. [Action] Make sure that other authentication methods are not used for login from the same terminal.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
48	NORMAL	LOGOUT	`Force logout ; Program stopped.`
	Legacy Dynamic VLAN Fixed VLAN		The authentication of all users was canceled because the Web authentication functionality stopped. [Action] To use Web authentication uninterruptedly for authentication, set the configuration.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
52	NORMAL	LOGOUT	`Force logout ; Authentic mode had changed (Legacy -> dynamic vlan).`
	Legacy		All authentications were canceled because the authentication mode changed from legacy mode to dynamic VLAN mode. [Action] None
			MAC, USER, VLAN[#2]
53	NORMAL	LOGOUT	`Force logout ; Authentic mode had changed (dynamic vlan -> Legacy).`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Dynamic VLAN		All authentications were canceled because authentication mode changed from dynamic VLAN mode to legacy mode. [Action] None
			MAC, USER, IP, PORT, VLAN[#2]
82	NORMAL	SYSTEM	`Accepted clear auth-state command.`
	Legacy Dynamic VLAN Fixed VLAN		A request issued by the `clear web-authentication auth-state` command to cancel authentication was received. [Action] None
			--
83	NORMAL	SYSTEM	`Accepted clear statistics command.`
	Legacy Dynamic VLAN Fixed VLAN		A request issued by the `clear web-authentication statistics` command to clear statistics was received. [Action] None
			--
84	NORMAL	SYSTEM	`Accepted commit command.`
	Legacy Dynamic VLAN Fixed VLAN		A commit notification issued by the `commit web-authentication` command for internal Web authentication DB was received. [Action] None
			--
98	NOTICE	LOGOUT	`Logout failed ; User is not authenticating.`
	Legacy Dynamic VLAN Fixed VLAN		Logout failed because the user had not been authenticated by Web authentication. [Action] Use the `show web-authentication login` command to check the authentication status.
			MAC
99	ERROR	SYSTEM	`Accounting failed ; RADIUS accounting.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		A response to an accounting request was not received from the RADIUS server. [Action] Check whether communication is available between the Switch and the RADIUS server.
			MAC, USER
105	NOTICE	LOGIN	`Login failed ; VLAN suspended.`
	Legacy Dynamic VLAN		An authentication error occurred because the VLAN that was to be used for the login user after authentication was in the `suspend` status. [Action] After authentication, execute the `state` command to activate the VLAN, and then log in again.
			MAC, USER, VLAN[#2]
106	NORMAL	LOGOUT	`Force logout ; VLAN suspended.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the status of VLAN for the login user changed to `suspend`. [Action] After authentication, execute the `state` command to activate the VLAN, and then log in again.
			MAC, USER, IP, PORT or CHGR, VLAN[#2]
255	ERROR	SYSTEM	`The other error.`
	Legacy Dynamic VLAN Fixed VLAN		An internal Web authentication error occurred. [Action] None
			--
256	NOTICE	LOGIN	`Login failed ; Invalid attribute received from RADIUS server.`
	Legacy Dynamic VLAN Fixed VLAN		A login attempt failed because the attribute of an Accept packet received from the RADIUS server could not be analyzed. [Action] Check the RADIUS server settings.
			MAC, USER, PORT or CHGR
260	NOTICE	LOGIN	`Login failed ; Multiple login sessions.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		A login attempt failed because duplicate authentication requests were issued. [Action] Open only one login window, and log in again. Also, press the **Login** button only once.
			MAC, USER, PORT or CHGR
264	NORMAL	SYSTEM	`Received login request.`
	Legacy Dynamic VLAN Fixed VLAN		A login request was received. [Action] None
			USER, IP
265	NORMAL	SYSTEM	`Received logout request.`
	Legacy Dynamic VLAN Fixed VLAN		A logout request was received. [Action] None
			IP
266	NORMAL	SYSTEM	`Received RADIUS server message.[`*Message*`]`
	Legacy Dynamic VLAN Fixed VLAN		This Reply-Message Attribute message is sent from the RADIUS server (up to 80 characters are displayed). [Action] None
			Message
267	NOTICE	SYSTEM	`Client was force-authorized.`
	Legacy Dynamic VLAN Fixed VLAN		Forced authentication has started because an error occurred when a request was sent to the RADIUS server. [Action] None
			MAC, USER, PORT
268	NORMAL	SYSTEM	`Client port roaming.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Dynamic VLAN Fixed VLAN		The terminal is roaming. [Action] None
			MAC, USER, PORT
269	NOTICE	LOGIN	`Login failed ; Authentic mode intermingled. (legacy vlan)`
	Legacy		Authentication failed in legacy mode because there are multiple authentication modes. [Action] Use only one authentication mode (legacy mode or dynamic VLAN mode) for one interface.
			MAC, USER, PORT or CHGR, VLAN[#2]
270	NOTICE	LOGIN	`Login failed ; login-process time out.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because a timeout occurred during authentication. [Action] Log in again.
			MAC, USER, IP
271	NOTICE	LOGIN	`Login failed ; login-process sequence error.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because the response to the PIN code from the RSA authentication server was not received within the designated waiting time. [Action] Log in again.
			MAC, USER, IP
272	NOTICE	LOGIN	`Login failed ; login-process incorrect.`
	Legacy Dynamic VLAN Fixed VLAN		A change of connection port was detected during terminal authentication. [Action] Log in again.
			MAC, USER, IP, PORT or CHGR
273	NOTICE	LOGIN	`Login failed ; login-process invalid.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed due to user invalidation because the response from the RSA authentication server was not received. [Action] Log in again.
			MAC, IP
276	NORMAL	LOGOUT	`Force logout ; Authentic method changed (single <-> multi-step).`
	Dynamic VLAN Fixed VLAN		Authentication for the port was canceled because of a switch between the single authentication and multistep authentication methods. [Action] None
			MAC, USER, IP, PORT, VLAN#2
277	NOTICE	LOGIN	`Login failed ; Multi-step failed.`
	Dynamic VLAN Fixed VLAN		Authentication failed because MAC-based authentication failed during multistep authentication. [Action] Log in again.
			MAC, USER, IP, PORT, VLAN#2
278	NORMAL	LOGOUT	`Force logout ; User replacement.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication for a logged-in user ID was canceled because another user ID logged in to the same client PC. [Action] None
			MAC, USER, IP, PORT or CHGR, VLAN#2
1xxx	NOTICE	LOGIN	`Login aborted ; <Abort reason>`
	See the last three digits for the operation log message.		Authentication processing was aborted. *xxx*: Operation log message number For details, see the description field for the operation log message number.

#1: Displayed when the mode is fixed VLAN mode.

#2: For dynamic VLAN mode or legacy mode, the VLAN ID might not be displayed until the VLAN to be accommodated is decided.

Impact on communication

None

Response messages

Table 26-18 List of response messages for the show web-authentication logging command

Message	Description
There is no logging data.	There is no operation log data.
There is no log data to match.	Log data matching the specified character string could not be found.
There is no memory.	There is not enough memory to collect data.

Notes

- Web authentication operation log messages are displayed starting from the newer messages.
- If you execute this command with the `search` parameter set and if information that matches the specified character string exists, the number of matched operation log messages is displayed at the end.

  Example: 3 events matched.

clear web-authentication logging

Clears the operation log information for Web authentication.

Syntax

```
clear web-authentication logging
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of clearing the operation log information for Web authentication.

```
# clear web-authentication logging

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-19 List of response messages for the clear web-authentication logging command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

show web-authentication

Displays the configuration for Web authentication.

Syntax

```
show web-authentication
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of displaying the configuration for Web authentication.

```
# show web-authentication

Date 2011/02/23 06:45:42 UTC
<<<Web-Authentication mode status>>>
  Dynamic-VLAN     : Enabled
  Static-VLAN      : Enabled

<<<System configuration>>>
 * Authentication parameter
  Authentic-mode   : Dynamic-VLAN
  ip address       : Disable
  web-port         : HTTP : 80(Fixed)  HTTPS : 443(Fixed)
  max-user         : 256
  user-group       : Disable
  user replacement : Disable
  roaming          : Disable
  html-files       : Default
  web-authentication vlan :

 * AAA methods
  Authentication Default       : RADIUS
  Authentication port-list-AAA : RADIUS ra-group-1
  Authentication End-by-reject : Disable
  Accounting Default           : RADIUS

 * Logout parameter
  max-timer        : 60(min)
  auto-logout      : Enabled
  logout ping      : tos-windows:   1  ttl:   1
  logout polling   : -

 * Redirect parameter
  redirect         : Enabled
  redirect-mode    : HTTPS
  tcp-port         : 80(Fixed), 443(Fixed)
  web-port         : HTTP : 80(Fixed)  HTTPS : 443(Fixed)
  jump-url         : Disable

 * Logging status
  [Syslog send]    : Disable
  [Traps]          : Disable

 * Internal DHCP sever status
```

```
  service dhcp vlan: Disable

<Port configuration>
  Port Count            : 2

  Port                  : 0/6
  VLAN ID               : 40
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 256
  HTML fileset          : FILESETXYZ

  Port                  : 0/22
  VLAN ID               : 40
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 256
  Authentication method : port-list-AAA
  HTML fileset          : FILESETXYZ

<<<System configuration>>>
 * Authentication parameter
  Authentic-mode    : Static-VLAN
  ip address        : Disable
  web-port          : HTTP : 80(Fixed)  HTTPS : 443(Fixed)
  max-user          : 1024
  user-group        : Disable
  user replacement  : Disable
  roaming           : Disable
  html-files        : Default
  web-authentication vlan : -

 * AAA methods
  Authentication Default       : RADIUS
  Authentication port-list-AAA : RADIUS ra-group-1
  Authentication End-by-reject : Disable
  Accounting Default           : RADIUS

 * Logout parameter
  max-timer         : 60(min)
  auto-logout       : Enabled
  logout ping       : tos-windows:   1  ttl:   1
  logout polling    : Enable  [ interval: 300, count: 3, retry-interval: 1 ]

 * Redirect parameter
  redirect          : Enabled
  redirect-mode     : HTTPS
  tcp-port          : 80(Fixed), 443(Fixed)
  web-port          : HTTP : 80(Fixed)  HTTPS : 443(Fixed)
  jump-url          : Disable

 * Logging status
  [Syslog send]     : Disable
  [Traps]           : Disable

 * Internal DHCP sever status
  service dhcp vlan: -

<Port configuration>
  Port Count            : 3
```

```
Port                  : 0/5
VLAN ID               : 4
Forceauth VLAN        : Disable
Access-list-No        : L2-auth
ARP relay             : Enabled
Max-user              : 1024
Authentication method : port-list-AAA
HTML fileset          : FILESETXYZ

Port                  : 0/6
VLAN ID               : 4
Forceauth VLAN        : Disable
Access-list-No        : L2-auth
ARP relay             : Enabled
Max-user              : 1024
HTML fileset          : FILESETXYZ

Port                  : 0/22
VLAN ID               : 4
Forceauth VLAN        : Disable
Access-list-No        : L2-auth
ARP relay             : Enabled
Max-user              : 1024
Authentication method : port-list-AAA
HTML fileset          : FILESETXYZ

#
```

Display items

Table 26-20 Information displayed for the Web authentication configuration

Item	Meaning	Displayed information	Mode		
			D	L	F
Dynamic-VLAN	Dynamic VLAN mode	Operating status of dynamic VLAN mode `Enable`: Enabled `Disable`: Disabled (If this item is `Disable`, the information that follows `<<<System configuration>>>` is not displayed.)	Y		N
Static-VLAN	Fixed VLAN mode	Operating status of fixed VLAN mode[#1] `Enable`: Enabled `Disable`: Disabled (If this item is `Disable`, the information that follows `<<<System configuration>>>` is not displayed.)	N		Y
* Authentication parameter					
Authentic-mode	Authentication mode	Authentication mode for the Web authentication functionality. `Dynamic-VLAN`: Indicates dynamic VLAN mode `Static-VLAN`: Indicates fixed VLAN mode	Y		Y
ip address	IP address	Web authentication IP address `Disable` is displayed when this item is not set.	Y		Y

Item	Meaning	Displayed information	Mode		
			D	L	F
fqdn	Domain name	Domain name This item is not displayed if it is not set.	Y		Y
web-port			Y		Y
HTTP	HTTP port number	The number of the HTTP communication port for the Web server Fixed at `80(Fixed)`			
HTTPS	HTTPS port number	The number of the HTTPS communication port for the Web server Fixed at `443(Fixed)`			
max-user	Maximum number of authenticated users	Maximum number of authenticated users for each device	Y		Y
user-group	Authentication method by user ID	Setting status for the user ID-based authentication method `Enable`: Enabled `Disable`: Disabled	Y[#2]		Y
user replacement	User switching option	Setting status of the user switching option `Enable`: Enabled `Disable`: Disabled	Y		Y
roaming	Roaming	Setting status for roaming `Enable`: Enabled `Disable`: Disabled	Y[#2]		Y
html-files	Window setting	Setting status of the basic Web authentication window `Default`: Default `Custom`: A window is replaced by the authentication window replacement functionality.	Y		Y
web-authentication vlan	VLAN allocated by Web authentication	VLAN ID allocated for the Web authentication dynamic VLAN mode	Y		N
* AAA methods					
Authentication Default	Default authentication method on the Switch	`Local`: Indicates local authentication `RADIUS`: Indicates RADIUS authentication `Local, RADIUS`: RADIUS authentication after local authentication `RADIUS, Local`: Local authentication after RADIUS authentication `Local` is displayed when this item is not set.	Y		Y

Item	Meaning	Displayed information	Mode		
			D	L	F
Authentication <List name>	The list name and authentication method for the authentication method list	Displays the RADIUS server group name for the authentication method list. `RADIUS` *<Group name>* `RADIUS`: Indicates RADIUS authentication *<Group name>*: RADIUS server group name `(Not defined)` is displayed after the group name if the RADIUS server group name that has been set is invalid. This item is not displayed if it is not set.	Y		Y
Authenticaion End-by-reject	Behavior when authentication is rejected	`Enable`: Authentication fails and the processing is terminated. `Disable`: Authentication is performed using the second authentication method specified by the `aaa authentication web-authentication` configuration command. `Disable` is displayed when this item is not set.	Y		Y
Accounting Default	Whether the accounting server is available	`RADIUS`: A general-use RADIUS server or a RADIUS server dedicated to Web authentication `Disable` is displayed when this item is not set.	Y		Y
* Logout parameter					
max-timer	Maximum connection time	Maximum connection time (in minutes) for a login user	Y		Y
auto-logout	Whether forced logout available	Use of the forced logout functionality based on MAC address aging in Web authentication `Enable`: Forced logout can be used. `Disable`: Forced logout cannot be used.	Y		Y
logout ping			Y		Y
tos-windows	TOS value	Conditions for the TOS value for special packet ping operations			
ttl	TTL value	Conditions for the TTL value for special packet ping operations			
logout polling	Monitoring functionality	Setting status of the functionality for monitoring the connection of an authenticated terminal `Enable`: Enabled `Disable`: Disabled	N		Y
interval	Monitoring packet sending interval	The interval for sending connection monitoring packets (in seconds)			
count	The number of monitoring packet retransmissions	The number of times connection monitoring packets retransmitted			

Item	Meaning	Displayed information	Mode		
			D	L	F
retry-interval	The interval for retransmitting monitoring packets	The interval for retransmitting connection monitoring packets (in seconds)			
* Redirect parameter					
redirect	Redirect functionality	Usage state of URL redirection in Web authentication `Enable`: Enabled `Disable`: Disabled	Y#2		Y
redirect-mode	Redirect mode	A protocol for displaying the Web authentication Login page when the URL redirect functionality is enabled	Y#2		Y
tcp-port	TCP port number	The number of the port dedicated to URL redirection `80(Fixed)`and `443(Fixed)` are always displayed.	Y#2		Y
web-port			Y#2		Y
HTTP	HTTP port number	The number of the port dedicated to URL redirection `80(Fixed)` is always displayed.			
HTTPS	HTTPS port number	The number of the port dedicated to URL redirection `443(Fixed)` is always displayed.			
jump-url	URL to jump to after authentication	URL to jump to after Web authentication is successful `Disable` is displayed when this item is not set.	Y		Y
* Logging status					
[Syslog send]	syslog	Setting status of syslog information output `Enable`: Enabled `Disable`: Disabled	Y		Y
[Traps]	Traps	SNMP trap setting status `Disable` is displayed if SNMP traps are disabled.	Y		Y
* Internal DHCP sever status					
service dhcp vlan	Setting status of the VLAN used for the internal DHCP server	Displays the VLAN for which the internal DHCP server operates. `Disable` is displayed when this item is not set.	Y		N
<Port configuration>					
Port Count	Total number of ports	Number of ports for which Web authentication is set to enabled	Y		Y

Item	Meaning	Displayed information	Mode		
			D	L	F
Port	Port information	Port number (`Legacy` is displayed after a port number if legacy mode is used.)	Y	Y	Y
VLAN ID	VLAN information	VLAN ID[#3] registered in Web authentication. `--` is displayed if this item has not been set.	Y	Y	Y
Forceauth VLAN	Forced authentication	Setting status of forced authentication in dynamic VLAN mode[#4] or legacy mode *xxxx*: Enabled. *xxxx* indicates the VLAN ID set in configuration. `VLAN unmatch`: Invalid due to an insufficient setting `Disable`: Disabled	Y	Y	N
		Setting status of forced authentication in fixed VLAN mode `Enable`: Enabled `Disable`: Disabled	N	N	Y
Access-list-No	Access Lists	Setting status of authentication IP access-group `Disable` is displayed if this item is not set.	Y	N	Y
Arp relay	ARP relay	Setting status of authentication arp-relay `Enable`: Enabled `Disable`: Disabled	Y	N	Y
Max-user	Maximum number of authenticated users	The maximum number of authenticated users on each port	Y	Y	Y
Authentication method	Authentication list name for the port-based authentication method	Displays the name of the authentication method list registered for each port. ● `(Not defined)` is displayed after the authentication method list name if the set authentication method list name is invalid. ● This item is not displayed if it is not set.	Y	N	Y
HTML fileset	File set name	Displays the file set name registered for each port. ● `(Not defined)` is displayed after the file set name if the file set name that has been set is invalid. ● `Default` is displayed if this item has not been set.	Y	N	Y

Legend:

D: Dynamic VLAN mode

L: Legacy mode

F: Fixed VLAN mode

Y: Applicable

N: Not applicable (`--` is also displayed on the screen)

#1: For details about the conditions for enabling the operating status, see *9.1.2 Procedure*

of configuration for Web authentication in the *Configuration Guide Vol. 2*.

#2: Legacy mode is not supported.

#3: VLAN IDs registered by automatic VLAN allocation are not displayed.

However, VLAN IDs are displayed if they are accommodated in the native VLAN (fixed) as the result of automatic VLAN allocation.

#4: When the `authentication force-authorized enable` command is enabled and the `authentication force-authorized vlan`

command is not set, `native vlan` is displayed.

Impact on communication

None

Response messages

Table 26-21 List of response messages for the show web-authentication command

Message	Description
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

show web-authentication statistics

Displays statistics for Web authentication.

Syntax

```
show web-authentication statistics
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of displaying statistics related to Web authentication.

```
# show web-authentication statistics

Date 2009/10/29 03:05:10 UTC
Web-Authentication Information:
  Authentication Request Total :         13
  Authentication Current Count :          1
  Authentication Error Total   :          2

RADIUS Web-Authentication Information:
[RADIUS frames]
  TxTotal   :        15  TxAccReq  :        14  TxError   :         1
  RxTotal   :        12  RxAccAccpt:        10  RxAccRejct:         2
                         RxAccChllg:         0  RxInvalid :         0
Account Web-Authentication Information:
[Account frames]
  TxTotal   :        19  TxAccReq  :        18  TxError   :         1
  RxTotal   :        18  RxAccResp :        18  RxInvalid :         0

#
```

Display items

Table 26-22 Items displayed for statistics related to Web authentication

Item	Meaning
Authentication Request Total	The total number of authentication requests
Authentication Current Count	The number of users currently authenticated
Authentication Error Total	The total number of authentication request errors
RADIUS frames	RADIUS server information
TxTotal	The total number of transmissions to the RADIUS server
TxAccReq	The total number of Access-Request packets sent to the RADIUS server
TxError	The number of errors occurring during transmission to the RADIUS server

Item	Meaning
RxTotal	The total number of receptions from the RADIUS server
RxAccAccpt	The total number of Access-Accept packets received from the RADIUS server
RxAccRejct	The total number of Access-Reject packets received from the RADIUS server
RxAccChllg	The total number of Access-Challenge packets received from the RADIUS server
RxInvalid	The total number of invalid frames received from the RADIUS server
Account frames	Accounting information
TxTotal	The total number of packets transmitted to the accounting server
TxAccReq	The total number of Accounting-Request packets sent to the accounting server
TxError	The number of errors occurring during transmission to the accounting server
RxTotal	The total number of received packets from the accounting server
RxAccResp	The total number of Accounting-Response packets received from the accounting server
RxInvalid	The total number of invalid frames received from the accounting server

Impact on communication

None

Response messages

Table 26-23 List of response messages for the show web-authentication statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

clear web-authentication statistics

Clears Web authentication statistics.

Syntax

```
clear web-authentication statistics
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of clearing Web authentication statistics:

```
# clear web-authentication statistics

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-24 List of response messages for the clear web-authentication statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

None

commit web-authentication

Stores the internal Web authentication DB in internal flash memory and reflects its contents for operation.

Syntax

```
commit web-authentication [-f]
```

Input mode

Administrator mode

Parameters

`-f`

Stores the internal Web authentication DB in internal flash memory and reflects its contents for operation. No confirmation message is displayed.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

The following shows an example of storing the internal Web authentication DB.

```
# commit web-authentication
Commitment web-authentication user data.  Are you sure? (y/n): y

Commit complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 26-25 List of response messages for the commit web-authentication command

Message	Description
Commit complete.	Storing the DB in internal flash memory and reflecting its contents for Web authentication finished normally.
Flash memory write failed.	Writing of the information to internal flash memory failed.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

The contents of the internal Web authentication DB are not overwritten during operation unless this command is executed after the following commands are executed to add, change, or delete users.

- set web-authentication user

commit web-authentication

- set web-authentication passwd
- set web-authentication vlan
- remove web-authentication user

store web-authentication

Backs up the internal Web authentication DB to a file.

Syntax

```
store web-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Backs up the internal Web authentication DB to a file on the RAMDISK.

<File name>

Specify the name of the file to which the internal Web authentication DB is to be backed up.

Specify the file name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Backs up the internal Web authentication DB to a file without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Backing up the internal Web authentication DB to the `web-DB_data` file:

```
# store web-authentication ramdisk web-DB_data
Backup web-authentication user data.  Are You sure? (y/n): y

Backup complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 26-26 List of response messages for the store web-authentication command

Message	Description
Backup complete.	A backup file has been created successfully.
Store operation failed.	The command could not be executed because of insufficient RAMDISK capacity.

Message	Description
Command information was damaged.	A backup file could not be created because the authentication information was corrupted.
Data doesn't exist.	A backup file could not be created. A commit operation might not have been executed. Execute a commit operation, and then check the result. If the commit operation fails again, the internal flash memory might be corrupted.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

All files on the RAMDISK are deleted when the device restarts. To save backup files, transfer them to a PC via FTP or use the `copy` command to copy them to the memory card.

load web-authentication

Restores the internal Web authentication DB from a backup file. Note that information registered or changed by using the following commands will be replaced by the information that is being restored:

- set web-authentication user
- set web-authentication passwd
- set web-authentication vlan
- remove web-authentication user
- commit web-authentication

Syntax

```
load web-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Restores the internal Web authentication DB from a backup file on the RAMDISK.

<File name>

Specifies the name of the backup file from which the internal Web authentication DB is to be restored.

Specify the file name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Restores the internal Web authentication DB without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Restoring the internal Web authentication DB from the `web-DB_data` file:

```
# load web-authentication ramdisk web-DB_data
Restore web-authentication user data.  Are you sure? (y/n): y

Restore complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 26-27 List of response messages for the load web-authentication command

Message	Description
Restore complete.	Restoration from the backup file was successful.
File format error.	The format of the specified backup file is different from the internal Web authentication DB.
Load operation failed.	Restoration from the backup file failed.
Flash memory write failed.	Writing of the information to internal flash memory failed.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.

Notes

1. Note that information registered or changed by using the following commands will be replaced by the information that is being restored:
   - set web-authentication user
   - set web-authentication passwd
   - set web-authentication vlan
   - remove web-authentication user
   - commit web-authentication
2. If restore information has been saved to a PC, transfer the information to the RAMDISK via FTP. If the restore information has been saved on the memory card, use the `copy` operation command to copy it to the RAMDISK. After either operation, execute the `load web-authentication` command. It is not possible to restore the files on a PC or the memory card directly.

clear web-authentication auth-state

Forcibly logs out an authenticated, currently logged-in user.

Syntax

```
clear web-authentication auth-state { user {<Web auth user name> | -all} | mac-address
<MAC>} [-f]
```

Input mode

Administrator mode

Parameters

`user {<Web auth user name> | -all }`

<Web auth user name>

Forces user logout by specifying an authenticated user that is currently logged in.

`-all`

Forces the logout of all authenticated uses that are currently logged in.

`mac-address` *<MAC>*

Forces user logout by specifying the MAC address of an authenticated user that is currently logged in.

`-f`

Forces user logout without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- Forcing logout of authenticated user `USR01` who is currently logged in:

```
# clear web-authentication auth-state user USER01
Logout user web-authentication.  Are you sure? (y/n): y
```

- Forces logout of all authenticated uses that are currently logged in:

```
# clear web-authentication auth-state user -all
Logout all user web-authentication.  Are you sure? (y/n): y
```

- Forcing logout of an authenticated user that is currently logged in by specifying the MAC address `0012.e200.0001`:

```
# clear web-authentication auth-state mac-address 0012.e200.0001
Logout user web-authentication of specified MAC address.  Are you sure?
(y/n): y
```

Display items

None

Impact on communication

Authentication for any user that is specified will be canceled.

Response messages

Table 26-28 List of response messages for the clear web-authentication auth-state command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Web-Authentication is not configured.	The Web authentication functionality is not enabled. Check the configuration.
The specified user is not login user.	The specified user is not a logged-in user.
The specified MAC address does not exist.	The specified MAC address does not exist.
User does not exist.	The user was not found

Notes

If the user is being replaced by the user switching option functionality, specify the user name used before the switch.

set web-authentication html-files

Replaces the images for Web authentication pages (such as login and logout pages), the messages output for authentication errors, and the icons displayed in the **Favorites** menu of the Web browser.

When you execute this command, specify the name of the directory in which the page images, messages, or icons to be registered are stored. Page images (such as HTML or GIF files), messages, and icons to be registered must have been created and stored in a directory on the RAMDISK beforehand. Note that if you execute this command with a new file specified, all registered information will be all cleared and the new information will take its place.

Syntax

```
set web-authentication html-files ramdisk <Directory name> [html-fileset <Name>][-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Specify a directory on the RAMDISK.

<Directory name>

Specify a directory that stores a custom file.

For details about how to specify a directory, see *Specifiable values for parameters*.

Specify the directory that stores the page images, messages, or icons to be displayed on the **Favorites** menu of the Web browser that you want to register.

Page images, messages, and icons to be displayed in the **Favorites** menu of the Web browser that you want to register must be stored on the RAMDISK according to the following conditions:

- There must be no subdirectories in the specified directory.
- There must be a `login.html` file in the specified directory.
- Specify the file names of the page images, messages, and icons to be registered as follows:

  Login page: `login.html`

  Authentication-in-progress page: loginProcess.html

  Login success page: `loginOK.html`

  Login failed page: `loginNG.html`

  Logout page: `logout.html`

  Logout success page: `logoutOK.html`

  Logout failed page: `logoutNG.html`

  Authentication error messages: `webauth.msg`

  Icons to be displayed on the **Favorites** menu of the Web browser: `favicon.ico`

  Other stored files, such as GIF files, can have any name.

`html-fileset` *<Name>*

Specify the custom file set name that holds the files for individual Web authentication

pages.

Specify the name with 1 to 16 characters. Use only uppercase alphanumeric characters.

Operation when this parameter is omitted:

The basic Web authentication page is replaced with the custom file set.

`-f`

Replaces pages, messages, and icons without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When a confirmation message is displayed:

```
# set web-authentication html-files ramdisk "web-file"
Do you wish to install new html-files? (y/n): y
executing...
Install complete.
```

- When a confirmation message is not displayed:

```
# set web-authentication html-files ramdisk "web-file" -f
executing...
Install complete.
```

Display items

None

Impact on communication

None

Response messages

Table 26-29 List of response messages for the set web-authentication html-files command

Message	Description
Can't execute.	The command could not be executed. Clear all registered information by using the `clear` command, and then try again.
Can't put a sub directory in the directory.	The specified directory contains a subdirectory.
Directory size over.	The capacity of the specified directory exceeds the limit (256 KB).
File name is too long.	The total number of characters in a directory name and its subordinate file name exceeds the limit of 64 characters.

Message	Description
File name 'xxx' is reserved.	The file name *xxx* is a reserved word and cannot be used. The following files are included in the directory specified for *<Directory name>*. ● `auth` ● `wol` Use the `del` command to delete both of the files in this directory, and then try again.
Install operation failed.	An attempt to register the file failed.
No login.html file in the directory.	There is no `login.html` file in the specified directory.
No such directory.	The specified directory does not exist.
The number of html-filesets exceeds 4.	The number of the registered custom file sets exceeds 4.
Too many files.	The number of files exceeds the limit of 64.

Notes

- This command does not check the contents of the HTML files. If the contents of the specified file are incorrect, login and logout operations for Web authentication might not be possible.
- This command can be executed regardless of whether or not the configuration command for Web authentication has been set.
- The pages, messages, and icons registered by this command remain in use if the device is restarted.
- For details about the total size of files and the number of the files that can be registered, see *3.2 Capacity Limit* in the *Configuration Guide Vol. 1*.
- An error occurs if the specified directory contains a subdirectory or if the `login.html` file does not exist.
- The default Web page is displayed while this command is being executed.
- An error occurs if the total number of characters in a directory name and its subordinate file name exceeds 64.
- You can register no more than 4 custom file set names.
- In dynamic VLAN mode or legacy mode, when the `loginOK.html` file is associated with any other file, the login success page might not be displayed successfully.

store web-authentication html-files

Retrieves the images of Web authentication pages (such as login and logout pages), the messages output for authentication errors, and the icons displayed on the **Favorites** menu of the Web browser, all of which are in current use, and stores them in any directory on the RAMDISK. Related files are also retrieved at the same time. Specific files cannot be specified.

Syntax

```
store web-authentication html-files ramdisk <Directory name> [html-fileset <Name>][-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Specifies the RAMDISK.

<Directory name>

Specify the directory that holds the applicable files.

For details about how to specify a directory, see *Specifiable values for parameters*.

`html-fileset` *<Name>*

Specify the name of the custom file set configured for an individual Web authentication page.

Files related to the specified custom file set are also retrieved at the same time.

Operation when this parameter is omitted:

The files related to the file set configured for the basic Web authentication page are retrieved at the same time.

`-f`

Stores the pages, messages, and icons without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When a confirmation message is displayed:

```
# store web-authentication html-files ramdisk "web-file"
Do you wish to store html-files? (y/n): y
executing...
Store complete.
```

- When a confirmation message is not displayed:

```
# store web-authentication html-files ramdisk "web-file" -f
executing...
Store complete.
```

Display items

None

Impact on communication

None

Response messages

Table 26-30 List of response messages for the store web-authentication html-files command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
Directory isn't empty.	The specified directory is not empty. Make sure there is no files or subdirectories in the directory.
File name is too long.	The total number of characters in a directory name and its subordinate file name exceeds the limit of 64 characters.
No such directory.	The specified directory does not exist.
No such html-fileset 'xxx'.	The specified custom file set was not found. *xxx*: Custom file set name
Store complete.	File retrieval was completed successfully.

Notes

- This command can be executed regardless of whether or not the configuration command for Web authentication has been set.
- An error occurs if the specified directory contains a file or subdirectory.
- The default page and the registered page are not distinguished with regard to the page image file.
- If the free capacity on the RAMDISK is insufficient (256 KB or more), use the `del` command to delete unnecessary files and then create a directory.
- An error occurs if the total number of characters in a directory name or subordinate file name exceeds 64. Check the file names by using the `show web-authentication html-files` command.

show web-authentication html-files

Displays the size of the file (in bytes) registered by the `set web-authentication html-files` command and the date and time registered. If no file has been registered, that the default setting is being used is displayed.

Syntax

```
show web-authentication html-files [detail]
```

Input mode

Administrator mode

Parameters

`detail`

Specify this parameter if you want to display information about individual files that are not the HTML file, msg (message) file, and ico (icon) file (such as GIF files).

Operation when this parameter is omitted:

Information about files other than the HTML file, msg file, and ico file is displayed collectively as `the other files`.

Example

The following shows examples of displaying the size of the file (in bytes) registered by the `set web-authentication html-files` command and the date and time the file was registered.

- When the parameter is omitted:

```
# show web-authentication html-files


Date 2009/10/29 02:59:53 UTC
    Total Size :          50,356


    File Date         Size Name
    2009/10/29 02:12       1,507 login.html      <---1
    2009/10/29 02:12       1,307 loginProcess.html
    2009/10/29 02:12       1,260 loginOK.html
    2009/10/29 02:12         666 loginNG.html
    2009/10/29 02:12         937 logout.html
    2009/10/29 02:12         586 logoutOK.html
    2009/10/29 02:12         640 logoutNG.html
    2009/10/29 02:12         545 webauth.msg
    default now                0 favicon.ico     <---2
    2009/10/29 02:12      17,730 the other files
    < FILESETXYZ >                          <------3
    2009/10/29 02:14       1,507 login.html
    2009/10/29 02:14       1,307 loginProcess.html
    2009/10/29 02:14       1,260 loginOK.html
```

```
    2009/10/29 02:14          666 loginNG.html
    2009/10/29 02:14          937 logout.html
    2009/10/29 02:14          586 logoutOK.html
    2009/10/29 02:14          640 logoutNG.html
    2009/10/29 02:14          545 webauth.msg
    default now                 0 favicon.ico
    2009/10/29 02:14       17,730 the other files

#
```

1. Displays the time required to register the basic Web authentication page custom file set.
2. For the default status, `default now` is displayed.
3. Displayed when the individual Web authentication page custom file set is registered.

- Specifying `detail` parameter (information about individual files that are not the HTML file, msg file, or ico file is displayed):

```
# show web-authentication html-files detail

Date 2009/10/29 02:59:56 UTC
    Total Size :          50,356

    File Date          Size Name
    2009/10/29 02:12       1,507 login.html
    2009/10/29 02:12       1,307 loginProcess.html
    2009/10/29 02:12       1,260 loginOK.html
    2009/10/29 02:12         666 loginNG.html
    2009/10/29 02:12         937 logout.html
    2009/10/29 02:12         586 logoutOK.html
    2009/10/29 02:12         640 logoutNG.html
    2009/10/29 02:12         545 webauth.msg
    default now                 0 favicon.ico
    2009/10/29 02:12       8,441 IMAGE001.JPG
    2009/10/29 02:12       5,528 IMAGE002.JPG
    2009/10/29 02:12       3,761 IMAGE003.GIF
    < FILESETXYZ >
    2009/10/29 02:14       1,507 login.html
    2009/10/29 02:14       1,307 loginProcess.html
    2009/10/29 02:14       1,260 loginOK.html
    2009/10/29 02:14         666 loginNG.html
    2009/10/29 02:14         937 logout.html
    2009/10/29 02:14         586 logoutOK.html
    2009/10/29 02:14         640 logoutNG.html
```

```
                2009/10/29 02:14         545 webauth.msg
                default now                0 favicon.ico
                2009/10/29 02:14       8,441 IMAGE001.JPG
                2009/10/29 02:14       5,528 IMAGE002.JPG
                2009/10/29 02:14       3,761 IMAGE003.GIF

              #
```

Display items

None

Impact on communication

None

Response messages

Table 26-31 List of response messages for the show web-authentication html-files command

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

Notes

This command can be executed regardless of whether or not the configuration command for Web authentication has been set.

clear web-authentication html-files

Deletes the Web authentication pages registered by the `set web-authentication html-files` command, messages, and icons, and reverts to the default file set.

Syntax

```
clear web-authentication html-files [{html-fileset <Name> | -all}][-f]
```

Input mode

Administrator mode

Parameters

`{html-fileset <Name> | -all}`

`html-fileset <Name>`

Deletes the custom file set for the specified individual Web authentication page.

`-all`

Deletes all custom file sets for individual Web authentication pages.

The basic Web authentication page reverts to the default file set.

Operation when this parameter is omitted:

The basic Web authentication page reverts to the default file set.

`-f`

Deletes the pages, messages, and icons without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When a confirmation message is displayed:

```
# clear web-authentication html-files
Do you wish to clear registered html-files and initialize? (y/n): y
executing...
Clear complete.

#
```

- When a confirmation message is not displayed:

```
# clear web-authentication html-file -f
executing...
Clear complete.

#
```

Display items

None

Impact on communication

None

Response messages

Table 26-32 List of response messages for the clear web-authentication html-files command

Message	Description
Can't clear because it is default now.	The file could not be deleted because it had default status.
Can't execute.	The command could not be executed. Re-execute the command.
Clear operation failed.	An attempt to delete the file failed.
No such html-fileset 'xxx'.	The specified custom file set was not found. *xxx*: Custom file set name

Notes

This command can be executed regardless of whether or not the configuration command for Web authentication has been set.

show ip dhcp binding

Displays the binding information on the DHCP server.

Syntax

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

Input mode

User mode and administrator mode

Parameters

{*<IP address>* | sort}

<IP address>

Displays the binding information for the specified IP address.

sort

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

Operation when this parameter is omitted:

Displays all binding information on the DHCP server without sorting.

Example

Figure 26-6 Execution result of displaying binding information on the DHCP server

```
> show ip dhcp binding

Date 2008/11/26 09:29:33 UTC
 No  IP Address        MAC Address      Lease Expiration       Type
 1   192.168.100.1     00d0.5909.7121   2008/11/26 10:29:16    Automatic

>
```

Display items

Table 26-33 Items displayed for the binding information on the DHCP server

Item	Meaning	Displayed information
#	Entry number	--
IP Address	Current IP address connected to the DHCP server	--
MAC Address	MAC address	--
Lease Expiration	Lease expiration date and time	*year*/*month*/*day* *hour*:*minute*:*second* `--` is displayed when this item is set to infinity.
Type	Connection type	`Automatic` (fixed)

Impact on communication

None

Response messages

Table 26-34 List of response messages for the show ip dhcp binding command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No such IP Address.	The specified IP address could not be found.
There is no information. (binding)	There is no binding information.

Notes

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

clear ip dhcp binding

Deletes the binding information from the DHCP server database.

Syntax

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

Input mode

User mode and administrator mode

Parameters

{*<IP address>* | all}

<IP address>

Deletes binding information for the specified IP address.

all

All IP addresses in the binding information are deleted.

Operation when this parameter is omitted:

All IP addresses in the binding information are deleted.

Example

Figure 26-7 Execution result of deleting all IP addresses in the binding information

```
> clear ip dhcp binding all

>
```

Display items

None

Impact on communication

None

Response messages

Table 26-35 List of response messages for the clear ip dhcp binding command

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

Notes

None

show ip dhcp conflict

Displays an IP address conflict detected by the DHCP server. An IP address conflict refers to an IP address assigned to a terminal over the network, although it is blank as a pool IP address on the DHCP server. An IP address conflict is detected by the DHCP DECLINE packet received from the client that detected the collision, or as a result of duplication of the IP address and the IP address for the VLAN that defines DHCP.

Syntax

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

Input mode

User mode and administrator mode

Parameters

<IP address>

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

Operation when this parameter is omitted:

All IP address conflict information detected by the DHCP server is displayed.

Example

Figure 26-8 Execution result of displaying IP address conflict information detected by the DHCP server

```
> show ip dhcp conflict

Date 2008/11/26 09:29:36 UTC
 No  IP Address        Detection Time
 1   192.168.100.200   2008/11/26 09:27:55
 2   192.168.100.6     2008/11/26 09:28:57

>
```

Display items

Table 26-36 Items displayed for IP address conflict information detected by DHCP server

Item	Meaning	Displayed information
#	Entry number	--
IP Address	IP address conflict detected by the DHCP server	--
Detection Time	Detection time	*year*/*month*/*day* *hour*:*minute*:*second*

Impact on communication

None

Response messages

Table 26-37 List of response messages for the show ip dhcp conflict command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No such IP Address.	The specified IP address could not be found.
There is no information. (conflict)	There is no IP address conflict information.

Notes

None

clear ip dhcp conflict

Clears the IP address conflict information from the DHCP server.

Syntax

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

Input mode

User mode and administrator mode

Parameters

{<*IP address*> | all}

<*IP address*>

Deletes IP address conflict information for the specified IP address.

all

All IP address conflict information is deleted.

Operation when this parameter is omitted:

All IP address conflict information is deleted.

Example

Figure 26-9 Execution result of deleting all IP address conflict information detected by the DHCP server

```
> clear ip dhcp conflict all

>
```

Display items

None

Impact on communication

None

Response messages

Table 26-38 List of response messages for the clear ip dhcp conflict command

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

Notes

An entry that duplicates the local IP address cannot be cleared.

show ip dhcp server statistics

Displays statistics about the DHCP server.

Syntax

```
show ip dhcp server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 26-10 Execution result of displaying DHCP server statistics

```
> show ip dhcp server statistics

Date 2009/04/13 09:31:14 UTC
   < DHCP Server use statistics >
     address pools          : 252
     automatic bindings     : 1
     expired bindings       : 1
     over pools request     : 0
     discard packets        : 0
   < Receive Packets >
     DHCPDISCOVER           : 8
     DHCPREQUEST            : 4
     DHCPDECLINE            : 2
     DHCPRELEASE            : 1
     DHCPINFORM             : 1
   < Send Packets >
     DHCPOFFER              : 8
     DHCPACK                : 4
     DHCPNAK                : 0

>
```

Display items

Table 26-39 Items displayed for the DHCP server statistics

Item	Meaning	Displayed information
< DHCP Server use statistics >	Statistics about the DHCP server	--
address pools	Number of pooled IP addresses (the number of remaining IP addresses)	--
automatic bindings	Number of automatic bindings	--
expired bindings	Number of completed releases	--
over pools request	Number of insufficient pooled IP addresses that has been detected	--

Item	Meaning	Displayed information
discard packets	Number of discarded packets	--
< Receive Packets >	The number of received packets	--
DHCPDISCOVER	Number of received DHCPDISCOVER packets	--
DHCPREQUEST	Number of received DHCPREQUEST packets	--
DHCPDECLINE	Number of received DHCPDECLINE packets	--
DHCPRELEASE	Number of received DHCPRELEASE packets	--
DHCPINFORM	Number of received DHCPINFORM packets	--
< Send Packets >	Send packet information	--
DHCPOFFER	Number of sent DHCPOFFER packets	--
DHCPACK	Number of sent DHCPACK packets	--
DHCPNAK	Number of sent DHCPNAK packets	--

Impact on communication

None

Response messages

Table 26-40 List of response messages for the show ip dhcp server statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
DHCP Server is not configured.	A DHCP server has not been configured. Check the configuration.

Notes

None

clear ip dhcp server statistics

Clears the DHCP server statistics.

Syntax

```
clear ip dhcp server statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 26-11 Result of executing the command for clearing DHCP statistics

```
> clear ip dhcp server statistics

>
```

Display items

None

Impact on communication

None

Response messages

Table 26-41 List of response messages for the clear ip dhcp server statistics command

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

Notes

None

27. MAC-based Authentication

show mac-authentication auth-state
clear mac-authentication auth-state
show mac-authentication auth-state select-option
show mac-authentication auth-state summary
show mac-authentication login
show mac-authentication login select-option
show mac-authentication login summary
show mac-authentication logging
clear mac-authentication logging
show mac-authentication
show mac-authentication statistics
clear mac-authentication statistics
set mac-authentication mac-address
remove mac-authentication mac-address
show mac-authentication mac-address
commit mac-authentication
store mac-authentication
load mac-authentication

For details such as a description of the authentication modes, see the *Configuration Guide Vol. 2*.

show mac-authentication auth-state

Displays information about the terminals (MAC address) that have been authenticated in ascending order by authenticated date and time.

Syntax

```
show mac-authentication auth-state
```

Input mode

Administrator mode

Parameters

None

Example

```
# show mac-authentication auth-state

Date 2009/03/24 17:14:56 UTC
 Dynamic VLAN mode total client counts(Login/Max):   1 / 256
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No F MAC address     Port VLAN  Login time            Limit     Reauth
    1 * 00d0.5909.7121  0/20  200  2009/03/24 17:14:55   infinity    3598

 Static VLAN mode total client counts(Login/Max):    1 / 1024
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No F MAC address     Port VLAN  Login time            Limit     Reauth
    1   0000.e28c.4add  0/10   10  2009/03/24 17:14:38   infinity    3582

#
```

Display items

Table 27-1 Items displayed for the authenticated terminal information

Item	Meaning	Displayed information
Dynamic VLAN mode total client counts	The number of currently authenticated terminals	`(Login / Max)`: The number of currently authenticated terminals / the maximum number of registered terminals set for the device
Static VLAN mode total client counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Hold down client counts	The number of terminals on which authentication has been suspended	--

Item	Meaning	Displayed information
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: MAC-based authentication entries in legacy mode
#	Entry number	The entry number for a currently authenticated terminal. This is just the displayed number, which changes depending on such factors as the filter conditions.
F	Forced authentication indication	`*`: A terminal authenticated by the forced authentication functionality. After the authentication state is canceled, the displayed asterisk (`*`) disappears if the RADIUS server accepts a request.
MAC address	MAC address	The MAC address of the currently authenticated terminal
Port	Port number	The number of the port used when the currently authenticated terminal was authenticated
VLAN	VLAN	The VLAN in which the currently authenticated terminal is accommodated
Login time	Date and time authentication was successful	The first time the currently authenticated terminal was authenticated (*year*`/`*month*`/`*day hour*`:`*minute*`:`*second*)
Limit	Remaining time for authentication	The remaining time for the authenticated state of the currently authenticated terminal (*hour*`:`*minute*`:`*second*). When a terminal is authenticated, the remaining time might be displayed as `00:00:00` immediately before authentication for the terminal is canceled due to a timeout. When the maximum connection time is set to unlimited: infinity (If this has not been configured, the default value is displayed.))
Reauth	Remaining time for re-authentication	The remaining time until re-authentication is performed (in seconds). `--` is displayed if re-authentication is disabled. When a terminal is authenticated, the remaining time might be displayed as `0` immediately before authentication for the terminal is canceled due to a timeout.

Impact on communication

None

Response messages

Table 27-2 List of response messages for the show mac-authentication auth-state command

Message	Description
There is no information. (mac auth-state)	There is no MAC address authenticated by MAC-based

Message	Description
	authentication.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

The input format and the information that is displayed are the same as that displayed by the description of the *show mac-authentication login* command.

clear mac-authentication auth-state

Forces cancellation of the authentication of a currently authenticated terminal.

Syntax

```
clear mac-authentication auth-state mac-address {<MAC> | -all} [-f]
clear mac-authentication auth-state {<MAC> | -all}[-f]
```

Input mode

Administrator mode

Parameters

`mac-address {<MAC> | -all}`

`{<MAC> | -all}`

<MAC>

Forces cancellation of the authentication of the currently authenticated terminal with the specified MAC address.

Specify the MAC address.

`-all`

Forces cancellation of the authentication for all currently authenticated terminals.

`-f`

Forces cancellation of the authentication for the specified MAC address without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- Forcing cancellation of the authentication of the currently authenticated terminal with the specified MAC address:

```
# clear mac-authentication auth-state mac-address 0012.e212.3345
Do you wish to clear the authenticated MAC? (y/n): y
```

- Forcing cancellation of the authentication of all currently authenticated terminals:

```
# clear mac-authentication auth-state mac-address -all
Do you wish to clear the all authenticated MAC? (y/n): y
```

Display items

None

Impact on communication

Authentication for the specified terminal will be canceled.

Response messages

Table 27-3 List of response messages for the clear mac-authentication auth-state command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
The specified MAC address does not exist.	The specified terminal (MAC address) does not exist (when a single MAC address is specified).
MAC address does not exist.	No terminals (MAC addresses) exist (when the `-all` parameter is specified).
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

None

show mac-authentication auth-state select-option

Extracts specified items from the information about the currently authenticated terminals (MAC address) and displays them in ascending order by authentication date and time.

Note that if you execute the command with the `detail` option specified, entries in the process of authentication and entries for which authentication processing has been suspended are also displayed as extracted entries.

Syntax

```
show mac-authentication auth-state select-option [mode {dynamic | static}]
[port <Port# list>] [vlan <VLAN ID list>] [mac <MAC>] [type force] [detail]
```

Input mode

Administrator mode

Parameters

When this command is executed, at least one parameter must be specified. Specify at least one of the parameters.

`mode {dynamic | static}`

`dynamic`

Displays information about terminals that have been authenticated in MAC-based authentication dynamic VLAN mode.

`static`

Displays information about terminals that have been authenticated in MAC-based authentication fixed VLAN mode.

Operation when this parameter is omitted:

Information about terminals authenticated in both dynamic VLAN mode and fixed VLAN mode is displayed.

`port` *<Port# list>*

Displays information about authenticated terminals for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`vlan` *<VLAN-ID-list>*

Displays information about authenticated terminals for the specified VLAN ID. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

`mac` *<MAC>*

Displays information about authenticated terminals for the specified MAC address.

`type force`

Displays information about terminals that have been authenticated by forced authentication.

`detail`

Displays detailed information, including information about terminals that have been authenticated, terminals in the process of being authenticated, and terminals for which authentication processing has been suspended due to authentication failure.

Example 1

Figure 27-2 Displaying information about authenticated terminals for the specified port

```
# show mac-authentication auth-state select-option port 0/20
```

```
Date 2009/03/24 17:15:14 UTC Dynamic VLAN mode total client counts(Login/Max):   1 /
256
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No F MAC address     Port VLAN  Login time            Limit     Reauth
    1 * 00d0.5909.7121  0/20  200  2009/03/24 17:14:55   infinity    3580

#
```

Display items 1

Table 27-4 Items displayed for the authenticated terminal information

Item	Meaning	Displayed information
Dynamic VLAN mode total client counts	The number of currently authenticated terminals	`(Login / Max)`: The number of currently authenticated terminals / the maximum number of registered terminals set for the device
Static VLAN mode total client counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Hold down client counts	The number of terminals on which authentication has been suspended	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: MAC-based authentication entries in legacy mode
#	Entry number	The entry number for a currently authenticated terminal. This is just the displayed number, which changes depending on such factors as the filter conditions.
F	Forced authentication indication	`*`: A terminal authenticated by the forced authentication functionality. After the authentication state is canceled, the displayed asterisk (`*`) disappears if the RADIUS server accepts a request.
MAC address	MAC address	The MAC address of the currently authenticated terminal
Port	Port number	The number of the port used when the currently authenticated terminal was authenticated
VLAN	VLAN	The VLAN in which the currently authenticated terminal is accommodated
Login time	Date and time authentication was successful	The first time the currently authenticated terminal was authenticated (*year*`/`*month*`/`*day hour*`:`*minute*`:`*second*)

Item	Meaning	Displayed information
Limit	Remaining time for authentication	The remaining time for the authenticated state of the currently authenticated terminal (*hour*:*minute*:*second*). When a terminal is authenticated, the remaining time might be displayed as `00:00:00` immediately before authentication for the terminal is canceled due to a timeout. When the maximum connection time is set to unlimited: infinity (If this has not been configured, the default value is displayed.))
Reauth	Remaining time for re-authentication	The remaining time until re-authentication is performed (in seconds). `--` is displayed if re-authentication is disabled. When a terminal is authenticated, the remaining time might be displayed as `0` immediately before authentication for the terminal is canceled due to a timeout.

Example 2

Figure 27-3 Displaying the detailed authentication status of MAC-based authentication

```
# show mac-authentication auth-state select-option detail

Date 2009/03/24 18:31:52 UTC Dynamic VLAN mode total client counts(Login/Max):   1 /
256
  Authenticating client counts :    1                                    |
  Hold down client counts      :    1                                    |(A)
  Port roaming : Disable                                                 |
   No F MAC address     Port VLAN  Login time            Limit     Reauth|
    1 * 00d0.5909.7121  0/20  200  2009/03/24 17:14:55   infinity    3580|
    Authenticating client list
        MAC address     Port       Status
        00d0.5909.7121  0/21       Authenticating
  Hold down client list
        MAC address     Port       Status                Remaining
        0000.e28c.4add  0/5        Failed (RADIUS fail)  00:04:56

 Static VLAN mode total client counts(Login/Max):    1 / 1024
  Authenticating client counts :    1                                    |
  Hold down client counts      :    1                                    |(A)
  Port roaming : Disable                                                 |
   No F MAC address     Port VLAN  Login time            Limit     Reauth|
     1   0000.e28c.4add  0/10   10  2009/03/24 17:14:38   infinity    3582|
  Authenticating client list
        MAC address     Port VLAN  Status
        0000.e227.8bf6  0/8  4000  Authenticating
  Hold down client list
        MAC address     Port VLAN  Status                Remaining
        0000.e227.8bf7  0/8  4000  Failed (refused)      00:00:59

#
```

Display items 2

Table 27-5 Items displayed for the detailed authentication status of MAC-based authentication

Item	Meaning	Displayed information
The explanation of (A) is the same as in *Display items 1*. See *Table 27-4 Items displayed for the authenticated terminal information*.		
Authenticating client list	List of terminals on which authentication is being processed	Information about terminals for which MAC-based authentication is being processed
MAC address	MAC address	MAC address of a terminal for which MAC-based authentication is being processed.
Port	Port number	Connection port number for a terminal for which MAC-based authentication is being processed.
VLAN	VLAN ID	The VLAN ID associated with a terminal for which MAC-based authentication is being processed. (This item is displayed for fixed VLAN mode only.)
Status	Authentication status	`Authenticating`: Authentication is in progress.
Hold down client list	List of terminals for which authentication has been suspended	Information about terminals for which MAC-based authentication has failed and authentication processing has been suspended
MAC address	MAC address	MAC address of a terminal for which MAC-based authentication has been suspended.
Port	Port number	Connection port number of a terminal for which MAC-based authentication has been suspended.
VLAN	VLAN ID	The VLAN ID associated with a terminal for which MAC-based authentication has been suspended. (This item is displayed for fixed VLAN mode only.)
Status	Status of a terminal for which authentication is being suspended	The status of a terminal for which MAC-based authentication has been suspended is displayed. `Failed(reason*1)`: Authentication failed. `(*1)` The following are the reasons for an authentication failure: For dynamic VLAN mode and legacy mode: ● VLAN unmatch (An undefined VLAN was allocated.) ● refused (Authentication was rejected.) ● timeout (The RADIUS server did not respond.) ● RADIUS fail (An error on the RADIUS server connection occurred.) ● VLAN suspend (The VLAN was suspended.) Information displayed in fixed VLAN mode ● refused (Authentication was rejected.) ● timeout (The RADIUS server did not respond.) ● RADIUS fail (An error on the RADIUS server connection occurred.) ● VLAN suspend (The VLAN was suspended.)

Item	Meaning	Displayed information
Remaining	The remaining time until re-authentication will start again	*hours*:*minutes*:*seconds*

Impact on communication

None

Response messages

Table 27-6 List of response messages for the show mac-authentication auth-state select-option command

Message	Description
There is no information. (mac auth-state)	There is no MAC address authenticated by MAC-based authentication.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

The input format and the information that is displayed are the same as that displayed by the description of the *show mac-authentication login select-option* command.

show mac-authentication auth-state summary

Displays the number of currently authenticated terminal entries by port or by VLAN.

Syntax

```
show mac-authentication auth-state summary {port [<Port# list>]
| vlan [<VLAN ID list>]}
```

Input mode

Administrator mode

Parameters

{port [*<Port# list>*] | vlan [*<VLAN ID list>*]}

<Port# list>

Displays the number of currently authenticated terminals for the specified port. For details about how to specify *<Port# list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The number of currently authenticated terminals for all ports is displayed.

<VLAN ID list>

Displays the number of currently authenticated terminals for the specified VLAN ID. For details about how to specify *<VLAN ID list>*, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The number of currently authenticated terminals for all VLANs is displayed.

Example 1

Figure 27-4 Displaying the number of authenticated terminals for the specified port

```
# show mac-authentication auth-state summary port

Date 2009/03/24 18:32:35 UTC
 Dynamic VLAN mode total client counts(Login/Max):   1 / 256
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No  Port  Login /  Max
    1  0/20      1 /  256

 Static VLAN mode total client counts(Login/Max):    1 / 1024
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No  Port  Login /  Max
    1  0/10      1 / 1024

#
```

Display items 1

Table 27-7 Display items for each port

Item	Meaning	Displayed information
Dynamic VLAN mode total client counts	The number of currently authenticated terminals	`(Login / Max)`: The number of currently authenticated terminals / the maximum number of registered terminals set for the device
Static VLAN mode total client counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Hold down client counts	The number of terminals on which authentication has been suspended	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
L	Legacy mode	`L`: MAC-based authentication entries in legacy mode
#	Entry number	The entry number for a currently authenticated terminal. This is just the displayed number, which changes depending on such factors as the filter conditions.
Port	Port number	Number of the port on which the currently authenticated terminal exists
Login	The number of currently authenticated terminals	Number of currently authenticated terminals on the port
Max	The maximum registered terminals on the port	The maximum number of terminals set for the port

Example 2

Figure 27-5 Displaying the number of authenticated terminals for the specified VLAN

```
# show mac-authentication auth-state summary vlan

Date 2009/03/24 18:33:20 UTC
 Dynamic VLAN mode total client counts(Login/Max):   1 / 256
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No  VLAN  Login
    1   200      1

 Static VLAN mode total client counts(Login/Max):    1 / 1024
  Authenticating client counts :    1
  Hold down client counts      :    1
  Port roaming : Disable
   No  VLAN  Login
```

```
            1    10      1

          #
```

Display items 2

Table 27-8 Items displayed for a VLAN

Item	Meaning	Displayed information
Dynamic VLAN mode total client counts	The number of currently authenticated terminals	`(Login / Max)`: The number of currently authenticated terminals / the maximum number of registered terminals set for the device
Static VLAN mode total client counts		
Authenticating client counts	The number of terminals on which authentication is being processed	--
Hold down client counts	The number of terminals on which authentication has been suspended	--
Port roaming	Roaming information	Changing of ports within the same VLAN. `Enable`: Enabled `Disable`: Disabled (default)
#	Entry number	The entry number for a currently authenticated terminal. This is just the displayed number, which changes depending on such factors as the filter conditions.
VLAN	VLAN ID	The VLAN ID in which the currently authenticated terminal exists
Login	The number of currently authenticated terminals	Number of currently authenticated terminals on the port

Impact on communication

None

Response messages

Table 27-9 List of response messages for the show mac-authentication auth-state summary command

Message	Description
There is no information. (mac auth-state)	The specified VLAN ID was not set for the Switch, so there was no information about the terminals that have been authenticated by MAC-based authentication.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

The input format and the information that is displayed are the same as that displayed by the description of the *show mac-authentication login summary* command.

show mac-authentication login

The input format and display contents for this command are the same as those of the *show mac-authentication auth-state* command. For details, see the description of the *show mac-authentication auth-state* command.

show mac-authentication login select-option

The input format and display contents for this command are the same as those of the *show mac-authentication auth-state select-option* command. For details, see the description of the *show mac-authentication auth-state select-option* command.

show mac-authentication login summary

The input format and display contents for this command are the same as those of the *show mac-authentication auth-state summary* command. For details, see the description of the *show mac-authentication auth-state summary* command

show mac-authentication logging

Displays the operation log messages collected by the MAC-based authentication functionality.

Syntax

```
show mac-authentication logging [search <Search string>]
```

Input mode

Administrator mode

Parameters

`search` *<Search string>*

Specifies the search string.

If you specify this parameter, only information that includes the search string will be displayed.

Specify the string with 1 to 64 characters. The characters are case sensitive.

Operation when this parameter is omitted:

All the operation log messages output by MAC-based authentication are displayed.

Example

- When the parameter is omitted:

```
# show mac-authentication logging


Date 2008/11/13 16:37:52 UTC
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.e227.8bf8 PORT=0/2
VLAN=4 Login succeeded.
AUT 11/13 16:18:48 MAC No=270:NOTICE:SYSTEM: MAC=0000.e227.8bf8
PORT=0/2 MAC address was force-authorized.
AUT 11/13 16:18:48 MAC No=265:NORMAL:SYSTEM: MAC=0000.e227.8bf8 Start
authenticating for MAC address.
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.e28c.4add PORT=0/8
VLAN=4000
Login succeeded.
AUT 11/13 16:18:48 MAC No=270:NOTICE:SYSTEM: MAC=0000.e28c.4add
PORT=0/8 MAC address was force-authorized.
AUT 11/13 16:18:48 MAC No=265:NORMAL:SYSTEM: MAC=0000.e28c.4add Start
authenticating for MAC address.
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.0000.0003 PORT=0/4
VLAN=40 Login succeeded.
AUT 11/13 16:18:48 MAC No=270:NOTICE:SYSTEM: MAC=0000.0000.0003
PORT=0/4 MAC address was force-authorized.


#
```

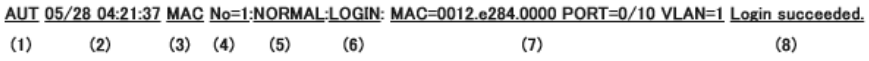
- Specifying `LOGIN` for the parameter:

```
# show mac-authentication logging search "LOGIN"
```

```
Date 2008/11/13 16:55:32 UTC
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.e227.8bf8 PORT=0/2
VLAN=4 Login succeeded.
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.e28c.4add PORT=0/8
VLAN=4000
Login succeeded.
AUT 11/13 16:18:48 MAC No=1:NORMAL:LOGIN: MAC=0000.0000.0003 PORT=0/4
VLAN=40 Login succeeded.

 3 events matched.

#
```

Display items

The following shows the display format of a message.



(1) Log functionality type: Indicates the type of authentication functionality. (Fixed at AUT.)

(2) Date and time: Indicates the date and time (*month*/*date hour*:*minute*:*second*) an event occurred.

(3) Authentication ID: Indicates MAC-based authentication.

(4) Message number: Indicates the number assigned to each message shown in *Table 27-12 List of operation log messages*.

(5) Log ID: Indicates the level of the operation log message.

(6) Log type: Indicates the type of operation that outputs the log message.

(7) Additional information: Indicates supplementary information provided in the message.

(8) Message body

Operation log messages show the following information:

- Log ID/type: See *Table 27-10 Log ID and type in operation log messages*.
- Additional information: See *Table 27-11 Added info*.
- Message list: See *Table 27-12 List of operation log messages*.

Table 27-10 Log ID and type in operation log messages

Log ID	**Log type**	Description
NORMAL	LOGIN	Indicates that authentication was successful.
	LOGOUT	Indicates that authentication was canceled.
	SYSTEM	Indicates a runtime notification.
NOTICE	LOGIN	Indicates that authentication failed.

Log ID	Log type	Description
	LOGOUT	Indicates that the attempt to cancel authentication failed.
	SYSTEM	Indicates an alternate operation when a communication failure occurs.
ERROR	SYSTEM	Indicates a communication failure or an operation failure in MAC-based authentication functionality.

Table 27-11 Added info

Display format	Meaning
MAC=*xxxx.xxxx.xxxx*	Indicates the MAC address.
PORT=*xx*/*xx*	Indicates the port number.
VLAN=*xxxx*	Indicates the VLAN ID.

Table 27-12 List of operation log messages

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
1	NORMAL	LOGIN	`Login succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		The terminal was successfully authenticated. [Action] None
			MAC, PORT, VLAN[#2]
2	NORMAL	LOGOUT	`Force logout ; Port link down.`
	Dynamic VLAN Fixed VLAN		Authentication was canceled because the link for the relevant port went down. [Action] Make sure the status of relevant port is link-up.
			MAC, PORT, VLAN[#2]
3	NORMAL	LOGOUT	`Force logout ; Authentic method changed (RADIUS <-> Local).`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the authentication method was switched. This log is collected when any of the following command settings are changed: ● `aaa authentication mac-authentication` ● `mac-authentication authentication` ● `aaa authentication mac-authentication end-by-reject` [Action] None
			MAC, PORT, VLAN[#2]
4	NORMAL	LOGOUT	`Force logout ; Clear mac-authentication command succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled by an operation command. [Action] None
			MAC, PORT, VLAN[#2]
5	NORMAL	LOGOUT	`Force logout ; Connection time was beyond a limit.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the maximum connection time was exceeded. [Action] None (If the terminal is connected, authentication is attempted again.)
			MAC, PORT, VLAN[#2]
6	NOTICE	LOGIN	`Login failed ; Port link down.`
	Fixed VLAN		Authentication error occurred because the port link was down. [Action] Make sure the status of relevant port is link-up.
			MAC, PORT, VLAN
8	NOTICE	LOGIN	`Login failed ; VLAN not specified.`
	Legacy Dynamic VLAN		An authentication error occurred because the authentication request was sent from a VLAN that does not exist on the port. [Action] Make sure the terminal is connected to the correct port. If there are no problems with the connection, check the configuration.
			MAC, PORT, VLAN[#2]

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
9	NORMAL	LOGOUT	`Force logout ; Program stopped.`
	Legacy Dynamic VLAN Fixed VLAN		The authentication of all terminals was canceled because the MAC-based authentication functionality stopped. [Action] To subsequently perform MAC-based authentication, set the configuration.
			MAC, PORT, VLAN[#2]
10	NORMAL	LOGOUT	`Force logout ; Other authentication program.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because it was overwritten by another authentication operation. [Action] Make sure another authentication operation was not performed on the same terminal.
			MAC, PORT, VLAN[#2]
11	NORMAL	LOGOUT	`Force logout ; VLAN deleted.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the VLAN for the authentication port was changed. [Action] Check the configuration of the VLAN.
			MAC, PORT, VLAN[#2]
12	NORMAL	LOGOUT	`Force logout ; Client moved.`
	Legacy Dynamic VLAN Fixed VLAN		The old authenticated state was canceled because the authenticated terminal was connected to another port. [Action] None Authentication is performed again.
			MAC, PORT, VLAN[#2]
13	NOTICE	LOGIN	`Login failed ; Double login. (L2MacManager)`
	Legacy Dynamic VLAN Fixed VLAN		The VLAN functionality reported that authentication was not possible. ● Duplicate MAC addresses were registered. [Action] Check whether the MAC address has already been authenticated. If necessary, cancel the existing authentication for the relevant MAC address from the authentication functionality that is currently authenticating the MAC address.

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			MAC, PORT, VLAN[#2]
15	NOTICE	LOGIN	`Login failed ; Number of login was beyond limit.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because the number of logins exceeded the maximum allowable number. [Action] Attempt authentication again after the number of authentications decreases.
			MAC
18	NOTICE	LOGIN	`Login failed ; MAC address could not register.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because registration of the MAC address failed. [Action] Attempt authentication again.
			MAC
20	NOTICE	LOGIN	`Login failed ; RADIUS authentication failed.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because RADIUS authentication failed. [Action] Make sure the terminal to be authenticated is correct. Also make sure the RADIUS definition is correct.
			MAC, PORT, VLAN[#2]
21	NOTICE	LOGIN	`Login failed ; Failed to connection to RADIUS server.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because an attempt to communicate with the RADIUS server failed. [Action] Check whether communication is possible between the Switch and the RADIUS server. After the Switch can communicate with the RADIUS server, attempt authentication again.
			MAC, PORT, VLAN[#2]
28	NORMAL	LOGOUT	`Force logout ; Port not specified.`
	Legacy Fixed VLAN		Authentication was canceled because the VLAN mode setting was deleted from the port.

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			[Action] Check the configuration.
			MAC, PORT, VLAN#2
30	NORMAL	LOGOUT	`Force logout ; mac-address-table aging.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because a MAC address was deleted due to MAC address table aging. [Action] The terminal is not in use. Check the terminal.
			MAC, PORT, VLAN#2
82	NORMAL	SYSTEM	`Accepted clear auth-state command.`
	Legacy Dynamic VLAN Fixed VLAN		A notification issued by the `clear mac-authentication auth-state` command for forcibly canceling authentication was received. [Action] None
			--
83	NORMAL	SYSTEM	`Accepted clear statistics command.`
	Legacy Dynamic VLAN Fixed VLAN		A request issued by the `clear mac-authentication statistics` command for deleting statistics was received. [Action] None
			--
84	NORMAL	SYSTEM	`Accepted commit command.`
	Legacy Dynamic VLAN Fixed VLAN		A notification issued by the `commit mac-authentication` command for re-configuring the authentication information was received. [Action] None
			--
99	ERROR	SYSTEM	`Accounting failed ; RADIUS accounting.`

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Legacy Dynamic VLAN Fixed VLAN		A response to an accounting request was not received from the RADIUS server. [Action] Check whether communication is available between the Switch and the RADIUS server. After the Switch can communicate with the RADIUS server, perform authentication again.
			MAC
105	NOTICE	LOGIN	`Login failed ; VLAN suspended.`
	Legacy Dynamic VLAN Fixed VLAN		An authentication error occurred because the status of the VLAN to be used for the terminal following a switch after authentication was suspended. [Action] After authentication, execute the `state` command to activate the VLAN, and then perform authentication again.
			MAC, PORT, VLAN[#2]
106	NORMAL	LOGOUT	`Force logout ; VLAN suspended.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication was canceled because the status of the VLAN for the authenticated terminal changed to suspend. [Action] After authentication, execute the `state` command to activate the VLAN, and then perform authentication again.
			MAC, PORT, VLAN[#2]
107	NOTICE	LOGIN	`Login failed ; MAC address not found to MAC authentication DB.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because the MAC address to be authenticated was not registered in the internal MAC-based authentication DB. [Action] Make sure the MAC address registered in the internal MAC-based authentication DB is correct.
			MAC, VLAN[#1#2]
108	NOTICE	LOGIN	`Login failed ; VLAN ID not found to MAC authentication DB.`
	Fixed VLAN		Authentication failed because the VLAN ID to be authenticated was not registered in the internal MAC-based authentication DB. [Action] Make sure the VLAN ID registered in the internal MAC-based authentication DB is correct.

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			MAC, VLAN
255	ERROR	SYSTEM	`The other error.`
	Legacy Dynamic VLAN Fixed VLAN		An internal MAC-based authentication error occurred. [Action] None
			--
256	NORMAL	LOGIN	`Reauthentication succeeded.`
	Legacy Dynamic VLAN Fixed VLAN		Re-authentication was successful. [Action] None
			MAC, PORT, VLAN[#2]
258	NOTICE	LOGIN	`Login failed ; Invalid attribute received from RADIUS server.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication failed because the attribute of an Accept packet received from the RADIUS server could not be analyzed. [Action] Check the RADIUS server settings.
			MAC, PORT
261	NOTICE	LOGIN	`Login failed ; Hardware restriction.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication could not be performed because the MAC address could not be registered due to hardware limitations. (There are no more available entries or hash entries) [Action] None
			MAC, PORT
263	NORMAL	LOGOUT	`Force logout ; MAC address changed the port, but the number of users of the new port is full.`
	Legacy Dynamic VLAN		Authentication has been canceled because the number of terminals at the new port exceeded the maximum allowable number. [Action] If there is a limit on number of allowable terminals, check the setting.

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
	Fixed VLAN		MAC, PORT (destination is displayed for port information), VLAN[#2]
264	NORMAL	LOGOUT	`Force logout ; MAC address changed the port, but the new port is not target of MAC Authentication.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication has been canceled because the new port does not support MAC-based authentication. [Action] None
			MAC, PORT (destination is displayed for port information), VLAN[#2]
265	NORMAL	SYSTEM	`Start authenticating for MAC address.`
	Legacy Dynamic VLAN Fixed VLAN		Authentication processing has started. [Action] None
			MAC
266	NORMAL	SYSTEM	`Restart authenticating for MAC address.`
	Legacy Dynamic VLAN Fixed VLAN		Re-authentication processing has started. [Action] None
			MAC
267	NORMAL	SYSTEM	`Stop authenticating for MAC address. [`*error-code*`]`
	Legacy Dynamic VLAN Fixed VLAN		Authentication processing has stopped. [Action] See the action described in the log entry indicated by *error-code*.
			MAC, error code
268	NORMAL	SYSTEM	`Received RADIUS server message.[`*Message*`]`
	Legacy Dynamic VLAN Fixed VLAN		This Reply-Message Attribute message is sent from the RADIUS server (up to 80 characters are displayed). [Action] None

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			Message
269	NORMAL	SYSTEM	`Client port roaming.`
	Dynamic VLAN Fixed VLAN		The terminal is roaming. [Action] None
			MAC, PORT
270	NOTICE	SYSTEM	`MAC address was force-authorized.`
	Legacy Dynamic VLAN Fixed VLAN		Forced authentication has started because an error occurred when a request was sent to the RADIUS server. [Action] None
			MAC, PORT
274	NOTICE	LOGIN	`Login failed ; Authentic mode intermingled. (legacy vlan)`
	Legacy		Authentication failed in legacy mode because there are multiple authentication modes. [Action] Use only one authentication mode (legacy mode or dynamic VLAN mode) for one interface.
			MAC, PORT, VLAN[#2]
275	NORMAL	LOGOUT	`Force logout ; Authentic mode had changed (Legacy -> dynamic vlan).`
	Legacy		All authentications were canceled because the authentication mode changed from legacy mode to dynamic VLAN mode. [Action] None
			MAC
276	NORMAL	LOGOUT	`Force logout ; Authentic mode had changed (dynamic vlan -> Legacy).`
	Dynamic VLAN		All authentications were canceled because authentication mode changed from dynamic VLAN mode to legacy mode. [Action] None

No.	Log ID	Log type	Message text
	Authentication mode		**Description**
			Added info
			MAC, PORT, VLAN#2
280	NORMAL	LOGOUT	`Force logout ; Multi-step finished.`
	Dynamic VLAN Fixed VLAN		MAC-based authentication has been canceled because multistep authentication has completed. [Action] None
			MAC, PORT, VLAN#2
282	NORMAL	LOGOUT	`Force logout ; Authentic method changed (single <-> multi-step).`
	Dynamic VLAN Fixed VLAN		Authentication for the port was canceled because of a switch between the single authentication and multistep authentication methods. [Action] None
			MAC, PORT, VLAN#2
1xxx	NOTICE	LOGIN	`Login aborted ; <Abort reason>`
	See the last three digits for the operation log message.		Authentication processing was aborted. *xxx*: Operation log message number For details, see the description field for the operation log message number.

#1: Displayed when the mode is in fixed VLAN mode.

#2: For dynamic VLAN mode or legacy mode, the VLAN ID might not be displayed until the VLAN to be accommodated is decided.

Impact on communication

None

Response messages

Table 27-13 List of response messages for the show mac-authentication logging command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no logging data.	There is no log data.

Message	Description
There is no log data to match.	Log data matching the specified character string could not be found.
There is no memory.	There is not enough memory to collect data.

Notes

- MAC-based authentication operation log messages are displayed starting from the newer messages.
- If you execute this command with the `search` parameter set and if information that matches the specified character string exists, the number of matched operation log messages is displayed at the end.

  Example:3 events matched.

clear mac-authentication logging

Clears the operation log information for MAC-based authentication.

Syntax

```
clear mac-authentication logging
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of clearing the operation log information for Mac-based authentication:

```
# clear mac-authentication logging

#
```

Display items

None

Impact on communication

None

Response messages

Table 27-14 List of response messages for the clear mac-authentication logging command

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

Notes

None

show mac-authentication

Displays the configuration for MAC-based authentication.

Syntax

```
show mac-authentication
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of displaying the configuration for MAC-based authentication:

```
# show mac-authentication

Date 2011/02/23 06:50:08 UTC
<<<MAC-Authentication mode status>>>
  Dynamic-VLAN     : Enabled
  Static-VLAN      : Enabled

<<<System configuration>>>
 * Authentication parameter
  Authentic-mode   : Dynamic-VLAN
  max-user         : 256
  id-format type   : xx-xx-xx-xx-xx-xx
  password         : Disable
  vlan-check       : -
  roaming          : Disable
  mac-authentication vlan :

 * AAA methods
  Authentication Default       : RADIUS
  Authentication port-list-BBB : RADIUS ra-group-2
  Authentication End-by-reject : Disable
  Accounting Default           : RADIUS

 * Logout parameter
  max-timer        : infinity
  auto-logout      : 3600
  quiet-period     : 300
  reauth-period    : 3600

 * Logging status
  [Syslog send]    : Disable
  [Traps]          : Disable

<Port configuration>
  Port Count            : 2

  Port                  : 0/6
  VLAN ID               : 40
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 256
```

```
  Port                  : 0/22
  VLAN ID               : 40
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 256
  Authentication method : port-list-BBB

<<<System configuration>>>
 * Authentication parameter
  Authentic-mode   : Static-VLAN
  max-user         : 1024
  id-format type   : xx-xx-xx-xx-xx-xx
  password         : Disable
  vlan-check       : Disable
  roaming          : Disable
  mac-authentication vlan : -

 * AAA methods
  Authentication Default       : RADIUS
  Authentication port-list-BBB : RADIUS ra-group-2
  Authentication End-by-reject : Disable
  Accounting Default           : RADIUS

 * Logout parameter
  max-timer        : infinity
  auto-logout      : 3600
  quiet-period     : 300
  reauth-period    : 3600

 * Logging status
  [Syslog send]    : Disable
  [Traps]          : Disable

<Port configuration>
  Port Count            : 3

  Port                  : 0/5
  VLAN ID               : 4
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 1024
  Authentication method : port-list-BBB

  Port                  : 0/6
  VLAN ID               : 4
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 1024

  Port                  : 0/22
  VLAN ID               : 4
  Forceauth VLAN        : Disable
  Access-list-No        : L2-auth
  ARP relay             : Enabled
  Max-user              : 1024
  Authentication method : port-list-BBB

#
```

Display items

Table 27-15 Items displayed for the configuration of MAC-based authentication

Item	Meaning	Displayed information	Mode		
			D	L	F
Dynamic-VLAN	Dynamic VLAN mode	Operating status of dynamic VLAN mode `Enable`: Enabled `Disable`: Disabled (If this item is `Disable`, the information that follows `<<<System configuration>>>` is not displayed.)	Y		N
Static-VLAN	Fixed VLAN mode	Operating status of fixed VLAN mode[#1] `Enable`: Enabled `Disable`: Disabled (If this item is `Disable`, the information that follows `<<<System configuration>>>` is not displayed.)	N		Y
* Authentication parameter					
Authentic-mode	Authentication mode	Authentication mode for the MAC-based authentication functionality. `Dynamic-VLAN`: Indicates dynamic VLAN mode `Static-VLAN`: Indicates fixed VLAN mode	Y		Y
max-user	Maximum number of authenticated terminals	The maximum number of authenticated terminals per device	Y		Y
id-format type	MAC address format	The MAC address format used when an authentication request is issued to the RADIUS server	Y		Y
password	Password	The password used when an authentication request is issued to the RADIUS server `Disable` is displayed if SNMP traps are disabled.	Y		Y
vlan-check	VLAN ID matching	VLAN ID matching in authentication `Enable`: Enabled `Disable`: Disabled	N		Y
key	Character string added to the user ID	A character string that is added to the user ID when an authentication request is issued to the RADIUS server. `%VLAN` is displayed if this item is not set.	N		Y
roaming	Roaming	Setting status for roaming `Enable`: Enabled `Disable`: Disabled	Y[#2]		Y
mac-authentication vlan	MAC-based authentication allocated VLAN	The VLAN ID allocated by MAC-based authentication dynamic VLAN mode	Y		N

Item	Meaning	Displayed information	Mode		
			D	L	F
* AAA methods					
Authentication Default	Default authentication method on the Switch	`Local`: Indicates local authentication `RADIUS`: Indicates RADIUS authentication `Local, RADIUS`: RADIUS authentication after local authentication `RADIUS, Local`: Local authentication after RADIUS authentication `Local` is displayed when this item is not set.	Y		Y
Authentication *<List name>*	The list name and authentication method for the authentication method list	Displays the RADIUS server group name for the authentication method list. `RADIUS` *<Group name>* `RADIUS`: Indicates RADIUS authentication *<Group name>*: RADIUS server group name `(Not defined)` is displayed after the group name if the RADIUS server group name that has been set is invalid. This item is not displayed if it is not set.	Y		Y
Authenticaion End-by-reject	Behavior when authentication is rejected	`Enable`: Authentication fails and the processing is terminated. `Disable`: Authentication is performed using the second authentication method specified by the `aaa authentication mac-authentication` configuration command. `Disable` is displayed when this item is not set.	Y		Y
Accounting Default	Whether the accounting server is available	`RADIUS`: A general-use RADIUS server or RADIUS server dedicated to MAC-based authentication `Disable` is displayed when this item is not set.	Y		Y
* Logout parameter					
max-timer	Maximum connection time	The maximum connection time for an authenticated terminal (in minutes)	Y		Y
auto-logout	Whether forcible cancellation of authentication is enabled	Use of the functionality that forcibly cancels authentication by MAC address aging in MAC-based authentication dynamic VLAN mode `Disable` is displayed if SNMP traps are disabled.	Y		Y
quiet-period	Time waiting for an authentication retry	The time waiting after a MAC-based authentication failure for the start of the next authentication processing for the same terminal (MAC address) (in seconds)	Y		Y
reauth-period	Re-authentication time	The interval between re-authentication operations for the terminal after MAC-based authentication has been successful in dynamic VLAN mode (in seconds)	Y		Y
* Logging status					

Item	Meaning	Displayed information	Mode		
			D	L	F
[Syslog send]	syslog	Setting status of syslog information output `Enable`: Enabled `Disable`: Disabled	Y		Y
[Traps]	Traps	SNMP trap setting status `Disable` is displayed if SNMP traps are disabled.	Y		Y
Port Count	Total number of ports	Number of ports for which MAC-based authentication is enabled	Y		Y
Port	Port information	Port number (`Legacy` is displayed after a port number if legacy mode is used.)	Y	Y	Y
VLAN ID	VLAN information	VLAN ID[#3] registered in MAC-based authentication. `--` is displayed if this item has not been set.	Y	Y	Y
Forceauth VLAN	Forced authentication	Setting status of forced authentication in dynamic VLAN mode[#4] or legacy mode *xxxx*: Enabled. *xxxx* indicates the VLAN ID set in configuration. `VLAN unmatch`: Invalid due to an insufficient setting `Disable`: Disabled (default)	Y	Y	N
		Setting status of forced authentication in fixed VLAN mode `Enable`: Enabled `Disable`: Disabled	N	N	Y
Access-list-No	Access Lists	Setting status of authentication IP access-group `Disable` is displayed if this item is not set.	Y	N	Y
Arp relay	ARP relay	Setting status of authentication arp-relay `Enable`: Enabled `Disable`: Disabled	Y	N	Y
Max-user	Maximum number of authenticated terminals	The maximum number of authentication terminals for each port	Y	Y	Y
Authentication method	Authentication list name for the port-based authentication method	Displays the name of the authentication method list registered for each port. ● `(Not defined)` is displayed after the authentication method list name if the set authentication method list name is invalid. ● This item is not displayed if it is not set.	Y	N	Y

Legend:

D: Dynamic VLAN mode

L: Legacy mode

F: Fixed VLAN mode

Y: Applicable

N: Not applicable (`--` is also displayed on the screen)

#1: For details about the conditions for enabling the operating status, see *11.1.2 Configuration procedure for MAC-based authentication* in the *Configuration Guide Vol. 2*.

#2: Legacy mode is not supported.

#3: VLAN IDs registered by automatic VLAN allocation are not displayed.

However, VLAN IDs are displayed if they are accommodated in the native VLAN (fixed) as the result of automatic VLAN allocation.

#4: When the `authentication force-authorized enable` command is enabled and the `authentication force-authorized vlan` command is not set, `native vlan` is displayed.

Impact on communication

None

Response messages

Table 27-16 List of response messages for the show mac-authentication command

Message	Description
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

None

show mac-authentication statistics

Displays MAC-based authentication statistics.

Syntax

```
show mac-authentication statistics
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of displaying MAC-based authentication statistics:

```
# show mac-authentication statistics

Date 2009/10/28 09:12:44 UTC
MAC-Authentication Information:
  Authentication Request Total :         12
  Authentication Success Total :          6
  Authentication Fail Total    :          5
  Authentication Refuse Total  :          0
  Authentication Current Count :          1
  Authentication Current Fail  :          0

RADIUS MAC-Authentication Information:
[RADIUS frames]
  TxTotal   :        12  TxAccReq  :        11  TxError   :         1
  RxTotal   :        11  RxAccAccpt:        11  RxAccRejct:         0
                         RxAccChllg:         0  RxInvalid :         0
Account MAC-Authentication Information:
[Account frames]
  TxTotal   :        11  TxAccReq  :        11  TxError   :         0
  RxTotal   :        11  RxAccResp :        11  RxInvalid :         0

#
```

Display items

Table 27-17 Items displayed for MAC-based authentication statistics

Item	Meaning
Authentication Request Total	The total number of authentication requests
Authentication Success Total	The total number of authenticated MAC addresses
Authentication Fail Total	The total number of MAC addresses for which authentication failed
Authentication Refuse Total	The total number of MAC addresses for which authentication was rejected
Authentication Current Count	The number of currently authenticated MAC addresses
Authentication Current Fail	The number of MAC addresses for which authentication has failed (waiting for

Item	Meaning
	re-authentication)
RADIUS frames	RADIUS server information
TxTotal	The total number of transmissions to the RADIUS server
TxAccReq	The total number of Access-Request packets sent to the RADIUS server
TxError	The number of errors occurring during transmission to the RADIUS server
RxTotal	The total number of receptions from the RADIUS server
RxAccAccpt	The total number of Access-Accept packets received from the RADIUS server
RxAccRejct	The total number of Access-Reject packets received from the RADIUS server
RxAccChllg	The total number of Access-Challenge packets received from the RADIUS server
RxInvalid	The total number of invalid frames received from the RADIUS server
Account frames	Accounting information
TxTotal	The total number of packets transmitted to the accounting server
TxAccReq	The total number of Accounting-Request packets sent to the accounting server
TxError	The number of errors occurring during transmission to the accounting server
RxTotal	The total number of received packets from the accounting server
RxAccResp	The total number of Accounting-Response packets received from the accounting server
RxInvalid	The total number of invalid frames received from the accounting server

None

Impact on communication

None

Response messages

Table 27-18 List of response messages for the show mac-authentication statistics command

Message	Description
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

None

clear mac-authentication statistics

Clears the MAC-based authentication statistics.

Syntax

```
clear mac-authentication statistics
```

Input mode

Administrator mode

Parameters

None

Example

The following shows an example of clearing MAC-based authentication statistics:

```
# clear mac-authentication statistics

#
```

Display items

None

Impact on communication

None

Response messages

Table 27-19 List of response messages for the clear mac-authentication statistics command

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

Notes

None

set mac-authentication mac-address

Adds a MAC address for MAC-based authentication to the internal MAC-based authentication DB. A MAC mask and a VLAN ID to which the MAC address belongs can also be specified. You can add a MAC address that has already been registered if its MAC mask or VLAN ID is different from the registered MAC address.

To check the editing or registration status, execute the `show mac-authentication mac-address` command.

To apply the setting to the internal MAC-based authentication DB, execute the `commit mac-authentication` command.

Syntax

```
set mac-authentication mac-address <MAC> [<MAC mask>] [<VLAN ID>]
```

Input mode

Administrator mode

Parameters

<MAC>

Specify the MAC address to be registered.

Specify the MAC address in the range from `0000.0000.0000` to `feff.ffff.ffff`. Note that you cannot specify a multicast MAC address (address in which the lowest bit of the first byte is 1).

<MAC mask>

Specify in MAC address format a MAC address mask in which you set the bits that you want to allow any value set to 1.

Specify the MAC address mask in the range from `0000.0000.0000` to `ffff.ffff.ffff`.

Operation when this parameter is omitted:

The MAC mask becomes `0000.0000.0000`.

Specification of `ffff.ffff.ffff` as the MAC mask:

All MAC addresses are applied.

Specify `0000.0000.0000` for the MAC address and `ffff.ffff.ffff` for the MAC mask.

Only one entry can be registered for this condition. If an entry in this condition has already been registered, registering a new entry overwrites the old one.

<VLAN ID>

Specify the VLAN ID of the VLAN to which the terminal will communicate after authentication. For details about the specifiable range of values, see *Specifiable values for parameters*.

Operation when this parameter is omitted:

The VLAN ID is not checked at authentication time.

Example

- To add `0012.e200.1234` as the MAC address and `10` as the VLAN ID:

```
# set mac-authentication mac-address 0012.e200.1234 10
```

- Adding `0012.e2` as the vender ID and `0000.00ff.ffff` as the MAC mask:

```
# set mac-authentication mac-address 0012.e200.0000 0000.00ff.ffff 10
```

- Adding `ffff.ffff.ffff` as the MAC mask:

```
# set mac-authentication mac-address 0000.0000.0000 ffff.ffff.ffff 1
```

Display items

None

Impact on communication

None

Response messages

Table 27-20 List of response messages for the set mac-authentication mac-address command

Message	Description
Already mac address xxxx.xxxx.xxxx,dddd exists.	The specified MAC address has already been registered. *xxxx.xxxx.xxxx*: MAC address *dddd*: VLAN ID (If `0` is displayed, no VLAN ID is set.)
Already mac address xxxx.xxxx.xxxx(nnnn.nnnn.nnnn),dddd exists.	The specified MAC address has already been registered. *xxxx.xxxx.xxxx*: MAC address *nnnn.nnnn.nnnn*: MAC mask *dddd*: VLAN ID (If `0` is displayed, no VLAN ID is set.)
The number of client exceeds limits.	A MAC address could not be added because the number of entries exceeded the maximum number of entries allowed for the internal MAC-based authentication DB.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

- This command cannot be used concurrently by multiple users.
- The setting is applied to the internal MAC-based authentication DB only when the `commit mac-authentication` command is executed.
- You can register a MAC address that has already been registered if its MAC mask or VLAN ID is different from the registered MAC address.

remove mac-authentication mac-address

Deletes MAC addresses, for MAC-based authentication, from the internal MAC-based authentication DB.

All entries specified by the MAC address and MAC mask (if registered) are deleted, (including when there are different VLAN IDs).

To check the editing or registration status, execute the `show mac-authentication mac-address` command.

To apply the setting to the authentication information, execute the `commit mac-authentication` command.

Syntax

```
remove mac-authentication mac-address {<MAC> [<MAC mask>] | -all} [-f]
```

Input mode

Administrator mode

Parameters

`{<mac> [<MAC mask>] | -all}`

<MAC>

Specify the MAC address to be deleted.

<MAC mask>

Specify the MAC mask for the MAC address to be deleted.

Operation when this parameter is omitted:

The specified MAC address (no MAC mask) is deleted.

To delete the MAC mask entry `ffff.ffff.ffff`:

Specify `0000.0000.0000` for the MAC address and `ffff.ffff.ffff` for the MAC mask.

`-all`

Deletes all MAC addresses.

`-f`

Deletes MAC addresses without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When deleting the MAC address `0012.e200.1234`:

```
# remove mac-authentication mac-address 0012.e200.1234
Remove mac-authentication mac-address.  Are you sure? (y/n): y
```

- Deleting all MAC addresses registered in the internal MAC-based authentication DB:

```
# remove mac-authentication mac-address -all
Remove all mac-authentication mac-address.  Are you sure? (y/n): y
```

- Deleting the MAC mask `ffff.ffff.ffff`:

```
# remove mac-authentication mac-address 0000.0000.0000 ffff.ffff.ffff
Remove mac-authentication mac-address.  Are you sure? (y/n): y
```

Display items

None

Impact on communication

None

Response messages

Table 27-21 List of response messages for the remove mac-authentication mac-address command

Message	Description
Unknown MAC address 'xxxx.xxxx.xxxx'.	The MAC address has not been registered. (when a single MAC address is specified). *xxxx.xxxx.xxxx*: MAC address
Unknown MAC address 'xxxx.xxxx.xxxx(nnnn.nnnn.nnnn)'.	The MAC address has not been registered. (when a single MAC address is specified). *xxxx.xxxx.xxxx*: MAC address *nnnn.nnnn.nnnn*: MAC mask
MAC address does not exist.	The MAC address has not been registered. (when the `-all` parameter is specified).
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

- The setting is applied to the internal MAC-based authentication DB only when the `commit mac-authentication` command is executed.
- MAC addresses that are not the same as registered addresses cannot be deleted.

show mac-authentication mac-address

Displays information about the MAC addresses for MAC-based authentication that are registered in a Switch. MAC address information which is either being entered or being edited by using the following commands can also be displayed:

- set mac-authentication mac-address
- remove mac-authentication mac-address

Information is displayed in ascending order by MAC address. Entries with no MAC mask information are displayed first, followed by the entries with MAC mask information.

Syntax

```
show mac-authentication mac-address {edit | commit}
Input mode
```

Input mode

Administrator mode

Parameters

{edit | commit}

edit

Displays information that is being edited.

commit

Displays information about the current internal MAC-based authentication DB.

Example

- When displaying information that is being edited:

```
# show mac-authentication mac-address edit

Date 2008/11/13 18:02:43 UTC
 Total mac-address counts: 5
 mac-address     mac-mask          VLAN
 0012.e200.1234  -                 4094
 0012.e200.abcd  -                    4
 0012.e200.1234  0000.0000.ffff      10
 0012.e200.abcd  0000.0000.ffff       8
 (any)           ffff.ffff.ffff       1 *

#
```

*: If an entry has been registered as (any), it always appears at the end.

- When displaying information about the current internal MAC-based authentication DB:

```
# show mac-authentication mac-address commit

Date 2008/11/13 18:02:48 UTC
 Total mac-address counts: 3
```

```
mac-address     mac-mask          VLAN
0012.e200.1234  -                 4094
0012.e200.abcd  -                    4
0012.e200.1234  0000.0000.ffff      10

#
```

Display items

Table 27-22 Items displayed for the MAC address information for MAC-based authentication

Item	Meaning	Displayed information
Total mac-address counts	The total number of registered MAC addresses	The number of registered MAC addresses
mac-address	MAC address	Registered MAC address (any): An entry registered with 0000.0000.0000 specified for the MAC address and ffff.ffff.ffff specified for the MAC mask
mac-mask	MAC mask	The registered MAC mask -: Indicates that a MAC mask has not been specified, in which case 0000.0000.0000 is used.
VLAN	VLAN	The VLAN set for a registered MAC address. -: Indicates that a VLAN has not been specified.

Impact on communication

None

Response messages

Table 27-23 List of response messages for the show mac-authentication mac-address command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (edit)	There was no information in the edit area of the internal MAC-based authentication DB.
There is no information. (commit)	There was no information in the commit area of the internal MAC-based authentication DB.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

None

commit mac-authentication

Stores the internal MAC-based authentication DB in internal flash memory and reflects its contents for operation.

The contents of the internal MAC-based authentication DB which is being used is not overwritten unless this command is executed after the following commands are executed to add or delete MAC addresses:

- set mac-authentication mac-address
- remove mac-authentication mac-address

Syntax

```
commit mac-authentication [-f]
```

Input mode

Administrator mode

Parameters

`-f`

Stores the internal MAC-based authentication DB in internal flash memory and reflects its contents for operation. No confirmation message is displayed.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

The following shows an example of storing the internal MAC-based authentication DB:

```
# commit mac-authentication
Commitment mac-authentication mac-address data.  Are you sure? (y/n): y

Commit complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 27-24 List of response messages for the commit mac-authentication command

Message	Description
Commit complete.	Storing the DB in internal flash memory and reflecting its contents for MAC-based authentication finished normally.
Flash memory write failed.	Writing of the information to internal flash memory failed.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

The information in the internal MAC-based authentication DB which is being used is modified only when this command is executed.

store mac-authentication

Backs up the internal MAC-based authentication DB to files.

Syntax

```
store mac-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Backs up the internal MAC-based authentication DB to files on the RAMDISK.

<File name>

Specify the name of a file to which the internal MAC-based authentication DB is to be backed up.

Two backup files, one which contains MAC mask information and the other which does not, are created on the RAMDISK.

The file names are as follows:

File that does not contain MAC mask information: *<File name>*

File that contains MAC mask information: *<File name>*`.msk`

Specify the file name with 60 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Backs up the internal MAC-based authentication DB to files without displaying confirmation messages.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Backing up the internal MAC-based authentication DB to the `mac-db.txt` file:

```
# store mac-authentication ramdisk mac-db.txt
Backup mac-authentication MAC address data.  Are You sure? (y/n): y

Backup complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 27-25 List of response messages for the store mac-authentication command

Message	Description
Backup complete.	A backup file has been created successfully.
Store operation failed.	The command could not be executed because of insufficient RAMDISK capacity.
Command information was damaged.	A backup file could not be created because the authentication information was corrupted.
Data doesn't exist.	A backup file could not be created. A commit operation might not have been executed. Execute a commit operation, and then check the result. If the commit operation fails again, the internal flash memory might be corrupted.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

- If the internal MAC-based authentication DB is backed up when the RAMDISK capacity is insufficient, incomplete backup files might be created.

  When creating backup files, use the `show ramdisk` command to make sure there is enough free capacity on the RAMDISK.

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

```
> show ramdisk

Date 2008/11/13 15:13:04 UTC
        used    68,608 byte
        free     6,182,912 byte
        total  6,251,520 byte

>
```

  Note: The underlined part (the value for `free` indicating the free capacity of the user area) must be at least 200kB.

- If the free capacity on the RAMDISK is insufficient, use the `del` command to delete unnecessary files before creating the backup files.

load mac-authentication

Restores the internal MAC-based authentication DB from a backup file to the internal MAC-based authentication DB. Note that the contents registered or changed by the following commands will be replaced by the contents of the restored backup:

- set mac-authentication mac-address
- remove mac-authentication mac-address
- commit mac-authentication

Syntax

```
load mac-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Restores the internal MAC-based authentication DB from a backup file on the RAMDISK.

<File name>

Specify the name of the backup file from which the internal MAC-based authentication DB is to be restored.

Specify the file name with 64 or fewer characters.

For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Restores the internal MAC-based authentication DB without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Restoring the internal MAC-based authentication DB from the `mac-db.txt` file:

```
# load mac-authentication ramdisk mac-db.txt
Restore mac-authentication MAC address data.  Are you sure? (y/n): y

Restore complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 27-26 List of response messages for the load mac-authentication command

Message	Description
Restore complete.	Restoration from the backup file was successful.
Load operation failed.	Restoration from the backup file failed.
File format error.	The format of the specified backup file is different from the internal MAC-based authentication DB.
Flash memory write failed.	Writing of the information to internal flash memory failed.
MAC-Authentication is not configured.	The MAC-based authentication functionality is not configured. Check the configuration.

Notes

Note that the contents registered or changed by the following commands will be replaced by the contents of the restored backup:

- set mac-authentication mac-address
- remove mac-authentication mac-address
- commit mac-authentication

28. Multistep Authentication

show authentication multi-step

show authentication multi-step

Displays the information for authenticated terminals on a multistep authentication port for an interface.

Syntax

```
show authentication multi-step [port <IF#>] [mac <MAC>]
```

Input mode

Administrator mode

Parameters

`port <IF#>`

Specify the number of the interface for which you want to display the multistep authentication progress.

Operation when this parameter is omitted:

The progress of multistep authentication is displayed for all MAC addresses.

`mac <MAC>`

Specify the MAC address for which you want to display multistep authentication progress.

Operation when this parameter is omitted:

The progress of multistep authentication is displayed for all MAC addresses.

Example

Figure 28-1 Displaying the progress of multistep authentication

```
# show authentication multi-step

Date 2009/10/29 06:58:27 UTC
Port 0/1  : multi-step dot1x
     <     Supplicant information     >  <Authentic method>
  No MAC address    State VLAN F Type    Last  (first step)
   1 000d.0b3a.e977 pass   100   multi   web   (dot1x)

Port 0/5  : multi-step
     <     Supplicant information     >  <Authentic method>
  No MAC address    State VLAN F Type    Last  (first step)
   1 0013.20a5.24ab pass    10 * single  mac   (-)

Port 0/22 : multi-step permissive
     <     Supplicant information     >  <Authentic method>
  No MAC address    State VLAN F Type    Last  (first step)
   1 000b.972f.e22b pass   100   single  dot1x (-)

#
```

Display items

Table 28-1 Information displayed for authenticated terminals on a multistep authentication port

Item	Meaning	Displayed information
Port	Port number	Displayed only when an authentication entry exists on the multistep authentication port.
<port status>	Multi-step	User authentication is not permitted if MAC-based authentication fails.
	Multi-step permissive	The `permissive` option has been set and user authentication is permitted even if MAC-based authentication fails.
	Multi-step dot1x	The `dot1x` option has been set and Web authentication is not permitted if MAC-base or IEEE 802.1x authentication fails.
#	Terminal display number	Terminal display number for each port
<Supplicant information>	Authentication terminal information	--
MAC address	MAC address	The MAC address of the terminal on which authentication is being processed.
State	Authentication status	`wait`: A new terminal is being authenticated. `pass`: Single authentication or multistep authentication has been completed. This status is displayed when re-authentication is in progress or when the authentication time is being updated.
VLAN	VLAN ID of the VLAN that accommodates a terminal	`1` to `4094`: Indicates a VLAN ID. For multistep authentication, the result of user authentication has precedence for determining the VLAN ID of the VLAN that will actually accommodate the terminal. `--` is displayed if the VLAN accommodating the terminal has not been identified because authentication has not been completed.
F	Forced authentication indication	*: The terminal that was logged in by using the forced authentication functionality. If a request is sent to the RADIUS server for processing such as re-authentication and the RADIUS server accepts the request, the displayed asterisk (`*`) disappears.
Type	Step authentication type	`single`: The terminal has been authenticated in single authentication mode. `multi`: The terminal has been authenticated in multistep authentication mode. `--` is displayed if the authentication type has not been identified because the authentication processing has not been completed.
<Authentic method>	Authentication functionality information	--

Item	Meaning	Displayed information
Last	Final authentication functionality	Displays the authentication functionality used for final authentication of the terminal. `mac`: MAC-based authentication `web`: Web authentication `dot1x`: IEEE 802.1X `--` is displayed if the final authentication processing has not been completed.
(first step)	First step authentication functionality	For the multistep authentication terminal, this item displays the authentication functionality used for the first step. `(mac)`: MAC-based authentication `(dot1x)`: IEEE 802.1X `--` is displayed if there is no awareness of authentication.

Impact on communication

None

Response messages

Table 28-2 List of response messages for the show authentication multi-step command

Message	Description
There is no information. (authentication multi-step)	There is no authenticated terminal information on the multistep authentication port.
Authentication multi-step is not configured.	The multistep authentication functionality has not been configured. Check the configuration.

Notes

None

29. Secure Wake-on-LAN [OP-WOL]

set wol-device name [OP-WOL]
set wol-device mac [OP-WOL]
set wol-device vlan [OP-WOL]
set wol-device ip [OP-WOL]
set wol-device alive [OP-WOL]
set wol-device description [OP-WOL]
remove wol-device name [OP-WOL]
show wol-device name [OP-WOL]
commit wol-device [OP-WOL]
store wol-device [OP-WOL]
load wol-device [OP-WOL]
set wol-authentication user [OP-WOL]
set wol-authentication password [OP-WOL]
set wol-authentication permit [OP-WOL]
remove wol-authentication user [OP-WOL]
show wol-authentication user [OP-WOL]
commit wol-authentication [OP-WOL]
store wol-authentication [OP-WOL]
load wol-authentication [OP-WOL]
wol [OP-WOL]
show wol [OP-WOL]

set wol-device name [OP-WOL]

Registers information about a new terminal that sends the startup command for Secure Wake-on-LAN. The information is registered in the internal DB used to register the terminal that sends the startup command.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device name <Name> <MAC> <VLAN ID>[ip <IP address> ][ alive {check [timeout
<Seconds>] | nocheck} ][ description <Description> ]
```

Input mode

Administrator mode

Parameters

<Name>

Specify a terminal name.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

<MAC>

Specify the MAC address.

Specify the MAC address in the range from `0000.0000.0000` to `feff.ffff.ffff`. Note that you cannot specify a multicast MAC address (address in which the lowest bit of the first byte is 1).

<VLAN ID>

Specify the VLAN ID of the VLAN to which the terminal will belong. For details about the specifiable range of values, see *Specifiable values for parameters*.

`ip` *<IP address>*

Directly specify the IP address of the terminal in a static IP address environment.

Specify the IP address in the range from `1.0.0.0` to `126.255.255.255` or from `128.0.0.0` to `223.255.255.255`.

Operation when this parameter is omitted:

DHCP is used. In a DHCP environment, an IP address is set in conjunction with DHCP snooping.

`alive`

Sets verification that the terminal is still activated.

`check [timeout` *<Seconds>*`]`

Verifies that the terminal is still activated.

`timeout` *<Seconds>*

Sets the interval for verifying terminal activation. Specify an interval from 60 to 600 seconds.

Operation when this parameter is omitted:

The verification interval is set to 120 seconds.

`nocheck`

Sets that verification of terminal activation is not performed.

`description <Description>`

Sets supplementary information about the terminal.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

Operation when this parameter is omitted:

No supplementary information is provided.

Example

Registering a new terminal `PC01`:

```
# set wol-device name PC01 1234.5678.9abc 1000 ip 192.168.100.100 alive check
timeout 600 description Commom-NotePC@example.com
```

Display items

None

Impact on communication

None

Response messages

Table 29-1 List of response messages for the set wol-device name command

Message	Description
Already device '*<Name>*' exists.	The specified terminal has already been registered.
The number of devices exceeds 300.	The number of terminals to be registered exceeds 300.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- To check the registered terminal information, execute the `show wol-device name` command.
- The maximum number of terminals that can be registered is 300.
- If the `alive nocheck` parameter is specified, the address information specified for the `ip` parameter is invalid.
- This command can be applied to a new terminal. To change the setting, use another `set wol-device` command.

set wol-device mac [OP-WOL]

Changes the MAC address of the terminal information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device mac <Name> <MAC>
```

Input mode

Administrator mode

Parameters

<Name>

Specify the name of the terminal whose MAC address is to be changed.

<MAC>

Specify a new MAC address.

Specify the MAC address in the range from `0000.0000.0000` to `feff.ffff.ffff`. Note that you cannot specify a multicast MAC address (address in which the lowest bit of the first byte is 1).

Example

Changing the MAC address for terminal `PC01`:

```
# set wol-device mac PC01 0012.ee86.6fd4
```

Display items

None

Impact on communication

None

Response messages

Table 29-2 List of response messages for the set wol-device mac command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of this command, terminal information must be registered by the `set wol-device name` command.

set wol-device vlan [OP-WOL]

Changes the VLAN ID in the terminal information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device vlan <Name> <VLAN ID>
```

Input mode

Administrator mode

Parameters

<Name>

Specify the name of the terminal whose VLAN ID is to be changed.

<VLAN ID>

Changes the VLAN ID of the VLAN to which the terminal will belong. For details about the specifiable range of values, see *Specifiable values for parameters*

Example

Changing the VLAN ID for terminal `PC01`:

```
# set wol-device vlan PC01 4094
```

Display items

None

Impact on communication

None

Response messages

Table 29-3 List of response messages for the set wol-device vlan command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of this command, terminal information must be registered by the `set wol-device name` command.

set wol-device ip [OP-WOL]

Changes the IP address and method used to identify the IP address in the terminal information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device ip <Name> {<IP address> | dhcp}
```

Input mode

Administrator mode

Parameters

<Name>

Specify the name of the terminal whose IP address information is to be changed.

`{`*<IP address>* `| dhcp}`

<IP address>

Directly specify the IP address of the terminal in a static IP address environment.

Specify the IP address in the range from `1.0.0.0` to `126.255.255.255` or from `128.0.0.0` to `223.255.255.255`.

`dhcp`

In a DHCP environment, an IP address is set in conjunction with DHCP snooping.

Example

Changing the IP address for terminal `PC01`:

```
# set wol-device ip PC01 202.68.133.72
```

Display items

None

Impact on communication

None

Response messages

Table 29-4 List of response messages for the set wol-device ip command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.

- Before execution of this command, terminal information must be registered by the `set wol-device name` command.
- If the `alive nocheck` parameter is specified, the address information specified for the `ip` parameter is invalid.

set wol-device alive [OP-WOL]

Changes the method for verifying terminal activation in the information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device alive <Name> {check [timeout <Seconds>] | nocheck}
```

Input mode

Administrator mode

Parameters

<Name>

Specify the name of the terminal whose setting for activation verification method is to be changed.

`check [timeout <Seconds>]`

Verifies that the terminal is still activated.

`timeout` *<Seconds>*

Sets the interval for verifying terminal activation. Specify an interval from 60 to 600 seconds.

Operation when this parameter is omitted:

The verification interval is set to 120 seconds.

`nocheck`

Sets that verification of terminal activation is not performed.

Example

Changing the interval for verifying activation of terminal `PC01`:

```
# set wol-device alive PC01 check timeout 300
```

Display items

None

Impact on communication

None

Response messages

Table 29-5 List of response messages for the set wol-device alive command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of this command, terminal information must be registered by the `set wol-device name` command.
- If the `alive nocheck` parameter is specified, the address information specified for the `ip` parameter is invalid.

set wol-device description [OP-WOL]

Changes the supplementary information in the terminal information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
set wol-device description <Name> [<Description>]
```

Input mode

Administrator mode

Parameters

<Name>

Specify the name of the terminal whose supplementary information is to be changed.

<Description>

Enter the new supplementary information.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

Operation when this parameter is omitted:

The supplementary information is deleted.

Example

Changing the supplementary information for terminal `PC01`:

```
# set wol-device description PC01 change-user
```

Display items

None

Impact on communication

None

Response messages

Table 29-6 List of response messages for the set wol-device description command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of this command, terminal information must be registered by the `set wol-device name` command.

remove wol-device name [OP-WOL]

Deletes the terminal information that has been registered.

To apply the setting to the terminal information, execute the `commit wol-device` command.

Syntax

```
remove wol-device name {<Name> | -all} [-f]
```

Input mode

Administrator mode

Parameters

`{<Name> | -all}`

<Name>

Specify the name of the terminal to be deleted.

`-all`

Deletes all terminal information.

`-f`

Deletes the terminal information without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- Deleting terminal `DEVICE01`:

```
# remove wol-device name PC01
Remove wol-device name.  Are you sure? (y/n): y
```

- Deleting all terminal information that has been registered in the internal DB used to register the terminal that sends the startup command:

```
# remove wol-device name -all
Remove all wol-device name.  Are you sure? (y/n): y
```

Display items

None

Impact on communication

None

Response messages

Table 29-7 List of response messages for the remove wol-device name command

Message	Description
Unknown device '*<Name>*'.	The specified terminal name has not been registered. (when a single MAC address is specified).

Message	Description
Device does not exist.	The terminal information was not found (when the `-all` parameter is specified).
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.

show wol-device name [OP-WOL]

Displays the terminal information that has been registered in the internal DB used to register the terminal that sends the startup command. This command can also display user information that is being entered or edited by using the following commands:

- `set wol-device name` command
- `set wol-device mac` command
- `set wol-device vlan` command
- `set wol-device ip` command
- `set wol-device alive` command
- `set wol-device description` command
- `remove wol-device name` command

Syntax

```
show wol-device name {edit | commit} [device-name <Name>] [detail]
```

Input mode

Administrator mode

Parameters

`{edit | commit}`

`edit`

Displays the terminal information being edited.

`commit`

Displays information about the terminals being operated.

`device-name <Name>`

Specify a terminal name.

If the specified character string partly matches a terminal name that has been registered, the relevant terminal information is displayed.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

Operation when this parameter is omitted:

All terminal information is displayed.

`detail`

Displays detailed information about the terminals that are being edited or operated.

Operation when this parameter is omitted:

Detailed information is not displayed.

Example 1

- Displaying the terminal information being edited:

```
# show wol-device name edit

Date 2008/11/06 14:48:49 UTC
 Total device counts:   5
  No Device name  MAC         VLAN IP address     Alive   Description
```

```
1 PC01       0012.ee86.6fd4 4094 202.68.133.72  300    change-user
2 PC02       00ee.16fd.a142  100 10.1.10.10    600    all-user-...
3 PC03_High...  0022.fa12.34dd   10 dhcp          60     High_price
4 PC04          04ff.d423.f145    5 dhcp           120
5 PC05         0612.7faf.1fdd 2000 202.68.133.70   no-check notePC

#
```

Display items in Example 1

Table 29-8 Items displayed for the terminal information

Item	Meaning	Displayed information
`Total device counts`	Number of registered terminals	Maximum of 300 terminals
#	Entry number	Maximum of 300 entries
`Device name`	Terminal name	Up to 12 characters are displayed. (If the name exceeds 12 characters, part of the name is omitted and replaced with three periods (`...`).The full name can be checked in detailed information.)
MAC	MAC address	--
VLAN	VLAN ID	--
IP address	IP address	`dhcp` is displayed if the IP address has been set via DHCP.
Alive	Time for verifying activation (seconds)	Displays the interval used to verify activation. `no-check` is displayed if activation verification is not performed.
Description	Supplementary explanation	Up to 12 characters are displayed. (If the name exceeds 12 characters, part of the name is omitted and replaced with three periods (`...`).The full name can be checked in detailed information.) This item is not displayed if it has not been set.

Example 2

Figure 29-2 Example of displaying detailed terminal information:

```
# show wol-device name edit detail

Date 2008/11/06 14:58:27 UTC
 No    1 : PC01
  MAC: 0012.ee86.6fd4,  VLAN: 4094
  IP address: 202.68.133.72,  Alive: check  Timeout: 300(s)
  Description: change-user

 No    2 : PC02
  MAC: 00ee.16fd.a142,  VLAN: 100
  IP address: 10.1.10.10,  Alive: check  Timeout: 600(s)
  Description: all-user-backup
```

```
 No    3 : PC03_High-Speed_machine
  MAC: 0022.fa12.34dd,  VLAN: 10
  IP address: dhcp,  Alive: check  Timeout: 60(s)
  Description: High_price

 No    4 : PC04
  MAC: 04ff.d423.f145,  VLAN: 5
  IP address: dhcp,  Alive: check  Timeout: 120(s)
  Description:

 No    5 : PC05
  MAC: 0612.7faf.1fdd,  VLAN: 2000
  IP address: 202.68.133.70,  Alive: no-check
  Description: notePC

#
```

Display items in Example 2

Table 29-9 Items displayed for the detailed terminal information

Item	Meaning	Displayed information
#	Entry number	Maximum of 300 entries
	Terminal name	--
MAC	MAC address	--
VLAN	VLAN ID	--
IP address	IP address	`dhcp` is displayed if the IP address has been set via DHCP.
Alive	Time for verifying activation (seconds)	Displays the interval used to verify activation. `no-check` is displayed if activation verification is not performed.
Description	Supplementary explanation	Displays supplementary information about the terminal. This item is not displayed if it has not been set.

Impact on communication

None

Response messages

Table 29-10 List of response messages for the show wol-device name command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (edit)	There was no information in the edit area of the internal DB.
There is no information. (commit)	There was no information in the commit area of the internal DB.

Message	Description
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.

commit wol-device [OP-WOL]

Stores the edited terminal information in internal flash memory and reflects its contents for operation.

Syntax

```
commit wol-device [-f]
```

Input mode

Administrator mode

Parameters

`-f`

Stores the edited terminal information in internal flash memory and reflects its contents for operation. A confirmation message is not displayed.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Example of storing the internal DB used to register the terminal that sends the startup command:

```
# commit wol-device
Commitment wol-device name data.  Are you sure? (y/n): y

Commit complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-11 List of response messages for the commit wol-device command

Message	Description
Commit complete.	Storing the information to internal flash memory and reflecting its contents for Secure Wake-on-LAN finished normally.
Flash memory write failed.	Writing of the information to internal flash memory failed.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- For current users of the terminal, the execution results are applied from the next

login. (Even if the information for the terminal being used has been deleted, the user can continue to use the terminal.)

store wol-device [OP-WOL]

Creates a backup file of the internal DB used to register the terminal that sends the startup command.

Syntax

```
store wol-device ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Creates on the RAMDISK a backup file of the internal DB used to register the terminal that sends the startup command.

<File name>

Specify the name of the file to which the internal DB used to register the terminal that sends the startup command is to be backed up.

Specify the file name with 64 or fewer characters. For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Creates a backup file of the internal DB used to register the terminal that sends the startup command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Create the backup file `wol_dev.txt` for the internal DB used to register the terminal that sends the startup command:

```
# store wol-device ramdisk wol_dev.txt
Backup wol-device name data.  Are You sure? (y/n): y

Backup complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-12 List of response messages for the store wol-device command

Message	Description
Backup complete.	A backup file has been created successfully.
Store operation failed.	The command could not be executed because of insufficient RAMDISK capacity.

Message	Description
Command information was damaged.	A backup file could not be created because the database information is corrupted.
Data doesn't exist.	A backup file could not be created. A commit operation might not have been executed. Execute a commit operation, and then check the result. If the commit operation fails again, the internal flash memory might be corrupted.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- If the free capacity on the RAMDISK is insufficient, use the `del` command to delete unnecessary files before creating the backup files.

load wol-device [OP-WOL]

Restores from a backup file the internal DB used to register the terminal that sends the startup command.

Note that information registered or changed by using the following commands will be replaced by the information that is being restored:

- `set wol-device name` command
- `set wol-device mac` command
- `set wol-device vlan` command
- `set wol-device ip` command
- `set wol-device alive` command
- `set wol-device description` command
- `remove wol-device name` command
- `commit wol-device` command

Syntax

```
load wol-device ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Restores to the RAMDISK from a backup file the internal DB used to register the terminal that sends the startup command.

<File name>

Specify the name of the file from which the internal DB for registering the terminal that sends the startup command is to be restored.

Specify the file name with 64 or fewer characters. For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Restores the internal DB used to register the terminal that sends the startup command without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Restore the internal DB used to register the terminal that sends the startup command from the backup file:

```
# load wol-device ramdisk wol_dev.txt
Restore wol-device name data.  Are you sure? (y/n): y

Restore complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-13 List of response messages for the load wol-device command

Message	Description
Restore complete.	Restoration from the backup file was successful.
File format error.	The format of the specified backup file is different from the internal DB used to register the terminal that sends the startup command.
Load operation failed.	Restoration from the backup file failed.
Flash memory write failed.	Writing of the information to internal flash memory failed.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- For current users of the terminal, the execution results are applied from the next login. (Even if the information for the terminal being used has been deleted, the user can continue to use the terminal.)

set wol-authentication user [OP-WOL]

Registers new user information in the internal DB for user authentication. Specify the name of an accessible terminal and access permissions.

To apply the setting to user information, execute the `commit wol-authentication` command.

Syntax

```
set wol-authentication user <User name> <Password> permit [any] [manual] [device-name <Name>]
```

Input mode

Administrator mode

Parameters

<User name>

The user name.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

<Password>

Specify the user password.

Specify 1 to 32 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

`permit [any] [manual] [device-name <Name>]`

`any`

Sets access permissions for all terminals that have been registered in the internal DB used to register the terminal that sends the startup command.

`manual`

Sets access permissions that directly specify the MAC address and VLAN ID.

`device-name <Name>`

Sets the terminal name that has been registered in the internal DB used to register the terminal that sends the startup command.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

Note on setting this parameter

You cannot omit all of the parameters. Specify at least one of the parameters.

Example

Registering the new user name `USER01`:

```
# set wol-authentication user USER01 pass permit any manual device-name PC01
```

Display items

None

Impact on communication

None

Response messages

Table 29-14 List of response messages for the set wol-authentication user command

Message	Description
Already user '*<User name>*' exists.	The specified user has already been registered.
The number of users exceeds 300.	The number of users to be registered exceeds 300.
The sum of the device of each user exceeds 300.	The number of combinations of users and terminals set for each user has exceeded 300.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- To check user information, execute the `show wol-authentication user` command.
- The maximum number of users that can be registered is 300.
- The upper limit on the number of combinations of users and terminals is 300. For example, if you allowed one user to access 300 terminals, then no more access permissions for other terminals can be set for the user. The `any` and `manual` settings are excluded from this limit.
- You can allow one user to access multiple terminals, but one execution of the command only registers access permissions for one terminal. To allow access to more terminals, use the `set wol-authentication permit` command.
- This command applies only to the registration of a new user. To change the setting, use another `set wol-authentication` command.

set wol-authentication password [OP-WOL]

Changes a user password that has been registered.

To apply the setting to user information, execute the `commit wol-authentication` command.

Syntax

```
set wol-authentication password <User name> <Old password> <New password>
```

Input mode

Administrator mode

Parameters

<User name>

Specify the name of the user whose password is to be changed.

<Old Password>

Specify the current password.

<New Password>

Specify the new password.

Specify 1 to 32 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

Example

Changing the password for user `USER01`:

```
# set wol-authentication password USER01 pass user0101
```

Display items

None

Impact on communication

None

Response messages

Table 29-15 List of response messages for the set wol-authentication password command

Message	Description
The old-password is different.	The old password for the specified user is incorrect.
Unknown user '*<User name>*'.	The specified user has not been registered.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of the command, user information must be registered by the `set`

set wol-authentication password [OP-WOL]

`wol-authentication user` command.

set wol-authentication permit [OP-WOL]

Changes (adds or deletes) information about the terminals that can be accessed by registered users.

To apply the setting to user information, execute the `commit wol-authentication` command.

Syntax

```
set wol-authentication permit <User name> { add [any][manual][device-name <Name>] |del [any][manual][device-name <Name>] }
```

Input mode

Administrator mode

Parameters

<User name>

Specify the name of the user whose access permissions for the terminal are to be changed.

`add [any][manual][device-name <Name>]`

`any`

Adds access permissions for all terminals that have been registered in the internal DB used to register the terminal that sends the startup command.

`manual`

Adds access permission for a terminal for which a MAC address and VLAN ID are directly specified.

`device-name <Name>`

Adds the terminal name that has been registered in the internal DB used to register the terminal that sends the startup command.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (@), hyphens (-), underscores (_), and periods (.).

Note on setting this parameter

You cannot omit all of the parameters. Specify at least one of the parameters.

`del [any][manual][device-name <Name>]`

`any`

Deletes the access permissions for all terminals that have been registered in the internal DB used to register the terminal that sends the startup command.

`manual`

Deletes the access permissions for the terminal for which a MAC address and VLAN ID are directly specified.

`device-name <Name>`

Deletes the terminal name that has been registered in the internal DB used to register the terminal that sends the startup command.

Note on setting this parameter

You cannot omit all of the parameters. Specify at least one of the parameters.

Example

- Adding user access permissions for a terminal:

```
# set wol-authentication permit USER01 add device-name PC02
```

- Deleting user access permissions for a terminal:

```
# set wol-authentication permit USER01 del any manual device-name PC02@
example.com
```

Display items

None

Impact on communication

None

Response messages

Table 29-16 List of response messages for the set wol-authentication permit command

Message	Description
Unknown user '*<User name>*'.	The specified user has not been registered.
The sum of the device of each user exceeds 300.	The number of combinations of users and terminals set for each user has exceeded 300.
The parameter cannot be adjusted to 0.	The parameter cannot be set to 0.
Unknown parameter.	The specified parameter could not be found.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- Before execution of the command, user information must be registered by the `set wol-authentication user` command.
- You can allow one user to access multiple terminals, but one execution of the command only registers access permissions for one terminal.
- An access permission that has already been registered cannot be added even if specified for the `add` parameter.
- The `del` parameter cannot be used to reduce the number of terminals that can be accessed to 0.

remove wol-authentication user [OP-WOL]

Deletes the user information that has been registered.

To apply the setting to user information, execute the `commit wol-authentication` command.

Syntax

```
remove wol-authentication user {<User name> | -all} [-f]
```

Input mode

Administrator mode

Parameters

`{<User name> | -all }`

<User name>

Specify the name of the user to be deleted.

`-all`

Deletes all users.

`-f`

Deletes the user without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

- When deleting the user `USER01`:

```
# remove wol-authentication user USER01
Remove wol-authentication user.  Are you sure? (y/n): y
```

- Deleting all users who have been registered in the internal DB for user authentication:

```
# remove wol-authentication user -all
Remove all wol-authentication user.  Are you sure? (y/n): y
```

Display items

None

Impact on communication

None

Response messages

Table 29-17 List of response messages for the remove wol-authentication user command

Message	Description
Unknown user '*<User name>*'.	The specified user has not been registered. (when a single MAC address is specified).

Message	Description
User does not exist.	The user was not found (when the `-all` parameter is specified).
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.

show wol-authentication user [OP-WOL]

Displays user information that has been registered in the internal DB for user authentication. This command can also display user information that is being entered or edited by using the following commands:

- `set wol-authentication user` command
- `set wol-authentication password` command
- `set wol-authentication permit` command
- `remove wol-authentication user` command

User information is displayed in ascending order of user name.

Syntax

```
show wol-authentication user { edit | commit } [username <User name>] [detail]
```

Input mode

Administrator mode

Parameters

`{edit | commit}`

`edit`

Displays user information being edited.

`commit`

Displays operating user information.

`username` *<User name>*

The user name.

If the specified character string partly matches the user name that has been registered, the relevant user information is displayed.

Specify 1 to 128 characters. You can use alphanumeric characters (case sensitive), at marks (`@`), hyphens (`-`), underscores (`_`), and periods (`.`).

Operation when this parameter is omitted:

All user information is displayed.

`detail`

Displays detailed information about the users who are being edited or operated.

Operation when this parameter is omitted:

Detailed information is not displayed.

Example 1

When displaying the user information being edited:

```
# show wol-authentication user edit

Date 2008/11/06 20:48:57 UTC
  Total user counts:   5
  Total device link:   7
   No any     manual  device  Username
    1 deny    deny         2  Mail-Address_of_USER04_of_The_Company...
    2 permit  permit       1  USER01
*   3 deny    permit       3  USER02
    4 permit  deny         0  USER03
```

```
*   5 permit  deny         1  USER05

#
```

* indicates that the relevant terminal name has not been registered in the internal DB used to register the terminal that sends the startup command.

Display items in Example 1

Table 29-18 Items displayed for the user information

Item	Meaning	Displayed information
Total user counts	Number of registered users	Maximum of 300 terminals
Total device link	Number of combinations of users and terminals	Maximum of 300 sets
#	Entry number	Maximum of 300 entries
any	Setting status of access permissions for all terminals	permit: Access permissions have been set. deny: Access permissions have not been set.
manual	Setting status of access permissions that have been entered manually	permit: Access permissions have been set. deny: Access permissions have not been set.
device	Number of combinations of users and terminals	The number of terminals that have been set for one user
Username	user name	Up to 40 characters are displayed. (If the name exceeds 40 characters, part of the name is replaced with three periods (...).The full name can be checked in the detailed information.)

Example 2

Figure 29-3 Example of displaying detailed user information:

```
# show wol-authentication user edit detail

Date 2008/11/06 20:49:10 UTC
 No    1 : Mail-Address_of_USER04_of_The_Company@example.com
  permit : any=deny, manual=deny
   device-name
        1  : PC01
        2  : PC03_High-Speed_machine

 No    2 : USER01
  permit : any=permit, manual=permit
   device-name
        1  : PC01

 No    3 : USER02
  permit : any=deny, manual=permit
   device-name
    *   1  : PC02@
        2  : PC01
        3  : PC03_High-Speed_machine

 No    4 : USER03
```

```
  permit : any=permit, manual=deny

 No    5 : USER05
  permit : any=permit, manual=deny
   device-name
    *   1  : PC04@

#
```

* indicates that the relevant terminal name has not been registered in the internal DB used to register the terminal that sends the startup command.

Display items in Example 2

Table 29-19 Items displayed for detailed user information

Item		Meaning	Displayed information
#		Entry number	Maximum of 300 entries
		user name	--
permit	any=	Setting status of access permissions for all terminals	`permit`: Access permissions have been set. `deny`: Access permissions have not been set.
	manual=	Setting status of access permissions that have been entered manually	`permit`: Access permissions have been set. `deny`: Access permissions have not been set.
	device-name	Entry number	Maximum of 300 entries
		Terminal name	This item is not displayed if it has not been set.

Impact on communication

None

Response messages

Table 29-20 List of response messages for the show wol-authentication user command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no information. (edit)	There was no information in the edit area of the internal DB.
There is no information. (commit)	There was no information in the commit area of the internal DB.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- (*) indicates that the relevant terminal name has not been registered in the internal DB used to register the terminal that sends the startup command. Use the `show wol-device-name` command to check the information that has been registered.

commit wol-authentication [OP-WOL]

Stores the edited user information in internal flash memory and reflects its contents for operation.

Syntax

```
commit wol-authentication [-f]
```

Input mode

Administrator mode

Parameters

`-f`

Stores the internal DB for user authentication in internal flash memory and reflects its contents for operation. A confirmation message is not displayed.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Example of storing the internal DB for user authentication:

```
# commit wol-authentication
Commitment wol-authentication user data.  Are you sure? (y/n): y

Commit complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-21 List of response messages for the commit wol-authentication command

Message	Description
Commit complete.	Storing the information to internal flash memory and reflecting its contents for Secure Wake-on-LAN finished normally.
Flash memory write failed.	Writing of the information to internal flash memory failed.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- For current users of the terminal, the execution results are applied from the next login. (Even if the information of the user being used has been deleted, the user can

continue to use the terminal.)

store wol-authentication [OP-WOL]

Creates a backup file of the internal DB for user authentication.

Syntax

```
store wol-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Creates a backup file of the internal DB for user authentication on the RAMDISK.

<File name>

Specify the name of the file to which the internal DB for user authentication is to be backed up.

Specify the file name with 64 or fewer characters. For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Creates a backup file of the internal DB for user authentication without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Creating the backup file `wol_auth.txt` for the internal DB for user authentication:

```
# store wol-authentication ramdisk wol_auth.txt
Backup wol-authentication user data.  Are You sure? (y/n): y

Backup complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-22 List of response messages for the store wol-authentication command

Message	Description
Backup complete.	A backup file has been created successfully.
Store operation failed.	The command could not be executed because of insufficient RAMDISK capacity.
Command information was damaged.	A backup file could not be created because the database information is corrupted.

Message	Description
Data doesn't exist.	A backup file could not be created. A commit operation might not have been executed. Execute a commit operation, and then check the result. If the commit operation fails again, the internal flash memory might be corrupted.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- If the free capacity on the RAMDISK is insufficient, use the `del` command to delete unnecessary files before creating the backup files.

load wol-authentication [OP-WOL]

Restores the internal DB for user authentication from a backup file.

Note that information registered or changed by using the following commands will be replaced by the information that is being restored:

- `set wol-authentication user` command
- `set wol-authentication password` command
- `set wol-authentication permit` command
- `remove wol-authentication user` command
- `commit wol-authentication` command

Syntax

```
load wol-authentication ramdisk <File name> [-f]
```

Input mode

Administrator mode

Parameters

`ramdisk`

Restores the internal DB for user authentication from a backup file to the RAMDISK.

<File name>

Specify the name of the backup file from which the internal DB for user authentication is to be restored.

Specify the file name with 64 or fewer characters. For the characters that can be specified, see *Specifiable values for parameters*.

`-f`

Restores the internal DB for user authentication without displaying a confirmation message.

Operation when this parameter is omitted:

A confirmation message is displayed.

Example

Restoring the internal DB for user authentication from the backup file `wol_auth.txt`:

```
# load wol-authentication ramdisk wol_auth.txt
Restore wol-authentication user data.  Are you sure? (y/n): y

Restore complete.
#
```

Display items

None

Impact on communication

None

Response messages

Table 29-23 List of response messages for the load wol-authentication command

Message	Description
Restore complete.	Restoration from the backup file was successful.
File format error.	The format of the specified backup file is different from the internal DB for authentication.
Load operation failed.	Restoration from the backup file failed.
Flash memory write failed.	Writing of the information to internal flash memory failed.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- For current users of the terminal, the execution results are applied from the next login. (Even if the information of the user being used has been deleted, the user can continue to use the terminal.)

wol [OP-WOL]

Directly sends the startup command to the specified terminal to turn it on.

Syntax

```
wol <MAC> <VLAN ID>
```

Input mode

Administrator mode

Parameters

<MAC>

Specify the MAC address of the terminal to which the startup command is to be sent.

Specify the MAC address in the range from `0000.0000.0000` to `feff.ffff.ffff`. Note that you cannot specify a multicast MAC address (address in which the lowest bit of the first byte is 1).

<VLAN ID>

Specify the VLAN ID of the VLAN to which the terminal to which the startup command is to be sent belongs. For details about the specifiable range of values, see *Specifiable values for parameters*.

Example

Sending the startup command to the terminal whose MAC address is `0012.e256.7890` and VLAN ID is `200`:

```
# wol 0012.e256.7890 200
```

Display items

None

Impact on communication

None

Response messages

Table 29-24 List of response messages for the wol command

Message	Description
The magic packet is sent.	The startup command has been sent.
The magic packet is not sent.	An attempt to send the startup command failed.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- One execution of this command will send the startup command only once.

show wol [OP-WOL]

Displays information about the users currently using the Secure Wake-on-LAN functionality from Web browsers.

Syntax

```
show wol
```

Input mode

Administrator mode

Parameters

None

Example

Example of displaying information about current users:

```
# show wol

Date 2008/11/06 17:32:25 UTC
  No User name                          Phase   Magic  Device IP       Target
   1 User-A                             IDLE    -      -               Timeout
   2 User-B                             CHECK   Sent   192.168.1.102   Waiting
   3 User-C                             IDLE    Sent   192.168.10.100  Alive
   4 User-D                             RESOLVE Failed Waiting         -
   5 User-E                             RESOLVE Sent   Waiting         -
   6 Mail-Address_of_USER04_of_The_Co... IDLE    Sent   202.68.133.72   Alive

#
```

Display items

Table 29-25 Information displayed for current users

Item	Meaning	Displayed information
#	Entry number	Maximum of 32 entries
User name	user name	The name of a user for which authentication is currently being processed Up to 35 characters are displayed. (If the name exceeds 35 characters, part of the name is replaced with three periods (`...`).)
Phase	The status of the user	`REGIST`: The initial user authentication status `MAGIC`: The startup command can be issued after the terminal information has been selected and entered. `RESOLVE`: IP resolution on the DHCP terminal is being monitored. `CHECK`: The terminal is being monitored. `IDLE`: A processing series either has been completed or has suspended due to timing out of a request or similar reason. `FIN`: The response to the final update request has been completed, or completion processing continues due to timing out of the request or a similar reason.

Item	Meaning	Displayed information
Magic	The status of sending the startup command	`Sent`: The startup command has been sent. `Failed`: An attempt to send the startup command failed. `-`: Not executed.
Device IP	Terminal IP address	Unknown IP address `Waiting`: The IP address for the DHCP terminal is being checked. `IPv4`: The terminal IP address has been resolved.
Target	The status of the applicable terminal	`-`: Not executed. `Waiting`: The terminal is being monitored. `Alive`: A verification response has been received. `Timeout`: Monitoring or a request has timed out. #: The monitoring status continues no more than 1 minute.

Impact on communication

None

Response messages

Table 29-26 List of response messages for the show wol command

Message	Description
There is no information.	There is no information about users using Secure Wake-on-LAN.
License key is not installed.	The Secure Wake-on-LAN software option license key has not been set.

Notes

- This command can be executed only after the software option license key has been installed.
- The execution results of the `wol` command are not applied.

Part 10: High Reliability Based on Redundant Configurations

30. GSRP

show gsrp aware

show gsrp aware

Displays GSRP aware information.

Syntax

```
show gsrp aware
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 30-1 Example of displaying the show gsrp aware command

```
> show gsrp aware

Date 2008/11/14 14:34:40 UTCLast mac_address_table Flush Time : 2008/11/14 14:34:35
GSRP Flush Request Parameters :
 GSRP ID : 10      VLAN Group ID : 6   Port : 0/16
 Source MAC Address : 0012.e208.2096

>
```

Display items

Item	Meaning	Displayed information
Last mac_address_table Flush Time	Time `mac_address_table Flush` was last performed	*yyyy/mm/dd hh:mm:ss* year/month/day hour:minute:second
GSRP Flush Request Parameters	Information about the GSRP Flush request frame when `mac_address_table Flush` was last performed	--
GSRP ID	GSRP group number	1 to 65535
VLAN Group ID	The VLAN group number for the received GSRP Flush request frame	1 to 64 (This ID indicates the number of the VLAN group in which the master and backup are switched.)
Port	Port on which a GSRP Flush request frame was received	--
Source MAC Address	MAC address from which the received GSRP Flush request frame was sent	--

Impact on communication

None

Response messages

Table 30-1 List of response messages for the show gsrp aware command

Message	Description
No received flush request frame.	No GSRP Flush request frames were received.

Notes

Receiving a GSRP Flush request frame clears all MAC address tables for every VLAN group IDs.

show gsrp aware

31. Uplink Redundancy

select switchport backup interface
show switchport backup
show switchport backup statistics
clear switchport backup statistics
show switchport backup mac-address-table update
show switchport backup mac-address-table update statistics
clear switchport backup mac-address-table update statistics

select switchport backup interface

Specifies the interface that performs a manual switchback.

Syntax

```
select switchport backup interface{gigabitethernet <IF#> | port-channel <Channel group#>} [AX2200S]
select switchport backup interface{{fastethernet | gigabitethernet} <IF#> | port-channel <Channel group#>} [AX1250S] [AX1240S]
```

Input mode

Administrator mode

Parameters

`gigabitethernet` *<IF#>* [AX2200S]

Specifies a 10BASE-T/100BASE-TX/1000BASE-T or 1000BASE-X interface.

`{fastethernet | gigabitethernet}` *<IF#>* [AX1250S][AX1240S]

`fastethernet`

Specify a 10BASE-T or 100BASE-TX interface.

`gigabitethernet`

Specify a 1000BASE-T, 100BASE-FX, or 1000BASE-X interface.

<IF#>

Specify an interface port number. For the specifiable range of values, see *Specifiable values for parameterss*.

`port-channel` *<Channel group#>*

Specify the channel group number for a port channel interface. For details about how to specify *<Channel group#>*, see *Specifiable values for parameters*.

Example

```
# select switchport backup interface fastethernet 0/1
```

Display items

None

Impact on communication

None

Response messages

Table 31-1 List of response messages for the select switchport backup interface command

Message	Description
Uplink redundant is not configured.	Uplink redundancy has not been set. Check the configuration.
Ethernet *<IF#>* is already selected.	The specified interface is already running. *<IF#>*: Interface port number

Message	Description
Port-channel <*Channel group#*> is already selected.	The specified interface is already running. <*Channel group#*>: Channel group number
Ethernet < *IF#* > is down.	The specified interface is not running. <*IF#*>: Interface port number
Port-channel <*Channel group#*> is down.	The specified interface is not running. <*Channel group#*>: Channel group number
Not ready. Please wait a minute.	Uplink redundancy is being initialized. Wait a while.

Notes

None

show switchport backup

Displays information about uplink redundancy.

Syntax

```
show switchport backup
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 31-2 Example of displaying uplink redundancy information

```
> show switchport backup

Date 2010/01/08 16:48:07 UTC
Startup active port selection: primary only
Switchport backup pairs                          Preemption    Flush
 Primary    Status      Secondary  Status       Delay Limit   VLAN
 Port 0/1   Blocking    Port 0/25  Forwarding       -     -   4094
*Port 0/10  Blocking    ChGr 4     Forwarding     100    98     10
 Port 0/11  Down        Port 0/15  Down             -     -      -
 Port 0/26  Blocking    ChGr 1     Forwarding      30    25   untag
 ChGr 8     Blocking    Port 0/24  Forwarding     300   297    100

>
```

Display items

Table 31-2 Display items for the uplink redundancy information

Item		Meaning	Displayed information
Startup active port selection		Setting of the functionality that permanently assigns the active port at device startup	`primary only`: The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
Switchport backup pairs	Primary	The number of the primary port or the channel group	If an asterisk (`*`) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.
	Status	Status of the primary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
	Secondary	The number of the secondary port or the channel group	--

Item		Meaning	Displayed information
	Status	Status of the secondary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
Preemption	Delay	The time value (in seconds) for automatic or timer switch-back	`-` is displayed when this item is not set.
	Limit	The time remaining until a timer switch-back (in seconds)	`-` is displayed when this item is not set.
Flush	VLAN	VLAN to which flush control frames are sent	`1` to `4094`: Indicates a VLAN ID. `untag`: No VLAN is specified. `-`: Send setting is not set.

Impact on communication

None

Response messages

Table 31-3 List of response messages for the `show switchport backup` command

Message	Description
Uplink redundant is not configured.	Uplink redundancy has not been set. Check the configuration.
Not ready. Please wait a minute.	Uplink redundancy is being initialized. Wait a while.

Notes

If there is no configuration for the port channel interface specified as the secondary port, no information about a primary or secondary pair is displayed.

show switchport backup statistics

Displays statistics related to flush control frames.

Syntax

```
show switchport backup statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 31-3 Example of displaying statistics about the flush control frames

```
> show switchport backup statistics

Date 2008/11/04 17:34:51 UTC
System ID : 00ed.f009.0001
Port 0/1  Transmit : on
          Transmit Total packets      :          3
          Receive  Total packets      :          0
                   Valid packets      :          0
                   Unknown version    :          0
                   Self-transmitted   :          0
                   Duplicate sequence :          0
  Last change time   : 2008/11/04 16:52:21 UTC (00:42:30 ago)
  Last transmit time : 2008/11/04 16:52:22 UTC (00:42:29 ago)
  Last receive time  : -
   Sender system ID  : 00ed.f001.0001

Port 0/2  Transmit : off
          Transmit Total packets      :          0
          Receive  Total packets      :          3
                   Valid packets      :          1
                   Unknown version    :          0
                   Self-transmitted   :          0
                   Duplicate sequence :          2
  Last change time   : -
  Last transmit time : -
  Last receive time  : 2008/11/04 17:18:26 UTC (00:16:25 ago)
   Sender system ID  : 00ed.f004.0001

      :

ChGr 8    Transmit : on
          Transmit Total packets      :          0
          Receive  Total packets      :          0
                   Valid packets      :          0
                   Unknown version    :          0
                   Self-transmitted   :          0
                   Duplicate sequence :          0
  Last change time   : -
  Last transmit time : -
  Last receive time  : -
   Sender system ID  : 00ed.f010.0001
```

>

Display items

Table 31-4 Items displayed for statistics about the flush control frames

Item	Meaning	Displayed information
System ID	MAC address of the Switch	--
Port:<*IF#*>	Interface port number	--
ChGr<*Channel group#*>	Channel group number	--
Transmit	Whether the transmission of flush control frames has been set	`on`: Transmit `off`: Does not transmit
Transmit Total packets	Number of times a flush control frame was sent	--
Receive Total packets	Number of times a flush control frame was received	--
Valid packets	Number of received frames for which the MAC address table was cleared	--
Unknown version	Number of received frames for which the MAC address table was not cleared	The version in the frames was unknown.
Self-transmitted	Number of received frames for which the MAC address table was not cleared	Frames originated by the device
Duplicate sequence	Number of received frames for which the MAC address table was not cleared	Sequence duplication in the frames
Last change time	Date and time the primary and secondary were last switched and the time that has elapsed since then	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* `UTC` `(`*d* `days` *hh*`:`*mm*`:`*ss* `ago)`[#1] `--` is displayed if the primary and secondary has never been switched.
Last transmit time	Date and time a flush control frame was last sent and the time that has elapsed since then	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* `UTC` `(`*d* `days` *hh*`:`*mm*`:`*ss* `ago)`[#1] `--` is displayed if the frame has never been sent.
Last receive time	Date and time a flush control frame was last received and the time that has elapsed since then	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* `UTC` `(`*d* `days` *hh*`:`*mm*`:`*ss* `ago)`[#1] `--` is displayed if the frame has never been received.
Sender system ID	MAC address from which the last received flush control frame was sent	`--` is displayed if the frame has never been received.

#1: Display of elapsed time:

If the elapsed time is 24 hours or less: *hh*`:`*mm*`:`*ss* `ago` (*hh*=hours, *mm*=minutes, *ss*=seconds)

If the elapsed time is more than 24 hours: *d* `days` *hh*`:`*mm*`:`*ss* ago (*d*=number of days, *hh*=hours, *mm*=minutes, *ss*=seconds)

Impact on communication

None

Response messages

None

Notes

None

clear switchport backup statistics

Clears statistics related to flush control frames.

Syntax

```
clear switchport backup statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
> clear switchport backup statistics

>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

show switchport backup mac-address-table update

Displays information about MAC address update frames.

Syntax

```
show switchport backup mac-address-table update
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 31-4 Example of displaying statistics about the MAC address update frames

```
> show switchport backup mac-address-table update

Date 2010/01/09 18:02:40 UTC
Startup active port selection: primary only
Switchport backup pairs                       Preemption    Retransmit
 Primary    Status      Secondary  Status      Delay Limit
 Port 0/1   Down        Port 0/2   Forwarding      0     -            -
  VLAN           : 1,101-149,151-200,2001-2049,2051-2100,4040-4049,4051-4094
  Exclude-VLAN   : 50,150,1050,2050,3050,4050

Switchport backup pairs                       Preemption    Retransmit
 Primary    Status      Secondary  Status      Delay Limit
 Port 0/25  Down        Port 0/26  Forwarding      0     -            3
  VLAN           : 1,101-149,151-200,2001-2049,2051-2100,4040-4049,4051-4094
  Exclude-VLAN   : 50,150,1050,2050,3050,4050

Switchport backup pairs                       Preemption    Retransmit
 Primary    Status      Secondary  Status      Delay Limit
 ChGr 1     Down        ChGr 2     Forwarding      0     -            3
  VLAN           : 1,101-149,151-200,2001-2049,2051-2100,4040-4049,4051-4094
  Exclude-VLAN   : 50,150,1050,2050,3050,4050

>
```

Display items

Table 31-5 Information displayed for MAC address update frames

Item		Meaning	Displayed information
Startup active port selection		Setting of the functionality that permanently assigns the active port at device startup	`primary only`: The functionality that permanently assigns the active port at device startup is enabled. This item is displayed only when this functionality is enabled.
Switchport backup pairs	Primary	The number of the primary port or the channel group	If an asterisk (*) is displayed, the port is an uplink port and the secondary port cannot be used for communication because the functionality that permanently assigns the active port at device startup is enabled.

Item		Meaning	Displayed information
	Status	Status of the primary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
	Secondary	The number of the secondary port or the channel group	--
	Status	Status of the secondary port	`Forwarding`: Forwarding `Blocking`: Blocking `Down`: Link down
Preemption	Delay	The time value (in seconds) for automatic or timer switch-back	`-` is displayed when this item is not set.
	Limit	The time remaining until a timer switch-back (in seconds)	`-` is displayed when this item is not set.
Retransmit		Number of retransmissions of MAC address update frames	`-` is displayed when this item is not set.
VLAN		VLANs that are subject to the MAC address update functionality	`-` is displayed when this item is not set.
Exclude-VLAN		VLANs that are not subject to the MAC address update functionality	`-` is displayed when this item is not set.

Impact on communication

None

Response messages

Table 31-6 List of response messages for the show switchport backup mac-address-table update command

Message	Description
Uplink redundant is not configured.	Uplink redundancy has not been set. Check the configuration.
Mac-address-table update is not configured.	The functionality for sending MAC address update frames has not been set or enabled.
Not ready. Please wait a minute.	Uplink redundancy is being initialized. Wait a while.

Notes

If there is no configuration for the port channel interface specified as the secondary port, no information about a primary or secondary pair is displayed.

show switchport backup mac-address-table update statistics

Displays statistics related to MAC address update frames.

Syntax

```
show switchport backup mac-address-table update statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 31-5 Example of displaying statistics about the MAC address update frames

```
> show switchport backup mac-address-table update statistics

Date 2009/03/20 18:04:33 UTC
System ID : 0012.e244.0000
Port 0/1  Transition count                :      20094
          Update transmit total packets   :          0
          Transmission over flows         :          0
  Last change time   : 2009/03/20 16:25:55 UTC (01:38:38 ago)
  Last transmit time : -

Port 0/2  Transition count                :      20094
          Update transmit total packets   :        294
          Transmission over flows         :          0
  Last change time   : 2009/03/20 16:25:59 UTC (01:38:34 ago)
  Last transmit time : 2009/03/20 16:26:07 UTC (01:38:26 ago)

Port 0/25 Transition count                :      18743
          Update transmit total packets   :     325020
          Transmission over flows         :       9224
  Last change time   : 2009/03/20 18:01:31 UTC (00:03:02 ago)
  Last transmit time : 2009/03/20 18:01:36 UTC (00:02:57 ago)

Port 0/26 Transition count                :      18743
          Update transmit total packets   :    4098830
          Transmission over flows         :      10569
  Last change time   : 2009/03/20 18:01:37 UTC (00:02:56 ago)
  Last transmit time : 2009/03/20 18:04:22 UTC (00:00:11 ago)

ChGr 1    Transition count                :        511
          Update transmit total packets   :      30553
          Transmission over flows         :        480
  Last change time   : 2009/03/20 18:01:29 UTC (00:03:04 ago)
  Last transmit time : 2009/03/20 18:01:19 UTC (00:03:14 ago)

ChGr 2    Transition count                :        512
          Update transmit total packets   :     128844
          Transmission over flows         :        480
  Last change time   : 2009/03/20 18:01:33 UTC (00:03:00 ago)
  Last transmit time : 2009/03/20 18:04:32 UTC (00:00:01 ago)

>
```

Display items

Table 31-7 Display items for statistics about MAC address update frames

Item	Meaning	Displayed information
System ID	MAC address of the Switch	--
Port*<IF#>*	Interface port number	--
ChGr*<Channel group#>*	Channel group number	--
Transition count	Number of primary and secondary switchovers	--
Update transmit total packets	Number of MAC address update frames that have been sent	--
Transmission over flows	Number of overflows when MAC address update frames were sent	Note: This counter is incremented when the MAC addresses subject to sending exceeds 1024 in one switchover.
Last change time	Date and time the primary and secondary were last switched and the time that has elapsed since then	*year/month/day hour:minute:second* UTC (*d* days *hh:mm:ss* ago)#1 -- is displayed if the primary and secondary has never been switched.
Last transmit time	Date and time a MAC address update frame was last sent and the time that has elapsed since then	*year/month/day hour:minute:second* UTC (*d* days *hh:mm:ss* ago)#1 -- is displayed if the frame has never been sent.

#1: Display of elapsed time:

If the elapsed time is 24 hours or less: *hh*:*mm*:*ss* ago (*hh*=hours, *mm*=minutes, *ss*=seconds)

If the elapsed time is more than 24 hours: *d* days *hh*:*mm*:*ss* ago (*d*=number of days, *hh*=hours, *mm*=minutes, *ss*=seconds)

Impact on communication

None

Response messages

Table 31-8 List of response messages for the show switchport backup mac-address-table update statistics command

Message	Description
Uplink redundant is not configured.	Uplink redundancy has not been set. Check the configuration.
Mac-address-table update is not configured.	The functionality for sending MAC address update frames has not been set or enabled.

Message	Description
Not ready. Please wait a minute.	Uplink redundancy is being initialized. Wait a while.

Notes

If there is no configuration for the port channel interface specified as the secondary port, no information about a primary or secondary pair is displayed.

clear switchport backup mac-address-table update statistics

Clears the statistics related to MAC address update frames.

Syntax

```
clear switchport backup mac-address-table update statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

```
> clear switchport backup mac-address-table update statistics

>
```

Display items

None

Impact on communication

None

Response messages

Table 31-9 List of response messages for the clear switchport backup mac-address-table update statistics command

Message	Description
Uplink redundant is not configured.	Uplink redundancy has not been set. Check the configuration.
Mac-address-table update is not configured.	The functionality for sending MAC address update frames has not been set or enabled.
Not ready. Please wait a minute.	Uplink redundancy is being initialized. Wait a while.

Notes

None

clear switchport backup mac-address-table update statistics

Part 11: High Reliability Based on Network Failure Detection

32. IEEE 802.3ah/UDLD

show efmoam
show efmoam statistics
clear efmoam statistics

show efmoam

Displays the IEEE 802.3ah/OAM configuration information and the status of ports.

Syntax

```
show efmoam [port <Port# list>]
```

Input mode

User mode and administrator mode

Parameters

`port` *<Port# list>*

Displays the IEEE 802.3ah/OAM configuration information for the specified port.

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:

The IEEE 802.3ah/OAM configuration information for all ports is displayed.

Operation when all parameters are omitted:

The IEEE 802.3ah/OAM configuration information for all ports is displayed.

Example

The following is an example of displaying brief information related to the IEEE 802.3ah/OAM configuration.

Figure 32-1 Displaying IEEE 802.3ah/OAM configuration information

```
> show efmoam

Date 2008/11/13 17:36:11 UTC
Port    Status              Dest MAC
0/1     Forced Down (UDLD)  0012.e214.ffae
0/2     Mutually Seen       0012.e214.ffaf
0/3     Partner Seen        0012.e214.ffb0
0/4     Down                unknown
0/5     Down                unknown

>
```

Display items

Table 32-1 Items displayed for the IEEE 802.3ah/OAM configuration

Item	Meaning	Displayed information
Port	Port number	Number of the interface port whose information is to be displayed
Status	Port status in the IEEE 802.3ah/UDLD functionality	`Forced Down (UDLD)`: Forced link-down in the UDLD functionality `Down`: Link-down due to some other reason `Passive Wait`: Wait status because the partner switch has not been recognized `Active Wait`: Wait status because the partner switch has not been recognized (OAM is being sent) `Partner Seen`: The partner switch has been

Item	Meaning	Displayed information
		recognized.(Whether the partner switch has recognized the Switch is not clear.) `Mutually Seen`: The partner switch has been recognized. (The partner switch has also recognized the Switch.)
Dest MAC	MAC address of the port on the partner device	`unknown`: No information has been received from the partner switch since the device started up. *<MAC address>*: The MAC address for the partner switch from which information was last received

Impact on communication

None

Response messages

Table 32-2 List of response messages for the show efmoam command

Message	Description
There is no information. (efmoam)	`efmoam disable` has been set. There is no log information to be displayed.

Notes

None

show efmoam statistics

Displays IEEE 802.3ah/OAM statistics.

Syntax

```
show efmoam statistics [port <Port# list>]
```

Input mode

User mode and administrator mode

Parameters

`port <Port# list>`

Displays the IEEE 802.3ah/OAM statistics for the specified port 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:

Statistics for all IEEE 802.3ah/OAM frames (OAMPDU) are displayed by port.

Example

The following is an example of displaying the statistics for all configured IEEE 802.3ah/OAM.

Figure 32-2 Displaying the IEEE 802.3ah/OAM statistics for the specified port

```
> show efmoam statistics port 0/1-3,0/15

Date 2008/11/13 17:35:25 UTC
Port 0/1 [Forced Down (UDLD)]
  OAMPDUs:Tx     :        133  Rx        :         57
          Invalid:          0  Unrecogn. :          0
  Expirings      :          1  Thrashings:          0  Blockings:          1
Port 0/2 [Mutually Seen]
  OAMPDUs:Tx     :        771  Rx        :        750
          Invalid:          0  Unrecogn. :          0
  Expirings      :          0  Thrashings:          0  Blockings:          0
Port 0/3 [Partner Seen]
  OAMPDUs:Tx     :        631  Rx        :        593
          Invalid:          0  Unrecogn. :          0
  Expirings      :          0  Thrashings:          0  Blockings:          0
Port 0/15 [Down]
  OAMPDUs:Tx     :          0  Rx        :          0
          Invalid:          0  Unrecogn. :          0
  Expirings      :          0  Thrashings:          0  Blockings:          0

>
```

Display items

Table 32-3 Display items for the IEEE 802.3ah/OAM statistics for the specified port

Item	Meaning	Displayed information
Port	Port number	Number of the interface port whose information is to be displayed

Item	Meaning	Displayed information
[Status]	Port status in the IEEE 802.3ah/UDLD functionality	`Forced Down (UDLD)`: Forced link-down in the UDLD functionality `Down`: Link-down due to some other reason `Passive Wait`: Wait status because the partner switch has not been recognized `Active Wait`: Wait status because the partner switch has not been recognized (OAM is being sent) `Partner Seen`: The partner switch has been recognized.(Whether the partner switch has recognized the Switch is not clear.) `Mutually Seen`: The partner switch has been recognized.(The partner switch has also recognized the Switch.)
OAMPDUs	Statistics for frames	--
Tx	Number of OAMPDUs that have been sent for each port	0 to 4294967295
Rx	Number of OAMPDUs that have been received for each port	0 to 4294967295
Invalid	Number of OAMPDUs that have been received but were discarded because they were invalid	0 to 4294967295
Unrecogn.	Number of unsupported OAMPDUs that have been received	0 to 4294967295
Expirings	Number of timeouts that occurred after the partner switch was detected	0 to 4294967295
Thrashings	Number of times other partner switches were detected before a timeout after a partner switch was initially detected	0 to 4294967295
Blockings	Number of shutdowns in UDLD	0 to 4294967295

Impact on communication

None

Response messages

Table 32-4 List of response messages for the show efmoam statistics command

Message	Description
There is no information. (efmoam)	`efmoam disable` has been set. There is no log information to be displayed.

Notes

The ports on which no OAMPDUs have been sent or received in passive mode are not

show efmoam statistics

displayed.

clear efmoam statistics

Clears the IEEE 802.3ah/OAM statistics.

Syntax

```
clear efmoam statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 32-3 Example of clearing IEEE 802.3ah/OAM statistics

```
> clear efmoam statistics

>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

clear efmoam statistics

33. Storm Control

show storm-control
clear storm-control

show storm-control

Displays storm control information.

Syntax

```
show storm-control [port <Port# list>][broadcast][multicast][unicast][detail]
```

Input mode

User mode and administrator mode

Parameters

`port` *<Port# list>*

Displays the storm control information for the specified port.

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:

Storm control information for all ports is displayed.

`broadcast`

Displays broadcast storm control information.

`multicast`

Displays multicast storm control information.

`unicast`

Displays unicast storm control information.

Note on setting parameters

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

`detail`

Displays detailed information about storm control.

Operation when this parameter is omitted:

Storm control information for all ports is displayed.

Example 1

Figure 33-1 Displaying storm control information

```
> show storm-control

Date 2009/03/24 10:46:35 UTC
<Broadcast>
 Port    Detect Recovery   Filter  State           Count Last detect
 0/1        200      100      100  Filtering           1 2009/03/24 10:46:25
 0/2        200      100        -  Forwarding          0 ----/--/-- --:--:--

<Unicast>
 Port    Detect Recovery   Filter  State           Count Last detect
 0/1      10000     5000     5000  Filtering           1 2009/03/24 10:45:52
 0/2      10000     5000        -  Forwarding          0 ----/--/-- --:--:--

>
```

Display items in Example 1

Table 33-1 Display items for storm control information

Item	Meaning	Displayed information
Port	Port number	--
Detect	Storm detection threshold	Displays the upper threshold.
Recovery	Recovery-from-storm threshold	--
Filter	Flow rate limit value	Displays the lower threshold. `--` is displayed if a storm-control action filter has not been set.
State	Storm detection status	`Forwarding`: Forwarding normally `Filtering`: The flow rate limit is on. `Inactivate`: A port has been blocked by storm detection. `Detecting`: A storm has been detected (this status is displayed when a port is being blocked or when a flow limit has not been set).
Count	Number of storms that have been detected	--
Last detect	Date and time a storm was last detected	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* `--` is displayed when no storms have been detected.

Example 2

Figure 33-2 Displaying detailed information about storm control

```
> show storm-control port 0/1 broadcast detail

Date 2009/03/24 10:48:20 UTC
<Broadcast>
 Port 0/1
  Detect rate : 200         Recover rate : 100         Filter rate : 100
  Action : Filter,Trap,Log
  Filter recovery time : 30
  <Status>
  State : Filtering          Filter recovery remaining time : 30
  Current rate :        189  Current filter rate     :        100
  Detect count :          1  Last detect             : 2009/03/24 10:46:25

>
```

Display items in Example 2

Table 33-2 Items displayed for detailed storm control information

Item	Meaning	Displayed information
Port	Port number	--
Detect rate	Storm detection threshold	Displays the upper threshold.

Item	Meaning	Displayed information
Recover rate	Recovery-from-storm threshold	`--` is displayed if this item has not been set.
Filter rate	Flow rate limit value	Displays the lower threshold. `--` is displayed if a storm-control action filter has not been set.
Action	Operations when a storm is detected	`Inactivate`: The applicable port is blocked. `Filter`: The flow rate of the received frames has a limit. `Trap`: An SNMP trap is issued. `Log`: A log message is output.
Filter recovery time	Monitoring time for canceling the flow rate limit	`--` is displayed if a storm-control action filter has not been set.
State	Storm detection status	`Forwarding`: Forwarding normally `Filtering`: The flow rate limit is on. `Inactivate`: A port has been blocked by storm detection. `Detecting`: A storm has been detected (this status is displayed when a port is being blocked or when a flow limit has not been set).
Filter recovery remaining time	Remaining monitoring time for canceling the flow rate limit (in seconds)	`--` is displayed if `State` is not `Filtering`.
Current rate	Current flow rate	--
Current filter rate	Current status of the flow rate limit	When `State` is `Filtering`: The flow limit value When `State` is not `Filtering`: The storm detection threshold
Detect count	Number of storms that have been detected	--
Last detect	Date and time a storm was last detected	*year*`/`*month*`/`*day* *hour*`:`*minute*`:`*second* `--` is displayed when no storms have been detected.

Impact on communication

None

Response messages

Table 33-3 List of response messages for the show storm-control command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
storm-control is not configured.	The storm control functionality has not been configured. Check the configuration.

Notes

None

clear storm-control

Clears the storm control statistics counters.

Syntax

```
clear storm-control
```

Input mode

User mode and administrator mode

Parameters

None

Example 1

Figure 33-3 Clearing the storm control statistics counters

```
> clear storm-control

>
```

Impact on communication

None

Response messages

Table 33-4 List of response messages for the clear storm-control command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
storm-control is not configured.	The storm control functionality has not been configured. Check the configuration.

Notes

None

34. L2 Loop Detection

show loop-detection
show loop-detection statistics
clear loop-detection statistics
show loop-detection logging
clear loop-detection logging

show loop-detection

Displays L2 loop detection information.

Syntax

```
show loop-detection [port <Port# list>] [channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`port` *<Port# list>*

Displays L2 loop detection information for the specified port numbers.

For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays L2 loop detection information for the specified channel group link aggregation (in a list).

For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Note on setting parameters

This command can display only the information relevant to the condition applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information that meets the conditions will be displayed.

Operation when all parameters are omitted:

All L2 loop detection information is displayed.

Example

Displays L2 loop detection information.

Figure 34-1 Example of displaying L2 loop detection information

```
> show loop-detection

Date 2008/11/12 16:22:28 UTC
Interval Time           :10
Output Rate             :20pps
Threshold               :200
Hold Time               :300
Auto Restore Time       :3600
VLAN Port Counts
    Configuration       :6          Capacity       :200
Port Information
  Port    Status     Type        DetectCnt RestoringTimer  SourcePort  Vlan
  0/1     Down       trap                0              -  -
  0/2     Down       trap                0              -  -
  0/3     Down       trap                0              -  -
  0/4     Down(loop) send-inact        200           3569  0/6           1
  0/5     Up         exception           0              -  0/7           1
  0/6     Down       send              200              -  0/4           1
  0/7     Up         send-inact          0              -  -
  0/8     Down(loop) send-inact        200           3569  ChGr:8(U)     1
```

```
0/9     Down       trap              0            -  -
0/10    Down       trap              0            -  -
0/17    Down       trap              0            -  -
0/18    Down       trap              0            -  -
0/19    Down       trap              0            -  -
0/20    Down       trap              0            -  -
0/21    Down       trap              0            -  -
0/22    Down       uplink            -            -  -
0/24    Down       trap              0            -  -
0/25    Down       trap              0            -  -
0/26    Down       trap              0            -  -
ChGr:1  Down(loop) send-inact      200         3569  ChGr:2        1
ChGr:2  Down(loop) send-inact      200         3569  ChGr:1        1
ChGr:5  Down       trap              0            -  -
ChGr:8  Down       uplink            -            -  0/8          1

>
```

Display items

Table 34-1 Items displayed for L2 loop detection information

Item	Meaning	Displayed information
Interval Time	Sending interval of L2 loop detection frames (in seconds)	--
Output Rate	Sending L2 loop detection frames rate (packets/s)	The current transmission rate for L2 loop detection frames is displayed.
Threshold	Number of detections before a port is blocked	Displays the setting value for the number of L2 loop detections before a port is blocked.
Hold Time	Time the number of detections is retained (in seconds)	Displays the setting time that the number of L2 loop detections is retained before a port is blocked. `infinity` is displayed if this item has not been set.#1
Auto Restore Time	Automatic restoration time (in seconds)	Displays the setting time before a blocked port is activated automatically. `--` is displayed if a port is not automatically restored.#2
Configuration	Number of ports set to send L2 loop detection frames	Displays the number of VLAN ports#3 that are set to send L2 loop detection frames If this value is larger than the value displayed for `Capacity` (the number of ports allowed for sending L2 loop detection frames), some L2 loop detection frames could not be sent.
Capacity	Number of ports allowed to send L2 loop detection frames	Number of VLAN ports#3 that are able to send L2 loop detection frames at the defined transmission rate
Port	Port number or channel group number	*<IF#>*: Port number `ChGr:`*<Channel group#>*: Channel group number

Item	Meaning	Displayed information
Status	Port state	`Up`: Indicates that the port status is Up. `Down`: The port is in Down status. `Down(loop)`: The port status is Down due to the L2 loop detection functionality.
Type	Port type	`send-inact`: Detection-frame-sending-and-port-blocking port `send`: Detection-frame-sending port `trap`: Detecting port `exception`: Out-of-scope port `uplink`: Uplink port
DetectCnt	Number of current detections	Displays the number of L2 loop detections. For an uplink port, `--` is displayed. The number of detections on the uplink port is counted on the sending port. The number of detections is updated until it reaches 10000.
RestoringTimer	Time remaining until automatic recovery (in seconds)	The time before the port is activated automatically is displayed. `--` is displayed if a port is not automatically restored.#2
SourcePort	L2 loop detection frame Sending port	The sending port used when an L2 loop detection frame was last received. <*IF#*>: Port number `ChGr:`<*Channel group#*>: Channel group number For the receive uplink port, `(U)` is displayed. `--` is displayed if no L2 loop detection frame has been received.
Vlan	L2 loop detection frame Source VLAN ID	Displays the source VLAN ID when an L2 loop detection frame was last received.

#1: When the `loop-detection hold-time` configuration command is omitted

#2: When the `loop-detection auto-restore-time` configuration command is omitted

#3: Total number in the VLANs set for the applicable physical ports or channel groups

Impact on communication

None

Response messages

Table 34-2 List of response messages for the show loop-detection command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No corresponding port information.	No port and channel group information for L2 loop detection was found.

Message	Description
L2 Loop Detection is not configured.	L2 loop detection has not been set, or the functionality has not been enabled. Check the configuration.

Notes

Changing or disabling the L2 loop detection functionality clears the L2 loop detection information.

show loop-detection statistics

Displays L2 loop detection statistics.

Syntax

```
show loop-detection statistics [port <Port# list>] [channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`port` *<Port# list>*

Displays L2 loop detection statistics for the specified port number.

For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Displays L2 loop detection statistics for the channel groups specified in list format in the specified link aggregation.

For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Note on setting parameters

This command can display only the information relevant to the condition applied by a parameter that has been set.

If the parameter has not been set, information is displayed with no condition applied. If multiple parameters are specified, information that meets the conditions will be displayed.

Operation when all parameters are omitted:

All L2 loop detection statistics are displayed.

Example

Displays L2 loop detection statistics.

Figure 34-2 Example of displaying L2 loop detection statistics

```
> show loop-detection statistics

Date 2008/11/12 16:22:54 UTC
Port:0/1   Down        Type :trap
 TxFrame       :                  0 RxFrame       :                  0
 Inactive Count:                  0 RxDiscard     :                  0
 Last Inactive :                  - Last RxFrame  :                  -
Port:0/2   Down        Type :trap
 TxFrame       :                  0 RxFrame       :                  0
 Inactive Count:                  0 RxDiscard     :                  0
 Last Inactive :                  - Last RxFrame  :                  -
Port:0/3   Down        Type :trap
 TxFrame       :                  0 RxFrame       :                  0
 Inactive Count:                  0 RxDiscard     :                  0
 Last Inactive :                  - Last RxFrame  :                  -
Port:0/4   Down(loop)  Type :send-inact
 TxFrame       :                200 RxFrame       :                200
 Inactive Count:                  1 RxDiscard     :                  0
 Last Inactive : 2008/11/12 16:21:56 Last RxFrame  : 2008/11/12 16:21:56
```

```
Port:0/5   Up          Type :exception
 TxFrame       :                  0 RxFrame       :                  201
 Inactive Count:                  0 RxDiscard     :                    0
 Last Inactive :                  - Last RxFrame  : 2008/11/12 16:22:46

                 :                          :

>
```

Display items

Table 34-3 Items displayed for L2 loop detection statistics

Item	Meaning	Displayed information
Port	Port number	*<IF#>*: Port number
ChGr	Channel group number	*<Channel group#>*: Channel group number
Up	The port is in Up status.	--
Down	The port is in Down status.	--
Down(loop)	The port status is Down due to the L2 loop detection functionality.	--
Type	Port type	`send-inact`: Indicates a detecting and blocking port. `send`: Indicates a detecting and sending port. `trap`: Indicates a detecting port. `exception`: Indicates a port exempted from detection. `uplink`: Indicates an uplink port.
TxFrame	Number of sent L2 loop detection frames	--
RxFrame	Number of received L2 loop detection frames	--
Inactive Count	Number of times the port has been blocked	--
RxDiscard	Number of L2 loop detection frames that have been received and discarded	Displays the number of abnormal L2 detection frames that have been received and discarded.
Last Inactive	Time the port was last blocked	*year/month/day hour:minute:second* `--` is displayed if the port is an uplink port or if the port has never been blocked.
Last RxFrame	Time when the L2 loop detection frame was last received	*year/month/day hour:minute:second* `--` is displayed if no L2 loop detection frame has been received. The time an L2 loop detection frame was received and discarded is not displayed.

Impact on communication

None

Response messages

Table 34-4 List of response messages for the show loop-detection statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
No corresponding port information.	No port and channel group information for L2 loop detection was found.
L2 Loop Detection is not configured.	L2 loop detection has not been set, or the functionality has not been enabled. Check the configuration.

Notes

Changing or disabling the L2 loop detection functionality clears the statistics.

clear loop-detection statistics

Clears L2 loop detection statistics.

Syntax

```
clear loop-detection statistics [port <Port# list>] [channel-group-number <Channel group# list>]
```

Input mode

User mode and administrator mode

Parameters

`port` *<Port# list>*

Clears the L2 loop detection statistics for the specified port number.

For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Clears the L2 loop detection statistics for the channel groups specified in list format in the specified link aggregation.

For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Note on setting parameters

This command can clear only the information relevant to the condition applied by a parameter that has been set.

If no parameter is specified, information is cleared without being limited by any conditions. If multiple parameters are specified, information that meets the conditions will be displayed.

Operation when all parameters are omitted:

All L2 loop detection statistics are cleared.

Example

Clears L2 loop detection statistics.

Figure 34-3 Example of clearing L2 loop detection statistics

```
# clear loop-detection statistics

#
```

Display items

None

Impact on communication

None

Response messages

Table 34-5 List of response messages for the clear loop-detection statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
L2 Loop Detection is not configured.	L2 loop detection has not been set, or the functionality has not been enabled. Check the configuration.

Notes

- Disabling the L2 loop detection functionality clears the statistics.
- Using this command to clear statistics also clears the MIB information obtained by SNMP.

show loop-detection logging

Displays the log information for the received L2 loop detection frames.

With this command, you can check the port from which an L2 loop detection frame was sent and the port on which it was received. Log entries for the latest 1000 received frames are displayed in reverse chronological order. Note that the discarded frames are not displayed.

Syntax

```
show loop-detection logging
```

Input mode

User mode and administrator mode

Parameters

None

Example

The following figure is an example of displaying the log information for the received L2 loop detection frames.

Figure 34-4 Example of displaying log information for received L2 loop detection frames

```
> show loop-detection logging

Date 2008/11/12 16:23:10 UTC
2008/11/12 16:22:16  0/5     Source: 0/7     Vlan: 1
2008/11/12 16:22:06  0/5     Source: 0/7     Vlan: 1
2008/11/12 16:21:56  ChGr:8  Source: 0/8     Vlan: 1     Uplink Inactive
2008/11/12 16:21:56  0/5     Source: 0/7     Vlan: 1
2008/11/12 16:21:56  0/4     Source: 0/6     Vlan: 1     Inactive
2008/11/12 16:21:56  0/6     Source: 0/4     Vlan: 1
2008/11/12 16:21:56  ChGr:1  Source: ChGr:2  Vlan: 1     Inactive
2008/11/12 16:21:56  ChGr:2  Source: ChGr:1  Vlan: 1     Inactive
2008/11/12 16:21:46  ChGr:8  Source: 0/8     Vlan: 1     Uplink

#
```

Display items

Table 34-6 Items displayed for the log information about received L2 loop detection frames

Item	Meaning	Displayed information
Data Time	Date and time the L2 loop detection frame was received	*yy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second
IF#	Port number	Displays the number of the port on which the L2 loop detection frame was received.
ChGr:<*Channel group#*>	Channel group number	Displays the number of the channel group on which the L2 loop detection frame was received.
Source	The number of the port from which the L2 loop detection frame was sent	Displays the number of the port from which the L2 loop detection frame was sent. <*IF#*>: Port number ChGr:<*Channel group#*>: Channel group

Item	Meaning	Displayed information
		number
Vlan	VLAN ID	Displays the VLAN ID when an L2 loop detection frame was sent.
Uplink	Uplink port	Indicates that the L2 loop detection frame was received at the uplink port.
Inactive	Port blocked	Indicates that a port has been blocked.

Impact on communication

None

Response messages

Table 34-7 List of response messages for the show loop-detection logging command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
There is no logging data.	There is no log data.
L2 Loop Detection is not configured.	L2 loop detection has not been set, or the functionality has not been enabled. Check the configuration.

Notes

Disabling the L2 loop detection functionality clears log information about the received detection frames.

clear loop-detection logging

Clears the log information for the received L2 loop detection frames.

Syntax

```
clear loop-detection logging
```

Input mode

User mode and administrator mode

Parameters

None

Example

The following figure is an example of clearing t the log information for the received L2 loop detection frames.

Figure 34-5 Example of clearing the log information for the received L2 loop detection frames

```
# clear loop-detection logging

#
```

Display items

None

Impact on communication

None

Response messages

Table 34-8 List of response messages for the clear loop-detection logging command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
L2 Loop Detection is not configured.	L2 loop detection has not been set, or the functionality has not been enabled. Check the configuration.

Notes

None

clear loop-detection logging

35. CFM

l2ping
l2traceroute
show cfm
show cfm remote-mep
clear cfm remote-mep
show cfm fault
clear cfm fault
show cfm l2traceroute-db
clear cfm l2traceroute-db
show cfm statistics
clear cfm statistics

l2ping

This command can be used to determine whether the MEP of the Switch can communicate with a remote MEP or MIP.

Syntax

```
l2ping {remote-mac <MAC address> | remote-mep <MEPID>} domain-level <Level> ma <No.> mep
<MEPID> [count <Count>] [timeout <Seconds>] [framesize <Size>]
```

Input mode

User mode and administrator mode

Parameters

`{remote-mac` *<MAC address>* `|` `remote-mep` *<MEPID>*`}`

`remote-mac` *<MAC address>*

Specify the MAC address of the remote MEP or MIP whose connectivity you want to verify.

`remote-mep` *<MEPID>*

Specify the ID of the remote MEP whose connectivity you want to verify. For this parameter, you can specify a remote MEP that can be checked by a CC.

`domain-level` *<Level>*

Specify the domain level whose connectivity you want to verify. For this parameter, you can specify a domain level that was set by a configuration command.

`ma` *<No.>*

Specify the MA ID number whose connectivity you want to verify. For this parameter, you can specify an MA ID number that was set by using a configuration command.

`mep` *<MEPID>*

Specify the ID of the Switch's MEP from which you want to verify connectivity. For this parameter, you can specify an MEP ID that was set by a configuration command.

`count` *<Count>*

Sends loopback messages for the number of times specified. The specifiable values are from 1 to 5.

Operation when this parameter is omitted:

Loopback messages are sent only five times.

`timeout` *<Seconds>*

Specify the wait time for a response in seconds. The specifiable values are from 1 to 60.

Operation when this parameter is omitted:

The wait time for a response is 5 seconds.

`framesize` *<Size>*

Specify the number of bytes of data to be added to the CFM PDU to be sent. The specifiable values are from 1 to 9192.

Operation when this parameter is omitted:

40 bytes are added, and the CFM PDU that is sent is 64 bytes.

Example

The following figure is an example of executing the `l2ping` command.

Figure 35-1 Example of executing the l2ping command

```
> l2ping remote-mep 1010 domain-level 7 ma 1000 mep 1020 count 3
L2ping to MP:1010(0012.e254.dc01) on Level:7  MA:1000  MEP:1020  VLAN:20
Time:2009/10/28 06:59:50
1: L2ping Reply from 0012.e254.dc01  64bytes  Time=   20 ms
2: L2ping Reply from 0012.e254.dc01  64bytes  Time=   10 ms
3: L2ping Reply from 0012.e254.dc01  64bytes  Time=   10 ms

--- L2ping Statistics ---
  Tx L2ping Request :    3  Rx L2ping Reply :    3  Lost Frame  :   0%
  Round-trip Min/Avg/Max : 10/13/20 ms
>
```

Display items

Table 35-1 Items displayed for the l2ping command

Item	Meaning	Displayed information
L2ping to MP:*<Remote MP>*	The MAC address of the destination remote MEP or MIP.	The MAC address of the destination remote MEP or MIP. *<Remote MAC address>*: When the MAC address of a remote MEP or MIP is specified. *<Remote MEP ID>*`(`*<Remote MAC address>*`)`: When a remote MEP ID is specified.
Level	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch
VLAN	VLAN ID	Source VLAN ID
Time	Send time	*yyyy*`/`*mm*`/`*dd hh*`:`*mm*`:`*ss* year/month/day hour:minute:second
<Count>	Test number	Test number
`L2ping Reply from` *<MAC address>*	MAC address of the replying MP	The MAC address of the remote MEP or MIP that replied.
bytes	Number of received bytes	Number of bytes starting from the common CFM header and ending with End TLV of the CFM PDU
Time	Response time	The time from the transmission of a loopback message until a loopback reply is received
Request Timed Out.	Reply wait timeout	Indicates that no reply was received within the reply wait time.
Transmission failure.	Transmission failure	Indicates that a message could not be sent from the source VLAN.
Tx L2ping Request	Number of loopback messages that were sent	--
Rx L2ping Reply	Number of loopback replies that were received	Number of replies that were received normally from the remote MEP or MIP

Item	Meaning	Displayed information
Lost Frame	Percentage of lost frames (%)	--
Round-trip Min/Avg/Max	Minimum, average, and maximum response time	--

Impact on communication

None

Response messages

Table 35-2 List of response messages for the l2ping command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.
No such Remote MEP.	The specified remote MEP is unknown. Make sure the specified parameter is correct, and then try again.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID number or the primary VLAN for the specified MA has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

- To halt execution of this command, press **Ctrl** + **C**.
- This command cannot be used concurrently by multiple users. (This command also cannot be used concurrently with the `l2traceroute` command.)
- If you want to specify 1476 bytes or more for the `framesize` parameter, use the `mtu` or `system mtu` configuration command to set the MTU value for the jumbo frame to 1500 byte or more.
- To verify connectivity, use the MAC address for the remote MP. Even when `remote-mep` is specified, the connectivity is verified by using the MAC address that corresponds to the MEP ID. Therefore, even when the specified MEP ID does not exist, due to a configuration change or another reason, a reply is sent if an MEP or MIP has that MAC address.

l2traceroute

Verifies the route from the Switch's MEP to a remote MEP or MIP.

Syntax

```
l2traceroute {remote-mac <MAC address> | remote-mep <MEPID>} domain-level <Level> ma
<No.> mep <MEPID> [timeout <Seconds>] [ttl <TTL>]
```

Input mode

User mode and administrator mode

Parameters

`{remote-mac` *<MAC address>* `| remote-mep` *<MEPID>*`}`

`remote-mac` *<MAC address>*

Specify the MAC address of the destination remote MEP or MIP whose route you want to verify.

`remote-mep` *<MEPID>*

Specify the destination remote MEP ID whose route you want to verify. For this parameter, you can specify a remote MEP ID that can be checked by a CC.

`domain-level` *<Level>*

Specify the domain level for which you want to verify there is a route. For this parameter, you can specify a domain level that was set by a configuration command.

`ma` *<No.>*

Specify the MA ID number whose route you want to verify. For this parameter, you can specify an MA ID number that was set by using a configuration command.

`mep` *<MEPID>*

Specify the MEP ID of the Switch from which you want to verify the route. For this parameter, you can specify an MEP ID that was set by a configuration command.

`timeout` *<Seconds>*

Specify the wait time for a response in seconds. The specifiable values are from 1 to 60.

Operation when this parameter is omitted:

The wait time for a response is 5 seconds.

`ttl` *<TTL>*

Specify the maximum time-to-live (the maximum number of hops) for the linktrace message. The specifiable values are from 1 to 255.

Operation when this parameter is omitted:

The maximum number of hops is 64.

Example

The following figure is an example of executing the `l2traceroute` command.

Figure 35-2 Example of executing the l2traceroute command

```
> l2traceroute remote-mep 1010 domain-level 7 ma 1000 mep 1020 ttl 64
L2traceroute to MP:1010(0012.e254.dc01) on Level:7  MA:1000  MEP:1020  VLAN:20
Time:2009/10/28 08:27:44
 63  00ed.f205.0115  Forwarded
 62  0012.e2a8.f8d0  Forwarded
 61  0012.e254.dc01  NotForwarded  Hit
>
```

Display items

Table 35-3 Items displayed for the l2traceroute command

Item	Meaning	Displayed information
L2traceroute to MP:*<Remote MP>*	The MAC address of the destination remote MEP or MIP.	The MAC address of the destination remote MEP or MIP. *<Remote MAC address>*: When the MAC address of a remote MEP or MIP is specified. *<Remote MEP ID>*(*<Remote MAC address>*): When a remote MEP ID is specified.
Level	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch
VLAN	VLAN ID	Source VLAN ID
Time	Send time	*yyyy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second
<TTL>	Time to Live	0 to 255
<Remote MAC address>	MAC address of the replying MP	The MAC address of the MEP or MIP that replied during route verification
Forwarded	Linktrace message forwarded	Indicates that the replying MP forwarded the linktrace message.
NotForwarded	Linktrace message not forwarded	Indicates that the replying MP did not forward the linktrace message.
Hit	Reply from the destination remote MEP or MIP	Indicates that the reply was from the destination remote MEP or MIP.
Transmission failure.	Transmission failure	Indicates that a message could not be sent from the source VLAN.

Impact on communication

None

Response messages

Table 35-4 List of response messages for the l2traceroute command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.

Message	Description
No such Remote MEP.	The specified remote MEP is unknown. Make sure the specified parameter is correct, and then try again.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID number or the primary VLAN for the specified MA has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

- To halt execution of this command, press **Ctrl** + **C**.
- This command cannot be used concurrently by multiple users. (This command also cannot be used concurrently with the `l2ping` command.)
- If you execute this command multiple times for the same remote MP, only the last execution result is retained in the linktrace database.
- Information about some replies is not displayed if those replies are received after being forwarded by a number of devices that exceeds the number of devices on the routes that can be registered in the linktrace database.
- The MAC address of the remote MP is used to verify the route. Even when `remote-mep` is specified, the route is verified by using the MAC address that corresponds to the MEP ID. Therefore, even when the specified MEP ID does not exist, due to a configuration change or another reason, a reply is sent if an MEP or MIP has that MAC address.
- We recommend that you specify 64 or less for the TTL value to maintain the reception performance of the Switch.

show cfm

Displays the configuration information for domains and MPs, and the CFM information related to detected failures.

Syntax

```
show cfm [{[domain-level <Level>] [ma <No.>] [mep <MEPID>] | summary}]
```

Input mode

User mode and administrator mode

Parameters

```
{[domain-level <Level>] [ma <No.>] [mep <MEPID>] | summary}
```

`domain-level <Level>`

Displays CFM information for the specified domain level.

`ma <No.>`

Displays CFM information for the specified MA ID number.

`mep <MEPID>`

Displays CFM information for the specified MEP ID.

Operation when a parameter is omitted

Only the CFM information conforming to the specified parameter condition can be displayed. If the parameter is not specified, the CFM information is displayed with no condition applied. If multiple parameters are specified, the CFM information conforming to the conditions will be displayed.

`summary`

Displays the number of MPs and CFM ports that can be accommodated.

Operation when this parameter is omitted:

All CFM information is displayed.

Example 1

The following figure is an example of displaying the CFM configuration information.

Figure 35-3 Example of displaying the CFM configuration information

```
> show cfm

Date 2009/10/28 09:31:33 UTC
Domain Level 3 Name(str): ProviderDomain_3
  MA 300   Name(str) : Tokyo_to_Osaka
    Primary VLAN:300   VLAN:10-20,300
    CC:Enable   Interval:1min
    Alarm Priority:2  Start Time: 2500ms  Reset Time:10000ms
    MEP Information
      ID:8012  UpMEP    CH1 (Up)    Enable   MAC:00ed.f205.0101  Status:-
  MA 400   Name(str) : Tokyo_to_Nagoya
    Primary VLAN:400   VLAN:30-40,400
    CC:Enable   Interval:10min
    Alarm Priority:0  Start Time: 7500ms  Reset Time: 5000ms
    MEP Information
      ID:8014  DownMEP  0/21(Up)    Disable  MAC:00ed.f205.0115  Status:-
  MIP Information
      0/12(Up)    Enable   MAC:00ed.f205.010c
      0/22(Down)  Enable   MAC:-
Domain Level 4 Name(str): ProviderDomain_4
```

```
    MIP Information
        CH8 (Up)    Enable   MAC:00ed.f205.0108

>
```

Display items in Example 1

Table 35-5 Items displayed for the CFM configuration information

Item	Meaning	Displayed information
Domain Level *<Level>*	Domain level and domain name	*<Level>*: Domain level `Name:-`: Indicates that the domain name is not used. `Name(str):`*<Name>*: A character string is used for the domain name. `Name(dns):`*<Name>*: A domain name server name is used for the domain name. `Name(mac):`*<MAC>*`(`*ID*`)`: A MAC address and ID are used for the domain name.
MA *<No.>*	MA ID number and MA name	*<No.>*: Configured MA ID number `Name(str):`*<Name>*: A character string is used for the MA name. `Name(id):`*ID*: A numeric value is used for the MA name. `Name(vlan):`*<VLAN ID>*: A VLAN ID is used for the MA name.
Primary VLAN	Primary VLAN ID	The primary VLAN in the VLANs belonging to the MA. `-` is displayed if the primary VLAN has not been configured.
VLAN	VLAN ID	VLAN ID belonging to the MA. `-` is displayed if no VLANs have been configured.
CC	Operating status of the CC	`Enable`: CC is enabled. `Disable`: CC is disabled.
Interval	Interval for sending CCMs	`1s`: The interval for sending CCMs is 1 second. `10s`: The interval for sending CCMs is 10 seconds. `1min`: The interval for sending CCMs is 1 minutes. `10min`: The interval for sending CCMs is 10 minutes. `-` is displayed if CC is disabled.
Alarm Priority	Failure detection level	The value of the failure detection level at which alarms are issued If a failure whose level is equal to or higher than the failure detection level that has been set occurs, an alarm is reported. ● `0`: Indicates that no alarms are reported. ● `1`: Indicates that a failure was detected on the remote MEP. ● `2`: Indicates a port failure on the remote MEP.

Item	Meaning	Displayed information
		● 3: Indicates CCM timeout. ● 4: Indicates that an invalid CCM was received from the remote MEP in the MA. ● 5: Indicates that a CCM was received from another MA. - is displayed if CC is disabled.
Start Time	Time from the detection of a failure until an alarm is issued	2500 to 10000 ms: The time lapsing from the detection of a failure until an alarm is issued -- is displayed if CC is not operating.
Reset Time	Time from the detection of a failure until an alarm is canceled	2500 to 10000 ms: The time lapsing from the detection of a failure until an alarm is canceled - is displayed if CC is disabled.
MEP Information	MEP information	--
ID	MEP ID	MEP ID for the Switch
UpMEP	Up MEP	MEP facing the relay side
DownMEP	Down MEP	MEP facing the line
IF#	Port number	MEP port number
CH*<Channel group#>*	Channel group number	MEP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Enabled	CFM on a port is enabled.	--
Disable	CFM on a port is disabled.	--
MAC	MEP MAC address	- is displayed if the status of the port to which the MEP belongs is Down.

Item	Meaning	Displayed information
Status	The status of failure detection on the MEP	The highest-level failure of the failures detected by MEP is displayed. ● `OtherCCM`: Indicates that a CCM was received from another MA. ● `ErrorCCM`: Indicates that a CCM that contains an invalid MEP ID, or a CCM with an invalid transmission interval, was received. ● `Timeout`: Indicates CCM timeout. ● `PortState`: Indicates that a CCM reporting a port failure was received. ● `RDI`: Indicates a CCM reporting failure detection was received. `--` is displayed if any failure has not been detected.
MIP Information	MIP information	--
IF#	Port number	MIP port number
CH<*Channel group#*>	Channel group number	MIP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Enabled	CFM on a port is enabled.	--
Disable	CFM on a port is disabled.	--
MAC	MIP MAC address	`-` is displayed if the status of the port to which the MIP belongs is Down.

Example 2

The following figure is an example of displaying the number of entities accommodated in the CFM configuration.

Figure 35-4 Example of displaying the number of entities accommodated in the CFM configuration

```
> show cfm summary

Date 2009/10/28 09:31:36 UTC
DownMEP Counts    :       1
UpMEP Counts      :       1
MIP Counts        :       3
CFM Port Counts   :       4

>
```

Display items in Example 2

Table 35-6 Items displayed for the number of entities accommodated in the CFM configuration

Item	Meaning	Displayed information
DownMEP Counts	Number of Down MEPs	Number of Down MEPs set in the configuration
UpMEP Counts	Number of Up MEPs	Number of Up MEPs set in the configuration
MIP Counts	Number of MIPs	Number of MIPs set in the configuration
CFM Port Counts	Total number of CFM ports	Total number of ports from which CFM PDUs are sent in the primary VLAN that has been set for the MA in the configuration

Impact on communication

None

Response messages

Table 35-7 List of response messages for the show cfm command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

show cfm remote-mep

Displays the configuration of a remote MEP that has been detected by the CC functionality of CFM, and the status of connection monitoring between the Switch and the remote MEP.

Syntax

```
show cfm remote-mep [domain-level <Level>] [ma <No.>] [mep <MEPID>] [remote-mep <MEPID>]
[detail]
```

Input mode

User mode and administrator mode

Parameters

`domain-level` *<Level>*

Displays the remote MEP information for the specified domain level.

`ma` *<No.>*

Displays the remote MEP information for the specified MA ID number.

`mep` *<MEPID>*

Displays the remote MEP information for the specified MEP ID.

`remote-mep` *<MEPID>*

Displays information for the specified remote MEP ID.

Operation when a parameter is omitted

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

`detail`

The following figure is an example of displaying detailed remote MEP information.

Operation when this parameter is omitted:

Summary information about the remote MEP is displayed.

Operation when all parameters are omitted:

Summary information about all remote MEPs is displayed.

Example 1

The following figure is an example of displaying remote MEP information.

Figure 35-5 Example of displaying remote MEP information

```
> show cfm remote-mep

Date 2009/10/29 06:05:00 UTC
Total RMEP Counts:      4
Domain Level 3 Name(str): ProviderDomain_3
  MA 100   Name(str) : Tokyo_to_Osaka
    MEP ID:101   0/20(Up)    Enable   Status:Timeout
      RMEP Information  Counts:  2
      ID:3     Status:Timeout     MAC:0012.e254.dbf1  Time:2009/10/29 05:54:17
      ID:15    Status:RDI         MAC:00ed.f006.0118  Time:2009/10/29 06:04:15
  MA 200   Name(str) : Tokyo_to_Nagoya
    MEP ID:8012  CH1 (Up)    Enable   Status:-
      RMEP Information  Counts:  2
      ID:8003  Status:-           MAC:0012.e254.dc20  Time:2009/10/29 06:04:17
```

```
                ID:8004  Status:-          MAC:00ed.f006.0108  Time:2009/10/29 06:04:35

        >
```

Display items in Example 1

Table 35-8 Items displayed for remote MEP information

Item	Meaning	Displayed information
Total RMEP Counts	Total number of remote MEPs	--
Domain Level *<Level>*	Domain level and domain name	*<Level>*:Domain level `Name:-`: Indicates that the domain name is not used. `Name(str):`*<Name>*: A character string is used for the domain name. `Name(dns):`*<Name>*: A domain name server name is used for the domain name. `Name(mac):`*<MAC>*`(`*ID*`)`: A MAC address and ID are used for the domain name.
MA *<No.>*	MA ID number and MA name	*<No.>*: Configured MA ID number `Name(str):`*<Name>*: A character string is used for the MA name. `Name(id):`*ID*: A numeric value is used for the MA name. `Name(vlan):`*<VLAN ID>*: A VLAN ID is used for the MA name.
MEP ID	MEP ID for the Switch	--
IF#	Port number	MEP port number
CH*<Channel group#>*	Channel group number	MEP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Enabled	CFM on a port is enabled.	--
Status	The status of failure detection on the Switch's MEP	The highest-level failure of the failures detected by the Switch's MEP is displayed. ● `OtherCCM`: Indicates that a CCM was received from another MA. ● `ErrorCCM`: Indicates that a CCM that contains an invalid MEP ID, or a CCM with an invalid transmission interval, was received. ● `Timeout`: Indicates CCM timeout. ● `PortState`: Indicates that a CCM reporting a port failure was received. ● `RDI`: Indicates a CCM reporting failure detection was received. `--` is displayed if any failure has not been detected.

Item	Meaning	Displayed information
RMEP Information	Remote MEP information	--
Counts	Number of remote MEPs	--
ID	Remote MEP ID	--
Status	The status of failure detection in the remote MEP	The highest-level failure of the failures detected by the remote MEP is displayed. ● `OtherCCM`: Indicates that a CCM was received from another MA. ● `ErrorCCM`: Indicates that a CCM that contains an invalid MEP ID, or a CCM with an invalid transmission interval, was received. ● `Timeout`: Indicates CCM timeout. ● `PortState`: Indicates that a CCM reporting a port failure was received. ● `RDI`: Indicates a CCM reporting failure detection was received. `--` is displayed if any failure has not been detected.
MAC	MAC address of the remote MEP	--
Time	The time when a CCM was last received	*yyyy/mm/dd hh:mm:ss* year/month/day hour:minute:second

Example 2

The following figure is an example of displaying detailed remote MEP information.

Figure 35-6 Example of displaying detailed remote MEP information

```
> show cfm remote-mep detail

Date 2009/10/29 06:05:03 UTC
Total RMEP Counts:      4
Domain Level 3 Name(str): ProviderDomain_3
  MA 100   Name(str) : Tokyo_to_Osaka
    MEP ID:101   0/20(Up)    Enable   Status:Timeout
      RMEP Information  Counts:  2
      ID:3     Status:Timeout     MAC:0012.e254.dbf1  Time:2009/10/29 05:54:17
        Interface:Down             Port:Blocked       RDI:-
        Chassis ID Type:MAC        Info: 0012.e254.dbf0
      ID:15    Status:RDI         MAC:00ed.f006.0118  Time:2009/10/29 06:04:15
        Interface:Up               Port:Forwarding    RDI:On
        Chassis ID Type:MAC        Info: 00ed.f006.0001
  MA 200   Name(str) : Tokyo_to_Nagoya
    MEP ID:8012  CH1 (Up)    Enable   Status:-
      RMEP Information  Counts:  2
      ID:8003  Status:-          MAC:0012.e254.dc20  Time:2009/10/29 06:04:17
        Interface:Up               Port:Forwarding    RDI:-
        Chassis ID Type:MAC        Info: 0012.e254.dbf0
      ID:8004  Status:-          MAC:00ed.f006.0108  Time:2009/10/29 06:04:35
        Interface:Up               Port:Forwarding    RDI:-
        Chassis ID Type:MAC        Info: 00ed.f006.0001

>
```

Display items in Example 2

Table 35-9 Items displayed for detailed remote MEP information

Item	Meaning	Displayed information
Total RMEP Counts	Total number of remote MEPs	--
Domain Level *<Level>*	Domain level and domain name	*<Level>*: Domain level `Name:-`: Indicates that the domain name is not used. `Name(str):`*<Name>*: A character string is used for the domain name. `Name(dns):`*<Name>*: A domain name server name is used for the domain name. `Name(mac):`*<MAC>*`(`*ID*`)`: A MAC address and ID are used for the domain name.
MA *<No.>*	MA ID number and MA name	*<No.>*:Configured MA ID number `Name(str):`*<Name>*: A character string is used for the MA name. `Name(id):`*ID*: A numeric value is used for the MA name. `Name(vlan):`*<VLAN ID>*: A VLAN ID is used for the MA name.
MEP ID	MEP ID for the Switch	--
IF#	Port number	MEP port number
CH*<Channel group#>*	Channel group number	MEP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
Enabled	CFM on a port is enabled.	--
Status	The status of failure detection on the Switch's MEP	The highest-level failure of the failures detected by the Switch's MEP is displayed. ● `OtherCCM`: Indicates that a CCM was received from another MA. ● `ErrorCCM`: Indicates that a CCM that contains an invalid MEP ID, or a CCM with an invalid transmission interval, was received. ● `Timeout`: Indicates CCM timeout. ● `PortState`: Indicates that a CCM reporting a port failure was received. ● `RDI`: Indicates a CCM reporting failure detection was received. `--` is displayed if any failure has not been detected.
RMEP Information	Remote MEP information	--
Counts	Number of remote MEPs	--

Item	Meaning	Displayed information
ID	Remote MEP ID	--
Status	The status of failure detection in the remote MEP	The highest-level failure of the failures detected by the remote MEP is displayed. ● `OtherCCM`: Indicates that a CCM was received from another MA. ● `ErrorCCM`: Indicates that a CCM that contains an invalid MEP ID, or a CCM with an invalid transmission interval, was received. ● `Timeout`: Indicates CCM timeout. ● `PortState`: Indicates that a CCM reporting a port failure was received. ● `RDI`: Indicates a CCM reporting failure detection was received. `--` is displayed if any failure has not been detected.
MAC	MAC address of the remote MEP	--
Time	The time when a CCM was last received	*yyyy/mm/dd hh:mm:ss* year/month/day hour:minute:second
Interface	The status of the remote MEP interface	The status of InterfaceStatus in the CCM that was last received. ● `Up`: Indicates Up status. ● `Down`: Indicates Down status. ● `Testing`: Indicates that the test is being performed. ● `Unknown`: The status is unknown. ● `Dormant`: Waiting for an external event ● `NotPresent`: There is no component for the interface. ● `LowerLayerDown`: Indicates that the status of the lower-layer interface is Down. `--` is displayed for the following cases: ● This information is not in the received CCM. ● The failure information has been cleared by the `clear cfm fault` command.
Port	The status of the remote MEP port	The status of PortStatus in the CCM that was last received. ● `Forwarding`: Indicates Forwarding status. ● `Blocked`: Indicates blocking status. `--` is displayed for the following cases: ● This information is not in the received CCM. ● The failure information has been cleared by the `clear cfm fault` command.
RDI	The status of failure detection in the remote MEP	Indicates that a failure has been detected by the remote MEP. This is the status of the RDI field in the CCM that was last received. ● `On`: A failure is being detected. `--` is displayed for the following cases: ● No failure has been detected. ● The failure information has been cleared by the `clear cfm fault` command.

Item	Meaning	Displayed information
Chassis ID	Chassis ID of the remote MEP	Displays the chassis ID information in the CCM that was last received.
Type	Subtype of the chassis ID	Type of the information displayed for `Info`. ● `CHAS-COMP`: Indicates that entPhysicalAlias of the Entity MIB is displayed for `Info`. ● `CHAS-IF`: Indicates that ifAlias of the interface MIB is displayed for `Info`. ● `PORT`: Indicates that portEntPhysicalAlias of the Entity MIB is displayed for `Info`. ● `MAC`: Indicates that macAddress of the CFM MIB is displayed for `Info`. ● `NET`: Indicates that networkAddress of the CFM MIB is displayed for `Info`. ● `NAME`: Indicates that ifName of the interface MIB is displayed for `Info`. ● `LOCAL`: Indicates that local of the CFM MIB is displayed for `Info`. `--` is displayed if this information is not in the received CCM. For this information sent from the Switch, MAC is displayed for `Type` and the MAC address of the Switch is displayed for `Info`.
Info	Information about the chassis ID	Information displayed for `Type`. `--` is displayed if this information is not in the received CCM.

Impact on communication

None

Response messages

Table 35-10 List of response messages for the show cfm remote-mep command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.
No such Remote MEP.	The specified remote MEP is unknown. Make sure the specified parameter is correct, and then try again.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

clear cfm remote-mep

Clears the remote MEP information.

Syntax

```
clear cfm remote-mep [domain-level <Level> [ma <No.> [mep <MEPID>][remote-mep <MEPID>]]]
```

Input mode

User mode and administrator mode

Parameters

`domain-level <Level>`

Clears the remote MEP information for the specified domain level.

`ma <No.>`

Clears the remote MEP information for the specified MA ID number.

`mep <MEPID>`

Clears the remote MEP information for the specified MEP.

`remote-mep <MEPID>`

Clears the information for the specified remote MEP ID.

Operation when a parameter is omitted

This command can clear only the information relevant to the condition applied by a parameter that has been set. If no parameter is specified, information is cleared without being limited by any conditions. If multiple parameters are specified, the information conforming to the conditions will be cleared.

Operation when all parameters are omitted:

All remote MEP information is cleared.

Example

The following figure is an example of clearing remote MEP information.

Figure 35-7 Example of clearing remote MEP information

```
> clear cfm remote-mep
>
```

Display items

None

Impact on communication

None

Response messages

Table 35-11 List of response messages for the clear cfm remote-mep command

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

Message	Description
CFM is not configured.	CFM has not been configured. Check the configuration.

Notes

None

show cfm fault

Displays the type of failure that has been detected by the CC functionality of CFM, and the information in the CCM that triggered the failure.

Syntax

```
show cfm fault [domain-level <Level>] [ma <No.>] [mep <MEPID>] [{fault | cleared}]
[detail]
```

Input mode

User mode and administrator mode

Parameters

`domain-level` *<Level>*

Displays the failure information for the specified domain level.

`ma` *<No.>*

Displays the failure information for the specified MA ID number.

`mep` *<MEPID>*

Displays the failure information for the specified MEP ID.

`{fault | cleared}`

`fault`

Displays only the failure information being detected.

`cleared`

Displays only the failure information that has been cleared.

Operation when a parameter is omitted

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

`detail`

Displays detailed information about a failure.

Operation when this parameter is omitted:

Summary information about a failure is displayed.

Operation when all parameters are omitted:

Summary information about all failures is displayed.

Example 1

Display summary information about a CFM failure.

Figure 35-8 Example of displaying failure information

```
> show cfm fault

Date 2009/10/29 07:28:29 UTC
MD:6  MA:100   MEP:600   Cleared  Time:-
MD:7  MA:1000  MEP:1000  Fault    Time:2009/10/29 07:27:20
MD:7  MA:1010  MEP:1011  Cleared  Time:-

>
```

Display items in Example 1

Table 35-12 Items displayed for failure information

Item	Meaning	Displayed information
MD	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch
Fault	A failure is being detected.	--
Cleared	A failure has been cleared.	--
Time	Time a failure was detected	The time a failure was detected by the MEP If multiple failures have been detected, the time each failure was detected is displayed. *yyyy/mm/dd hh:mm:ss* year/month/day hour:minute:second - is displayed if the failure has been cleared.

Example 2

The following figure is an example of displaying detailed information about a CFM failure.

Figure 35-9 Example of displaying detailed failure information

```
> show cfm fault domain-level 7 detail

Date 2009/10/29 07:28:32 UTC
MD:7  MA:1000  MEP:1000  Fault
  OtherCCM : -  RMEP:1001 MAC:0012.e254.dbff VLAN:1000 Time:2009/10/29 07:18:44
  ErrorCCM : On RMEP:1001 MAC:0012.e254.dbff VLAN:1000 Time:2009/10/29 07:27:45
  Timeout  : On RMEP:1001 MAC:0012.e254.dbff VLAN:1000 Time:2009/10/29 07:27:20
  PortState: -
  RDI      : -  RMEP:1001 MAC:0012.e254.dbff VLAN:1000 Time:2009/10/29 07:23:45
MD:7  MA:1010  MEP:1011  Cleared
  OtherCCM : -
  ErrorCCM : -  RMEP:1010 MAC:0012.e254.dc01 VLAN:1011 Time:2009/10/29 07:19:01
  Timeout  : -  RMEP:1010 MAC:0012.e254.dc01 VLAN:1011 Time:2009/10/29 07:18:44
  PortState: -
  RDI      : -  RMEP:1010 MAC:0012.e254.dc01 VLAN:1011 Time:2009/10/29 07:21:01

>
```

Display items in Example 2

Table 35-13 Items displayed for detailed failure information

Item	Meaning	Displayed information
MD	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch

Item	Meaning	Displayed information
Fault	A failure is being detected.	--
Cleared	A failure has been cleared.	--
OtherCCM	Failure level 5 A CCM was received from another MA.	Indicates that a CCM was received from the remote MEP belonging to another MA. On: A failure was found. -: No failures were found.
ErrorCCM	Failure level 4 An invalid CCM was received.	Indicates that an invalid CCM was received from the remote MEP belonging to the same MA. The MEP ID or CCM transmission interval is incorrect. On: A failure was found. -: No failures were found.
Timeout	Failure level 3 CCM timeout	Indicates that no CCMs were received from the remote MEP. On: A failure was found. -: No failures were found.
PortState	Failure level 2 Failure on the remote MEP port	Indicates that a CCM reporting a port failure was received from the remote MEP. On: A failure was found. -: No failures were found.
RDI	Failure level 1 A failure is being detected on the remote MEP.	Indicates that a CCM reporting detection of a failure was received from the remote MEP. On: A failure was found. -: No failures were found.
RMEP	Remote MEP ID	Displays the ID of the remote MEP that sent the CCM when the last failure was detected.
MAC	MAC address of the remote MEP	--
VLAN	VLAN that received a CCM	--
Time	Time a failure was detected	The time a failure was detected *yyyy/mm/dd hh:mm:ss* year/month/day hour:minute:second

Impact on communication

None

Response messages

Table 35-14 List of response messages for the show cfm fault command

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

Message	Description
CFM is not configured.	CFM has not been configured. Check the configuration.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

clear cfm fault

Clears the CFM failure information.

Syntax

```
clear cfm fault [domain-level <Level> [ma <No.> [mep <MEPID>]]]
```

Input mode

User mode and administrator mode

Parameters

`domain-level <Level>`

Clears the failure information for the specified domain level.

`ma <No.>`

Clears the failure information for the specified MA ID number.

`mep <MEPID>`

Clears the failure information for the specified MEP ID.

Operation when a parameter is omitted

This command can clear only the information relevant to the condition applied by a parameter that has been set. If no parameter is specified, information is cleared without being limited by any conditions. If multiple parameters are specified, the information conforming to the conditions will be cleared.

Operation when all parameters are omitted:

All failure information is cleared.

Example

The following figure is an example of clearing CFM failure information.

Figure 35-10 Example of clearing CFM failure information

```
> clear cfm fault
>
```

Display items

None

Impact on communication

None

Response messages

Table 35-15 List of response messages for the clear cfm fault command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.

Notes

None

show cfm l2traceroute-db

Displays route information acquired by the `l2traceroute` command and information about the MP on the route. The information registered in the linktrace database is displayed.

Syntax

```
show cfm l2traceroute-db [{remote-mac <MAC address> | remote-mep <MEPID>} domain-level
<Level> ma <No.>] [detail]
```

Input mode

User mode and administrator mode

Parameters

`{remote-mac` *<MAC address>* `| remote-mep` *<MEPID>*`}`

`remote-mac` *<MAC address>*

Specify the MAC address of the destination remote MEP or MIP on the route that will be displayed.

`remote-mep` *<MEPID>*

Specify the destination remote MEP ID on the route that will be displayed.

`domain-level` *<Level>*

Specify the domain level to which the destination remote MEP or MIP belongs.

`ma` *<No.>*

Specify the MA ID number to which the destination remote MEP or MIP belongs.

`detail`

Displays detailed information about the route and the MP on the route.

Operation when this parameter is omitted:

Only the route information is displayed.

Operation when all parameters are omitted:

All route information in the linktrace database is displayed.

Example 1

The following figure is an example of displaying route information in the linktrace database.

Figure 35-11 Example of displaying linktrace database information

```
> show cfm l2traceroute-db

Date 2009/10/29 08:28:28 UTCL2traceroute to MP:0012.e254.dc09 on Level:3  MA:300
MEP:300  VLAN:300
Time:2009/10/29 08:21:05
63   00ed.f205.0111  Forwarded
62   0012.e254.dc09  NotForwarded  Hit

>
```

Display items in Example 1

Table 35-16 Items displayed for linktrace database information

Item	Meaning	Displayed information
L2traceroute to MP:*<Remote MP>*	The MAC address of the destination remote MEP or MIP.	The MAC address of the destination remote MEP or MIP. *<Remote MAC address>*: When the MAC address of a remote MEP or MIP is specified. *<Remote MEP ID>*(*<Remote MAC address>*): When a remote MEP ID is specified.
Level	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch
VLAN	VLAN ID	Source VLAN ID
Time	Send time	*yyyy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second
<TTL>	Time to Live	0 to 255
<Remote MAC address>	MAC address of the replying MP	The MAC address of the MEP or MIP that replied during route verification
Forwarded	Linktrace message forwarded	Indicates that the replying MP forwarded the linktrace message.
NotForwarded	Linktrace message not forwarded	Indicates that the replying MP did not forward the linktrace message.
Hit	Reply from the destination remote MEP or MIP	Indicates that the reply was from the destination remote MEP or MIP.

Example 2

The following figure is an example of displaying detailed linktrace database information.

Figure 35-12 Example of displaying detailed linktrace database information

```
> show cfm l2traceroute-db detail

Date 2009/10/29 08:45:32 UTC
L2traceroute to MP:302(0012.e254.dc09) on Level:3  MA:300   MEP:300  VLAN:300
Time:2009/10/29 08:35:02
63   00ed.f205.0111  Forwarded
  Last Egress : 00ed.f205.0001  Next Egress : 00ed.f205.0001
  Relay Action: MacAdrTbl
  Chassis ID    Type: MAC       Info: 00ed.f205.0001
  Ingress Port  Type: LOCAL      Info: Port 0/1
    MP Address: 00ed.f205.0101  Action: OK
  Egress Port   Type: LOCAL      Info: Port 0/17
    MP Address: 00ed.f205.0111  Action: OK
62   0012.e254.dc09  NotForwarded  Hit
  Last Egress : 00ed.f205.0001  Next Egress : 0012.e254.dbf0
  Relay Action: RlyHit
```

```
    Chassis ID    Type: MAC       Info: 0012.e254.dbf0
    Ingress Port  Type: LOCAL      Info: Port 0/17
      MP Address: 0012.e254.dc01  Action: OK
    Egress Port   Type: LOCAL      Info: Port 0/25
      MP Address: 0012.e254.dc09  Action: OK

  >
```

Display items in Example 2

Table 35-17 Items displayed for the detailed linktrace database information

Item	Meaning	Displayed information
L2traceroute to MP:*<Remote MP>*	The MAC address of the destination remote MEP or MIP.	The MAC address of the destination remote MEP or MIP. *<Remote MAC address>*: When the MAC address of a remote MEP or MIP is specified. *<Remote MEP ID>*(*<Remote MAC address>*): When a remote MEP ID is specified.
Level	Domain level	0 to 7
MA	MA ID number	Configured MA ID number
MEP	MEP ID	MEP ID for the Switch
VLAN	VLAN ID	Source VLAN ID
Time	Send time	*yyyy*/*mm*/*dd hh*:*mm*:*ss* year/month/day hour:minute:second
<TTL>	Time to Live	0 to 255
<Remote MAC address>	MAC address of the replying MP	The MAC address of the MEP or MIP that replied during route verification
Forwarded	Linktrace message forwarded	Indicates that the replying MP forwarded the linktrace message.
NotForwarded	Linktrace message not forwarded	Indicates that the replying MP did not forward the linktrace message.
Hit	Reply from the destination remote MEP or MIP	Indicates that the reply was from the destination remote MEP or MIP.
Last Egress	ID of the source device that forwarded a linktrace message	The MAC address that identifies the device that forwarded a linktrace message. -- is displayed if this information is not in the received linktrace reply.
Next Egress	ID of the device that received a linktrace message	The MAC address that identifies the device that received a linktrace message. -- is displayed if this information is not in the received linktrace reply. The device MAC address is used for sending this information from the Switch to another device.

Item	Meaning	Displayed information
Relay Action	The processing method for forwarding a linktrace message	The processing method for forwarding a linktrace message ● `RlyHit`: A linktrace message was not forwarded because it had reached the destination (the destination remote MEP or MIP). ● `MacAdrTbl`: A linktrace message was forwarded by using the MAC address table. ● `MPCCMDB`: A linktrace message was forwarded by using the `MIPCCM` database. `--` is displayed if a linktrace message was not forwarded for a response from a destination other than the MP.
Chassis ID	Chassis ID of the replying MP	The chassis ID of the MP that sent a linktrace reply.
Type	Subtype of the chassis ID	Type of the information displayed for `Info`. ● `CHAS-COMP`: Indicates that entPhysicalAlias of the Entity MIB is displayed for `Info`. ● `CHAS-IF`: Indicates that ifAlias of the interface MIB is displayed for `Info`. ● `PORT`: Indicates that portEntPhysicalAlias of the Entity MIB is displayed for `Info`. ● `MAC`: Indicates that macAddress of the CFM MIB is displayed for `Info`. ● `NET`: Indicates that networkAddress of the CFM MIB is displayed for `Info`. ● `NAME`: Indicates that ifName of the interface MIB is displayed for `Info`. ● `LOCAL`: Indicates that local of the CFM MIB is displayed for `Info`. `--` is displayed if this information is not in the received linktrace reply. For this information sent from the Switch, MAC is displayed for `Type` and the MAC address of the Switch is displayed for `Info`.
Info	Information about the chassis ID	Information displayed for `Type`. `--` is displayed if this information is not in the received linktrace reply.
Ingress Port	Information about MP ports that received a linktrace message	--

Item	Meaning	Displayed information
Type	Subtype of the ingress port	Type of the information displayed for `Info`. ● `PORT`: Indicates that `ifAlias` of the interface MIB is displayed for `Info`. ● `COMP`: Indicates that `entPhysicalAlias` of the Entity MIB is displayed for `Info`. ● `MAC`: Indicates that macAddress of the CFM MIB is displayed for `Info`. ● `NET`: Indicates that networkAddress of the CFM MIB is displayed for `Info`. ● `NAME`: Indicates that ifName of the interface MIB is displayed for `Info`. ● `AGENT`: Indicates that `Agent Circuit ID` defined in IETF RFC 3046 is displayed for `Info`. ● `LOCAL`: Indicates that local of the CFM MIB is displayed for `Info`. `--` is displayed if this information is not in the received linktrace reply. For this information sent from the Switch, `LOCAL` is displayed for `Type` and the following character string is displayed for `Info`: `port` *<IF#>*: Port number `CH` *<Channel group#>*: Channel group number
Info	Ingress port information	Information displayed for `Type`. `--` is displayed if this information is not in the received linktrace reply.
MP Address	MAC address of the MP that received a linktrace message	The MAC address of the MP that received a linktrace message. `--` is displayed if this information is not in the received linktrace reply.
Action	Status of the port that received a linktrace message	Displays the status of the MP port that received the linktrace message of each device. ● `OK`: Indicates normal status. ● `Down`: Indicates Down status. ● `Blocked`: Indicates Blocked status. ● `NoVLAN`: Indicates that there is no VLAN setting for linktrace messages. `--` is displayed if this information is not in the received linktrace reply.
Egress Port	Port information for the MP that forwarded a linktrace message	--

Item	Meaning	Displayed information
Type	Subtype of the egress port	Type of the information displayed for `Info`. ● `PORT`: Indicates that `ifAlias` of the interface MIB is displayed for `Info`. ● `COMP`: Indicates that `entPhysicalAlias` of the Entity MIB is displayed for `Info`. ● `MAC`: Indicates that macAddress of the CFM MIB is displayed for `Info`. ● `NET`: Indicates that networkAddress of the CFM MIB is displayed for `Info`. ● `NAME`: Indicates that ifName of the interface MIB is displayed for `Info`. ● `AGENT`: Indicates that `Agent Circuit ID` defined in IETF RFC 3046 is displayed for `Info`. ● `LOCAL`: Indicates that local of the CFM MIB is displayed for `Info`. `--` is displayed if this information is not in the received linktrace reply. For this information sent from the Switch, `LOCAL` is displayed for `Type` and the following character string is displayed for `Info`: `port` *<IF#>*: Port number `CH` *<Channel group#>*: Channel group number
Info	Egress port information	Information displayed for `Type`. `--` is displayed if this information is not in the received linktrace reply.
MP Address	MAC address of the MP that forwarded the linktrace message	MAC address of the MP of those configured on the egress ports that sent the linktrace message `--` is displayed if this information is not in the received linktrace reply.
Action	Status of the port used to forward a linktrace message	The status of the MP port used to forward each device's linktrace message. ● `OK`: Indicates normal status. ● `Down`: Indicates Down status. ● `Blocked`: Indicates Blocked status. ● `NoVLAN`: Indicates that there is no VLAN setting for linktrace messages. `--` is displayed if this information is not in the received linktrace reply.

Impact on communication

None

Response messages

Table 35-18 List of response messages for the show cfm l2traceroute-db command

Message	Description
CFM is not configured.	CFM has not been configured. Check the configuration.

Message	Description
No such destination MAC address.	The specified destination MAC address is unknown. Make sure the specified parameter is correct, and then try again.
No such Domain Level.	The specified domain level is unknown. Make sure the specified parameter is correct, and then try again.
No such MA.	The specified MA ID is unknown. Make sure the specified parameter is correct, and then try again.
No such Remote MEP.	The specified remote MEP is unknown. Make sure the specified parameter is correct, and then try again.

Notes

Information about some replies is not displayed if those replies are received after being forwarded by a number of devices that exceeds the number of devices on the routes that can be registered in the linktrace database.

clear cfm l2traceroute-db

Clears CFM linktrace database information.

Syntax

```
clear cfm l2traceroute-db
```

Input mode

User mode and administrator mode

Parameters

None

Example

The following figure is an example of clearing CFM linktrace database information.

Figure 35-13 Example of clearing CFM linktrace database information

```
> clear cfm l2traceroute-db
>
```

Display items

None

Impact on communication

None

Response messages

Table 35-19 List of response messages for the clear cfm l2traceroute-db command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.

Notes

None

show cfm statistics

Displays the CFM statistics.

Syntax

```
show cfm statistics [domain-level <Level>] [ma <No.>] [mep <MEPID>]
```

Input mode

User mode and administrator mode

Parameters

`domain-level` *<Level>*

Displays the CFM statistics for the specified domain level.

`ma` *<No.>*

Displays the CFM statistics for the specified MA ID number.

`mep` *<MEPID>*

Displays the CFM statistics for the specified MEP ID.

Operation when a parameter is omitted

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

Operation when all parameters are omitted:

All CFM statistics are displayed.

Example

The following figure is an example of displaying CFM statistics.

Figure 35-14 Example of displaying CFM statistics

```
> show cfm statistics domain-level 3

Date 2009/10/29 08:26:39 UTC
Domain Level 3 Name(str): ProviderDomain_3
  MA 300   Name(str) : Tokyo_to_Osaka_300
    MEP ID:300   0/1 (Up)    CFM:Enable
      CCM Tx:         23  Rx:         23  RxDiscard:         0
      LBM Tx:          5  Rx:          5  RxDiscard:         0
      LBR Tx:          5  Rx:          5  RxDiscard:         0
      LTM Tx:          3  Rx:          1  RxDiscard:         0
      LTR Tx:          1  Rx:          6  RxDiscard:         0
                                  Other RxDiscard:         0
  MIP Information
    0/17(Up)    CFM:Enable
      CCM Tx:          -  Rx:          -  RxDiscard:         -
      LBM Tx:          -  Rx:          5  RxDiscard:         0
      LBR Tx:          5  Rx:          -  RxDiscard:         -
      LTM Tx:          -  Rx:          4  RxDiscard:         0
      LTR Tx:          4  Rx:          -  RxDiscard:         -
                                  Other RxDiscard:         0

>
```

Display items

Table 35-20 Items displayed for CFM statistics

Item	Meaning	Displayed information
Domain Level *<Level>*	Domain level and domain name	*<Level>*: Domain level `Name:-`: Indicates that the domain name is not used. `Name(str):`*<Name>*: A character string is used for the domain name. `Name(dns):`*<Name>*: A domain name server name is used for the domain name. `Name(mac):`*<MAC>*`(`*ID*`)`: A MAC address and ID are used for the domain name.
MA *<No.>*	MA ID number and MA name	*<No.>*: Configured MA ID number `Name(str):`*<Name>*: A character string is used for the MA name. `Name(id):`*ID*: A numeric value is used for the MA name. `Name(vlan):`*<VLAN ID>*: A VLAN ID is used for the MA name.
MEP ID	MEP ID for the Switch	--
IF#	Port number	MEP port number
CH*<Channel group#>*	Channel group number	MEP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.
CFM	Operating status of CFM on a port	The operating status of CFM on a port to which MEP belongs. `Enable`: Indicates that CFM on the port is enabled. `Disable`: Indicates that CFM on the port is disabled.
MIP Information	MIP information	--
IF#	Port number	MIP port number
CH*<Channel group#>*	Channel group number	MIP channel group number
Up	The port is in Up status.	Indicates that the port is in Up status. If link aggregation is used, this means that the channel group is in Up status.
Down	The port is in Down status.	Indicates that the port is in Down status. If link aggregation is used, this means that the channel group is in Down status.

Item		Meaning	Displayed information
CFM		Operating status of CFM on a port	The operating status of CFM on a port to which MIP belongs. `Enable`: Indicates that CFM on the port is enabled. `Disable`: Indicates that CFM on the port is disabled.
CCM	Tx	Number of CCM transmissions	`-` is displayed for MIP.
	Rx	Number of CCM receptions	`-` is displayed for MIP.
	RxDiscard	Number of discarded CCMs	For an MEP, the following CCMs are discarded: ● CCM with an invalid format ● CCM for another MA ● CCM with the same MEP ID as the one set for the Switch ● CCM whose transmission interval is different from the Switch's MA ● CCM with a low domain level `-` is displayed for MIP.
LBM	Tx	Number of loopback messages that have been sent	`-` is displayed for MIP.
	Rx	Number of loopback messages that have been received	--
	RxDiscard	Number of loopback messages that have been discarded	The following loopback messages are discarded: ● A loopback message with an invalid format ● A loopback message whose destination MAC address is not the MAC address for the receiving MP or the multicast address for CC ● A loopback message whose source MAC address is the multicast address for a CC or a linktrace ● A loopback message whose destination MAC address is not the MAC address for the receiving MIP (for an MIP)
LBR	Tx	Number of loopback replies that have been sent	--
	Rx	Number of loopback replies that have been received	`-` is displayed for MIP.

Item		Meaning	Displayed information
	RxDiscard	Number of loopback replies that have been discarded	For an MEP, the following loopback replies are discarded: ● A loopback reply with an invalid format ● A loopback reply whose destination MAC address is different from the MAC address of the MEP ● A loopback reply whose source MAC address is the multicast address or broadcast address ● A loopback reply whose `Loopback Transaction Identifier` value is different from that in the loopback message that was sent ● A loopback reply that was received after the wait time for a response that was set by an operation command expired - is displayed for MIP.
LTM	Tx	Number of linktrace messages that have been sent	- is displayed for MIP.
	Rx	Number of linktrace messages that have been received	--
	RxDiscard	Number of linktrace messages that have been discarded	The following linktrace messages are discarded: ● A linktrace message with an invalid format ● A linktrace message whose LTM TTL value is 0 ● A linktrace message whose destination MAC address is different from the multicast address for linktrace or the MAC address of the receiving MP ● A linktrace message that cannot result in a linktrace reply
LTR	Tx	Number of linktrace replies that have been sent	--
	Rx	Number of linktrace replies that have been received	- is displayed for MIP.
	RxDiscard	Number of linktrace replies that have been discarded	For an MEP, the following linktrace replies are discarded: ● A linktrace reply with an invalid format ● A linktrace reply whose destination MAC address is different from the MAC address of the receiving MEP ● A linktrace reply whose `LTR Transaction Identifier` value is different from the value in the linktrace message ● A linktrace reply that was received after the wait time for a response that was set by an operation command expired - is displayed for MIP.
Other RxDiscard		Number of other CFM PDUs that have been	A count of the number of unsupported CFM PDUs

Item	Meaning	Displayed information
	discarded	

Impact on communication

None

Response messages

Table 35-21 List of response messages for the show cfm statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.
Specified Domain Level is not configured.	The specified domain level has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MA is not configured.	The specified MA ID has not been configured. Make sure the specified parameter is correct, and then try again.
Specified MEP is not configured.	The specified MEP ID has not been configured. Make sure the specified parameter is correct, and then try again.

Notes

None

clear cfm statistics

Clears the CFM statistics.

Syntax

```
clear cfm statistics [domain-level <Level> [ma <No.> [mep <MEPID>]]]
clear cfm statistics [domain-level <Level> [mip] [port <Port# list>] [channel-group-number
<Channel group# list>]]
```

Input mode

User mode and administrator mode

Parameters

`domain-level` *<Level>*

Clears CFM statistics for the specified domain level.

`ma` *<No.>*

Clears CFM statistics for the specified MA ID number.

`mep` *<MEPID>*

Clears CFM statistics for the specified MEP ID.

`mip`

Clears CFM statistics for MIP.

`port` *<Port# list>*

Clears CFM statistics for the specified port number. For details about how to specify *<Port# list>* and the specifiable range of values, see *Specifiable values for parameters*.

`channel-group-number` *<Channel group# list>*

Clears CFM statistics for the channel groups specified in list format in the specified link aggregation. For details about how to specify *<Channel group# list>*, see *Specifiable values for parameters*.

Operation when a parameter is omitted

This command can clear only the information relevant to the condition applied by a parameter that has been set. If no parameter is specified, information is cleared without being limited by any conditions. If multiple parameters are specified, the information conforming to the conditions will be cleared.

Operation when all parameters are omitted:

All CFM statistics are cleared.

Example

The following figure is an example of clearing CFM statistics.

Figure 35-15 Example of clearing CFM statistics

```
> clear cfm statistics
>
```

Display items

None

Impact on communication

None

Response messages

Table 35-22 List of response messages for the clear cfm statistics command

Message	Description
Can't execute.	The command could not be executed. Re-execute the command.
CFM is not configured.	CFM has not been configured. Check the configuration.

Notes

None

Part 12: Management of Neighboring Device Information

36. LLDP

show lldp
clear lldp
show lldp statistics
clear lldp statistics

show lldp

Displays LLDP configuration information and neighboring device information.

Syntax

```
show lldp [port <Port# list>] [detail]
```

Input mode

User mode and administrator mode

Parameters

`port <Port# list>`

Displays LLDP information for the specified port.

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:

The LLDP information for all ports is displayed.

`detail`

Displays the LLDP configuration information for the Switch and the neighboring device information in detail.

Operation when this parameter is omitted:

The LLDP configuration information for the Switch and the neighboring device information are displayed in a simplified format.

Operation when all parameters are omitted:

The LLDP configuration information for the Switch and all neighboring device information are displayed in a simplified format.

Example 1

The following figure is an example of displaying the LLDP configuration information in a simplified format.

Figure 36-1 Example of displaying the LLDP configuration information and neighboring device information in a simplified format

```
> show lldp

Date 2011/09/15 13:32:41 UTC
Status: Enabled  Chassis ID: Type=MAC       Info=0012.e204.0001
Interval Time: 30   Hold Count: 4  TTL: 120
Port Counts=5
  0/5(CH:1)   Link: Up    Neighbor Counts: 1
  0/6(CH:1)   Link: Up    Neighbor Counts: 1
  0/18        Link: Up    Neighbor Counts: 1
  0/23        Link: Down  Neighbor Counts: 0
  0/24        Link: Up    Neighbor Counts: 1

>
```

Display items in Example 1

Table 36-1 Simplified display of LLDP setting information and neighboring device information

Item	Meaning	Displayed information
Status	Status of the LLDP functionality on the Switch	`Enabled`: The LLDP functionality is enabled. `Disabled`: The LLDP functionality is disabled. When the status is `Disabled`, `LLDP is not configured` is displayed because there is no information.
Chassis ID	Chassis ID of the Switch	--
Type	Subtype for the chassis ID	`MAC`: Indicates that a MAC address is displayed for `Info`.
Info	MAC address of the Switch	--
Interval Time	Interval for sending LDPDUs that has been set on the Switch (in seconds)	5 to 32768
Hold Count	Multiplier for Interval Time, used for calculating the LDPDU retention time to be reported to neighboring devices	2 to 10
TTL	LDPDU retention time to be reported to neighboring devices	10 to 65535
Port Counts	Number of ports	Number of ports that has been set for enable-port
IF#	Interface port number	Number of the interface port whose information is to be displayed
CH	Channel group number	This item is displayed if the applicable port belongs to a channel group.
Link	Port state	`Up`: Indicates that the port status is Up. `Down`: Indicates that the port status is Down.
Neighbor Counts	Number of neighboring devices whose information is retained	Number of neighboring devices whose information is retained by the applicable port

Example 2

The following is an example of displaying LLDP information when the `detail` parameter is specified.

Figure 36-2 Example of displaying detailed LLDP configuration information and neighboring device information

```
> show lldp detail

Date 2011/09/15 13:33:18 UTC
Status: Enabled  Chassis ID: Type=MAC     Info=0012.e204.0001
Interval Time: 30  Hold Count: 4  TTL: 120
System Description: ALAXALA AX1240 AX-1240-24T2C [AX1240S-24T2C] Switching software
```

```
Ver. 2.3.B OS-LT2
Total Neighbor Counts=4
Port Counts=5
Port 0/5(CH:1)     Link: Up   Neighbor Counts: 1                          ┐
  Port ID: Type=MAC     Info=0012.e204.0105                               |
  Port Description: FastEther 0/5                                         |1
  Tag ID: Tagged=10,100,4094                                              |
  IPv4 Address: Tagged: 10    192.168.10.2                                ┘
  1  TTL:92 Chassis ID: Type=MAC     Info=0012.e284.0001                  ┐
     System Description: ALAXALA AX1240 AX-1240-24T2C [AX1240S-24T2C] Switching
software Ver. 2.3.B OS-LT2                                                |2
     Port ID: Type=MAC     Info=0012.e284.0105                          |
     Port Description: FastEther 0/5                                    |
     Tag ID: Tagged=10                                                  |
     IPv4 Address: Tagged: 10    192.168.10.1                           ┘
                :
                :

>
```

1. Information about the Switch's port
2. Information about neighboring devices

Display items in Example 2

Table 36-2 Detailed display of LLDP setting information and neighboring device information

Item	Meaning	Displayed information
Status	Status of the LLDP functionality on the Switch	`Enabled`: The LLDP functionality is enabled. `Disabled`: The LLDP functionality is disabled. When the status is `Disabled`, `LLDP is not configured` is displayed because there is no information.
Chassis ID	Chassis ID of the Switch	--
Type	Subtype for the chassis ID	`MAC`: Indicates that a MAC address is displayed for `Info`.
Info	MAC address of the Switch	--
Interval Time	Interval for sending LDPDUs that has been set on the Switch (in seconds)	5 to 32768
Hold Count	Multiplier for Interval Time, used for calculating the LDPDU retention time to be reported to neighboring devices	2 to 10
TTL	LDPDU retention time to be reported to neighboring devices	10 to 65535
System Name	System name of the Switch	The character string that has been set by the `hostname` command parameter This item is not displayed if the information has not been set in the configuration.

Item	Meaning	Displayed information
System Description	System description of the Switch	The same character string as the string used for the MIB (sysDescr)
Total Neighbor Counts	Total number of neighboring devices connected to the Switch	Number of neighboring devices whose information is retained by the Switch. 0 to 50
Port Counts	Number of ports	Number of ports that has been set for enable-port
Port	Applicable port number	IF#
CH	Channel group number	This item is displayed if the applicable port belongs to a channel group.
Link	Link status of the applicable port	`Up`: Indicates that the port status is Up. `Down`: Indicates that the port status is Down.
Neighbor Counts	Number of neighboring devices	Number of neighboring devices whose information is retained by the applicable port
Port ID	Port ID of the applicable port	--
Type	Subtype for the port ID	`MAC`: Indicates that a MAC address is displayed for `Info`. This item is always `MAC` (fixed).
Info	Information about the port ID	MAC address of the port
Port Description	Port description for the port	The same character string as the string used for the MIB (ifDescr).
Tag ID	List of VLANs to which the port belongs	VLAN ID list This item is not displayed if the information has not been set in the configuration.
IPv4 Address	Port IP address (IPv4)	This item is not displayed if the information has not been set in the configuration.
Untagged	When the VLAN to which an IP address has been assigned is untagged	--
Tagged	VLAN ID for the VLAN to which an IP address has been assigned	The smallest ID is displayed if multiple IDs have been assigned.
<IP Address>	IP address that has been assigned	An IP address assigned to the VLAN that is described in the previous item.
TTL	Remaining LDPDU retention time (in seconds)	0 to 65535
Chassis ID	Chassis ID of the neighboring device	--

Item	Meaning	Displayed information
Type	Subtype for the chassis ID	`CHAS-COMP`: Indicates that entPhysicalAlias of the Entity MIB is displayed for `Info`. `CHAS-IF`: Indicates that ifAlias of the interface MIB is displayed for `Info`. `PORT`: Indicates that portEntPhysicalAlias of the Entity MIB is displayed for `Info`. `MAC`: Indicates that macAddress of the LLDP MIB is displayed for `Info`. `NET`: Indicates that networkAddress of the LLDP MIB is displayed for `Info`. `LOCL`: Indicates that local of the LLDP MIB is displayed for `Info`.
Info	Information about the chassis ID	Information displayed for the subtype
System Name	System name of the neighboring device	This item is not displayed if it has not been reported.
System Description	System description of the neighboring device	--
Port ID	Port ID for the neighboring device	--
Type	Subtype for the port ID	`PORT`: Indicates that ifAlias of the InterfaceMIB is displayed for `Info`. `ENTRY`: Indicates that portEntPhysicalAlias of the Entity MIB is displayed for `Info`. `MAC`: Indicates that macAddress of the LLDP MIB is displayed for `Info`. `NET`: Indicates that networkAddress of the LLDP MIB is displayed for `Info`. `LOCL`: Indicates that local of the LLDP MIB is displayed for `Info`.
Info	Information about the port ID	Information displayed for the subtype
Port Description	Port description of the neighboring device	--
Tag ID	List of VLANs to which the neighboring device port belongs	VLAN ID list This item is not displayed if it has not been reported.
IPv4 Address	IP address assigned to the neighboring device (IPv4)	This item is not displayed if it has not been reported.
Untagged	When the VLAN to which the IPv4 address of the neighboring device has been assigned is untagged	--
Tagged	VLAN ID for the VLAN to which the IPv4 address of the neighboring device has been assigned	The smallest ID is displayed if multiple IDs have been assigned.
<IP Address>	IPv4 address that has been	An IP address assigned to the VLAN that is

Item	Meaning	Displayed information
	assigned	described in the previous item.
IPv6 Address	IP address assigned to the neighboring device (IPv6)	This item is not displayed if it has not been reported.
Untagged	When the VLAN to which the IPv6 address of the neighboring device has been assigned is untagged	--
Tagged	VLAN ID for the VLAN to which the IPv6 address of the neighboring device has been assigned	The smallest ID is displayed if multiple IDs have been assigned.
<IP Address>	IPv6 address that has been assigned	An IP address assigned to the VLAN that is described in the previous item.

Impact on communication

None

Response messages

Table 36-3 List of response messages for the show lldp command

Message	Description
LLDP is not configured.	LLDP has not been configured. Check the configuration.

Notes

None

clear lldp

Clears LLDP neighboring device information.

Syntax

```
clear lldp
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 36-3 Example of executing the clear lldp command

```
> clear lldp

>
```

Display items

None

Impact on communication

None

Response messages

Table 36-4 List of response messages for the clear lldp command

Message	Description
LLDP is not configured.	LLDP has not been configured. Check the configuration.

Notes

None

show lldp statistics

Displays LLDP statistics.

Syntax

```
show lldp statistics [port <Port# list>]
```

Input mode

User mode and administrator mode

Parameters

`port <Port# list>`

Displays LLDP statistics for the specified 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 statistics for all LLDP frames by port.

Example

Figure 36-4 Example of displaying LLDP statistics

```
> show lldp statistics

Date 2008/11/13 13:27:48 UTC
Port Counts: 3
Port 0/1  LDPDUs     : Tx  =         4  Rx    =         0  Invalid=         0
          Discard TLV: TLVs=         0
Port 0/12 LDPDUs     : Tx  =         0  Rx    =         0  Invalid=         0
          Discard TLV: TLVs=         0
Port 0/13 LDPDUs     : Tx  =         0  Rx    =         0  Invalid=         0
          Discard TLV: TLVs=         0

>
```

Display items

Table 36-5 Items displayed for the LLDP statistics

Item	Meaning	Displayed information
Port counts	Number of ports subject to this statistics	--
Port	Port number	IF#
LDPDUs	Statistics for frames	--
Tx	Number of LDPDUs that have been sent	0 to 4294967295
Rx	Number of LDPDUs that have been received	0 to 4294967295
Invalid	Number of invalid LDPDUs	0 to 4294967295

Item	Meaning	Displayed information
Discard TLV	TLV statistics	--
TLVs	Number of TLVs that have been discarded	0 to 4294967295

Impact on communication

None

Response messages

Table 36-6 List of response messages for the show lldp statistics command

Message	Description
LLDP is not configured.	LLDP has not been configured. Check the configuration.
There is no information. (lldp statistics)	There is no `lldp statistics` information.

Notes

None

clear lldp statistics

Clears LLDP statistics.

Syntax

```
clear lldp statistics
```

Input mode

User mode and administrator mode

Parameters

None

Example

Figure 36-5 Example of executing the clear lldp statistics command

```
> clear lldp statistics

>
```

Display items

None

Impact on communication

None

Response messages

None

Notes

None

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