AX6700S/AX6600S/AX6300S/AX3800S/AX3600S/AX2400S

Troubleshooting Guide

AX36S-T001X-E0

Alaxala

■ Relevant products

This manual applies to the models in the AX6700S, AX6600S, AX6300S, AX3800S, AX3600S, and AX2400S series of switches.

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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.

Please note that the actual product might differ from how it is depicted in output examples and figures.

■ Editions history

December 2012 (Edition 15) AX36S-T001X-E0 (SOFT-AM-006_R15)

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History of Amendments

[Edition 14]

Summary of amendments

Item	Changes
Failure analysis for the AX3800S, AX3600S, and AX2400S series	• A description of AX3830S-44X4QW was added.
Loop connector specifications	• A description of 40GBASE-SR4 loop connector specifications was added.

[Edition 13]

Summary of amendments

Item	Changes
Returning to administrator mode from configuration command mode is not possible	• This subsection was added.
Stack configuration problems	• This subsection was added.
Communication failures in filters and QoS configurations	• Descriptions of policy-based routing and policy-based switching were added.
Policy-based routing problems	• This subsection was added.
Policy-based switching problems	• This subsection was added.
Action to be taken when a MAC address table resource shortage occurs	• A description of policy-based switching was added to *Table 4-3 How to delete MAC address table entries*.
Obtaining failure information	• A description of stacks was added.

[Edition 12]

Summary of amendments

Item	Changes
Failure analysis for the AX3800S, AX3600S, and AX2400S series	• A description of AX3800S series switches was added.
Communication is not possible in IPv4 PIM-DM networks	• This subsection was added.
Multicast data is forwarded twice in an IPv4 PIM-DM network	• This subsection was added.

[Edition 11]

Summary of amendments

Item	Changes
Failure analysis for the AX3600S and AX2400S series	• A description of AX3600 and AX2400S series switches was added.
Failures occurring when the Ring Protocol functionality is used	• A description of the multi-fault monitoring functionality was added.
Communication is not possible or is disconnected	• The description was changed in accordance with the addition of VRF support in AX3600S and AX2400 series switches.

Item	Changes
Communication is not possible or is disconnected	• The description was changed in accordance with the addition of VRF support in AX3600S and AX2400 series switches.
Creating loop connectors	• This subsection was added.
Detailed display contents of the "show tech-support" command	• Commands were added to the detailed description.

[Edition 10]

Summary of amendments

Item	Changes
IPv4 network communication failures	• Actions to be taken when using DHCP snooping were added.
IPv6 DHCP relay communication problems	• This subsection was added.
IPv6 multicast communication problems in VRF	• This subsection was added.
IPv6 multicast communication problems in an extranet	• This subsection was added.
Problems due to the redundant configuration of the NIF	• This section was added.
Access list logging problems	• This section was added.
DHCP snooping problems	• This section was added.
Detailed display contents of the "show tech-support" command	• Commands were added to the detailed description.

[Edition 9]

Summary of amendments

Item	Changes
Login from a remote terminal is not possible	• Actions to be taken when a user cannot log in were added.
Login authentication using RADIUS/TACACS+ is not possible	• Actions to be taken when a user cannot log in to the Switch were added.
Command authentication using RADIUS/TACACS+ and local is not possible	• Items to be checked were added. • Actions to be taken when all commands are restricted were added.
Actions to be taken for 100BASE-FX/1000BASE-X problems	• Actions to be taken for 100BASE-FX were added.
Problems that occur during IPv4 multicast communication in the extranet	• This subsection was added, and actions to be taken when a problem occurs during IPv4 multicast communication in the extranet were added.
Communication is not possible or is disconnected	• Items to be checked for the optional license OP-NPAR were added.
No IPv6 routing information exists in the VRF	• This subsection was added, and a description of the failure analysis method for the option license OP-NPAR was added.
Communication is not possible with uplink redundancy	• This subsection was added, and a description of the failure analysis method with uplink redundancy was added.
Detailed display contents of the "show tech-support" command	• Commands were added to the detailed description.

[Edition 8]

Summary of amendments

Item	Changes
Addition of series	• A description relating to the addition of AX6600S series switches was added.
Procedure for handling switch faults	• Items for handling failures were added.
Memory card problems	• This section was added.
BSU/PSP communication failures	• PSP was added. In addition, items for analyzing failures were added or modified.
Actions to be taken for PoE problems	• This subsection was added.
Failures occurring when the Ring Protocol functionality is used	• Items for analyzing failures were added.
GSRP communication failures	• Items for analyzing failures were added.
Power saving-related problems	• This section was added.

[Edition 7]

Summary of amendments

Item	Changes
Communication is not possible or is disconnected	• Items to be checked for the optional license OP-NPAR were added.
No RIP routing information exists	• Items to be checked for the optional license OP-NPAR were added.
No OSPF routing information exists	• Items to be checked for the optional license OP-NPAR were added.
No BGP4 routing information exists	• Items to be checked for the optional license OP-NPAR were added. • The actions to be taken were changed.
No routing information exists in the VRF	• This subsection was added.
Communication failures in the IPv4 multicast routing functionality	• Items for analyzing failures were added. • Items to be checked for the optional license OP-NPAR were added.
No BGP4+ routing information exists	• The actions to be taken were changed.
Communication failures in the IPv6 multicast routing functionality	• Items for analyzing failures were added.
Communication failures occurring when Web authentication is used	• Items for analyzing failures were added. • The actions to be taken were changed.
Communication failures occurring when MAC-based authentication is used	• The actions to be taken were changed.
Communication is not possible with the VRRP configuration of IPv4 networks	• Items for analyzing failures of the grouping functionality were added.
Communication is not possible with the VRRP configuration of IPv6 networks	• Items for analyzing failures of the grouping functionality were added.
Packet congestion in CPU processing does not recover	• This section was added.

Item	Changes
Detailed display contents of the "show tech-support" command	• Content displayed by the added or changed commands was added.

[Edition 6]

Summary of amendments

Item	Changes
Information cannot be entered from the console or does not appear correctly	• The item "After line disconnection, reconnection is not possible." for problems occurring during connection to a modem was added.
Ethernet port cannot be connected	• Actions to be taken when L2 loop detection functionality deactivates the port (makes it `inactive`) were added to the port status check items.
Actions to be taken for 10BASE-T/100BASE-TX/ 1000BASE-T problems	• Items to be checked for pin-mapping depending on the port settings were added.
Failures occurring when the Spanning Tree functionality is used	• Actions to be taken when the Spanning Tree functionality is used with the Ring Protocol were added.
Multicast forwarding by IGMP snooping is not possible	• Items to be checked when using IPv4 multicast concurrently were added.
Multicast forwarding by MLD snooping is not possible	• Items to be checked when using IPv6 multicast concurrently were added.
Communication is not possible on the IPv4 PIM-SM networks	• Actions to be taken when checking by using the `show igmp-snooping` command
Communication is not possible on the IPv4 PIM-SSM networks	• Actions to be taken when checking by using the `show igmp-snooping` command
Communication is not possible on the IPv6 PIM-SM networks	• Actions to be taken when checking by using the `show mld-snooping` command
Communication is not possible on the IPv6 PIM-SSM networks	• Actions to be taken when checking by using the `show mld-snooping` command
Communication failures occurring when Web authentication is used	• Actions to be taken when an operation log message is output, and when authentication for a terminal subject to authentication fails completely were added.
Transferring maintenance information files	• The procedure for transferring information when a configuration file failure occurs was added.
Detailed display contents of the "show tech-support" command	• Content displayed by the added commands was added.

[Edition 5]

Summary of amendments

Item	Changes
MAC-based authentication	• This item was added.

[Edition 4]

Summary of amendments

Item	Changes
Ring Protocol	• This item was added.

[Edition 3]

Summary of amendments

Item	Changes
Additional model	• A description relating to the additional model was added.
Web Authentication	• This item was added.
sFlow statistics	• This item was added.
IEEE 802.3ah/UDLD functionality	• This item was added.

[Edition 2]

Summary of amendments

Item	Changes
Additional model	• A description relating to the additional model was added.
Authentication VLAN	• This item was added.
SNMPv3	• This item was added.
Detailed display contents of the "show tech-support" command	• This item was added.

Preface

Relevant products

This manual applies to the models in the AX6700S, AX6600S, AX6300S, AX3800S, AX3600S, and AX2400S series of switches.

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

Corrections to the manual

Corrections to this manual are contained in the *Manual Corrections*.

Intended readers

This manual is intended for system administrators who configure and operate a network system that uses AX6700S, AX6600S, AX6300S, AX3800S, AX3600S, and AX2400S series switches.

Readers must have an understanding of the following:

- The basics of network system management

Manual URL

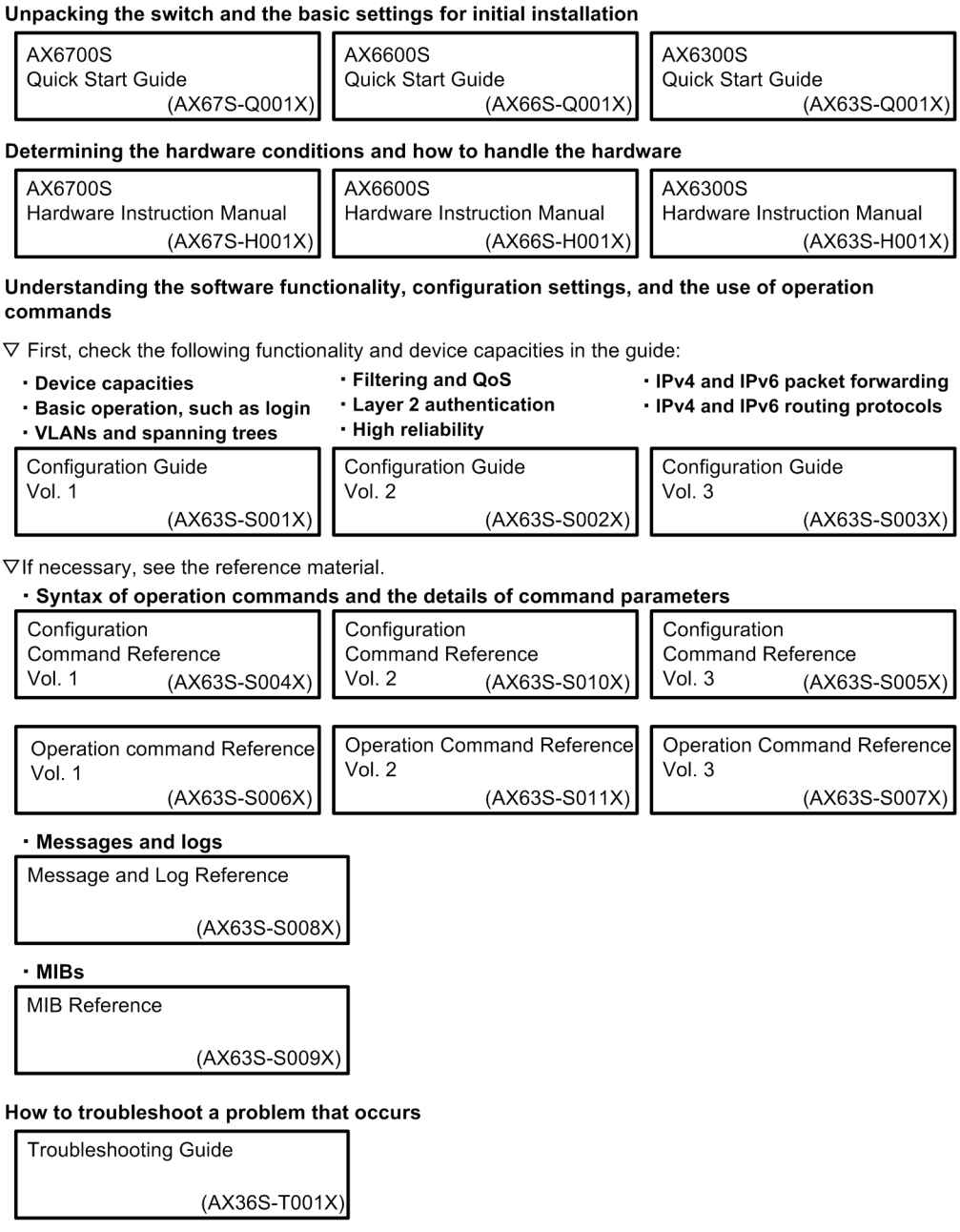
You can view this manual on our website at:

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 a switch.

AX6700S, AX6600S, and AX6300S series switches



AX3800S and AX3650S series switches

● **Unpacking the switch and the basic settings for initial installation**

Quick Start Guide
(AX36S-Q001X)

● **Determining the hardware facility conditions and how to handle the hardware**

Hardware Instruction Manual
(AX36S-H001X)

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

Configuration Guide Vol.1
(AX38S-S001X)
Vol.2
(AX38S-S002X)
Vol.3
(AX38S-S003X)

● **Learning the syntax of configuration commands and the details of command parameters**

Configuration Command Reference Vol. 1
(AX38S-S004X)
Vol.2
(AX38S-S005X)

● **Learning the syntax of operation commands and the details of command parameters**

Operation Command Reference Vol. 1
(AX38S-S006X)
Vol.2
(AX38S-S007X)

● **Understanding messages and logs**

Message and Log Reference
(AX38S-S008X)

● **Understanding the MIB**

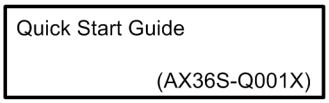
MIB Reference
(AX38S-S009X)

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

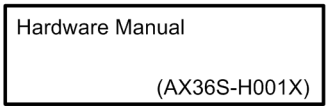
Troubleshooting Guide
(AX36S-T001X)

AX3640S and AX3630S series switches

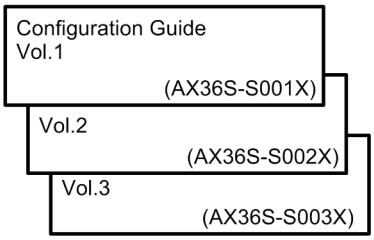
● **Unpacking the switch and the basic settings for initial installation**



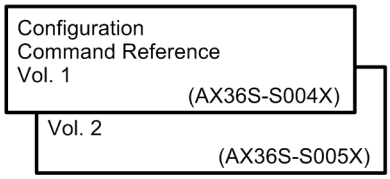
● **Determining the hardware facility conditions and how to handle the hardware**



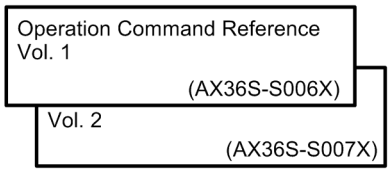
● **Understanding the software functions, configuration settings, and use of the operation commands**



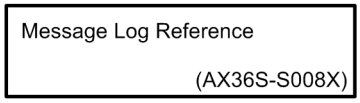
● **Learning the syntax of configuration commands and the details of command parameters**



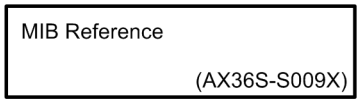
● **Learning the syntax of operation commands and the details of command parameters**



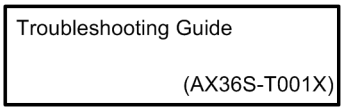
● **Understanding messages and logs**



● **Understanding the MIBs**



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



AX2400S series switches

- Unpacking the device, and the basic settings for initial installation

  Quick Start Guide (AX36S-Q001X)

- Determining the hardware functionality requirements, and handling the hardware

  AX3600S/AX2400S Hardware Instruction Manual (AX36S-H001X)

- Understanding the software functionality, configuration settings, and the use of operation commands

  Configuration Guide Vol. 1 (AX24S-S001X)

  Vol. 2 (AX24S-S002X)

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

  Configuration Command Reference (AX24S-S003X)

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

  Operation Command Reference (AX24S-S004X)

- Understanding messages and logs

  Message Log Reference (AX24S-S005X)

- Understanding MIBs

  MIB Reference (AX24S-S006X)

- How to troubleshoot a problem that occurs

  Troubleshooting Guide (AX36S-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
BCU	Basic Control Unit
BGP	Border Gateway Protocol
BGP4	Border Gateway Protocol - version 4
BGP4+	Multiprotocol Extensions for Border Gateway Protocol - version 4
bit/s	bits per second (can also appear as bps)
BPDU	Bridge Protocol Data Unit
BRI	Basic Rate Interface
BSU	Basic Switching Unit
CC	Continuity Check
CDP	Cisco Discovery Protocol
CFM	Connectivity Fault Management
CIDR	Classless Inter-Domain Routing
CIR	Committed Information Rate
CIST	Common and Internal Spanning Tree
CLNP	ConnectionLess Network Protocol
CLNS	ConnectionLess Network System
CONS	Connection Oriented Network System
CRC	Cyclic Redundancy Check
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSNP	Complete Sequence Numbers PDU
CST	Common Spanning Tree
CSU	Control and Switching Unit
DA	Destination Address
DC	Direct Current
DCE	Data Circuit terminating Equipment
DHCP	Dynamic Host Configuration Protocol
DIS	Draft International Standard/Designated Intermediate System
DNS	Domain Name System
DR	Designated Router
DSAP	Destination Service Access Point
DSCP	Differentiated Services Code Point
DTE	Data Terminal Equipment
DVMRP	Distance Vector Multicast Routing Protocol
E-Mail	Electronic Mail
EAP	Extensible Authentication Protocol
EAPOL	EAP Over LAN
EFM	Ethernet in the First Mile
ES	End System
FAN	Fan Unit
FCS	Frame Check Sequence
FDB	Filtering DataBase
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
LLPQ	Low Latency Priority Queueing
LLQ+3WFQ	Low Latency Queueing + 3 Weighted Fair Queueing
LLRLQ	Low Latency Rate Limited Queueing
LSP	Label Switched Path
LSP	Link State PDU
LSR	Label Switched Router
MA	Maintenance Association
MAC	Media Access Control
MC	Memory Card
MD5	Message Digest 5
MDI	Medium Dependent Interface
MDI-X	Medium Dependent Interface crossover
MEP	Maintenance association End Point
MIB	Management Information Base
MIP	Maintenance domain Intermediate Point
MRU	Maximum Receive Unit
MSTI	Multiple Spanning Tree Instance
MSTP	Multiple Spanning Tree Protocol
MSU	Management and Switching Unit
MTU	Maximum Transfer Unit
NAK	Not AcKnowledge
NAS	Network Access Server
NAT	Network Address Translation
NCP	Network Control Protocol
NDP	Neighbor Discovery Protocol
NET	Network Entity Title
NIF	Network Interface
NLA ID	Next-Level Aggregation Identifier
NPDU	Network Protocol Data Unit
NSAP	Network Service Access Point
NSSA	Not So Stubby Area
NTP	Network Time Protocol
OADP	Octpower Auto Discovery Protocol
OAM	Operations,Administration,and Maintenance
OSPF	Open Shortest Path First
OUI	Organizationally Unique Identifier
packet/s	packets per second (can also appear as pps)
PAD	PADding
PAE	Port Access Entity
PC	Personal Computer
PCI	Protocol Control Information
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PID	Protocol IDentifier
PIM	Protocol Independent Multicast
PIM-DM	Protocol Independent Multicast-Dense Mode
PIM-SM	Protocol Independent Multicast-Sparse Mode
PIM-SSM	Protocol Independent Multicast-Source Specific Multicast
PoE	Power over Ethernet
PRI	Primary Rate Interface
PS	Power Supply
PSNP	Partial Sequence Numbers PDU
PSP	Packet Switching Processor
QoS	Quality of Service
QSFP+	Quad Small Form factor Pluggable Plus

RA	Router Advertisement
RADIUS	Remote Authentication Dial In User Service
RDI	Remote Defect Indication
REJ	REJect
RFC	Request For Comments
RGQ	Rate Guaranteed Queueing
RIP	Routing Information Protocol
RIPng	Routing Information Protocol next generation
RMON	Remote Network Monitoring MIB
RPF	Reverse Path Forwarding
RQ	ReQuest
RSTP	Rapid Spanning Tree Protocol
SA	Source Address
SD	Secure Digital
SDH	Synchronous Digital Hierarchy
SDU	Service Data Unit
SEL	NSAP SELector
SFD	Start Frame Delimiter
SFP	Small Form factor Pluggable
SFP+	Enhanced Small Form factor Pluggable
SMTP	Simple Mail Transfer Protocol
SNAP	Sub-Network Access Protocol
SNMP	Simple Network Management Protocol
SNP	Sequence Numbers PDU
SNPA	Subnetwork Point of Attachment
SOP	System Operational Panel
SPF	Shortest Path First
SSAP	Source Service Access Point
STP	Spanning Tree Protocol
TA	Terminal Adapter
TACACS+	Terminal Access Controller Access Control System Plus
TCP/IP	Transmission Control Protocol/Internet Protocol
TLA ID	Top-Level Aggregation Identifier
TLV	Type, Length, and Value
TOS	Type Of Service
TPID	Tag Protocol Identifier
TTL	Time To Live
UDLD	Uni-Directional Link Detection
UDP	User Datagram Protocol
UPC	Usage Parameter Control
UPC-RED	Usage Parameter Control - Random Early Detection
uRPF	unicast Reverse Path Forwarding
VAA	VLAN Access Agent
VLAN	Virtual LAN
VPN	Virtual Private Network
VRF	Virtual Routing and Forwarding/Virtual Routing and Forwarding Instance
VRRP	Virtual Router Redundancy Protocol
WAN	Wide Area Network
WDM	Wavelength Division Multiplexing
WFQ	Weighted Fair Queueing
WGQ	Weighted Guaranteed Queueing
WRED	Weighted Random Early Detection
WS	Work Station
WWW	World-Wide Web
XFP	10 gigabit small Form factor Pluggable

Conventions: The terms "Switch" and "switch"

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

AX6700S, AX6600S, and AX6300S series switches

AX3800S and AX3600S series switches

AX2400S 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.

Conventions: KB, MB, GB, and TB

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

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A.1 Detailed display contents of the "show tech-support" command 206

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Safety Information [AX6700S]

Using AX6700S series switches correctly and safely

- This guide provides important information for ensuring safe use of AX6700S series switches. Please read this guide completely before using the Switch.
- Keep this guide handy after finishing it, so that it is available for later reference.
- Operate the Switch according to the instructions and procedures provided in this guide.
- Heed all warnings and cautions on the Switch in this guide. Failure to do so could result in injury or damage to the Switch.

Caution indications

These indications are intended to ensure safe and correct use of the Switch and to prevent serious injury, and equipment and property damage. Make sure you fully understand the meaning of the indications before continuing with the main body of this manual.

⚠WARNING

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in death or serious injury to yourself and others.

⚠CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in injury to yourself and others.

CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious damage to the Switch or nearby property.

NOTE

Information preceded by this indication is supplementary information that, if ignored, will not result in physical injury or serious damage to the Switch.

Unauthorized operations

Do not attempt to perform any operations that are not described in this guide.

In the event of a Switch problem, perform one of the following operations, and then contact maintenance personnel.

- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF.

Using common sense

The warnings and cautions provided on the Switch and in this guide have been selected after careful consideration.

Nevertheless, there is always the possibility of the unexpected occurring. Therefore, while using a Switch, stay alert and use common sense in addition to following all instructions.

⚠WARNING

If anything seems wrong, immediately turn off the power.

- If smoke or an unusual smell is emanating from the Switch, or if liquid is spilled into the Switch or a foreign object falls into the Switch, immediately turn off Switch power as described below. Continuing operation could result in fire or electric shock.
- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF. This is required for terminal connections.

Do not place the Switch in an unstable location.

- When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in serious injury to yourself and others.

Do not remove the Switch cover.

- Do not remove the Switch cover. Doing so could result in electric shock.

Do not allow any foreign objects to get into the Switch.

- Do not insert or drop any foreign objects, such as anything metallic or flammable, through the Switch's ventilation slots. Doing so could result in fire or electric shock.

Do not modify the Switch.

- Do not modify the Switch. Doing so could result in fire or electric shock.

Do not subject the Switch to shocks.

- In the event that the Switch is dropped or any of its components are damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Discontinue using the cable to avoid the risk of fire or electric shock.

Do not place any objects on the Switch.

- Do not place any metallic object such as a small pin or a paper clip or any container with a liquid, such as a vase or a flowerpot, on the Switch. Liquid or metallic objects falling into the Switch could result in fire or electric shock.

Use the Switch only with the indicated power supply.

- Do not use the Switch at any voltage other than the indicated voltage. Doing so could result in fire or electric shock.

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker.

- Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

Ground the Switch.

- Up to 3.5 mA of leakage current flows through this Switch. When connecting the Switch to an AC power supply, always use a grounded power outlet for the switch. Using the

switch without grounding could result in electric shock or failures due to electrical noise.

- When the Switch is connected to a DC power supply unit, always connect the ground terminal for proper grounding. Using the switch without grounding could result in electric shock or failures due to electrical noise.

Systemize the power supply into 2 systems

- When setting up redundant power by connecting the Switch to a power supply greater than AC230V, systemize the power supply into 2 systems so power can be supplied from each system.
- When the power supplied from one system causes a maximum of 5 mA of leakage current per device.

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel.

- Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. Terminal connections are required for connection of the DC power cable to the power facility. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable.

- Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker set to ON could result in an electric shock.

Place an insulation cover over the 0 V and -48 V terminals of DC power cables.

- When using a DC power cable, place an insulation cover over the 0 V and -48 V terminals. Using the terminals without an insulation cover could result in electric shock.

When using a DC power supply unit, do not use the terminal board with its cover removed.

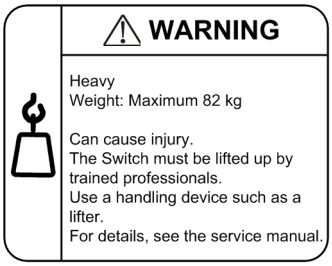
- When using a DC power supply unit, place a cover over the terminal board after connecting the DC power cable. Using the terminal board without a cover could result in electric shock.

Do not touch the voltage-measuring terminals.

- A power supply unit has voltage-measuring terminals. Do not use the terminals because they are used for a factory inspection before shipment. In addition, do not insert anything with a sharp point, such as a pin or paper clip, into the voltage-measuring terminals. Doing so could result in fire or electric shock.

Installing and carrying the switch must be performed by trained personnel or a professional carrier.

- The maximum weight of the switch is 82 kg. Installing and carrying the switch must be performed by trained personnel or a professional carrier. If anyone other than those mentioned above performs these tasks, the switch might fall, resulting in serious injury. Use a handling device such as a hand lifter when installing or carrying the switch. Carrying the switch without using a handling device might cause the switch to fall, resulting in serious injury. Note that the following label is attached to the Switch.



Handle power cables carefully.

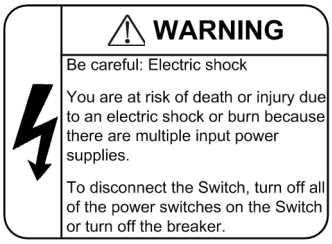
- Do not place anything heavy on a power cable. Do not pull, bend, or process a cable. Doing so could damage the cable, resulting in fire or electric shock. If the power cable is covered by a carpet, it is easy to forget that the cable is there and to place something heavy on it.
- Use the supplied or a designated power cable. Using another cable could result in fire or electric shock. In addition, do not use the supplied cable with other devices. Doing so could result in a fire or electric shock.
- If the power cable is damaged so that the wires underneath the covering are visible or cut, stop using it, and ask maintenance personnel to replace it. Discontinue using the cable to avoid the risk of fire or electric shock.
- Make sure the power plug is free of dust, and insert the plug completely up to the base of the prongs to prevent any looseness. Using a power plug with dust on it or one that is imperfectly connected could result in fire or electric shock.

Do not overload the power outlet.

- Do not overload the power outlet by connecting multiple power plugs to the same outlet. Overloading the outlet could result in fire or the circuit breaker tripping due to excessive power used. This might affect other equipment.

To turn off the power, turn off all power switches of the Switch or the breaker.

- The Switch has multiple input power supplies. To turn off the power, turn off all power switches of the Switch (if the Switch has an AC power supply unit) or the breaker (if the Switch has a DC power supply unit). Note that the following label is attached to the Switch.



Adding or replacing a module must be performed by a trained technician or maintenance personnel.

- Adding or replacing optional modules must be performed by a trained technician or maintenance personnel. Adding or replacing a power supply unit involves connecting and disconnecting the power cable. If anyone other than those mentioned above performs these tasks incorrectly, a fire, electric shock, or failure could result. In addition, using optional modules incorrectly could result in injury or Switch malfunction.

When pressing the button of the basic control unit, do not use anything with a fragile tip, or anything that might become caught in the switch, such as a pin or paper clip.

- When pressing the button on the front panel of the basic control unit, do not use anything with a fragile tip, or anything that might become caught in the switch, such as a pin or paper clip. Doing so could result in fire or electric shock.

Disconnect the power cable before adding or replacing a power supply unit.

- When adding or replacing a power supply unit, disconnect the power cable from the power supply unit to be replaced. If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. Because of this, if you add or replace a power supply unit with the power cable connected, a fire or electric shock could result.

Do not use an air duster near a flame.

- When cleaning the optical connectors, do not use an air duster that contains flammable gas near a flame. Doing so could result in a fire.

⚠CAUTION

Do not install the Switch in a dusty or humid location.

- Do not install the Switch in a dusty or humid location. Doing so could result in fire or electric shock.
- Condensation might form on the surfaces and the inside of the Switch if it is moved from a cold location to a warm location. Using the Switch in this condition could result in fire or electric shock. After moving the Switch between two locations with a large temperature variation, let the Switch stand a few hours before using it.

Do not stack Switches on top of one another.

- Do not stack Switches on top of one another. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

Do not step on the Switch, lean against it, or place anything on it.

- Do not step on the Switch, lean against it, or place anything on it. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

When mounting the switch in a rack, use guide rails or a shelf.

- Rack mounting brackets of the Switch are for securing the Switch to the rack, not for supporting the weight of the Switch. Use guide rails or a shelf. Note that you need to use the guide rails or shelves that are supplied with the rack and that can support the weight of the switch (when all optional modules are mounted).

Do not obstruct the ventilation slots.

- Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in a fire. Maintain a space of at least 70 mm around the ventilation slots.

Do not allow hair or objects near the ventilation slots.

- Cooling fan units are mounted in the Switch. Do not allow anything near the ventilation slots. Doing so causes heat to accumulate inside the Switch and could cause a failure. Do not allow hair or other objects near the ventilation slots. They might be sucked into the Switch, resulting in injury.

When moving the Switch, do not hold the handle of an optional module.

- When moving the Switch, do not hold the handle of a fan unit or power supply unit. The handle might come off, resulting in the device falling and possibly causing injury. Moreover, the fan unit or power supply unit might become damaged, resulting in a fire or electric shock.

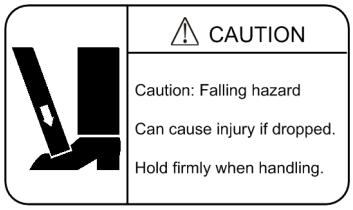
When moving a Switch, unplug all cables.

- Before moving a Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become deformed, or might damage the Switch, resulting in fire or electric shock.

Do not drop optional modules.

- Handle the optional modules with care to avoid dropping them. Dropping them might cause injury.
- A DC power supply unit weighs 5.6 kg and is 163 mm long. When removing a power

supply unit from a Switch, hold the power supply unit tightly. Pulling a power supply unit carelessly from a Switch might cause the power supply unit to fall, resulting in injury. The following label is attached to a DC power supply unit.



Do not touch the inside of the Switch with your hands.

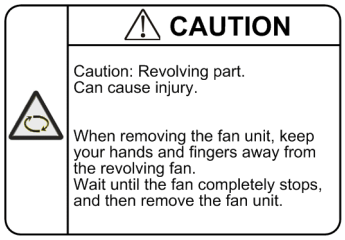
- Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

Be careful of heat when removing a basic control unit or network interface unit.

- Some components installed on a basic control unit or network interface unit might be hot. Do not touch the installed components. Doing so could result in burns.

When removing a fan unit, do not put your hands near the rotating fan.

- The fan might be rotating just after it is removed. Do not put hands or fingers near the fan while it is rotating. Doing so could result in injury. The following label is attached to a fan unit.



Handle the power cable carefully.

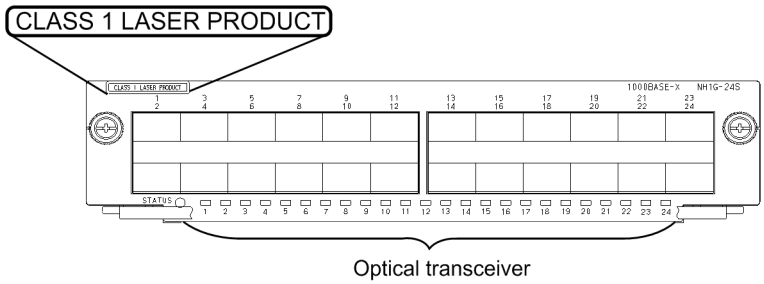
- Do not place the power cable near a heat-generating apparatus. The heat could melt the cable coating, resulting in fire or electric shock.
- When connecting or disconnecting the power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.

Do not touch the Switch directly if you have a metal allergy.

- The Switch is coated with zinc, nickel, gold, and other elements. Do not touch the Switch directly if you have an allergic reaction to these metallic elements. Doing so might cause eczema or skin irritation.

Avoid looking directly at laser beams.

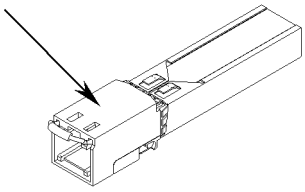
- Network interface units with the following label attached use laser beams. Never look directly into the optical transceiver.



Do not touch the SFP-T during operation and just after operation stops.

- During operation (when a link is established), the temperature of the SFP-T can rise to 65?C. Do not touch the device while it is operating or just after it stops. Doing so could result in burns.

Caution: Hot
(During operation, all sides are very hot.)



- When you remove the SFP-T, use the following procedure. Failure to do so could result in burns.

1. To remove the device when the Switch is turned on, execute the `inactivate` command, and then wait five minutes before removing the device.
2. To remove the device after turning off the Switch, turn off the Switch, wait five minutes, and then remove the device.

- The following label is attached to the SFP-T.

Lithium battery

- The Switch has a lithium battery for the real-time clock. Incorrect handling of the lithium battery could cause the battery to heat up, explode, or catch fire, resulting in injury or a fire. Do not remove the battery from the Switch, disassemble it, heat it to 100C or higher, incinerate it, or immerse it in water.

Cleaning

- Remove dust on and around the Switch regularly. In addition to causing the Switch to stop, accumulated dust could result in a fire or electric shock.

CAUTION

Do not turn off the power during a software update (while the ppupdate command is executing).

- The Switch automatically restarts after the `ppupdate` command is executed. Do not turn off the power while the switch is restarting (wait until the STATUS LED of the basic control unit changes from blinking green to solid green). Turning off the power could result in a switch fault.

Handle memory cards carefully.

- When inserting a memory card, do not push the card too strongly or flick it with your finger. When removing a memory card, do not forcibly pull out the card if it is locked. Doing so might damage the connector of the memory card slot.
- When moving the Switch, remove memory cards. If a memory card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

When the ACC LED is lit, do not remove the memory card or turn off the power.

- When the ACC LED on the basic control unit is lit, the memory card is being accessed. When a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card. In addition, some commands require a certain amount of time after being entered to finish accessing the card. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Do not attach any labels to a transceiver.

- A label attached to the transceiver indicates that the transceiver is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or the mechanism that prevents the transceiver from coming loose from the cage. Attaching a label to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the network interface units.

Ensure that voltage drop does not occur in the power facility due to inrush current.

- Turning on the Switch causes inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drop could affect not only the Switch, but also other devices connected to the same power facility.

Turn off the power before connecting or disconnecting a power cable.

- Before connecting or disconnecting a power cable, turn off the power of the power supply unit of the cable that is to be connected or disconnected.

When replacing a fan unit with the Switch turned on, observe the time limit.

- When replacing a fan unit with the Switch turned on, you must remove and replace the unit within one minute. If this time limit is exceeded, the temperature inside the Switch rises. This might affect other units.

When carrying or packing a Switch and its optional modules, wear a wrist strap to protect against static electricity.

- Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

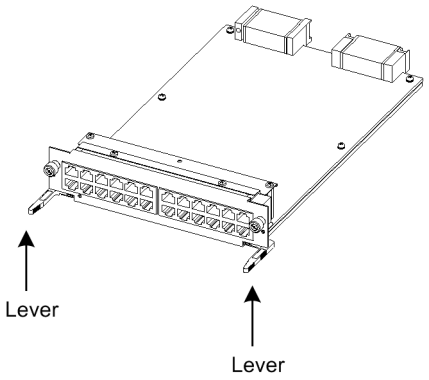
When removing optional modules, attach blank panels.

- When removing optional modules, attach blank panels. If you use the Switch without attaching a blank panel, airflow through the Switch cannot be maintained. If airflow is not maintained, the temperature inside the Switch rises, resulting in a failure.

Be careful when installing an optional module.

- When installing an optional module, follow the procedures below. Not doing so could result in a failure.

1. Open the levers as shown in the figure.



2. Hold the levers, and push the optional module slowly until the levers touch the Switch.
3. Insert the optional module all the way by using the levers. When moving the levers, move them slowly (by taking at least one second) without using excessive force.

Before removing an optional module, loosen the screws completely.

- The levers are used to remove a basic control unit, basic switching unit, or network interface unit. If the screws are not loosened completely, the optional module might be damaged when the levers are opened.

When carrying and packing optional modules, handle them carefully.

- Do not touch the installed components and the solder surface when carrying or packing an optional module, such as a basic control unit, basic switching unit, network interface unit, memory card, transceiver, or power supply unit. Also, when storing an optional module, use an antistatic bag.

Do not place a Switch in a high-temperature location.

- Do not place a Switch in direct sunlight or near a heater or other heat-generating apparatus.

Do not use a TV or a radio near a Switch.

- Do not use a TV or a radio near a Switch. Placing a Switch near a TV or a radio could affect both devices. If you hear noise on the TV or radio, do the following:

1. Place the Switch as far away as possible from the TV or radio.
2. Adjust the orientation of the TV or radio antenna.
3. Use separate outlets.

Do not place a Switch where it will be exposed to hydrogen sulfide or salt.

- Placing a Switch in an area where sulfides are present, such as a hot-springs area, or in an area with salty air, such as along a coast, could shorten the life of the Switch.

Use care when handling an air duster.

- Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.
- Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

Use care when handling an optical connector cleaner.

- Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.
- Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.
- Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.
- Rotate the optical connector cleaner (stick) clockwise only. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

Maintenance

- Clean any dirty areas on the exterior of the Switch with a clean, dry cloth, or a cloth damp with (but not soaked with) water or a neutral detergent. Do not use volatile organic solutions (such as benzene or paint thinner), chemicals, chemically treated cloths, or pesticides because these substances might deform, discolor, or damage the switch.

If the Switch will not be used for a long time

- For safety reasons, unplug the power cable from the outlet if the Switch will not be used for a long time. If you are using a DC power supply unit, turn off the circuit breaker at the supply of power.

Disposal of a Switch

- When disposing of a Switch, you should either follow local ordinances or regulations, or contact your local waste disposal and treatment facility.

Safety Information [AX6600S]

Using AX6600S series switches correctly and safely

- This guide provides important information for ensuring safe use of AX6600S series switches. Please read this guide completely before using the Switch.
- Keep this guide handy after finishing it, so that it is available for later reference.
- Operate the Switch according to the instructions and procedures provided in this guide.
- Heed all warnings and cautions on the Switch in this guide. Failure to do so could result in injury or damage to the Switch.

Caution indications

These indications are intended to ensure safe and correct use of the Switch and to prevent serious injury, and equipment and property damage. Make sure you fully understand the meaning of the indications before continuing with the main body of this manual.

⚠WARNING

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in death or serious injury to yourself and others.

⚠CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in injury to yourself and others.

CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious damage to the Switch or nearby property.

NOTE

Information preceded by this indication is supplementary information that, if ignored, will not result in physical injury or serious damage to the Switch.

Unauthorized operations

Do not attempt to perform any operations that are not described in this guide.

In the event of a Switch problem, perform one of the following operations, and then contact maintenance personnel.

- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF.

Using common sense

The warnings and cautions provided on the Switch and in this guide have been selected after careful consideration.

Nevertheless, there is always the possibility of the unexpected occurring. Therefore, while using a Switch, stay alert and use common sense in addition to following all instructions.

⚠WARNING

If anything seems wrong, immediately turn off the power.

- If smoke or an unusual smell is emanating from the Switch, or if liquid is spilled into the Switch or a foreign object falls into the Switch, immediately turn off Switch power as described below. Continuing operation could result in fire or electric shock.
- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF. This is required for terminal connections.

Do not place the Switch in an unstable location.

- When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in serious injury to yourself and others.

Do not remove the Switch cover.

- Do not remove the Switch cover. Doing so could result in electric shock.

Do not allow any foreign objects to get into the Switch.

- Do not insert or drop any foreign objects, such as anything metallic or flammable, through the Switch's ventilation slots. Doing so could result in fire or electric shock.

Do not modify the Switch.

- Do not modify the Switch. Doing so could result in fire or electric shock.

Do not subject the Switch to shocks.

- In the event that the Switch is dropped or any of its components are damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Discontinue using the cable to avoid the risk of fire or electric shock.

Do not place any objects on the Switch.

- Do not place any metallic object such as a small pin or a paper clip or any container with a liquid, such as a vase or a flowerpot, on the Switch. Liquid or metallic objects falling into the Switch could result in fire or electric shock.

Use the Switch only with the indicated power supply.

- Do not use the Switch at any voltage other than the indicated voltage. Doing so could result in fire or electric shock.

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker.

- Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

Ground the Switch.

- Each Switch has at most 3.5 mA of leakage current. When the Switch is connected to an AC power supply unit, always use a grounded power outlet. Using the Switch without

grounding could result in electric shock or failures due to electrical noise.

- When the Switch is connected to a DC power supply unit, always connect the ground terminal for proper grounding. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel.

- Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. Terminal connections are required for connection of the DC power cable to the power facility. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable.

- Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker set to ON could result in an electric shock.

Place an insulation cover over the 0 V and -48 V terminals of DC power cables.

- When using a DC power cable, place an insulation cover over the 0 V and -48 V terminals. Using the terminals without an insulation cover could result in electric shock.

When using a DC power supply unit, do not use the terminal board with its cover removed.

- When using a DC power supply unit, place a cover over the terminal board after connecting the DC power cable. Using the terminal board without a cover could result in electric shock.

Do not touch the voltage-measuring terminals.

- A power supply unit has voltage-measuring terminals. This terminal is used for a factory inspection before shipment. Because of this, do not use this terminal. In addition, do not insert anything with a sharp point, such as a pin or paper clip, into the voltage-measuring terminals. Doing so could result in fire or electric shock.

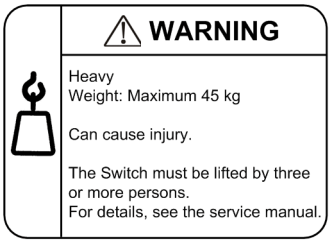
Installing and carrying a Switch must be performed by at least three people.

- The weight of the Switches is as shown in the table below. Installing and carrying a Switch must be performed by at least three people. If these tasks are performed by fewer than three people, the Switch might fall, resulting in serious injury.

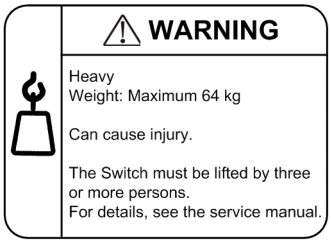
  Number of people required to carry a Switch

Model	Weight	Number of people required
AX6604S	45 kg	Three or more people
AX6608S	64 kg	

Note that the following label is attached to the Switch.



AX6604S



AX6608S

Handle power cables carefully.

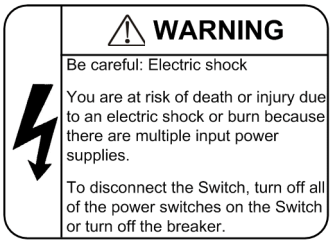
- Do not place anything heavy on a power cable. Do not pull, bend, or process a cable. Doing so could damage the cable, resulting in fire or electric shock. If the power cable is covered by a carpet, it is easy to forget that the cable is there and to place something heavy on it.
- Use the supplied or a designated power cable. Using another cable could result in fire or electric shock. In addition, do not use the supplied cable with other devices. Doing so could result in a fire or electric shock.
- If the power cable is damaged so that the wires underneath the covering are visible or cut, stop using it, and ask maintenance personnel to replace it. Discontinue using the cable to avoid the risk of fire or electric shock.
- Make sure the power plug is free of dust, and insert the plug completely up to the base of the prongs to prevent any looseness. Using a power plug with dust on it or one that is imperfectly connected could result in fire or electric shock.

Do not overload the power outlet.

- Do not overload the power outlet by connecting multiple power plugs to the same outlet. Overloading the outlet could result in fire or the circuit breaker tripping due to excessive power used. This might affect other equipment.

To turn off the power, turn off all power switches of the Switch or the breaker.

- The Switch has multiple input power supplies. To turn off the power, turn off all power switches of the Switch (if the Switch has an AC power supply unit) or the breaker (if the Switch has a DC power supply unit). Note that the following label is attached to the Switch.



Adding or replacing a module must be performed by a trained technician or maintenance personnel.

- Adding or replacing optional modules must be performed by a trained technician or maintenance personnel. Adding or replacing a power supply unit involves connecting and disconnecting the power cable. If anyone other than those mentioned above performs these tasks incorrectly, a fire, electric shock, or failure could result. In addition, using optional modules incorrectly could result in injury or Switch malfunction.

When pressing the button of the control and switching unit, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip.

- When pressing the button on the front panel of the control and switching unit, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in fire or electric shock.

Disconnect the power cable before adding or replacing a power supply unit.

- When adding or replacing a power supply unit, disconnect the power cable from the power supply unit to be replaced. If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. Because of this, if you add or replace a power supply unit with the power cable connected, a fire or electric shock could result.

Do not use an air duster near a flame.

- When cleaning the optical connectors, do not use an air duster that contains flammable gas near a flame. Doing so could result in a fire.

⚠CAUTION

Do not install the Switch in a dusty or humid location.

- Do not install the Switch in a dusty or humid location. Doing so could result in fire or electric shock.
- Condensation might form on the surfaces and the inside of the Switch if it is moved from a cold location to a warm location. Using the Switch in this condition could result in fire or electric shock. After moving the Switch between two locations with a large temperature variation, let the Switch stand a few hours before using it.

Do not stack Switches on top of one another.

- Do not stack Switches on top of one another. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

Do not step on the Switch, lean against it, or place anything on it.

- Do not step on the Switch, lean against it, or place anything on it. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

When mounting a Switch in a rack, use brackets that support the weight of the Switch.

- Rack mounting brackets of the Switch are for securing the Switch to the rack, not for supporting the weight of the Switch. Use one of the following parts:

1. AX6604S: Guide rails, a shelf, or support brackets
2. AX6608S: Guide rails or a shelf

If you use guide rails or a shelf, use those that are supplied with the rack and that can support the weight of the Switch (when all optional modules are mounted).

Use support brackets only for the AX6604S.

- Support brackets are only for the AX6604S. Do not use support brackets for any switches other than the AX6604S. If support brackets are used for a switch other than the AX6604S, the switch might fall, resulting in injury.

Be careful when using support brackets.

- When mounting the Switch in a rack by using support brackets, position the Switch horizontally while supporting the front and back of the Switch, and continue to support it until the screws are tightened. If the Switch is not level, the Switch might fall, resulting in injury. In addition, other devices mounted on the same rack might be damaged.
- When mounting the Switch in a rack by using support brackets, the weight of the Switch is supported by the rack mounting brackets and support brackets only. Be sure to tighten the screws of the rack mounting brackets and support brackets firmly.

Do not obstruct the ventilation slots.

- Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in a fire. Maintain a space of at least 70 mm around the ventilation slots.

Do not allow hair or objects near the ventilation slots.

- Cooling fan units are mounted in the Switch. Do not allow anything near the ventilation slots. Doing so causes heat to accumulate inside the Switch and could cause a failure. Do

not allow hair or other objects near the ventilation slots. They might be sucked into the Switch, resulting in injury.

When moving the Switch, do not hold the handle of an optional module.

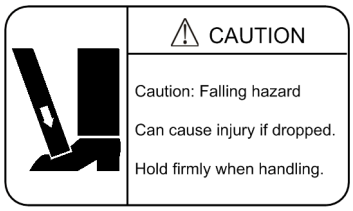
- When moving the Switch, do not hold the handle of a fan unit or power supply unit. The handle might come off, resulting in the device falling and possibly causing injury. Moreover, the fan unit or power supply unit might become damaged, resulting in a fire or electric shock.

When moving a Switch, unplug all cables.

- Before moving a Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become deformed, or might damage the Switch, resulting in fire or electric shock.

Do not drop optional modules.

- Handle the optional modules with care to avoid dropping them. Dropping them might cause injury.
- A DC power supply unit weighs 5.6 kg and is 163 mm long. When removing a power supply unit from a Switch, hold the power supply unit tightly. Pulling a power supply unit carelessly from a Switch might cause the power supply unit to fall, resulting in injury. The following label is attached to a DC power supply unit.



Do not touch the inside of the Switch with your hands.

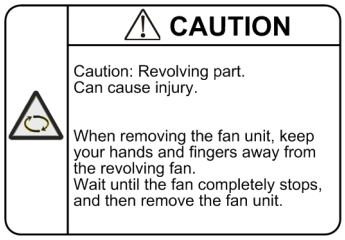
- Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

Be careful of heat when removing a control and switching unit or network interface unit.

- Some components installed on a control and switching unit or network interface unit might be hot. Do not touch the installed components. Doing so could result in burns.

When removing a fan unit, do not put your hands near the rotating fan.

- The fan might be rotating just after it is removed. Do not put hands or fingers near the fan while it is rotating. Doing so could result in injury. The following label is attached to a fan unit.



Handle the power cable carefully.

- Do not place the power cable near a heat-generating apparatus. The heat could melt the

cable coating, resulting in fire or electric shock.

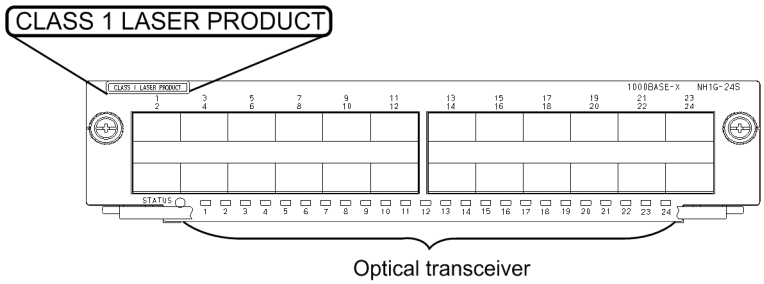
- When connecting or disconnecting the power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.

Do not touch the Switch directly if you have a metal allergy.

- The Switch is coated with zinc, nickel, gold, and other elements. Do not touch the Switch directly if you have an allergic reaction to these metallic elements. Doing so might cause eczema or skin irritation.

Avoid looking directly at laser beams.

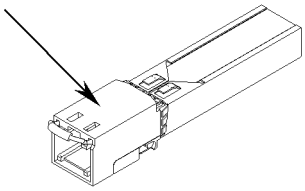
- Network interface units with the following label attached use laser beams. Never look directly into the optical transceiver.



Do not touch the SFP-T during operation and just after operation stops.

- During operation (when a link is established), the temperature of the SFP-T can rise to 65C. Do not touch the device while it is operating or just after it stops. Doing so could result in burns.

Caution: Hot
(During operation, all sides are very hot.)



- When you remove the SFP-T, use the following procedure. Failure to do so could result in burns.

1. To remove the device when the Switch is turned on, execute the `inactivate` command, and then wait five minutes before removing the device.
2. To remove the device after turning off the Switch, turn off the Switch, wait five minutes, and then remove the device.

- The following label is attached to the SFP-T.

Lithium battery

- The Switch has a lithium battery for the real-time clock. Incorrect handling of the lithium battery could cause the battery to heat up, explode, or catch fire, resulting in injury or a fire. Do not remove the battery from the Switch, disassemble it, heat it to 100C or higher,

incinerate it, or immerse it in water.

Cleaning

- Remove dust on and around the Switch regularly. In addition to causing the Switch to stop, accumulated dust could result in a fire or electric shock.

CAUTION

Do not turn off the power during a software update (while the ppupdate command is executing).

- The Switch automatically restarts after the `ppupdate` command is executed. Do not turn off the power while the Switch is restarting (wait until the STATUS LED of the control and switching unit changes from blinking green to solid green). Turning off the power could result in a switch fault.

Handle memory cards carefully.

- When inserting a memory card, do not push the card too strongly or flick it with your finger. When removing a memory card, do not forcibly pull out the card if it is locked. Doing so might damage the connector of the memory card slot.
- When moving the Switch, remove memory cards. If a memory card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

When the ACC LED is lit, do not remove the memory card or turn off the power.

- When the ACC LED of the control and switching unit is lit, the memory card is being accessed. When a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card. In addition, some commands require a certain amount of time after being entered to finish accessing the card. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Do not attach any labels to a transceiver.

- A label attached to the transceiver indicates that the transceiver is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or the mechanism that prevents the transceiver from coming loose from the cage. Attaching a label to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the network interface units.

Ensure that voltage drop does not occur in the power facility due to inrush current.

- Turning on the Switch causes inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drop could affect not only the Switch, but also other devices connected to the same power facility.

Turn off the power before connecting or disconnecting a power cable.

- Before connecting or disconnecting a power cable, turn off the power of the power supply unit of the cable that is to be connected or disconnected.

When replacing a fan unit with the Switch turned on, observe the time limit.

- When replacing a fan unit with the Switch turned on, you must remove and replace the unit within one minute. If this time limit is exceeded, the temperature inside the Switch rises. This might affect other units.

When carrying or packing a Switch and its optional modules, wear a wrist strap to protect against static electricity.

- Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

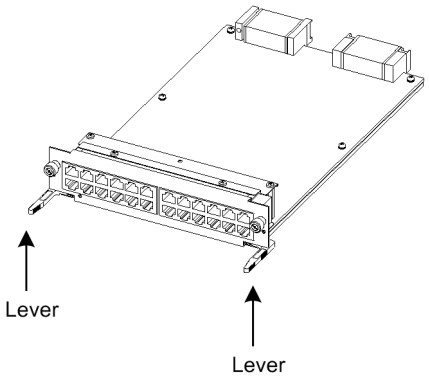
When removing optional modules, attach blank panels.

- When removing optional modules, attach blank panels. If you use the Switch without attaching a blank panel, airflow through the Switch cannot be maintained. If airflow is not maintained, the temperature inside the Switch rises, resulting in a failure.

Be careful when installing an optional module.

- When installing an optional module, follow the procedures below. Not doing so could result in a failure.

1. Open the levers as shown in the figure.



2. Hold the levers, and push the optional module slowly until the levers touch the Switch.
3. Insert the optional module all the way by using the levers. When moving the levers, move them slowly (by taking at least one second) without using excessive force.

Before removing an optional module, loosen the screws completely.

- The levers are used to remove a control and switching unit or network interface unit. If the screws are not loosened completely, the optional module might be damaged when the levers are opened.

When carrying and packing optional modules, handle them carefully.

- Do not touch the installed components and the solder surface when carrying or packing an optional module, such as a control and switching unit, network interface unit, memory card, transceiver, or power supply unit. Also, when storing an optional module, use an antistatic bag.

Do not place a Switch in a high-temperature location.

- Do not place a Switch in direct sunlight or near a heater or other heat-generating apparatus.

Do not use a TV or a radio near a Switch.

- Do not use a TV or a radio near a Switch. Placing a Switch near a TV or a radio could affect both devices. If you hear noise on the TV or radio, do the following:

1. Place the Switch as far away as possible from the TV or radio.
2. Adjust the orientation of the TV or radio antenna.
3. Use separate outlets.

Do not place a Switch where it will be exposed to hydrogen sulfide or salt.

- Placing a Switch in an area where sulfides are present, such as a hot-springs area, or in an area with salty air, such as along a coast, could shorten the life of the Switch.

Use care when handling an air duster.

- Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.
- Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

Use care when handling an optical connector cleaner.

- Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.
- Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.
- Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.
- Rotate the optical connector cleaner (stick) clockwise only. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

Maintenance

- Clean any dirty areas on the exterior of the Switch with a clean, dry cloth, or a cloth damp with (but not soaked with) water or a neutral detergent. Do not use volatile organic solutions (such as benzene or paint thinner), chemicals, chemically treated cloths, or pesticides because these substances might deform, discolor, or damage the switch.

If the Switch will not be used for a long time

- For safety reasons, unplug the power cable from the outlet if the Switch will not be used for a long time. If you are using a DC power supply, turn off the circuit breaker at the supply of power.

Disposal of a Switch

- When disposing of a Switch, you should either follow local ordinances or regulations, or contact your local waste disposal and treatment facility.

Safety Information [AX6300S]

Using AX6300S series switches correctly and safely

- This guide provides important information for ensuring safe use of AX6300S series switches. Please read this guide completely before using the Switch.
- Keep this guide handy after finishing it, so that it is available for later reference.
- Operate the Switch according to the instructions and procedures provided in this guide.
- Heed all warnings and cautions on the Switch in this guide. Failure to do so could result in injury or damage to the Switch.

Caution indications

These indications are intended to ensure safe and correct use of the Switch and to prevent serious injury, and equipment and property damage. Make sure you fully understand the meaning of the indications before continuing with the main body of this manual.

⚠WARNING

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in death or serious injury to yourself and others.

⚠CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in injury to yourself and others.

CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious damage to the Switch or nearby property.

NOTE

Information preceded by this indication is supplementary information that, if ignored, will not result in physical injury or serious damage to the Switch.

Unauthorized operations

Do not attempt to perform any operations that are not described in this guide.

In the event of a Switch problem, perform one of the following operations, and then contact maintenance personnel.

- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF.

Using common sense

The warnings and cautions provided on the Switch and in this guide have been selected after careful consideration.

Nevertheless, there is always the possibility of the unexpected occurring. Therefore, while using a Switch, stay alert and use common sense in addition to following all instructions.

⚠WARNING

If anything seems wrong, immediately turn off the power.

- If smoke or an unusual smell is emanating from the Switch, or if liquid is spilled into the Switch or a foreign object falls into the Switch, immediately turn off Switch power as described below. Continuing operation could result in fire or electric shock.
- If the Switch has an AC power supply unit, turn off the Switch, and then unplug the power cable.
- If the Switch has a DC power supply unit, turn off the Switch, and then set the power supply circuit breaker to OFF. This is required for terminal connections.

Do not place the Switch in an unstable location.

- When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in serious injury to yourself and others.

Do not remove the Switch cover.

- Do not remove the Switch cover. Doing so could result in electric shock.

Do not allow any foreign objects to get into the Switch.

- Do not insert or drop any foreign objects, such as anything metallic or flammable, through the Switch's ventilation slots. Doing so could result in fire or electric shock.

Do not modify the Switch.

- Do not modify the Switch. Doing so could result in fire or electric shock.

Do not subject the Switch to shocks.

- In the event that the Switch is dropped or any of its components are damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Discontinue using the cable to avoid the risk of fire or electric shock.

Do not place any objects on the Switch.

- Do not place any metallic object such as a small pin or a paper clip or any container with a liquid, such as a vase or a flowerpot, on the Switch. Liquid or metallic objects falling into the Switch could result in fire or electric shock.

Use the Switch only with the indicated power supply.

- Do not use the Switch at any voltage other than the indicated voltage. Doing so could result in fire or electric shock.

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker.

- Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

Ground the Switch.

- Each Switch has at most 3.5 mA of leakage current. When the Switch is connected to an AC power supply unit, always use a grounded power outlet. Using the Switch without

grounding could result in electric shock or failures due to electrical noise.

- When the Switch is connected to a DC power supply unit, always connect the ground terminal for proper grounding. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel.

- Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel. Terminal connections are required for connection of the DC power cable to the power facility. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable.

- Set the power supply circuit breaker to OFF before connecting or disconnecting the DC power cable. Connecting or disconnecting the cable with the circuit breaker set to ON could result in an electric shock.

Place an insulation cover over the 0 V and -48 V terminals of DC power cables.

- When using a DC power cable, place an insulation cover over the 0 V and -48 V terminals. Using the terminals without an insulation cover could result in electric shock.

When using a DC power supply unit, do not use the terminal board with its cover removed.

- When using a DC power supply unit, place a cover over the terminal board after connecting the DC power cable. Using the terminal board without a cover could result in electric shock.

Do not touch the voltage-measuring terminals.

- A power supply unit has voltage-measuring terminals. This terminal is used for a factory inspection before shipment. Because of this, do not use this terminal. In addition, do not insert anything with a sharp point, such as a pin or paper clip, into the voltage-measuring terminals. Doing so could result in fire or electric shock.

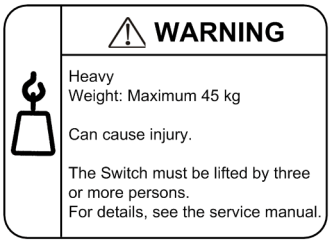
Installing and carrying a Switch must be performed by at least three people.

- The weight of the Switches is as shown in the table below. Installing and carrying a Switch must be performed by at least three people. If these tasks are performed by fewer than three people, the Switch might fall, resulting in serious injury.

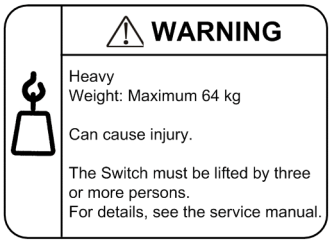
  Number of people required to carry a Switch

Model	Weight	Number of people required
AX6304S	45 kg	Three or more people
AX6308S	64 kg	

Note that the following label is attached to the Switch.



AX6304S



AX6308S

Handle power cables carefully.

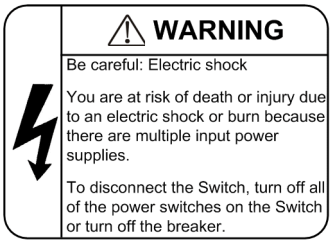
- Do not place anything heavy on a power cable. Do not pull, bend, or process a cable. Doing so could damage the cable, resulting in fire or electric shock. If the power cable is covered by a carpet, it is easy to forget that the cable is there and to place something heavy on it.
- Use the supplied or a designated power cable. Using another cable could result in fire or electric shock. In addition, do not use the supplied cable with other devices. Doing so could result in a fire or electric shock.
- If the power cable is damaged so that the wires underneath the covering are visible or cut, stop using it, and ask maintenance personnel to replace it. Discontinue using the cable to avoid the risk of fire or electric shock.
- Make sure the power plug is free of dust, and insert the plug completely up to the base of the prongs to prevent any looseness. Using a power plug with dust on it or one that is imperfectly connected could result in fire or electric shock.

Do not overload the power outlet.

- Do not overload the power outlet by connecting multiple power plugs to the same outlet. Overloading the outlet could result in fire or the circuit breaker tripping due to excessive power used. This might affect other equipment.

To turn off the power, turn off all power switches of the Switch or the breaker.

- The Switch has multiple input power supplies. To turn off the power, turn off all power switches of the Switch (if the Switch has an AC power supply unit) or the breaker (if the Switch has a DC power supply unit). Note that the following label is attached to the Switch.



Adding or replacing a module must be performed by a trained technician or maintenance personnel.

- Adding or replacing optional modules must be performed by a trained technician or maintenance personnel. Adding or replacing a power supply unit involves connecting and disconnecting the power cable. If anyone other than those mentioned above performs these tasks incorrectly, a fire, electric shock, or failure could result. In addition, using optional modules incorrectly could result in injury or Switch malfunction.

When pressing the button of the management and switching unit, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip.

- When pressing the button on the front panel of the management and switching unit, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in fire or electric shock.

Disconnect the power cable before adding or replacing a power supply unit.

- When adding or replacing a power supply unit, disconnect the power cable from the power supply unit to be replaced. If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. Because of this, if you add or replace a power supply unit with the power cable connected, a fire or electric shock could result.

Do not use an air duster near a flame.

- When cleaning the optical connectors, do not use an air duster that contains flammable gas near a flame. Doing so could result in a fire.

⚠CAUTION

Do not install the Switch in a dusty or humid location.

- Do not install the Switch in a dusty or humid location. Doing so could result in fire or electric shock.
- Condensation might form on the surfaces and the inside of the Switch if it is moved from a cold location to a warm location. Using the Switch in this condition could result in fire or electric shock. After moving the Switch between two locations with a large temperature variation, let the Switch stand a few hours before using it.

Do not stack Switches on top of one another.

- Do not stack Switches on top of one another. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

Do not step on the Switch, lean against it, or place anything on it.

- Do not step on the Switch, lean against it, or place anything on it. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

When mounting a Switch in a rack, use brackets that support the weight of the Switch.

- Rack mounting brackets of the Switch are for securing the Switch to the rack, not for supporting the weight of the Switch. Use one of the following parts:

1. AX6304S: Guide rails, a shelf, or support brackets
2. AX6308S: Guide rails or a shelf

If you use guide rails or a shelf, use those that are supplied with the rack and that can support the weight of the Switch (when all optional modules are mounted).

Use support brackets only for the AX6304S.

- Support brackets are only for the AX6304S. Do not use support brackets for any switches other than the AX6304S. If support brackets are used for a switch other than the AX6304S, the switch might fall, resulting in injury.

Be careful when using support brackets.

- When mounting the Switch in a rack by using support brackets, position the Switch horizontally while supporting the front and back of the Switch, and continue to support it until the screws are tightened. If the Switch is not level, the Switch might fall, resulting in injury. In addition, other devices mounted on the same rack might be damaged.
- When mounting the Switch in a rack by using support brackets, the weight of the Switch is supported by the rack mounting brackets and support brackets only. Be sure to tighten the screws of the rack mounting brackets and support brackets firmly.

Do not obstruct the ventilation slots.

- Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in a fire. Maintain a space of at least 70 mm around the ventilation slots.

Do not allow hair or objects near the ventilation slots.

- Cooling fan units are mounted in the Switch. Do not allow anything near the ventilation slots. Doing so causes heat to accumulate inside the Switch and could cause a failure. Do

not allow hair or other objects near the ventilation slots. They might be sucked into the Switch, resulting in injury.

When moving the Switch, do not hold the handle of an optional module.

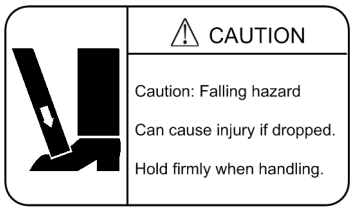
- When moving the Switch, do not hold the handle of a fan unit or power supply unit. The handle might come off, resulting in the device falling and possibly causing injury. Moreover, the fan unit or power supply unit might become damaged, resulting in a fire or electric shock.

When moving a Switch, unplug all cables.

- Before moving a Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become deformed, or might damage the Switch, resulting in fire or electric shock.

Do not drop optional modules.

- Handle the optional modules with care to avoid dropping them. Dropping them might cause injury.
- A DC power supply unit weighs 5.6 kg and is 163 mm long. When removing a power supply unit from a Switch, hold the power supply unit tightly. Pulling a power supply unit carelessly from a Switch might cause the power supply unit to fall, resulting in injury. The following label is attached to a DC power supply unit.



Do not touch the inside of the Switch with your hands.

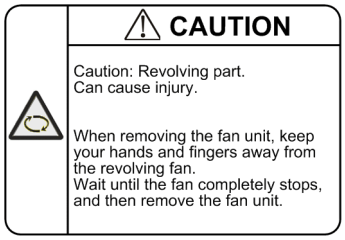
- Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

Be careful of heat when removing a management and switching unit or network interface unit.

- Some components installed on a management and switching unit or network interface unit might be hot. Do not touch the installed components. Doing so could result in burns.

When removing a fan unit, do not put your hands near the rotating fan.

- The fan might be rotating just after it is removed. Do not put hands or fingers near the fan while it is rotating. Doing so could result in injury. The following label is attached to a fan unit.



Handle the power cable carefully.

- Do not place the power cable near a heat-generating apparatus. The heat could melt the

cable coating, resulting in fire or electric shock.

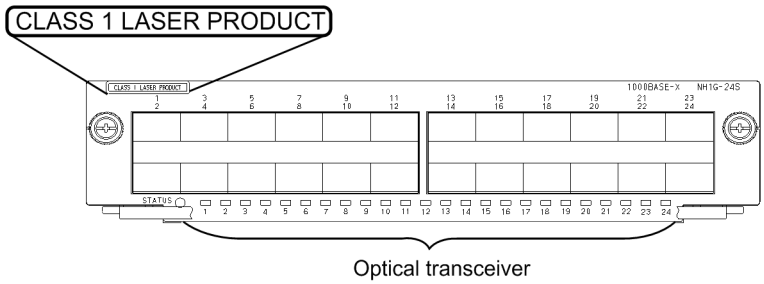
- When connecting or disconnecting the power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.

Do not touch the Switch directly if you have a metal allergy.

- The Switch is coated with zinc, nickel, gold, and other elements. Do not touch the Switch directly if you have an allergic reaction to these metallic elements. Doing so might cause eczema or skin irritation.

Avoid looking directly at laser beams.

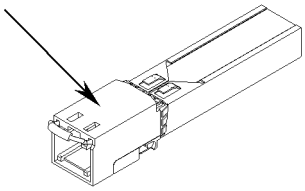
- Network interface units with the following label attached use laser beams. Never look directly into the optical transceiver.



Do not touch the SFP-T during operation and just after operation stops.

- During operation (when a link is established), the temperature of the SFP-T can rise to 65C. Do not touch the device while it is operating or just after it stops. Doing so could result in burns.

Caution: Hot
(During operation, all sides are very hot.)



- When you remove the SFP-T, use the following procedure. Failure to do so could result in burns.

1. To remove the device when the Switch is turned on, execute the `inactivate` command, and then wait five minutes before removing the device.
2. To remove the device after turning off the Switch, turn off the Switch, wait five minutes, and then remove the device.

- The following label is attached to the SFP-T.

Lithium battery

- The Switch has a lithium battery for the real-time clock. Incorrect handling of the lithium battery could cause the battery to heat up, explode, or catch fire, resulting in injury or a fire. Do not remove the battery from the Switch, disassemble it, heat it to 100C or higher,

incinerate it, or immerse it in water.

Cleaning

- Remove dust on and around the Switch regularly. In addition to causing the Switch to stop, accumulated dust could result in a fire or electric shock.

CAUTION

Do not turn off the power during a software update (while the ppupdate command is executing).

- The Switch automatically restarts after the `ppupdate` command is executed. Do not turn off the power while the Switch is restarting (wait until the STATUS LED of the management and switching unit changes from blinking green to solid green). Turning off the power could result in a switch fault.

Handle memory cards carefully.

- When inserting a memory card, do not push the card too strongly or flick it with your finger. When removing a memory card, do not forcibly pull out the card if it is locked. Doing so might damage the connector of the memory card slot.
- When moving the Switch, remove memory cards. If a memory card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

When the ACC LED is lit, do not remove the memory card or turn off the power.

- When the ACC LED of the management and switching unit is lit, the memory card is being accessed. When a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card. In addition, some commands require a certain amount of time after being entered to finish accessing the card. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Do not attach any labels to a transceiver.

- A label attached to the transceiver indicates that the transceiver is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or the mechanism that prevents the transceiver from coming loose from the cage. Attaching a label to a location that interferes with these functions could cause a malfunction in the transceiver or damage to the network interface units.

Ensure that voltage drop does not occur in the power facility due to inrush current.

- Turning on the Switch causes inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drop could affect not only the Switch, but also other devices connected to the same power facility.

Turn off the power before connecting or disconnecting a power cable.

- Before connecting or disconnecting a power cable, turn off the power of the power supply unit of the cable that is to be connected or disconnected.

When replacing a fan unit with the Switch turned on, observe the time limit.

- When replacing a fan unit with the Switch turned on, you must remove and replace the unit within one minute. If this time limit is exceeded, the temperature inside the Switch rises. This might affect other units.

When carrying or packing a Switch and its optional modules, wear a wrist strap to protect against static electricity.

- Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

When removing optional modules, attach blank panels.

- When removing optional modules, attach blank panels. If you use the Switch without attaching a blank panel, airflow through the Switch cannot be maintained. If airflow is not maintained, the temperature inside the Switch rises, resulting in a failure.

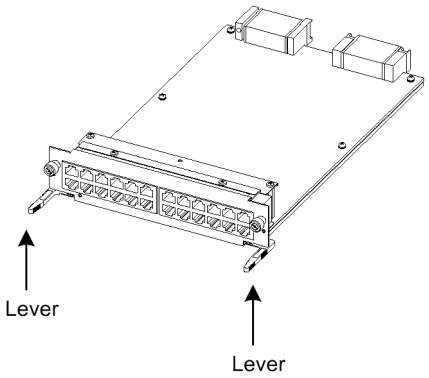
When installing a network interface unit, keep the tray attached.

- When installing a network interface (NIF) unit, keep the tray attached to the Switch. If a NIF is inserted without the tray attached, the NIF will not fit with the connector of the Switch, possibly resulting in damage to both the Switch and the connector of the NIF.

Be careful when installing an optional module.

- When installing an optional module, follow the procedures below. Not doing so could result in a failure.

1. Open the levers as shown in the figure.



2. Hold the levers, and push the optional module slowly until the levers touch the Switch.
3. Insert the optional module all the way by using the levers. When moving the levers, move them slowly (by taking at least one second) without using excessive force.

Before removing an optional module, loosen the screws completely.

- The levers are used when removing a management and switching unit or network interface unit. If the screws are not loosened completely, the optional module might be damaged when the levers are opened.

When carrying and packing optional modules, handle them carefully.

- Do not touch the installed components and the solder surface when carrying or packing an optional module, such as a management and switching unit, network interface unit, memory card, transceiver, or power supply unit. Also, when storing an optional module, use an antistatic bag.

Do not place a Switch in a high-temperature location.

- Do not place a Switch in direct sunlight or near a heater or other heat-generating apparatus.

Do not use a TV or a radio near a Switch.

- Do not use a TV or a radio near a Switch. Placing a Switch near a TV or a radio could affect

both devices. If you hear noise on the TV or radio, do the following:

1. Place the Switch as far away as possible from the TV or radio.
2. Adjust the orientation of the TV or radio antenna.
3. Use separate outlets.

Do not place a Switch where it will be exposed to hydrogen sulfide or salt.

- Placing a Switch in an area where sulfides are present, such as a hot-springs area, or in an area with salty air, such as along a coast, could shorten the life of the Switch.

Use care when handling an air duster.

- Use an air duster specially designed for cleaning optical connectors. Using another type of air duster could cause the ferrule tip to become dirty.
- Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

Use care when handling an optical connector cleaner.

- Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.
- Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.
- Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.
- Rotate the optical connector cleaner (stick) clockwise only. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

Maintenance

- Clean any dirty areas on the exterior of the Switch with a clean, dry cloth, or a cloth damp with (but not soaked with) water or a neutral detergent. Do not use volatile organic solutions (such as benzene or paint thinner), chemicals, chemically treated cloths, or pesticides because these substances might deform, discolor, or damage the switch.

If the Switch will not be used for a long time

- For safety reasons, unplug the power cable from the outlet if the Switch will not be used for a long time. If you are using a DC power supply, turn off the circuit breaker at the supply of power.

Disposal of a Switch

- When disposing of a Switch, you should either follow local ordinances or regulations, or contact your local waste disposal and treatment facility.

Safety Information [AX3800S] [AX3600S] [AX2400S]

Using AX3800S, AX3600S, and AX2400S series switches correctly and safely

- This guide provides important information for ensuring safe use of AX3800S, AX3600S, and AX2400S series switches. Please read this guide completely before using the Switch.
- Keep this guide handy after finishing it, so that it is available for later reference.
- Operate the Switch according to the instructions and procedures provided in this guide.
- Heed all warnings and cautions on the Switch in this guide. Failure to do so could result in injury or damage to the Switch.

Caution indications

These indications are intended to ensure safe and correct use of the Switch and to prevent serious injury, and equipment and property damage. Make sure you fully understand the meaning of the indications before continuing with the main body of this manual.

⚠WARNING

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in death or serious injury to yourself and others.

⚠CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in injury to yourself and others.

CAUTION

Ignoring instructions preceded by this indication and using the Switch incorrectly could result in serious damage to the Switch or nearby property.

NOTE

Information preceded by this indication is supplementary information that, if ignored, will not result in physical injury or serious damage to the Switch.

Unauthorized operations

Do not attempt to perform any operations that are not described in this guide and the *AX3800S/AX3600S/AX2400S Hardware Instruction Manual*. In the event of a Switch problem, turn off the power, unplug the power cable, and then contact maintenance personnel.

Using common sense

The warnings and cautions provided on the Switch and in this guide have been selected after careful consideration. Nevertheless, there is always the possibility of the unexpected occurring. Therefore, while using a Switch, stay alert and use common sense in addition to following all instructions.

⚠WARNING

If anything seems wrong, immediately turn off the power.

- If smoke or an unusual smell is emanating from the Switch, or if liquid is spilled into the Switch or a foreign object falls into the Switch, immediately turn off Switch power as described below. Continuing operation could result in fire or electric shock.

  Actions to take for abnormal conditions

Device in which an error occurred		Action to take
AC models AC (PoE) models	When an external redundant power unit (EPU) is not used	Turn off the Switch and unplug the power cable.
	When an external redundant power unit (EPU) is used	Turn off the Switch and the power supply module supplying power to the Switch, and then unplug the power cable.
DC models		Turn off the Switch, and then set the power supply circuit breaker to OFF.
Redundant power models	When an AC power supply unit is installed	Turn off all power supply units installed on the Switch, and then unplug the power cable.
	When a DC power supply unit is installed	Turn off all power supply units installed on the Switch, and then set the power supply circuit breaker to OFF.
EPU		Turn off the EPU, and then unplug the power cable.

Do not allow any foreign objects to get into the Switch.

- Do not insert or drop any foreign objects, such as anything metallic or flammable, through the Switch's ventilation slots. Doing so could result in fire or electric shock.

When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip.

- When pressing the RESET button, do not use anything with a fragile tip, or anything that might become caught in the Switch, such as a pin or paper clip. Doing so could result in fire or electric shock.

Do not modify the Switch.

- Do not modify the Switch. Doing so could result in fire or electric shock.

Do not subject the Switch to shocks.

- In the event that the Switch is dropped or any of its components are damaged, turn off the power, unplug the power cable, and contact maintenance personnel. Discontinue using the cable to avoid the risk of fire or electric shock.

Do not place any objects on the Switch.

- Do not place any metallic object such as a small pin or a paper clip or any container with a liquid, such as a vase or a flowerpot, on the Switch. Liquid or metallic objects falling into the Switch could result in fire or electric shock.

Use the Switch only with the indicated power supply.

- Do not use the Switch at any voltage other than the indicated voltage. Doing so could result in fire or electric shock.

Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker.

- Ensure that the capacity for incoming current to the distribution board is greater than the operating current of the circuit breaker. If it is not, the circuit breaker might not operate properly in the event of a failure, which could result in a fire.

Ground the Switch.

- When using an AC model, an AC (PoE) model, redundant power model (with an AC power supply unit installed), and an EPU, always use a grounded power outlet. Using the Switch without grounding could result in electric shock or failures due to electrical noise.
- When using a DC model and a redundant power model (with a DC power supply unit installed), connect a ground cable to ground the switch. Using the Switch without grounding could result in electric shock or failures due to electrical noise.

Use a DC power supply for which the primary side and the secondary side are insulated.

- When using DC power, use a power supply for which the primary side and the secondary side are insulated. Using a power supply that is not insulated could result in electric shock.

Connecting and disconnecting a DC power cable must be performed by a trained technician or maintenance personnel.

- Connecting or disconnecting the DC power cable to the power supply unit must be performed by a trained technician or maintenance personnel. Terminal connections are required for connection of the DC power cable to the power facility. For this reason, incorrect handling of the DC power cable could result in fire or electric shock.

Before connecting or disconnecting a DC power cable, set the power supply circuit breaker to OFF.

- Before connecting or disconnecting a DC power cable, set the power supply circuit breaker to OFF. Connecting or disconnecting the cable with the circuit breaker set to ON could result in a fire or electric shock.

Place an insulation cover over the G and -48 V terminals of DC power cables.

- Place an insulation cover on the G and -48 V terminals of a DC power cable (on the side grounded to the power supply). Using the terminals without an insulation cover could result in electric shock.

Observe the specified stripping length of the sheath for DC power cables.

- When using a -48 V DC power cable for a redundant power model, adjust the stripping length of the sheath for the power cable (the switch end) to the specified length. For details on striping length, see the *Hardware Instruction Manual*. If the striping length is too short, connection might fail or the cable might become disconnected. Conversely, if the length is too long, the core will be exposed, risking a fire or electric shock.

Do not use the Switch with the protection cap removed.

- Do not remove the protection cap except when attaching a cable. Using an AX3800S, AX3600S, or AX2400S series switch without a protection cap could result in a fire or electric shock. Note that the following label is attached near the standby power connector

due to the high output power of EPU-B.

Handle power cables carefully.

- Do not place anything heavy on a power cable. Do not pull, bend, or process a cable. Doing so could damage the cable, resulting in fire or electric shock. If the power cable is covered by a carpet, it is easy to forget that the cable is there and to place something heavy on it.
- Use the supplied or a designated power cable. Using another cable could result in fire or electric shock. In addition, do not use the supplied cable with other devices. Doing so could result in a fire or electric shock.
- If the power cable is damaged so that the wires underneath the covering are visible or cut, stop using it, and ask maintenance personnel to replace it. Discontinue using the cable to avoid the risk of fire or electric shock.
- Make sure the power plug is free of dust, and insert the plug completely up to the base of the prongs to prevent any looseness. Using a power plug with dust on it or one that is imperfectly connected could result in fire or electric shock.

Do not overload the power outlet.

- Do not overload the power outlet by connecting multiple power plugs to the same outlet. Overloading the outlet could result in fire or the circuit breaker tripping due to excessive power used. This might affect other equipment.

Remove the power cable when installing or removing a power supply unit.

- When installing or removing a power supply unit, remove the power cable from the power supply unit. If the power cable is connected and the power switch is turned off, power is still supplied to some circuits. Because of this, if you install or remove a power supply unit with the power cable connected, a fire or electric shock could result.

Adding or replacing a module must be performed by a trained technician or maintenance personnel.

- Adding or replacing a power system or module, or replacing the fan unit must be performed by a trained technician or maintenance personnel. Adding or replacing a module requires connecting or disconnecting power cables. If anyone other than those mentioned above performs these tasks incorrectly, a fire, electric shock, or failure could result.

Do not use an air duster near a flame.

- When cleaning the optical connectors, do not use an air duster that contains flammable gas near a flame. Doing so could result in a fire.

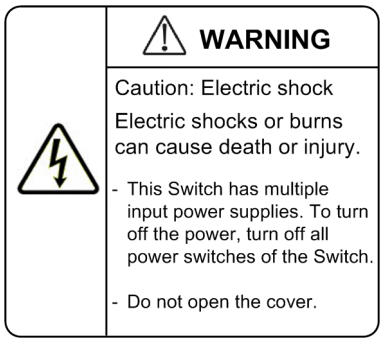
⚠CAUTION

Do not place the Switch in an unstable location.

- When installing the Switch on a table, position the Switch horizontally on a worktable strong enough to bear the weight of the Switch. Placing the Switch in an unstable location, such as on an unsteady or tilting surface, might cause the Switch to fall, resulting in injury.
- When mounting the Switch in a rack, make sure that the Switch is stable. If the Switch is unstable, it might fall, resulting in injury.

Do not open the Switch cover.

- Do not open the Switch cover. Doing so could result in electric shock. The following label is attached to a Switch.



Do not obstruct the ventilation slots.

- Do not obstruct the ventilation slots of the Switch. Doing so causes heat to accumulate inside the Switch, and could result in a fire. Maintain a space of at least 50 mm around the ventilation slots.

Do not allow hair or objects near the ventilation slots.

- Cooling fan units are mounted in the Switch. Do not allow anything near the ventilation slots. Doing so causes heat to accumulate inside the Switch and could cause a failure. Do not allow hair or other objects near the ventilation slots. They might be sucked into the Switch, resulting in injury.

When moving the Switch, do not hold the handle of the power supply unit, fan unit, or power supply module.

- When moving a redundant power model, do not hold the handle of a power supply unit or a fan unit. The handle might come off, resulting in the device falling and possibly causing injury. Also, the power supply module might become damaged, resulting in a fire or electric shock.
- Do not hold the handle of the power supply module when moving an EPU. The handle might come off, resulting in the device falling and possibly causing injury. Also, the power supply module might become damaged, resulting in a fire or electric shock.

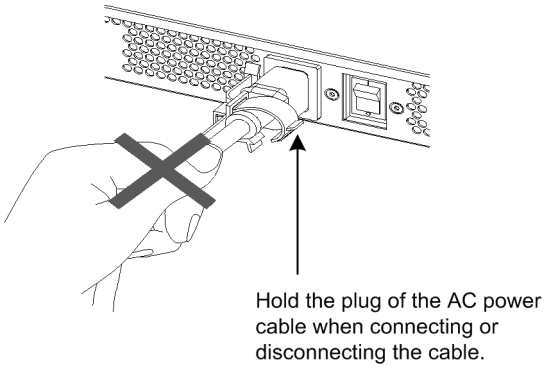
When moving a Switch

- Before moving a Switch, you must turn it off and unplug all cables. Failure to do so might cause the Switch or cable to become deformed, or might damage the Switch, resulting in fire or electric shock.

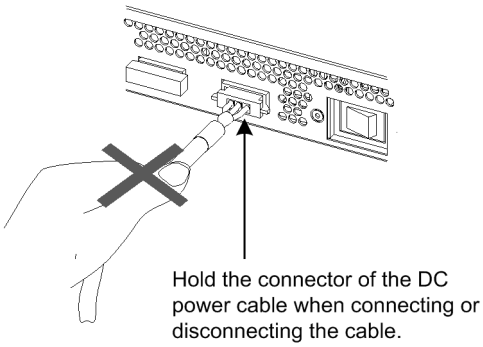
- If you must stack multiple Switches during transport, use appropriate packaging. Failure to do so might cause the Switches to become deformed or damaged, resulting in a fire or electric shock.

Handle the power cable carefully.

- Do not place the power cable near a heat-generating apparatus. The heat could melt the cable coating, resulting in fire or electric shock.
- When connecting or disconnecting the AC power cable from the outlet, always hold the plug, not the cable itself. Pulling the cable itself might cause the wires to break.

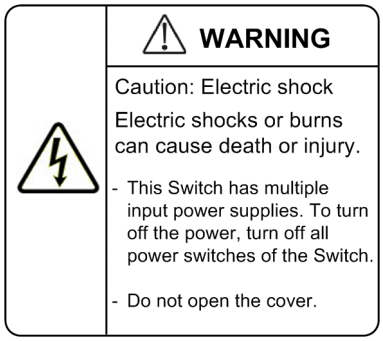


- When connecting or disconnecting a DC power cable, always hold the connector of the cable. Pulling the cable itself might cause the wires to break.



When turning off the power, stop the supply of all power to the Switch.

- If power is supplied to an AC model and an AC (PoE) model from an EPU, switch power cannot be turned off by setting just the power switch of the switch to OFF. To turn off the power, turn off the Switch and all power supply modules. The label below is attached to a Switch.
- If the power supply unit for a redundant power model has been made redundant, the Switch cannot be turned off by setting the power switch of only one power supply unit to OFF. To turn off the power, set the switches of all power supply units installed on the Switch to OFF. The label below is attached to a Switch.



Do not touch the Switch directly if you have a metal allergy.

- The Switch is coated with zinc, nickel, gold, and other elements. Do not touch the Switch directly if you have an allergic reaction to these metallic elements. Doing so might cause eczema or skin irritation.

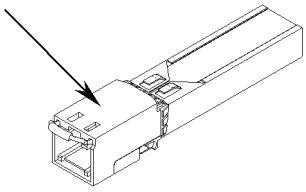
Avoid looking directly at laser beams.

- The Switch uses laser beams that are colorless and transparent, and invisible to the eye. Never look directly into the optical transceiver. AX3830S-44X4QW is classified as a 1 M-class laser product, and the other switches are class 1-laser products.

Do not touch the SFP-T and SFP-T(T) during operation and just after operation stops.

- During operation (when a link is established), the temperature of the SFP-T and SFP-T(T) can rise to 65C. Do not touch the device while it is operating or just after it stops. Doing so could result in burns.

Caution: Hot
(During operation, all sides are very hot.)



- When you remove the SFP-T or SFP-T(T), use the following procedure. Failure to do so could result in burns.

1. To remove the device when the Switch is turned on, execute the `inactivate` command, and then wait five minutes before removing the device.
2. To remove the device after turning off the Switch, turn off the Switch, wait five minutes, and then remove the device.

- The following label is attached to the SFP-T and SFP-T(T).

Do not install the Switch in a dusty or humid location.

- Do not install the Switch in a dusty or humid location. Doing so could result in fire or electric shock.

- Condensation might form on the surfaces and the inside of the Switch if it is moved from a cold location to a warm location. Using the Switch in this condition could result in fire or electric shock. After moving the Switch between two locations with a large temperature variation, let the Switch stand a few hours before using it.

Do not touch the inside of the Switch with your hands.

- Do not carelessly put your hands inside the Switch. The frame and components might cause injury.

Do not step on the Switch, lean against it, or place anything on it.

- Do not step on the Switch or lean against it. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.
- Do not place anything that weighs more than 5 kg on a switch. Doing so might damage the Switch. Furthermore, the Switch might fall, or become unbalanced, resulting in injury.

Install a fan unit for the slot of a redundant power model (AX3630S and AX3640S) with no power supply unit.

Install a fan unit for the slot of a redundant power model (AX3630S and AX3640S) with no power supply unit. If you use the Switch without installing a fan unit, the following problems might occur.

- Heat might accumulate inside the Switch and could cause a failure.
- The frame and components might cause injury.
- If foreign objects fall into the Switch, the Switch might no longer work properly.
- The radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

Attach a blank panel to the slot of a redundant power model (AX3830S and AX3650S) with no power supply unit.

Attach a blank panel to the slot of a redundant power model (AX3830S and AX3650S) with no power supply unit. If you use the Switch without attaching a blank panel, the following problems might occur.

- Heat might accumulate inside the Switch and could cause a failure.
- The frame and components might cause injury.
- If foreign objects fall into the Switch, the Switch might no longer work properly.
- The radio waves generated by the Switch might affect another device, or the radio waves generated by another device might affect the Switch, resulting in a malfunction.

Attach a blank panel to a slot in which a power supply module for an EPU is not installed.

- Attach a blank panel to a slot in which a power supply module for an EPU is not installed. If you use the switch without attaching a blank panel, you might be injured by a moving part. In addition, if foreign objects fall into the Switch, the Switch might no longer work properly.

Cleaning

- Remove dust on and around the Switch regularly. In addition to causing the Switch to stop, accumulated dust could result in a fire or electric shock.

CAUTION

Do not place a Switch in a high-temperature location.

- Do not place a Switch in direct sunlight or near a heater or other heat-generating apparatus.

Do not use a TV or a radio near a Switch.

Do not use a TV or a radio near a Switch. Placing a Switch near a TV or a radio could affect both devices. If you hear noise on the TV or radio, do the following:

1. Place the Switch as far away as possible from the TV or radio.
2. Adjust the orientation of the TV or radio antenna.
3. Use separate outlets.

Do not place the Switch in an undesirable environment.

Using the Switch in the following locations might shorten the life of the Switch or result in Switch malfunction.

- An area with salty air, such as a coast
- An area where corrosive gases are present, such as a hot-springs area
- An area where oily smoke is present
- An area where continuous vibrations are present

Ensure that voltage drop does not occur in the power facility due to inrush current.

- Turning on the Switch causes inrush current. Ensure that voltage drop does not occur in the power facility due to the inrush current. Voltage drops affect not only the Switch, but also the devices connected to the same power facility.

Turn off the power before connecting or disconnecting the power cable.

- Turn off the power of AX3800S, AX3600S, or AX2400S series switches before connecting or disconnecting the power cable of an AC model, an AC (PoE) model, and an EPU model.
- Turn off the power of a power supply unit before connection or disconnection of the power cable or the connector of the cable for a redundant power model.
- For a standby power cable, turn off the power of the power supply module first.

When replacing a power supply unit or a fan unit with the switch turned on, observe the time limit.

When performing the following operations with the switch turned on, you must remove and replace the unit within three minutes. If the operation takes longer than three minutes, the temperature inside the switch will rise and might cause a fault.

- Replacing a power supply unit or a fan unit of a redundant power model AX3630S or AX3640S
- Replacing a fan unit of a redundant power model AX3650S

When performing the following operations with the switch turned on, you must remove and replace the unit within one minute. If the operation takes longer than one minute, the temperature inside the switch will rise and might cause a fault.

- Replacing a fan unit of a redundant power model AX3830S

Turn off the power before installing or removing a power supply module.

- Before installing or removing a power supply module, turn off its power. Installing or removing the module with the power supply module turned on causes a (switch) failure. The following label is attached to the EPU.

⚠ CAUTION
Before connecting or disconnecting the power supply module, turn the switch (front side) off.

Turn off the power of the power supply modules before turning on the main power switch of an EPU.

- Before setting the main power switch of the EPU to ON, you must set the power switches of the installed power supply modules to OFF.

Do not turn off the main power switch of an EPU if the standby power supply unit is used for the switch.

- Turning off the main power switch of an EPU stops the supply of all standby power to the switch. Do not turn off the main power switch if a standby power supply unit is being used for the switch.

Handle memory cards and dummy memory cards carefully.

- When installing a memory card and a dummy memory card, do not force the card. When removing a memory card, do not forcibly pull out the card if it is locked. Doing so might damage the connector of the memory card slot.
- When moving the Switch, remove memory cards and dummy memory cards. If a memory card or dummy memory card is subjected to excessive force when the Switch is moved, the connector of the memory card slot might be damaged.

When the ACC LED is lit, do not remove the memory card or turn off the power.

- When the ACC LED on the front panel of the Switch is lit, the memory card is being accessed. When a memory card is being accessed, do not remove the memory card or turn off the power. Doing so might damage the memory card. In addition, some commands require a certain amount of time after being entered to finish accessing the card. Make sure that the memory card is no longer being accessed before removing the card or turning off the power.

Do not attach any labels to a transceiver or a direct attach cable connector.

- A label attached to the transceiver or direct attach cable connector indicates that the transceiver or direct attach cable connector is a standard product from ALAXALA or another manufacturer. However, such labels are attached where they do not interfere with heat dissipation from the transceiver or from the direct attach cable connector or interfere with the mechanism that prevents the transceiver or the direct attach cable connector from coming loose from the cage. Attaching a label to a location that interferes with these functions could cause a malfunction in the transceiver or the direct attach cable connector or cause damage to the Switch.

Make sure that you use a valid combination for the direct attach cable and the Switch.

The following Switches support SFPP-CU1M/3M/5M. Use the transceivers only with the indicated Switches. Not doing so could result in a Switch malfunction.

- AX3650S-24T6XW (Supported ports: 25 to 30)
- AX3650S-20S6XW (Supported ports: 25 to 30)
- AX3650S-48T4XW (Supported ports: 49 to 52)
- AX3830S-44XW (Supported ports: 1 to 44)
- AX3830S-44X4QW (Supported ports: 1 to 44)

The following Switch supports QSFP-CU35C/1M/3M/5M. Use the transceivers only with the indicated Switch. Not doing so could result in a Switch malfunction.

- AX3830S-44X4QW (Supported ports: 49 to 52)

Make sure that you use a valid combination for the transceiver and the Switch.

The following Switches support SFP-FX and SFP-FX(T). Use the transceivers only with the indicated Switches. Not doing so could result in a Switch malfunction.

- AX3640S-24SW (Supported ports: 5 to 24)
- AX3640S-24S2XW (Supported ports: 5 to 24)
- AX3650S-20S6XW (Supported ports: 1 to 20)

The following Switches support SFP-SX2 and SFP-SX2(T). Use the transceivers only with the indicated Switches. Not doing so could result in a Switch malfunction.

- AX2430S series switches
- AX3630S series switches
- AX3640S series switches
- AX3650S-20S6XW (Supported ports: 1 to 20)

Do not turn off the switch while the ST1 LED is blinking green (turning on for 0.5 seconds and off for 0.5 seconds).

In the following case, do not turn off the power until the ST1 LED on the front panel of the Switch changes from blinking green (turning on for 0.5 seconds and off for 0.5 seconds) to solid green. Turning off the power could result in a switch fault.

- While software is being updated

When carrying or packing a Switch and its optional modules, wear a wrist strap to protect against static electricity.

- Be sure to wear an antistatic wrist strap. If you handle the Switch without wearing an antistatic wrist strap, the Switch might be damaged by static electricity.

When carrying and packing optional modules, handle them carefully.

- Do not touch a connector when carrying or packing a transceiver, direct attach cable, memory card, power supply unit, fan unit, or power supply module. Also, when storing an optional module, use an antistatic bag.

Use care when handling an air duster.

- Use an air duster specially designed for cleaning optical connectors. Using another type of

air duster could cause the ferrule tip to become dirty.

- Keep the nozzle or container of the air duster from coming into contact with the ferrule tip. Contact could result in a malfunction.

Use care when handling an optical connector cleaner.

- Always use a dedicated optical connector cleaner. If you use another type of cleaner, the ferrule tip might become dirty.
- Before cleaning, make sure that the tip of the optical connector cleaner is clean and free of defects, such as lint, dirt, or other foreign substances. Using a cleaner with a defective tip might damage the ferrule tip.
- Do not apply excessive pressure when cleaning. Doing so might damage the ferrule tip.
- Rotate the optical connector cleaner (stick) clockwise only. Rotating the cleaner alternately clockwise and counterclockwise might damage the ferrule tip.

Maintenance

- Clean any dirty areas on the exterior of the Switch with a clean, dry cloth, or a cloth damp with (but not soaked with) water or a neutral detergent. Do not use volatile organic solutions (such as benzene or paint thinner), chemicals, chemically treated cloths, or pesticides because these substances might deform, discolor, or damage the switch.

If the Switch will not be used for a long time

- For safety reasons, unplug the power cable from the outlet if the Switch will not be used for a long time. If you are using a DC power supply unit, turn off the circuit breaker at the supply of power.

Disposal of a Switch

- When disposing of a Switch, you should either follow local ordinances or regulations, or contact your local waste disposal and treatment facility.

Chapter 1. Overview

This chapter provides an overview of failure analysis.

1.1 Overview of analyzing failures
1.2 Overview of analyzing failures of all or part of the Switch
1.3 Overview of analyzing failures of functionality

1.1 Overview of analyzing failures

Use this manual when there is a problem in an AX6700S, AX6600S, AX6300S, AX3800S, AX3600S, or AX2400S series switch.

When failure analysis requires looking at the actual Switch, do the analysis according to *1.2 Overview of analyzing failures of all or part of the Switch*.

When failure analysis requires logging in to the Switch, do the analysis according to *1.3 Overview of analyzing failures of functionality*.

1.2 Overview of analyzing failures of all or part of the Switch

1.2.1 Failure analysis for AX6700S, AX6600S, and AX6300S series switches

If a failure occurs during operation and the actual switch can be looked at, take appropriate action as described in *2.1 Troubleshooting faults for AX6700S, AX6600S, and AX6300S series switches* to troubleshoot the failure.

The status of a switch is shown in the basic control unit (BCU) for AX6700S series switches, in the control and switching unit (CSU) for AX6600S series switches, and in the management and switching unit (MSU) for AX6300S series switches. *Table 1-1: LED indications, buttons, and connectors* describes the LED indications of the BCU, CSU, and MSU and what they mean. *Figure 1-1: Example layout of the front panel* shows a front panel layout example.

For LED indications of optional modules other than the BCU, CSU, and MSU, such as the BSU, a NIF, a power supply unit, or a fan unit module, see the *Hardware Instruction Manual*. The manual also provides front panel layouts other than the one shown in *Figure 1-1: Example layout of the front panel*.

Note that even when you cannot look at the actual switch, you can still check the LED indications of the switch and troubleshoot failures accordingly, just like when you can look at the actual switch, by issuing operation commands from a remote terminal.

Table 1-1: LED indications, buttons, and connectors

No.	Name	Type	Status	Description
1	STATUS	LED: Green, orange, or red	Operating status of BCU, CSU, or MSU	Green: The switch is available for operation. Orange: The unit is under self diagnosis operation. Blinking green: The unit is loading software. Red: A fault has been detected. Off: The power is off. (The BCU, CSU, or MSU can be replaced.)[#1]
2	SYSTEM OPERATION PANEL	LCD and operation keys	System operation panel	The system operation panel displays device information, operating instructions, or failure information. (For details, see the *Configuration Guide*.)
3	ACC	LED: Green	Memory card status	Green: The memory card is being accessed. Do not remove the memory card. Off: The memory card is idle. The memory card can be inserted or removed.
4	SD CARD	Connector	SD card slot	SD card slot
5	RESET	Button (non-locking)	Manual reset button for the device	Pressing the button for one second: Perform this operation if, for example, a fault occurs with the switch.[#2#3] Pressing the button for five seconds: Perform this operation if the password is forgotten.[#2#4]
6	ACH	Button (non-locking)	Button for altering the active and standby BCU, CSU, or MSU modules	When the BCU, CSU, or MSU modules are duplicated, pressing the button swaps the active and standby units.[#2#5]
7	ACTIVE	LED: Green	Operating status of the BCU, CSU, or MSU	Green: Active Off: Standby

No.	Name	Type	Status	Description
8	SYSTEM1	LED: Green, orange, or red	Status of the switch	Green: The switch is available for operation. Orange: A partial switch fault has been detected. Red: A switch fault has been detected.
9	SYSTEM2	LED: Green, orange, or red	Power mode status#6#7	Green: Power saving mode Blinking green: Changing power mode Off: Normal power mode Orange: Not supported Red: Not supported
10	AUX	Connector	AUX port	RS-232C port for connecting an operation terminal
11	CONSOLE	Connector	CONSOLE port	RS-232C port for connecting an operation terminal
12	MANAGEMENT	Connector	MANAGEMENT port	10BASE-T/100BASE-TX Ethernet port for connecting an operation terminal
13	LINK	LED: Green or orange	Operating status of the MANAGEMENT port	Green: A link has been established. Orange: A fault has been detected. Off: A link failure occurred#8 or operation has stopped.#9
14	T/R	LED: Green	Operating status of the MANAGEMENT port	Green: A packet is being transmitted. Off: No packet is being transmitted.

#1: The BCU, CSU, or MSU can be turned off by the Inactivate operation from the system operation panel or by entering a command from the operation terminal.

#2: The button is pushed down below the front panel. Use a screwdriver with a small head to press the button.

#3: If you press the button for one second or less, the switch might not be reset.

#4: After a restart, a login password and an administrator password are no longer required. Therefore, be especially careful if you restart the unit with this method.

#5: The system can be switched only if you press the ACH button on the BCU, CSU, or MSU of the active system.

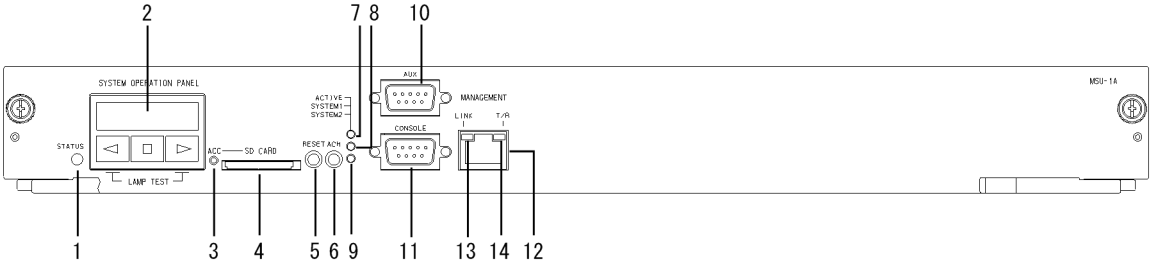
#6: This LED is always off for the MSU (for AX6300S series switches) and for the BCU with a software version earlier than 11.1 (for AX6700S series switches).

#7: This LED only shows the power mode of an active BCU or CSU.

#8: Cable disconnection is also included.

#9: You can stop operation by entering a command.

Figure 1-1: Example layout of the front panel



1.2.2 Failure analysis for AX3800S, AX3600S, and AX2400S series switches

If a failure occurs during operation and the actual switch can be looked at, take appropriate action as described in *2.2 Troubleshooting faults for AX3800S, AX3600S, and AX2400S series switches* to troubleshoot the failure.

For a description of the LEDs on the switch, see the examples shown in *Figure 1-2: Example layout of the front panel* and *Table 1-2: LED indications, buttons, and connectors*.

Note that even when you cannot look at the actual switch, you can still check the LED indications of the switch and troubleshoot failures accordingly, just like when you can look at the actual switch, by issuing operation commands from a remote terminal.

The terms AX3800S, AX3600S, and AX2400S collectively refer to the following models:

AC models

AX3640S-24T, AX3630S-24T, AX3630S-24T2X, AX3630S-24P

AX2430S-24T, AX2430S-24T2X, AX2430S-48T, AX2430S-48T2X

DC models

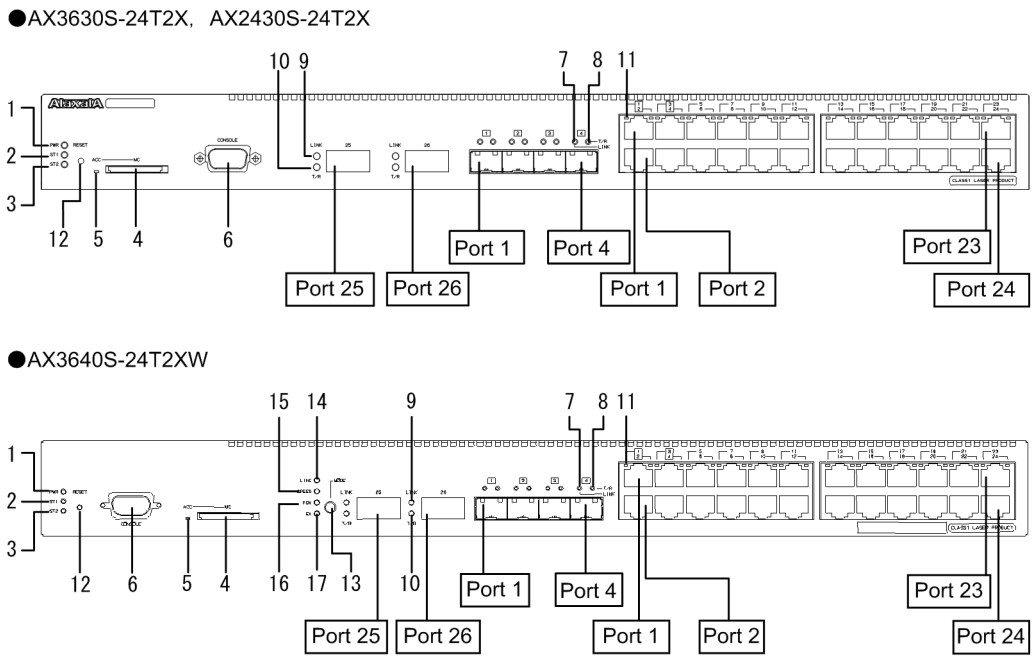
AX3630S-24TD, AX3630S-24T2XD

AX2430S-24TD, AX2430S-24T2XD, AX2430S-48TD

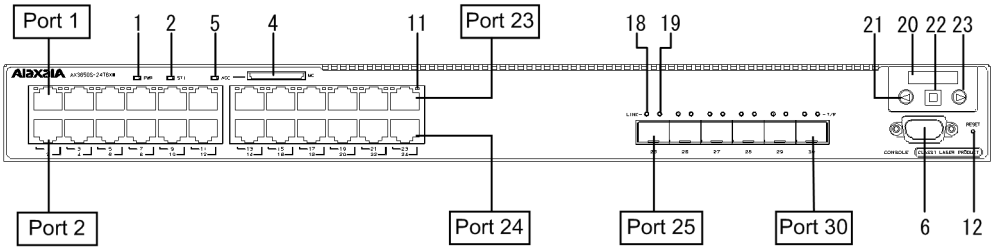
Redundant power models

AX3830S-44XW, AX3830S-44X4QW, AX3650S-24T6XW, AX3650S-20S6XW, AX3650S-48T4XW, AX3640S-24TW, AX3640S-24T2XW, AX3640S-48TW, AX3640S-48T2XW, AX3640S-24SW, AX3640S-24S2XW, AX3630S-48TW, AX3630S-48T2XW, AX3630S-24S2XW

Figure 1-2: Example layout of the front panel



●AX3650S-24T6XW



●AX3830S-44X4QW

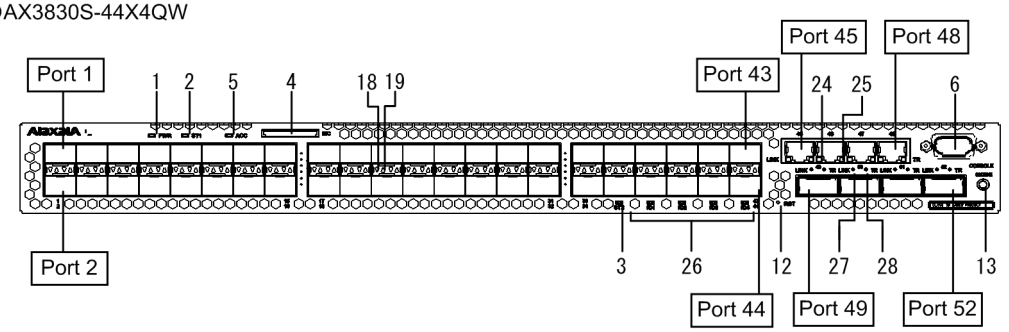


Table 1-2: LED indications, buttons, and connectors

No.	Name	Type	Status		LED brightness	Description
1	PWR	LED: Green	Power supply status	Green	Regular	Power is on.
				Blinking green[#1]	Regular	Sleep state
				Off	--	Power is off or the power supply failed.
2	ST1	LED: Green or red	Status of the switch	Green	Regular	Available for operation
					Low[#2]	
				Blinking green	Regular	Preparatory state (switch starting up)
				Blinking green[#1]	Low	Configuring the LED off mode
				Blinking red	Regular	Partial fault in the device
					Low[#3]	
				Red	Regular	Fatal fault in the device (operation cannot continue)
					Low[#3]	
				Off	--	Power is off or the power supply failed.
3	ST2	LED: Green	Not supported	--	--	--

No.	Name	Type	Status		LED brightness	Description
4	MC	Connector	Memory card slot	--	--	Memory card slot
5	ACC	LED: Green	Memory card status	ON	Regular	The memory card is being accessed. (Do not remove the memory card.)
					Low[#3]	
				Off	--	The memory card is idle. (Memory cards can be inserted or removed.)
6	CONSOLE	Connector	CONSOLE port	--	--	RS-232C port to connect a console terminal
7	LINK	LED: Green or orange	Operating status of the SFP slot Ethernet port	Green	Regular	Link established, 100 Mbit/s[#4], full duplex[#5]
					Low[#2]	
				Blinking green	Regular	1000 Mbit/s[#4]
				Orange	Regular	Line failure detection
					Low[#2]	
				Off	--	Link failure or block when the green ST1 LED is on[#6], 10 Mbit/s[#4], half duplex[#5]
8	T/R	LED: Green		Blinking green	Regular	A frame is being sent or received
					Low[#2]	
				Off	--	Not used
9	LINK	LED: Green or orange	Operating status of the XFP slot Ethernet port	Green	Regular	Link established, full duplex[#5]
					Low[#2]	
				Blinking green	Regular	10 Gbit/s[#4]
				Orange	Regular	Line failure detection
					Low[#2]	
				Off	--	Link failure or block when the green ST1 LED is on[#6]
10	T/R	LED: Green		Blinking green	Regular	A frame is being sent or received
					Low[#2]	
				Off	--	Not used

No.	Name	Type	Status		LED brightness	Description
11	1-24	LED: Green or orange	Operating status of 10/100/1000BASE-T Ethernet ports	Green	Regular	Link established, 100 Mbit/s[#4], full duplex[#5]
					Low[#2]	
				Blinking green	Regular	A link is established and frames are being sent or received, 1000 Mbit/s[#4]
					Low[#2]	
				Orange	Regular	Line failure detection
					Low[#2]	
				Off	--	Link failure or block when the green ST1 LED is on[#6], 10 Mbit/s[#4], half duplex[#5]
12	RESET	Button (non-locking)	Manual reset button for the device	--	--	Device restart
13	MODE	Button (non-locking)	Mode button	--	--	LED indication mode change[#7]
14	LINK	LED: Green	Selection of the LED indication mode	Green	Regular	LINK mode is selected
15	SPEED					`SPEED` mode is selected
16	FDX					`DUPLEX` mode is selected
17	EX					Extended mode is selected
18	LINK	LED: Green or orange	Operating status of the SFP+ slot Ethernet port	Green	Regular	A link has been established.
					Low[#2]	
				Orange	Regular	Line failure detection
					Low[#2]	
				Off	--	Link failure or block when the green ST1 LED is on[#6]
19	T/R	LED: Green		Blinking green	Regular	A frame is being sent or received
					Low[#2]	
				Off	--	Not used
20	Display	--	Not supported	--	--	--
21	BACK	Button	Not supported	--	--	--
22	ENTR	Button				
23	FWRD	Button				

No.	Name	Type	Status		LED brightness	Description
24	LINK	LED: Green or orange	Operating status of 10/100/1000BASE-T Ethernet ports	Green	Regular	A link has been established.
					Low#2	
				Orange	Regular	Line failure detection
					Low#2	
				Off	--	Link failure or block when the green ST1 LED is on#6
25	T/R	LED: Green		Blinking green	Regular	A frame is being sent or received
					Low#2	
				Off	--	Not used
26	ID1 to ID4	LED: Green	Not supported	--	--	--
27	LINK	LED: Green or orange	Operating status of Ethernet ports for QSFP+ slots	Green	Regular	A link has been established.
					Low#2	
				Orange	Regular	Line failure detection
					Low#2	
				Off	--	Link failure or block when the green ST1 LED is on#6
28	T/R	LED: Green		Blinking green	Regular	A frame is being sent or received
					Low#2	
				Off	--	Not used

Legend: --: Not applicable

#1: The LED blinks green at long intervals (turns on for 0.5 seconds and off for 5 seconds).

#2: This applies when the device is in the power saving brightness mode.

#3: This applies when the device is in the power saving brightness mode or in the LED off mode.

#4: This applies when the **Mode** button used to set the device to SPEED mode.

#5: This applies when the **Mode** button is used to set the device to DUPLEX mode.

#6: When the device is in the LED off mode, this might indicate either a link has been established, a frame is being sent or received, or a line failure has been detected.

#7: AX3830S series switches do not support this functionality.

1.3 Overview of analyzing failures of functionality

The following table provides an overview of analyzing functional failures on the Switch.

Because communication failures in a lower layer might cause communication failures in an upper layer, check the items applicable to lower layers.

Table 1-3: Status of functional failures and where to find information

Category	Sub-category	Reference
Forgotten login password	Forgotten login user password	*3.1.1 Forgotten login user password*
	Forgotten administrator mode password	*3.1.2 Forgotten password for administrator mode*
Memory card problems	`MC : --------` is displayed.	*3.2.1 The "show system" or "show mc" command displays "MC : --------"*
	`MC not found.` is displayed.	*3.2.2 "MC not found." is displayed when the memory card is accessed*
Operation terminal problems	Data cannot be input from or displayed in the console.	*3.3.1 Information cannot be entered from the console or does not appear correctly*
	Remote login to the switch not possible	*3.3.2 Login from a remote terminal is not possible*
	Returning to administrator mode is not possible	*3.3.3 Returning to administrator mode from configuration command mode is not possible*
	Login authentication not possible	*3.3.4 Login authentication using RADIUS/ TACACS+ is not possible*
	Command authorization not possible	*3.3.5 Command authorization using RADIUS/ TACACS+ and local is not possible*
Stack configuration problems	Stack configuration is not possible	*3.4.1 Stack configuration is not possible*
	Stack configuration cannot be edited	*3.4.2 Stack configuration cannot be edited*
	Configuring a stack by a fixed master switch	*3.4.3 Configuring a stack with a specific member switch as the master switch*
Network interface communication failures	Ethernet port communication failure	*3.5.1 Ethernet port cannot be connected*
	BSU/PSP communication failures	*3.5.2 BSU/PSP communication failures*
	10BASE-T/100BASE-TX/ 1000BASE-T communication failure	*3.5.3 Actions to be taken for 10BASE-T/ 100BASE-TX/1000BASE-T problems*
	100BASE-FX/1000BASE-X communication failure	*3.5.4 Actions to be taken for 100BASE-FX/ 1000BASE-X problems*
	10GBASE-R communication failure	*3.5.5 Actions to be taken for 10GBASE-R/ 40GBASE-R problems*
	Failures occurring when PoE is used	*3.5.6 Actions to be taken for PoE problems*
	Link aggregation failure	*3.5.7 Communication failures when link aggregation is used*
Layer 2 network communication failures	VLAN failure	*3.6.1 Layer 2 communication by VLANs is not possible*

Category	Sub-category	Reference
	Spanning tree failure	*3.6.2 Failures occurring when the Spanning Tree functionality is used*
	Ring Protocol failure	*3.6.3 Failures occurring when the Ring Protocol functionality is used*
	IGMP snooping not possible	*3.6.4 Multicast forwarding by IGMP snooping is not possible*
	MLD snooping not possible	*3.6.5 Multicast forwarding by MLD snooping is not possible*
IPv4 network communication failures	Communication not possible	*3.7.1 Communication is not possible or is disconnected*
	DHCP not functioning properly	*3.7.2 IP addresses cannot be assigned by the DHCP functionality*
	Dynamic DNS not functioning properly	*3.7.3 Dynamic DNS link does not work in the DHCP functionality*
IPv4 unicast routing communication failures	No RIP information	*3.8.1 No RIP routing information exists*
	No OSPF information	*3.8.2 No OSPF routing information exists*
	No BGP4 information	*3.8.3 No BGP4 routing information exists*
	No VRF information	*3.8.4 IPv4 routing information cannot be found in VRF*
Communication failures in the IPv4 multicast routing functionality	Communication not possible in the PIM-SM network	*3.9.1 Communication is not possible on the IPv4 PIM-SM networks*
	Data is forwarded twice in a PIM-SM network	*3.9.2 Multicast data is forwarded twice in the IPv4 PIM-SM network*
	Communication not possible in a PIM-SSM network	*3.9.3 Communication is not possible on the IPv4 PIM-SSM networks*
	Data is forwarded twice in a PIM-SSM network	*3.9.4 Multicast data is forwarded twice in the IPv4 PIM-SSM network*
	VRF communication problem	*3.9.5 IPv4 multicast communication problems in VRF*
	Extranet communication problem	*3.9.6 Problems that occur during IPv4 multicast communication in the extranet*
	Communication not possible in the PIM-DM network	*3.9.7 Communication is not possible on the IPv4 PIM-DM networks*
	Data is forwarded twice in the PIM-DM network	*3.9.8 Multicast data is forwarded twice in the IPv4 PIM-DM network*
IPv6 network communication failures	Communication not possible	*3.10.1 Communication is not possible or is disconnected*
	DHCP relay problems	*3.10.2 IPv6 DHCP relay communication problems*
	DHCP server problems	*3.10.3 Troubleshooting IPv6 DHCP server problems*
IPv6 unicast routing communication failures	No RIPng information	*3.11.1 RIPng routing information cannot be found*

Category	Sub-category	Reference
	No OSPFv3 information	*3.11.2 OSPFv3 routing information cannot be found*
	No BGP4+ information	*3.11.3 No BGP4+ routing information exists*
	No VRF information	*3.11.4 No IPv6 routing information exists in the VRF*
Communication failures in the IPv6 multicast routing functionality	Communication not possible in the PIM-SM network	*3.12.1 Communication is not possible on the IPv6 PIM-SM networks*
	Data is forwarded twice in a PIM-SM network	*3.12.2 Multicast data is forwarded twice in the IPv6 PIM-SM network*
	Communication not possible in a PIM-SSM network	*3.12.3 Communication is not possible on the IPv6 PIM-SSM networks*
	Data is forwarded twice in a PIM-SSM network	*3.12.4 Multicast data is forwarded twice in the IPv6 PIM-SSM network*
	VRF communication problem	*3.12.5 IPv6 multicast communication problems in VRF*
	Extranet communication problem	*3.12.6 IPv6 multicast communication problems in an extranet*
Layer 2 authentication communication failures	IEEE 802.1X authentication not possible	*3.13.1 Communication failures occurring when IEEE 802.1X is used*
	Web authentication not possible	*3.13.2 Communication failures occurring when Web authentication is used*
	MAC-based authentication not possible	*3.13.3 Communication failures occurring when MAC-based authentication is used*
	Authentication not possible in an authentication VLAN	*3.13.4 Communication failures occurring when an authentication VLAN is used*
GSRP failures	--	*3.14.1 GSRP communication failures*
IPv4 VRRP failures	--	*3.14.2 Communication is not possible with the VRRP configuration of IPv4 networks*
IPv6 VRRP failures	--	*3.14.3 Communication is not possible with the VRRP configuration of IPv6 networks*
Uplink redundancy functionality failures	--	*3.14.4 Communication is not possible with uplink redundancy*
SNMP communication failures	The MIB cannot be obtained.	*3.15.1 MIBs cannot be obtained from the SNMP manager*
	Traps cannot be received.	*3.15.2 Traps cannot be received by the SNMP manager*
sFlow statistics failures	sFlow packets cannot be sent.	*3.16.1 sFlow packets cannot be sent to the collector*
	Flow samples cannot be sent.	*3.16.2 Flow samples cannot be sent to the collector*
	Counter samples cannot be sent.	*3.16.3 Counter samples cannot be sent to the collector*

Category	Sub-category	Reference
Neighboring device information cannot be obtained by the LLDP functionality	--	*3.17.1 Neighboring device information cannot be obtained by the LLDP functionality*
Neighboring device information cannot be obtained by the OADP functionality	--	*3.17.2 Neighboring device information cannot be obtained by the OADP functionality*
NTP communication failures	--	*3.18.1 The Switch cannot be synchronized by using NTP*
Failures when the IEEE 802.3ah/UDLD functionality is used	Port in inactivate status	*3.19.1 Port is in inactivate status by the IEEE 802.3ah/UDLD functionality*
Problems due to the redundant configuration of the BCU, CSU, or MSU	--	*3.20.1 Active-standby switchover is not possible*
Problems due to the redundant configuration of the BSU	BSU switchover not possible	*3.21.1 BSU switchover is not possible*
Problems due to the redundant configuration of the NIF	NIF switchover not possible	*3.22 Problems due to the redundant configuration of the NIF*
Power saving-related problems	Scheduling is disabled	*3.23.1 Scheduling is disabled*
Communication failures caused by discarded packets	--	*3.25.1 Checking the filters and QoS configuration information*
Access list logging problems	Access list logs cannot be output.	*3.26.1 Actions to be taken when access list logs are not output*
DHCP snooping problems	--	*3.27 DHCP snooping problems*
Policy-based routing problems	Forwarding to specified route is not possible	*3.28.1 Actions to take when packets are not forwarded in policy-based routing*
	Track status is in an unexpected state	*3.28.2 Actions to be taken when the tracking functionality of policy-based routing is in an unexpected track state*
Policy-based switching problems	Forwarding to specified route is not possible	*3.29.1 Actions to be taken when packets are not forwarded in policy-based switching*
Communication failures caused by resource shortage	The MAC address table entries exceed the capacity limit.	*4.1 MAC address table resource shortage*
	The VLAN identification table entries exceed the capacity limit.	*4.2 When a VLAN identification table resource shortage occurs*
	Resource shortage in shared memory	*4.3 When a resource shortage occurs in shared memory*
Other cases	--	Check the settings again by referring to the *Configuration Guide*.

Chapter

2. Troubleshooting Switch Failures

This chapter describes how to take actions when a failure occurs on a Switch.

2.1 Troubleshooting faults for AX6700S, AX6600S, and AX6300S series switches
2.2 Troubleshooting faults for AX3800S, AX3600S, and AX2400S series switches

2.1 Troubleshooting faults for AX6700S, AX6600S, and AX6300S series switches

2.1.1 Procedure for handling switch faults

Use the procedure described below if a failure occurs on a Switch.

Table 2-1: Troubleshooting Switch failures

No.	Problem	Action
1	• Smoke emanates from the switch. • An abnormal odor emanates from the switch. • An abnormal sound emanates from the switch.	Immediately take the following actions: 1. Turn off the switch. 2. When a cable latch is used to fix the power cable in position, remove the cable latch from the cable. 3. If you are using an AC power supply unit, remove the power cable. 4. If you are using a DC power supply unit, turn off the circuit breaker at the distribution board. After performing the above procedure to stop operation of the switch, contact your distributor.
2	The login prompt does not appear.	1. If a memory card has been inserted, remove the card, and turn the switch off and then on again to restart the switch. 2. If a memory card has not been inserted, turn the switch off and then on again to restart the switch. 3. If restarting the switch does not solve the problem, replace the BCU, CSU, or MSU.
3	The LEDs of the BCU, CSU, or MSU are all off.	1. Check the power supply unit LEDs and take the following actions: (1) If the ALARM LED of any power supply unit is lit in red, replace the power supply unit. (2) If both the POWER LED and ALARM LED of any power supply unit are off, follow the procedure shown in *Table 2-2: Points to be checked in case of power failures*. If the problem persists, replace the power supply unit whose LEDs are off. 2. If the power supply unit is operating properly without any problems, replace the BCU, CSU, or MSU.
4	The SYSTEM1 LED of the BCU, CSU, or MSU is lit in red or orange.	1. If an error message is displayed on the system operation panel, take appropriate action for the relevant error message as described in the manual *Message and Log Reference* to troubleshoot the failure. 2. If no error message is displayed, replace the board (BCU, BSU, CSU, MSU, or NIF) whose STATUS LED is lit in red.
5	An error message is displayed on the system operation panel.	Take appropriate action for the relevant error message as described in the manual *Message and Log Reference* to troubleshoot the failure.

No.	Problem	Action
6	The STATUS LED of the BCU, CSU, or MSU is lit in red, the other LEDs are all off, and no message is displayed on the system operation panel.	1. Check the single or redundant configuration of the BCU, CSU, or MSU modules. (1) When a single configuration is used, follow steps 3 onwards shown below. (2) When a redundant configuration is used, follow steps 2 onwards shown below. 2. Check the status of the active and standby BCU, CSU, or MSU modules. (1) If a fault only occurs on one of the units, replace the applicable BCU, CSU, or MSU. In this case, you do not need to perform steps 3 onwards shown below. (2) When both active and standby systems have failed, follow steps 3 onwards shown below. 3. Check the power supply unit LEDs. (1) If the ALARM LED of any power supply unit is lit in red, replace the power supply unit. (2) If both the POWER LED and ALARM LED of any power supply unit are off, follow the procedure shown in *Table 2-2: Points to be checked in case of power failures*. If the problem persists, replace the power supply unit whose LEDs are off. (3) If all the power supply units are operating properly, retain them as they are. 4. Turn off all the power supply units implemented on the Switch. 5. Wait at least two seconds, and then turn on all the power supply units implemented on the Switch. (1) If this fault occurs on the BCU, CSU, or MSU, replace the applicable BCU, CSU, or MSU.

Table 2-2: Points to be checked in case of power failures

No.	Point to be checked	Action
1	The power button of the power supply unit is off.	Turn the power switch on.
2	• The power cable is disconnected. • The power cable is not firmly connected. • The power cable is not fixed with a cable latch.	Perform the following procedure: 1. Turn the power switch off. 2. If you are using a DC power supply unit, turn off the circuit breaker at the distribution board. 3. Connect the power cable correctly. 4. When possible, use a cable latch to fix the power cable in position. 5. If you are using a DC power supply unit, turn on the circuit breaker at the distribution board. 6. Turn the power switch on.

No.	Point to be checked	Action
3	The power supply unit is not firmly installed and is unstable.	Perform the following procedure: 1. Turn the power switch off. 2. If you are using a DC power supply unit, turn off the circuit breaker at the distribution board. 3. When a cable latch is used to fix the power cable in position, remove the cable latch from the cable. 4. Disconnect the power cable. 5. Remove and then insert the power supply unit again so that it is firmly fixed. 6. Connect the power cable. 7. When possible, use a cable latch to fix the power cable in position. 8. If you are using a DC power supply, turn on the circuit breaker at the distribution board. 9. Turn the power switch on.
4	The measured input power supply is outside the following range: For 100 V AC: 90 to 132 V AC For 200 V AC: 180 to 264 V AC For -48 V DC: -40.5 to -57 V DC Note: Take this action only if the input power supply can be measured.	Ask the person responsible for the facility where the switch is housed to take action regarding the input power supply.

2.1.2 Replacing the switch and optional modules

The procedure to replace the switch and optional modules is described in the *Hardware Instruction Manual*. Follow the instructions in the manual.

2.2 Troubleshooting faults for AX3800S, AX3600S, and AX2400S series switches

2.2.1 Procedure for handling switch faults

Use the procedure described below if a failure occurs on a Switch.

Table 2-3: Troubleshooting switch failures

No.	Problem	Action
1	• Smoke emanates from the switch. • An abnormal odor emanates from the switch. • An abnormal sound emanates from the switch.	Immediately take the following actions: 1. Turn off the switch. 2. Remove the power cable from the switch. After completing the above procedure, replace the switch.
2	The login prompt does not appear.	1. If a memory card has been inserted, remove the card, and turn the switch off and then on again to restart the switch. 2. If a memory card has not been inserted, turn the switch off and then on again to restart the switch. 3. If restarting the switch does not solve the problem, replace the switch.
3	The PWR LED of the switch is off.	Follow the procedure shown below: 1. Perform the steps shown in *Table 2-4: Isolating the cause of power failures*. 2. For a redundant power model, replace the power supply unit on which a malfunction has occurred. When a malfunction occurs on a power supply unit, either of the following applies: (a) The POWER LED is off. (b) The ALM1 LED is lit in red. (c) The ALM2 LED is lit in red. 3. If neither step 1 nor 2 above applies, restart the switch and check whether there are any abnormalities. (1) Turn the power switch of the switch (or of the power supply unit for a redundant power model) off and then on again to restart the switch. (2) If the switch successfully restarts, execute the `show logging` command to check the failure information. `>show logging | grep ERR` (3) If the failure information contains a high-temperature warning message, the operating environment might be the cause of the problem. Ask the system administrator to improve the environment. (4) If you cannot restart the Switch in step (1) or if failure information cannot be obtained in step (3) or does not contain a high-temperature warning message, a fault has occurred on the switch. In this case, replace the switch.
4	The red ST1 LED of the switch is on.	A fault has occurred on the switch, or the power to the switch is turned on after a long period (more than one month) of being in a non-powered state. 1. If power is to be supplied after a long period without power, turn the power switch off and then on again to restart the Switch. 2. If step 1 above does not apply, a fault has occurred on the Switch. Replace the Switch.

No.	Problem	Action
5	• The red ST1 LED of the switch blinks. • The LINK LED (10GBASE-R or 1000BASE-X port) and the 1-48 LED (10/100/1000BASE-T port) of ports on the switch are lit in orange or off.	A problem has occurred on the switch or line. 1. For a redundant power model, check the status of the power supply unit and fan unit. If a fault is found, replace the applicable unit. - If the ALM LED of the fan unit is lit in red, replace the fan unit. - If the ALM1 LED or ALM2 LED of the power supply unit is lit in red, replace the power supply unit. - If the POWER LED of the power supply unit is off, follow the instructions in *Table 2-4: Isolating the cause of power failures* to take action regarding the power failure. If the POWER LED is still off, replace the power supply unit. 2. If step 1 above does not apply, check the error message and take action accordingly. Use the `show logging` command to check the failure information and take action. `>show logging | grep ERR` If a fault has occurred on an external redundant power unit (EPU), identify the problem by referring to *2.2.2 Isolating the cause of external redundant power unit failures*.
6	LED indications of the switch and EPU show no abnormality, but the device administrator command displays `EPU:Disconnect`.	Make sure that the cable is properly connected between the switch and EPU. If the cable is disconnected, follow the procedure below to restart the switch: 1. Turn off the switch. 2. Properly connect the disconnected cable. 3. Turn on the switch.

Table 2-4: Isolating the cause of power failures

No.	Problem	Action
1	The power switch of the switch (or of the power supply unit for a redundant power model) is off.	Turn the power switch on.
2	The power cable is disconnected or loose.	Perform the following procedure: 1. Turn the power switch off. 2. Connect the power cable correctly. 3. Turn the power switch on.
3	When a redundant power model is used, the power supply unit is not firmly installed and is unstable.	Perform the following procedure: 1. Turn the power switch off. 2. Install the power supply unit correctly. 3. Turn the power switch on.
4	The measured input power supply is outside the following range: For 100 V AC: 90 to 127 V AC For 200 V AC: 180 to 254 V AC For -48 V DC: -40.5 to -57 V DC Note: Take this action only if the input power supply can be measured.	Ask the person responsible for the facility where the switch is housed to take action regarding the input power supply.

2.2.2 Isolating the cause of external redundant power unit failures

Use the procedure described below to isolate the cause of the failure if a failure occurs on an EPU.

Table 2-5: Isolating the cause of external redundant power unit failures

No.	Problem	Action
1	The POWER LED of the EPU is lit in green.	Identify the power supply module that is not operating properly by checking the LEDs of the power supply modules mounted on the EPU. When power supply modules are operating properly, the following conditions apply: • For EPU-A DC-OK: Lit in green, DC-ALM: Off • For EPU-B DC-OK: Lit in green, DC-FAIL: Off, AC-OK: Lit in green Perform the steps shown in *Table 2-7: Isolating the cause of power supply module failures* on the power supply module that is not operating properly.
2	The POWER LED of the EPU is off.	Perform the steps shown in *Table 2-6: Isolating the cause of external redundant power unit hardware faults*.

Table 2-6: Isolating the cause of external redundant power unit hardware faults

No.	Problem	Action
1	The power switch of the EPU is off.	Turn the power switch on.
2	The power cable of the EPU is not correctly connected to the switch.	1. Turn the power switch off. 2. Connect the power cable correctly. 3. Turn the power switch on.
3	The input power supply to the EPU is outside the following range: (AC power supply: 90 to 132 V)	This is a power facility failure (not a switch fault). Ask the system administrator to take action.
4	Failure other than the above	Replace the EPU.

Table 2-7: Isolating the cause of power supply module failures

No.	Problem	Action
1	The power switch of the power supply module is off.	Set the power switch of the power supply module to ON.
2	The power cable of the power supply module is not correctly connected to the switch.	1. Set the power switch of the power supply module to OFF. 2. Connect the power cable correctly. 3. Set the power switch of the power supply module to ON.
3	The power supply module is not properly installed on the EPU.	1. Turn the power switch off. 2. Install the power supply module correctly. 3. Turn the power switch on.
4	Failure other than the above	Replace the power supply module.

2.2.3 Replacing the switch and optional modules

The procedure to replace the switch and optional modules is described in the *Hardware Instruction Manual*. Follow the instructions in the manual.

Chapter

3. Troubleshooting Functional Failures During Operation

This chapter describes what actions to take when a problem occurs, such as when a Switch does not operate correctly or cannot communicate.

3.1 Problems related to login passwords
3.2 Memory card problems
3.3 Operation terminal problems
3.4 Stack configuration problems
3.5 Network interface communication failures
3.6 Layer 2 network communication failures
3.7 IPv4 network communication failures
3.8 IPv4 unicast routing communication failures
3.9 Communication failures in the IPv4 multicast routing functionality
3.10 IPv6 network communication failures
3.11 IPv6 unicast routing communication failures
3.12 Communication failures in the IPv6 multicast routing functionality
3.13 Layer 2 authentication communication failures
3.14 Communication failures in the high-reliability functionality
3.15 SNMP communication failures
3.16 Troubleshooting the sFlow statistics (flow statistics) functionality
3.17 Communication failures in the neighboring device management functionality
3.18 NTP communication failures
3.19 Communication failures in the IEEE 802.3ah/UDLD functionality
3.20 Problems due to the redundant configuration of the BCU, CSU, or MSU
3.21 Problems due to the redundant configuration of the BSU
3.22 Problems due to the redundant configuration of the NIF
3.23 Power saving-related problems
3.24 Packet congestion in CPU processing does not recover
3.25 Communication failures in filters and QoS configurations
3.26 Access list logging problems
3.27 DHCP snooping problems
3.28 Policy-based routing problems
3.29 Policy-based switching problems

3.1 Problems related to login passwords

3.1.1 Forgotten login user password

If a user forgets his or her login user password and is unable to log in to the Switch, do the following:

- If another user can log in:

  Ask the user who can log in to execute the `password` command in administrator mode to reset the forgotten login user password. Alternatively, ask the user to use the `clear password` command to delete the password.

  Execute these commands in administrator mode. Therefore, the user who logs in must know the password for the `enable` command for changing the input mode to administrator mode.

  The following figure shows an example of resetting the forgotten password for `user1` in administrator mode.

  Figure 3-1: Example of resetting the password for user1

```
# password user1
Changing local password for user1.
New password:
Retype new password:
#
```

- If no users can log in:

  If no users can log in or if a user can log in but does not know the password for the `enable` command, push and hold the RESET button for at least five seconds to perform a default restart. After startup due to the default restart, reset the password.

  Take care when performing a default restart. A startup due to the default restart does not perform authentication by password, authentication when changing to administrator mode (`enable` command), or command authorization.

  For details about default restarts, see the *Configuration Guide*.

The reset password takes effect after the Switch restarts.

3.1.2 Forgotten password for administrator mode

If you cannot change the input mode to administrator mode because you forgot the password for the `enable` command, push and hold the RESET button for at least five seconds to perform a default restart. After startup due to the default restart, reset the password.

Take care when performing a default restart. A startup due to the default restart does not perform authentication by password, authentication when changing to administrator mode (`enable` command), or command authorization.

For details about default restarts, see the *Configuration Guide*.

The reset password takes effect after the Switch restarts.

3.2 Memory card problems

3.2.1 The "show system" or "show mc" command displays "MC : --------"

If the `show system` or `show mc` command displays `MC : --------`, check the problem and take action according to the following table.

Table 3-1: Action to take when "MC : --------" is displayed

No.	Items to check and commands	Action
1	Check the ACC LED.	If the ACC LED is green, another process might be accessing the memory card. After the ACC LED turns off, execute the command again. If the ACC LED is not green, go to No. 2.
2	Remove the memory card and insert it again.	After removing and inserting the memory card, execute the command again. Before inserting the memory card, check the memory card and memory card slot of the Switch for dust. If there is dust, wipe it off with a dry cloth and insert the memory card. If you remove and insert the memory card several times but the problem is not resolved, go to No. 3.
3	Replace the memory card.	After replacing the memory card, execute the command again. If replacing the memory card does not resolve the problem, the memory card slot might have failed. • For AX6700S, AX6600S, or AX6300S series switches: Replace the BCU, CSU, or MSU. • For AX3800S, AX3600S, or AX2400S series switches: Replace the Switch.

3.2.2 "MC not found." is displayed when the memory card is accessed

If `MC not found.` is displayed when a command that accesses the memory card is executed, check the problem and take action according to the following table.

Table 3-2: Action to take when "MC not found." is displayed

No.	Items to check and commands	Action
1	Check the ACC LED.	If the ACC LED is green, another process might be accessing the memory card. After the ACC LED turns off, execute the command again. If the ACC LED is not green, go to No. 2.
2	Remove the memory card and insert it again.	After removing and inserting the memory card, execute the command again. Before inserting the memory card, check the memory card and memory card slot of the Switch for dust. If there is dust, wipe it off with a dry cloth and insert the memory card. If you remove and insert the memory card several times but the problem is not resolved, go to No. 3.
3	Replace the memory card.	After replacing the memory card, execute the command again. If replacing the memory card does not resolve the problem, the memory card slot might have failed. • For AX6700S, AX6600S, or AX6300S series switches: Replace the BCU, CSU, or MSU. • For AX3800S, AX3600S, or AX2400S series switches: Replace the Switch.

3.3 Operation terminal problems

3.3.1 Information cannot be entered from the console or does not appear correctly

If a problem occurs during a connection to the console, check the problem and take action according to *Table 3-3: Problems occurring during connection to the console and action to take*.

If a problem occurs during connection to the modem, check the problem and take action according to *Table 3-4: Problems occurring during connection to the modem and action to take*. Also, see the documentation provided with the modem.

Table 3-3: Problems occurring during connection to the console and action to take

No.	Problem	Items to check
1	Nothing is displayed on the screen.	Perform the following procedure: 1. Make sure the ST1 LED on the front panel of the Switch is green. If it is not, see *1.2 Overview of analyzing failures of all or part of the Switch*. 2. Check whether the cables are connected correctly (for example, check for incomplete insertion). 3. Make sure an RS232C cross cable is being used. 4. Make sure the communication software settings, including port number, communication speed, data length, parity bit, stop bit, and flow control, are specified as follows: Communication speed: 9600 bit/s (or the set value if you have changed this value) Data length: 8 bits Parity bit: None Stop bit: 1 bit Flow control: None
2	Key entry is not accepted.	Perform the following procedure: 1. Data transmission might have been interrupted by XON/XOFF flow control. End the interruption by pressing **Ctrl** + **Q**. If the Switch still does not accept entry from the keys after this operation, perform steps 2 and 3. 2. Make sure that the communication software settings are correct. 3. The screen might not respond because **Ctrl** + **S** was pressed. Press any key.
3	Unexpected characters are displayed.	Negotiation with the communication software might not have been performed correctly. Check the software communication speed by doing the following: 1. If the communication speed of CONSOLE (RS232C) was not specified by using the `line console 0` configuration command, make sure that the communication speed of the communication software is set to 9600 bit/s. 2. If the communication speed of CONSOLE (RS232C) has been set to 1200, 2400, 4800, 9600, or 19200 bit/s by using the `line console 0` configuration command, make sure that the communication speed of the communication software is set correctly.
4	Unexpected characters are displayed when a user name is being entered.	The communication speed of CONSOLE (RS232C) might have been changed. See No. 3.
5	Login is not possible.	1. Make sure that the login prompt is displayed on the screen. If it is not, the Switch is starting up. Wait a while. 2. Use the `aaa authentication login console` and `aaa authentication login` configuration commands to make sure that the RADIUS or TACACS+ authentication is not set. (For details, see *3.3.4 Login authentication using RADIUS/TACACS+ is not possible*.)

No.	Problem	Items to check
6	When the communication speed of the communication software is changed after login, unexpected characters are displayed and no commands can be entered.	Despite changing the communication speed of the communication software after login, correct display is not possible. Restore the original communication speed of the communication software.
7	A user wants to use Tera Term Pro to log in, but unexpected characters are displayed during login.	Negotiation with the communication software might not have been performed correctly. See No. 3. Issue a break signal by pressing the **Alt** + **B** keys simultaneously. Note, however, that the login page might not be displayed unless the break signal is issued several times, depending on the communication speed of Tera Term Pro.
8	Item names and the corresponding content are displayed out of alignment.	The displayed information might be greater than the maximum number of characters that can be displayed on one line. Change the screen size setting of the communication software to increase the number of characters that can be displayed on one line.

Table 3-4: Problems occurring during connection to the modem and action to take

No.	Problem	Items to check
1	The modem does not answer automatically.	Check the following: • The cables are connected correctly. • The power of the modem is turned on. • The phone number is correctly specified. • The settings for the modem are correct. • If the modem is connected to two terminals, a line connection can be established by dialing.
2	Unexpected characters are displayed at login.	Perform the following procedure: 1. Set the communication speed of the modem to 9600 bit/s. 2. If the modem supports the V.90, K56flex, x2, or later communication standards, specify the V.34 or earlier communication mode to connect to the line.
3	After a line disconnection, redialing fails to connect due to a busy line.	After a line is disconnected, the modem might not answer for some seconds. See the documentation for the modem.
4	After a line failure, the connection cannot be re-established.	If a line is disconnected due to a line failure, it might take up to 120 seconds before you can reconnect. If you want to reconnect immediately, log in as another user, and use the `killuser` command to forcibly log out the user connected to the AUX port with a dial-up IP connection.
5	After a line disconnection, the connection cannot be re-established.	If a dial-up IP connection is disconnected, it might take some time before you can reconnect. In such case, wait 300 seconds or so before trying to reconnect.

3.3.2 Login from a remote terminal is not possible

If a problem occurs during connection to a remote terminal, check the status according to the following table.

Table 3-5: Problems occurring during connection to a remote terminal and action to take

No.	Problem	Action
1	Remote connection is not possible.	Perform the following procedure: 1. Use the `ping` command from a PC or workstation to make sure that a route for remote connection has been established. 2. After the "connection established" message is displayed, if it takes time before the prompt appears, communication with the DNS server might not be possible. (If communication with the DNS server is not possible, it takes about five minutes before the prompt appears. This time is a general estimate and varies depending on the network status.)
2	Login is not possible.	Perform the following procedure: 1. Make sure that the terminal you are using has an IP or IPv6 address that is permitted in the access list for the configuration command `line vty` mode. Also, make sure that `deny` is not specified for the IP or IPv6 address set in the configuration command access list. (For details, see the *Configuration Guide.*) 2. Make sure that the maximum number of users who can log in has not been exceeded. (For details, see the *Configuration Guide.*) If the number of login users has reached the maximum and if connection from a remote terminal to the Switch is lost and then restored, no more users will be able to log in from a remote terminal until the TCP protocol of the session times out and the session is disconnected. Although the timeout period of the TCP protocol varies depending on the status of a remote terminal or the network, the protocol usually times out after 10 minutes. 3. Use the `transport input` configuration command in `line vty` mode to make sure that a protocol for which access to the Switch is prohibited is not used. (For details, see the manual *Configuration Command Reference.*) 4. Use the `aaa authentication login` configuration command to make sure that the RADIUS or TACACS+ authentication is not set. (For details, see *3.3.4 Login authentication using RADIUS/TACACS+ is not possible.*)
3	Key entry is not accepted.	Perform the following procedure: 1. Data transmission might have been interrupted by XON/XOFF flow control. End the interruption by pressing **Ctrl** + **Q**. If the Switch still does not accept entry from the keys after this operation, perform steps 2 and 3. 2. Make sure that the communication software settings are correct. 3. The screen might not respond because **Ctrl** + **S** was pressed. Press any key.
4	A user remains logged in.	Either wait for the user to be automatically logged out, or log in again and delete the login user by using the `killuser` command. If the user was editing the configuration, the editing has not been finished and the configuration might have not been saved. Log in to the Switch again and enter configuration mode to save the configuration, and then finish editing.

3.3.3 Returning to administrator mode from configuration command mode is not possible

If you cannot return to administrator mode from configuration command mode, resolve the problem by using either of the following methods.

(1) When connected to a console

Use the following procedure to forcibly log out the target user:

1. Use the `show sessions` command to check the login number of the target user.

Execution example

```
(config)# $show sessions
operator console admin 1 Jan 6 14:16
```

↑ Login number of the target user

2. Use the `killuser` command to forcibly log out the target user.

   Specify the login number you checked in step 1, to the `login no.` parameter.

   Execution example
   ```
   (config)# $killuser 1
   ```

(2) When connected to a remote terminal

Temporarily shut down the remote terminal, and then re-connect it.

If any users are still logged in, see *Table 3-5: Problems occurring during connection to a remote terminal and action to take* and follow item number 4 to resolve the problem.

3.3.4 Login authentication using RADIUS/TACACS+ is not possible

If a login cannot be authenticated by using RADIUS or TACACS+, check the following:

1. Communication with the RADIUS or TACACS+ server

   Use the `ping` command to check if a connection from the Switch to the RADIUS or TACACS+ server has been established. If a connection has not been established, see *3.7.1 Communication is not possible or is disconnected*. If a local address is specified in the configuration, use the `ping` command from the local address to make sure that a connection from the Switch to the RADIUS or TACACS+ server has been established.

2. Settings for the timeout value and the number of retries

   For RADIUS authentication, depending on the `radius-server host`, `radius-server retransmit`, and `radius-server timeout` configuration command settings, the maximum length of time required by the Switch to determine that the Switch is unable to connect to the RADIUS server is calculated as follows: <*set-response-timeout-value-(in-seconds)*> x <*set-number-of-retries*> x <*set-number-of-RADIUS-servers*>.

   For TACACS+ authentication, depending on the `tacacs-server host` and `tacacs-server timeout` configuration command settings, the maximum length of time required by the Switch to determine that the Switch is unable to connect to the TACACS+ server is calculated as follows: <*set-response-timeout-value-(in-seconds)*> x <*set-number-of-TACACS+-servers*>. If the time increases significantly, an application on a remote terminal, such as Telnet, might have terminated due to a timeout. If this happens, change the RADIUS or TACACS+ configuration settings or the timeout setting of an application running on a remote terminal. In addition, Telnet or FTP might have failed even when a message indicating successful RADIUS or TACACS+ authentication is output to the operation log. In this case, an application running on a remote terminal might time out before the application can connect to a running RADIUS or TACACS+ server of those servers you specified in the configuration. Change the settings so that a running RADIUS or TACACS+ server takes priority, or decrease the value of <*response-timeout-value-(in-seconds)*> x <*number-of-retries*>.

3. Action to take when a login to the Switch is not possible

   If you cannot log in to the Switch due to, for example, incorrect settings, log in from the console and modify the settings. If login authentication has also been implemented on the console by the `aaa authentication login console` configuration command, perform a default restart and then log in.

Default restart

Push and hold the RESET button for at least five seconds.

Take care when performing a default restart. A startup due to the default restart does not perform authentication by password, authentication when changing to administrator mode (`enable` command), or command authorization. The specified password takes effect after the Switch restarts.

3.3.5 Command authorization using RADIUS/TACACS+ and local is not possible

After RADIUS, TACACS+, or local authentication is successful and you log in to the Switch, if command authorization fails or if a command cannot be executed due to an authorization error, check the following:

1. Checking with the `show whoami` command

   Use the `show whoami` command for the Switch to display and check the list of operation commands that are permitted or restricted for the current user. Make sure that the command list can be obtained as specified in the settings for the RADIUS or TACACS+ server. Also, if the local command authorization is used, make sure that the command list has been set as specified in the configuration.

2. Checking the server settings and configuration

   Make sure that the settings related to the command authorization for the Switch are correct on the RADIUS or TACACS+ server. Take care with the settings of the vendor-specific attributes for RADIUS, or the service and attribute name settings for TACACS+. Also, if local command authorization is used, make sure that the settings in the configuration are correct. For details about the RADIUS, TACACS+, and local (configuration) settings, see the *Configuration Guide*.

   Notes on coding a command list

   Note the handling of space characters when you code a command list for command authorization for the Switch. For example, if "`show ip ` " (i.e., `show ip` followed by a space) is specified in the permission command list, the `show ip interface` is permitted, but the `show ipv6 interface` command is not permitted.

3. Action to take when all commands are restricted

   If all commands are restricted due to, for example, incorrect settings, log in from the console and modify the settings. If command authorization has also been implemented on the console by the `aaa authorization commands console` configuration command, perform a default restart and then log in.

   Default restart

   Push and hold the **RESET** button for at least five seconds.

   Take care when performing a default restart. A startup due to the default restart does not perform authentication by password, authentication when changing to administrator mode (`enable` command), or command authorization. The specified password takes effect after the Switch restarts.

3.4 Stack configuration problems

3.4.1 Stack configuration is not possible

If you cannot configure a stack successfully, check the following in order: the state of member switches, the optional license information, and the state of the stack port.

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolate the cause of the problem, from possible causes such as the state of member switches, the optional license information, and the state of the stack ports.

   Isolate the cause according to the following table.

   Table 3-6: Action to take when you cannot configure a stack

No.	Items to check and commands	Action
1	Execute the following command on each member switch to check the state of the switch: `show switch detail`	If the stack status is `Disable`, standalone operation is in progress. After setting the configuration command to `stack enable` and saving it to the startup configuration, restart the device and execute the stack functionality.
		If `Switch No` is the same for multiple member switches, you cannot configure a stack. Use the `set switch` command to change the switch number, and make sure that no member switches share the same switch number. To enable the use of the `set switch` command to change switch numbers, you must restart the member switches.
		If your problem does not apply to the above, go to No. 2.
2	Execute the following command on each member switch to check the optional license information of the switch: `show license`	If the optional licenses set for each member switch are not consistent, you cannot configure a stack. Use the `set license` command or the `erase license` command to make the optional licenses consistent between member switches. To enable license keys applied by using these commands, you must restart the member switches.
		If your problem does not apply to the above, go to No. 3.

3	Execute the following commands on each member switch to check the state of the stack ports:
	`show port`
	`show switch detail`
		In the results of executing the `show port` command, if `Status` is not `up`, see *3.5.1 Ethernet port cannot be connected* and check the Ethernet port status.

		In the results of executing the `show port` command, if `Status` is `up`, yet in the results of executing the `show switch` command with the `detail` parameter specified, `Status` is `Down`, there might be a mistake in the configuration of the member switches connected via stack port. Check the configuration as follows: • Switch number and device model settings: Make sure the switch numbers and device models set by using the configuration command `switch provision` are consistent with the switch numbers and device models of the member switches that are actually connected. • Stack port settings Make sure the stack ports set by using the `stack` parameter of the configuration command `switchport mode` are consistent with the ports that are actually connected.

3.4.2 Stack configuration cannot be edited

If you can make a stack configuration but cannot edit the configuration, check the software information.

Execute `remote command all show version` on the master switch to check the software information of all member switches in the stack configuration. Even if you already have a stack configuration, the following software information must be consistent before you can edit the configuration:

- Software type (OS-L3SA-A/OS-L3SA or OS-L3SL-A/OS-L3SL)
- Software version

If the above are not consistent, make sure that the software information is consistent for all member switches in the stack configuration.

3.4.3 Configuring a stack with a specific member switch as the master switch

Even if you set a high master selection priority for a member switch you want to make the master switch, and start (or restart) all the member switches in the stack configuration simultaneously, a member switch with a high master selection priority might not become the master switch. This is because the time taken to start up can change due to the following causes, upsetting the synchronization of the startup of member switches:

- The switch is being restarted
- The software type or software version is different
- The startup configuration is different
- The software was updated or upgraded before startup

If you want to the member switch that becomes the master switch to be fixed, configure the stack by using either of the following methods:

- Start up the member switch that you want to make the master switch first. After confirming that this member switch has started and become the master switch, start the remaining member switches.
- Set a value of `2` or greater for the master selection priority of the member switch you want to make the master switch, and set `1` for the master selection priority of the remaining member switches. Afterward, start all the member switches.

3.5 Network interface communication failures

3.5.1 Ethernet port cannot be connected

If it is possible that the Ethernet port caused the communication failure, do the following:

- For AX6700S, AX6600S, or AX6300S series switches:

  Check the NIF status, port status, and port statistics in this order.

- For AX3800S, AX3600S, or AX2400S series switches:

  Check the port status and port statistics in this order.

(1) Checking the status of the NIF

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem by checking the NIF status

   Use the `show interfaces` command to check the NIF status, and isolate the cause of the problem according to the following table.

   Table 3-7: Checking the NIF status and action to take

No.	NIF status	Cause	Action
1	`active`	The target NIF is operating normally.	Check the port status according to *Table 3-8: Checking the port status and action to take*.
2	`notconnect`	The target NIF is not implemented.	Implement the NIF board.
3	`inactive`	The `inactivate` command is set.	Use the `activate` command to activate the target NIF.
		The target NIF is not fully inserted.	Implement the NIF board correctly.
		The NIF is not operating.	Use the `show system` command to check the operating status of the BSU, and activate the NIF.
			Use the `show system` command to check the operating status of the PSP, and activate the NIF.
		A NIF not supported in this software version is implemented.	Check the NIF board type and the software version, and then either replace the NIF board or update the software.
		A NIF not supported in the Switch is implemented.	Replace the NIF board.
4	`fault`	A failure has occurred on the target NIF.	Based on the log entry for the target NIF displayed by the `show logging` command, see the manual *Message and Log Reference* and take the action described in *Action*.
5	`initialize`	The target NIF is being initialized.	Wait until the initialization is complete.
6	`disable`	`no power enable` is set by a configuration command.	Make sure that the NIF board to use is implemented, and use the `power enable` configuration command to put the target NIF into active status.

(2) Checking the port status

1. Checking the log

For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem by checking the port status

Use the `show interfaces` command to check the port status, and isolate the cause of the problem according to the following table.

Table 3-8: Checking the port status and action to take

No.	Port status	Cause	Action
1	`active up`	The target port is operating normally.	No
2	`active down`	A line failure has occurred on the target port.	Based on the log entry for the target port displayed by the `show logging` command, see the manual *Message and Log Reference* and take the action described in *Action*.
3	`inactive`	The port is in inactive status due to one of the following reasons: • `inactivate` command • The standby link functionality of link aggregation • The BPDU guard functionality of a Spanning Tree Protocol • Port resetting of GSRP • Failure detection in the IEEE 802.3ah/UDLD functionality • The port is deactivated by the L2 loop detection functionality. • The port is deactivated by the storm control functionality.	• If the port is deactivated by the standby link functionality of the link aggregation, this is normal operating status. Do not activate the port by using the `activate` command. Use the `show channel-group` command with the `detail` parameter to check the standby link functionality. • If the port is deactivated by the BPDU guard functionality of a Spanning Tree Protocol, check the settings of the partner switch, modify the configuration so that the Switch does not receive BPDUs, and use the `activate` command to activate the target port. Use the `show spanning-tree` command with the `detail` parameter to check the BPDU guard functionality. • If the port is deactivated by the port resetting of GSRP, the port will automatically return to the active status. This inactive status of the port is normal. Do not activate the port by using the `activate` command. • If the port is deactivated due to the unidirectional link failure detection or L2 loop detection in the IEEE 802.3ah/UDLD functionality, see *3.19 Communication failures in the IEEE 802.3ah/UDLD functionality*. After restoration from the failure, use the `activate` command to activate the target port. • If the port is deactivated by the L2 loop detection functionality, modify the configuration in which the loop occurs, and then use the `activate` command to activate the target port. Also, if `loop-detection auto-restore-time` is specified by a configuration command, the port will automatically return to the active status. • If the port is deactivated by the storm control functionality, after the LAN is restored from the storm, use the `activate` command to activate the target port. • If any of the reasons described above do not apply and you want to activate the port, make sure the cable is connected to the target port, and then use the `activate` command to activate the target port.
4	`test`	A line test is being performed at the port by the `test interfaces` command.	To resume the communication, use the `no test interfaces` command to stop the line test, and then use the `activate` command to activate the target port.
5	`fault`	A failure has occurred on the hardware of the target port.	Based on the log entry for the target port displayed by the `show logging` command, see the manual *Message and Log Reference* and take the action described in *Action*.
6	`initialize`	The target port is being initialized.	Wait until the initialization is complete.

No.	Port status	Cause	Action
7	`disable` or `locked`	The `shutdown` configuration command is set.	Make sure the cable is connected to the target port, and set the `no shutdown` configuration command to activate the target port.

(3) Checking statistics

You can use the `show port statistics` command to check the number of sent and received packets and the number of discarded send and receive packets for all ports on the Switch.

Figure 3-2: Example of checking the operating status of the ports

```
> show port statistics
2006/03/23 12:00:00
Port Counts:48
Port  Name     Status  T/R   Unicast   Multicast   Broadcast     Discard
1/ 1  geth1/1  up      Tx          0           0           0           0
                       Rx          0           0           0           0
1/ 2  geth1/2  down    Tx          0           0           0           0
                       Rx          0           0           0           0
1/ 3  geth1/3  down    Tx          0           0           0           0
                       Rx          0           0           0           0
(data omitted)
>
```

Note that if a value of the display item `Discard` is larger than 0, it indicates that a failure has occurred and packets have been discarded. Use the `show interfaces` command to obtain the detailed information about the target port.

3.5.2 BSU/PSP communication failures

If it is possible that BSU/PSP units cause the communication failure, perform the check procedure described below.

(1) Checking the operating status of BSU/PSP units

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem by checking the operating status of BSU/PSP units

   Use the `show system` command to check the operating status of BSU/PSP units, and isolate the cause of the problem according to the following table.

   Table 3-9: Checking the operating status of a BSU/PSP and action to take

No.	Operating status of the BSU/PSP	Cause	Action
1	`active`	The target BSU/PSP is operating normally as an active unit.	See *3.5.1 Ethernet port cannot be connected*.
2	`standby hot`	The target BSU/PSP is operating normally as a standby unit in hot standby mode.	See *3.5.1 Ethernet port cannot be connected*.
3	`standby cold`	The target BSU is operating normally as a standby unit in cold standby mode.	See *3.5.1 Ethernet port cannot be connected*.
4	`standby cold2`	The target BSU/PSP is operating normally as a standby unit in cold standby 2 mode.	See *3.5.1 Ethernet port cannot be connected*.
5	`fault`	The configuration contains a setting that cannot be used.	Correctly set the flow distribution pattern for the filters and QoS functionality by using the `fldm prefer` configuration command.

No.	Operating status of the BSU/PSP	Cause	Action
6			Correctly set the distribution pattern of the maximum number of entries per switch by using the `fwdm prefer` configuration command.
7		A failure has occurred on the target BSU/PSP.	Based on the log entry for the target BSU/PSP displayed by the `show logging` command, see the manual *Message and Log Reference* and take the action described in *Action*.
8	`inactive`	The `inactivate bsu` command is set.	Use the `activate bsu` command to put the target BSU into active, standby hot, or standby cold status. If the BSU cannot be put into the standby hot or standby cold status, see *3.21 Problems due to the redundant configuration of the BSU*.
9		The target BSU is not fully inserted.	Implement the BSU board correctly.
10		Different types of BSU units are implemented.	Implement only one type of BSU board.
11		A BSU not supported in this software version is implemented.	Check the type of the BSU board and the version of the software, and replace the BSU board or update the software.
12		A BSU not supported in the Switch is implemented.	Replace the BSU board.
13	`notconnect`	The target BSU is not implemented.	Make sure that as many BSU boards as the number of active and standby BSUs (or the number of active BSUs only, if standby BSUs are not required) are implemented. If the required number of boards is already implemented, no action is required. If not implemented, implement as many BSU boards as required.
14	`initialize`	The target BSU/PSP is being initialized.	Wait until the initialization is complete.
15	`disable`	`no power enable` is set by a configuration command.	Make sure that the BSU board to be used is implemented, and use the `power enable` configuration command to put the target BSU into active, standby hot, or standby cold status. If the BSU cannot be put into the standby hot or standby cold status, see *3.21 Problems due to the redundant configuration of the BSU*.

3.5.3 Actions to be taken for 10BASE-T/100BASE-TX/1000BASE-T problems

If a 10BASE-T/100BASE-TX/1000BASE-T problem occurs, use the following procedure to isolate the failure:

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem according to the failure analysis method

   Isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-10: Failure analysis method for 10BASE-T/100BASE-TX/1000BASE-T problems

No.	Items to check	Cause	Action
1	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • Link down	Line quality is degraded.	Check whether the cable types are correct. For the types, see the *Hardware Instruction Manual*.
			If the Switch is set as follows, make sure that the pin mapping is for MDIX. • A fixed connection is set for the target port. • Auto-negotiation is enabled and the automatic MDIX functionality is disabled for the target port.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion).
			Replace with the connection interface supported by the Switch. For details about the connection interfaces supported by the Switch, see the *Configuration Guide*.
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` (Ethernet) command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
2	Use the `show interfaces` command to display the failure statistics for the receiving side, and check whether there are counts for the following items for the target port. If there is a count, see the *Cause* and *Action* columns. • CRC errors • Symbol errors	Line quality is degraded.	Check whether the cable types are correct. For the types, see the *Hardware Instruction Manual*.
			If the Switch is set as follows, make sure that the pin mapping is for MDIX. • A fixed connection is set for the target port. • Auto-negotiation is enabled and the automatic MDIX functionality is disabled for the target port.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion).
			Replace with the connection interface supported by the Switch. For details about the connection interfaces supported by the Switch, see the *Configuration Guide*.

No.	Items to check	Cause	Action
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
3	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • MDI cross over changed	The pin mapping of the cable is not correct.	Modify the pin mapping correctly. For details about the pin mapping, see the *Configuration Guide*.
4	Execute the `show interfaces` command and check the line type and line speed in the detail information displayed for the target port. If the line type or speed is invalid, see the *Cause* and *Action* columns.	The cable is not compatible.	Check whether the cable types are correct. For the types, see the *Hardware Instruction Manual*.
		The values specified for the `speed` and `duplex` configuration commands are different from those on the remote device.	For the `speed` and `duplex` configuration commands, specify the same values that are on the remote device.
		Other than the above	To use a specific speed in auto-negotiation, set the line speed for auto-negotiation. For details, see the *Configuration Guide*.
5	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • Long frames	Packets exceeding the maximum allowed frame length are received.	Adjust the jumbo frame settings to those on the remote device.
6	Use the `show qos queueing` command to check whether there is a count for the following item. If there is a count, see the *Cause* and *Action* columns. • discard_pkt	Packets are discarded.	Check whether drop control and the shaper are being used appropriately in the system configuration.

3.5.4 Actions to be taken for 100BASE-FX/1000BASE-X problems

If a 100BASE-FX/1000BASE-X problem occurs, use the procedure below to isolate the failure.

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem according to the failure analysis method

   Isolate the cause of the problem according to the failure analysis method described in the following table.

   Table 3-11: Failure analysis method for 100BASE-FX/1000BASE-X problems

No.	Items to check	Cause	Action
1	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • Link down • Signal detect errors	Line quality on the receiving side is degraded.	Check the type of the optical fiber. For the types, see the *Hardware Instruction Manual*.
			If an optical attenuator is used, check the attenuation value. For the optical level, see the *Hardware Instruction Manual*.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion). Make sure that the end sections of the cables are clean. If they are dirty, clean them.
			Check whether the transceiver is connected correctly.
			For the `speed` and `duplex` configuration commands, specify the same values that are on the remote device.
			Comply with the segment standard of the remote device.
			Check whether the optical level is correct. For the optical level, see the *Hardware Instruction Manual*.
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
2	Use the `show interfaces` command to display the failure statistics for the receiving side, and check whether there are counts for the following items for the target port. If there is a count, see the *Cause* and *Action* columns. • CRC errors • Symbol errors	Line quality on the receiving side is degraded.	Check the type of the optical fiber. For the mode, see the *Hardware Instruction Manual*.
			If an optical attenuator is used, check the attenuation value. For the optical level, see the *Hardware Instruction Manual*.

No.	Items to check	Cause	Action
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion). Make sure that the end sections of the cables are clean. If they are dirty, clean them.
			Check whether the transceiver is connected correctly.
			For the `speed` and `duplex` configuration commands, specify the same values that are on the remote device.
			Comply with the segment standard of the remote device.
			Check whether the optical level is correct. For the optical level, see the *Hardware Instruction Manual*.
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
3	For AX3800S, AX3600S, or AX2400S series switches, use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • TX fault	The transceiver has failed.	Replace the transceiver.
4	If a single-core optical fiber cable such as 1000BASE-BX is used, make sure that the transceiver of the Switch is suitable to use with the remote transceiver.	The combination of the transceivers is incorrect.	If 1000BASE-BX is used, one side must use a U-type transceiver and the other side must use a D-type transceiver. Check whether the transceiver types are correct.
5	If 100BASE-FX is used, execute the `show interfaces` command and check the line type and line speed in the detail information displayed for the target port. If the line type or speed is invalid, see the *Cause* and *Action* columns.	The values specified for the `speed` and `duplex` configuration commands are different from those on the remote device.	For the `speed` and `duplex` configuration commands, specify the same values that are on the remote device.

No.	Items to check	Cause	Action
6	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • Long frames	Packets exceeding the maximum allowed frame length are received.	Adjust the jumbo frame settings to those on the remote device.
7	Use the `show qos queueing` command to check whether there is a count for the following item. If there is a count, see the *Cause* and *Action* columns. • discard_pkt	Packets are discarded.	Check whether drop control and the shaper are being used appropriately in the system configuration.

3.5.5 Actions to be taken for 10GBASE-R/40GBASE-R problems

If a 10GBASE-R/40GBASE-R problem occurs, use the procedure below to isolate the failure.

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem according to the failure analysis method

   Isolate the cause of the problem according to the failure analysis method described in the following table.

   Table 3-12: Failure analysis method for 10GBASE-R/40GBASE-R problems

No.	Items to check	Cause	Action
1	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. For AX6700S, AX6600S, or AX6300S series switches: - Signal detect errors - LOS of sync - HI_BER - LF For AX3800S, AX3600S, or AX2400S series switches: - Signal detect errors	Line quality on the receiving side is degraded.	Check the type of the optical fiber. For the types, see the *Hardware Instruction Manual*.
			If an optical attenuator is used, check the attenuation value. For the optical level, see the *Hardware Instruction Manual*.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.

No.	Items to check	Cause	Action
			Check whether the cables are connected correctly (for example, check for incomplete insertion). Make sure that the end sections of the cables are clean. If they are dirty, clean them.
			Check whether the transceiver is connected correctly.
			Adjust the transceiver to comply with the segment standard of the remote device.
			Check whether the optical level is correct. For the optical level, see the *Hardware Instruction Manual*.
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
2	Use the `show interfaces` command to display the failure statistics for the receiving side, and check whether there are counts for the following items for the target port. If there is a count, see the *Cause* and *Action* columns. • CRC errors • Symbol errors	Line quality on the receiving side is degraded.	Check the type of the optical fiber. For the types, see the *Hardware Instruction Manual*.
			If an optical attenuator is used, check the attenuation value. For the optical level, see the *Hardware Instruction Manual*.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion). Make sure that the end sections of the cables are clean. If they are dirty, clean them.
			Check whether the transceiver is connected correctly.
			Adjust the transceiver to comply with the segment standard of the remote device.
			Check whether the optical level is correct. For the optical level, see the *Hardware Instruction Manual*.
			Perform a line test on the Switch and make sure that the functionality of the receiving side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.

No.	Items to check	Cause	Action
3	For AX6700S, AX6600S, or AX6300S series switches, use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • RF	Line quality on the sending side is degraded.	Check the type of the optical fiber. For the types, see the *Hardware Instruction Manual*.
			If an optical attenuator is used, check the attenuation value. For the optical level, see the *Hardware Instruction Manual*.
			Check the cable length. For the cable length, see the *Hardware Instruction Manual*.
			Check whether the cables are connected correctly (for example, check for incomplete insertion). Make sure that the end sections of the cables are clean. If they are dirty, clean them.
			Check whether the transceiver is connected correctly.
			Adjust the transceiver to comply with the segment standard of the remote device.
			Check whether the optical level is correct. For the optical level, see the *Hardware Instruction Manual*.
			Perform a line test on the Switch and make sure that the functionality of the sending side has no problem. Check the results of the `no test interfaces` command, and take the action described in Action. For the test types to be specified, see *6.1 Testing a line*.
4	Use the `show interfaces` command to display the failure statistics, and check whether there is a count for the following item for the target port. If there is a count, see the *Cause* and *Action* columns. • Long frames	Packets exceeding the maximum allowed frame length are received.	Adjust the jumbo frame settings to those on the remote device.
5	Use the `show qos queueing` command to check whether there is a count for the following item. If there is a count, see the *Cause* and *Action* columns. • discard_pkt	Packets are discarded.	Check whether drop control and the shaper are being used appropriately in the system configuration.

3.5.6 Actions to be taken for PoE problems

If a problem such as a disabled power supply unit occurs when PoE is used, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-13: Communication failure analysis method when PoE is used

No.	Items to check and commands	Action
1	Use the `show power inline` command to check the information displayed for `PoEStatus` for the target port.	• When `off` is displayed for `PoEStatus`: Power is not being supplied. Go to No. 2. • When `denied` is displayed for `PoEStatus`: The supplied power is insufficient for the entire switch. Go to No. 3. • When `faulty` is displayed for `PoEStatus`: The power supply unit to the connected device is disabled. Go to No. 4.
2	Check whether `shutdown` is set for the target port.	• When set: Set `no shutdown`. • When not set: Make sure a power-receiving device is connected.
3	Use the `show power inline` command to check the values of `Threshold(W)` and `Allocate(W)`.	Power cannot be supplied because the value of `Allocate(W)` is larger than the value of `Threshold(W)`. Check the amount of power being supplied to the entire switch, the amount of power allocation to the ports, and the power consumption by the ports, and then adjust the allocation amount in the configuration.
4	Execute the `show logging` command and check whether a failure has occurred.	There might be a problem with the power-receiving device or a connection cable. • When `0/x Supplying power was stopped by the overload detection.` is displayed: Power cannot be supplied because an overload was detected. Check the power-receiving device or connection cables. If the problem cannot be corrected, check the cable length and cable type in the *Hardware Instruction Manual*, and replace the cables. If devices to which PoE power can be supplied are connected, use the `power inline` configuration command to disable PoE on the target port.

3.5.7 Communication failures when link aggregation is used

If communication is not possible or if degraded operation is in effect when link aggregation is used, isolate the cause of the problem according to the failure analysis method in the following table.

Table 3-14: Communication failure analysis method when link aggregation is used

No.	Items to check and commands	Action
1	Use the `show channel-group` command with the `detail` parameter to check the link aggregation setting that caused the communication failure.	Make sure the link aggregation mode is the same as the mode for the remote device. If the modes are different, modify the link aggregation mode so that it will be the same as the mode for the remote device.
		If the link aggregation modes match, check whether the LACP start method is set to passive for both ports. If passive is set for both ports, change the setting of one of the ports to active.
2	Use the `show channel-group` command with the `detail` parameter to check the operating status of the port that caused the communication failure.	Check the status of each port displayed for `Status`. If all ports of the channel group have gone down, the channel group also goes down. Based on the value displayed for `Reason`, take one of the actions described below on ports that have gone down. • CH Disabled The link channel group is disabled and down.

No.	Items to check and commands	Action
		• Port Down The status of the port is link down. For details, see *3.5 Network interface communication failures*. • Port Speed Unmatch The line speed of the port is different from that of the other ports in the channel group, and degradation has occurred. To avoid the degradation, specify the same speed for all ports in the channel group. • Duplex Half The mode is `Half` and degradation has occurred. To avoid the degradation, set Duplex mode to `Full`. • Port Selecting The port aggregation condition check is being performed, and degradation has occurred. Wait for a while, and if the problem is not resolved, check the operating status and the settings of the remote device. • Waiting Partner Synchronization The port aggregation condition check has been finished, but degradation has occurred because the system is waiting for the partner port to be synched. Wait for a while, and if the problem is not resolved, check the operating status and the settings of the remote device. • Partner System ID Unmatch The Partner System ID received from the partner port is different from the Partner System ID of the group, and degradation has occurred. To avoid the degradation, check the operating status of the remote device and also check the wiring. • LACPDU Expired The valid time of the LACPDU from the partner port has expired, and the target port is in a degraded state. Use the `show channel-group statistics` command with the `lacp` parameter to check the statistics for the LACPDU. Also, check the operating status of the remote device. • Partner Key Unmatch The key received from the partner port is different from the Partner Key of the group, and degradation has occurred. To avoid the degradation, check the operating status of the remote device and also check the wiring. • Partner Aggregation Individual A "link aggregation impossible" message is received from the partner port, and degradation has occurred. To avoid degradation, check the operating status and the settings of the remote device. • Partner Synchronization OUT_OF_SYNC A "synchronization impossible" message is received from the partner port, and degradation has occurred. (This state occurs if the configuration is changed on the Switch or if the line is deactivated on the remote device.) • Port Moved The connected port has been connected to another port. Check the wiring. • Operation of Detach Port Limit The port detachment restriction functionality is activated, and the channel group is down.

3.6 Layer 2 network communication failures

3.6.1 Layer 2 communication by VLANs is not possible

If Layer 2 communication is not possible when VLANs are used, isolate the cause of the problem according to the failure analysis method described in the table below.

(1) Checking the VLAN status

Execute the `show vlan` command or the `show vlan` command with the `detail` parameter to check the status of the VLAN. The following describes the items that must be checked for each VLAN type.

(a) Items checked in common for all VLAN types

- Check whether the VLAN is configured correctly on the port.
- Check whether the correct mode is set for the port. If the expected port does not belong to the default VLAN (VLAN ID 1), check whether:
  - A port VLAN other than VLAN ID 1 is specified for the access VLAN or native VLAN.
  - The default VLAN is set in `allowed vlan` for trunk ports.
  - The port is specified as a mirror port.
- Check whether IEEE 802.1X VLAN-based authentication (static), Web authentication (fixed VLAN mode), or MAC-based authentication is set only for some of the VLANs configured for trunk ports.

(b) For protocol VLANs

When you are using a protocol VLAN, execute the `show vlan` command and make sure the protocol has been configured correctly.

```
# show vlan
       :
VLAN ID:100   Type:Protocol based  Status:Up
  Protocol VLAN Information  Name:ipv4
    EtherType:0800,0806  LLC:  Snap-EtherType:
  Learning:On   Uplink-VLAN:       Uplink-Block:    Tag-Translation:
       :
```

(c) For MAC VLANs

- When you are using a MAC VLAN, execute the `show vlan mac-vlan` command and make sure the MAC addresses allowed for communication that uses the VLAN have been set correctly. In the example below, the value enclosed in parentheses indicates the functionality used to register the MAC address.

  [Functionality]

  `static`: The MAC address is set in the configuration.

  `dot1x`: The MAC address is set by the IEEE 802.1X functionality.

  `wa`: The MAC address is set by Web authentication.

  `vaa`: The MAC address is set by an authentication VLAN.

```
# show vlan mac-vlan
       :
VLAN ID:100     MAC Counts:4
    0012.e200.0001 (static)        0012.e200.00:02 (static)
    0012.e200.0003 (static)        0012.e200.00:04 (dot1x)
```

- Execute the `show vlan mac-vlan` command and make sure the MAC address set for a VLAN by using the Layer 2 authentication functionality has not been set for another VLAN in the configuration. In the example below, the MAC address indicated with an asterisk (`*`) is disabled because the address has also been set in the configuration.

```
# show vlan mac-vlan
       :
VLAN ID:500     MAC Counts:4
    0012.e200.aa01 (static)         0012.e200.aa02 (static)
    0012.e200.aa03 (static)         0012.e200.aa04 (dot1x)
VLAN ID:600     MAC Counts:1
  * 0012.e200.aa01 (dot1x)
```

(2) Checking the port status

- Execute the `show vlan` command with the `detail` parameter and make sure the port status is `Up`. If the status is `Down`, see *3.5 Network interface communication failures*.
- Make sure the port status is `Forwarding`. If it is `Blocking`, the cause is indicated in parentheses. Check the status of the functionality that caused the problem.

[Cause]

`VLAN`: Suspend is specified for the VLAN.

`CH`: Transfer has been suspended by the link aggregation functionality.

`STP`: Transfer has been suspended by the Spanning Tree functionality.

`GSRP`: Transfer has been suspended by GSRP.

`dot1x`: Transfer has been suspended by the IEEE 802.1X functionality.

`CNF`: Transfer has been suspended because the configuration cannot be set.

`AXRP`: Transfer has been suspended by Ring Protocol.

```
# show vlan detail
       :
VLAN ID:100   Type:Protocol based  Status:Up
       :
  Port Information
   0/1          Up   Forwarding      Untagged
   0/2          Up   Forwarding      Tagged
```

(3) Checking the MAC address table

(a) Checking the status of MAC address learning

- Execute the `show mac-address-table` command and check the information about the destination MAC address that caused the communication failure.

```
# show mac-address-table
MAC address        VLAN    Type     Port-list
0012.e22c.650c       10    Dynamic  0/1
0012.e22c.650b        1    Dynamic  0/2
```

- Take one of the actions described below according to the value displayed for `Type`.

When Dynamic is displayed for Type:

The MAC address learning information might not have been updated. Use the `clear mac-address-table` command to clear the old information. Information can also be updated by sending frames from the destination device.

When Static is displayed for Type:

Use the `mac-address-table static` configuration command to check the destination

port for the transfer.

When Snoop is displayed for Type:

See *3.6.4 Multicast forwarding by IGMP snooping is not possible* and *3.6.5 Multicast forwarding by MLD snooping is not possible*.

When Dot1x is displayed for Type:

See *3.13.1 Communication failures occurring when IEEE 802.1X is used*.

When Wa is displayed for Type:

See *3.13.2 Communication failures occurring when Web authentication is used*.

When Macauth is displayed for Type:

See *3.13.3 Communication failures occurring when MAC-based authentication is used*.

- If the target MAC address is not displayed, flooding is performed.
  - For AX6700S, AX6600S, and AX6300S series switches:

    If the MAC address is not displayed, but communication is still disabled, check whether learning has been suspended by the limitation of MAC address learning. Also check whether a threshold that is too low is set for the storm control functionality.
  - For AX3800S, AX3600S, and AX2400S series switches:

    If the MAC address is not displayed, but communication is still disabled, check whether inter-port relay suppression has been set. Also check whether a threshold that is too low is set for the storm control functionality.

(b) Checking the MAC address learning limitation

For AX6700S, AX6600S, and AX6300S series switches, execute the `show mac-address-table` command with the `learning-counter` parameter and check the information about the MAC address learning limitation for the target port and VLAN.

```
>show mac-address-table learning-counter port 1/1-6
Date 2005/09/21 20:00:57 UTC
Port counts:6
Port       Count  Maximum Threshold  Status
1/1            3        -         -  -
1/2         1000     1000       800  Learning
1/3            0        -         -  -
1/4           50       60        40  Stop learning   <---1
1/5           45       60        40  Learning
1/6            0       60        40  Learning
>show mac-address-table learning-counter vlan
Date 2005/09/21 20:00:57 UTC
VLAN counts:4
ID         Count  Maximum Threshold  Status
   1           3        -         -  -
 100        1000     1000       800  Stop learning   <---1
 200           0        -         -  No learning     <---2
4095          90      100       100  Learning
```

1. The MAC address learning limit value has been reached, and MAC address learning has been stopped. Received frames that contain an unlearned sender MAC address are discarded without the MAC address being learned. However, frames from a VLAN for which MAC address learning is suppressed are flooded.
2. MAC address learning is set to be suppressed. The received frames are flooded.

(4) Checking filters and QoS

Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. Make sure that the setting conditions for filters and QoS control

in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

3.6.2 Failures occurring when the Spanning Tree functionality is used

If Layer 2 communication fails or the operating status of the Spanning Tree Protocol does not conform to the network configuration when the Spanning Tree functionality is used, use the analysis method described below to isolate the cause of the problem. For Multiple Spanning Tree, perform the check for each CIST or each MST instance. When checking a root bridge, for example, replace the word root bridge with CIST root bridge or root bridge for each MST instance.

Table 3-15: Failure analysis method for Spanning Tree Protocols

No.	Items to check and commands	Action
1	Execute the `show spanning-tree` command for the Spanning Tree Protocol that caused the failure, and then check the status of the protocol of the Spanning Tree Protocol.	If the displayed status is `Enable`, go to No. 2.
		If Ring Protocol and PVST+ are used together, but the tree information of the target VLAN is not displayed, go to No. 7.
		If the displayed status is `Disable`, the Spanning Tree Protocol has stopped. Check the configuration.
		If Ring Protocol and Multiple Spanning Tree are used together, go to No. 8.
		Check whether the number of the PVST+ instances is within the capacity limit.
2	Execute the `show spanning-tree` command for the Spanning Tree Protocol that caused the failure, and then check the bridge identifier of the root bridge for the Spanning Tree Protocol.	If the bridge identifier of the root bridge indicates the root bridge defined in the network configuration, go to No. 3.
		If the bridge identifier of the root bridge does not indicate the root bridge defined in the network configuration, check the network configuration and other configurations.
3	Execute the `show spanning-tree` command for the Spanning Tree Protocol that caused the failure, and then check the port status and port role for the Spanning Tree Protocol.	If the port status and port role for the Spanning Tree Protocol are the same as those defined in the network configuration, go to No. 4.
		For versions prior to Version 10.6: If the status of a port for which the loop guard functionality is enabled is `Blocking` or `Discarding`, check whether the port is a designated port. If it is a designated port, delete the setting of the loop guard functionality.
		If the port status and port role for the Spanning Tree Protocol are different from the network configuration, check the status of neighboring devices and their configurations.
4	Execute the `show spanning-tree statistics` command for the Spanning Tree Protocol that caused the failure, and then check whether BPDUs were sent and received on the failed port.	Check the BPDU sending or receiving counter. For a root port: If the BPDU receiving counter has been incremented, go to No. 5. If the counter has not been incremented, BPDUs might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. See *3.25.1 Checking the filters and QoS configuration information* and check for a problem. If you do not find any problems, check the neighboring devices. For a designated port: If the BPDU sending counter has been incremented, go to No. 5. If the counter has not been incremented, see *3.5 Network interface communication failures*.

No.	Items to check and commands	Action
5	Execute the `show spanning-tree` command with the `detail` parameter for the Spanning Tree Protocol that caused the failure, and then check the bridge identifier for the received BPDUs.	Make sure the root bridge identifier and sending bridge identifier for the received BPDUs are the same as those defined in the network configuration. If they are different from the network configuration, check the status of the neighboring devices.
6	Check whether the value for maximum number of Spanning Tree Protocols, one of which caused the failure, is within the capacity limit.	Set a value within the capacity limit. For details about capacity limits, see the *Configuration Guide*.
7	Make sure that only one VLAN intended to be used in PVST+ mode is set in `vlan-mapping` for Ring Protocol.	Set the target VLAN in `vlan-mapping` for Ring Protocol if not set. If multiple VLANs are set in `vlan-mapping`, specify only one VLAN in the `vlan-mapping` setting.
8	Make sure that VLANs intended to be used in an MST instance are correctly set in `vlan-mapping` for Ring Protocol.	If any of the target VLANs are not set in `vlan-mapping` for Ring Protocol, set them to be consistent with the VLANs for Multiple Spanning Tree.

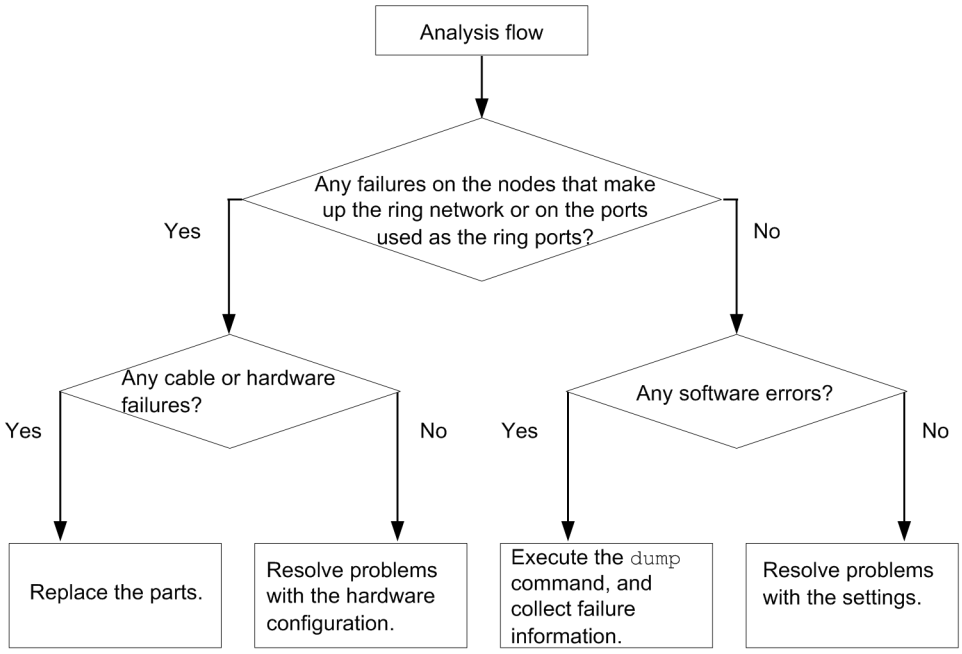
3.6.3 Failures occurring when the Ring Protocol functionality is used

This subsection describes failures occurring in the Autonomous Extensible Ring Protocol.

The Autonomous Extensible Ring Protocol (abbreviated hereafter to *Ring Protocol*) is a Layer 2 network redundancy protocol for ring topologies.

If communication is not possible when the Ring Protocol is used, use the following analysis flowchart to determine the problem and isolate the cause.

Figure 3-3: Analysis flowchart



If operation cannot be performed correctly or a ring network failure is detected when the Ring Protocol is used, use the failure analysis method described in the table below to isolate the cause of the problem for all nodes in the target ring network.

Table 3-16: Failure analysis method for the Ring Protocol

No.	Items to check and commands	Action
1	Use the `show axrp` command to check the operating status of the Ring Protocol.	If `enable` is displayed for `Oper State`, go to No. 3.
		If a hyphen (`-`) is displayed for `Oper State`, required items for using the Ring Protocol have not been configured. Check the configuration.
		If `disable` is displayed for `Oper State`, the Ring Protocol is disabled. Check the configuration.
		If `Not Operating` is displayed for `Oper State`, the Ring Protocol functionality is not running. Check the configuration for any conflict (for example, an incorrect combination of the attribute and ring port for the operating mode of the Switch). If there is no conflict in the configuration, for AX6700S, AX6600S, or AX6300S series switches, go to No. 2. For AX3800S, AX3600S, or AX2400S series switches, go to No. 3.
2	Use the `show logging` command to check whether entries are properly registered in the MAC address table as the initial operation of the Ring Protocol.	If the message `The MAC address entry can't be registered at hardware tables.` is not displayed, go to No. 3.
		If the message `The MAC address entry can't be registered at hardware tables.` is displayed, the entry setting in the MAC address table needed to operate the Ring Protocol has failed. See the appropriate part in the manual *Message and Log Reference*, and take the action described in Action. Also, see *4.1.2 Actions to be taken when a MAC address table resource shortage occurs*.
3	Use the `show axrp` command to check the operating mode and attribute.	If the operating mode and attribute defined in the network configuration are displayed for `Mode` and `Attribute`, go to No. 4.
		If any other information is displayed, check the configuration.
4	Use the `show axrp` command to check the ring port and its status for each VLAN group.	If the information about the port and status defined in the network configuration is displayed for `Ring Port` and `Role/State`, go to No. 5.
		If any other information is displayed, check the configuration.
5	Use the `show axrp detail` command to check the control VLAN ID.	If the VLAN ID defined in the network configuration is displayed for `Control VLAN ID`, go to No. 6.
		If any other information is displayed, check the configuration. For example, the Control VLAN IDs might be different for each device in a ring topology.
6	Use the `show axrp detail` command to check the VLAN IDs that belong to the VLAN group.	If the VLAN IDs defined in the network configuration are displayed for `VLAN ID`, go to No. 7.
		If any other information is displayed, check the configuration. For example, the VLAN IDs that belong to the VLAN group might be different for each device in a ring topology.
7	Use the `show axrp detail` command to check the timer value of the health-check frame sending interval and that of the health-check frame hold time.	If the `Health Check Hold Time` timer value of the health-check frame hold time is larger than the `Health Check Interval` timer value of the health-check frame sending interval (i.e., transmission delay is taken into account), go to No. 8.
		If the timer value of the health-check frame hold time is equal to or smaller than that of the health-check frame sending interval (i.e., transmission delay is not taken into account), check the settings in the configuration.

No.	Items to check and commands	Action
8	Use the `show vlan detail` command to check the state of the VLAN used for the Ring Protocol and the VLAN port states.	If there is no anomaly in the states of the VLAN and its ports, go to No. 9. Also, go to No. 10 for the configuration in which a Spanning Tree Protocol or GSRP is used together with the Ring Protocol, and go to No. 11 for the configuration in which the multi-fault monitoring functionality is applied.
		If there is any anomaly, check the configuration and restore the states of the VLAN and its ports.
9	Check the filters and QoS control configurations.	The control frames used for the Ring Protocol might have been discarded by filters and QoS control. See *3.25.1 Checking the filters and QoS configuration information* and check for a problem. Also, see the *Configuration Guide*.
10	If a Spanning Tree Protocol or GSRP is set to be used together with the Ring Protocol, check the virtual link settings.	Check whether the virtual link settings in the configuration are the same as those defined in the network configuration. • Check whether the virtual link is set for devices that use a Spanning Tree Protocol or GSRP together with the Ring Protocol. • For devices in the entire ring network, check whether the VLANs used in the virtual link are included in the VLAN group for the Ring Protocol.
11	If the multi-fault monitoring functionality is applied, use the `show axrp detail` command to check the operating mode for the multi-fault monitoring functionality.	If shared nodes have `monitor-enable` configured and other devices have `transport-only` configured, go to No. 12.
		If any other information is displayed, check the configuration.
12	Use the `show axrp detail` command to check the backup ring IDs and VLAN IDs for the multi-fault monitoring functionality.	If the backup ring ID and the VLAN ID for the multi-fault monitoring functionality defined in the network configuration are displayed for `Backup Ring ID` and `Control VLAN ID`, go to No. 13.
		If any other information is displayed, check the configuration.
13	Use the `show axrp detail` command to check the timer value of the multi-fault monitoring functionality frame sending interval and that of the hold time to determine that multiple faults have occurred when multi-fault monitoring frames are not received.	Make sure that the `Multi Fault Detection Hold Time` timer value is larger than the `Multi Fault Detection Interval` timer value (i.e., transmission delay is taken into account).
		If any other information is displayed, check the configuration.

3.6.4 Multicast forwarding by IGMP snooping is not possible

If multicast forwarding is not possible when IGMP snooping is used, use the following analysis flowchart to determine the problem and isolate the cause.

Figure 3-4: Analysis flowchart

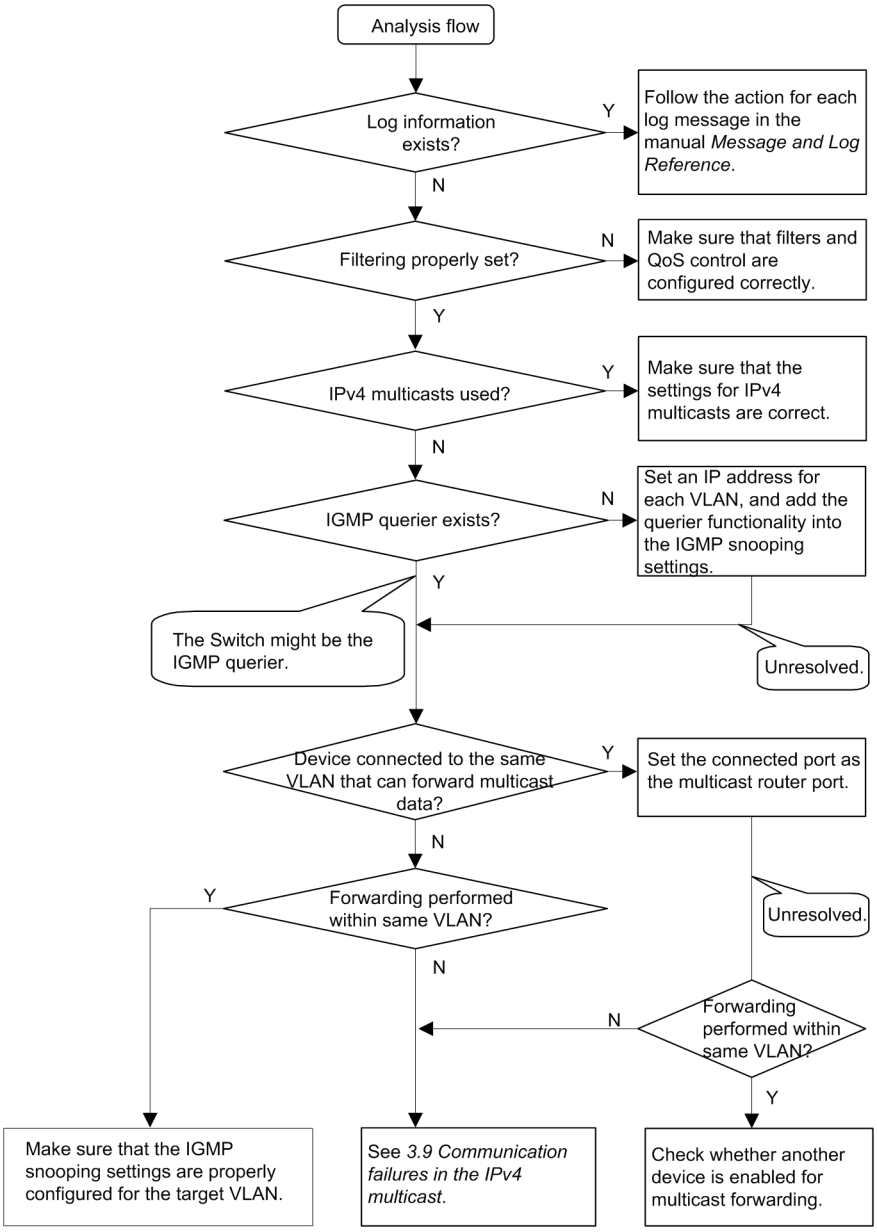


Table 3-17: Failure analysis method for multicast forwarding

No.	Items to check and commands	Action
1	Use the `show logging` command and check whether a failure has occurred.	Check the following: • Check whether log information about a physical fault has been recorded.
2	Make sure filters and QoS control are configured correctly.	Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

No.	Items to check and commands	Action

3	Make sure the settings for using IPv4 multicast are correct.	Check the following:
		• For AX3800S or AX3600S series switches, check whether the setting of the `swrt_multicast_table` configuration command is applied.
		
		If the `swrt_multicast_table` configuration command is correctly set, `On` is displayed for `Current selected swrt_multicast_table:` when the `show system` command is executed.
		
		`Current selected swrt_multicast_table: On`
		
		If `Off` is displayed when the `swrt_multicast_table` configuration command has been set, the Switch must be restarted.
		
		• For AX3800S or AX3600S series switches, if both IPv4 multicast and IGMP snooping are used simultaneously, make sure that IPv4 multicast is used for the target VLAN.
		
		If the IPv4 multicast is used for the target VLAN, `On` is displayed for `IPv4 Multicast routing:` when the `show igmp-snooping` command is executed.
		
		`IPv4 Multicast routing: On`
		
		• If the static group participation functionality of IPv4 multicast is used for the target VLAN, set the multicast router port for ports that use the multicast communication.
		
		• If the number of entries registered for IGMP snooping exceeds the capacity limit, multicast relay entries of IPv4 multicast generated subsequently are for communications only for multicast router ports. Configure the network so that the number of entries registered for IGMP snooping does not exceed the capacity limit.
		
		If the number of entries registered for IGMP snooping exceeds the capacity limit, the following log information is displayed:
		
		`IGMP snooping: The number of the IGMP snooping entry exceeded the capacity of this system.`

No.	Items to check and commands	Action

4	Use the `show igmp-snooping` command to check the IGMP snooping configuration.	Check the following:
		• To check whether the IGMP querier that monitors the group members exists, make sure one of the following messages is displayed.
		
		(1) If the IGMP querier exists, the IP address of the IGMP querier is displayed:
		`IGMP querying system: 192.168.11.20*`
		
		(2) If the IGMP querier does not exist, nothing is displayed for `IGMP querying system:`
		`IGMP querying system:`
		
		• If the Switch is the IGMP querier, make sure the IP address has been set for the VLAN.
		
		(1) If the IP address has been set for the VLAN, the following message is displayed:
		`IP Address: 192.168.11.20*`
		
		(2) If the IP address has not been set for the VLAN, nothing is displayed for `IP Address`:
		`IP Address:`
		
		• If a multicast router is connected, check the `Mrouter-port` setting.
		
		`> show igmp-snooping 100`
		`Date 2005/05/15 15:20:00`
		`VLAN 100:`
		`IP Address:192.168.11.20 Querier : enable`
		`IGMP querying system : 192.168.11.20`
		`Port (2): 0/1,0/3`
		`Mrouter-port:0/1`
		`Group Counts: 3`

5	Use the `show igmp-snooping` command with the `group` parameter to check the IPv4 multicast group address.	Check the following:
		• Make sure the joined IPv4 multicast group address is displayed by the `show igmp-snooping group` command.
		
		`> show igmp-snooping group 100`
		`Date 2005/05/15 15:20:00`
		`VLAN 100 Group counts:3`
		`Group Address MAC Address`
		`224.10.10.10 0100.5e0a.0a0a`
		`Port-list 0/1-3`
		`225.10.10.10 0100.5e0a.0a0a`
		`Port-list 0/1-2`
		`239.192.1.1 0100.5e40.1606`
		`Port-list 0/1`

If the Switch is the IGMP querier, the same address is displayed for `IGMP querying system` and `IP Address`. If any other device is the IGMP querier, the address displayed for `IGMP querying system` is not the same as the address displayed for `IP Address`.

3.6.5 Multicast forwarding by MLD snooping is not possible

If multicast forwarding is impossible when MLD snooping is used, use the following analysis flowchart to determine the problem and isolate the cause.

Figure 3-5: Analysis flowchart

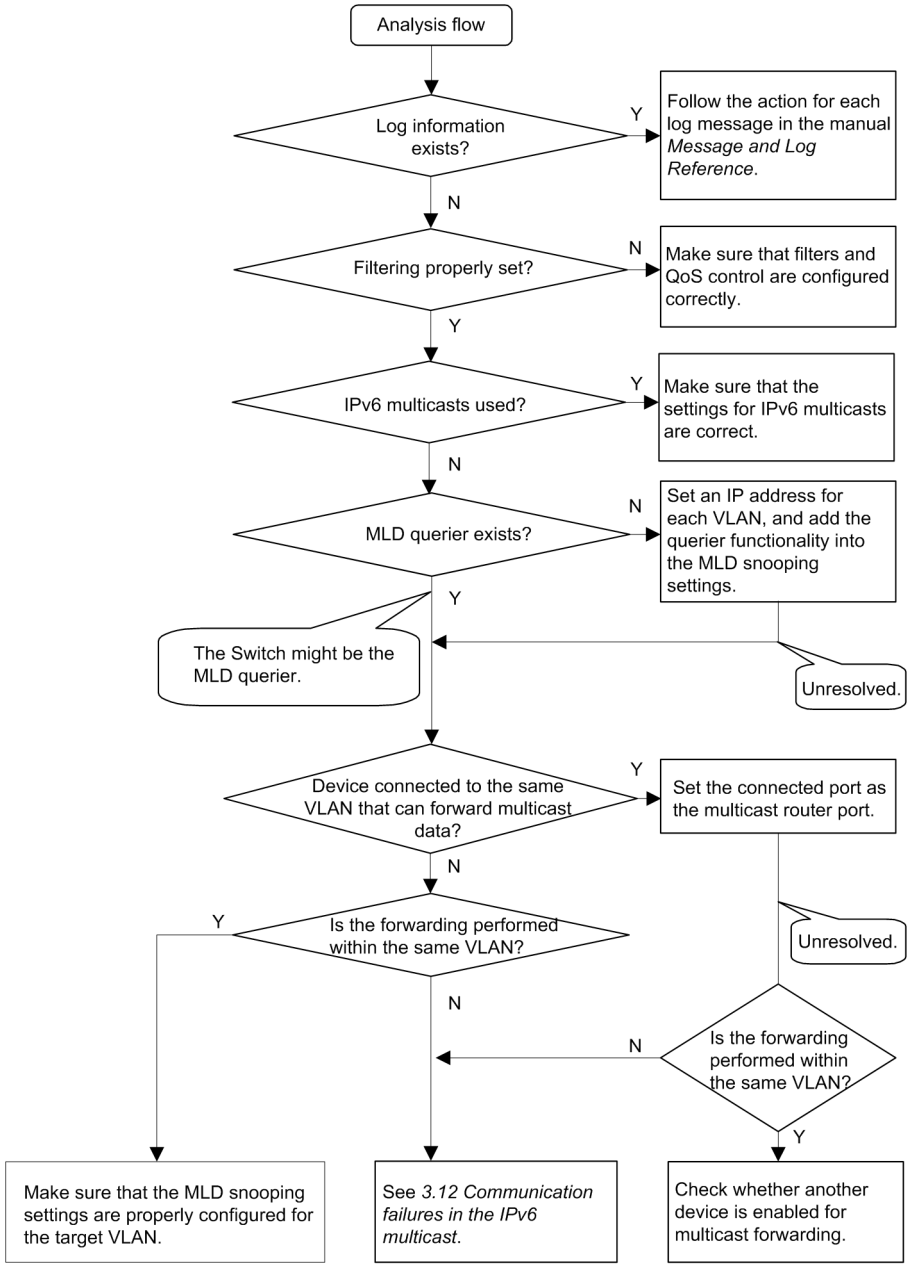


Table 3-18: Failure analysis method for multicast forwarding

No.	Items to check and commands	Action
1	Use the `show logging` command and check whether a failure has occurred.	Check the following: • Check whether log information about a physical fault has been recorded.
2	Make sure filters and QoS control are configured correctly.	Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

No.	Items to check and commands	Action

3	Make sure the settings for using IPv6 multicast are correct.	Check the following:
		• For AX3800S or AX3600S series switches, check whether the setting of the `swrt_multicast_table` configuration command is applied.
		
		If the `swrt_multicast_table` configuration command is correctly set, `On` is displayed for `Current selected swrt_multicast_table:` when the `show system` command is executed.
		
		`Current selected swrt_multicast_table: On`
		
		If `Off` is displayed when the `swrt_multicast_table` configuration command has been set, the Switch must be restarted.
		
		• For AX3800S or AX3600S series switches, if both IPv6 multicast and MLD snooping are used simultaneously, make sure that IPv6 multicast is used for the target VLAN.
		
		If the IPv6 multicast is used for the target VLAN, `On` is displayed for `IPv6 Multicast routing:` when the `show mld-snooping` command is executed.
		
		`IPv6 Multicast routing: On`
		
		• If the static group participation functionality of IPv6 multicast is used for the target VLAN, set the multicast router port for ports that use the multicast communication.
		
		• If the number of entries registered for MLD snooping exceeds the capacity limit, multicast relay entries of IPv6 multicast generated subsequently are for communications only for multicast router ports. Configure the network so that the number of entries registered for MLD snooping does not exceed the capacity limit.
		
		If the number of entries registered for MLD snooping exceeds the capacity limit, the following log information is displayed.
		
		`MLD snooping: The number of the MLD snooping entry exceeded the capacity of this system.`

No.	Items to check and commands	Action

4	Use the `show mld-snooping` command to check the MLD snooping configuration.	Check the following:
		• To check whether the MLD querier that monitors the group members exists, make sure one of the following messages is displayed.
		
		(1) If the MLD querier exists, the IP address of the MLD querier is displayed:
		`MLD querying system: fe80::200:87ff:fe10:1959*`
		
		(2) If the MLD querier does not exist, nothing is displayed for `MLD querying system:`
		`MLD querying system:`
		
		• If the Switch is the MLD querier, make sure the IP address has been set for the VLAN.
		
		(1) If the IP address has been set for the VLAN, the following message is displayed:
		`IP Address: fe80::200:87ff:fe10:1959*`
		
		(2) If the IP address has not been set for the VLAN, nothing is displayed for `IP Address`:
		`IP Address:`
		
		• If a multicast router is connected, check the `Mrouter-port` setting.
		
		`>show mld-snooping 100`
		`Date 2005/05/15 15:20:00`
		`VLAN 100:`
		`IP Address:fe80::200:87ff:fe10:1959 Querier : enable`
		`MLD querying system: fe80::200:87ff:fe10:1959`
		`Port(2): 0/1,0/3`
		`Mrouter-port: 0/1`
		`Group Count :3`

5	Use the `show mld-snooping` command with the `group` parameter to check the IPv6 multicast group address.	Check the following:
		• Make sure the joined IPv6 multicast group address is displayed by the `show mld-snooping group` command.
		
		`> show mld-snooping group 100`
		`Date 2005/05/15 15:20:00`
		`VLAN 100 Group count:2`
		`Group Address MAC Address`
		`ff0e::0e0a:0a01 3333.0e0a.0a01`
		`Port-list 0/1-3`
		`ff0e::0102:0c11 3333.0102.0c11`
		`Port-list 0/1-2`

#: If the Switch is the MLD querier, the same address is displayed for `MLD querying system` and `IP Address`. If any other switch is the MLD querier, the address displayed for `MLD querying system` is not the same as the address displayed for `IP Address`.

3.7 IPv4 network communication failures

3.7.1 Communication is not possible or is disconnected

There are three probable causes of problems that occur during communication on an IPv4 network employing a Switch:

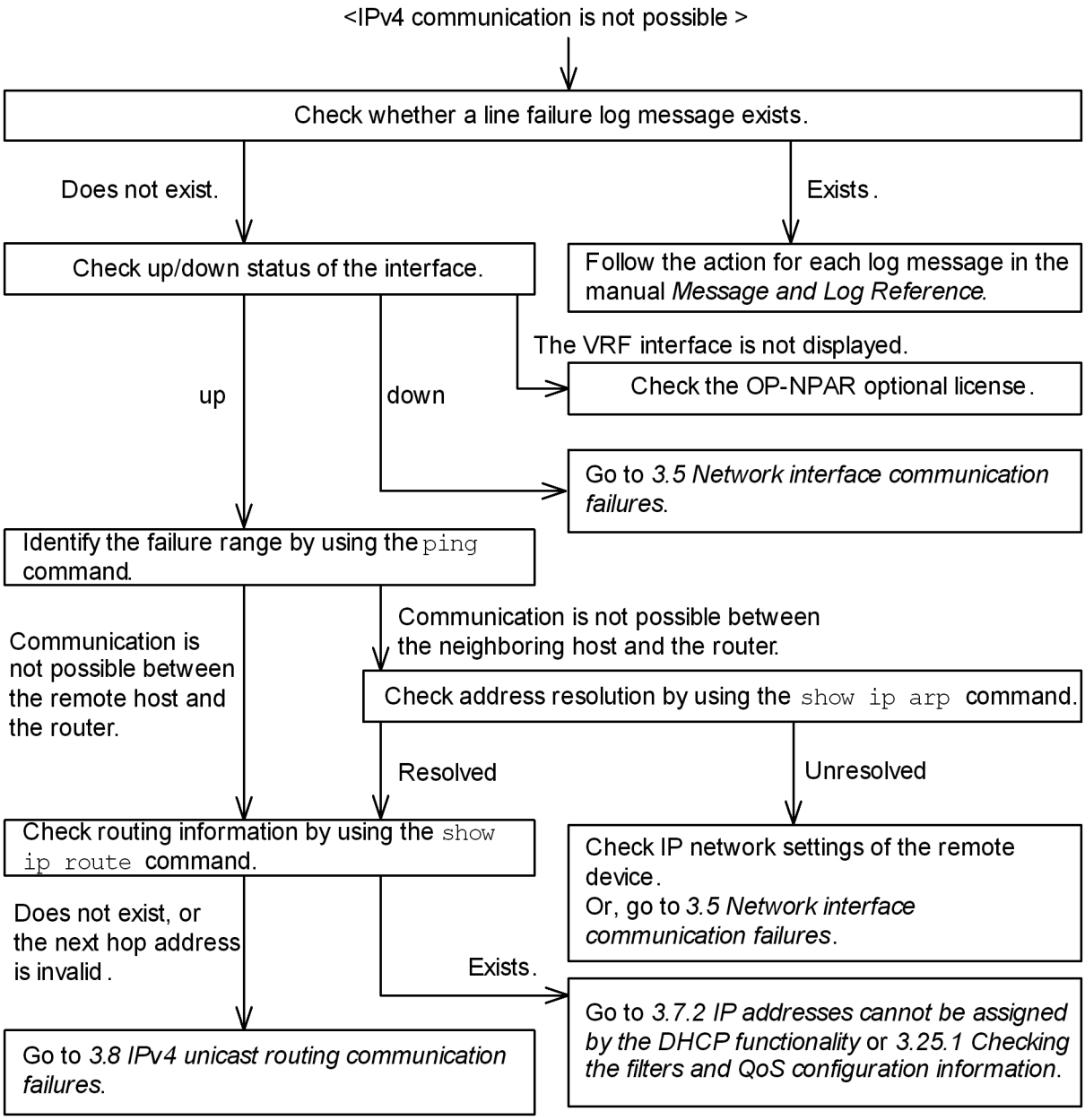
1. A configuration related to IP communication is changed.
2. The network configuration is changed.
3. A network device fails.

For causes 1 and 2, check the differences in the configuration and network configuration before and after the change to uncover any cause that could disable communication.

This subsection describes the procedure for isolating the fault location to determine the cause of a problem, and applies mainly to cause 3 failures. For example, IP communication might not be possible even when the configuration and the network configuration are correct, or for operation that hitherto has been normal, IP communication is no longer possible.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-6: Failure analysis procedure when IPv4 communication is not possible



(1) Checking the log

One probable cause of disabled communication is a line failure (or damage). To display the messages that indicate a hardware failure, carry out the procedure below. You can find these messages in the log displayed by the Switch.

For details about the contents of the log, see the manual *Message and Log Reference*.

1. Log in to the Switch.
2. Use the `show logging` command to display the log.
3. Each entry in the log indicates the date and time that a failure occurred. Check whether a log entry was displayed for the date and time when communication was disabled.
4. For details about the failure and corrective action for the log entry described above, see the manual *Message and Log Reference*, and then follow the instructions given in the manual.

5. If a log entry was not displayed for the date and time when communication was disabled, see *(2) Checking the interface status*.

(2) Checking the interface status

Even when the Switch hardware is operating normally, a fault could have occurred on the hardware of a neighboring device connected to the Switch.

To check the status of the interface between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ip interface` command to check whether the status of the interface with the target neighboring device is `Up` or `Down`.
3. For AX6700S, AX6600S, and AX6300S series switches, if the target interface working as a VRF interface is not displayed, see *(9) Checking the optional license OP-NPAR*.
4. If the status of the target interface is `Down`, see *3.5 Network interface communication failures*.
5. If the status of the target interface is `Up`, see *(3) Identifying the range for a failure (from the Switch)*.

(3) Identifying the range for a failure (from the Switch)

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote devices. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. Use the `ping` command to check the communication with the two remote devices that are unable to communicate. For details about examples of using the `ping` command and how to interpret the execution result, see the *Configuration Guide*.
3. If communication with the remote devices cannot be verified by the `ping` command, execute the command again to check communication with each of the devices up to the remote device, beginning with the device closest to the Switch.
4. If the execution result of the `ping` command indicates that the failure occurred on the neighboring device, see *(5) Checking the ARP resolution information with a neighboring device*. If the execution result indicates a failure on the remote device, see *(6) Checking the unicast routing information*.

(4) Identifying the range for a failure (from a customer's terminal)

To use the customer's terminal to identify the range for a failure so that you can determine the fault location on the route with a remote device in an environment in which login to the Switch is not possible, do the following:

1. Make sure the customer's terminal has the `ping` functionality.
2. Use the `ping` functionality to check whether communication between the customer's terminal and the remote device is possible.
3. If communication with the remote device cannot be verified by using the `ping` functionality, use the `ping` command to check communication with each of the devices up to the remote device, beginning with the device closest to the customer's terminal.
4. If you are able to determine the range for the failure by using the `ping` functionality and pinpoint the Switch that is likely to have the failure, log in to the Switch and investigate the cause of the failure based on the failure analysis flowchart.

(5) Checking the ARP resolution information with a neighboring device

If the execution result of the `ping` command indicates that communication with a neighboring

device is impossible, the address might not have been resolved by ARP. To check the status of address resolution between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ip arp` command to check the status of address resolution (whether ARP entry information exists) between the Switch and the neighboring device.
3. If the address with the neighboring device has been resolved (ARP entry information exists), see *(6) Checking the unicast routing information*.
4. If the address has not been resolved (no ARP entry information exists), check whether the IP network settings between the neighboring device and the Switch are identical.
5. If DHCP snooping is used, packets might have been discarded by dynamic ARP inspection. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(6) Checking the unicast routing information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device during IPv4 unicast communication, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Execute the `show ip route` command to check the routing information obtained by the Switch.
3. For AX6700S, AX6600S, and AX6300S series switches, check whether packets are discarded at the null interface. If `null0` is displayed for the sending interface that caused the communication failure in the routing information, packets are discarded at the null interface. Check the setting conditions for the static routing functionality in the configuration.
4. If the routing information obtained by the Switch does not contain the routing information about the interface that caused the communication failure or contains an incorrect address of the interface's next hop, see *3.8 IPv4 unicast routing communication failures*.
5. If the routing information obtained by the Switch contains routing information about the interface that caused the communication failure, the interface might have a problem with the functionality shown below. That functionality must be checked.
   - DHCP and BOOTP functionality

     See *(7) Checking the DHCP and BOOTP configuration information*.
   - Filters and QoS functionality

     See *(8) Checking the filters and QoS configuration information*.

(7) Checking the DHCP and BOOTP configuration information

If IP addresses are assigned to neighboring devices by the relay or server functionality of DHCP and BOOTP on the Switch, the IP addresses might have not been properly assigned.

Check whether the setting conditions for the relay or server functionality of DHCP and BOOTP in the configuration are correct. For details about the procedure, see *3.7.2 IP addresses cannot be assigned by the DHCP functionality*.

(8) Checking the filters and QoS configuration information

Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper.

Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system

configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

In addition, if DHCP snooping is used, packets might have been discarded by a terminal filter. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(9) Checking the optional license OP-NPAR

If the target interface is a VRF interface and the configuration is present, but the interface is not displayed by the `show ip interface` command, the optional license OP-NPAR might have not been registered or might be invalid. Use the `show license` command to check optional licenses of the Switch. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show license` command to check the license software and enabled options.
3. If OP-NPAR is not displayed for the license software, the OP-NPAR license key is not registered. Register the OP-NPAR license key.
4. If OP-NPAR is displayed for the license software, but OP-NPAR is not displayed for the enabled options, the hardware configuration of the Switch might not support OP-NPAR. Check the hardware configuration. For details about the hardware configurations that do not support OP-NPAR, see the *Configuration Guide Vol. 1*.
5. If the hardware configuration of the Switch supports OP-NPAR, but OP-NPAR is not displayed for the enabled options, it is necessary to restart the Switch to enable the optional license. Use the `reload` command to restart the Switch.
6. If OP-NPAR is displayed for the enabled options, perform steps 4 onwards in *(2) Checking the interface status*.

3.7.2 IP addresses cannot be assigned by the DHCP functionality

(1) Communication problems on DHCP and BOOTP relays

There are three probable causes for communication problems on DHCP and BOOTP relays:

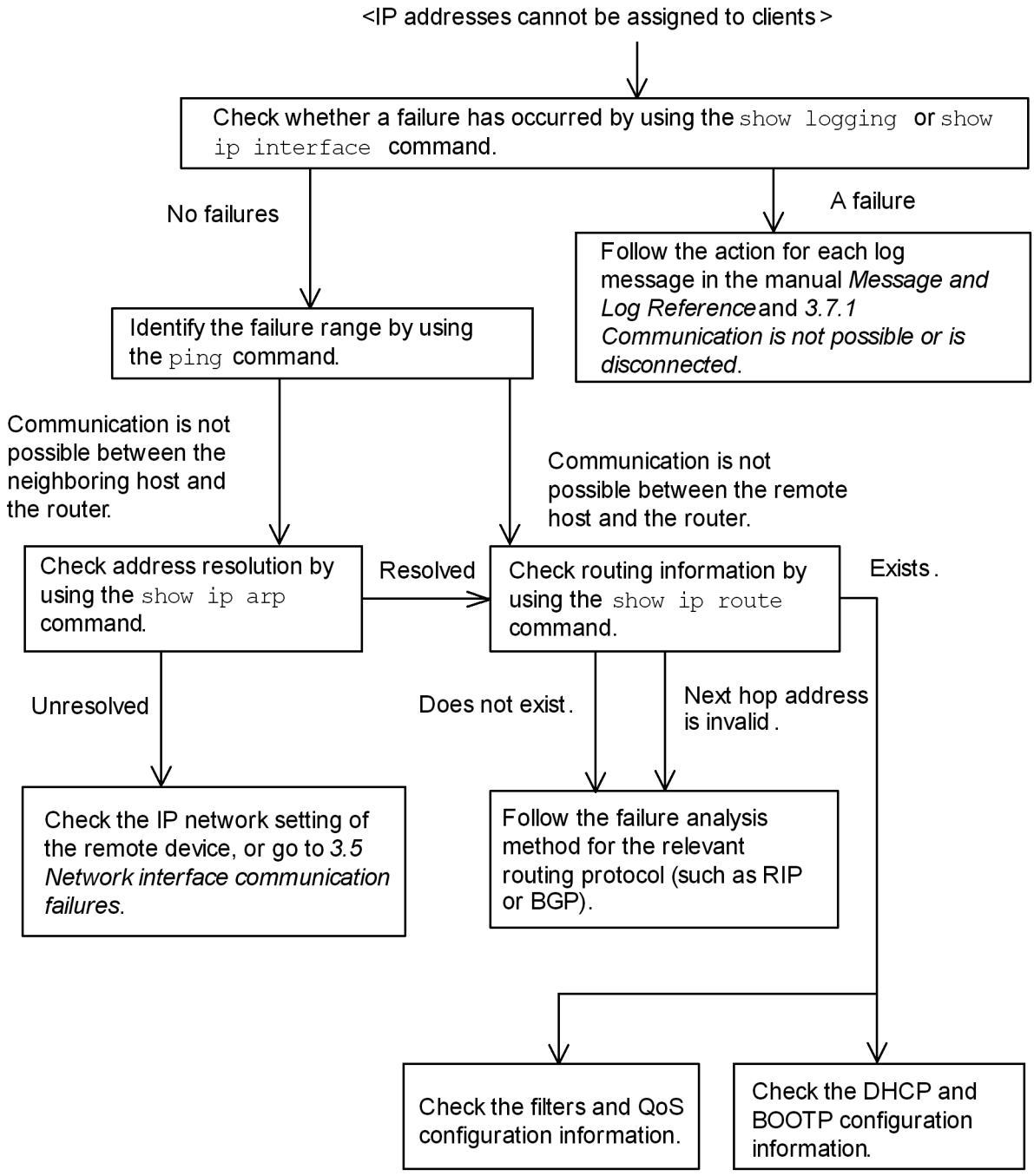
1. A configuration related to the DHCP or BOOTP relay communication is changed.
2. The network configuration is changed.
3. The DHCP or BOOTP server fails.

For cause 2, check the differences in the network configuration before and after the change to uncover any cause that could disable communication.

In this section, ALAXALA Networks Corporation considers a case to which the cause 1 or 3 applies, assuming that you have checked the client settings (such as network card settings and cable connections). This is a case when, for example, after the configuration is changed, the DHCP or BOOTP server cannot assign IP addresses, or when the configuration and network configuration are correct, but IP addresses cannot be assigned to clients and IP communication fails. The following describes the procedure for isolating the fault location to identify the cause of the problem.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-7: Failure analysis procedure on DHCP and BOOTP relays



(a) Checking the log and interface

One probable cause of disabled assignment of IP addresses to clients is that communication between the client and the server has been disabled. Check the log displayed by the Switch or use the `show ip interface` command to check whether the interface status is `Up` or `Down`. For details about the procedure, see *3.7.1 Communication is not possible or is disconnected*.

(b) Identifying the range for a failure (from the Switch)

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote device. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. Use the `ping` command to check the communication with the two remote devices that are unable to communicate. For details about examples of using the `ping` command and how to interpret the execution result, see the *Configuration Guide*.
3. If communication with the remote devices cannot be verified by the `ping` command, execute the command again to check communication with each of the devices up to the remote device, beginning with the device closest to the Switch.
4. If the execution result of the `ping` command indicates that the failure occurred on the neighboring device, see *(d)Checking the ARP resolution information with a neighboring device*. If the execution result indicates a failure on the remote device, see *(e)Checking the routing information*.

(c) Identifying the range for a failure (from a customer's terminal)

To use the customer's terminal to identify the range for a failure so that you can determine the fault location on the route with a remote device in an environment in which login to the Switch is not possible, do the following:

1. Make sure the customer's terminal has the `ping` functionality.
2. Use the `ping` functionality to check whether communication between the customer's terminal and the remote device is possible.
3. If communication with the remote device cannot be verified by using the `ping` functionality, use the `ping` command to check communication with each of the devices up to the remote device, beginning with the device closest to the customer's terminal.
4. If you are able to determine the range for the failure by using the `ping` functionality and pinpoint the Switch that is likely to have the failure, log in to the Switch and investigate the cause of the failure based on the failure analysis flowchart.

(d) Checking the ARP resolution information with a neighboring device

If the result of the `ping` command indicates that communication with a neighboring device is impossible, the address might not have been resolved by ARP. To check the status of address resolution between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ip arp` command to check the status of address resolution (whether ARP entry information exists) between the Switch and the neighboring device.
3. If the address with the neighboring device has been resolved (ARP entry information exists), see *(e)Checking the routing information*.
4. If the address has not been resolved (no ARP entry information exists), check whether the IP network settings between the neighboring device and the Switch are correctly set to allow communication between them.
5. If DHCP snooping is used, packets might have been discarded by dynamic ARP inspection. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(e) Checking the routing information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show ip route` command to check the routing information obtained by the Switch.

3. If the routing information obtained by the Switch does not contain the routing information about the interface that caused the communication failure or contains an incorrect address of the interface's next hop, see *3.8 IPv4 unicast routing communication failures*.
4. If the routing information obtained by the Switch contains routing information about the interface that caused the communication failure, the interface might have a problem with the functionality shown below. That functionality must be checked.
   - Filters and QoS functionality

     See *(f)Checking the filters and QoS configuration information*.
   - DHCP and BOOTP functionality

     See *(g)Checking the DHCP and BOOTP configuration information*.

(f) Checking the filters and QoS configuration information

Filtering might have been set to discard only specific packets or packets might have been discarded by bandwidth monitoring, drop control, or the QoS control shaper.

Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

In addition, if DHCP snooping is used, packets might have been discarded by a terminal filter. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(g) Checking the DHCP and BOOTP configuration information

If many of the IP addresses to be leased are left on the DHCP or BOOTP server, it can be assumed that IP addresses cannot be assigned to clients due to incorrect configuration settings for the DHCP or BOOTP relay. The following describes the operations for checking the configuration.

1. Check whether the IP address of the DHCP or BOOTP server or the IP address of the next router with the DHCP or BOOTP relay agent functionality is set for `ip helper-address`.
2. Check whether `ip helper-address` is set for the client interface.
3. Check whether the value of `ip bootp-hops` is set to a bootp hops value that is correct from the viewpoint of the client.
4. For a multihomed configuration, check whether the value of `ip relay-agent-address` is the same as the subnet of the IP address distributed by the DHCP or BOOTP server.
5. If DHCP snooping is used, packets might have been discarded by DHCP snooping. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(h) Checking when the DHCP relay and VRRP are operated on the same interface

If the DHCP or BOOTP relay and VRRP are operated on the same interface, the DHCP or BOOTP client gateway address (router option) on the DHCP or BOOTP server must be set to the virtual router address that is set in the VRRP configuration. If the gateway address is not set as above, after switching between the master and standby routers is performed by VRRP, the communication of the DHCP or BOOTP clients might be disabled. To check the settings, follow the procedure for checking the settings for each DHCP or BOOTP server.

(2) Communication problems on the DHCP server

There are three probable causes for problems such as disabled address distribution to clients that might occur during communication with the DHCP server:

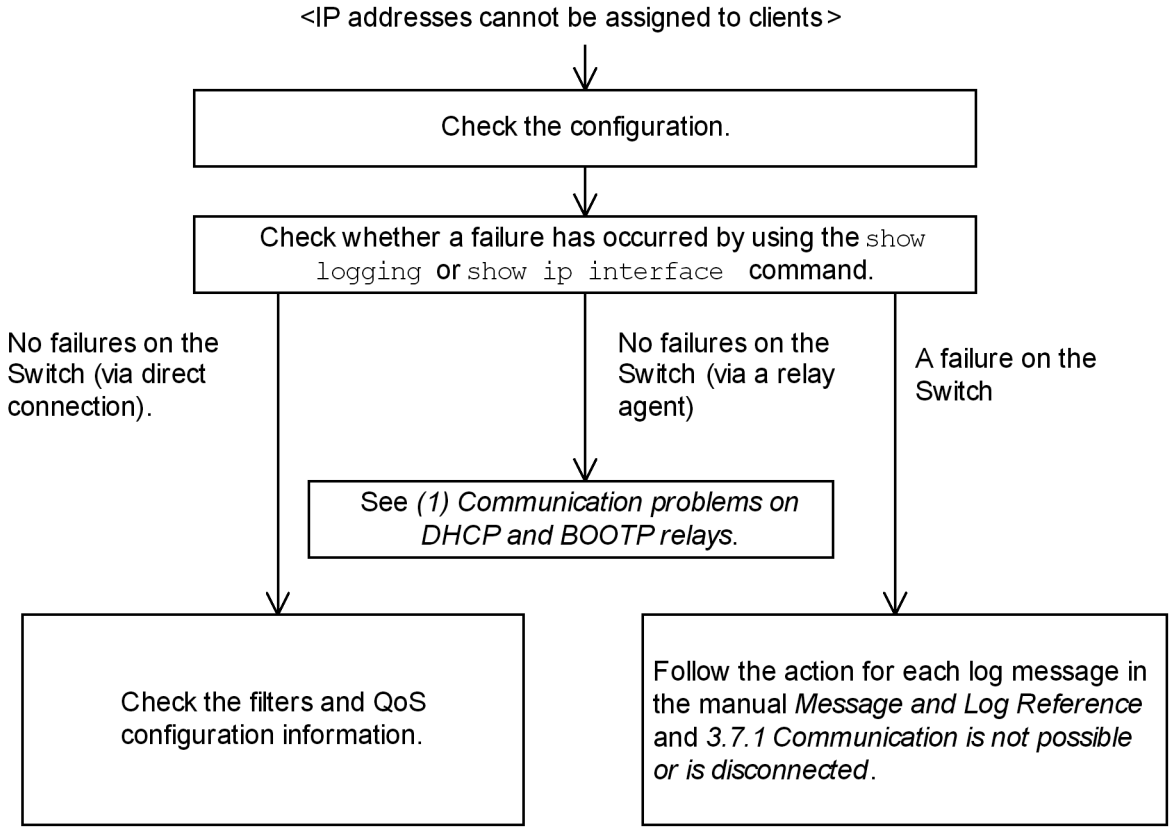
1. A configuration is set incorrectly.

2. The network configuration is changed.
3. The DHCP server fails.

First, check for cause 1. Described below are likely examples of incorrect configuration. For cause 2, check the differences in the network configuration before and after the change to uncover any cause that could disable communication. You might have checked the client and server settings (such as network card settings and cable connections) and concluded that cause 3 applies. For example, the configuration and network configuration are correct, but IP communication is not possible due to disabled allocation of IP addresses to clients. In such a case, see *(b)Checking the log messages and interface* through *(e)Checking the filters and QoS configuration information* for details.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-8: Failure analysis procedure on the DHCP server



(a) Checking the configuration

It can be assumed that IP addresses cannot be assigned to clients because the resources on the DHCP server are configured incorrectly. To check the configuration, do the following:

1. In the configuration, make sure there is an `ip dhcp pool` setting that contains the network setting for the DHCP addresses to be assigned to the DHCP clients.
2. In the configuration, make sure the number of IP address pools to be assigned to a DHCP client is larger than the number of concurrently used clients set in the `ip dhcp excluded-address` configuration command.
3. If the Switch has assigned addresses to the clients but the clients cannot communicate with other devices, the default router might have not been set. Make sure that the router address (default router) of the network to which the clients are connected has been set by the `default-router` configuration command (see the manual *Configuration Command Reference*).

4. Check the settings of the device used as the DHCP relay agent. If the Switch is used as the relay agent, see *(1) Communication problems on DHCP and BOOTP relays*.
5. If DHCP snooping is used, packets might have been discarded by DHCP snooping. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(b) Checking the log messages and interface

One probable cause of disabled assignment of IP addresses to clients is that communication between the client and the server has been disabled. Check the log messages displayed by the Switch or use the `show ip interface` command to check whether the interface status is `Up` or `Down`. For details about the procedure, see *3.7.1 Communication is not possible or is disconnected*.

(c) Identifying the range for a failure (from the Switch)

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote device. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. If there are devices such as a router between the client and the server, use the `ping` command to check the communication between the router and the remote device (DHCP client). If the communication with the remote device cannot be verified by using the `ping` command, execute the `ping` command again to check communication with each of the devices up to the client, beginning with the device closest to the Switch. For details about examples of using the `ping` command and how to interpret the execution result, see the *Configuration Guide*.
3. If the server and the client are directly connected, check the hub and cable connections.
4. Select a suitable next step in the failure analysis flowchart depending on whether the range of the failure determined by the `ping` command is in the neighboring device or remote device.

(d) Checking the routing information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show ip route` command to check the routing information obtained by the Switch.

(e) Checking the filters and QoS configuration information

Only certain packets might have been discarded by filtering, or packets might have been discarded by bandwidth monitoring, drop control, or the QoS control shaper.

On the Switch and the relay device between the client and server, make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

In addition, if DHCP snooping is used, packets might have been discarded by a terminal filter. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(f) Checking the Layer 2 network

If you do not find any incorrect settings or a failure in the steps (a) to (e), there might be a problem with the Layer 2 network. Check the Layer 2 network according to *3.6 Layer 2 network communication failures*.

3.7.3 Dynamic DNS link does not work in the DHCP functionality

(1) Communication problems on the DHCP server

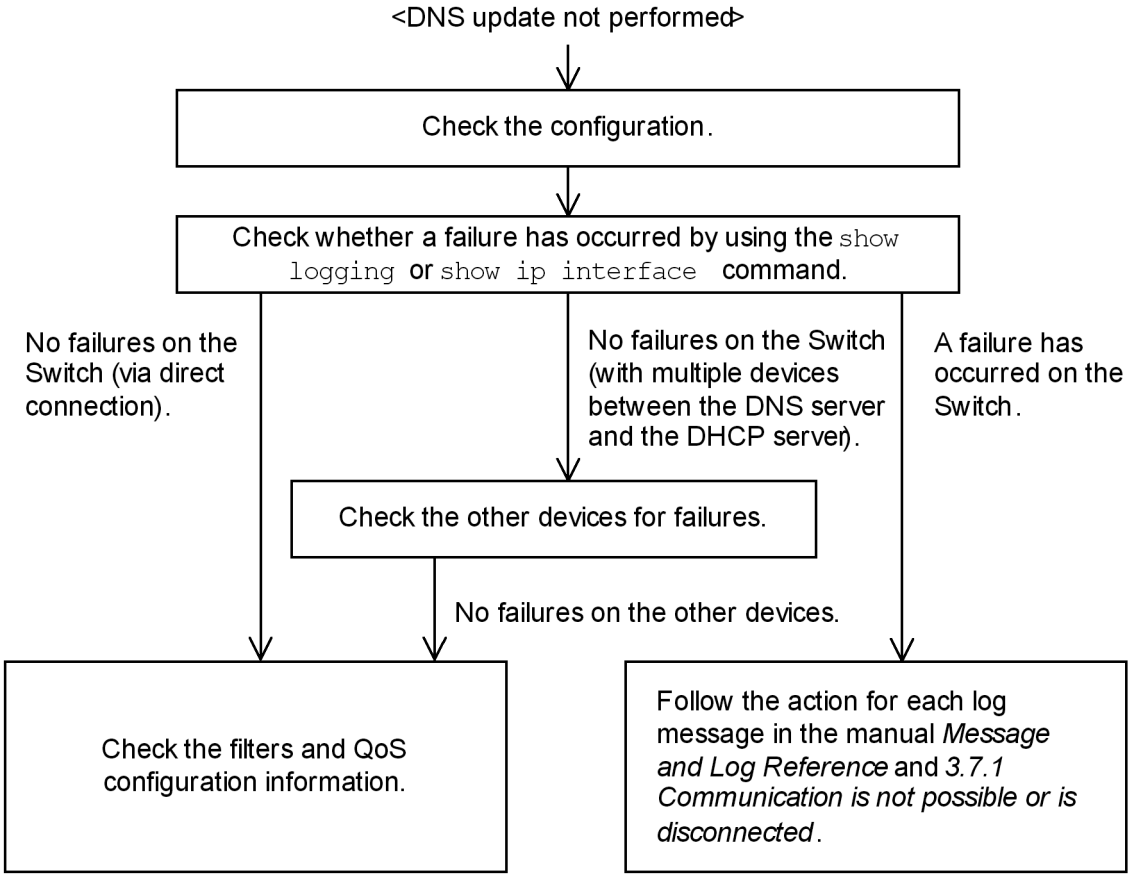
There are three probable causes for communication problems on a DHCP server:

1. A configuration is set incorrectly.
2. The network configuration is changed.
3. The DHCP server fails.

First, check for cause 1. Described below are likely examples of incorrect configuration. For cause 2, check the differences in the network configuration before and after the change to uncover any cause that could disable communication. You might have checked the settings of the DNS server and DHCP server (such as network card settings and cable connections) and concluded that cause 3 applies. For example, the configuration and network configuration are correct, but the Dynamic DNS link does not work. In such a case, see *(b)Checking the time information* through *(f)Checking the filters and QoS configuration information* for details.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-9: Failure analysis procedure on the DHCP server when DNS is linked



(a) Checking the configuration

The probable cause is that DNS updating is not working properly for Dynamic DNS because some settings on the DHCP server are incorrect or not consistent with the settings on the DNS server. To check the configuration, do the following:

1. First, check the method for permitting DNS updating on the DNS server. For access permission based on IP addresses and networks, see the items 3 onwards. For permission based on authentication keys, see the items 2 onwards.

2. Make sure that the key information and the authentication key specified on the DNS server are consistent with the key information included in the DHCP server configuration (see the manual *Configuration Command Reference*).
3. Make sure that the zone information specified on the DNS server is consistent with the zone information included in the DHCP server configuration (see the manual *Configuration Command Reference*). Also, make sure that both the normal and reverse lookups are set.
4. Make sure that DNS updating is set (see the manual *Configuration Command Reference*). This setting is required to enable DNS updating because DNS updating is disabled by default.
5. Make sure that the domain name used by the client is consistent with the domain name registered in the DNS server. If the DHCP is used to distribute domain names, make sure that the setting is correct in the configuration (see the manuals *Configuration Command Reference* and *Operation Command Reference*).

(b) Checking the time information

If an authentication key is used in DNS updating, in most cases, the difference between the UTC time on the Switch and that on the DNS server must be five minutes or less. Use the `show clock` command to check the time information on the Switch, and if necessary, see the manual *Configuration Command Reference* to synchronize the time information.

(c) Checking the log messages and interface

One of the causes of the failure in communication with the DNS server might be the communication failure between the DNS server and the DHCP server. Check the log messages displayed by the Switch or use the `show ip interface` command to check whether the interface status is `Up` or `Down`. For details about the procedure, see *3.7.1 Communication is not possible or is disconnected*

(d) Identifying the range for a failure (from the Switch)

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote device. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. If there are devices such as a router between the DNS server and the DHCP server, use the `ping` command to check the communication between the router and the remote device (DNS server). If the communication with the remote device cannot be verified by using the `ping` command, execute the `ping` command again to check communication with each of the devices up to the client, beginning with the device closest to the Switch. For details about examples of using the `ping` command and how to interpret the execution result, see the *Configuration Guide*.
3. If the DNS server and the DHCP server are directly connected, check the hub and cable connections.
4. Select a suitable next step in the failure analysis flowchart depending on whether the range of the failure determined by the `ping` command is in the neighboring device or remote device.

(e) Checking the routing information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show ip route` command to check the routing information obtained by the Switch.

(f) Checking the filters and QoS configuration information

Only certain packets might have been discarded by filtering, or packets might have been discarded by bandwidth monitoring, drop control, or the QoS control shaper.

On the Switch and the relay device between the DNS server and the DHCP server, make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

In addition, if DHCP snooping is used, packets might have been discarded by a terminal filter. Check whether the setting conditions for DHCP snooping in the configuration are correct. For details about the procedure, see *3.27 DHCP snooping problems*.

(g) Checking the Layer 2 network

If you do not find any incorrect settings or a failure in the steps (a) to (f), there might be a problem with the Layer 2 network. Check the Layer 2 network according to *3.6 Layer 2 network communication failures*.

3.8 IPv4 unicast routing communication failures

3.8.1 No RIP routing information exists

If RIP routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.8.4 IPv4 routing information cannot be found in VRF*.

Table 3-19: Failure analysis method for RIP

No.	Items to check and commands	Action
1	Display the RIP neighboring information. `show ip rip neighbor`	If the interface of the neighboring router is not displayed, go to No. 2.
		If the interface of the neighboring router is displayed, go to No. 3.
2	Check whether the RIP setting in the configuration is correct.	If the configuration is correct, go to No. 3.
		If the configuration is not correct, modify the configuration.
3	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the RIP route.
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.8.2 No OSPF routing information exists

If OSPF routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.8.4 IPv4 routing information cannot be found in VRF*.

Table 3-20: Failure analysis method for OSPF

No.	Items to check and commands	Action
1	Display the OSPF interface status. `show ip ospf interface` <*IP Address*>	If the interface status is `DR` or `P to P`, go to No. 3.
		If the interface status is `BackupDR` or `DR Other`, go to No. 2.
		If the interface status is `Waiting`, wait for a while and execute the command again. Go to No. 1.
2	Check the neighboring router status with DR in `Neighbor List`.	If the neighboring router status with DR is other than `Full`, go to No. 4.
		If the neighboring router status with DR is `Full`, go to No. 5.
3	Check the status of every neighboring router in `Neighbor List`.	If the status of any neighboring router is other than `Full`, go to No. 4.

No.	Items to check and commands	Action
		If the status of every neighboring router is `Full`, go to No. 5.
4	Check whether the OSPF setting in the configuration is correct.	If the configuration is correct, go to No. 5.
		If the configuration is not correct, modify the configuration.
5	Check the route that has learned the OSPF route. show ip route all-routes	If the route is `InActive`, go to No. 6.
		If the route does not exist, check whether the neighboring router is advertising the OSPF route.
6	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the OSPF route.
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.8.3 No BGP4 routing information exists

If BGP4 routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.8.4 IPv4 routing information cannot be found in VRF*.

Table 3-21: Failure analysis method for BGP4

No.	Items to check and commands	Action
1	Check the BGP4 peer status. `show ip bgp neighbors`	If the peer status is other than `Established`, go to No. 2.
		If the peer status is `Established`, go to No. 3.
2	Check whether the BGP4 setting in the configuration is correct.	If the configuration is correct, go to No. 3.
		If the configuration is not correct, modify the configuration.
3	Check whether the BGP4 route has been learned. `show ip bgp received-routes`	If the route exists but its status is not `active`, go to No. 4.
		If the route does not exist, go to No. 5.
4	Check whether the routing information that resolves the next hop address of the BGP4 route exists. `show ip route`	If the routing information that resolves the next hop address exists, go to No. 5.
		If the routing information that resolves the next hop address does not exist, perform the failure analysis for the protocol for learning the routing information.
5	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the BGP4 route.

No.	Items to check and commands	Action
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.8.4 IPv4 routing information cannot be found in VRF

If the routing information of each protocol cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-22: Failure analysis method for VRF

No.	Items to check and commands	Action
1	Check whether the number of routes in VRF is equal to or larger than the maximum value specified in the configuration. `show ip vrf`	If the number of routes is equal to or larger than the maximum value, go to No. 2.
		If the number of routes is less than the maximum value, perform the failure analysis for the protocol for the route that does not exist. For RIP, see *3.8.1 No RIP routing information exists*. For OSPF, see *3.8.2 No OSPF routing information exists*. For BGP4, see *3.8.3 No BGP4 routing information exists*.
2	Check the maximum number of routes in VRF specified in the configuration.	Increase the maximum number, or reduce the number of routes by, for example, aggregating the routes.

3.9 Communication failures in the IPv4 multicast routing functionality

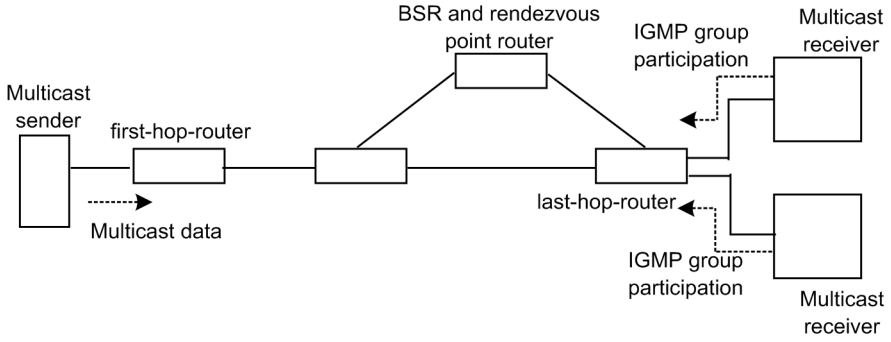
This section describes actions to be taken when an IPv4 multicast communication failure occurs on the Switch.

3.9.1 Communication is not possible on the IPv4 PIM-SM networks

If multicast forwarding is not possible in an IPv4 PIM-SM network configuration, isolate the cause of the problem according to the failure analysis method described below.

The following figure shows an example of an IPv4 PIM-SM network.

Figure 3-10: Example of an IPv4 PIM-SM network



Notes:

- BSR: The router that distributes rendezvous point information. (For details, see the *Configuration Guide*.)
- Rendezvous point router: The router that forwards packets to the multicast receivers if the destination of the packets has not been determined. (For details, see the *Configuration Guide*.)
- `first-hop-router`: The router that is connected directly to the multicast sender
- `last-hop-router`: The router that is connected directly to the multicast receivers

(1) Items checked in common

The following table shows the items checked in common for all the Switches in an IPv4 PIM-SM network configuration.

Table 3-23: Items checked in common

No.	Items to check and commands	Action
1	Make sure that the setting for using the multicast functionality (`ip multicast routing`) exists in the configuration. `show running-config`	If the setting for using the multicast functionality does not exist, modify the configuration.
2	For AX6700S, AX6600S, or AX6300S series switches, make sure that the multicast protocol used in the configuration is PIM-SM. (`ip multicast protocol pim-sm` is specified or no command is specified) `show running-config`	If a protocol other than PIM-SM is specified for the multicast protocol, modify the configuration. In addition, if no multicast protocol is specified in the configuration, PIM-SM is specified for the multicast protocol to be used.

No.	Items to check and commands	Action
3	Make sure that PIM-SM is running on one or more interfaces. `show ip pim interface`	If PIM-SM is not running, check and modify the configuration so that PIM-SM runs on at least one of the interfaces. If the configuration contains the setting for running PIM on an interface, but the interface is not displayed by the `show ip pim interface` command, make sure that multihoming is not set for the target interface.
4	Check whether IGMP snooping is set for the interface on which PIM runs. `show igmp-snooping`	If IGMP snooping is set, check the following: • Check whether the multicast router port for IGMP snooping is set for the port connected to the neighboring router. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.
5	Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets and multicast packets on the interface on which PIM and IGMP run. `show running-config`	If the configuration contains a setting that suppresses forwarding of protocol packets and multicast packets, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.
6	Check the PIM neighboring information. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim interface` command to make sure that PIM-SM is running on the interface connected with the neighboring routers. • Check the settings of the neighboring routers.
7	Check whether the unicast route to the multicast data sender exists. `show ip route`	If the unicast route does not exist, see *3.8 IPv4 unicast routing communication failures*.
8	Make sure that PIM is running on the interface connected to the next hop address to the multicast data sender. `show ip pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on the interface connected to the next hop address to the multicast data sender.
9	Check the configuration to make sure that the PIM-SSM group addresses do not contain the forwarding target group address. `show running-config`	If the PIM-SSM group addresses contain the forwarding target group address, modify the configuration.
10	Make sure that BSR has been determined. This checking is not required if the rendezvous point for the forwarding target group address is a static rendezvous point. `show ip pim bsr`	If BSR has not been determined, check whether the unicast route to BSR exists. If the unicast route does not exist, see *3.8 IPv4 unicast routing communication failures*. If the unicast route exists, check the BSR settings. If the Switch is used as BSR, see *(2) Items to check for BSR*.
11	Make sure that the rendezvous point has been determined. `show ip pim rp-mapping`	If the rendezvous point has not been determined, check whether the unicast route to the rendezvous point exists. If the unicast route does not exist, see *3.8 IPv4 unicast routing communication failures*. If the unicast route exists, check the rendezvous point settings. If the Switch is used as the rendezvous point, see *(3) Items to check for the rendezvous point router*.
12	Make sure that the rendezvous point group addresses contain the forwarding target group address. `show ip pim rp-mapping`	If the forwarding target group address is not contained, check the rendezvous point router settings. If the Switch is used as the rendezvous point, see *(3) Items to check for the rendezvous point router*.

No.	Items to check and commands	Action
13	Make sure that multicast forwarding entries exist. `show ip mcache`	If multicast forwarding entries do not exist, make sure that multicast data has reached the upstream port. If multicast data has not reached the upstream port, check the settings of the multicast sender or upstream router.
14	Make sure that multicast routing information exists. `show ip mroute`	If multicast routing information does not exist, check the downstream router settings.

15	Check whether the number of the multicast routing information entries or multicast forwarding entries exceeds its upper limit.
	For the multicast routing information:
	`show ip mroute`
	For the multicast forwarding entries:
	`show ip mcache`
	`netstat multicast`
		If a warning is displayed, check whether an unexpected multicast routing information entry or unexpected multicast forwarding entry has been created. If many negative caches are found among the multicast forwarding entries, check whether there is a terminal that is sending unnecessary packets.

(2) Items to check for BSR

The following table shows the items to check when the Switch is used as BSR in an IPv4 PIM-SM network configuration.

Table 3-24: Items to check for BSR

No.	Items to check and commands	Action
1	Make sure the Switch is a BSR candidate. `show ip pim bsr`	If the Switch is not a BSR candidate, check and modify the configuration so that the Switch can work as a BSR candidate. If an address is not set for the loopback interface, the Switch does not work as a BSR candidate. Also make sure that a loopback interface address is set.
2	Make sure the Switch is used as BSR. `show ip pim bsr`	If the Switch is not used as BSR, check the priorities of other BSR candidates. A larger value represents a higher priority. If the priority is the same among BSR candidates, the BSR candidate that has the highest BSR address becomes BSR.

(3) Items to check for the rendezvous point router

The following table shows the items to check when the Switch is used as a rendezvous point router in an IPv4 PIM-SM network configuration.

Table 3-25: Items to check for the rendezvous point router

No.	Items to check and commands	Action
1	Make sure the Switch is a rendezvous point candidate for the forwarding target group address. `show ip pim rp-mapping`	If the Switch is not a rendezvous point candidate for the forwarding target group address, check and modify the configuration so that the Switch can work as a rendezvous point candidate for the forwarding target group address. If an address is not set for the loopback interface, the Switch does not work as a rendezvous point candidate. Also make sure that a loopback interface address is set.

No.	Items to check and commands	Action
2	Make sure the Switch is the rendezvous point for the forwarding target group address. `show ip pim rp-hash <Group Address>`	If the Switch is not the rendezvous point, check the priorities of other rendezvous point candidates. A smaller value represents a higher priority. If the priority of another rendezvous point candidate is higher than that of the Switch, the Switch does not work as the rendezvous point. If the priority is the same between another candidate and the Switch, they are assigned to a different group address due to the protocol specification, and the Switch might not work as the rendezvous point for the target group. If you want to use the Switch as the rendezvous point, set a higher priority for the Switch than other rendezvous point candidates.

(4) Items to check for last-hop-router

The following table shows the items to check when the Switch is used as `last-hop-router` in an IPv4 PIM-SM network configuration.

Table 3-26: Items to check for last-hop-router

No.	Items to check and commands	Action
1	Make sure that IGMP is running on the interface connected to the multicast receivers. `show ip igmp interface`	If IGMP is not running, check and modify the configuration so that IGMP runs on the interface.
2	Make sure that the multicast receivers participate in the forwarding target group through IGMP. `show ip igmp group`	If a multicast receiver does not participate in the forwarding target group, check the multicast receiver settings.
3	If the interface in which the forwarding target group participates exists, make sure that the Switch is DR. `show ip pim interface`	If the Switch is not DR, check the DR of the forwarding target interface.
4	Check whether IGMP snooping is set for the interface on which the static group participation functionality is used. `show igmp-snooping`	If IGMP snooping is set, check the following: • Check whether the multicast router port for IGMP snooping is set for the destination port. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.
5	Check whether any anomaly has been detected on any interface. `show ip igmp interface`	Make sure that no warning information is displayed for `Notice`. If warning information is displayed, check the following: • `L`: More participation requests than the expected maximum number have occurred. Check the number of connected users. • `Q`: The IGMP version is different from that on the neighboring router. Use the same IGMP version. • `R`: A user is sending a report that cannot be received with the current settings. Change the IGMP version on the Switch, or check the settings of the participation user.

(5) Items to check for first-hop-router

The following table shows the items to check when the Switch is used as `first-hop-router` in an IPv4 PIM-SM network configuration.

Table 3-27: Items to check for first-hop-router

No.	Items to check and commands	Action
1	Make sure that the Switch is directly connected to the multicast sender.	If the Switch is not connected directly, check the network configuration.

2	Make sure that PIM-SM or IGMP is running on the interface connected to the multicast sender.
	`show ip pim interface`
	`show ip igmp interface`
		If PIM-SM or IGMP is not running, check and modify the configuration so that PIM-SM or IGMP runs on the interface.

3	Check whether multicast routing information exists. `show ip mroute`	If multicast routing information does not exist, make sure that the multicast data source address is the network address of the interface directly connected to the multicast sender.

3.9.2 Multicast data is forwarded twice in the IPv4 PIM-SM network

If multicast data is forwarded twice in an IPv4 PIM-SM network configuration, check the settings of each router and if multiple routers exist in one network, modify the settings so that PIM-SM runs on the interface in the network.

The following table shows the items to check when data continues to be forwarded twice even after you have checked and modified the settings as described above.

Table 3-28: Items to check when data continues to be forwarded twice

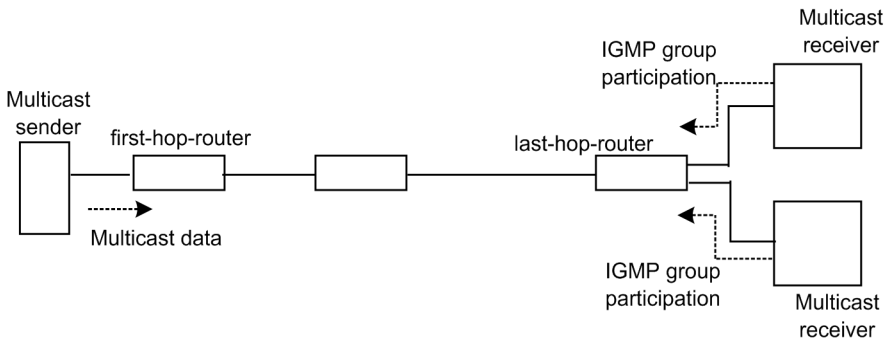
No.	Items to check and commands	Action
1	Check the PIM neighboring information of the interface belonging to the network with multiple routers. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim interface` command to make sure that PIM-SM is running on the interface connected with the neighboring routers. • Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*. • Check the settings of the neighboring routers.

3.9.3 Communication is not possible on the IPv4 PIM-SSM networks

If multicast forwarding is not possible in an IPv4 PIM-SSM network configuration, isolate the cause of the problem according to the failure analysis method described below.

The following figure shows an example of an IPv4 PIM-SSM network.

Figure 3-11: Example of an IPv4 PIM-SSM network



Notes:

- `first-hop-router`: The router that is connected directly to the multicast sender
- `last-hop-router`: The router that is connected directly to the multicast receivers

(1) Items checked in common

The following table shows the items checked in common for all the Switches in an IPv4 PIM-SSM network configuration.

Table 3-29: Items checked in common

No.	Items to check and commands	Action
1	Make sure that the setting for using the multicast functionality (`ip multicast routing`) exists in the configuration. `show running-config`	If the setting for using the multicast functionality does not exist, modify the configuration.
2	For AX6700S, AX6600S, or AX6300S series switches, make sure that the multicast protocol used in the configuration is PIM-SM. (`ip multicast protocol pim-sm` is specified or no command is specified) `show running-config`	If a protocol other than PIM-SM is specified for the multicast protocol, modify the configuration. In addition, if no multicast protocol is specified in the configuration, PIM-SM is specified for the multicast protocol to be used.
3	Make sure that PIM-SM is running on one or more interfaces. `show ip pim interface`	If PIM-SM is not running, check and modify the configuration so that PIM-SM runs on at least one of the interfaces. If the configuration contains the setting for running PIM on an interface, but the interface is not displayed by the `show ip pim` command with the `interface` parameter, make sure that multihoming is not set for the target interface.
4	Check whether IGMP snooping is set for the interface on which PIM runs. `show igmp-snooping`	If IGMP snooping is set, check the following: • Check whether the multicast router port for IGMP snooping is set for the port connected to the neighboring router. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.
5	Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets and multicast packets on the interface on which PIM and IGMP run. `show running-config`	If the configuration contains a setting that suppresses forwarding of protocol packets and multicast packets, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.
6	Check the PIM neighboring information. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim` command with the `interface` parameter to make sure that PIM is running on the interface connected with the neighboring routers. • Check the settings of the neighboring routers.
7	Check whether the unicast route to the multicast data sender exists. `show ip route`	If the unicast route does not exist, see *3.8 IPv4 unicast routing communication failures*.
8	Make sure that PIM is running on the unicast route send interface to the multicast data sender. `show ip pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on the unicast route send interface.

No.	Items to check and commands	Action
9	Check the configuration to make sure that the PIM-SSM group addresses contain the forwarding target group address. `show running-config`	If the PIM-SSM group addresses do not contain the forwarding target group address, modify the configuration.
10	Check whether multicast routing information exists. `show ip mroute`	If multicast routing information does not exist, check the downstream router settings.

11	Check whether the number of the multicast routing information entries or multicast forwarding entries exceeds its upper limit.
	For the multicast routing information:
	`show ip mroute`
	For the multicast forwarding entries:
	`show ip mcache`
	`netstat multicast`
		If a warning is displayed, check whether an unexpected multicast routing information entry or unexpected multicast forwarding entry has been created. If many negative caches are found among the multicast forwarding entries, check whether there is a terminal that is sending unnecessary packets.

(2) Items to check for last-hop-router

The following table shows the items to check when the Switch is used as `last-hop-router` in an IPv4 PIM-SSM network configuration.

Table 3-30: Items to check for last-hop-router

No.	Items to check and commands	Action
1	Make sure that the configuration contains the setting (`ip igmp ssm-map enable`) to enable the PIM-SSM linkage operation in IGMPv1 and IGMPv2. `show running-config`	If the configuration does not contain the setting to enable the PIM-SSM linkage operation in IGMPv1 and IGMPv2, modify the configuration.
2	Make sure that the configuration contains the setting (`ip igmp ssm-map static`) to enable the group address and source address forwarded via PIM-SSM to work with PIM-SSM in IGMPv1 and IGMPv2. `show running-config`	If the configuration does not contain the setting to enable the linkage operation with PIM-SSM in IGMPv1 and IGMPv2, modify the configuration.
3	Make sure that IGMP is running on the interface connected to the multicast receivers. `show ip igmp interface`	If IGMP is not running, check and modify the configuration so that IGMP runs on the interface.
4	Make sure that the multicast receivers participate in the forwarding target group through IGMP. `show ip igmp group`	If a multicast receiver does not participate in the forwarding target group, check the multicast receiver settings.
5	If the interface in which the forwarding target group participates exists, make sure that the Switch is DR. `show ip pim interface`	If the Switch is not DR, check the DR of the forwarding target interface.
6	Check whether IGMP snooping is set for the interface on which the static group participation functionality is used. `show igmp-snooping`	If IGMP snooping is set, check the following: • Check whether the multicast router port for IGMP snooping is set for the destination port. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.

No.	Items to check and commands	Action
7	Check whether any anomaly has been detected on any interface. `show ip igmp interface`	Make sure that no warning information is displayed for `Notice`. If warning information is displayed, check the following: • `L`: More participation requests than the expected maximum number have occurred. Check the number of connected users. • `Q`: The IGMP version is different from that on the neighboring router. Use the same IGMP version. • `R`: A user is sending a report that cannot be received with the current settings. Change the IGMP version on the Switch, or check the settings of the participation user. • `S`: Parts of the participation information have been discarded because the number of sources stored in a message exceeds the maximum number for IGMPv3. Check the settings of the participation user.

(3) Items to check for first-hop-router

The following table shows the items to check when the Switch is used as `first-hop-router` in an IPv4 PIM-SSM network configuration.

Table 3-31: Items to check for first-hop-router

No.	Items to check and commands	Action
1	Make sure that the Switch is directly connected to the multicast sender.	If the Switch is not connected directly, check the network configuration.

2	Make sure that PIM-SM or IGMP is running on the interface connected to the multicast sender.
	`show ip pim interface`
	`show ip igmp interface`
		If PIM-SM or IGMP is not running, check and modify the configuration so that PIM-SM or IGMP runs on the interface.

3	Check whether multicast data has reached the Switch.	If the multicast data has not reached the Switch, check the settings of the multicast sender.

4	Check whether the group address and source address are the same between multicast data and multicast routing information.
	`show ip mroute`
	`show netstat multicast`
		If the different group address and source address are used, check the settings of the multicast sender and `last-hop-router`.

3.9.4 Multicast data is forwarded twice in the IPv4 PIM-SSM network

If multicast data is forwarded twice in an IPv4 PIM-SSM network configuration, check the settings of each router and if multiple routers exist in one network, modify the settings so that PIM-SM runs on the interface in the network.

The following table shows the items to check when data continues to be forwarded twice even after you have checked and modified the settings as described above.

Table 3-32: Items to check when data continues to be forwarded twice

No.	Items to check and commands	Action
1	Check the PIM neighboring information of the interface belonging to the network with multiple routers. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim` command with the `interface` parameter to make sure that PIM-SM is running on the interface connected with the neighboring routers. • Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*. • Check the settings of the neighboring routers.

3.9.5 IPv4 multicast communication problems in VRF

If a problem on IPv4 multicast communication occurs in VRF, check the following.

Table 3-33: Items to check for VRF

No.	Items to check and commands	Action

1	Check the port number and VLAN ID to make sure that the interface for VRF is correct.
	`show ip vrf`
	`show vlan`
	`show ip pim interface`
		If the settings are not correct, modify the configuration or connection.

2	For AX6700S, AX6600S, or AX6300S series switches, make sure that the multicast protocol used in the configuration is PIM-SM. (`ip multicast protocol pim-sm` is specified or no command is specified) `show running-config`	If a protocol other than PIM-SM is specified for the multicast protocol, modify the configuration. In addition, if no multicast protocol is specified in the configuration, PIM-SM is specified for the multicast protocol to be used. If PIM-DM is specified, multicast protocols are not used in VRF.

3	If the Switch is used as the rendezvous point or BSR, check the configuration to make sure that the loopback interface is set for the target VRF.
	`show ip vrf`
	`show running-config`
		Set the loopback interface number specified for the rendezvous point or BSR to be the same as the loopback interface number for the target VRF.
		Also, set the IPv4 address for the loopback interface if no address has been set.

4	If multiple VRFs are used, check whether a global network or specific VRF occupies an unexpectedly large number of multicast forwarding entries. `show ip mcache vrf all`	If a global network or specific VRF occupies more multicast forwarding entries than expected in the network design, check whether any unexpected multicast forwarding entries are created. If many negative caches are found, check whether there is a terminal that is sending unnecessary packets. Also, set the maximum number of forwarding entries for each VRF to prevent a global network or specific VRF from occupying forwarding entries. Target configuration: `ip pim vrf <`*vrf id*`> mcache-limit <`*number*`>`
5	Check each VRF configuration by using the check items in *3.9.1 Communication is not possible on the IPv4 PIM-SM networks* through *3.9.4 Multicast data is forwarded twice in the IPv4 PIM-SSM network*.	Specify the target VRF for each command to check the information of the VRF. For details about specifying VRF, see the manual *Operation Command Reference*.

3.9.6 Problems that occur during IPv4 multicast communication in the extranet

To resolve problems on IPv4 multicast communication in an extranet, first, try to use the check items described in *3.9.5 IPv4 multicast communication problems in VRF* and make sure that multicast communication is possible in each VRF. After that, check the following.

Table 3-34: Items to check for an extranet

No.	Items to check and commands	Action
1	Make sure that the unicast route from the destination VRF to the source address is the expected VRF or global network. `show ip rpf`	If it is not the case, check the settings of the unicast extranet.
2	Make sure that the protocol (PIM-SM or PIM-SSM) for the IPv4 multicast address used in the extranet is the same between the destination VRF and the upstream VRF. `show running-config`	If the protocol is different between the destination VRF and the upstream VRF, select a suitable IPv4 multicast address so that the protocol can be the same between them.
3	For the upstream VRF, check whether the unicast route to the source address is not another VRF. `show ip rpf`	Configure the upstream VRF so that the unicast route to the source address is a VRF with an actual interface in the VRF.
4	If the PIM-SM VRF gateway is used, make sure that (`*,G`) entries have been generated in the upstream VRF. Also, make sure that `V` is displayed for `Flags` for the target (`*,G`) entry. `show ip mroute`	If (`*,G`) entries are not generated correctly, make sure that the IPv4 multicast address used in extranet communication has been specified as the host address and permitted for the IPv4 multicast route filtering for the upstream VRF.
5	If the PIM-SM VRF gateway is used, make sure that the destination VRF is displayed for the downstream interface for the (`*,G`) entry generated in the upstream VRF. `show ip mroute`	If the destination VRF does not exist in the downstream interface for the (`*,G`) entry of the upstream VRF, make sure that the destination VRF has been permitted for route-map that specifies the host address for IPv4 multicast route filtering in the upstream VRF. If no specific VRF is specified for route-map by the `match vrf` command, every VRF is permitted to be a destination.

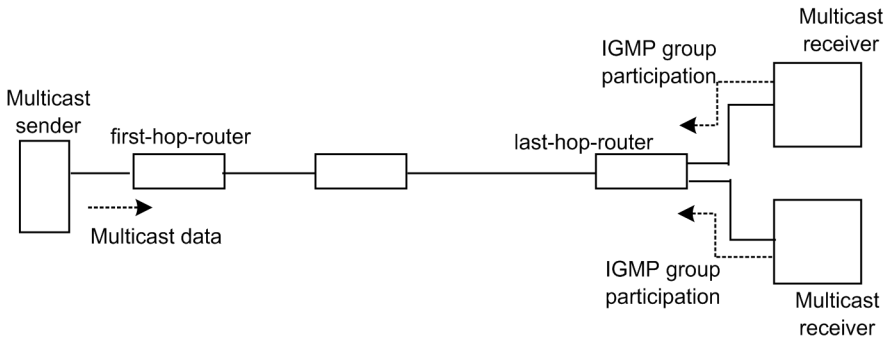
6	If `(denied)` is displayed for the VRF of the upstream interface by the `show ip mroute` command, IPv4 multicast route filtering for the upstream VRF has not been set correctly. If the route does not exist, check the IPv4 multicast route filtering of the upstream VRF in the configuration.
	`show ip mroute`
	`show running-config`
		Make sure that the IPv4 multicast address and destination VRF that are used in extranet communication have been permitted for the IPv4 multicast route filtering for the upstream VRF.
		If neither specific IPv4 multicast address nor specific VRF is specified for the IPv4 multicast route filtering, all IPv4 multicast addresses and VRFs are permitted.

3.9.7 Communication is not possible on the IPv4 PIM-DM networks

If multicast forwarding is not possible in an IPv4 PIM-DM network configuration, isolate the cause of the problem according to the failure analysis method described below.

The following figure shows an example of an IPv4 PIM-DM network.

Figure 3-12: Example of an IPv4 PIM-DM network



Notes:

- `first-hop-router`: The router that is connected directly to the multicast sender
- `last-hop-router`: The router that is connected directly to the multicast receivers

(1) Items checked in common

The following table shows the items checked in common for all the Switches in an IPv4 PIM-DM network configuration.

Table 3-35: Items checked in common

No.	Items to check and commands	Action
1	Make sure that the setting for using the multicast functionality (`ip multicast routing`) exists in the configuration. `show running-config`	If the setting for using the multicast functionality does not exist, modify the configuration.
2	Make sure that PIM-DM is specified (`ip multicast protocol pim-dm`) for the multicast protocol used in the configuration. `show running-config`	If PIM-DM is not specified for the multicast protocol, modify the configuration.
3	Make sure that PIM-DM is running on one or more interfaces. `show ip pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on at least one of the interfaces. If the configuration contains the setting for running PIM-DM on an interface, but the interface is not displayed by the `show ip pim interface` command, make sure that multihoming is not set for the target interface.
4	Check whether IGMP snooping is set for the interface on which PIM runs. `show igmp-snooping`	If IGMP snooping is set, check the following: Check whether the multicast router port for IGMP snooping is set for the port connected to the neighboring router. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.
5	Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets and multicast packets on the interface on which PIM and IGMP run. `show running-config`	If the configuration contains a setting that suppresses forwarding of protocol packets and multicast packets, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

No.	Items to check and commands	Action
6	Check the PIM neighboring information. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim interface` command to make sure that PIM is running on the interface connected with the neighboring routers. • Check the settings of the neighboring routers.
7	Check whether the unicast route to the multicast data sender exists. `show ip route`	If the unicast route does not exist, see *3.8 IPv4 unicast routing communication failures*.
8	Make sure that PIM is running on the interface connected to the next hop address to the multicast data sender. `show ip pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on the interface connected to the next hop address to the multicast data sender.
9	Make sure that multicast forwarding entries exist. `show ip mcache`	If multicast forwarding entries do not exist, make sure that multicast data has reached the upstream port. If multicast data has not reached the upstream port, check the settings of the multicast sender or upstream router.
10	Check whether multicast routing information exists. `show ip mroute`	If multicast routing information does not exist, check the downstream router settings.

(2) Items to check for last-hop-router

The following table shows the items to check when the Switch is used as `last-hop-router` in an IPv4 PIM-DM network configuration.

Table 3-36: Items to check for last-hop-router

No.	Items to check and commands	Action
1	Make sure that IGMP is running on the interface connected to the multicast receivers. `show ip igmp interface`	If IGMP is not running, check and modify the configuration so that IGMP runs on the interface.
2	Make sure that the multicast receivers participate in the forwarding target group through IGMP. `show ip igmp group`	If a multicast receiver does not participate in the forwarding target group, check the multicast receiver settings.
3	Check whether IGMP snooping is set for the interface on which the static group participation functionality is used. `show igmp-snooping`	If IGMP snooping is set, check the following: • Check whether the multicast router port for IGMP snooping is set for the destination port. • See *3.6.4 Multicast forwarding by IGMP snooping is not possible*.
4	Check whether any anomaly has been detected on any interface. `show ip igmp interface`	Make sure that no warning information is displayed for `Notice`. If warning information is displayed, check the following: • `L`: More participation requests than the expected maximum number have occurred. Check the number of connected users. • `Q`: The IGMP version is different from that on the neighboring router. Use the same IGMP version. • `R`: A user is sending a report that cannot be received with the current settings. Change the IGMP version on the Switch, or check the settings of the participation user.

(3) Items to check for first-hop-router

The following table shows the items to check when the Switch is used as `first-hop-router` in an

IPv4 PIM-DM network configuration.

Table 3-37: Items to check for first-hop-router

No.	Items to check and commands	Action
1	Make sure that the Switch is directly connected to the multicast sender.	If the Switch is not connected directly, check the network configuration.
2	Make sure that PIM-DM is running on the interface connected to the multicast sender. `show ip pim interface`	If PIM-DM is not running, check and modify the configuration so that PIM-DM runs on the interface.
3	Check whether multicast routing information exists. `show ip mroute`	If multicast routing information does not exist, make sure that the multicast data source address is the network address of the interface directly connected to the multicast sender.

3.9.8 Multicast data is forwarded twice in the IPv4 PIM-DM network

If multicast data is forwarded twice in an IPv4 PIM-DM network configuration, check the settings of each router and if multiple routers exist in one network, modify the settings so that PIM-DM runs on the interface in the network.

The following table shows the items to check when data continues to be forwarded twice even after you have checked and modified the settings as described above.

Table 3-38: Items to check when data continues to be forwarded twice

No.	Items to check and commands	Action
1	Check the PIM neighboring information of the interface belonging to the network with multiple routers. `show ip pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ip pim interface` command to make sure that PIM-DM is running on the interface connected with the neighboring routers. • Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*. • Check the settings of the neighboring routers.

3.10 IPv6 network communication failures

3.10.1 Communication is not possible or is disconnected

There are three probable causes of problems that occur during communication on an IPv6 network employing a Switch:

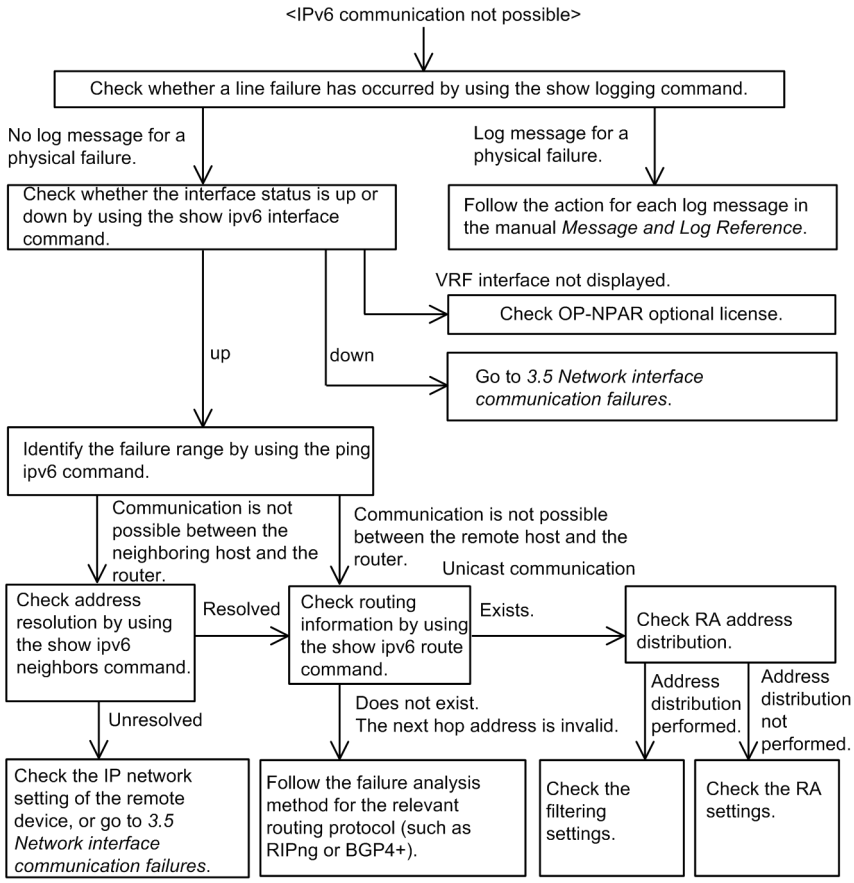
1. A configuration related to IPv6 communication is changed.
2. The network configuration is changed.
3. A network device fails.

For causes 1 and 2, check the differences in the configuration and network configuration before and after the change to uncover any cause that could disable communication.

This subsection describes the procedure for isolating the fault location to determine the cause of a problem, and applies mainly to cause 3 failures. For example, IPv6 communication might not be possible even when the configuration and the network configuration are correct, or for operation that hitherto has been normal, IPv6 communication is no longer possible.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-13: Failure analysis procedure when IPv6 communication is not possible



(1) Checking the log

One probable cause of disabled communication is a line failure (or damage). To display the messages that indicate a hardware failure, carry out the procedure below. You can find these messages in the log displayed by the Switch.

For details about the contents of the log, see the manual *Message and Log Reference*.

1. Log in to the Switch.
2. Use the `show logging` command to display the log.
3. Each entry in the log indicates the date and time that a failure occurred. Check whether a log entry was displayed for the date and time when communication was disabled.
4. For details about the failure and corrective action for the log entry described above, see the manual *Message and Log Reference*, and then follow the instructions given in the manual.
5. If a log entry was not displayed for the date and time when communication was disabled, see *(2) Checking the interface status*.

(2) Checking the interface status

Even when the Switch hardware is operating normally, a fault could have occurred on the hardware of a neighboring device connected to the Switch.

To check the status of the interface between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ipv6 interface` command to check whether the status of the interface with the target neighboring device is Up or Down.
3. For AX6700S, AX6600S, and AX6300S series switches, if the target interface working as a VRF interface is not displayed, see *(9) Checking the optional license OP-NPAR*.
4. If the status of the target interface is `Down`, see *3.5 Network interface communication failures*.
5. If the status of the target interface is `Up`, see *(3) Identifying the range for a failure (from the Switch)*.

(3) Identifying the range for a failure (from the Switch)

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote devices. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. Use the `ping ipv6` command to check the communication with the two remote devices that are unable to communicate. For details about examples of using the `ping ipv6` command and how to interpret the execution result, see the *Configuration Guide*.
3. If communication with the remote devices cannot be verified by the `ping ipv6` command, execute the command again to check communication with each of the devices up to the remote device, beginning with the device closest to the Switch.
4. If the execution result of the `ping ipv6` command indicates that the failure occurred on the neighboring device, see *(5) Checking the NDP resolution information with a neighboring device*. If the execution result indicates a failure on the remote device, see *(6) Checking the unicast interface information*.

(4) Identifying the range for a failure (from a customer's terminal)

To use the customer's terminal to identify the range for a failure so that you can determine the fault location on the route with a remote device in an environment in which login to the Switch is not possible, do the following:

1. Make sure the customer's terminal has the `ping ipv6` functionality.
2. Use the `ping ipv6` functionality to check whether communication between the customer's terminal and the remote device is possible.

3. If communication with the remote device cannot be verified by using the `ping ipv6` functionality, use the `ping ipv6` command to check communication with each of the devices up to the remote device, beginning with the device closest to the customer's terminal.
4. If you are able to determine the range for the failure by using the `ping ipv6` functionality and pinpoint the Switch that is likely to have the failure, log in to the Switch and investigate the cause of the failure based on the failure analysis flowchart.

(5) Checking the NDP resolution information with a neighboring device

If the execution result of the `ping ipv6` command indicates that communication with a neighboring device is impossible, the address might not have been resolved by NDP. To check the status of address resolution between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ipv6 neighbors` command to check the status of address resolution (whether NDP entry information exists) between the Switch and the neighboring device.
3. If the address with the neighboring device has been resolved (NDP entry information exists), see *(6) Checking the unicast interface information*.
4. If the address has not been resolved (no NDP entry information exists), check whether the IP network settings between the neighboring device and the Switch are identical.

(6) Checking the unicast interface information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device during IPv6 unicast communication, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Execute the `show ipv6 route` command to check the routing information obtained by the Switch.
3. For AX6700S, AX6600S, and AX6300S series switches, check whether packets are discarded at the null interface. If `null0` is displayed for the sending interface that caused the communication failure in the routing information, packets are discarded at the null interface. Check the setting conditions for the static routing functionality in the configuration.
4. If the routing information obtained by the Switch does not contain the routing information about the interface that caused the communication failure or contains an incorrect address of the interface's next hop, see *3.11 IPv6 unicast routing communication failures*.
5. If the routing information obtained by the Switch contains routing information about the interface that caused the communication failure, the interface might have a problem with the functionality shown below. That functionality must be checked.
   - RA functionality

     See *(8) Checking the RA configuration information*.

(7) Checking the filters and QoS configuration information

Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper.

Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

(8) Checking the RA configuration information

If communication between the Switch and a terminal directly connected to the Switch is not

possible, address information might not be correctly distributed by RA. Therefore, check whether the RA functionality is correctly set in the configuration. To carry out the check, do the following:

1. Log in to the Switch.
2. Execute the `show ipv6 routers` command to check the RA information for the Switch.
3. If the IPv6 address information has been correctly distributed, the interface might have a problem with the functionality shown below. That functionality must be checked.
   - Filters and QoS functionality

     See *(7) Checking the filters and QoS configuration information*.

(9) Checking the optional license OP-NPAR

If the target interface is a VRF interface and the configuration is present, but the interface is not displayed by the `show ipv6 interface` command, or if in the same situation, the interface is displayed but the IPv6 address specified in the configuration is not displayed by the same command, the optional license OP-NPAR might have not been registered or might be invalid. Use the `show license` command to check optional licenses of the Switch. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show license` command to check the license software and enabled options.
3. If OP-NPAR is not displayed for the license software, the OP-NPAR license key is not registered. Register the OP-NPAR license key.
4. If OP-NPAR is displayed for the license software, but OP-NPAR is not displayed for the enabled options, the hardware configuration of the Switch might not support OP-NPAR. Check the hardware configuration. For details about the hardware configurations that do not support OP-NPAR, see the *Configuration Guide Vol. 1*.
5. If the hardware configuration of the Switch supports OP-NPAR, but OP-NPAR is not displayed for the enabled options, it is necessary to restart the Switch to enable the optional license. Use the `reload` command to restart the Switch.
6. If OP-NPAR is displayed for the enabled options, see *(3) Identifying the range for a failure (from the Switch)*.

3.10.2 IPv6 DHCP relay communication problems

There are three probable causes for communication problems on an IPv6 DHCP relay.

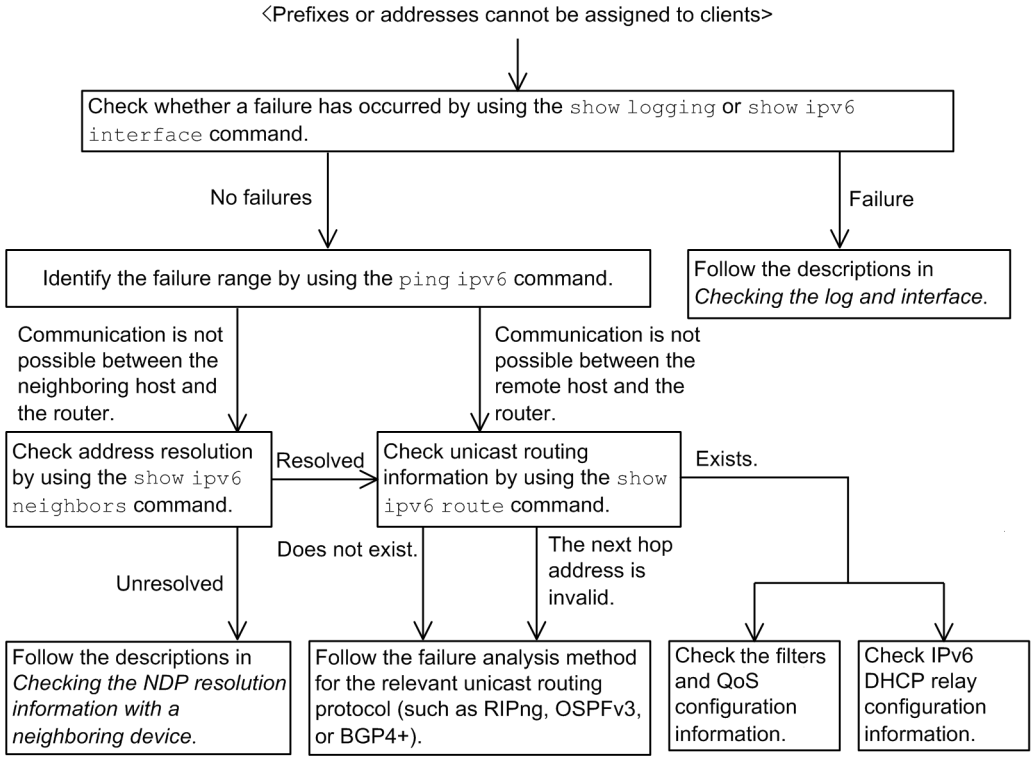
1. A configuration related to the IPv6 DHCP relay is changed.
2. The network configuration is changed.
3. The IPv6 DHCP server fails.

For cause 2, check the differences in the network configuration before and after the change to uncover any cause that could disable communication.

In this subsection, ALAXALA Networks Corporation considers a case to which the cause 1 or 3 applies, assuming that you have checked the client settings. This is a case when, for example, after the configuration is changed, the IPv6 DHCP server cannot distribute information, or when the configuration and network configuration are correct, but prefixes (addresses) cannot be assigned to clients and IP communication fails. The following describes the procedure for isolating the fault location to identify the cause of the problem.

Use the following flowchart to isolate the fault location to identify the cause of the problem.

Figure 3-14: Failure analysis procedure on IPv6 DHCP relays



(1) Checking the log and interface

One probable cause of disabled assignment of prefixes or addresses to clients is that communication between the client and the server has been disabled. Check the log displayed by the Switch or use the `show ipv6 interface` command to check whether the interface status is `Up` or `Down`. For details about the procedure, see *3.10.1 Communication is not possible or is disconnected*.

(2) Identifying the range for a failure

If a failure has not occurred on the Switch, a failure might have occurred somewhere on the route between the Switch and the remote devices. To identify the range for a failure in order to determine the fault location on the route, do the following:

1. Log in to the Switch.
2. Use the `ping ipv6` command to check the communication with the two remote devices that are unable to communicate. For details about examples of using the `ping ipv6` command and how to interpret the execution result, see the *Configuration Guide*.
3. If communication with the remote devices cannot be verified by the `ping ipv6` command, execute the command again to check communication with each of the devices up to the remote device, beginning with the device closest to the Switch.
4. If the execution result of the `ping ipv6` command indicates that the failure occurred on the neighboring device, see *(3) Checking the NDP resolution information with a neighboring device*. If the execution result indicates a failure on the remote device, see *(4) Checking the unicast routing information*.

(3) Checking the NDP resolution information with a neighboring device

If the result of the `ping ipv6` command indicates that communication with a neighboring device is disabled, the address might not have been resolved by NDP. To check the status of address resolution between the Switch and the neighboring device, do the following:

1. Log in to the Switch.
2. Use the `show ipv6 neighbors` command to check the status of address resolution (whether NDP entry information exists) between the Switch and the neighboring device.
3. If the address with the neighboring device has been resolved (NDP entry information exists), see *(4) Checking the unicast routing information*.
4. If the address has not been resolved (no NDP entry information exists), check whether the IP network settings between the neighboring device and the Switch are correctly set to allow communication between them.

(4) Checking the unicast routing information

You need to check the routing information obtained by the Switch if (a) communication is still disabled after address resolution with the neighboring device is completed, (b) communication is disabled on the route to the remote device, or (c) the route to the remote device has a problem. To carry out the check, do the following:

1. Log in to the Switch.
2. Use the `show ipv6 route` command to check the routing information obtained by the Switch.
3. If the routing information obtained by the Switch does not contain the routing information about the interface that caused the communication failure or contains an incorrect address of the interface's next hop, see *3.11 IPv6 unicast routing communication failures*.
4. If the routing information obtained by the Switch contains routing information about the interface that caused the communication failure, the interface might have a problem with the functionality shown below. That functionality must be checked.
   - Filters and QoS functionality

     See *(5) Checking the filters and QoS configuration information*.
   - IPv6 DHCP relay

     See *(6) Checking the IPv6 DHCP relay configuration information*.

(5) Checking the filters and QoS configuration information

Even if there is no physical fault on the Switch and the routing information is correctly set, communication might not be possible. In this case, filtering might have been set to discard only specific packets or packets might have been discarded by bandwidth monitoring, drop control, or the QoS control shaper.

Therefore, make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25 Communication failures in filters and QoS configurations*.

(6) Checking the IPv6 DHCP relay configuration information

If many of the prefixes or addresses to be leased are left on the IPv6 DHCP server, it can be assumed that the prefixes or addresses cannot be assigned to clients due to incorrect configuration settings for the IPv6 DHCP relay.

The following describes the operations for checking the configuration.

1. Check whether the IPv6 address of the IPv6 DHCP server or IPv6 DHCP relay, or the interface to the network in which the IPv6 DHCP server exists, is specified by the `ipv6 dhcp relay destination` configuration command.
2. Check whether the `ipv6 dhcp relay destination` configuration command is set for the client interface.
3. Check whether the IPv6 address (or interface) of the IPv6 DHCP server that must lease a

prefix or address to the target client is set by the `ipv6 dhcp relay destination` configuration command.

4. Check whether the `hop-limit` value specified for the `ipv6 dhcp relay hop-limit` configuration command is equal to or larger than an appropriate hop value for the client.

3.10.3 Troubleshooting IPv6 DHCP server problems

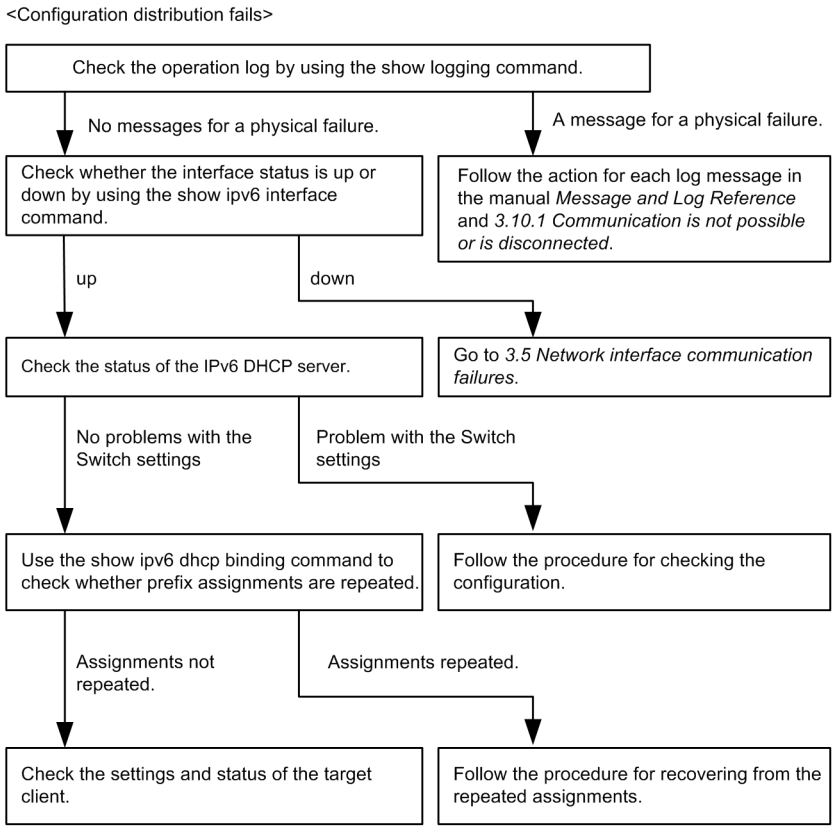
(1) The configuration distribution fails

There are five probable causes of a service operation failure that occurs when you use the prefix distribution functionality of the IPv6 DHCP server on the Switch.

1. The number of actual clients is larger than the specified number of prefixes available for distribution.
2. An incorrect client DUID (DHCP Unique Identifier) is specified.
3. The `ipv6 dhcp server` setting is not correct.
4. A failure occurs during IPv6 DHCP server operation.
5. Other failures

Use the following procedure to isolate the failures listed above.

Figure 3-15: Failure analysis procedure on the IPv6 DHCP server



(a) Checking the log and interface

Probable causes of disabled communication are a failure (or damage) of the NIM or interface and a failure of a neighboring device. Check the log displayed by the Switch or use the `show ipv6 interface` command to check whether the interface status is `Up` or `Down`. For details about the procedure, see *3.10.1 Communication is not possible or is disconnected*.

(b) Checking the status of the IPv6 DHCP server on the Switch

1. Checking whether the IPv6 DHCP server service is running

   Use the `show ipv6 dhcp server statistics` command to check whether information can be obtained from the IPv6 DHCP server daemon. If the following result is displayed by executing the `show ipv6 dhcp server statistics` command, use the `service ipv6 dhcp` configuration command to configure the IPv6 DHCP server functionality again.

   [Execution result]
   ```
   > show ipv6 dhcp server statistics
   > < show statistics >: dhcp6_server doesn't seem to be running.
   ```

2. Checking the remainder of the prefixes available for distribution

   Use the `show ipv6 dhcp server statistics` command to check the remainder of the prefixes available for distribution by the IPv6 DHCP server. For details about the check procedure, see the *Configuration Guide*. If it is found that the remainder of the prefixes is zero, increase the total number of prefixes available for distribution. Note that the upper limit of the number of prefixes available for distribution is 1024.

(c) Procedure for checking the configuration

1. Checking whether the IPv6 DHCP server functionality is set to be enabled

   Use the `show service` configuration command to check whether the IPv6 DHCP server is enabled. In the following execution result, the underlined line indicates that the IPv6 DHCP server functionality is disabled. If this line is not displayed, the IPv6 DHCP server functionality is enabled.

   [Execution result]
   ```
   (config)# show service
   no service ipv6 dhcp
   !
   (config)#
   ```

2. Checking the `ipv6 dhcp server` setting

   Use the `show` configuration command to check whether the `ipv6 dhcp server` setting exists. If the setting does not exist, add the setting. If the setting exists, make sure that the specified interface is configured for a network for client connections.

   [Execution result]
   ```
   (config)# show
   interface vlan 10
     ipv6 address 3ffe:1:2:: linklocal
     ipv6 enable
     ipv6 dhcp server Tokyo preference 100
   !
   (config)#
   ```

3. Checking the settings of `ipv6 dhcp pool`, `ipv6 local pool`, `prefix-delegation`, and `prefix-delegation pool`

   Use the `show ipv6 dhcp` configuration command to check whether the setting for prefix distribution by the IPv6 DHCP server exists. If the setting does not exist, add the setting. If the setting exists, check the setting values for `prefix-delegation` and `ipv6 local pool` that specify prefixes to be distributed. Also, check whether the `duid` is set to specify the clients to which the prefixes are distributed. Furthermore, check whether the client DUID values specified for `duid` are correct.

   [Execution result]
   ```
   (config)# show ipv6 dhcp
   ipv6 dhcp pool Tokyo
     prefix-delegation 3ffe:1:2::/48 00:03:00:01:11:22:33:44:55
   ```

```
!
(config)#
```

(d) Duplicate assignment to a client

1. Checking the binding information

   Use the `show ipv6 dhcp binding` command with the `detail` parameter to check whether multiple prefixes have been distributed to a single DUID. The following shows an example.

   [Execution result]

```
> show ipv6 dhcp binding detail
Total: 2 prefixes
<Prefix>             <Lease expiration>  <Type>
  <DUID>
3ffe:1234:5678::/48      05/04/01 11:29:00   Automatic
  00:01:00:01:55:55:55:55:00:11:22:33:44:55
3ffe:aaaa:1234::/48      05/04/01 11:29:00   Automatic
  00:01:00:01:55:55:55:55:00:11:22:33:44:55
>
```

   If the same DUIDs are displayed multiple times as shown in the underlined lines, the relevant client might have incorrectly received prefix information. Check the prefix value distributed to each client.

2. Establishing correspondences between the distributed prefixes and clients

   If you cannot find a client with duplicate prefixes in the result of the `show ipv6 dhcp binding detail` command, establish correspondences between the displayed DUIDs and client devices. To establish correspondences between them, check the binding information to compare the distributed prefix values and the information of the prefixes distributed to the client devices.

(e) Checking the client setting status

To check the setting status of the clients, follow the documentation provided with each client.

(f) Procedure for recovering from duplicate distribution

If you have confirmed that the IPv6 DHCP server on the Switch distributed multiple prefixes to a client, find currently unused prefixes, based on correspondences between the displayed DUIDs and clients. Use the `clear ipv6 dhcp binding` <*unused prefix*> command to delete the binding information of each currently unused prefix.

[Execution result]

```
> show ipv6 dhcp binding detail
Total: 2 prefixes
<Prefix>             <Lease expiration>  <Type>
  <DUID>
3ffe:1234:5678::/48      05/04/01 11:29:00   Automatic
  00:01:00:01:55:55:55:55:00:11:22:33:44:55
3ffe:aaaa:1234::/48      05/04/01 11:29:00   Automatic
  00:01:00:01:55:55:55:55:00:11:22:33:44:55
> clear ipv6 dhcp binding 3ffe:1234:5678::/48
> show ipv6 dhcp binding detail
<Prefix>             <Lease expiration>  <Type>
  <DUID>
3ffe:aaaa:1234::/48      05/04/01 11:29:00   Automatic
  00:01:00:01:55:55:55:55:00:11:22:33:44:55
>
```

(2) Communication to a prefix distribution target is not possible

The automatic routing information setting functionality can be used for distributing prefixes from the DHCP server on the Switch to prefix assignment targets. If the routing information cannot be set with the functionality, there are two probable causes.

1. The configuration has been set but not distributed.
2. An operation or event has occurred that affects functions related to the automatic routing information setting.

To isolate the cause of the problem, first, execute the `show ipv6 route -s` command to display the routing information. Next, execute the `show ipv6 dhcp server binding` command to display the information of the distributed prefixes. Then, compare the information obtained from the results of the both commands.

Table 3-39: Isolating the cause of a failure related to the routing information setting for prefix distribution targets

Conditions		Causes
Does the binding information exist?	**Does the routing information exist?**	
Yes	Yes	Not applicable. The status is active.
Yes	No	Cause 2
No	Yes	Cause 2
No	No	Causes 1 and 2

The routing information for prefix distribution targets is not always retained, as shown in the following table.

Table 3-40: Conditions that affect whether the routing information for prefix distribution targets is retained

Prefix-related information to be retained	Events that affect whether the information is retained			
	The server functionality is restarted		The routing manager is restarted	The Switch is estarted
	By executing a command	Due to a server failure		
Routing information for clients	Y	Y/N	Y	N

Legend

Y: Retained

Y/N: Not retained (The information of each state might be retained.)

N: Not retained (The information is initialized and needs to be set again.)

Notes:

The route management functionality needed to perform the routing information setting operation for prefix distribution targets

For details about other failures, see *3.10.1 Communication is not possible or is disconnected*.

(a) Checking the routing information

Consider the case where the automatic route setting functionality is used for distributing prefixes from the IPv6 DHCP server on the Switch to assignment targets. In this case, use the `show ipv6 route` command with the `-s` parameter to check the routing information after prefix distribution.

Figure 3-16: Checking the routing information by using the operation command

```
> show ipv6 route -s
Total: 10routes
```

```
Destination             Next Hop      Interface        Metric  Protocol  Age
3ffe:1234:5678::/48     ::1           tokyo            0/0      Static   45m
        <Active Gateway Dhcp>
3ffe:aaaa:1234::/48     ::1           osaka            0/0      Static   23m
        <Active Gateway Dhcp>
:
>
```

(b) Setting the routing information again

Consider the case where the automatic route setting functionality is used for distributing prefixes from the IPv6 DHCP server on the Switch to assignment targets. In this case, if an event has cleared the routing information due to a failure, the prefixes must be distributed again. Perform necessary operations to obtain the prefix information again on the clients.

(3) The DUID is duplicated between the Switch and another device

In a network where multiple IPv6 DHCP servers including the Switch are operated, if the DUID is duplicated between the Switch and another server, use the following procedure to set the DUID of the Switch again.

(a) Deleting the file that contains the DUID information

The DUID of the Switch is saved in `/usr/var/dhcp6/dhcp6s_duid`. Use the `rm` command on the operation command line to explicitly delete the file.

(b) Regenerating the DUID

After the DUID file is deleted, use the `restart ipv6-dhcp server` command to restart the server or add the IPv6 DHCP server setting in the configuration. At startup, the IPv6 DHCP server on the Switch obtains the MAC address of the IPv6 interface that is used as the IPv6 DHCP server interface. Then, the IPv6 DHCP server regenerates the DUID based on the obtained MAC address and time information.

(c) Checking the DUID

To check the DUID, execute the `show ipv6 dhcp server statistics` command. The DUID is displayed for `< Server DUID >`. For details, see the *Configuration Guide*.

3.11 IPv6 unicast routing communication failures

3.11.1 RIPng routing information cannot be found

If RIPng routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.11.4 No IPv6 routing information exists in the VRF*.

Table 3-41: Failure analysis method for RIPng

No.	Items to check and commands	Action
1	Display the RIPng neighboring information. `show ipv6 rip neighbor`	If the interface of the neighboring router is not displayed, go to No. 2.
		If the interface of the neighboring router is displayed, go to No. 3.
2	Check whether the RIPng setting in the configuration is correct.	If the configuration is correct, go to No. 3.
		If the configuration is not correct, modify the configuration.
3	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the RIPng route.
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.11.2 OSPFv3 routing information cannot be found

If OSPFv3 routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.11.4 No IPv6 routing information exists in the VRF*.

Table 3-42: Failure analysis method for OSPFv3

No.	Items to check and commands	Action
1	Displays the OSPFv3 interface status. `show ipv6 ospf interface` *<Interface Name>*	If the interface status is `DR` or `P to P`, go to No. 3.
		If the interface status is `BackupDR` or `DR Other`, go to No. 2.
		If the interface status is `Waiting`, wait for a while and execute the command again. Go to No. 1.
2	Check the neighboring router status with DR from the information in `Neighbor List`.	If the neighboring router status with DR is other than `Full`, go to No. 4.
		If the neighboring router status with DR is `Full`, go to No. 5.

No.	Items to check and commands	Action
3	Check the status of every neighboring router from the information in `Neighbor List`.	If the status of any neighboring router is other than `Full`, go to No. 4.
		If the status of every neighboring router is `Full`, go to No. 5.
4	Check whether the OSPFv3 setting in the configuration is correct.	If the configuration is correct, go to No. 5.
		If the configuration is not correct, modify the configuration.
5	Check the route that has learned the OSPFv3 route. `show ipv6 route all-routes`	If the route is `InActive`, go to No. 6.
		If the route does not exist, check whether the neighboring router is advertising the OSPFv3 route.
6	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the OSPFv3 route.
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.11.3 No BGP4+ routing information exists

If BGP4+ routing information cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Also, if network partitioning is used and the maximum number of routes is set by the `maximum routes` configuration command, first, follow the failure analysis method described in *3.11.4 No IPv6 routing information exists in the VRF*.

Table 3-43: Failure analysis method for BGP4+

No.	Items to check and commands	Action
1	Check the BGP4+ peer status. `show ipv6 bgp neighbors`	If the peer status is other than `Established`, go to No. 2.
		If the peer status is `Established`, go to No. 3.
2	Check whether the BGP4+ setting in the configuration is correct.	If the configuration is correct, go to No. 3.
		If the configuration is not correct, modify the configuration.
3	Check whether the BGP4+ route has been learned. `show ipv6 bgp received-routes`	If the route exists but its status is not `active`, go to No. 4.
		If the route does not exist, go to No. 5.
4	Check whether the routing information that resolves the next hop address of the BGP4+ route exists. `show ipv6 route`	If the routing information that resolves the next hop address exists, go to No. 5.
		If the routing information that resolves the next hop address does not exist, perform the failure analysis for the protocol for learning the routing information.

No.	Items to check and commands	Action
5	Check whether the route is filtered in the configuration.	Check whether the neighboring router is advertising the BGP4+ route.
		If the configuration is not correct, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.

3.11.4 No IPv6 routing information exists in the VRF

If routing information for each protocol cannot be found in the routing information obtained by the Switch, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-44: Failure analysis method for VRF

No.	Items to check and commands	Action
1	Check whether the number of routes in VRF is equal to or larger than the maximum value specified in the configuration. show ipv6 vrf	If the number of routes is equal to or larger than the maximum value, go to No. 2.
		If the number of routes is less than the maximum value, perform the failure analysis for the protocol for the route that does not exist. For RIPng, see *3.11.1 RIPng routing information cannot be found*. For OSPFv3, see *3.11.2 OSPFv3 routing information cannot be found*. For BGP4+, see *3.11.3 No BGP4+ routing information exists*.
2	Check the maximum number of routes in VRF specified in the configuration.	Increase the maximum number, or reduce the number of routes by, for example, aggregating the routes.

3.12 Communication failures in the IPv6 multicast routing functionality

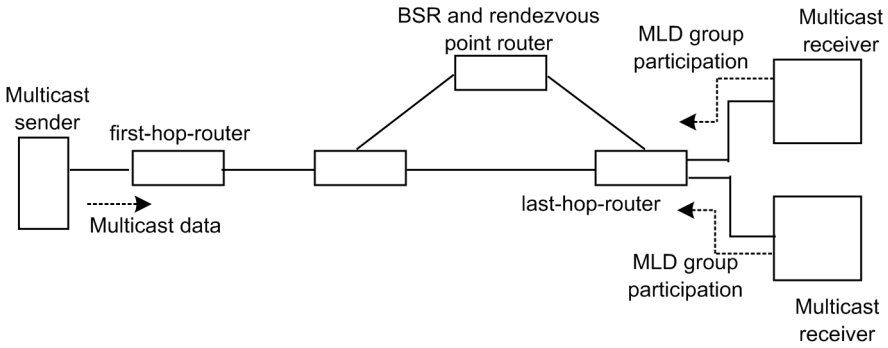
This section describes actions to be taken when an IPv6 multicast communication failure occurs on the Switch.

3.12.1 Communication is not possible on the IPv6 PIM-SM networks

If multicast forwarding is not possible in an IPv6 PIM-SM network configuration, isolate the cause of the problem according to the failure analysis method described below.

The following figure shows an example of an IPv6 PIM-SM network.

Figure 3-17: Example of an IPv6 PIM-SM network



Notes:

- BSR: The router that distributes rendezvous point information. (For details, see the *Configuration Guide*.)
- Rendezvous point router: The router that forwards packets to the multicast receivers if the destination of the packets has not been determined. (For details, see the *Configuration Guide*.)
- `first-hop-router`: The router that is connected directly to the multicast sender
- `last-hop-router`: The router that is connected directly to the multicast receivers

(1) Items checked in common

The following table shows the items checked in common for all the Switches in an IPv6 PIM-SM network configuration.

Table 3-45: Items checked in common

No.	Items to check and commands	Action
1	Make sure that the setting for using the multicast functionality (`ipv6 multicast routing`) exists in the configuration. `show running-config`	If the setting for using the multicast functionality does not exist, modify the configuration.
2	Make sure that the address setting for the loopback interface exists in the configuration. `show running-config`	If the address setting for the loopback interface does not exist in the configuration, modify the configuration.
3	Make sure that PIM is running on one or more interfaces. `show ipv6 pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on at least one of the interfaces.

No.	Items to check and commands	Action
4	Check whether MLD snooping is set for the interface on which PIM runs. `show mld-snooping`	If MLD snooping is set, check the following: • Check whether the multicast router port for MLD snooping is set for the port connected to the neighboring router. • See *3.6.5 Multicast forwarding by MLD snooping is not possible*.
5	Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets and multicast packets on the interface on which PIM and MLD run. `show running-config`	If the configuration contains a setting that suppresses forwarding of protocol packets and multicast packets, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.
6	Check the PIM neighboring information. `show ipv6 pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ipv6 pim` command with the `interface` parameter to make sure that PIM is running on the interface connected with the neighboring routers. • Check the settings of the neighboring routers.
7	Check whether the unicast route to the multicast data sender exists. `show ipv6 route`	If the unicast route does not exist, see *3.11 IPv6 unicast routing communication failures*.
8	Make sure that PIM is running on the interface connected to the next hop address to the multicast data sender. `show ipv6 pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on the interface connected to the next hop address to the multicast data sender.
9	Check the configuration to make sure that the PIM-SSM group addresses do not contain the forwarding target group address. `show running-config`	If the PIM-SSM group addresses contain the forwarding target group address, modify the configuration.
10	Make sure that BSR has been determined. This checking is not required if the rendezvous point for the forwarding target group address is a static rendezvous point. `show ipv6 pim bsr`	If BSR has not been determined, check whether the unicast route to BSR exists. If the unicast route does not exist, see *3.11 IPv6 unicast routing communication failures*. If the unicast route exists, check the BSR settings. If the Switch is used as BSR, see *(2) Items to check for BSR*.
11	Make sure that the rendezvous point has been determined. `show ipv6 pim rp-mapping`	If the rendezvous point has not been determined, check whether the unicast route to the rendezvous point exists. If the unicast route does not exist, see *3.11 IPv6 unicast routing communication failures*. If the unicast route exists, check the rendezvous point settings. If the Switch is used as the rendezvous point, see *(3) Items to check for the rendezvous point router*.
12	Make sure that the rendezvous point group addresses contain the forwarding target group address. `show ipv6 pim rp-mapping`	If the forwarding target group address is not contained, check the rendezvous point router settings.
13	Make sure that multicast forwarding entries exist. `show ipv6 mcache`	If multicast forwarding entries do not exist, make sure that multicast data has reached the upstream port. If multicast data has not reached the upstream port, check the settings of the multicast sender or upstream router.
14	Make sure that multicast routing information exists. `show ipv6 mroute`	If multicast routing information does not exist, check the downstream router settings.

No.	Items to check and commands	Action

15	Check whether the number of the multicast routing information entries or multicast forwarding entries exceeds its upper limit.
	For the multicast routing information:
	`show ipv6 mroute`
	For the multicast forwarding entries:
	`show ipv6 mcache`
	`netstat multicast`
		If a warning is displayed, check whether an unexpected multicast routing information entry or unexpected multicast forwarding entry has been created. If many negative caches are found among the multicast forwarding entries, check whether there is a terminal that is sending unnecessary packets.

(2) Items to check for BSR

The following table shows the items to check when the Switch is used as BSR in an IPv6 PIM-SM network configuration.

Table 3-46: Items to check for BSR

No.	Items to check and commands	Action
1	Make sure the Switch is a BSR candidate. `show ipv6 pim bsr`	If the Switch is not a BSR candidate, check and modify the configuration so that the Switch can work as a BSR candidate. If an address is not set for the loopback interface, the Switch does not work as a BSR candidate. Also make sure that a loopback interface address is set.
2	Make sure the Switch is used as BSR. `show ipv6 pim bsr`	If the Switch is not used as BSR, check the priorities of other BSR candidates. A larger value represents a higher priority. If the priority is the same among BSR candidates, the BSR candidate that has the highest BSR address becomes BSR.

(3) Items to check for the rendezvous point router

The following table shows the items to check when the Switch is used as a rendezvous point router in an IPv6 PIM-SM network configuration.

Table 3-47: Items to check for the rendezvous point router

No.	Items to check and commands	Action
1	Make sure the Switch is a rendezvous point candidate for the forwarding target group address. `show ipv6 pim rp-mapping`	If the Switch is not a rendezvous point candidate for the forwarding target group address, check and modify the configuration so that the Switch can work as a rendezvous point candidate for the forwarding target group address. If an address is not set for the loopback interface, the Switch does not work as a rendezvous point candidate. Also make sure that a loopback interface address is set.
2	Make sure the Switch is the rendezvous point for the forwarding target group address. `show ipv6 pim rp-hash` <*Group Address*>	If the Switch is not the rendezvous point, check the priorities of other rendezvous point candidates. A smaller value represents a higher priority. If the priority of another rendezvous point candidate is higher than that of the Switch, the Switch does not work as the rendezvous point. If the priority is the same between another candidate and the Switch, they are assigned to a different group address due to the protocol specification, and the Switch might not work as the rendezvous point for the target group. If you want to use the Switch as the rendezvous point, set a higher priority for the Switch than other rendezvous point candidates.

(4) Items to check for last-hop-router

The following table shows the items to check when the Switch is used as `last-hop-router` in an IPv6 PIM-SM network configuration.

Table 3-48: Items to check for last-hop-router

No.	Items to check and commands	Action
1	Make sure that MLD is running on the interface connected to the multicast receivers. `show ipv6 mld interface`	If MLD is not running, check and modify the configuration so that MLD runs on the interface.
2	Make sure that the multicast receivers participate in the forwarding target group through MLD. `show ipv6 mld group`	If a multicast receiver does not participate in the forwarding target group, check the multicast receiver settings.
3	If the interface in which the forwarding target group participates exists and PIM runs, make sure that the Switch is DR. `show ipv6 pim interface`	If the Switch is not DR, check the DR of the forwarding target interface.
4	Check whether MLD snooping is set for the interface on which the static group participation functionality is used. `show mld-snooping`	If MLD snooping is set, check the following: • Check whether the multicast router port for MLD snooping is set for the destination port. • See *3.6.5 Multicast forwarding by MLD snooping is not possible*.
5	Check whether any anomaly has been detected on any interface. `show ipv6 mld interface`	Make sure that no warning information is displayed for `Notice`. If warning information is displayed, check the following: • `L`: More participation requests than the expected maximum number have occurred. Check the number of connected users. • `Q`: The MLD version is different from that on the neighboring router. Use the same MLD version. • `R`: A user is sending a report that cannot be received with the current settings. Change the MLD version on the Switch, or check the settings of the participation user. • `S`: Parts of the participation information have been discarded because the number of sources stored in a message exceeds the maximum number for MLDv2. Check the settings of the participation user.

(5) Items to check for first-hop-router

The following table shows the items to check when the Switch is used as `first-hop-router` in an IPv6 PIM-SM network configuration.

Table 3-49: Items to check for first-hop-router

No.	Items to check and commands	Action
1	Make sure that the Switch is directly connected to the multicast sender.	If the Switch is not connected directly, check the network configuration.

2	Make sure that PIM or MLD is running on the interface connected to the multicast sender.
	`show ipv6 pim interface`
	`show ipv6 mld interface`
		If PIM or MLD is not running, check and modify the configuration so that PIM or MLD runs on the interface.

No.	Items to check and commands	Action
3	Check whether multicast routing information exists. `show ipv6 mroute`	If multicast routing information does not exist, make sure that the multicast data source address is the network address of the interface directly connected to the multicast sender.

3.12.2 Multicast data is forwarded twice in the IPv6 PIM-SM network

If multicast data is forwarded twice in an IPv6 PIM-SM network configuration, check the settings of each router and if multiple routers exist in one network, modify the settings so that PIM runs on the interface in the network.

The following table shows the items to check when data continues to be forwarded twice even after you have checked and modified the settings as described above.

Table 3-50: Items to check when data continues to be forwarded twice

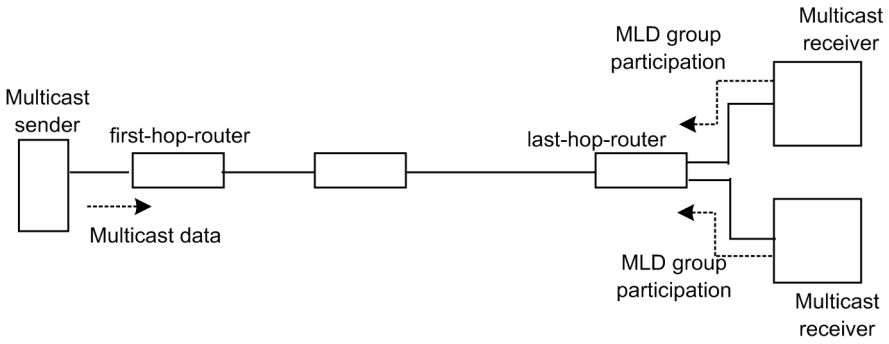
No.	Items to check and commands	Action
1	Check the PIM neighboring information of the interface belonging to the network with multiple routers. `show ipv6 pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ipv6 pim` command with the `interface` parameter to make sure that PIM is running on the interface connected with the neighboring routers. • Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*. • Check the settings of the neighboring routers.

3.12.3 Communication is not possible on the IPv6 PIM-SSM networks

If multicast forwarding is not possible in an IPv6 PIM-SSM network configuration, isolate the cause of the problem according to the failure analysis method described below.

The following figure shows an example of an IPv6 PIM-SSM network.

Figure 3-18: Example of an IPv6 PIM-SSM network



Notes:

- `first-hop-router`: The router that is connected directly to the multicast sender
- `last-hop-router`: The router that is connected directly to the multicast receivers

(1) Items checked in common

The following table shows the items checked in common for all the Switches in an IPv6 PIM-SSM

network configuration.

Table 3-51: Items checked in common

No.	Items to check and commands	Action
1	Make sure that the setting for using the multicast functionality (`ipv6 multicast routing`) exists in the configuration. `show running-config`	If the setting for using the multicast functionality does not exist, modify the configuration.
2	Make sure that the address setting for the loopback interface exists in the configuration. `show running-config`	If the address setting for the loopback interface does not exist in the configuration, modify the configuration.
3	Make sure that PIM is running on one or more interfaces. `show ipv6 pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on at least one of the interfaces.
4	Check whether MLD snooping is set for the interface on which PIM runs. `show mld-snooping`	If MLD snooping is set, check the following: • Check whether the multicast router port for MLD snooping is set for the port connected to the neighboring router. • See *3.6.5 Multicast forwarding by MLD snooping is not possible*.
5	Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets and multicast packets on the interface on which PIM and MLD run. `show running-config`	If the configuration contains a setting that suppresses forwarding of protocol packets and multicast packets, modify the configuration. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*.
6	Check the PIM neighboring information. `show ipv6 pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ipv6 pim` command with the `interface` parameter to make sure that PIM is running on the interface connected with the neighboring routers. • Check the settings of the neighboring routers.
7	Check whether the unicast route to the multicast data sender exists. `show ipv6 route`	If the unicast route does not exist, see *3.11 IPv6 unicast routing communication failures*.
8	Make sure that PIM is running on the unicast route send interface to the multicast data sender. `show ipv6 pim interface`	If PIM is not running, check and modify the configuration so that PIM runs on the unicast route send interface.
9	Check the configuration to make sure that the PIM-SSM group addresses contain the forwarding target group address. `show running-config`	If the PIM-SSM group addresses do not contain the forwarding target group address, modify the configuration.
10	Check whether multicast routing information exists. `show ipv6 mroute`	If multicast routing information does not exist, check the downstream router settings.

11	Check whether the number of the multicast routing information entries or multicast forwarding entries exceeds its upper limit.
	For the multicast routing information:
	`show ipv6 mroute`
	For the multicast forwarding entries:
	`show ipv6 mcache`
	`netstat multicast`
		If a warning is displayed, check whether an unexpected multicast routing information entry or unexpected multicast forwarding entry has been created. If many negative caches are found among the multicast forwarding entries, check whether there is a terminal that is sending unnecessary packets.

(2) Items to check for last-hop-router

The following table shows the items to check when the Switch is used as `last-hop-router` in an IPv6 PIM-SSM network configuration.

Table 3-52: Items to check for last-hop-router

No.	Items to check and commands	Action
1	If the mode of the multicast receivers is MLDv1 or MLDv2 (EXCLUDE mode), make sure that `ipv6 mld ssm-map enable` is set in the configuration. This setting enables the use of PIM-SSM in MLDv1 or MLDv2 (EXCLUDE mode). `show running-config`	If the configuration does not contain the setting to enable the use of PIM-SSM in MLDv1 or MLDv2 (EXCLUDE mode), modify the configuration.
2	If the mode of the multicast receivers is MLDv1 or MLDv2 (EXCLUDE mode), make sure that `ipv6 mld ssm-map static` is set in the configuration. This setting enables the linkage operation with PIM-SSM in MLDv1 or MLDv2 (EXCLUDE mode) for the group address and source address that are forwarded via PIM-SSM. `show running-config`	If the configuration does not contain the setting to enable the linkage operation with PIM-SSM in MLDv1 or MLDv2 (EXCLUDE mode), modify the configuration.
3	Make sure that MLD is running on the interface connected to the multicast receivers. `show ipv6 mld interface`	If MLD is not running, check and modify the configuration so that MLD runs on the interface.
4	Make sure that no MLD warning information is displayed on the interface connected to the multicast receivers. `show ipv6 mld interface`	If any warning information is displayed, take action according to the information. For details about the contents of each warning, see the manual *Operation Command Reference*.
5	Make sure that the multicast receivers participate in the forwarding target group through MLD. `show ipv6 mld group`	If a multicast receiver does not participate in the forwarding target group, check the multicast receiver settings.
6	Check whether the source address is registered in the MLD group information. `show ipv6 mld group`	If the mode of the multicast receivers is MLDv2 (INCLUDE mode) and the source address is not registered, check the multicast receivers. If the mode of the multicast receivers is MLDv1 or MLDv2 (EXCLUDE mode), make sure that the configuration contains the setting to enable the linkage operation with PIM-SSM.
7	If the interface in which the forwarding target group participates exists and PIM runs, make sure that the Switch is DR. `show ipv6 pim interface`	If the Switch is not DR, check the DR of the forwarding target interface.
8	Check whether MLD snooping is set for the interface on which the static group participation functionality is used. `show mld-snooping`	If MLD snooping is set, check the following: • Check whether the multicast router port for MLD snooping is set for the destination port. • See *3.6.5 Multicast forwarding by MLD snooping is not possible*.

No.	Items to check and commands	Action
9	Check whether any anomaly has been detected on any interface. `show ipv6 mld interface`	Make sure that no warning information is displayed for `Notice`. If warning information is displayed, check the following: • `L`: More participation requests than the expected maximum number have occurred. Check the number of connected users. • `Q`: The MLD version is different from that on the neighboring router. Use the same MLD version. • `R`: A user is sending a report that cannot be received with the current settings. Change the MLD version on the Switch, or check the settings of the participation user. • `S`: Parts of the participation information have been discarded because the number of sources stored in a message exceeds the maximum number for MLDv2. Check the settings of the participation user.

(3) Items to check for first-hop-router

The following table shows the items to check when the Switch is used as `first-hop-router` in an IPv6 PIM-SSM network configuration.

Table 3-53: Items to check for first-hop-router

No.	Items to check and commands	Action
1	Make sure that the Switch is directly connected to the multicast sender.	If the Switch is not connected directly, check the network configuration.

2	Make sure that PIM or MLD is running on the interface connected to the multicast sender.
	`show ipv6 pim interface`
	`show ipv6 mld interface`
		If PIM or MLD is not running, check and modify the configuration so that PIM or MLD runs on the interface.

3	Check whether multicast data has reached the Switch.	If the multicast data has not reached the Switch, check the settings of the multicast sender.

4	Check whether the group address and source address are the same between multicast data and multicast routing information.
	`show ipv6 mroute`
	`show netstat multicast`
		If the different group address and source address are used, check the settings of the multicast sender and `last-hop-router`.

3.12.4 Multicast data is forwarded twice in the IPv6 PIM-SSM network

If multicast data is forwarded twice in an IPv6 PIM-SSM network configuration, check the settings of each router and if multiple routers exist in one network, modify the settings so that PIM runs on the interface in the network.

The following table shows the items to check when data continues to be forwarded twice even after you have checked and modified the settings as described above.

Table 3-54: Items to check when data continues to be forwarded twice

No.	Items to check and commands	Action
1	Check the PIM neighboring information of the interface belonging to the network with multiple routers. `show ipv6 pim neighbor`	If neighboring routers are not displayed, check the following: • Use the `show ipv6 pim` command with the `interface` parameter to make sure that PIM is running on the interface connected with the neighboring routers. • Make sure that the configuration does not contain filtering or other settings that suppress forwarding of protocol packets. For details about the procedure for checking the filter configuration information, see *3.25.1 Checking the filters and QoS configuration information*. • Check the settings of the neighboring routers.

3.12.5 IPv6 multicast communication problems in VRF

If a problem on IPv6 multicast communication occurs in VRF, check the following.

Table 3-55: Items to check for VRF

No.	Items to check and commands	Action

1	Check the port number and VLAN ID to make sure that the interface for VRF is correct.
	`show ipv6 vrf`
	`show vlan`
	`show ipv6 pim interface`
		If the settings are not correct, modify the configuration or connection.

2	If the Switch is used as the rendezvous point, make sure that the Switch is operating as a rendezvous point candidate on the target VRF. `show ipv6 pim vrf all rp-mapping`	If the Switch is not operating as a rendezvous point candidate, check whether the address of the loopback interface for the target VRF is specified in the rendezvous point candidate setting in the configuration. `show running-config`
3	If the Switch is used as BSR, make sure that the Switch is operating as a BSR candidate on the target VRF. `show ipv6 pim vrf all bsr`	If the Switch is not operating as a BSR candidate, check whether the address of the loopback interface for the target VRF is specified in the BSR candidate setting in the configuration. `show running-config`
4	If multiple VRFs are used, check whether a global network or specific VRF occupies an unexpectedly large number of multicast forwarding entries. `show ipv6 mcache vrf all`	If a global network or specific VRF occupies more multicast forwarding entries than expected in the network design, check whether any unexpected multicast forwarding entries are created. If many negative caches are found, check whether there is a terminal that is sending unnecessary packets. Also, set the maximum number of forwarding entries for each VRF to prevent a global network or specific VRF from occupying forwarding entries. Target configuration: `ipv6 pim vrf <vrf id> mcache-limit <number>`
5	Check each VRF configuration by using the check items in *3.12.1 Communication is not possible on the IPv6 PIM-SM networks* through *3.12.4 Multicast data is forwarded twice in the IPv6 PIM-SSM network*.	Specify the target VRF for each command to check the information of the VRF. For details about specifying VRF, see the manual *Operation Command Reference*.

3.12.6 IPv6 multicast communication problems in an extranet

To resolve problems on IPv6 multicast communication in an extranet, first, try to use the check items described in *3.12.5 IPv6 multicast communication problems in VRF* and make sure that

multicast communication is possible in each VRF. After that, check the following.

Table 3-56: Items to check for an extranet

No.	Items to check and commands	Action
1	Make sure that the unicast route from the destination VRF to the source address is the expected VRF or global network. `show ipv6 rpf`	If it is not the case, check the settings of the unicast extranet.
2	Make sure that the protocol (PIM-SM or PIM-SSM) for the IPv6 multicast address used in the extranet is the same between the destination VRF and the upstream VRF. `show running-config`	If the protocol is different between the destination VRF and the upstream VRF, select a suitable IPv6 multicast address so that the protocol can be the same between them.
3	For the upstream VRF, check whether the unicast route to the source address is not another VRF. `show ipv6 rpf`	Configure the upstream VRF so that the unicast route to the source address is a VRF with an actual interface in the VRF.
4	If the PIM-SM VRF gateway is used, make sure that (`*`,`G`) entries have been generated in the upstream VRF. Also, make sure that `V` is displayed for `Flags` for the target (`*`,`G`) entry. `show ipv6 mroute`	If (`*`,`G`) entries are not generated correctly, make sure that the IPv6 multicast address used in extranet communication has been specified as the host address and permitted for the IPv6 multicast route filtering for the upstream VRF.
5	If the PIM-SM VRF gateway is used, make sure that the destination VRF is displayed for the downstream interface for the (`*`,`G`) entry generated in the upstream VRF. `show ipv6 mroute`	If the destination VRF does not exist in the downstream interface for the (`*`,`G`) entry of the upstream VRF, make sure that the destination VRF has been permitted for route-map that specifies the host address for IPv6 multicast route filtering in the upstream VRF. If no specific VRF is specified for route-map by the `match vrf` command, every VRF is permitted to be a destination.

6	If `(denied)` is displayed for the VRF of the upstream interface by the `show ipv6 mroute` command, IPv6 multicast route filtering for the upstream VRF has not been set correctly. Check the IPv6 multicast route filtering of the upstream VRF in the configuration.
	`show ipv6 mroute`
	`show running-config`
		Make sure that the IPv6 multicast address and destination VRF that are used in extranet communication have been permitted for the IPv6 multicast route filtering for the upstream VRF.
		If neither specific IPv6 multicast address nor specific VRF is specified for the IPv6 multicast route filtering, all IPv6 multicast addresses and VRFs are permitted.

3.13 Layer 2 authentication communication failures

3.13.1 Communication failures occurring when IEEE 802.1X is used

If authentication is not possible when IEEE 802.1X is used, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-57: Authentication failure analysis method for IEEE 802.1X

No.	Items to check and commands	Action
1	Use the `show dot1x` command to check the operating status of IEEE 802.1X.	If `Dot1x doesn't seem to be running` is displayed, IEEE 802.1X is not running. Check whether the `dot1x system-auth-control` command is set in the configuration. If `System 802.1X : Enable` is displayed, go to No. 2.
2	Execute the `show dot1x statistics` command, and make sure an EAPOL handshake has been performed.	If the value displayed for `RxTotal` under `[EAPOL frames]` is `0`, EAPOL frames have not been sent from the terminal. If a value other than `0` is displayed for `RxInvalid` or `RxLenErr`, an invalid EAPOL frame has been received from the terminal, in which case the event is logged. Use the `show dot1x logging` command to view the log. The `Invalid EAPOL frame received` message is also logged to describe the invalid EAPOL frame. If any of the above conditions exists, check the Supplicant setting on the terminal. For other cases, go to No. 3.
3	Execute the `show dot1x statistics` command, and make sure data has been sent to the RADIUS server.	If the value displayed for `TxNoNakRsp` under `[EAPoverRADIUS frames]` is `0`, no data has been sent to the RADIUS server. Check the following: • Check whether `aaa authentication dot1x default group radius` has been specified in a configuration command. • Check whether the `radius-server host` configuration command is set correctly. • If the authentication mode is port-based authentication or VLAN-based authentication (static), make sure the authentication terminal has not been registered with the `mac-address-table static` configuration command. For VLAN-based authentication (dynamic), make sure the authentication terminal has not been registered with the `mac-address` configuration command. • If the authentication mode is VLAN-based authentication (dynamic), check whether `aaa authorization network default group radius` has been set in a configuration command. For other cases, go to No. 4.
4	Execute the `show dot1x statistics` command, and make sure packets have been received from the RADIUS server.	If the value displayed for `RxTotal` under `[EAP overRADIUS frames]` is `0`, packets have not been received from the RADIUS server. Check the following: • If the RADIUS server is associated with the remote network, make sure a route to the remote network exists. • Make sure the ports on the RADIUS server are not subject to authentication. For other cases, go to No. 5.
5	Execute the `show dot1x logging` command, and check data exchange with the RADIUS server.	• If `Invalid EAP over RADIUS frames received` is displayed, invalid packets were received from the RADIUS server. Check whether the RADIUS server is running normally. • If `Failed to connect to RADIUS server` is displayed, an attempt to establish a connection with the RADIUS server has failed. Check whether the RADIUS server is running normally. For other cases, go to No. 6.

No.	Items to check and commands	Action
6	Execute the `show dot1x logging` command, and check whether authentication failed.	• If `New Supplicant Auth Fail.` is displayed, authentication failed for either of the following reasons. Check for problems. The user ID or password has not been registered on the authentication server. The user ID or password is entered incorrectly. • If `The number of supplicants on the switch is full` is displayed, authentication failed because the maximum number of supplicants for the device was exceeded. • If `The number of supplicants on the interface is full` is displayed, authentication failed because the maximum number of supplicants for the interface was exceeded. • If `Failed to authenticate the supplicant because it could not be registered to mac-address-table.` is displayed, authentication was successful, but an attempt to set the MAC address table for the hardware failed. See the appropriate part in the manual *Message and Log Reference*, and take the action described in *Action*. For AX6700S, AX6600S, and AX6300S series switches, see *4.1.2 Actions to be taken when a MAC address table resource shortage occurs*. • If `Failed to authenticate the supplicant because it could not be registered to MAC VLAN.` is displayed, authentication was successful, but an attempt to set the MAC VLAN table for the hardware failed. See the appropriate part in the manual *Message and Log Reference*, and take the action described in *Action*. For AX6700S, AX6600S, and AX6300S series switches, see *4.2.2 Actions to be taken when a VLAN identification table resource shortage occurs*. If the above does not apply and the port to be authenticated is VLAN-based authentication (dynamic), go to No. 7. For other authentication units, see the RADIUS server log to check whether authentication has failed.

No.	Items to check and commands	Action
7	Execute the `show dot1x logging` command, and check whether dynamic allocation in VLAN-based authentication (dynamic) failed.	• If `Failed to assign VLAN.(Reason: No Tunnel-Type Attribute)` is displayed, dynamic allocation has failed because the `Tunnel-Type` attribute is not set for the `RADIUS` attribute of the RADIUS frame. Add the `Tunnel-Type` attribute in the `RADIUS` attribute setting of the RADIUS server. • If `Failed to assign VLAN.(Reason:Tunnel-Type Attribute is not VLAN(13) )` is displayed, dynamic allocation has failed because the value of the `Tunnel-Type` attribute for the `RADIUS` attribute is not VLAN(13). Set VLAN(13) for the `Tunnel-Type` attribute of the RADIUS server. • If `Failed to assign VLAN.(Reason: No Tunnel-Medium-Type Attribute)` is displayed, dynamic allocation has failed because the `Tunnel-Medium-Type` attribute is not set for the `RADIUS` attribute. Set the `Tunnel-Medium-Type` attribute for the `RADIUS` attribute of the RADIUS server. • If `Failed to assign VLAN. (Reason: Tunnel-Medium-Type Attribute is not IEEE802(6) )` is displayed, dynamic allocation has failed. This is because the value of the `Tunnel-Medium-Type` attribute is not IEEE802(6) or because the value of the `Tunnel-Medium-Type` attribute is correct but the tag value does not match the tag of the `Tunnel-Type` attribute. Set the correct value or tag for the `Tunnel-Medium-Type` attribute for the `RADIUS` attribute of the RADIUS server. • If `Failed to assign VLAN. (Reason: No Tunnel-Private-Group-ID Attribute)` is displayed, dynamic allocation has failed because the `Tunnel-Private-Group-ID` attribute is not set for the `RADIUS` attribute of the RADIUS server. Set the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server. • If `Failed to assign VLAN. (Reason: Invalid Tunnel-Private-Group-ID Attribute)` is displayed, dynamic allocation has failed because an invalid value is set for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute. Set the correct VLAN ID for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server. • If `Failed to assign VLAN. (Reason: The VLAN ID is out of range.)` is displayed, dynamic allocation has failed. This is because a VLAN ID that is out of range is set for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server. Set the correct VLAN ID for the `Tunnel-Private-Group-ID` attribute. • If `Failed to assign VLAN. (Reason: The port doesn't belong to VLAN.)` is displayed, dynamic allocation has failed. This is because the authentication port does not belong to the VLAN ID specified for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server. Correct the configuration so that the VLAN ID specified for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server matches the VLAN ID of the MAC VLAN specified for the authenticating port. • If `Failed to assign VLAN. (Reason: The VLAN ID is not set to radius-vlan.)` is displayed, the VLAN ID specified for the `Tunnel-Private-Group-ID` attribute of the `RADIUS` attribute of the RADIUS server is not enabled for VLAN-based authentication (dynamic). Correct the configuration so that the VLAN ID specified for the `Tunnel-Private-Group-ID` attribute for the `RADIUS` attribute of the RADIUS server matches the VLAN ID of the MAC VLAN specified for the authenticating port. If none of the above apply, see the RADIUS server log to check whether authentication has failed.

For AX3800S, AX3600S, or AX2400S series switches, if communication is not possible on a port or VLAN that uses IEEE 802.1X, isolate the cause of the problem according to the failure analysis method described in the table below. If neither is the case, see *3.6 Layer 2 network communication*

failures.

Table 3-58: Communication failure analysis method for IEEE 802.1X

No.	Items to check and commands	Action
1	Make sure that VLANs with a VLAN-based authentication (static) setting and VLANs with another setting are not set simultaneously for the trunk port.	Communication is possible only for VLANs with a VLAN-based authentication (static) setting. Set all those VLANs for a port excluded from authentication, or set the VLANs with a VLAN-based authentication (static) setting for one port and the VLANs with another setting for another port.
2	Check whether the authenticated terminal has moved to an unauthenticated port in the same VLAN.	If the terminal authenticated on the Switch has moved to an unauthenticated port, communication is disabled until the authentication information is cleared. Use the `clear dot1x auth-state` command to clear the authentication status of the terminal.

3.13.2 Communication failures occurring when Web authentication is used

If a failure occurs when Web authentication is used, isolate the cause of the problem according to the failure analysis method described in *Table 3-59: Failure analysis method for Web authentication*.

For details about checking the configuration and accounting of Web authentication, see *Table 3-60: Checking the configuration of Web authentication* and *Table 3-61: Checking the accounting of Web authentication*, respectively, to isolate the cause of the problem.

Table 3-59: Failure analysis method for Web authentication

No.	Items to check and commands	Action
1	Check whether the login page appears on the terminal.	• If the login page and logout page do not appear, go to No. 2. • If the login page appears in local authentication method, go to No. 5. • If the login page appears in RADIUS authentication method, go to No. 7. • If the operation log message is displayed, go to No. 14.
2	Check whether the URLs specified for login and logout are correct.	• If incorrect URLs are specified for login or logout, use the correct URLs. • If the login page or logout page is not displayed in fixed or dynamic VLAN mode, check and modify the following settings: AX6700S, AX6600S, and AX6300S series switches: Make sure that a Web authentication IP address has been set with the `web-authentication ip address` configuration command. If URL redirection is used in dynamic VLAN mode, check whether the `web-authentication redirect-vlan` configuration command has been set. AX3800S, AX3600S, and AX2400S series switches: Check whether the Web authentication IP address has been set in the `web-authentication ip address` configuration command or URL redirection has been enabled by the `web-authentication redirect enable` configuration command. • For other cases, go to No. 3.

No.	Items to check and commands	Action
3	Make sure that the Web server is running.	• Execute the following command to check whether the Web server is running. If the Web server is running, go to No. 4. Command: `# ps -auwx | grep httpd` Check procedure: If `/usr/local/sbin/httpd` is displayed in the result of the `ps` command, the Web server is running. • If the Web server is not running, check the `web-authentication web-port` configuration command. • If the Web authentication configuration command has been set correctly, use the `restart web-authentication web-server` command to restart the Web server. • If the Web server does not start with the above operation, stop Web authentication by using the `no web-authentication system-auth-control` command, and wait about 10 seconds. After that, use the `web-authentication system-auth-control` configuration command to restart Web authentication.
4	Check the setting of the authentication IPv4 access list.	• If an unauthenticated terminal sends certain types of packets to destinations outside the Switch, make sure an authentication IPv4 access list is set. When both a standard access list and an authentication IPv4 access list are set, make sure the filter conditions in the authentication IPv4 access list are also set in the standard access list. • Make sure a filtering condition for discarding IP packets (such as `deny ip`) is not set in the standard access list or authentication IPv4 access list. • Make sure addresses including the Web authentication IP address are not set in the filtering condition in the authentication IPv4 access list. • Make sure `any` is not set for the destination IP address in the filtering condition in the authentication IPv4 access list. • For other cases, go to No. 9.
5	Use the `show web-authentication user` command to check whether the user ID is registered.	• If the user ID is not registered, use the `set web-authentication user` command to register the user ID, password, and VLAN ID. • For other cases, go to No. 6.
6	Check whether the entered password is correct.	• If the password does not match, use the `set web-authentication passwd` command to change the password. Alternatively, you can use the `remove web-authentication user` command to delete the user ID, and then use the `set web-authentication user` command to register the user ID, password, and VLAN ID again. • For other cases, go to No. 9.

No.	Items to check and commands	Action
7	Use the `show web-authentication statistics` command to check the communication status with the RADIUS server.	• If the value displayed for `TxTotal` under `[RADIUS frames]` is `0`, check whether the `aaa authentication web-authentication default group radius` and `radius-server host` configuration commands have been set correctly. • For AX3800S, AX3600S, and AX2400S series switches, even if communication is restored from the no-response state of the RADIUS server caused by the dead interval functionality, an authentication error occurs. This is because no authentication check is performed on the RADIUS server during the time interval specified by the `authentication radius-server dead-interval` configuration command. In this case, if the authentication failure due to no response from the RADIUS server continues too long, change the setting value of the `authentication radius-server dead-interval` configuration command or execute the `clear web-authentication dead-interval-timer` command. The authentication operation by the first RADIUS server resumes. • For other cases, go to No. 8.
8	Check whether the password and user ID are registered on the RADIUS server.	• If the user ID is not registered, register it on the RADIUS server. • For other cases, go to No. 9.
9	Use the `show web-authentication statistics` command to check whether Web authentication statistics are displayed.	• If Web authentication statistics are not displayed, go to No. 10. • For other cases, go to No. 11.
10	Check whether the `web-authentication system-auth-control` configuration command has been set.	• If the `web-authentication system-auth-control` configuration command has not been set, set the command. • For other cases, go to No. 11.
11	Execute the `show web-authentication logging` command and check for operation problems.	• If `The login failed because of hardware restriction.` is output in the log of the `show web-authentication logging` command, see *4.2.2 Actions to be taken when a VLAN identification table resource shortage occurs*. • If authentication information for the port to which the authentication terminal is connected is not displayed in fixed VLAN mode, use the `web-authentication port` configuration command to check whether the authenticating port has been set correctly. Also, make sure that the authenticating port to which the terminal is connected is neither in the `link-down` status nor is shut down. • For other cases, go to No. 13.
12	If no account is recorded on the accounting server, use the `show web-authentication statistics` command to check the communication status with the accounting server.	• If the value displayed for `TxTotal` under `[Account frames]` is `0`, check whether the `aaa accounting web-authentication default start-stop group radius` and `radius-server host` configuration commands have been set correctly. • For other cases, check the Web authentication configuration.

No.	Items to check and commands	Action
13	Check whether authentication fails on the connected terminal.	• If a terminal subject to authentication cannot be authenticated at all, use the `restart web-authentication web-server` command to restart the Web server. • If authentication still fails after the Web server restarts, execute the `restart vlan mac-manager` command. • For other cases, check the Web authentication configuration and correct the configuration.
14	Use the `show logging` command to check the operation log.	• If the following operations are performed, a Web server (httpd) stop message and Web server (httpd) restart message might be displayed in the operation log. Web authentication is stopped (by executing the `no web-authentication system-auth-control` command) and then restarted (by executing the `web-authentication system-auth-control` command). System switching occurs on AX6700S series switches (BCU), AX6600S series switches (CSU), or AX6300S series switches (MSU). The `restart web-authentication web-server` command is used to restart the Web server. Web server (httpd) stop message: Level: `E7` Message identifier: `2a001000` Message: `httpd aborted.` Web server (httpd) restart message: Level: `R7` Message identifier: `2a001000` Message: `httpd restarted.` These messages indicate that the Web server (httpd) stopped and then automatically restarted. After the Web server (httpd) restarts, the authentication operation resumes. • For other cases, see the manual *Message and Log Reference*.

Check the following for the configuration related to Web authentication.

Table 3-60: Checking the configuration of Web authentication

No.	Items to check	Action
1	Check the Web authentication configuration settings.	Make sure the following configuration commands have been set correctly. Common configuration: • `aaa accounting web-authentication default start-stop group radius` • `aaa authentication web-authentication default group radius` • `web-authentication system-auth-control` Configuration for dynamic VLAN mode: • `web-authentication auto-logout` • `web-authentication max-timer` • `web-authentication max-user` • `web-authentication vlan` Configuration for fixed VLAN mode: • `web-authentication ip address` • `web-authentication port` • `web-authentication static-vlan max-user` • `web-authentication web-port` For AX6700S, AX6600S, and AX6300S series switches, make sure also the following commands have been set. • `authentication ip access-group` • `web-authentication redirect-vlan` • `web-authentication redirect-mode` For AX3800S, AX3600S, and AX2400S series switches, make sure also the following commands have been set. • `authentication arp-relay` • `authentication ip access-group` • `web-authentication redirect enable` • `web-authentication redirect-mode`
2	Check the IP address settings for the VLAN interfaces.	For dynamic VLAN mode, make sure the IP addresses for the following VLAN interfaces are set correctly: • Pre-authentication VLAN • Post-authentication VLAN
3	Check the DHCP relay agent configuration.	For dynamic VLAN mode, if an external DHCP server is used on an L3 switch, make sure DHCP relay agents are correctly set between the following VLANs: • Between the pre-authentication VLAN and the VLAN for the server • Between the post-authentication VLAN and the VLAN for the server
4	Check the filtering configuration.	For dynamic VLAN mode, when the filtering is used for an L3 switch, make sure that the filters are correctly set between the following VLANs: • From the VLAN used for authentication to the post-authentication VLAN: A filter is set to disable all IP communication. • From the post-authentication VLAN to the VLAN used for authentication: A filter is set to forward only communication by Web browsers. Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

No.	Items to check	Action
5	Check the configuration of the access filter for authentication.	For fixed or dynamic VLAN mode, make sure the filter conditions required for communication from unauthenticated terminals to destinations outside the Switch have been set correctly by using the `authentication ip access-group` and `ip access-list extended` configuration commands.
6	Check the ARP relay configuration.	For AX3800S, AX3600S, and AX2400S series switches, in fixed or dynamic VLAN mode, make sure the `authentication arp-relay` configuration command has been set correctly so that unauthenticated terminals can send ARP packets to devices outside the Switch.

Check the following for the accounting of Web authentication.

Table 3-61: Checking the accounting of Web authentication

No.	Items to check	Action
1	Check whether authentication result account logs have been correctly recorded.	• If no authentication state is displayed in the execution result of the `show web-authentication login` command, see *Table 3-59: Failure analysis method for Web authentication*and take necessary action. • If the logs are not recorded on the accounting server, go to No. 2. • If the logs are not recorded on the syslog server, go to No. 3.
2	Use the `show web-authentication statistics` command to check the communication status with the accounting server.	• If the value displayed for `TxTotal` under `[Account frames]` is `0`, check whether the `aaa accounting web-authentication default start-stop group radius` or `radius-server host` configuration command has been set correctly. • For other cases, check the Web authentication configuration.
3	Check the syslog server configuration.	Make sure the following configuration commands have been set correctly. • Make sure that the syslog server has been set by the `logging host` command. • Make sure that `aut` has been set for the event type in the `logging event-kind` command. • Make sure that the `web-authentication logging enable` command has been set.

3.13.3 Communication failures occurring when MAC-based authentication is used

If a failure occurs when MAC-based authentication is used, isolate the cause of the problem according to the failure analysis method described in *Table 3-62: Failure analysis method for MAC-based authentication*.

For details about checking the configuration and accounting of MAC-based authentication, see *Table 3-63: Checking the configuration of MAC-based authentication* and *Table 3-64: Checking the accounting of MAC-based authentication*, respectively, to isolate the cause of the problem.

Table 3-62: Failure analysis method for MAC-based authentication

No.	Items to check and commands	Action
1	Check whether communication with the terminal is possible.	• If authentication in local authentication method is not possible, go to No. 2. • If authentication in RADIUS authentication method is not possible, go to No. 3. • For other cases, go to No. 5.
2	Use the `show mac-authentication mac-address` command to make sure the MAC address and VLAN ID are registered.	• If the MAC address is not registered, use the `set mac-authentication mac-address` command to register the MAC address and VLAN ID. • For other cases, go to No. 5.
3	Use the `show mac-authentication statistics` command to check the communication status with the RADIUS server.	• If the value displayed for `TxTotal` under `[RADIUS frames]` is `0`, check whether the `aaa authentication mac-authentication default group radius`, `radius-server host`, and `mac-authentication radius-server host` configuration commands have been set correctly. • For AX3800S, AX3600S, and AX2400S series switches, even if communication is restored from the no-response state of the RADIUS server caused by the dead interval functionality, an authentication error occurs. This is because no authentication check is performed on the RADIUS server during the time interval specified by the `authentication radius-server dead-interval` configuration command. In this case, if the authentication failure due to no response from the RADIUS server continues on for too long, change the setting value of the `authentication radius-server dead-interval` configuration command or execute the `clear mac-authentication dead-interval-timer` command. The authentication operation by the first RADIUS server resumes. • For other cases, go to No. 4.
4	Check whether the MAC address and password are registered on the RADIUS server.	• If the MAC address is not registered as the user ID of the RADIUS server, register the MAC address on the RADIUS server. • If a MAC address is used as the password, set the MAC address that has been set for the user ID. • If a value common to the RADIUS server is set as the password, make sure that the value matches the password set in the `mac-authentication password` configuration command. • For other cases, go to No. 5.

No.	Items to check and commands	Action
5	Check the setting of the authentication IPv4 access list.	• If an unauthenticated terminal sends certain types of packets to destinations outside the Switch, make sure an authentication IPv4 access list is set. When both a standard access list and an authentication IPv4 access list are set, make sure the filter conditions in the authentication IPv4 access list are also set in the standard access list. • If communication is possible without authentication, make sure a filtering condition for permitting IP packet communication (such as `permit ip any`) is not set in the access list. • For AX3800S, AX3600S, and AX2400S series switches, even if the `deny ip any any` filtering condition is set in the authentication IPv4 access list specified for the authenticating port, MAC-based authentication is performed depending on the received ARP packets. To remove the target port from the ports subject to MAC-based authentication, use the `no mac-authentication port` configuration command. • For other cases, go to No. 6.
6	Use the `show mac-authentication statistics` command to check whether the MAC-based authentication statistics are displayed.	• If the MAC-based authentication statistics are not displayed, go to No. 7. • For other cases, go to No. 8.
7	Check whether the `mac-authentication system-auth-control` configuration command has been set.	• If the `mac-authentication system-auth-control` configuration command has not been set, set the command. • Check whether the authenticating port is correctly set by the `mac-authentication port` configuration command. • Make sure that the authenticating port to which the terminal is connected is neither in the `link-down` status nor is shut down. • For other cases, go to No. 8.
8	Execute the `show mac-authentication logging` command and check for operation problems.	• If the number of authenticated devices has reached the maximum capacity limit, wait a while until the authentication of another terminal is cancelled. • For other cases, check the MAC-based authentication configuration.

Check the following for the configuration related to MAC-based authentication.

Table 3-63: Checking the configuration of MAC-based authentication

No.	Items to check	Action
1	Check the MAC-based authentication configuration settings.	Make sure the following configuration commands have been set correctly. • `aaa accounting mac-authentication default start-stop group radius` • `aaa authentication mac-authentication default group radius` • `mac-authentication password` • `mac-authentication port` • `mac-authentication radius-server host` • `mac-authentication static-vlan max-user` • `mac-authentication system-auth-control`

No.	Items to check	Action
2	Check the configuration of the access filter for authentication.	Make sure the filter conditions required for communication from unauthenticated terminals to destinations outside the Switch have been set correctly by using the `authentication ip access-group` and `ip access-list extended` configuration commands.

Check the following for the accounting of MAC-based authentication.

Table 3-64: Checking the accounting of MAC-based authentication

No.	Items to check	Action
1	Check whether authentication result account logs have been correctly recorded.	• If no authentication state is displayed in the result of the `show mac-authentication login` command, see *Table 3-62: Failure analysis method for MAC-based authentication* and take necessary action. • If the logs are not recorded on the accounting server, go to No. 2. • If the logs are not recorded on the syslog server, go to No. 3.
2	Use the `show mac-authentication statistics` command to check the communication status with the accounting server.	• If the value displayed for `TxTotal` under `[Account frames]` is `0`, check whether the `aaa accounting mac-authentication default start-stop group radius`, `radius-server host`, or `mac-authentication radius-server host` configuration command has been set correctly. • For other cases, check the MAC-based authentication configuration.
3	Check the syslog server configuration.	Make sure the following configuration commands have been set correctly. • Make sure that the syslog server has been set by the `logging host` command. • Make sure that `aut` has been set for the event type in the `logging event-kind` command. • Make sure that the `mac-authentication logging enable` command has been set.

3.13.4 Communication failures occurring when an authentication VLAN is used

If a failure occurs when an authentication VLAN is used, isolate the cause of the problem according to the following table.

Table 3-65: Failure analysis method for the authentication VLAN

No.	Items to check and commands	Action
1	Execute the `show logging` command, and check whether any hardware failure is recorded in the operation log.	• If any hardware failure is recorded in the operation log, replace the device. • For other cases, go to No. 2.
2	Execute the `show fense server` command to make sure the VLAN is operating normally.	• If the error message `Connection failed to VAA program.` is displayed, take action described in No. 8. • For other cases, go to No. 3.

No.	Items to check and commands	Action
3	Execute the `show fense server` command to check the operating status of the authentication VLAN.	• If VAA NAME is not set (i.e., `-` is displayed), the `fense vaa-name` command is not set in the configuration. Set the `fense vaa-name` command in the configuration. • If `disable` is displayed for `Status` of VAA IDs, the authentication VLAN is not operating. Check the configuration. • For other cases, go to No. 4.
4	Execute the `show fense server` command to check the connection status to the authentication server.	• If the IP address of the authentication server is not displayed for `Server Address` of VAA IDs, communication with the authentication server is not possible. That is also the case if the TCP port number of the authentication server is not displayed for `Port` of VAA IDs. Check the configuration. • If a value other than `CONNECTED` is displayed for `Agent Status` of VAA IDs, the VLAN is not connected to the authentication server. Check the status and settings of the authentication server. • For other cases, go to No. 5.
5	Execute the `show fense server` command with the `detail` parameter to check the setting of the `fense vlan` configuration.	• If no VLAN ID is displayed for VAA IDs or incorrect information is displayed, there is no VLAN to be switched after authentication of terminals. Check the configuration. • For other cases, go to No. 6.
6	Execute the `show fense statistics` command multiple times to check the connection status to the authentication server.	• If the values of `Connect Failure Count` and `Timeout Disconnect Count` increase for VAA IDs, the connection to the authentication server is unstable. Check the status of the network between the authentication server and authentication VLAN. • If the network status is normal, make sure that the `alive-time` value set by the `fense alive-timer` configuration command and the setting parameters (`HCinterval` and `RecvMsgTimeout`) for the authentication server meet the following conditions. alive-time >= HCinterval + 5 RecvMsgTimeout >= HCinterval + 5 • If the authentication VLAN repeats connecting and disconnecting to the authentication server, use the `restart vaa` command to restart the authentication VLAN. Furthermore, restart VLANaccessController on the authentication server as well as the respective functions of the authentication VLAN. • For other cases, go to No. 7.
7	Execute the `show fense statistics` command, and make sure communication with the MAC VLAN functionality is operating normally.	• If the `Request` count of `VLANaccessAgent Recv Message` of VAA IDs does not match the `Request` count of `Terget-VLAN Registration`, an internal inconsistency has occurred. Use the `restart vaa` command to restart the authentication VLAN. • For other cases, go to No. 8.

No.	Items to check and commands	Action
8	Execute the `show vlan mac-vlan` command, and make sure authenticated MAC addresses have been registered for the MAC VLAN functionality.	• If the `show vlan mac-vlan` command shows that authenticated MAC addresses have been registered, authentication of those MAC addresses cannot be enabled. Delete the registered MAC addresses. • If MAC addresses authenticated for each VLAN are not displayed, an internal inconsistency has occurred. Use the `restart vaa` command to restart the authentication VLAN. • If the authentication VLAN restarts but authenticated MAC addresses are not displayed, execute the `restart vlan` command with the `mac-manager` parameter to restart the L2MAC manager program. • For other cases, go to No. 9.
9	Execute the `show fense logging` command, and make sure communication with the authentication server is operating normally.	• For AX6700S, AX6600S, or AX6300S series switches, if `The registration of the MAC address failed.` is output in the log of the `show fense logging` command, see *4.2.2 Actions to be taken when a VLAN identification table resource shortage occurs*. For other cases, check the authentication VLAN configuration.

Check the following for the configuration related to the authentication VLAN.

Table 3-66: Checking the configuration of the authentication VLAN

No.	Items to check	Action
1	Check the authentication VLAN configuration settings.	Make sure the following configuration commands have been set correctly. • `fense vaa-name` • `fense vlan` • `fense server` • `fense retry-count` • `fense retry-timer` • `fense alive-timer`
2	Check the IP address settings for the VLAN interfaces.	Make sure the IP addresses for the following VLAN interfaces are set correctly: • VLAN used for authentication • Authenticated VLAN • VLAN for the authentication server • VLAN for the network to be accessed
3	Check the DHCP relay agent configuration.	Make sure that the DHCP relay agents are correctly set between the following VLANs: • Between the VLAN used for authentication and the VLAN for the authentication server • Between the authenticated VLAN and the VLAN for the authentication server

No.	Items to check	Action
4	Check the filtering configuration.	Make sure that the filters are correctly set between the following VLANs: • Between the VLAN used for authentication and the authenticated VLAN: A filter is set to disable all IP communication. • Between the VLAN used for authentication and the VLAN for the authentication server: A filter is set to forward only HTTP, DHCP, and ICMP communication. • Between the VLAN used for authentication and the VLAN for the network to be accessed: A filter is set to disable all IP communication. • Between the authenticated VLAN and the VLAN for the authentication server: A filter is set to forward only HTTP, DHCP, and ICMP communication. • Between the VLAN for the authentication server and the VLAN for the network to be accessed: A filter is set to disable all IP communication. Certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. Make sure that the setting conditions for filters and QoS control in the configuration are correct, and that bandwidth monitoring, drop control, or the shaper is used appropriately in the system configuration. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.

3.14 Communication failures in the high-reliability functionality

3.14.1 GSRP communication failures

If communication is not possible in a GSRP configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-67: Communication failure analysis method for a GSRP configuration

No.	Items to check and commands	Action
1	On the Switch and partner device that make up a GSRP group, execute the `show gsrp` command, and check the status of the VLAN group containing the target VLAN that causes the communication failure.	If the state of one of them is `Master` and the state of the other is other than `Master`, go to No. 2.
		If the state of one of them is `Backup(No Neighbor)`, resolve the communication problem in the direct link. GSRP Advertise frames might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper. See *3.25.1 Checking the filters and QoS configuration information* and check for a problem. If necessary, on the one whose state is `Backup(No Neighbor)` use the `set gsrp master` command to change the state to `Master`.
		If the state of both of them is either `Backup` or `Backup(Waiting)`, make sure that the method for selecting the master or backup state (`Selection-Pattern`) is the same between the devices.
		If the state of both of them is `Backup(Lock)`, cancel the lock state of one or both of them.
		If the state of both of them is `Master`, use the `restart gsrp` command to restart the GSRP program on one of them.
		For other cases, the devices are temporarily undergoing a status transition. Wait a while until communication is restored.
2	Check the status of the target VLAN port on the Switch and the devices on the communication path.	If the target VLAN port on the Switch or a device on the communication path has a failure, restore the device.
		If all of the following conditions are met, use the `activate` command to activate the target VLAN port: • The method for flushing the MAC address table of the target VLAN port is `Reset`. (To check this, use the `show gsrp` command with the `port` parameter.)
		If the target VLAN port on the Switch and the devices on the communication path have no problem, go to No. 3.
3	Use the `show gsrp` command with the `port` parameter to check the method (`GSRP`, `Reset`, or `No`) for flushing the MAC address table of the target VLAN port on the Switch.	If the method for flushing the MAC address table is `GSRP` or `Reset` and is not suitable for the current GSRP configuration, modify the `gsrp reset-flush-port` or `gsrp no-flush-port` configuration command.
		If the method for flushing the MAC address table is `GSRP` or `Reset` and is suitable for the current GSRP configuration, use the `restart gsrp` command to restart the GSRP program on the Switch.
		If the method for flushing the MAC address table is `No`, wait a while until aging occurs on the MAC address table for the neighboring device on the communication path.

If intended switching between master and backup states does not occur in a GSRP configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-68: Failure analysis method when state switching fails in a GSRP configuration

No.	Items to check and commands	Action
1	Use the `show gsrp` command to check the status of the VLAN group in which intended switching between master and backup states does not occur.	If the state of one of them is `Master` and the state of the other is other than `Master`, go to No. 2.
		If the state of one of them is `Backup(No Neighbor)`, resolve the communication problem in the direct link. If necessary, also use the `set gsrp master` command for the one whose state is `Backup(No Neighbor)` to change the state to `Master`.
		If the state of both of them is either `Backup` or `Backup(Waiting)`, make sure that the method for selecting the master or backup state (`Selection-Pattern`) is the same between the devices.
		If the state of both of them is `Backup(Lock)`, cancel the lock state of one or both of them.
		If the state of both of them is `Master`, use the `restart gsrp` command to restart the GSRP program on one of them.
		For other cases, the devices are temporarily undergoing a status transition. Wait a while.
2	Execute the `show gsrp` and `show gsrp` <*GSRP-ID*> `vlan-group` <*VLAN group ID list*> commands. Based on the information displayed by the commands, make sure that the master and backup states are correctly selected. The information includes the method for selecting the master or backup state (`Selection-Pattern`), the number of active ports on the Switch and on the partner device (`Active-Ports`), the priority information (`Priority`), and the MAC addresses.	If the selected states are correct but the number of active ports (`Active Ports`) does not match the number of up ports (`Up Ports`), go to No. 3.
		If the selected states are not correct, use the `restart gsrp` command to restart the GSRP program on the Switch.
3	Use the `show gsrp detail` and `show gsrp` <*GSRP-ID*> `port` <*Port list*> commands to check the delay time before up ports are counted for the number of active ports (`port-up-delay`) and also the remaining delay time (`delay`).	If the delay time (`port-up-delay`) is `infinity` and you want to include the number of up ports (`UP Ports`) in the number of active ports (`Active Ports`), execute the `clear gsrp port-up-delay` command.
		If the delay time (`port-up-delay`) is not `infinity` and the remaining delay time (`delay`) is not zero, wait a while. The up ports are counted as active ports after the remaining delay time passes. If you want to count the up ports as active ports immediately, execute the `clear gsrp port-up-delay` command.

In a GSRP configuration, if a reception timeout for GSRP Advertise frames is detected and a neighbor unknown state occurs, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-69: Failure analysis method when a neighbor unknown state occurs in a GSRP configuration

No.	Items to check and commands	Action
1	Use the `show gsrp detail` command to check the sending interval (`Advertise Interval`) and retention time (`Advertise Hold Time`) of GSRP Advertise frames.	If the retention time of GSRP Advertise frames is smaller than or equal to the sending interval of GSRP Advertise frames, set the retention time to a value larger than the sending interval.
		If the retention time of GSRP Advertise frames is larger than the sending interval of GSRP Advertise frames, set the retention time to a value larger than the current value depending on the network environment.

No.	Items to check and commands	Action
		See *3.25.1 Checking the filters and QoS configuration information*, and check whether there is any cause of GSRP Advertise frames being discarded by filtering, or by bandwidth monitoring, drop control, or the QoS control shaper.

3.14.2 Communication is not possible with the VRRP configuration of IPv4 networks

If communication is not possible in a VRRP configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-70: Failure analysis method for VRRP

No.	Items to check and commands	Action
1	On the Switch and remote devices that make up a virtual router, check the status of the virtual router, and check whether only one device is the master router and the others are backup routers.	For devices that make up a virtual router, if only one device is the master router and the others are the backup routers, check the following: • If terminals are connected directly to the virtual router not via other routers, make sure the virtual IP address of the virtual router is set as the default gateway in the network settings of the terminals. • Check the routing information of the devices on the communication path that includes the Switch. If there is no problem with the terminal settings and with the routing information of the devices on the communication path, go to No. 2.
		If the status of the virtual router is not correct, go to No. 3.
2	Execute the `show vlan` command with the `detail` parameter, and check whether the status of the physical port is `Forwarding` in the VLAN to which the virtual router is connected.	• If the status of the physical port is `Blocking`, communication might have been temporarily blocked due to, for example, the topology change for STP. Wait a while, and then make sure that the status of the physical port is `Forwarding`. If you wait a while but the status of the physical port is not `Forwarding`, check the configuration and physical network configuration. • If the status of the physical port is `down`, the port is not physically connected. Check whether connectors and cables are connected correctly.
		If the status of the physical port is `Forwarding`, check whether the load of the routing destination network is high.
3	For the virtual routers of the Switch and remote devices that make up a virtual router, check whether only one virtual router is the master router.	• For AX6700S, AX6600S, or AX6300S series switches: If multiple virtual routers are master routers, go to No. 4. • For AX3800S or AX3600S series switches: If multiple virtual routers are master routers, go to No. 6.
		If only one virtual router is the master router, go to No. 10.
4	Execute the `show vrrpstatus` command with the `detail` parameter, and check whether the primary virtual router that is followed by other virtual routers has been configured.	If the primary virtual router followed by other virtual routers has been configured, go to No. 5.
		If the primary virtual router followed by other virtual routers has not been configured, go to No. 6.
5	Execute the `show vrrpstatus` command with the `detail` parameter, and check whether VLANs and VRIDs for the followed primary virtual router are the same among devices that make up the virtual routers.	If VLANs and VRIDs for the primary virtual router are different among devices that make up the virtual routers, multiple routers will be master routers. Use the same settings among devices that make up the virtual routers.

No.	Items to check and commands	Action
		If VLANs and VRIDs for the primary virtual router are the same among devices that make up the virtual routers, go to No. 6. Note that items No. 6 onward must be applied to the primary virtual router.
6	Check communication between routers that make up the virtual router by using the `ping` command with actual IPv4 addresses.	If communication with actual IPv4 addresses is not possible between routers that make up the virtual router, check the physical network configuration.
		If the result of the `ping` command indicates that communication with actual IPv4 addresses is possible between routers that make up the virtual router, go to No. 7.
7	Use the `show logging` command and the `show vrrpstatus` command with the `statistics` parameter to check the reception status of ADVERTISEMENT packets.	• You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet for which the advertisement interval is different than the one configured for local virtual router.` In this case, if the value of <*Number of packets*> `with bad advertisement interval` increases in the statistics, check whether the setting value of the ADVERTISEMENT packet-sending interval matches between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that does not pass the authentication check.` In this case, if the value of <*Number of packets*> `with authentication failed` increases in the statistics, check whether the authentication password setting matches between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet with IP TTL not equal to 255.` In this case, if the value of <*Number of packets*> `with bad ip ttl` increases in the statistics, make sure that there is no other router between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet for which the address list does not match the locally configured list for the virtual router.` In this case, if the value of <*Number of packets*> `with bad ip address list` increases in the statistics, make sure that the virtual IP address setting is the same between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that does not pass the authentication check.` In this case, if the value of <*Number of packets*> `with bad authentication type` increases in the statistics, check whether the authentication password setting exists in the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that length less than the length of the VRRP header.` In this case, if the value of <*Number of packets*> `with packet length error` increases in the statistics, make sure that the VRRP operation mode setting is the same between the Switch and remote device. • You might find that the following is registered in the reference log: `VRRP packet received with unsupported version number.` In this case, if the value of <*Number of packets*> `with invalid type` increases in the statistics, make sure that the VRRP operation mode setting is the same between the Switch and remote device.

No.	Items to check and commands	Action
		If ADVERTISEMENT packets are received correctly, check the remote device. If ADVERTISEMENT packets are not received, go to No. 8.
8	Execute the `show interfaces` command and check the statistics for the physical port to which a remote device that makes up the same virtual router is connected. Also, execute the `show cpu` command to check the CPU usage.	For the physical port to which a remote device that makes up the same virtual router is connected, you might find that the `Input rate` and `Output rate` values are large and the line load is high. In addition, the CPU usage displayed by using the `show cpu` command might be high. If these are the cases, take the following actions: • If a loop occurs in the line, check the use of STP and the physical network configuration, and resolve the loop. • Use the `vrrp timers advertise` configuration command to set a longer sending interval for ADVERTISEMENT packets. • Use the `vrrp preempt delay` configuration command to set the automatic switchback suppression time.
		If the load at the physical port is not high, go to No. 9.
9	Make sure that there is no filtering setting for discarding ADVERTISEMENT packets.	If there is such a filtering setting, modify the setting so that ADVERTISEMENT packets are not discarded.
		If such a filtering setting does not exist, check the operating status of the remote device that makes up the same virtual router.
10	If the fault-monitoring interface is set, check the status of the fault-monitoring interface.	Make sure that another virtual router is set on the interface for which the fault-monitoring interface is set and the fault-monitoring interface of the virtual router is not the interface of the target virtual router. If the fault-monitoring interface of the virtual router is the interface of the target virtual router, delete the setting of either of the fault-monitoring interfaces.
		If there is no setting of the fault-monitoring interface described above, go to No. 11.
11	Execute the `show vrrpstatus` command with the `detail` parameter, and make sure that the status of the virtual router is not `Initial`.	If the status of the virtual router is `Initial`, check the following: • If the current priority is not zero, resolve the cause of disabling the virtual router that is displayed for `Admin State`. (For details about the cause of disabling the virtual router, see the manual *Operation Command Reference*.) • For AX3800S or AX3600S series switches, execute the `show logging` command to check the log. If the log contains `The VRRP virtual MAC address entry can't be registered at hardware tables.`, the setting of the MAC address table has failed on the hardware. The virtual router might be enabled if you do the following. Delete the configuration of the target virtual router, and then set the configuration again with a different virtual router number or change the VLAN ID of the VLAN for which the virtual router is set.
		If the status of the virtual router is not `Initial`, check the operating status of the remote device that makes up the same virtual router.

3.14.3 Communication is not possible with the VRRP configuration of IPv6 networks

If communication is not possible in a VRRP configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-71: Failure analysis method for VRRP

No.	Items to check and commands	Action
1	On the Switch and remote devices that make up a virtual router, check the status of the virtual router, and check whether only one device is the master router and the others are backup routers.	For devices that make up a virtual router, if only one device is the master router and the others are the backup routers, check the following: • If terminals are connected directly to the virtual router not via other routers, make sure the virtual IP address of the virtual router is set as the default gateway in the network settings of the terminals. • Check the routing information of the devices on the communication path that includes the Switch. If there is no problem with the terminal settings and with the routing information of the devices on the communication path, go to No. 2.
		If the status of the virtual router is not correct, go to No. 3.
2	Execute the `show vlan` command with the `detail` parameter, and check whether the status of the physical port is `Forwarding` in the VLAN to which the virtual router is connected.	• If the status of the physical port is `Blocking`, communication might have been temporarily blocked due to, for example, the topology change for STP. Wait a while, and then make sure that the status of the physical port is `Forwarding`. If you wait a while but the status of the physical port is not `Forwarding`, check the configuration and physical network configuration. • If the status of the physical port is `down`, the port is not physically connected. Check whether connectors and cables are connected correctly.
		If the status of the physical port is `Forwarding`, check whether the load of the routing destination network is high.
3	For the virtual routers of the Switch and remote devices that make up a virtual router, check whether only one virtual router is the master router.	• For AX6700S, AX6600S, or AX6300S series switches: If multiple virtual routers are master routers, go to No. 4. • For AX3800S or AX3600S series switches: If multiple virtual routers are master routers, go to No. 6.
		If only one virtual router is the master router, go to No. 10.
4	Execute the `show vrrpstatus` command with the `detail` parameter, and check whether the primary virtual router that is followed by other virtual routers has been configured.	If the primary virtual router followed by other virtual routers has been configured, go to No. 5.
		If the primary virtual router followed by other virtual routers has not been configured, go to No. 6.
5	Execute the `show` vrrpstatus command with the `detail` parameter, and check whether VLANs and VRIDs for the followed primary virtual router are the same among devices that make up the virtual routers.	If VLANs and VRIDs for the primary virtual router are different among devices that make up the virtual routers, multiple routers will be master routers. Use the same settings among devices that make up the virtual routers.
		If VLANs and VRIDs for the primary virtual router are the same among devices that make up the virtual routers, go to No. 6. Note that items No. 6 onward must be applied to the primary virtual router.
6	Check communication between routers that make up the virtual router by using the `ping ipv6` command with actual IPv6 addresses.	If communication with actual IPv6 addresses is not possible between routers that make up the virtual router, check the physical network configuration.
		If the result of the `ping ipv6` command indicates that communication with actual IPv6 addresses is possible between routers that make up the virtual router, go to No. 7.

No.	Items to check and commands	Action
7	Execute the `show vrrpstatus` command with the `statistics` parameter, and check the reception status of ADVERTISEMENT packets.	• You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet for which the advertisement interval is different than the one configured for local virtual router.` In this case, if the value of <*Number of packets*> `with bad advertisement interval` increases in the statistics, make sure that the setting value of the ADVERTISEMENT packet-sending interval matches between the Switch and remote device. Also make sure that the VRRP operation mode setting matches between them. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that does not pass the authentication check.` In this case, if the value of <*Number of packets*> `with authentication failed` increases in the statistics, make sure that the authentication password setting is the same between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet with IP HopLimit not equal to 255.` In this case, if the value of <*Number of packets*> `with bad ipv6 hoplimit` increases in the statistics, make sure that there is no other router between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet for which the address list does not match the locally configured list for the virtual router.` In this case, if the value of <*Number of packets*> `with bad ipv6 address` increases in the statistics, make sure that the virtual IP address setting and VRRP operation mode setting are the same between the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that does not pass the authentication check.` In this case, if the value of <*Number of packets*> `with bad authentication type` increases in the statistics, check whether the authentication password setting exists in the Switch and remote device. • You might find that the following is registered in the reference log: `Virtual router` <*VRID*> `of` <*Interface Name*> `received VRRP packet that length less than the length of the VRRP header.` In this case, if the value of <*Number of packets*> `with packet length error` increases in the statistics, make sure that the VRRP operation mode setting is the same between the Switch and remote device. • You might find that the following is registered in the reference log: `VRRP packet received with unsupported version number.` In this case, if the value of <*Number of packets*> `with invalid type` increases in the statistics, make sure that the VRRP operation mode setting is the same between the Switch and remote device.
		If ADVERTISEMENT packets are received correctly, check the remote device. If ADVERTISEMENT packets are not received, go to No. 8.

No.	Items to check and commands	Action
8	Execute the `show interfaces` command and check the statistics for the physical port to which a remote device that makes up the same virtual router is connected. Also, execute the `show cpu` command to check the CPU usage.	For the physical port to which a remote device that makes up the same virtual router is connected, you might find that the `Input rate` and `Output rate` values are large and the line load is high. In addition, the CPU usage displayed by using the `show cpu` command might be high. If these are the cases, take the following actions: • If a loop occurs in the line, check the use of STP and the physical network configuration, and resolve the loop. • Use the `vrrp timers advertise` configuration command to set a longer sending interval for ADVERTISEMENT packets. • Use the `vrrp preempt delay` configuration command to set the automatic switchback suppression time.
		If the load at the physical port is not high, go to No. 9.
9	Make sure that there is no filtering setting for discarding ADVERTISEMENT packets.	If there is such a filtering setting, modify the setting so that ADVERTISEMENT packets are not discarded.
		If such a filtering setting does not exist, check the operating status of the remote device that makes up the same virtual router.
10	If the fault-monitoring interface is set, check the status of the fault-monitoring interface.	Make sure that another virtual router is set on the interface for which the fault-monitoring interface is set and the fault-monitoring interface of the virtual router is not the interface of the target virtual router. If the fault-monitoring interface of the virtual router is the interface of the target virtual router, delete the setting of either of the fault-monitoring interfaces.
		If there is no setting of the fault-monitoring interface described above, go to No. 11.
11	Execute the `show vrrpstatus` command with the `detail` parameter, and check the status of the virtual router.	If the status of the virtual router is `Initial`, check the following: • If the current priority is not zero, resolve the cause of disabling the virtual router that is displayed for `Admin State`. (For details about the cause of disabling the virtual router, see the manual *Operation Command Reference*.) • For AX3800S or AX3600S series switches, execute the `show logging` command to check the log. If the log contains `The VRRP virtual MAC address entry can't be registered at hardware tables.`, the setting of the MAC address table has failed on the hardware. The virtual router might be enabled if you do the following. Delete the configuration of the target virtual router, and then set the configuration again with a different virtual router number or change the VLAN ID of the VLAN for which the virtual router is set.
		If the status of the virtual router is not `Initial`, check the operating status of the remote device that makes up the same virtual router.

3.14.4 Communication is not possible with uplink redundancy

If communication is not possible in an uplink redundancy configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-72: Failure analysis method for uplink redundancy

No.	Items to check and commands	Action
1	Execute the `show switchport-backup` command, and make sure that the states of the primary and secondary ports are `Forwarding` or `Blocking` correctly.	If neither the primary port nor the secondary port is `Forwarding`, check the following: • If both of them are `Blocking`, active port locking might be enabled. Execute the `show switchport-backup` command, and check whether active port locking is operating. If active port locking is operating, wait a while until the primary port is linked up. Alternatively, use the `set switchport-backup active` command to activate the secondary port. • If `Down` is displayed, check the line status. For details about the check procedure, see *3.5 Network interface communication failures*.
		If there is no problem with the `Forwarding` or `Blocking` state of the devices, go to No. 2.
2	Check the upstream devices for the uplink redundancy.	If the upstream devices do not support the flush control frame reception functionality, check whether the MAC address update functionality is enabled on the device that uses the uplink redundancy. The MAC address update functionality might be disabled or the network configuration might not allow MAC address update frames to be received. In such a case, if switchover or switchback occurs due to uplink redundancy, communication of the upstream devices is not restored until the MAC address table is aged out. If this is the case, wait a while and check the communication status again. Alternatively, clear the MAC address table on the upstream devices.
		If the upstream devices support the flush control frame reception functionality, go to No. 3.
3	Check whether the settings are correct for the VLAN to which flush control frames are sent.	Execute the `show switchport-backup` command, and make sure that the VLAN to which flush control frames are sent is displayed as specified in the configuration. If expected information is not displayed, the settings in the configuration are not correct. Check the settings of the VLAN to which flush control frames are sent and the VLAN settings for the primary and secondary ports in the configuration.
		If the settings are correct for the VLAN to which flush control frames are sent, go to No. 4.
4	Make sure that the upstream devices can receive flush control frames.	Execute the `show logging` command, and make sure that the upstream devices can receive flush control frames. If the upstream devices cannot receive flush control frames, check whether a VLAN that can receive flush control frames has been set.

3.15 SNMP communication failures

3.15.1 MIBs cannot be obtained from the SNMP manager

Make sure the configuration has been set correctly.

When using SNMPv1 or SNMPv2C

Execute the `show access-list` configuration command, and check whether the IP address of the SNMP manager has been set in the access list in the configuration. After that, execute the `show snmp-server` configuration command, and check whether the community name and access list have been set correctly.

If the community name and access list have not been set, execute the `snmp-server community` configuration command to set information about the SNMP manager.

```
(config)# show access-list
 access-list enable
 access-list 1 permit ip 20.1.1.1 0.0.0.255
 !
(config)# show snmp-server
 snmp-server community "event-monitor" ro 1
 !
(config)#
```

When using SNMPv3

Execute the `show snmp-server` configuration command, and check whether the information about SNMP has been set correctly in the configuration of the Switch. If the information has not been set correctly, execute the following configuration commands to set the information about SNMP.

- `snmp-server engineID local`
- `snmp-server view`
- `snmp-server user`
- `snmp-server group`

```
(config)# show snmp-server
  snmp-server engineID local "engine-ID"
  snmp-server group "v3group" v3 priv read "view1" write "view1"
  snmp-server user "v3user" "v3group" v3 auth md5 "abc*_1234" priv des "xyz/
+6789"
  snmp-server view "view1" 1.3.6.1.2.1.1 included
  !
(config)#
```

3.15.2 Traps cannot be received by the SNMP manager

Make sure the configuration has been set correctly.

When using SNMPv1 or SNMPv2C

Execute the `show snmp-server` configuration command, and check whether the information about the SNMP manager and traps has been set in the configuration of the Switch.

If the information has not been set, execute the `snmp-server host` configuration command to set the information about the SNMP manager and traps.

```
(config)# show snmp-server
 snmp-server host    20.1.1.1 traps "event-monitor" snmp
 !
(config)#
```

When using SNMPv3

Execute the `show snmp-server` configuration command, and check whether the information about SNMP and traps has been set correctly in the configuration of the Switch. If the information has not been set correctly, execute the following configuration commands to set the information about SNMP and traps.

- `snmp-server engineID local`
- `snmp-server view`
- `snmp-server user`
- `snmp-server group`
- `snmp-server host`

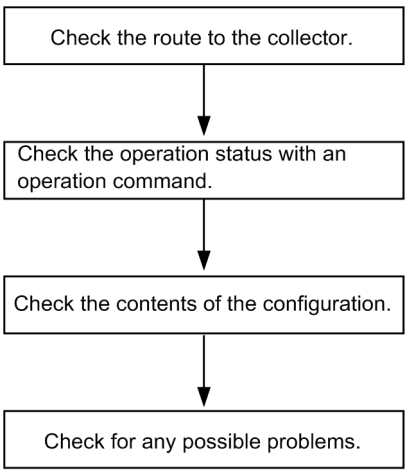
```
(config)# show snmp-server
  snmp-server engineID local "engine-ID"
  snmp-server group "v3group" v3 priv notify "view1"
  snmp-server host   20.1.1.1 traps "v3user" version 3 priv snmp
  snmp-server user "v3user" "v3group" v3 auth md5 "abc*_1234" priv des "xyz/
+6789"
  snmp-server view "view1" 1.3.6.1 included
  !
(config)#
```

Some SNMP manager systems might not be able to receive ospf and bgp traps issued under SNMPv2C or SNMPv3. If so, check the trap reception setting for the SNMP manager based on the object ID of each type of traps described in the manual *MIB Reference*.

3.16 Troubleshooting the sFlow statistics (flow statistics) functionality

The following figure shows the workflow for troubleshooting the sFlow statistics functionality on the Switch.

Figure 3-19: Workflow for troubleshooting the sFlow statistics functionality



3.16.1 sFlow packets cannot be sent to the collector

(1) Checking the route to the collector

See *3.7.1 Communication is not possible or is disconnected* and *3.10.1 Communication is not possible or is disconnected*, and make sure that the network is correctly connected to the collector. If the maximum size of an sFlow packet (`max-packet-size`) has been modified in the configuration, check whether it is possible to connect to the collector with the specified packet size.

(2) Using an operation command to check the operation

Execute the `show sflow` command a few times to display the sFlow statistics, and check whether the sFlow statistics functionality is running. If the underlined values do not increase, see *(3) Checking the configuration*. If the values increase, see *3.7.1 Communication is not possible or is disconnected*, *3.10.1 Communication is not possible or is disconnected* and *(5) Checking the settings on the collector*, and make sure the network is correctly connected to the collector.

Figure 3-20: Example of the "show sflow" command output

```
> show sflow
Date 2006/10/24 20:04:01 UTC
sFlow service status: enable
Progress time from sFlow statistics cleared:  16:00:05
sFlow agent data :
  sFlow service version  : 4
  CounterSample interval rate: 60 seconds
  Default configured rate: 1 per 2048 packets
  Default actual rate    : 1 per 2048 packets
  Configured sFlow ingress ports :  1/ 2-4
  Configured sFlow egress ports  :  5/ 9-11
  Received sFlow samples : 37269  Dropped sFlow samples(Dropped Que) :
2093(2041)
  Exported sFlow samples : 37269  Couldn't exported sFlow samples    :       0
sFlow collector data :
  Collector IP address: 192.168.4.199  UDP:6343  Source IP address: 130.130.130.1
  Send FlowSample UDP packets   : 12077  Send failed packets:     0
  Send CounterSample UDP packets:   621  Send failed packets:     0
  Collector IP address: 192.168.4.203  UDP:65535  Source IP address: 130.130.130.1
  Send FlowSample UDP packets   : 12077  Send failed packets:     0
```

```
  Send CounterSample UDP packets:   621  Send failed packets:     0
>
```

Note: Make sure that the underlined values increase.

(3) Checking the configuration

Check the following in the active configuration:

- Make sure that the IP address and UDP port number of the collector to which sFlow packets are sent have been set correctly in the configuration.

  Figure 3-21: Configuration example 1

```
(config)# show sflow
sflow destination 192.1.1.1 6455   <-- Collector information must be set
correctly.
sflow sample 2048
!
(config)#
```

- Make sure that the sampling interval has been set.

  If the sampling interval is not set, a large default value is used. This value is too large, and almost no flow samples are sent to the collector. Therefore, set an appropriate value for the sampling interval. Note that if a value that is much smaller than the recommended value is set, the CPU usage might increase.

  Figure 3-22: Make sure that the sampling interval has been set.

```
(config)# show sflow
sflow destination 192.1.1.1 6455
sflow sample 2048      <-- An appropriate value for the sampling interval must
be set.
!
(config)#
```

Figure 3-23: Example of the operation command

```
> show sflow
Date 2006/10/24 20:04:01 UTC
sFlow service status: enable
Progress time from sFlow statistics cleared:  16:00:05
  sFlow agent data :
  sFlow service version  : 4
  CounterSample interval rate: 60 seconds
  Default configured rate: 1 per 2048 packets
  Default actual rate    : 1 per 2048 packets
  Configured sFlow ingress ports :  1/ 2-4
  Configured sFlow egress ports  :  5/ 9-11
  Received sFlow samples : 37269  Dropped sFlow samples(Dropped Que) :
2093(2041)
  Exported sFlow samples : 37269  Couldn't exported sFlow samples    :       0
                           :
>
```

Note: Make sure that the underlined part displays an appropriate sampling interval.

- Make sure that `sflow forward` has been set for the physical port at which the flow statistics are recorded.

  Figure 3-24: Configuration example 3

```
(config)# show interfaces
interface gigabitethernet 1/2
```

```
  switchport mode access
  sflow forward ingress      <-- sflow forward must be set.
!
(config)#
```

- Make sure that filter has not been set for the physical port at which the flow statistics are recorded. For details about the procedure, see *3.25.1 Checking the filters and QoS configuration information*.
- If the sender (agent) IP address of an sFlow packet has been set by using the `sflow source` command, make sure that the IP address has been assigned to the port of the Switch.

Figure 3-25: Configuration example 4

```
(config)# show sflow
sflow destination 192.1.1.1 6455
sflow sample 2048
sflow source 192.1.1.100     <-- This IP address must be the one assigned to the
port of the Switch
!
(config)#
```

(4) Checking the NIF status and port status

Execute the `show interfaces` command, and make sure the up/down status of the physical port on the Switch monitored by the sFlow statistics and the physical port connected to the collector is `active` (normal operation).

Figure 3-26: Example of the port status

```
> show interfaces gigabitethernet 1/5
Date 2006/10/24 17:19:34 UTC
NIF1: active  48-port 10BASE-T/100BASE-TX/1000BASE-T    retry:0
        Average:150Mbps/24Gbps  Peak:200Mbps at 15:44:37
Port5: active up  100BASE-TX full(auto)    0012.e220.ec31
  Time-since-last-status-change:1:47:47
    Bandwidth:10000kbps  Average out:5Mbps  Average in:5Mbps
    Peak out:5Mbps at 15:44:36  Peak in:5Mbps at 15:44:18
    Output rate:    4893.5kbps       16.8kpps
    Input  rate:    4893.5kbps       16.8kpps
    Flow control send   :off
    Flow control receive:off
    TPID:8100
                              :
>
```

Note: Make sure that the underlined parts are active or active up.

If the port status is `DOWN`, see *3.7.1 Communication is not possible or is disconnected* and *3.10.1 Communication is not possible or is disconnected*.

(5) Checking the settings on the collector

- Make sure that the UDP port number (6343 by default) of the collector has been set so that data can be received. If data cannot be received, ICMP (`[`*Type*`]Destination Unreachable [`*Code*`]Port Unreachable`) is sent to the Switch.
- In addition, make sure that the collector currently used is configured correctly.

3.16.2 Flow samples cannot be sent to the collector

If you have taken actions according to *3.16.1 sFlow packets cannot be sent to the collector* but your problem is not resolved, check the following.

(1) Checking whether packets are forwarded

Execute the `show interfaces` command, and check whether packets are forwarded.

Figure 3-27: Example of the port status

```
> show interfaces gigabitethernet 1/5
Date 2006/10/24 17:19:34 UTC
NIF1: active  48-port 10BASE-T/100BASE-TX/1000BASE-T    retry:0
        Average:150Mbps/24Gbps  Peak:200Mbps at 15:44:37
Port5: active up  100BASE-TX full(auto)    0012.e220.ec31
  Time-since-last-status-change:1:47:47
    Bandwidth:10000kbps  Average out:5Mbps  Average in:5Mbps
    Peak out:5Mbps at 15:44:36  Peak in:5Mbps at 15:44:18
    Output rate:    4893.5kbps       16.8kpps
    Input  rate:    4893.5kbps       16.8kpps
    Flow control send   :off
    Flow control receive:off
    TPID:8100
                                :
>
```

Note: Make sure that the underlined parts to make sure packets are forwarded.

(2) Checking the settings on the collector

Make sure that the collector currently used is configured correctly.

3.16.3 Counter samples cannot be sent to the collector

If you have taken actions according to *3.16.1 sFlow packets cannot be sent to the collector* but your problem is not resolved, check the following.

(1) Checking the sending interval of counter samples

Make sure that the sending interval of counter samples related to the flow statistics is not zero in the configuration of the Switch. If the value is zero, counter sample data cannot be sent to the collector.

Figure 3-28: Configuration example

```
(config)# show sflow
sflow destination 192.1.1.1 6455
sflow sample 2048
sflow polling-interval 60      <-- This value must not be set to zero
!
(config)#
```

3.17 Communication failures in the neighboring device management functionality

3.17.1 Neighboring device information cannot be obtained by the LLDP functionality

If neighboring device information cannot be obtained correctly by using the LLDP functionality, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-73: Failure analysis method when the LLDP functionality is used

No.	Items to check and commands	Action
1	Execute the `show lldp` command and check the operating status of the LLDP functionality.	If `Enabled` is displayed for `Status`, go to No. 2.
		If the displayed status is `Disabled`, the LLDP functionality has been disabled. Enable the LLDP functionality.
2	Execute the `show lldp` command and check the port information.	If information for the port to which the neighboring device is connected is displayed, go to No. 3.
		If information for the port to which the neighboring device is connected is not displayed, the LLDP functionality is disabled for the target port. Enable the LLDP functionality for the target port.
3	Execute the `show lldp statistics` command and check the statistics for the port to which the neighboring device is connected.	If the `Tx` count has been incremented but the `Rx` count has not, check No. 1 through No. 3 on the neighboring device. If the `Tx` count has also been incremented on the neighboring device, the connection between the devices might be incorrect. Check the connection.
		If the `Discard` count has been incremented, check the connection between the devices.
		For other cases, go to No. 4.
4	Execute the `show lldp` command and check the port status in the information for the port to which the neighboring device is connected.	If `Up` is displayed for `Link`, go to No. 5.
		If `Down` is displayed for `Link`, check the line status. For details about the check procedure, see *3.5 Network interface communication failures*.
5	Execute the `show lldp` command, and check the number of neighboring device information items on the port to which the neighboring device is connected.	If `0` is displayed for `Neighbor Counts`, check No. 1 through No. 5 on the neighboring device. If the number of neighboring device information items is also `0` on the neighboring device, the connection between the devices might be incorrect. Check the connection. Also, LLDP control frames might have been discarded by filters or QoS control. See *3.25.1 Checking the filters and QoS configuration information*.

3.17.2 Neighboring device information cannot be obtained by the OADP functionality

If neighboring device information cannot be obtained correctly by using the OADP functionality, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-74: Failure analysis method when the OADP functionality is used

No.	Items to check and commands	Action
1	Execute the `show oadp` command and check the operating status of the OADP functionality.	If `Enabled` is displayed for `Status`, go to No. 2.
		If the displayed status is `Disabled`, the OADP functionality has been disabled. Enable the OADP functionality.
2	Execute the `show oadp` command and check the port information.	If information for the port to which the neighboring device is connected is displayed for `Enabled Port`, go to No. 3.
		If the port to which the neighboring device is connected is not displayed for `Enabled Port`, the OADP functionality is disabled for the port. Enable the OADP functionality for the port. Note that the OADP functionality is not enabled for a port that belongs to a channel group. Enable the OADP functionality for the channel group.
3	Execute the `show oadp statistics` command and check the statistics for the port to which the neighboring device is connected.	If the `Tx` count has been incremented but the `Rx` count has not, check No. 1 through No. 3 on the neighboring device. If the `Tx` count has also been incremented on the neighboring device, the connection between the devices might be incorrect. Check the connection.
		If the `Discard/ERR` count has been incremented, check the connection between the devices.
		For other cases, go to No. 4.
4	Execute the `show interfaces` command, and check the status of the port to which the neighboring device is connected.	If the status of the target port is `active up`, go to No. 5.
		For other cases, see *3.5 Network interface communication failures*.
5	Execute the `show vlan` command, and check the status of the VLAN that contains the port to which the neighboring device is connected.	If `Up` is displayed for `Status`, go to No. 6.
		If the displayed status is `Disable`, the OADP functionality is disabled for the port. Enable the VLAN.
		For other cases, see *3.6 Layer 2 network communication failures*.
6	Execute the `show oadp` command, and check the neighboring device information for the port to which the neighboring device is connected.	If the information is not displayed, check No. 1 through No. 6 on the neighboring device. If the neighboring device also does not display the neighboring device information for the target port, the connection between the devices might be incorrect. Check the connection. Also, OADP control frames might have been discarded by filters or QoS control. See *3.25.1 Checking the filters and QoS configuration information* and check for a problem.

3.18 NTP communication failures

3.18.1 The Switch cannot be synchronized by using NTP

If the system clock cannot be synchronized by NTP, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-75: NTP failure analysis method

No.	Items to check and commands	Action
1	Use the `show clock` command to make sure the time zone is set.	If the time zone is set in the information displayed by the command, go to No. 2.
		If the time zone is not set in the information displayed by the command, set the time zone.
2	Check the time difference between the Switch and the NTP server.	If the time difference between the Switch and the NTP server is less than 1000 seconds, go to No. 3.
		If the time difference between the Switch and the NTP server is 1000 seconds or more, use the `set clock` command to match the system clock of the Switch with the NTP server.
3	Check communication with the NTP server via IPv4.	Use the `ping` command to check whether communication is possible via IPv4 between the NTP server and the Switch.
		Make sure that there is no setting for discarding any packets at the UDP port number 123 in the settings of the NTP server or the Switch.

3.19 Communication failures in the IEEE 802.3ah/UDLD functionality

3.19.1 Port is in inactivate status by the IEEE 802.3ah/UDLD functionality

If the IEEE 802.3ah/UDLD functionality has deactivated a port, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-76: Failure analysis method when the IEEE 802.3ah/UDLD functionality is used

No.	Items to check and commands	Action
1	Execute the `show efmoam` command and check the failure type for the port that was deactivated by the IEEE 802.3ah/UDLD functionality.	If `Down(loop)` is displayed for `Link status`, an L2 loop might have occurred in this network configuration. Revise the network configuration.
		If `Down(uni-link)` is displayed for `Link status`, go to No. 2.
2	Make sure the IEEE 802.3ah/OAM functionality is enabled on the partner switch.	If the IEEE 802.3ah/OAM functionality is not enabled on the partner switch, enable the functionality.
		If the IEEE 802.3ah/OAM functionality is enabled on the partner switch, go to No. 3.
3	Execute the `show efmoam statistics` command and make sure that a prohibited configuration is not used.	If the count of `Unstable` displayed for `Info TLV` has been incremented, a configuration prohibited for the IEEE 802.3ah/UDLD functionality might be used. Make sure only one device is specified as the destination for the target physical port.
		If the count of `Unstable` for `Info TLV` has not been incremented, go to No. 4.
4	Make sure the Switch is directly connected to the partner switch.	If a media converter or hub is connected between switches, review and correct the network configuration so that the Switch is directly connected to the partner switch. If a relay device is absolutely necessary, use a media converter that allows the link status on both sides to be identical (however, using a relay device is not recommended).
		If the switches are directly connected, go to No. 5.
5	Execute the `show efmoam` command and check the number of times a response timeout occurred during failure detection.	If the value displayed for `udld-detection-count` is less than the initial value, an unidirectional link failure is more likely to be detected even if a failure has not actually occurred. Change this value.
		If the value displayed for `udld-detection-count` is equal to or more than the initial value, go to No. 6.
6	Check the filters and QoS control configurations.	The control frames (`slow-protocol`) used for the IEEE 802.3ah/UDLD functionality might have been discarded by filters or QoS control. See*3.25.1 Checking the filters and QoS configuration information* and check for a problem. If there is no problem, go to No. 7.
7	Test the line.	See *6. Line Testing* to perform a line test. If there is no problem, go to No. 8.
8	Check the cable connection.	The cable might be defective. Replace the cable used for the target port.

Note: IEEE 802.3ah/OAM: An OAM protocol defined in IEEE 802.3ah

IEEE 802.3ah/UDLD: Unidirectional link failure detection functionality specific for a Switch that uses IEEE 802.3ah/OAM

3.20 Problems due to the redundant configuration of the BCU, CSU, or MSU

3.20.1 Active-standby switchover is not possible

If switching between the active and standby systems is not possible, check the problem and take action according to the following table.

Table 3-77: Problems occurring during switchover of the active system and action to take

No.	Cause of the problem in switching	Items to check	
1	The standby system is not running. Check the STATUS LED on the standby system.	Red	A fault has occurred on the standby system. Replace the board of the standby BCU, standby CSU, or standby MSU.
		Off or orange	The board is not working. Execute the `inactivate standby` and `activate standby` commands from the active system to start the standby system.
		Blinking green	The standby system is starting. Wait a while until the STAUTS LED is green.
		Green	The standby system has started. The problem in switching seems to have occurred due to another cause. See the other check items.
2	The standby system is not ready for switching. Log in to the active system. Execute the `show system` command, and check the status of the standby system.	`fault`	One of the following applies: • The standby system has failed to start. • A prohibited combination of boards is used between the active and standby systems. Remove the cause of the problem, and restart the system. • The configuration contains a setting that cannot be used. Check the configuration. For other cases, see No. 1.
		`inactive`	Startup of the standby system has been suppressed. Execute the `activate standby` command to start up the standby system.
		`notconnect`	The standby system has not been implemented. Implement the standby system, and then execute the `activate standby` command to start up the standby system.
		`initialize`	Startup of the standby system has not been completed. Wait a while until the startup is complete.
		`active` or `standby`	The problem in switching seems to have occurred due to another cause. See the other check items.
3	Any configuration operation is being performed. If an operation command is executed to switch the system, the command fails.	System switching by an operation command is not allowed during configuration operations. Execute the `status` configuration command from the active system. Log out all the users who are operating the configuration, and then `execute` an operation command to switch the system.	

3.21 Problems due to the redundant configuration of the BSU

3.21.1 BSU switchover is not possible

If the active and standby BSUs cannot be switched in a redundant BSU configuration, perform the check procedure described below.

1. Checking the log

   For details about the log, see the manual *Message and Log Reference*.

2. Isolating the cause of the problem by checking the operating status of BSU units

   Use the `show system` command to check the operating status of BSU units, and isolate the cause of the problem according to the following table.

Table 3-78: Failure analysis method when BSU units cannot be switched

No.	Operating status of BSU units	Cause	Action
1	`active` (not `standby hot`, `standby cold`, or `standby cold2`)	The number of BSU units specified by the `redundancy max-bsu` configuration command does not match the number of BSU units to be used as active BSU units.	Execute the `redundancy max-bsu` configuration command to specify the number of BSU units to be used as active BSU units.
		BSU boards to be used as the standby system have not been implemented.	Implement BSU boards.
2	`fault`	The configuration contains a setting that cannot be used.	Correctly set the flow distribution pattern for the filters and QoS functionality by using the `fldm prefer` configuration command.
			Correctly set the distribution pattern of the maximum number of entries per switch by using the `fwdm prefer` configuration command.
		The target BSU causes the failure.	Based on the log entry for the target BSU displayed by the `show logging` command, see the manual *Message and Log Reference* and take the action described in *Action*.
3	`inactive`	The `inactivate bsu` command is set.	Use the `activate bsu` command to put the target BSU into `active`, `standby hot`, `standby cold`, or `standby cold2` status.
		The `redundancy bsu-load-balancing smac` or `redundancy bsu-mode fixed` configuration command is set.	Delete the `redundancy bsu-load-balancing smac` and `redundancy bsu-mode fixed` configuration commands, and restart the device. For details, see the *Configuration Guide*.
		The target BSU is not fully inserted.	Implement the BSU board correctly.
		Different types of BSU units are implemented.	Implement only one type of BSU board.
		A BSU not supported in this software version is implemented.	Check the type of the BSU board and the version of the software, and replace the BSU board or update the software.
		A BSU not supported in the Switch is implemented.	Replace the BSU board.

No.	Operating status of BSU units	Cause	Action
4	`notconnect`	The target BSU is not implemented.	Make sure that as many BSU boards as the number of active and standby BSUs (or the number of active BSUs only, if standby BSUs are not required) are implemented. If the required number of boards is already implemented, no action is required. If not implemented, implement as many BSU boards as required.
5	`initialize`	The target BSU is being initialized.	Wait until the initialization is complete.
6	`disable`	`no power enable` is set by a configuration command.	Make sure that the BSU board to use is implemented, and set the `power enable` configuration command to put the target BSU into `active`, `standby hot`, `standby cold`, or `standby cold2` status.

3.22 Problems due to the redundant configuration of the NIF

3.22.1 The standby NIF cannot be switched to the active system

If a failure occurs on the active NIF in a redundant NIF configuration but the standby NIF cannot be switched to the active system, isolate the cause of the problem according to the following table.

Table 3-79: Failure analysis method when the standby NIF cannot be switched to the active system

No.	Items to check	Cause	Action
1	Use the `show nif` command to check the NIF status.	The NIF status is `inactive`.	Use the `activate nif` command to start up the NIF.
2		The NIF status is `disable`.	Use the `power enable` or `no schedule-power-control shutdown` configuration command to start up the NIF.

3.22.2 The active NIF cannot be switched to the standby system

In a redundant NIF configuration, if an active NIF with higher priority is restored from a failure but the current active NIF is not switched to the standby system, isolate the cause of the problem according to the following table.

Table 3-80: Failure analysis method when the active NIF cannot be switched to the standby system

No.	Items to check	Cause	Action
1	Execute the `show interfaces` command, and check the status of the port for the higher priority NIF that belongs to the redundant NIF group.	The status of the port for the higher priority NIF that belongs to the redundant NIF group is not `active up` or `disable`.	Use the `shutdown` or `schedule-power-control shutdown` configuration command for the port not used for communication.

3.23 Power saving-related problems

3.23.1 Scheduling is disabled

If scheduling is disabled, perform the check procedure described below.

1. Execute the `show power-control schedule` command to check whether the displayed schedule contains the current time, and isolate the cause of the problem according to the following table.

   Table 3-81: Scheduling problems occurring when the power saving functionality is used and action to take

No.	Resulting display	Items to check	Cause	Action
1	The current time is not contained.	Check the setting of the `schedule-power-control time-range` configuration command.	The `schedule-power-control time-range` configuration command has not been set correctly.	• Specify an entry that contains the current time if such an entry is not specified. • If `action` for an entry that contains the current time has been set to `disable`, delete the entry for which `disable` has been set.
2	The current time is contained.	Check whether the functionality specified with the `schedule-power-control` configuration does not match the functionality specified to be used during a normal time range. If they match each other, see the *Cause* and *Action* columns.	The functionality is operating as set with the `schedule-power-control` configuration.	Check the setting of the `schedule-power-control` configuration.
3		Execute the `show system` command, and check whether `(changing suspended)` is displayed for the BSU or PSP status. If `(changing suspended)` is displayed, see the *Cause* and *Action* columns.	The number of the BSU or PSP units currently operating is insufficient.	To perform BSU or PSP power control, a redundant BSU or CSU configuration must be implemented. For details about redundant configurations, see the *Configuration Guide*.
4		Execute the `show logging` command to display the log. Confirm that the system time was not changed within 30 minutes before the start or end time of the schedule. If the system time was changed, see the *Cause* and *Action* columns.	A time error has occurred in the schedule due to the change of the system time.	Wait a while. The schedule will start within 30 minutes. For notes on changing the time, see the *Configuration Guide*.

3.24 Packet congestion in CPU processing does not recover

This section describes how to take actions if packet congestion in CPU processing is not cleared up.

Packet congestion in CPU processing occurs due to the overflow of the input queue when the CPU receives a large number of packets to be processed in software.

When packet congestion in CPU processing is detected, the following message is output:

```
E3 SOFTWARE 00003301 1000:000000000000 CPU congestion detected.
```

When packet congestion is cleared, the following message is output:

```
E3 SOFTWARE 00003302 1000:000000000000 CPU has recovered from congestion.
```

Packet congestion in CPU processing might occur even if the system is working normally such as when the CPU receives a large number of packets with unknown destinations due to the aging of routing information. If packet congestion is not cleared up or packet congestion occurs repeatedly, the setting of the Switch or the network configuration might have a problem. When such an event occurs, take action according to the following table.

Table 3-82: Action to take when packet congestion in CPU processing is not cleared

No.	Items to check and commands	Action
1	Identify packet types. • Execute the `show netstat statistics` command at 20-second intervals, and compare the results.	If the comparison shows that the count of the `total packets received` statistics item increases drastically for the `ip` or `ip6` packet type, go to No. 2.
		If the comparison shows that the count of the `packets received` statistics item increases drastically for the `arp` packet type, go to No. 2.
		For other cases, go to No. 4.
2	Identify the VLAN interface that is receiving the packets. • Execute the `show netstat interface` command at 20-second intervals, and compare the results.	If the comparison shows that the count of the `Ipkts` statistics item increases drastically for a specific VLAN interface, go to No. 3.
		For other cases, go to No. 4.
3	Identify the source and destination addresses of the packets. • For the VLAN interface identified in No. 2, execute the `show tcpdump interface` command. Check the source and destination addresses for the packet type identified in No. 1.	If the packet type is `ip` or `ip6` and the destination address of the target packets is the address of the Switch, the packets might be sent incorrectly. Check the settings of the terminal that has the source address or check the network configuration. Modify them so that the target packets are not sent to the Switch.
		If the packet type is `ip` or `ip6` and the destination address of the target packets is the address of another device, the address of ARP information might not be resolved or a large number of packets with unknown destination might be sent. • If the packet type is `ip`, see *3.7.1 Communication is not possible or is disconnected (5) Checking the ARP resolution information with a neighboring device*. • If the packet type is `ip6`, see *3.10.1 Communication is not possible or is disconnected (5) Checking the NDP resolution information with a neighboring device*.

No.	Items to check and commands	Action
		If the packet type is `arp`, a large number of ARP packets have been received. In this case, an L2 loop configuration might be used. Revise the network configuration. If there is no problem in the network configuration, check the settings of the terminal that has the source address.
4	Collect analysis information. • For AX6700S series switches: Execute the `show tech-support` command and `dump bsu` command twice in this order. • For AX6600S or AX6300S series switches: Execute the `show tech-support` command and `dump psp` command twice in this order. • For AX3800S, AX3600S, or AX2400S series switches: Execute the `show tech-support` command twice. Notes: • When executing the `dump bsu` or `dump psp` command, do not execute the next command until a log entry is output that indicates that collection of a memory dump file is complete. • Executing the `dump bsu` or `dump psp` command a second time deletes the memory dump file collected by the first execution of the command. Therefore, save the file before executing the command a second time to prevent the file from being deleted.	Send the collected information to the support division.

3.25 Communication failures in filters and QoS configurations

3.25.1 Checking the filters and QoS configuration information

If a communication problem occurs on a network employing the Switch, it is possible that certain packets might have been discarded either by filtering or by bandwidth monitoring, drop control, or the QoS control shaper.

To determine which functionality discarded which packets when packets have been discarded in the Switch by filters and QoS control, do the following.

Note that even if the policy-based routing or policy-based switching specified for filtering follows default operations, their default discarding of packets is treated the same way as the discarding of packets by filters. Along with the procedure below, see *3.28.1 Actions to take when packets are not forwarded in policy-based routing* and *3.29.1 Actions to be taken when packets are not forwarded in policy-based switching*.

(1) Checking whether packets have been discarded by filtering

1. Log in to the Switch.
2. Execute the `show access-filter` command, and check the filter conditions in the access list applied to the interface, the number of packets that match the filter conditions, and the number of packets discarded by a filter entry for implicit discard.
3. Compare the filter conditions you checked in step 2 and the contents of the packets that cannot be forwarded to determine whether the target packets were discarded, or whether you have executed policy-based routing or policy-based switching. If the contents of the packets that cannot be forwarded do not match any of the applied filter conditions, the packets might have been discarded implicitly.
4. Check whether the setting conditions in the filtering configuration are correct.
5. If the configuration has been correctly set, use access list logging to check the information of the discarded packets.

(2) Checking whether packets have been discarded by the bandwidth monitoring of QoS control

1. Log in to the Switch.
2. Execute the `show qos-flow` command, and check the flow detection conditions and operation settings of the bandwidth monitoring applied to the interface and also the number of packets that match the flow detection conditions.
3. Compare the flow detection conditions you checked in step 2 and the contents of the packets that cannot be forwarded to determine whether the target packets were discarded. If a packet violates the maximum bandwidth control conditions, the packet is discarded and the count of the `matched packets(max-rate over)` statistics item is incremented. If the count of this statistics item has been incremented, packets might have been discarded by bandwidth monitoring applied to the interface.
4. Make sure that the setting conditions for QoS control in the configuration are correct, and that the bandwidth monitoring has been set appropriately in the system configuration.

(3) Checking whether packets have been discarded by drop control and the QoS control legacy shaper

For AX6700S, AX6600S, and AX6300S series switches:

1. Log in to the Switch.
2. Execute the `show qos queueing` command with the `interface` parameter, and check the

discard_pkt statistics item displayed for the port input and output queues of the input and output interfaces used for communication.

3. Execute the show qos queueing command with the distribution parameter, and check the discard_pkt statistics item displayed for the distribution input and output queues for the input or output interface used for communication.
4. If the counts of the statistics items checked in steps 2 and 3 are incremented, packets are discarded by QoS control drop control.
5. Check whether drop control and the legacy shaper are being used appropriately in the system configuration.

For AX3800S, AX3600S, and AX2400S series switches:

1. Log in to the Switch.
2. Use the show qos queueing command to check the information displayed for discard packets in the output interface statistics.
3. If the count of the statistics item checked in step 2 is incremented, packets are discarded by drop control and the QoS control legacy shaper.
4. Check whether drop control and the legacy shaper are being used appropriately in the system configuration.

(4) Checking whether packets have been discarded by drop control and the QoS control hierarchical shaper

For AX6700S, AX6600S, and AX6300S series switches:

1. Log in to the Switch.
2. Execute the show shaper command with the port list parameter, and check the discard_pkt statistics item displayed for the user queues of the input and output interfaces used for communication.
3. Execute the show qos queueing command with the interface parameter, and check the discard_pkt statistics item displayed for the port input and output queues of the input and output interfaces used for communication.
4. Execute the show qos queueing command with the distribution parameter, and check the discard_pkt statistics item displayed for the distribution input and output queues for the input or output interface used for communication.
5. If the counts of the statistics items checked in steps 2 to 4 are incremented, packets are discarded by QoS control drop control.
6. Check whether drop control and the hierarchical shaper are being used appropriately in the system configuration.

3.26 Access list logging problems

3.26.1 Actions to be taken when access list logs are not output

If an access list log cannot be output when access list logging is used, take the following action.

Table 3-83: Action to take when access list logs are not output

No.	Items to check and commands	Action
1	Check the log output status of access list logging. • Execute the `show access-log` command and check the status displayed for `logging` of `Access list logging Information`.	If the displayed status is `disable`, use the `debug access-log` command to change the log output setting.
		If the displayed status is `enable`, go to No. 2.
2	Check the capacity limit status of access list logging. • Execute the `show access-log` command, and check the value of the `flow table full` item of `Access list logging Statistics`.	If the value is not `0`, packets exceeding the number of items of access list log information that can be handled might have been discarded by filtering.
		If the value is `0`, go to No. 3.
3	Check the operation status of access list logging. • Execute the `show access-log` command, and check the value of the `rate-limit discard` item of `Access list logging Statistics`.	If the value is not `0`, packets might have been discarded because packets exceeding the setting of `rate-limit` have been received.
		If the value is `0`, go to No. 4.
4	Check the setting conditions for the filtering configuration.	If the settings are not correct, modify the configuration.
		If the settings are correct, go to No. 5.
5	Collect analysis information. • For AX6700S series switches: Execute the `show tech-support` command, `dump access-log` command, and `dump bsu` command twice in this order.#1 • For AX6600S or AX6300S series switches: Execute the `show tech-support` command, `dump access-log` command, and `dump psp` command twice in this order.#2	Send the collected information to the support division.

#1

When executing the `dump bsu` command, do not execute the next command until a log entry is output that indicates that collection of a memory dump file is complete. Also, executing the `dump access-log` or `dump bsu` command a second time deletes the memory dump file collected by the first execution of the command. Therefore, save the file before executing the command a second time to prevent the file from being deleted.

#2

When executing the `dump psp` command, do not execute the next command until a log entry is output that indicates that collection of a memory dump file is complete. Also, executing the `dump access-log` or `dump psp` command a second time deletes the memory dump file collected by the first execution of the command. Therefore, save the file before executing the command a second time to prevent the file from being deleted.

3.27 DHCP snooping problems

3.27.1 Problems related to DHCP

If DHCP cannot distribute IP addresses in a DHCP snooping configuration, isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-84: Failure analysis method when DHCP cannot distribute IP addresses in a DHCP snooping configuration

No.	Items to check	Action
1	Execute the `show logging` command, and check whether any hardware failure is recorded in the operation log.	If any hardware failure is recorded in the operation log, replace the device.
		For other cases, go to No. 2.
2	Check whether IP addresses cannot be newly distributed or only IP addresses already assigned cannot be updated.	If IP addresses cannot be newly distributed, go to No. 3.
		If assigned IP addresses cannot be updated, go to No. 9.
3	Execute the `show ip dhcp snooping statistics` command to check the operation status of DHCP snooping.	If a port is displayed as an untrusted port at which DHCP snooping is enabled and the port is the one connected to the target device (to which an IP address cannot be distributed), go to No. 4.
		If the target device is connected to another port, DHCP snooping is not enabled for the device. Check the network configuration and the settings of the DHCP server, and if there is no problem, go to No. 10.
4	Check the connection method between the clients and server.	If the Switch is connected as a Layer 2 switch between the clients and server, go to No. 8.
		If the DHCP server on the Switch is used, go to No. 5.
		If the DHCP relay on the Switch is used, go to No. 5.
		If there is a DHCP relay between the Switch and clients, go to No. 6.
		If a device that adds Option 82 data is located between the Switch and clients, go to No. 7.
		If multiple conditions described above are met, see each item in the order above.
5	Make sure that there is no problem with the operation of the DHCP server and DHCP relay.	See *3.7.2 IP addresses cannot be assigned by the DHCP functionality* and make sure that the DHCP server and DHC relay can distribute IP addresses. If there is no problem, go to No. 8.
6	If packets via DHCP relay are forwarded, make sure that the `no ip dhcp snooping verify mac-address` configuration command is set.	Packets forwarded via DHCP relay are discarded because the client hardware address and the source MAC address in the packets are different. To forward those packets, set the `no ip dhcp snooping verify mac-address` configuration command.
7	If packets that contain the relay agent information option are forwarded, make sure that the `ip dhcp snooping information option allow-untrusted` configuration command is set.	By default, packets that contain the relay agent information option (Option 82) are discarded. To forward those packets, set the `ip dhcp snooping information option allow-untrusted` configuration command.

No.	Items to check	Action
8	Make sure the DHCP server is connected to a trusted port.	DHCP server response packets from an untrusted port are discarded. If the target DHCP server is an authorized one, set the `ip dhcp snooping trust` configuration command for the port to which the DHCP server is connected. Note that if the DHCP server on the Switch is used, the port can be an untrusted port. If the DHCP relay on the Switch is used, the DHCP server must be connected to a VLAN exempt from DHCP snooping or to a trusted port.
9	Use the `show ip dhcp snooping binding` command to check the binding information.	If the IP address cannot be updated after the device restarts, check the save status of the binding database. See *3.27.2 Problems related to saving the binding database*.
		You might find that a different port or VLAN ID is displayed in the binding information for a target entry (that has the target MAC address and target IP address). In this case, the connection port or the VLAN capacity limit might have been changed after assignment of an IP address. To continue using the current port or VLAN, obtain an IP address again.
10	Other cases	If any of the above actions do not resolve your problem, check other functionality used in the device according to this manual.

3.27.2 Problems related to saving the binding database

If binding information cannot be inherited at a device restart, probable causes are problems related to saving the binding database. Isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-85: Failure analysis method for problems related to saving the binding database

No.	Items to check	Action
1	Use the `show mc` or `show flash` command to check whether there is a sufficient amount of unused space in the flash memory or memory card.	If there is not a sufficient amount of unused space, delete unnecessary files to have an enough space.
		If there is no problem, go to No. 2.
2	Check the storage destination of the binding database.	If the binding database is saved in the flash memory, go to No. 4.
		If the binding database is saved in a memory card, go to No. 3.
3	Execute the `ls mc-dir` command to check whether the directory for saving the database exists in the memory card.	If the directory does not exist, use the `mkdir` command to create the directory.
		If there is no problem, go to No. 4.
4	Check the setting of the `ip dhcp snooping database write-delay` configuration command. Also, execute the `show ip dhcp snooping binding` command to check the last time when the binding database was saved.	Even if the binding information is updated, the binding database is not saved until the specified time passes. After an IP address is distributed, wait a while until the specified time passes, and then make sure that the last time when the binding database was saved is updated.
		If there is no problem, go to No. 5.

No.	Items to check	Action
5	Make sure that the lease time of the IP addresses distributed to the DHCP clients is longer than the wait time for saving the database.	If the lease time is shorter, the lease of the IP addresses might expire before the binding database is completely read in. Use the `ip dhcp snooping database write-delay` configuration command to shorten the wait time for saving the database on the Switch. Alternatively, on the DHCP server, extend the lease time of the IP addresses.
		If there is no problem, go to No. 6.
6	Other cases	If there is no problem when the binding database is saved in the flash memory, but the binding information cannot be inherited when the database is saved in a memory card, replace the memory card. Note that if you are planning long-term operation, save the binding database in a memory card.

3.27.3 Problems related to ARP

If ARP packets are discarded, IPv4 communication is not possible. A probable cause of ARP packets being discarded is dynamic ARP inspection. Isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-86: Failure analysis method for problems caused by dynamic ARP inspection

No.	Items to check	Action
1	Check the DHCP snooping configuration.	See *3.27.1 Problems related to DHCP*, and make sure DHCP snooping is operating normally.
		If there is no problem, go to No. 2.
2	Execute the `show ip arp inspection statistics` command to check the operation status of dynamic ARP inspection.	If a port is displayed as an untrusted port at which dynamic ARP inspection is enabled and the port is the one at which IPv4 communication is not possible, go to No. 3.
		If the target device is connected to another port, dynamic ARP inspection is not enabled for the device. Check the network configuration and the settings of the device on which IPv4 communication is not possible, and if there is no problem, go to No. 4.
3	Execute the `show ip dhcp snooping binding` command, and make sure that the binding information is present for the device on which communication is not possible.	If the binding information is not present and the target device has a fixed IP address, set the `ip source binding` configuration command. If the binding information is not present and the target device obtains an IP address by DHCP, obtain an IP address again.
4	Other cases	If any of the above actions do not resolve your problem, check other functionality used in the device according to this manual.

3.27.4 Communication problems due to causes other than DHCP and ARP

If terminal filters are enabled, all packets are discarded, except DHCP and ARP packets from devices not in the binding information. Isolate the cause of the problem according to the failure analysis method described in the following table.

Table 3-87: Failure analysis method for problems caused by terminal filters

No.	Items to check	Action
1	Check the DHCP snooping configuration.	See *3.27.1 Problems related to DHCP,* and make sure DHCP snooping is operating normally.

No.	Items to check	Action
		If there is no problem, go to No. 2.
2	Check whether the `ip verify source` configuration command is set for the target port.	If `ip verify source` is set, packets from devices not in the binding information are discarded. If there is no problem, go to No. 3.
		If `ip verify source` is not set, go to No. 4.
3	Execute the `show ip dhcp snooping binding` command, and make sure that the binding information is present for the device on which communication is not possible.	If the binding information is not present and the target device has a fixed IP address, set the `ip source binding` configuration command. If the binding information is not present and the target device obtains an IP address by DHCP, obtain an IP address again.
4	Other cases	If any of the above actions do not resolve your problem, check other functionality used in the device according to this manual.

3.28 Policy-based routing problems

3.28.1 Actions to take when packets are not forwarded in policy-based routing

If packets are not forwarded to the specified route when a policy-based routing group is used, resolve the problem as shown in the following table.

Table 3-88: Action to take when packets are not forwarded in policy-based routing for AX6700S, AX6600S, or AX6300S

No.	Items to check and commands	Action
1	Check the operating status of the filter for which the policy-based routing list information is set • Execute the `show access-filter` command, and in `matched packets :`, check whether the number of packets matches the filter condition.	If the number of packets that could not be transmitted differs from the `matched packets` value, it is possible that the filter detection conditions are incorrect, causing implicit discards. Revise the filter settings.
		If the number of packets that could not be transmitted is the same as the `matched packets` value, go to No. 2.
2	Check the operating status of the policy-based routing group • Execute the `show ip cache policy` command, and check the display status of `*>`.	If the status is not displayed, the group might be in the process of starting, in the process of switching, or in default operation. To check if the group is in the process of starting, go to No. 3. To check if the group is in the process of switching, go to No. 4. To check if the group is in default operation, go to No. 5.
		If the status is displayed, go to No. 5.
3	Check the operating status of path switching in policy-based routing • Check the `Start Time` and `End Time` values of the `Policy Base Routing Default Init Interval` of the `show ip cache policy` command.	If `-` is displayed for `End Time` only, the packets might have been discarded because the group is in the process of starting. Wait until startup finishes.
		If `Start Time` and `End Time` are both `-` or the date is displayed, go to No. 5.
4	Check the operating status of path switching in policy-based routing • Check the `Start Time` and `End Time` values of the `Policy Base Routing Default Aging Interval` of the `show ip cache policy` command.	If `-` is displayed for `End Time` only, the packets might have been discarded because the group is in the process of path switching. Wait until path switching finishes.
		If `Start Time` and `End Time` are both `-` or the date is displayed, go to No. 5.
5	Check the status of the VLAN interface and tracking functionality of the policy-based routing forwarding destination • Execute the `show vlan` command, and check the `Status:` item. • Execute the `show track-object` command, and check the track state of the `State` item.	If the status of either the VLAN interface or the tracking functionality of the policy-based routing forwarding destination is not `Up`, packets are being forwarded normally or discarded due to default operation. Make sure the VLAN interface and tracking functionality of the forwarding destination are both in the `Up` status.
		If both the VLAN interface and tracking functionality are in the `Up` status, go to No. 6.

No.	Items to check and commands	Action
6	Check the path switch-back operation setting of policy-based routing • Execute the `show ip cache policy` command, and check the `Recover` item.	If the setting is `Off`, path switch-back operations are not performed, and thus the path is not being re-selected. Execute the `reset policy-list` command to re-select the path.
		If the setting is `On`, go to No. 7.
7	Check if a network communication failure has occurred in the destination interface • See *3.7 IPv4 network communication failures*.	If a communication failure has occurred, follow the instructions in the referenced section.
		If a communication failure has not occurred, go to No. 8.
8	Collect analysis information • For AX6700S Execute the `show tech-support` command, the `dump policy` command, and then the `dump bsu` command, twice in that order.#1 • For AX6600S or AX6300S Execute the `show tech-support` command, the `dump policy` command, and then the `dump psp` command, twice in that order.#2	Send the information you collected to the support center.

#1

If you execute the `dump bsu` command, do not execute any more commands until a log entry is output stating that collection of the memory dump file is complete. Also, the second time you execute the `dump policy` command or the `dump bsu` command, the memory dump file you collected the first time is deleted, so be sure to save the memory dump file before executing the command for the second time.

#2

If you execute the `dump psp` command, do not execute any more commands until a log entry is output stating that collection of the memory dump file is complete. Also, the second time you execute the `dump policy` command or the `dump psp` command, the memory dump file you collected the first time is deleted, so be sure to save the memory dump file before executing the command for the second time.

Table 3-89: Action to take when packets are not forwarded in policy-based routing for AX3800S, AX3650S, or AX3640S

No.	Items to check and commands	Action
1	Check the operating status of the filter for which the policy-based routing list information is set • Execute the `show access-filter` command, and in `matched packets :`, check whether the number of packets matches the filter condition.	If the number of packets that could not be transmitted differs from the `matched packets` value, it is possible that the filter detection conditions are incorrect, causing implicit discards. Revise the filter settings.
		If the number of packets that could not be transmitted is the same as the `matched packets` value, go to No. 2.
2	Check the operating status of the policy-based routing group • Execute the `show ip cache policy` command, and check the display status of `*>`.	If the status is not displayed, the group might be in the process of starting, or in default operation, causing default forwarding or discards to be performed. To check if the group is in the process of starting, go to No. 3.
		If the status is displayed, go to No. 4.

No.	Items to check and commands	Action
3	Check the operating status of path switching in policy-based routing • Check the `Start Time` and `End Time` values of the `Policy Base Routing Default Init Interval` of the `show ip cache policy` command.	If `-` is displayed for `End Time` only, the packets might have been discarded because the group is in the process of starting. Wait until startup finishes.
		If `Start Time` and `End Time` are both `-` or the date is displayed, go to No. 5.
4	Check the status of the VLAN interface and tracking functionality of the policy-based routing forwarding destination • Execute the `show vlan` command, and check the `Status:` item. • Execute the `show track-object` command, and check the track state of the `State` item.	If the status of either the VLAN interface or the tracking functionality of the policy-based routing forwarding destination is not `Up`, packets are being forwarded normally or discarded due to default operation. Make sure the VLAN interface and tracking functionality of the forwarding destination are both in the `Up` status.
		If both are in the `Up` status, go to No. 5.
5	Check the path switch-back operation setting of policy-based routing • Execute the `show ip cache policy` command, and check the `Recover` item.	If the setting is `Off`, path switch-back operations are not performed, and thus the path is not being re-selected. Execute the `reset policy-list command` to re-select the path.
		If the setting is `On`, go to No. 6.
6	Check the ARP information of the policy-based routing forwarding destination • Execute the `show ip arp` command, and check if the next hop of the forwarding destination is registered. • Execute the `show mac-address-table` command, and check if the MAC address of the forwarding destination is registered.	If ARP is not registered, specify static ARP. If the MAC address is not registered, specify a MAC address static entry. Also, use the tracking functionality of policy-based routing.
		If ARP is registered, go to No. 7.
7	Check if a network communication failure has occurred on the destination interface • See *3.7 IPv4 network communication failures*.	If a communication failure has occurred, follow the instructions in the referenced section.
		If a communication failure has not occurred, go to No. 8.
8	Collect analysis information • Execute the `show tech-support` command and the `dump policy` command, twice in that order.#	Send the information you collected to the support center.

#

The second time you execute the `dump policy` command, the memory dump file you collected the first time is deleted, so be sure to save the memory dump file you collected before executing the command for the second time.

3.28.2 Actions to be taken when the tracking functionality of policy-based routing is in an unexpected track state

The Switch might have an unexpected track state for one of the following three reasons:

1. The track configuration was changed.
2. Due to a network failure, communication cannot be made with the polling monitoring track

target.

3. Due to network congestion, communication with the polling monitoring track target is unstable.

To investigate the cause of the current unexpected track state, you must follow the methods of analysis shown in the following table to determine the cause.

Table 3-90: Action to take when the track state is unexpected for AX6700S, AX6600S, or AX6300S

No.	Items to check and commands	Action
1	Check the track information • Specify the `<track-object id>` parameter for the `show track-object` command, and display the track information.	If the track information is not displayed, or the track type is UNSPECIFIED, the track is not set. If the track operating status is `Disable`, stop the track in the configuration. Check the configuration.
		If the track operating status is `Init`, the track has stopped because startup has just finished. Wait until the startup wait time has elapsed.
		If the track operating status is `Aging`, system switching is in progress. The track state immediately before system switching is retained. Wait until the system switching wait time has elapsed.
		If the track is operating, yet the track type is ICMP, go to No. 2.
2	Check whether IPv4 communication with the track target is possible For the destination address, source address, and next hop, use the same values as for the track settings. • Execute the `ping` command.	If the ping destination address and responding address are different, the address that responded is the subnet broadcast address of the destination address. IPv4 ICMP polling monitoring does not operate when the destination is a broadcast address. Check the configuration.
		If the track has no next hop specified, and there is no response or response is unstable, check the IPv4 network communication between the Switch and the track target device.
		If the track has a next hop specified, and there is no response or the response is unstable, go to No. 3.
3	Check whether IPv4 communication can be made with the router specified as the next hop • Execute the `ping` command.	If communication with the device specified as the next hop is unstable, check the IPv4 network communication between the Switch and the next hop device.
		If communication with the device specified as the next hop is unstable, check the IPv4 network communication between the next hop device and the track target device.

Table 3-91: Action to take when the track state is unexpected for AX3800S, AX3650S, or AX3640S

No.	Items to check and commands	Action
1	Check the track information • Specify the `<track-object id>` parameter for the `show track-object` command, and display the track information.	If the information is not displayed, or the track type is UNSPECIFIED, the track is not set. If the track operating status is `Disable`, stop the track in the configuration. Check the configuration.

No.	Items to check and commands	Action
		If the track operating status is `Init`, the track is stopped because it is immediately after startup. Wait until the startup waiting time elapses.
		If the track operates, yet the track type is ICMP, go to No. 2.
2	Check whether IPv4 communication can be made with track target For the destination address, source address, and next hop, use the same values as for the track settings. • Execute the `ping` command.	If the ping destination address and responding address are different, the address that responded is the subnet broadcast address of the destination address. IPv4 ICMP polling monitoring does not operate when the destination is a broadcast address. Check the configuration.
		If the track has no next hop specified, and there is no response or the response is unstable, check the network communication between the Switch and the track target device.
		If the track has a next hop set, and there is no response or the response is unstable, go to No. 3.
3	Check whether IPv4 communication can be made with the router set as the next hop • Execute the `ping` command.	If communication with the device specified as the next hop is unstable, check the IPv4 network communication between the Switch and the next-hop device.
		If communication with the device specified as the next hop is stable, check the IPv4 network communication between the next-hop device and the track target device.

3.29 Policy-based switching problems

3.29.1 Actions to be taken when packets are not forwarded in policy-based switching

When you are using a policy-based switching group, if packets are not forwarded to the specified route, resolve the problem as shown in the following table.

Table 3-92: Action to take when packets are not forwarded in policy-based switching

No.	Items to check and commands	Action
1	Check the operating status of the filter for which policy-based switching list information is set • Execute the `show access-filter` command, and in `matched packets :` check whether the number of packets matches the filter conditions.	If the number of packets that could not be transmitted differs from the `matched packets` value, it is possible that the filter detection conditions are incorrect, causing implicit discards. Revise the filter settings.
		If the number of packets that could not be transmitted is the same as the `matched packets` value, go to No. 2.
2	Check the operating status of groups in policy-based switching • Execute the `show cache policy-switch` command, and check the display status of `*>`.	If the status is not displayed, the group might be in the process of starting, in the process of switching, or in default operation. To check if the group is in the process of starting, go to No. 3. To check if the group is in the process of switching, go to No. 4. To check if the group is in default operation, go to No. 5.
		If the status is displayed, go to No. 5.
3	Check the operating status of path switching in policy-based switching • Check the `Start Time` and `End Time` values of the `Policy Base Switching Default Init Interval` of the `show cache policy-switch` command.	If `-` is displayed for `End Time` only, the packets might have been discarded because the group is in the process of starting. Wait until startup finishes.
		If `Start Time` and `End Time` are both `-`, or the date is displayed, go to No. 5.
4	Check the operating status of path switching in policy-based switching • Check the `Start Time` and `End Time` values of the `Policy Base Switching Default Aging Interval` of the `show cache policy-switch` command.	If `-` is displayed for `End Time` only, the packets might have been discarded because the group is in the process of path switching. Wait until path switching finishes.
		If `Start Time` and `End Time` are both `-`, or the date is displayed, go to No. 5.
5	Check the status of the policy-based switching forwarding destination port, the channel group status, and the tracking functionality • Execute the `show port` command, and check the track state of the `Status` item. • Execute the `show channel-group` command, and check the `CH Status` item. • Execute the `show track-object` command, and check the `State` item.	If any of the following is not `Up`, forwarding and discarding follow default operation: the policy-based switching forwarding destination port, the channel group status, or the tracking functionality status. Make sure that the forwarding destination port, the channel group status, and the tracking functionality statuses are all `Up`.
		If both are in the `Up` status, go to No. 6.

No.	Items to check and commands	Action
6	Check the path switch-back operation settings for policy-based switching • Execute the `show cache policy-switch` command, and check the `Recover` item.	If the setting is `Off`, path switch-back operations are not performed, and thus the path is not being re-selected. Execute the `reset policy-switch-list` command to re-select the path.
		If the setting is `On`, go to No. 7.
7	Check if a network communication failure has occurred in the destination interface • See *3.6.1 Layer 2 communication by VLANs is not possible*.	If a communication failure has occurred, follow the instructions in the referenced section.
		If a communication failure has not occurred, go to No. 8.
8	Collect analysis information • For AX6700S Execute the `show tech-support` command, the `dump policy` command, and then the `dump bsu` command, twice in that order.#1 • For AX6600S or AX6300S Execute the `show tech-support` command, the `dump policy` command, and then the `dump psp` command, twice in that order.#2	Send the information you collected to the support center.

#1

If you execute the `dump bsu` command, do not execute any more commands until a log entry is output stating that collection of the memory dump file is complete. Also, the second time you execute the `dump policy` command or the `dump bsu` command, the memory dump file you collected the first time is deleted, so be sure to save the memory dump file before executing the command for the second time.

#2

If you execute the `dump psp` command, do not execute any more commands until a log entry is output stating that collection of the memory dump file is complete. Also, the second time you execute the `dump policy` command or the `dump psp` command, the memory dump file you collected the first time is deleted, so be sure to save the memory dump file before executing the command for the second time.

Chapter

4. Troubleshooting Communication Failures Due to a Resource Shortage

This chapter describes communication failures due to a resource shortage in AX6700S, AX6600S, and AX6300S series switches.

4.1 MAC address table resource shortage
4.2 When a VLAN identification table resource shortage occurs
4.3 When a resource shortage occurs in shared memory

4.1 MAC address table resource shortage

4.1.1 Checking the MAC address table resource usage

The Switch outputs operation log messages when the MAC address table entries reach 80% and 100% of the capacity limit. The table below lists the operation log message to be output.

Table 4-1: Operation log message that indicates resource usage

No.	Trigger	Operation log message
1	When the MAC address table entries reach 80% of the capacity limit	`MAC address table entries was beyond 80 percent of capacity.`
2	When the MAC address table entries reach 100% of the capacity limit	`MAC address table entries exceeded capacity.`

Communication is not affected immediately after the MAC address table entries reach 80% of the capacity limit. If, however, entries continue to increase, the capacity limit might be reached. This might lead to a resource shortage and cause problems such as the suppression of MAC address learning. You need to pre-check the set value and the capacity limit value to avoid a situation where the capacity limit is exceeded.

You can check resource usage of the MAC address table by using the `show system` command. (For details, see the manual *Operation Command Reference*.)

4.1.2 Actions to be taken when a MAC address table resource shortage occurs

When the MAC address table entries reach the capacity limit, the Switch outputs a log message corresponding to the triggers listed in the table below.

Table 4-2: Log message output triggers and log text

No.	Trigger	Log message
1	MAC address learning ARP/NDP learning	`MAC address table entries exceeded capacity.`
2	Static ARP/NDP registration	`MAC address table entries exceeded capacity.`
3	Static MAC address registration	`The static MAC address entry can't be registered at MAC address table. ( VLAN <`*ID*`>,mac <`*MAC*`> )`[#]
4	Setting up of MAC address learning suppression	`The "no mac-address-table learning" entry can't be registered at MAC address table. ( VLAN <`*ID*`> )`[#]
5	IEEE 802.1X (port-based authentication, VLAN-based authentication [static])	`The 802.1X Supplicant MAC address can't be registered at hardware tables.`[#] Note: This log message is displayed when the show `dot1x logging` command is executed.
6	Enabling of the Ring Protocol Additional Ring Protocol registration	`AXRP <`*ring id*`> : The MAC address entry can't be registered at hardware tables.`
7	IGMP snooping registration	`IGMP snooping: The number of the IGMP snooping entry exceeded the capacity of this system.`
8	MLD snooping registration	`MLD snooping: The number of the MLD snooping entry exceeded the capacity of this system.`

No.	Trigger	Log message
9	Web authentication (fixed VLAN mode)	`The login failed because of hardware restriction.` Note: This log message is displayed when the `show web-authentication logging` command is executed.
10	MAC-based authentication	`The login failed because of hardware restriction.` Note: This log message is displayed when the `show mac-authentication logging` command is executed.

#: This message might be output with log message No. 1 in the above table.

If any of these log messages are output, you cannot set up any additional functions that use the MAC address table. You must review your network configuration and change it so that the switch can operate below the capacity limit.

In Nos. 2, 3, 4, and 6 in the above table, no entry was added to the MAC address table with the last configuration command. In No. 5, no entry of the last authenticated terminal (Authentication failed) was added to the MAC address table. To reconfigure the settings, follow these steps:

1. Review your configuration so that when in a later step you make more space available in the table, MAC address learning, ARP/NDP learning, IEEE 802.1X, Web authentication, or MAC-based authentication will not add any new entries to the MAC address table.
2. Delete the executed command (for Nos. 2, 3, 4, and 6 in the above table).
3. Make more space available in the MAC address table.#
4. Re-execute the command (for Nos. 2, 3, 4, and 6 in the above table), or re-authenticate (for No. 5).

#: You must delete some registered entries to make more space available in the MAC address table. The following table lists the procedures for deleting various types of entries.

Table 4-3: How to delete MAC address table entries

No.	Entry to be deleted	Procedure
1	Learned MAC address	Execute the `clear mac-address-table` and `clear arp-cache` commands.#1
2	Static MAC address Static ARP/NDP MAC address learning suppression	Execute the following configuration commands to clear the configuration.#2 • `no mac-address-table static` • `no arp` • `no ipv6 neighbor` • `mac-address table learning vlan`
3	IEEE 802.1X	Execute the `clear dot1x auth-state` command to cancel authentication.#1
4	MAC address for Ring Protocol	• Execute the `disable` configuration command to disable the Ring Protocol.#2 • Execute any of the following configuration commands to clear the configuration.#2 - `no axrp` - `no axrp vlan-mapping` - `no axrp-ring-port` - `no control-vlan` - `no mode` - `no vlan-group`

No.	Entry to be deleted	Procedure
5	IGMP/MLD snooping	Execute the `clear igmp-snooping all` and `clear mld-snooping all` commands.#1
6	Web Authentication	Execute the `clear web-authentication auth-state` command to cancel authentication.#1
7	MAC-based authentication	Execute the `clear mac-authentication auth-state` command to cancel authentication.#1
8	Policy-based switching	Execute the following configuration commands to clear the configuration.#2 • `no advance access-group` • `no ip access-group` • `no ipv6 traffic-filter` • `no mac access-group` • `no policy-switch-list` • `no policy-vlan` • `no policy-interface`

#1: For details, see the manual *Operation Command Reference*.
#2: For details, see the manual *Configuration Command Reference*.

4.2 When a VLAN identification table resource shortage occurs

4.2.1 Checking the VLAN identification table resource usage

The Switch outputs an operation log message when the VLAN identification table entries reach 80% of the capacity limit. The table below lists the operation log message to be output.

Table 4-4: Operation log message that indicates resource usage

No.	Trigger	Operation log message
1	When the VLAN identification table entries reach 80% of the capacity limit	`VLAN classification table entries was beyond 80 percent of capacity.`

Communication is not affected immediately after the entries reach 80% of the capacity limit. If, however, functionality such as Layer 2 authentication continues to use the VLAN identification table, the capacity limit might be reached. This might lead to a resource shortage and cause problems such as a failure of Layer 2 authentication. You need to pre-check the set value and the capacity limit value to avoid a situation where the capacity limit is exceeded.

To check resource usage of the VLAN identification table, see the *Configuration Guide*.

4.2.2 Actions to be taken when a VLAN identification table resource shortage occurs

When the VLAN identification table entries reach the capacity limit, the Switch outputs a log message corresponding to the triggers listed in the table below.

Table 4-5: Log message output triggers and log text

No.	Trigger	Loge message
1	Configuring tag translation	• `The vlan mapping entry can't be registered at VLAN classification table (VLAN <ID>, port(<NIF No.>/<Port No.>)).` • `The vlan mapping entry can't be registered at VLAN classification table (VLAN <ID>, Channel Group <Channel Group Number>).`
2	Configuring a protocol VLAN	• `The protocol based VLAN entry can't be registered at VLAN classification table (VLAN <ID>,port(<NIF No.>/<Port No.>)).` • `The protocol based VLAN entry can't be registered at VLAN classification table (VLAN <ID>,Channel Group <Channel Group Number>).` • `The protocol based VLAN entry can't be registered at VLAN classification table (protocol {ethertype | llc | snap-ethertype } <HEX>,VLAN <ID>).` • `The protocol based VLAN entry can't be registered at VLAN classification table (protocol {ethertype | llc | snap-ethertype } <HEX>,Vlan-Protocol <Protocol name>).`
3	Configuring a MAC VLAN static entry	• `The MAC-VLAN MAC Address entry can't be registered at hardware tables.`
4	IEEE 802.1X (VLAN-based authentication [dynamic])	• `The 802.1X Supplicant MAC address of MAC VLAN can't be registered at hardware tables.` Note: This log message is displayed when the show dot1x logging command is executed.

No.	Trigger	Loge message
5	Authentication VLAN	• `The registration of the MAC address failed.` Note: This log message is displayed when the show fense logging command is executed.
6	Web authentication (dynamic VLAN mode)	• `The login failed because of hardware restriction.` Note: This log message is displayed when the show web-authentication logging command is executed.

If any of these log messages are output, you cannot set up any additional functionality that uses the VLAN identification table. You must review your network configuration and change it so that the switch can operate below the capacity limit.

In Nos. 1, 2, and 3 in the above table, no entry was added to the VLAN identification table with the last configuration command. In Nos. 4 and 5, no entry of the last authenticated terminal was added to the VLAN identification table. To reconfigure the settings, follow these steps:

1. Review your configuration so that when, in a later step, you make more space available in the table, the IEEE 802.1X, Web authentication, or authentication VLAN will not add any new entries to the VLAN identification table.
2. Delete the executed command (for Nos. 1, 2, and 3 in the above table).
3. Make more space available in the VLAN identification table.#
4. Re-execute the command (for Nos. 1, 2, and 3 in the above table), re-authenticate (for No. 4), or review the number of users authenticated by the authentication server (for No. 5).

#: You must delete some registered entries to make more space available in the VLAN identification table. The following table lists the procedures for deleting various types of entries.

Table 4-6: How to delete VLAN identification table entries

No.	Entry to be deleted	Procedure
1	Tag translation	Execute the `no switchport vlan mapping enable` and `no switchport vlan mapping` configuration commands.#1
2	Protocol VLAN	Execute the `no switchport protocol` configuration command to clear the protocol VLAN settings.#1
3	MAC VLAN static entry	Execute the `no mac-address` configuration command.#1
4	IEEE 802.1X	Execute the `clear dot1x auth-state` command.#2
5	Authentication VLAN	Review the number of users authenticated by the authentication server.
6	Web Authentication	Execute the `clear web-authentication auth-state` command.#2

#1: For details, see the manual *Configuration Command Reference*.

#2: For details, see the manual *Operation Command Reference*.

4.3 When a resource shortage occurs in shared memory

4.3.1 Checking the resource usage of shared memory

You can check the usage of shared memory installed on a Switch by using the `show system` command.

```
# show system
      :
            Shared resources Used/Max: 0B/1638400B
                IPv4 Unicast Single-path used :          0B
                IPv4 Unicast Multi-path used  :          0B
                IPv6 Unicast Single-path used :          0B
                IPv6 Unicast Multi-path used  :          0B
                IPv4 Multicast used           :          0B
                IPv6 Multicast used           :          0B
                IPv4 Policy Based Routing used:          0B
                IPv6 Policy Based Routing used:          0B
                Policy Based Switching used   :          0B
                VLAN config used              :          0B
                IGMP/MLD Snooping used        :          0B
      :
```

For details on the `show system` command, see the manual *Operation Command Reference*.

4.3.2 Actions to be taken when a resource shortage occurs in shared memory

When a resource shortage occurs in the shared memory, see the *Configuration Guide* and check the set value and the capacity limit value.

Chapter 5. Obtaining Failure Information

This chapter mainly describes how to obtain failure information.

5.1 Collecting maintenance information
5.2 Transferring maintenance information files
5.3 Collecting information and transferring files by using the "show tech-support" command
5.4 Collecting information and transferring files by using the "ftp" command on a remote terminal
5.5 Writing data to a memory card

5.1 Collecting maintenance information

When a fault occurs with the switch during operation, log and dump information is automatically collected. You can also use operation commands to capture dump information.

5.1.1 Maintenance information

(1) Maintenance information for AX6700S, AX6600S, and AX6300S series switches

The following table lists the maintenance information for AX6700S, AX6600S, and AX6300S series switches.

Table 5-1: Maintenance information (AX6700S, AX6600S, and AX6300S)

Item	Path and file name	Remarks
Dump information file created when the switch restarts	`/dump0/rmdump`	• Use binary mode to transfer these files with the `ftp` command. • Delete these files after the transfer is completed.
Dump information file created when the BSU fails	`/usr/var/hardware/bsu`**. *** in the system that failed (For versions prior to Version 10.5: `/dump0/bsu`**. *** in the system that failed) **: BSU number of the BSU that failed ***: Serial number assigned since the first dump data was collected. Up to two files, the oldest and the latest files, are stored.	
BSU dump information file created when the `dump bsu` command is executed	`/usr/var/hardware/bsu`**`.cmd` in the system in which the command is executed (For versions prior to Version 10.5: `/dump0/bsu`**`.cmd` in the system in which the command is executed) **: BSU number of the specified BSU	
Dump information file created when the PSP fails	`/usr/var/hardware/psp`**. *** in the active system (For versions prior to Version 10.5: `/dump0/psp`**. *** in the system that failed) (This file is stored in the active system even if the standby PSP fails. You can check the file name to determine which PSP has failed.) **: `01` if the PSP CSU1/MSU1 fails, or `02` if the PSP CSU2/MSU2 fails ***: Serial number assigned since the first dump data was collected. Up to two files, the oldest and the latest files, are stored. `/dump0/rmdump` in the system that failed (This information is simultaneously collected. It is stored in the standby system if the standby PSP fails.)	
PSP dump information file created when the `dump psp` command is executed	`/usr/var/hardware/psp`**`.cmd` in the system in which the command is executed (For versions prior to Version 10.5: `/dump0/psp`**`.cmd` in the system in which the command is executed) **: `01` if the specified PSP is CSU1/MSU1, or `02` if the specified PSP is CSU2/MSU2	

Item	Path and file name	Remarks
Dump information file created when the NIF fails	/usr/var/hardware/nif**. *** in the system that failed (For versions prior to Version 10.5: /dump0/nif**. *** in the active system) **: NIF number of the NIF that failed ***: Serial number assigned since the first dump data was collected. Up to two files, the oldest and the latest files, are stored.	
NIF dump information file created when the dump nif command is executed	/usr/var/hardware/nif**.cmd in the system in which the command is executed (For versions prior to Version 10.5: /dump0/nif**.cmd in the system in which the command is executed) **: NIF number of the specified NIF	
Log information	Depending on the source directory, the files are stored with the following names: Operation log: log.txt Reference log: log_ref.txt	• Use ASCII mode to transfer these files with the ftp command.
Information when the configuration file encounters an error	In administrator mode, execute the following commands to copy two files to the home directory. Then transfer these files. cp /config/system.cnf system.cnf cp /config/system.txt system.txt	• Use binary mode to transfer these files with the ftp command. • Delete the source files after the transfer is completed.
Error save information	/usr/var/core/*.core	• Use binary mode to transfer these files with the ftp command. • Delete these files after the transfer is completed.

(2) Maintenance information for AX3800S, AX3600S, and AX2400S series switches

The following table lists the maintenance information for AX3800S, AX3600S, and AX2400S series switches. Note that when you are configuring a stack, maintenance information is stored in each member switch. For this reason, collect information from each member switch at the time of stack configuration.

Table 5-2: Maintenance information (AX3800S, AX3600S, and AX2400S)

Item	Path and file name	Remarks
Dump information file created when the switch restarts	/dump0/rmdump	• Use binary mode to transfer these files with the ftp command. • Delete these files after the transfer is completed.
Dump information file created when the network interface fails	/usr/var/hardware/ni00.000 (For versions prior to Version 10.5: /dump0/ni00.000)	
Log information	Depending on the source directory, the files are stored with the following names: Operation log: log.txt Reference log: log_ref.txt	• Use ASCII mode to transfer these files with the ftp command.

Item	Path and file name	Remarks

Information when the configuration file encounters an error	In administrator mode, execute the following commands to copy two files to the home directory. Then transfer these files.
	`cp /config/system.cnf system.cnf`
	`cp /config/system.txt system.txt`
	When configuring a stack, copy the files of each member switch to the master switch.
	`cp switch <`*switch no.*`> /config/system.cnf system_<`*switch no.*`>.cnf`
	`cp switch <`*switch no.*`> /config/system.txt system_<`*switch no.*`>.txt`
		• Use binary mode to transfer these files with the `ftp` command.
		• Delete the source files after the transfer is completed.

Error save information	`/usr/var/core/*.core`	• Use binary mode to transfer these files with the `ftp` command. • Delete these files after the transfer is completed.

5.1.2 Collecting failure information by using the "dump" command

In the AX6700S, AX6600S, and AX6300S series, you can use operation commands to capture memory dump information of the board or other components of the switch. The dump procedures are described below.

(1) Capturing a memory dump when a communication failure occurs

When a communication failure occurs, execute all of the following commands to capture memory dumps. The captured memory dump files are stored in `/usr/var/hardware` (for versions prior to Version 10.5, in `/dump0`) in the system in which the commands were executed. You need to delete the memory dump files after capturing the memory dumps.

In the AX6700S series:

1. In the active BCU, execute the `dump bsu` command for all the BSUs that are installed.
2. In the active BCU, execute the `dump nif` command for all the ports that have failed.

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1 when the BSUs are installed on the BSU numbers 1 and 2.

1. Log in to the active BCU, and then execute the `dump` command.

```
> dump bsu 1
Dump command accept.
>
11/01 17:43:42 E3 BSU BSU:1 25070700 1681:000000000000 BSU online dump
command executed.
```

2. After the above log information is displayed, execute the following `dump` command.

```
> dump bsu 2
Dump command accept.
>
11/01 18:10:42 E3 BSU BSU:2 25070700 1681:000000000000 BSU online dump
command executed.
```

3. After the above log information is displayed, execute the following `dump` command.

```
> dump nif 1
Dump command accept.
>
11/01 18:15:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

In the AX6600S series:

1. In the active system, execute the `dump psp` command for the PSP in the active system.
2. In the active system, execute the `dump nif` command for the port that has failed.

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1.

1. Log in to the active system, and then execute the `dump` command.
```
> dump psp
Dump command accept.
>
11/01 17:43:42 E3 CSU 25070700 2301:000000000000 PSP online dump command
executed.
```
2. After the above log information is displayed, execute the following `dump` command.
```
> dump nif 1
Dump command accept.
>
11/01 18:10:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

In the AX6300S series:

1. In the active system, execute the `dump psp` command for the PSP in the active system.
2. In the active system, execute the `dump nif` command for the port that has failed.

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1.

1. Log in to the active system, and then execute the `dump` command.
```
> dump psp
Dump command accept.
>
11/01 17:43:42 E3 MSU 25070700 2301:000000000000 PSP online dump command
executed.
```
2. After the above log information is displayed, execute the following `dump` command.
```
> dump nif 1
Dump command accept.
>
11/01 18:10:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

(2) Capturing a memory dump when a communication failure occurs after a switchover of the BCU, CSU, or MSU systems

When a communication failure occurs after a system switchover, execute all of the following commands to capture memory dumps. The captured memory dump files are stored in `/usr/var/hardware` (for versions prior to Version 10.5, in `/dump0`) in the system in which the commands were executed. You need to delete the memory dump files after capturing the memory dumps.

In the AX6700S series:

1. In the active BCU, execute the `dump bsu` command for all the BSUs that are installed.
2. In the active BCU, execute the `dump nif` command for all the ports that have failed.
3. In the standby BCU, execute the `dump bsu` command for one of the BSUs that are installed. You do not have to do this for all the BSUs.

Example:

The following procedure shows an example in which communication fails on port number 1

of NIF number 1 when the BSUs are installed on the BSU numbers 1 and 2 in a redundant BCU environment.

1. Log in to the active BCU, and then execute the `dump` command.
```
> dump bsu 1
Dump command accept.
>
11/01 17:43:42 E3 BSU BSU:1 25070700 1681:000000000000 BSU online dump
command executed.
```

2. After the above log information is displayed, execute the following `dump` command.
```
> dump bsu 2
Dump command accept.
>
11/01 18:10:42 E3 BSU BSU:2 25070700 1681:000000000000 BSU online dump
command executed.
```

3. After the above log information is displayed, execute the following `dump` command.
```
> dump nif 1
Dump command accept.
>
11/01 18:15:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

4. After the above log information is displayed, log in to the standby BCU, and then execute the following `dump` command.
```
SBY:> dump bsu 1
Dump command accept.
SBY:>
11/01 18:17:42 E3 BSU BSU:1 25070700 1681:000000000000 BSU online dump
command executed.
```

In the AX6600S series:

1. In the active system, execute the `dump psp` command for the PSP in the active system.
2. In the active system, execute the `dump nif` command for the port that has failed.
3. In the active system, execute the `dump psp standby` command for the PSP in the standby system.
4. In the standby system, execute the `dump psp` command for the PSP in the standby system.

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1 in a redundant CSU environment.

1. Log in to the active system, and then execute the `dump` command.
```
> dump psp
Dump command accept.
>
11/01 17:43:42 E3 CSU 25070700 2301:000000000000 PSP online dump command
executed.
```

2. After the above log information is displayed, execute the following `dump` command.
```
> dump nif 1
Dump command accept.
>
11/01 18:15:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

3. After the above log information is displayed, execute the following `dump` command.
```
> dump psp standby
Dump command accept.
>
```

```
11/01 18:18:42 E3 CSU 25070700 2301:000000000000 PSP online dump command
executed.
```

4. After the above log information is displayed, log in to the standby system, and then execute the following `dump` command.

```
SBY:> dump psp
Dump command accept.
SBY:>
11/01 18:20:42 E3 CSU 25070700 2301:000000000000 PSP online dump command
executed.
```

In the AX6300S series:

1. In the active system, execute the `dump psp` command for the PSP in the active system.
2. In the active system, execute the `dump nif` command for the port that has failed.
3. In the active system, execute the `dump psp standby` command for the PSP in the standby system.
4. In the standby system, execute the `dump psp` command for the PSP in the standby system (for Version 10.3 and later).

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1 in a redundant MSU environment.

1. Log in to the active system, and then execute the `dump` command.

```
> dump psp
Dump command accept.
>
11/01 17:43:42 E3 MSU 25070700 2301:000000000000 PSP online dump command
executed.
```

2. After the above log information is displayed, execute the following `dump` command.

```
> dump nif 1
Dump command accept.
>
11/01 18:15:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

3. After the above log information is displayed, execute the following `dump` command.

```
> dump psp standby
Dump command accept.
>
11/01 18:18:42 E3 MSU 25070700 2301:000000000000 PSP online dump command
executed.
```

4. After the above log information is displayed, log in to the standby system, and then execute the following `dump` command (for Version 10.3 and later).

```
SBY:> dump psp
Dump command accept.
SBY:>
11/01 18:20:42 E3 MSU 25070700 2301:000000000000 PSP online dump command
executed.
```

(3) Capturing a memory dump when a communication failure occurs after a switchover of the BSU systems

When a communication failure occurs after a BSU switchover, execute all of the following commands to capture memory dumps. The captured memory dump files are stored in `/usr/var/hardware` (for versions prior to Version 10.5, in `/dump0`) in the system in which the commands were executed. You need to delete the memory dump files after capturing the memory dumps.

1. In the active BCU, execute the `dump bsu` command for all the BSUs that are installed.

2. In the active BCU, execute the `dump nif` command for all the ports that have failed.

Example:

The following procedure shows an example in which communication fails on port number 1 of NIF number 1 when the BSUs are installed on the BSU numbers 1 and 2.

1. Log in to the active BCU, and then execute the `dump` command.
```
> dump bsu 1
Dump command accept.
>
11/01 17:43:42 E3 BSU BSU:1 25070700 1681:000000000000 BSU online dump
command executed.
```

2. After the above log information is displayed, execute the following `dump` command.
```
> dump bsu 2
Dump command accept.
>
11/01 18:10:42 E3 BSU BSU:2 25070700 1681:000000000000 BSU online dump
command executed.
```

3. After the above log information is displayed, execute the following `dump` command.
```
> dump nif 1
Dump command accept.
>
11/01 18:15:42 E3 NIF NIF:1 25000700 1240:000000000000 NIF online dump
command executed.
```

5.2 Transferring maintenance information files

This section describes how to transfer files that contain log or dump information.

The `ftp` command available for the Switch allows you to transfer files containing maintenance information to a remote terminal or remote host. AX3800S, AX3600S, and AX2400S series switches also have the ability to transfer files to a console by using the `zmodem` command.

In a stack configuration, files containing maintenance information can be transferred from only the master switch. To transfer maintenance information files of member switches other than the master switch, use the `cp` command to copy the files from each member switch to the master switch, and then transfer the files from the master switch.

5.2.1 Transferring files using the "ftp" command

Use the `ftp` command to transfer files between the Switch and a remote terminal.

(1) Transferring a dump file to a remote terminal

Figure 5-1: Transferring a dump file to a remote terminal

```
> cd <dump file directory>                                    <---1
> ftp 192.168.0.1                                          <---2
Connected to 192.168.0.1.
220 FTP server (Version 6.00LS) ready.
Name (192.168.0.1:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> prompt                                               <---3
Interactive mode off.
ftp> bin                                                   <---4
200 Type set to I.
ftp>cd <destination directory>                              <---5
250 CMD command successful.
ftp> put <dump file name>                                  <---6
local: <dump file name> remote: <dump file name>
200 EPRT command successful.
150 Opening BINARY mode data connection for '<dump file name>'.
100% |************************************|  3897       2.13 MB/s    00:00 ETA
226 Transfer complete.
3897 bytes sent in 00:00 (82.95 KB/s)
ftp> bye
221 Goodbye.
>
```

1. Specify the source directory.
2. Specify the destination terminal address.
3. Change the interactive mode.
4. Specify binary mode.#
5. Specify the destination directory.
6. Transfer the dump file.

#

Make sure that you use binary mode to transfer dump files. If dump files are transferred in ASCII mode, correct dump information cannot be obtained.

(2) Transferring log information to a remote terminal

Figure 5-2: Transferring log information to a remote terminal

```
> show logging > log.txt
> show logging reference > log_ref.txt
> ftp 192.168.0.1                                    <---1
Connected to 192.168.0.1.
220 FTP server (Version 6.00LS) ready.
Name (192.168.0.1:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> ascii                                         <---2
200 Type set to A.
ftp>cd <destination directory>                       <---3
250 CMD command successful.
ftp> put log.txt                                   <---4
local: log.txt remote: log.txt
200 EPRT command successful.
150 Opening ASCII mode data connection for 'log.txt'.
100% |************************************| 89019     807.09 KB/s    --:-- ETA
226 Transfer complete.
89019 bytes sent in 00:00 (315.22 KB/s)
ftp> put log_ref.txt
local: log_ref.txt remote: log_ref.txt
200 EPRT command successful.
150 Opening ASCII mode data connection for 'log_ref.txt'.
100% |************************************|  4628       1.04 MB/s    --:-- ETA
226 Transfer complete.
4628 bytes sent in 00:00 (102.86 KB/s)
ftp> bye
221 Goodbye.
>
```

1. Specify the destination terminal address.
2. Specify ASCII mode.
3. Specify the destination directory.
4. Transfer the log information.

(3) Transferring an error save information file to a remote terminal

Figure 5-3: Transferring an error save information file to a remote terminal

```
> cd /usr/var/core/
> ls                                               <---1
nimd.core       nodeInit.core
> ftp 192.168.0.1                                  <---2
Connected to 192.168.0.1.
220 FTP server (Version 6.00LS) ready.
Name (192.168.0.1:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> prompt                                        <---3
Interactive mode off.
ftp> bin                                           <---4
200 Type set to I.
ftp>cd <destination directory>                       <---5
250 CMD command successful.
ftp> mput *.core                                   <---6
local: nimd.core remote: nimd.core
```

```
200 EPRT command successful.
150 Opening BINARY mode data connection for 'nimd.core'.
100% |*****************************************************************|
272 KB    1.12 MB/s    00:00 ETA
226 Transfer complete.
278528 bytes sent in 00:00 (884.85 KB/s)
local: nodeInit.core remote: nodeInit.core
200 EPRT command successful.
150 Opening BINARY mode data connection for 'nodeInit.core'.
100% |*****************************************************************|
1476 KB    1.40 MB/s    00:00 ETA
226 Transfer complete.
1511424 bytes sent in 00:01 (1.33 MB/s)
ftp> bye
221 Goodbye.
>
```

1. Make sure that the error save information file exists.

   If the file does not exist, exit the procedure without doing anything.
2. Specify the destination terminal address.
3. Change the interactive mode.
4. Specify binary mode.#
5. Specify the destination directory.
6. Transfer the error save information file.

#

Make sure that you use binary mode to transfer error save information files. If error save information files are transferred in ASCII mode, correct error save information cannot be obtained.

5.2.2 Transferring files using the "zmodem" command

AX3800S, AX3600S, and AX2400S series switches allow you to transfer files between the switch and a console via an RS232C cable by using the `zmodem` command. To do this, before starting communication, you must run the communication program on the console to start receiving files.

(1) Transferring a dump file to a console

Figure 5-4: Transferring a dump file to a console

```
> cd <dump file directory>                    <---1
> zmodem put <dump file name>                    <---2
>
```

1. Specify the source directory.
2. Transfer the dump file.

(2) Transferring log information to a console

Figure 5-5: Transferring a log file to a console

```
> show logging > log.txt
> show logging reference > log_ref.txt
> zmodem put log.txt                              <---1
> zmodem put log_ref.txt
>
```

1. Transfer the log file.

(3) Transferring an error save information file to a console

Figure 5-6: Transferring an error save information file to a console

```
> cd /usr/var/core/
> ls                                                <---1
interfaceControl.core    nodeInit.core
> zmodem put interfaceControl.core                  <---2
> zmodem put nodeInit.core
>
```

1. Make sure that the error save information file exists.

   If the file does not exist, exit the procedure without doing anything.
2. Transfer the log file.

5.3 Collecting information and transferring files by using the "show tech-support" command

You can use the `show tech-support` command to collect information when a failure has occurred in a batch operation. You can also specify the `ftp` parameter for this command to transfer the collected information to a remote terminal or remote host.

In a stack configuration, you can transfer files with the `ftp` parameter specified, only by executing the `show tech-support` command on the master switch. You cannot use the `show tech-support` command to specify the `ftp` parameter for member switches other than the master switch.

To collect information and transfer files by using the `show tech-support` command on member switches other than the master switch, perform the following procedure:

1. Execute the following command on the master switch to collect information from the time the failure occurred:
   ```
   remote command <switch no.> show tech-support
   ```

2. Use the `cp` command to copy information collected from each member switch from the member switches to the master switch, and then transfer the files from the master switch.

   For the procedure for transferring the files, see *5.2 Transferring maintenance information files*.

(1) Collecting information and transferring files by using the "show tech-support" command (AX6700S, AX6600S, and AX6300S series switches)

Figure 5-7: Transferring maintenance information files to a remote terminal (AX6700S, AX6600S, and AX6300S series switches)

```
> show tech-support ftp                                          <---1
Specify Host Name of FTP Server.       : 192.168.0.1            <---2
Specify User ID for FTP connections.   : staff1                 <---3
Specify Password for FTP connections.  :                        <---4
Specify Path Name on FTP Server.       : /usr/home/staff1       <---5
Specify File Name of log and Dump files: support                <---6
Check and Extract Dump Files in a Standby system?(y/n)y         <---7
Mon Dec 18 21:49:59 UTC 2006
Transferred support.txt .
Executing.
.....................................................................
...........
.....................................................................
.....................................................
Operation normal end.
########## Dump files' Information ##########
***** ls -l /dump0 *****
total 4568
-rwxrwxrwx  1 root  wheel  4677464 Dec 18 21:16 rmdump
***** ls -l /usr/var/hardware *****
-rwxrwxrwx  1 root  wheel  130886 Dec  8 16:43 nif01.000
***** ls -l /standby/dump0 *****
total 0
-rwxrwxrwx  1 root  wheel  4207084 Dec 18 21:16 rmdump
***** ls -l /standby/usr/var/hardware *****
########## End of Dump files' Information ##########
########## Core files' Information ##########
***** ls -l /usr/var/core *****
***** ls -l /standby/usr/var/core *****
No Core files
########## End of Core files' Information ##########
Transferred support.tgz .
Executing.
```

```
.....................................................................
...........
.....................................................................
.....................................................
Operation normal end.
>
```

1. Execute the command.
2. Specify the remote host name.
3. Specify a user name.
4. Enter the password.
5. Specify the destination directory.
6. Specify a file name.
7. Choose to collect dump files from the standby system.

(2) Collecting information and transferring files by using the "show tech-support" command (AX3800S, AX3600S, and AX2400S series switches)

Figure 5-8: Transferring maintenance information files to a remote terminal (AX3800S, AX3600S, and AX2400S series switches)

```
> show tech-support ftp                                    <---1
Specify Host Name of FTP Server.       : 192.168.0.1        <---2
Specify User ID for FTP connections.   : staff1             <---3
Specify Password for FTP connections.  :                    <---4
Specify Path Name on FTP Server.       : /usr/home/staff1   <---5
Specify File Name of log and Dump files: support            <---6
Mon Dec 18 20:42:58 UTC 2006
Transferred support.txt .
Executing.
.....................................................................
...........
.....................................................................
.....................................................
Operation normal end.
########## Dump files' Information ##########
***** ls -l /dump0 *****
total 2344
-rwxrwxrwx  1 root  wheel  2400114 Dec  8 16:46 rmdump
***** ls -l /usr/var/hardware *****
-rwxrwxrwx  1 root  wheel  264198 Dec  8 16:43 ni00.000
########## End of Dump files' Information ##########
########## Core files' Information ##########
***** ls -l /usr/var/core *****
No Core files
########## End of Core files' Information ##########
Transferred support.tgz .
Executing.
.....................................................................
...........
.....................................................................
.....................................................
Operation normal end.
>
```

1. Execute the command.
2. Specify the remote host name.
3. Specify a user name.
4. Enter the password.

5. Specify the destination directory.
6. Specify a file name.

(3) Use the "remote command" command to use the "show tech-support" command to collect information (at the time of stack configuration)remote command

Figure 5-9: Collection of member switch (switch number 2) maintenance information by the master switch (at the time of stack configuration)

```
> remote command 2 show tech-support > support.txt              <---1
Executing.
.....................................................................
..........
.....................................................................
.....................................................
Operation normal end.
>
```

1. Execute the command.

5.4 Collecting information and transferring files by using the "ftp" command on a remote terminal

You can use the `ftp` command on a remote terminal or remote server to connect to the Switch and to obtain failure or maintenance information by specifying a file name.

In a stack configuration, you can connect to the master switch by using the `ftp` command. You cannot connect to member switches other than the master switch by using the `ftp` command.

To collect failure or maintenance information or to transfer files by using member switches other than the master switch, perform the following procedure:

1. Use each member switch to collect the failure or maintenance information.
2. Use the `cp` command to copy the information collected from each member switch from the member switches to the master switch, and then transfer the files from the master switch.

   For the procedure for transferring the files, see *5.2 Transferring maintenance information files*.

(1) Collecting "show tech-support" information

The procedures below describe how to connect a remote operation terminal, as a client, to the Switch by using the `ftp` command, and how to collect information by specifying the name of a file that contains the required `show tech-support` information.

Table 5-3: ftpInformation you can obtain with the "ftp" command

File name to specify in the "get" subcommand	Information to be obtained
`.show-tech`	Results obtained from the `show tech-support` command
`.show-tech-unicast`	Results obtained from the `show tech-support unicast` command
`.show-tech-multicast`	Results obtained from the `show tech-support multicast` command
`.show-tech-layer-2`	Results obtained from the `show tech-support layer-2` command

Figure 5-10: Obtaining the basic "show tech-support" information

```
client-host> ftp 192.168.0.60                        <---1
Connected to 192.168.0.60.
220 192.168.0.60 FTP server (NetBSD-ftpd) ready.
Name (192.168.0.60:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> get .show-tech show-tech.txt                    <---2
local: show-tech.txt remote: .show-tech
150 Opening BINARY mode data connection for '/etc/ftpshowtech'.
226 Transfer complete.
270513 bytes received in 8.22 seconds (32.12 KB/s)
ftp> quit
221 Thank you for using the FTP service on 192.168.0.60.
client-host>
```

1. Use FTP on a client to connect to the Switch.
2. Transfer the `.show-tech` file to the client. (The file name `show-tech.txt` is specified.)

Figure 5-11: Obtaining the "show tech-support" unicast information

```
client-host> ftp 192.168.0.60                      <---1
Connected to 192.168.0.60.
220 192.168.0.60 FTP server (NetBSD-ftpd) ready.
Name (192.168.0.60:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> get .show-tech-unicast show-tech-uni.txt      <---2
local: show-tech-uni.txt remote: .show-tech-uni.txt
150 Opening BINARY mode data connection for '/etc/ftpshowtech'.
226 Transfer complete.
343044 bytes received in 30.43 seconds (11.01 KB/s)
ftp> quit
221 Thank you for using the FTP service on 192.168.0.60.
client-host>
```

1. Use FTP on a client to connect to the Switch.
2. Transfer the `.show-tech-unicast` file to the client. (The file name `show-tech-uni.txt` is specified.)

Notes:

- `ftp` subcommands such as `ls` cannot view a file specified for the `get` subcommand. Therefore, you cannot check the file size before transferring the file.
- When you obtain the information, execute the commands on the switch. In this case, the file transfer might take a long time. However, you must not interrupt the transfer before it ends.
- Depending on the load on the switch or the state of the communication path, the client might close the connection due to a network timeout. If this occurs, you must set a longer client timeout period.
- When you use FTP to obtain failure information, you cannot collect results from any command that can only be executed in administrator mode, such as `show running-config` command.
- When you obtain `show tech-support` information, the system writes the user name `ftpuser` to the log information.

(2) Obtaining dump information files

The procedures below describe how to connect a remote operation terminal, as a client, to the Switch by using the `ftp` command, and how to collect information by specifying the name of a file that contains the required dump information.

Table 5-4: Files you can obtain with the "ftp" command

File name to specify in the "get" subcommand	Files to be obtained
`.dump`	Files in `/dump0` and `/usr/var/hardware` (compressed) (For versions prior to Version 10.5: files in `/dump0` and `/dump1` [compressed].)
`.dump0`	Files in `/dump0` (compressed)
`.hardware`	Files in `/usr/var/hardware` (compressed) (for Version 10.5 and later)

Figure 5-12: Obtaining dump files from a remote terminal

```
client-host> ftp 192.168.0.60                      <---1
Connected to 192.168.0.60.
```

```
220 192.168.0.60 FTP server (NetBSD-ftpd) ready.
Name (192.168.0.60:staff1): staff1
331 Password required for staff1.
Password:
230 User staff1 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> binary                                          <---2
200 Type set to I.
ftp> get .dump dump.tgz                              <---3
local: dump.tgz remote: .dump
150 Opening BINARY mode data connection for '/etc/ftpdump'.
226 Transfer complete.
2411332 bytes received in 5.78 seconds (407.13 KB/s)
ftp> quit
221 Thank you for using the FTP service on 192.168.0.60.
client-host>
```

1. Use FTP on a client to connect to the switch.
2. Make sure that you use binary mode to transfer dump information files.

   You cannot transfer files in ASCII mode.
3. Transfer the `.dump` files to the client. (The file name `dump.tgz` is specified.)

Notes

- `ftp` subcommands such as `ls` cannot view a file specified for the `get` subcommand. Therefore, you cannot check the file size before transferring the file.
- Depending on the load on the switch or the state of the communication path, the client might close the connection due to a network timeout. If this occurs, you must set a longer client timeout period.

5.5 Writing data to a memory card

Failure and maintenance information can be written to a memory card. Note, however, that memory cards have a capacity limit.

5.5.1 Writing data to a memory card by using an operation terminal

This section describes how to write the Switch information to a memory card by using an operation terminal.

Figure 5-13: Writing information to a memory card

```
Insert a memory card into the Switch to which information is to be written.
Use the ls -l command to check the size of the source file (tech.log).
> ls -l tech.log
-rw-r--r--  1 operator  users  234803 Nov 15 15:52 tech.log

Use the show mc command to check available space.
>show mc
Date 2005/11/15 15:50:40 UTC
MC  : Enabled
    Manufacture ID : 00000003
    16,735kB used
    106,224kB free                                  <---1
    122,959kB total

Use the cp command to copy the source file to the memory card with the destination
file name tech-1.log.
> cp tech.log mc-file tech-1.log

Make sure the file has been written to the memory card.
> ls mc-dir
Name             Size
tech-1.log               234803
>
```

1. Available space

Chapter 6. Line Testing

6.1 Testing a line

6.1 Testing a line

In line tests, what loops back test frames varies depending on the test type. The following figure shows what loops back the test frames for various line test types.

Note that line testing for stack configuration is not supported.

Figure 6-1: What loops back the test frames for various line test types

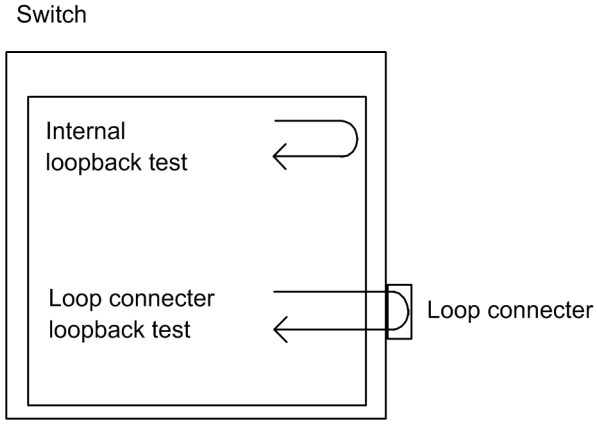


Table 6-1: Test types and fault locations to be identified

Test type	What loops back frames	Fault location to be identified
Internal loopback test	Switch	• AX6700S, AX6600S, and AX6300S series switches NIF (except for the RJ45 connector and transceiver) • AX3800S, AX3600S, and AX2400S series switches Switch (except for the RJ45 connector and transceiver)
Loop connector loopback test	Loop connector	• AX6700S, AX6600S, and AX6300S series switches NIF (including the RJ45 connector and transceiver) • AX3800S, AX3600S, and AX2400S series switches Switch (including the RJ45 connector and transceiver)

6.1.1 Internal loopback test

The internal loopback test, which loops back frames on the Switch, is executed to check for any faults. You can execute this test for all line types.

The test procedure is described below.

1. Use the inactivate command to put the port to be tested into an inactive state.
2. Execute the `test interfaces` command with the `internal` parameter specified. Wait about one minute after the execution of the command.
3. Execute the `no test interfaces` command, and then check the displayed results.
4. Use the `activate` command to place the port back into an active state.

The following figure shows an example of a test in which the sending interval of test frames is set to two seconds on port number 1 of NIF number 1.

Figure 6-2: Example of an internal loopback test

```
> inactivate gigabitethernet 1/1
> test interfaces gigabitethernet 1/1 internal interval 2 pattern 4

> no test interfaces gigabitethernet 1/1
```

```
Date 2006/03/10 00:20:21 UTC
Interface type              :100BASE-TX
Test count                  :30
Send-OK                     :30             Send-NG                 :0
Receive-OK                  :30             Receive-NG              :0
Data compare error          :0              Out underrun            :0
Out buffer hunt error       :0              Out line error          :0
In CRC error                :0              In frame alignment      :0
In monitor time out         :0              In line error           :0
H/W error                   :none
> activate gigabitethernet 1/1
```

After the test is completed, check the following:

If both Send-NG and Receive-NG are 0, the line test has successfully completed.

If either Send-NG or Receive-NG is not 0, there might be some sort of problem. See the description of the no test interfaces command in the manual *Operation Command Reference*.

6.1.2 Loop connector loopback test

The loop connector loopback test, which loops back frames on the loop connector, is executed to check for any faults. You can execute this test for all line types.

The test procedure is described below.

1. Use the `inactivate` command to put the port to be tested into an inactive state.
2. Remove the cable from the target port, and then connect the loop connector to that port.#
3. Execute the `test interfaces` command with the connector parameter specified. Wait about one minute after the execution of the command.
4. Execute the `no test interfaces` command, and then check the displayed results.
5. Remove the loop connector, and then reconnect the cable to the port.
6. Use the `activate` command to place the port back into an active state.

#

Note that if the loop connecter is not connected, or if the connected loop connector is inappropriate for the port, the test might provide invalid results.

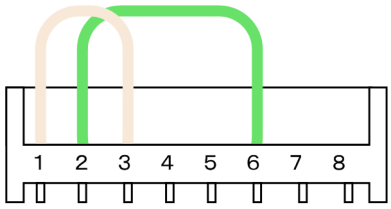
You can check the test results in the same way as described in *6.1.1 Internal loopback test*.

6.1.3 Loop connectors specification

(1) 10BASE-T/100BASE-TX loop connector

As shown in the following figure, insert the cables into the connector and crimp them by using a crimping tool.

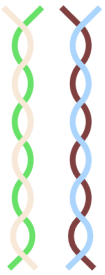
Figure 6-3: 10BASE-T/100BASE-TX loop connector specification



(2) 10BASE-T/100BASE-TX/1000BASE-T loop connector

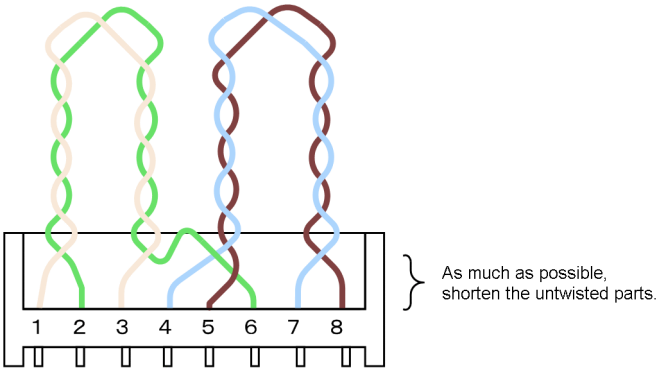
1. Create two 6-to-7-cm long twisted pair cables before you start the procedure.

Figure 6-4: Twisted pair cable



2. As shown in the following figure, insert the cables into the connector and crimp them by using a crimping tool.

Figure 6-5: 10BASE-T/100BASE-TX/1000BASE-T loop connector specification

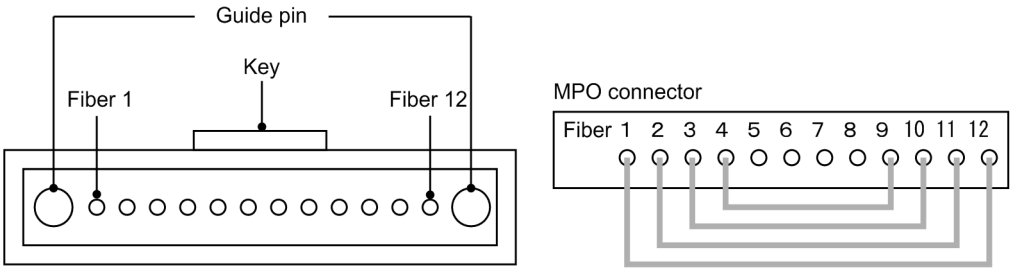


Note that the 1000BASE-T loop connector above is only supported for loop operation for the Switch. (Loop operation by the 1000BASE-T connector is a non-standard, proprietary action.)

(3) 40GBASE-SR4 loop connector

Use a loop connector as specified below.

Figure 6-6: 40GBASE-SR4 loop connector specification



Chapter 7. Device Restart

This chapter mainly describes how to restart the device.

7.1 Restarting the device

7.1 Restarting the device

7.1.1 Device restart

You can use the `reload` command to restart the device. Log data is stored when the device restarts.

For details on the syntax and parameters of the command, see the manual *Operation Command Reference*.

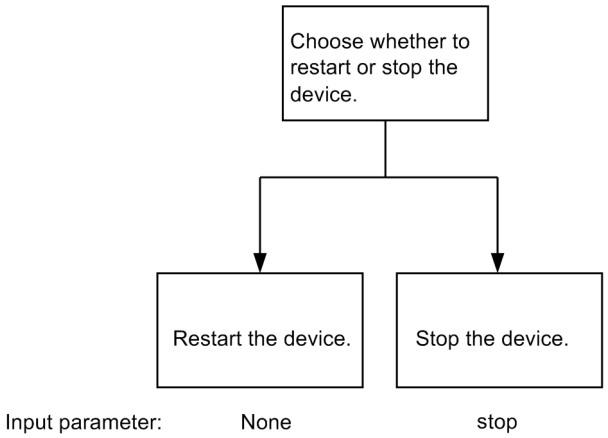
AX6700S, AX6600S, and AX6300S series switches

As an example, the following steps describe how to select parameters for the `reload` command. In this example, you choose to *restart the standby system* and capture the CPU memory dump of the BCU, CSU, or MSU by interacting with the confirmation messages.

Step1

Choose whether you want to restart or stop the device.

Figure 7-1: Selecting to restart or stop the device

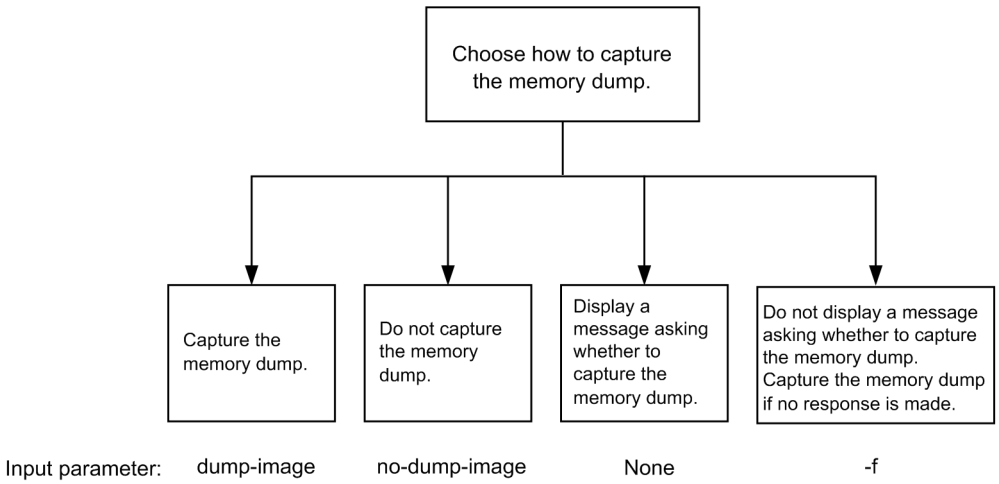


In step 1, you choose to restart the standby system. According to the figure above, you do not use any parameters.

Step2

In this step, choose whether you capture the dump.

Figure 7-2: Selection of the CPU memory dump type

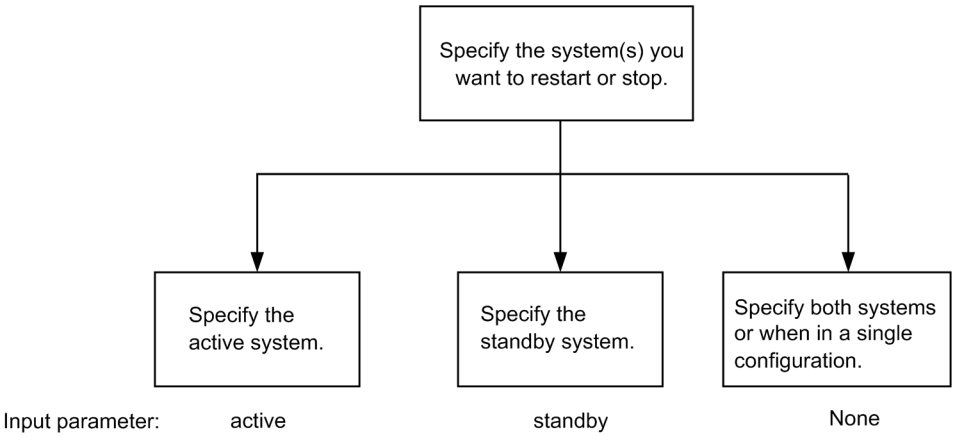


In step 2, you will be asked whether you want to capture the CPU memory dump. According to the figure above, you do not use any parameters.

Step3

In the last step, specify the system you want to restart or stop.

Figure 7-3: Selection of the system or systems to be stopped

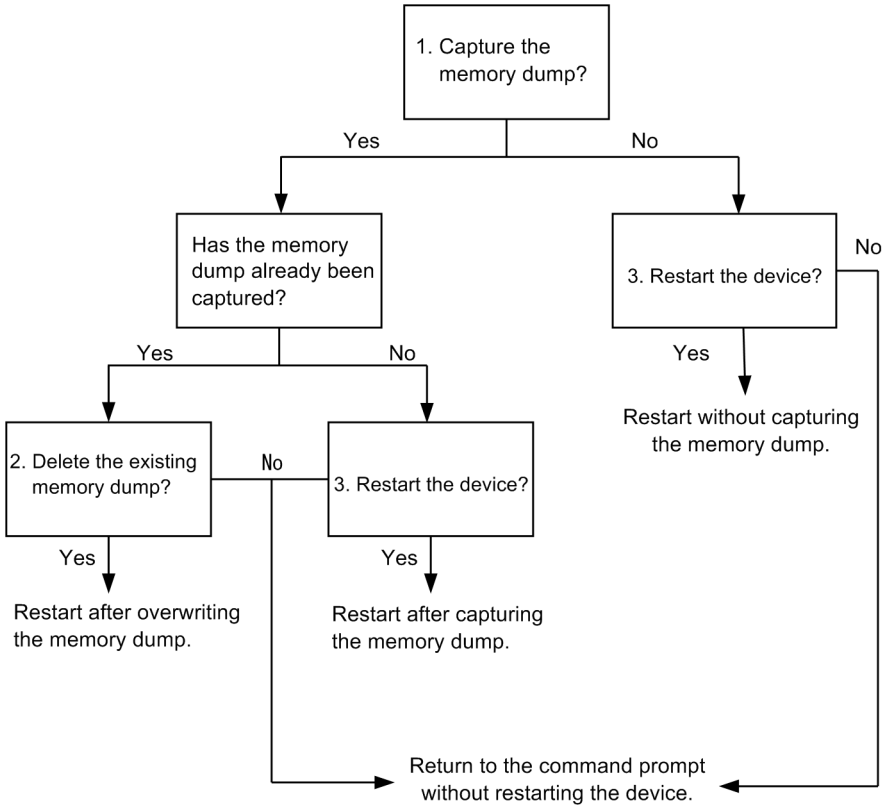


In step 3, you choose to restart the standby system. According to the figure above, the `standby` parameter is used. Combining the parameters selected in steps 1 through 3 results in the command `reload standby`. When you enter this command, the dump capture confirmation messages are displayed as follows:

1. `Dump information extracted?(y/n):_`
2. `standby :old dump file(rmdump 06/21 18:32) delete OK? (y/n): _`
3. `Restart OK? (y/n): _`

The numbers in the flow chart below correspond to each numbered message above, indicating when each message is displayed.

Figure 7-4: Confirmation messages for CPU memory dump capturing



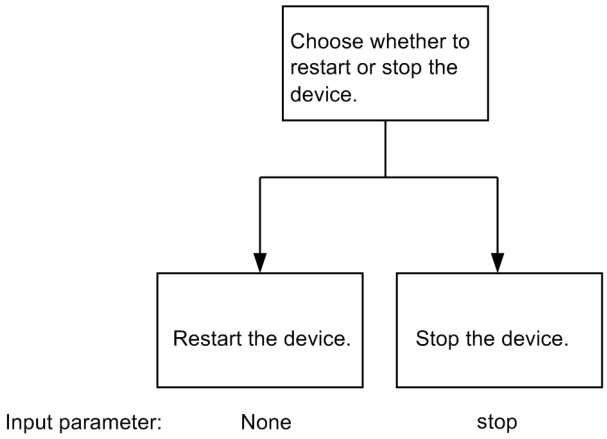
AX3800S, AX3600S, and AX2400S series switches

As an example, the following steps describe how to select parameters for the `reload` command. In this example, you choose to *restart the device* and capture the CPU memory dump by interacting with the confirmation messages.

Step1

Choose whether you want to restart or stop the device.

Figure 7-5: Selecting to restart or stop the device

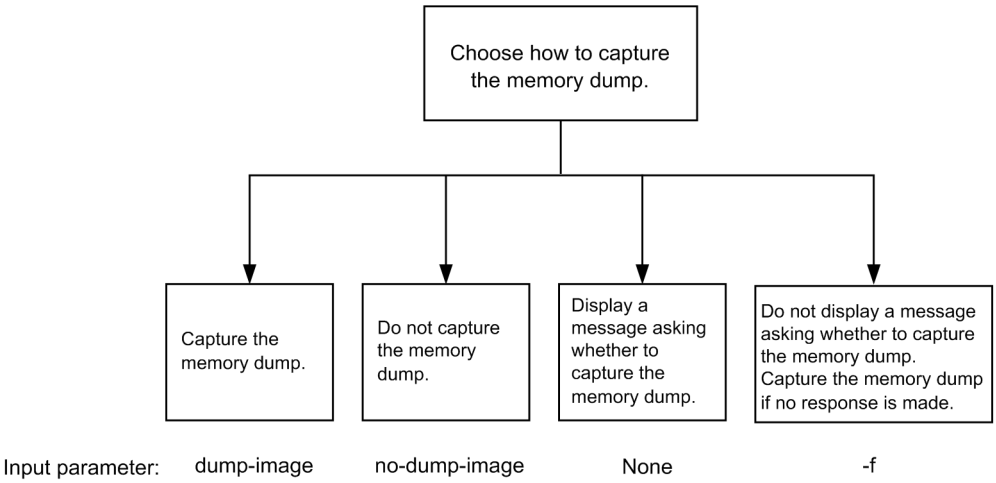


In step 1, you restart the device. So according to the figure above, you do not use any parameters.

Step2

In this step, choose whether you capture the dump.

Figure 7-6: Selection of the CPU memory dump type



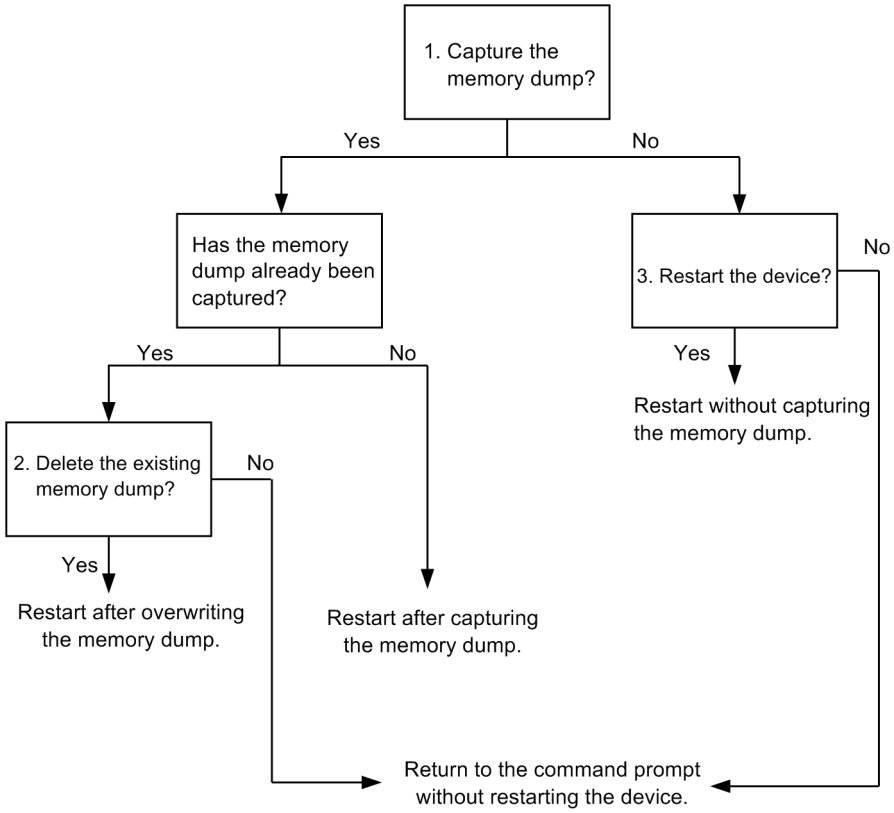
In step 2, you will be asked whether you want to capture the CPU memory dump. According to the figure above, you do not use any parameters.

Combining the parameters selected in steps 1 and 2 results in the command `reload`. When you enter this command, the dump capture confirmation messages are displayed as follows:

1. `Dump information extracted?(y/n):_`
2. `old dump file(rmdump 01/01 00:00) delete OK? (y/n):_`
3. `Restart OK? (y/n):_`

The numbers in the flow chart below correspond to each numbered message above, indicating when each message is displayed.

Figure 7-7: Confirmation messages for CPU memory dump capturing



Appendix

A. Detailed Display Contents of the "show tech-support" Command

A. Detailed Display Contents of the "show tech-support" Command

A.1 Detailed display contents of the "show tech-support" command

The following tables list descriptions of the content that is displayed when protocol parameters are used with the `show tech-support` command.

For details on the displayed information, see the manual *Operation Command Reference*.

Note

The manual *Operation Command Reference* does not cover part of the information displayed by the `show tech-support` command. Such information is not disclosed to the public because it contains internal information of the device.

Note that some information might not appear depending on the software version.

(1) AX6700S, AX6600S, and AX6300S series switches

The following table lists the commands, the information that they display, and parameter information for AX6700S, AX6600S, and AX6300S series switches.

Table A-1: Command details (AX6700S, AX6600S, and AX6300S series switches)

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
1	`show version`	Software version and hardware information of the Switch	Y	Y	Y	Y
2	`show license`	Optional license information	Y	Y	Y	Y
3	`show system`	Operating status of the device	Y	Y	Y	Y
4	`show environment`	Fan/power supply unit/operating time information	Y	Y	Y	Y
5	`show process cpu`	CPU usage of processes	Y	Y	Y	Y
6	`show process memory`	Memory usage of processes	Y	Y	Y	Y
7	`show cpu days hours minutes seconds`	CPU utilization	Y	Y	Y	Y
8	`show memory summary`	Memory usage of the device	Y	Y	Y	Y
9	`/sbin/dmesg`	Kernel event information	Y	Y	Y	Y
10	`cat /var/run/dmesg.boot`	Kernel event information (for Version 10.5 and later)	Y	Y	Y	Y
11	`cat /var/log/messages`	Internal information of the kernel and daemons	Y	Y	Y	Y
12	`cat /standby/var/run/dmesg.boot`	Kernel event information (for Version 10.5 and later)	Y	Y	Y	Y
13	`cat /standby/var/log/messages`	Internal information of the kernel and daemons (for Version 10.5 and later)	Y	Y	Y	Y
14	`/usr/local/diag/statShow`	Kernel internal statistics	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
15	/usr/local/diag/pk_tmrd	Operating time information (for Version 11.2 and later)	Y	Y	Y	Y
16	fstat	File descriptor information	Y	Y	Y	Y
17	/usr/local/diag/rtsystat	Internal device-related information	Y	Y	Y	Y
18	/usr/local/diag/rtastat	Path distribution-related information	Y	Y	Y	Y
19	show netstat all-protocol-address numeric	Layer 4-related statistics	Y	Y	Y	Y
20	show netstat statistics	Layer 3-related statistics	Y	Y	Y	Y
21	show dumpfile	Information on captured dump files	Y	Y	Y	Y
22	ls -lTiR /dump0	Dump file information	Y	Y	Y	Y
23	ls -lTiR /usr/var/hardware	Hardware dump file information (for Version 10.5 and later)	Y	Y	Y	Y
24	ls -lTiR /usr/var/core	core file information	Y	Y	Y	Y
25	ls -lTiR /config	config file information	Y	Y	Y	Y
26	ls -lTiR /standby/dump0	Dump file information	Y	Y	Y	Y
27	ls -lTiR /standby/usr/var/hardware	Hardware dump file information (for Version 10.5 and later)	Y	Y	Y	Y
28	ls -lTiR /standby/usr/var/core	core file information	Y	Y	Y	Y
29	ls -lTiR /standby/config	config file information	Y	Y	Y	Y
30	ls -lTiR /var	Memory file system information	Y	Y	Y	Y
31	df -ik	Partition information	Y	Y	Y	Y
32	du -Pk /	File system usage	Y	Y	Y	Y
33	show logging	Chronological log information for the active system	Y	Y	Y	Y
34	show logging reference	Reference log information for the active system	Y	Y	Y	Y
35	show logging standby	Chronological log information for the standby system	Y	Y	Y	Y
36	show logging reference standby	Reference log information for the standby system	Y	Y	Y	Y
37	show ntp associations	Operating information of the NTP server	Y	Y	Y	Y
38	/usr/bin/w -n	Login-related information	Y	Y	Y	Y
39	show session	Login session information	Y	Y	Y	Y
40	/usr/sbin/pstat -t	Terminal information	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
41	`stty -a -f /dev/tty00`	Console terminal information	Y	Y	Y	Y
42	`cat /var/log/clitrace1`	CLI trace information 1	Y	Y	Y	Y
43	`cat /var/log/clitrace2`	CLI trace information 2	Y	Y	Y	Y
44	`cat /var/log/mmitrace`	Operation command trace information (for Version 10.5 and later)	Y	Y	Y	Y
45	`cat /var/log/kern.log`	Internal trace information of the kernel	Y	Y	Y	Y
46	`cat /var/log/daemon.log`	Daemon-related internal trace information	Y	Y	Y	Y
47	`cat /var/log/fixsb.log`	Internal trace information of the kernel (for Version 10.5 and later)	Y	Y	Y	Y
48	`cat /standby/var/log/ kern.log`	Internal trace information of the kernel (for Version 10.5 and later)	Y	Y	Y	Y
49	`cat /standby/var/log/ daemon.log`	Daemon-related internal trace information (for Version 10.5 and later)	Y	Y	Y	Y
50	`cat /standby/var/log/ fixsb.log`	Internal trace information of the kernel (for Version 10.5 and later)	Y	Y	Y	Y
51	`cat /usr/var/pplog/ ppupdate.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
52	`cat /usr/var/pplog/ ppupdate2.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
53	`cat /standby/usr/var/pplog/ ppupdate.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
54	`cat /standby/usr/var/pplog/ ppupdate2.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
55	`tail -n 30 /var/log/authlog`	Authentication trace information	Y	Y	Y	Y
56	`tail -n 30 /var/log/xferlog`	FTP trace information	Y	Y	Y	Y
57	`cat /var/log/ssh.log`	SSH log information	Y	Y	Y	Y
58	`show accounting`	Accounting information	Y	Y	Y	Y
59	`cat /var/tmp/gen/trace/ mng.trc`	Configuration command trace information 1	Y	Y	Y	Y
60	`tail -n 20 /var/tmp/gen/ trace/api.trc`	Configuration command trace information 2 (for versions earlier than Version 10.7)	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
61	`cat /var/tmp/gen/trace/mng_sub.trc`	Configuration command trace information 3 (for Version 10.7 and later)	Y	Y	Y	Y
62	`tail -n 400 /var/tmp/gen/trace/api.trc`	Configuration command trace information 4 (for Version 10.7 and later)	Y	Y	Y	Y
63	`tail -n 400 /var/tmp/gen/trace/ctl.trc`	Configuration command trace information 5 (for Version 10.7 and later)	Y	Y	Y	Y
64	`show netstat interface`	Kernel interface information	Y	Y	Y	Y
65	`show vlan list`	VLAN information list	Y	Y	Y	Y
66	`show port`	Port information	Y	Y	Y	Y
67	`show port statistics`	Port statistics	Y	Y	Y	Y
68	`show port protocol`	Protocol information for ports	Y	Y	Y	Y
69	`show port transceiver debug`	Transceiver details for ports	Y	Y	Y	Y
70	`show interfaces nif XXX_NIF line XXX_LINE debug`	Detailed statistics for ports	Y	Y	Y	Y
71	`show running-config`	Configuration for operation	Y	Y	Y	Y
72	`show channel-group detail`	Link aggregation details	Y	Y	Y	Y
73	`show spanning-tree detail`	Spanning tree details	Y	Y	Y	Y
74	`show gsrp all`	Details for all GSRPs	Y	Y	Y	Y
75	`show axrp detail`	Ring Protocol details	Y	Y	Y	Y
76	`show efmoam detail`	IEEE 802.3ah/OAM functionality configuration information and port status	Y	Y	Y	Y
77	`show efmoam statistics`	IEEE 802.3ah/OAM functionality statistics	Y	Y	Y	Y
78	`show lldp detail`	Neighboring device information for the LLDP functionality	Y	Y	Y	Y
79	`show oadp detail`	Neighboring device information for the OADP functionality	Y	Y	Y	Y
80	`show loop-detection`	Information on L2 loop detection (for Version 10.7 and later)	N	N	N	Y
81	`show loop-detection statistics`	Statistics on L2 loop detection (for Version 10.7 and later)	N	N	N	Y
82	`show loop-detection logging`	Log information for L2 loop detection (for Version 10.7 and later)	N	N	N	Y
83	`show channel-group statistics`	Link aggregation statistics	N	N	N	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
84	`show channel-group statistics lacp`	LACP statistics for link aggregation		N	N	N	Y
85	`show spanning-tree statistics`	Spanning tree statistics		N	N	N	Y
86	`show vlan detail`	VLAN details		N	Y	Y	Y
87	`show vlan mac-vlan`	MAC VLAN information		N	N	N	Y
88	`show qos queueing`	Statistics on all queues	For versions prior to Version 10.6	N	Y	Y	Y
			For Version 10.6 and later	Y	Y	Y	Y
89	`show shaper`	Statistics on the hierarchical shaper functionality (for Version 10.7.A and later)		Y	Y	Y	Y
90	`show ip cache policy`	Status display of policy-based routing (for Version 11.7 and later)		Y	Y	Y	Y
91	`show cache policy-switch`	Status display of policy-based switching (for Version 11.7 and later)		Y	Y	Y	Y
92	`policy tool tech`	Internal trace of the policy-based program (for Version 11.7 and later)		Y	Y	Y	Y
93	`show access-filter`	Statistics on filtering		N	Y	Y	Y
94	`show access-log`	Access list logging statistics		N	Y	Y	Y
95	`access-log trace`	Internal trace for the access list logging program		N	Y	Y	Y
96	`cat /var/log/acllogd.log`	Log information for the access list logging program		N	Y	Y	Y
97	`show qos-flow`	QoS control function statistics		N	Y	Y	Y
98	`show lldp statistics`	LLDP functionality statistics		N	N	N	Y
99	`show oadp statistics`	OADP functionality statistics		N	N	N	Y
100	`show mac-address-table`	mac-address-table information		N	Y	Y	Y
101	`show fense server detail`	FENSE server information for the VAA function		N	N	N	Y
102	`show fense statistics`	VAA function statistics		N	N	N	Y
103	`show fense logging`	Operation log information for the VAA function		N	N	N	Y
104	`show dot1x logging`	Operation log messages logged for IEEE 802.1X authentication		N	N	N	Y
105	`show dot1x statistics`	Statistics on IEEE 802.1X authentication		N	N	N	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
106	`show dot1x detail`	Authentication status information on IEEE 802.X authentication	N	N	N	Y
107	`show igmp-snooping`	IGMP snooping information	N	N	N	Y
108	`show igmp-snooping group`	IGMP snooping group information	N	N	N	Y
109	`show igmp-snooping statistics`	IGMP snooping statistics	N	N	N	Y
110	`show mld-snooping`	MLD snooping information	N	N	N	Y
111	`show mld-snooping group`	MLD snooping group information	N	N	N	Y
112	`show mld-snooping statistics`	MLD snooping statistics	N	N	N	Y
113	`show netstat routing-table numeric`	Route-related information in the kernel (unicast)	N	Y	Y	N
114	`show netstat multicast numeric`	Route-related information in the kernel (multicast)	N	Y	Y	N
115	`show ip multicast statistics`	IPv4 multicast statistics (for Version 10.5 and later)	N	N	Y	N
116	`show ipv6 multicast statistics`	IPv6 multicast statistics (for Version 10.5 and later)	N	N	Y	N
117	`show ip multicast resources`	Number of entries used for IPv4 multicast routing (for Version 11.2 and later)	N	N	Y	N
118	`show ip igmp interface`	Information on interfaces with IGMP enabled	N	N	Y	N
119	`show ip igmp group`	Information on groups managed by IGMP	N	N	Y	N
120	`show ip pim interface (detail)`	Information on interfaces with IPv4 PIM enabled	N	N	Y	N
121	`show ip pim neighbor (detail)`	IPv4 PIM neighbor information	N	N	Y	N
122	`show ip pim bsr`	IPv4 PIM BSR information	N	N	Y	N
123	`show ip pim rp-mapping`	IPv4 PIM rendezvous point information	N	N	Y	N
124	`show ip mroute`	IPv4 multicast routing information	N	N	Y	N
125	`show ip mcache`	IPv4 multicast forwarding entries	N	N	Y	N
126	`show ipv6 multicast resources`	Number of entries used for IPv6 multicast routing (for Version 11.4 and later)	N	N	Y	N
127	`show ipv6 mld interface`	Information on interfaces with MLD enabled	N	N	Y	N
128	`show ipv6 mld group`	Information on groups managed by MLD	N	N	Y	N

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
129	`show ipv6 pim interface (detail)`	Information on interfaces with IPv6 PIM enabled	N	N	Y	N
130	`show ipv6 pim neighbor (detail)`	IPv6 PIM neighbor information	N	N	Y	N
131	`show ipv6 pim bsr`	IPv6 PIM BSR information	N	N	Y	N
132	`show ipv6 pim rp-mapping`	IPv6 PIM rendezvous point information	N	N	Y	N
133	`show ipv6 mroute`	IPv6 multicast routing information	N	N	Y	N
134	`show ipv6 mcache`	IPv6 multicast forwarding entries	N	N	Y	N
135	`show vrrpstatus detail statistics`	VRRP virtual router status and statistics	N	Y	N	N
136	`show vrrpstatus group`	Grouping information on VRRP virtual routers (for Version 11.0 and later)	N	Y	N	N
137	`show vrrpstatus vrrp-vlan`	VRRP-managed VLAN information (for Version 11.0 and later)	N	Y	N	N
138	`show track detail`	VRRP fault-monitoring interface information	N	Y	N	N
139	`show ip interface ipv4-unicast`	Interface information on the Switch recognized by the unicast routing program	N	Y	N	N
140	`show processes memory unicast`	Available memory amount and memory usage for the unicast routing program	N	Y	N	N
141	`show processes cpu minutes unicast`	CPU usage for the unicast routing program	N	Y	N	N
142	`show dhcp giaddr all`	Destination IP address information for DHCP packets sent from a DHCP relay agent	N	Y	N	N
143	`show dhcp traffic`	DHCP relay agent statistics	N	Y	N	N
144	`show ip dhcp server statistics`	DHCP server statistics	N	Y	N	N
145	`show ip dhcp conflict`	Information on conflicted IP addresses detected by a DHCP server	N	Y	N	N
146	`show ipv6 dhcp server statistics`	IPv6 DHCP server statistics	N	Y	N	N
147	`show ipv6 dhcp traffic`	IPv6 DHCP relay statistics (for Version 11.4 and later)	N	Y	N	N
148	`show ip dhcp snooping statistics`	DHCP snooping statistics (for Version 11.4 and later)	Y	Y	Y	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
149	`show ip arp inspection statistics`	Dynamic ARP inspection statistics (for Version 11.4 and later)		Y	Y	Y	Y
150	`show ip dhcp snooping logging info`	DHCP snooping log information (for Version 11.4 and later)		N	N	N	Y
151	`dhsn debug`	DHCP snooping event information (for Version 11.4 and later)		N	N	N	Y
152	`show ip route summary`	Number of active and inactive routes maintained by routing protocols	For versions prior to Version 10.6	N	Y	N	N
			For Version 10.6 and later	Y	Y	Y	Y
153	`show ip rip statistics`	RIP statistics		N	Y	N	N
154	`show ip rip advertised-routes summary`	Number of routes advertised by RIP		N	Y	N	N
155	`show ip rip received-routes summary`	Number of routes learned by RIP		N	Y	N	N
156	`show ip ospf`	OSPF global information		N	Y	N	N
157	`show ip ospf discard-packets`	Information on packets discarded by OSPF		N	Y	N	N
158	`show ip ospf statistics`	Statistics on sent/received packets collected by OSPF		N	Y	N	N
159	`show ip ospf neighbor detail`	OSPF neighboring router details		N	Y	N	N
160	`show ip ospf virtual-links detail`	OSPF virtual link details		N	Y	N	N
161	`show ip ospf database database-summary`	Number of LSAs for each OSPF LS type		N	Y	N	N
162	`show ip bgp neighbor detail`	BGP4 peering information		N	Y	N	N
163	`show ip bgp notification-factor`	Messages that caused the disconnection of BGP4 connections		N	Y	N	N
164	`show ip bgp received-routes summary`	Number of routes received from BGP4 peers		N	Y	N	N
165	`show ip bgp advertised-routes summary`	Number of routes advertised to BGP4 peers		N	Y	N	N
166	`show ip vrf all`	Number of routes learned for each VRF	For Version 11.0 and later and prior to Version 11.2	N	Y	N	N
			For Version 11.2 and later	Y	Y	Y	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
167	`show graceful-restart unicast`	Operating status of restart routers that perform graceful restarts in the unicast routing protocol (for Version 10.3 and later)		N	Y	N	N
168	`show ipv6 interface ipv6-unicast`	Interface information on the Switch recognized by the unicast routing program		N	Y	N	N
169	`show ipv6 route summary`	Number of active and inactive routes maintained by the unicast routing program	For versions prior to Version 10.6	N	Y	N	N
			For Version 10.6 and later	Y	Y	Y	Y
170	`show ipv6 rip advertised-routes summary`	Number of routes advertised by RIPng		N	Y	N	N
171	`show ipv6 rip received-routes summary`	Number of routes learned by RIPng		N	Y	N	N
172	`show ipv6 rip statistics`	RIPng statistics		N	Y	N	N
173	`show ipv6 ospf`	OSPFv3 global information		N	Y	N	N
174	`show ipv6 ospf discard-packets`	Information on packets discarded by OSPFv3		N	Y	N	N
175	`show ipv6 ospf statistics`	Statistics on packets collected by OSPFv3		N	Y	N	N
176	`show ipv6 ospf neighbor detail`	OSPFv3 neighboring router status		N	Y	N	N
177	`show ipv6 ospf virtual-links detail`	OSPFv3 virtual link information		N	Y	N	N
178	`show ipv6 ospf database database-summary`	Number of LS-Databases for OSPFv3		N	Y	N	N
179	`show ipv6 bgp neighbor detail`	BGP4+ peering information		N	Y	N	N
180	`show ipv6 bgp notification-factor`	Packets that caused the disconnection of BGP4+ connections		N	Y	N	N
181	`show ipv6 bgp received-routes summary`	Number of routes received from BGP4+ peers		N	Y	N	N
182	`show ipv6 bgp advertised-routes summary`	Number of routes advertised to BGP4+ peers		N	Y	N	N
183	`show ipv6 vrf all`	Number of routes learned for various VRFs (for Version 11.2 and later)		Y	Y	Y	Y
184	`show web-authentication user edit`	Display of registrations and changes in the internal Web authentication DB (for Version 10.3 and later)		N	N	N	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
185	`show web-authentication user commit`	Display of entries registered in the internal Web authentication DB (for Version 10.3 and later)	N	N	N	Y
186	`show web-authentication statistics`	Display of Web authentication statistics (for Version 10.3 and later)	N	N	N	Y
187	`show web-authentication login`	Display of authenticated-user information (account information) (for Version 10.3 and later)	N	N	N	Y
188	`show web-authentication logging`	Display of operation logs for Web authentication (for Version 10.3 and later)	N	N	N	Y
189	`show sflow detail`	Display of sFlow statistics (details) (for Version 10.3 and later)	Y	Y	Y	Y
190	`show mac-authentication`	Display of MAC-based authentication settings (for Version 10.6 and later)	N	N	N	Y
191	`show mac-authentication statistics`	Display of MAC-based authentication statistics (for Version 10.6 and later)	N	N	N	Y
192	`show mac-authentication mac-address edit`	Display of registrations and changes in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
193	`show mac-authentication mac-address commit`	Display of entries registered in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
194	`show mac-authentication login`	Display of authenticated-user information (account information) (for Version 10.6 and later)	N	N	N	Y
195	`show mac-authentication logging`	Display of operation logs for MAC-based authentication (for Version 10.6 and later)	N	N	N	Y
196	`show power-control schedule`	Schedule information of power saving functionality (for Version 11.1 and later)	Y	Y	Y	Y
197	`show redundancy nif-group`	Group information for redundant NIF configurations (for Version 11.4 and later)	Y	Y	Y	Y
198	`show engine-traffic statistics detail days`	Average bandwidth used by packet-transfer buses (daily) (for Version 11.4 and later)	Y	Y	Y	Y
199	`show engine-traffic statistics detail hours`	Average bandwidth used by packet-transfer buses (per hour) (for Version 11.4 and later)	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
200	`show engine-traffic statistics detail minutes`	Average bandwidth used by packet-transfer buses (per minute) (for Version 11.4 and later)	Y	Y	Y	Y
201	`pktbusdisp`	For AX6700S series switches, the display of the combination of packet-transfer buses and port numbers (for Version 10.7 and later)	Y	Y	Y	Y
202	`nifhdcinfo`	NIF HDC information (for Version 10.7 and later)	Y	Y	Y	Y
203	`devstatus`	Display of detailed status of the device (for Version 11.1 and later)	Y	Y	Y	Y
204	`show environment temperature-logging`	Temperature history information (for Version 11.4.E and later)	Y	Y	Y	Y
205	`show track-object detail`	Detailed information of tracking functionality for policy-based routing (for Version 11.7 and later)	Y	Y	Y	Y
206	`/usr/local/bin/trackobj -t | tail -n 1024`	Trace information of tracking functionality for policy-based routing (for Version 11.7 and later)	Y	Y	Y	Y

Legend Y: Displayed; N: Not displayed

Note: Parentheses in the Command (displayed) column indicate that information specified by the parameter in the parentheses is displayed depending on the software version.

(2) AX3800S and AX3600S series switches

The following table lists the commands, the information that they display, and parameter information for AX3800S and AX3600S series switches.

Table A-2: Command details (AX3800S and AX3600S series switches)

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
1	`show version`	Software version and hardware information of the Switch	Y	Y	Y	Y
2	`show license`	Optional license information	Y	Y	Y	Y
3	`show system`	Operating status of the device	Y	Y	Y	Y
4	`show environment`	Fan/power supply unit/operating time information	Y	Y	Y	Y
5	`show process cpu`	CPU usage of processes	Y	Y	Y	Y
6	`show process memory`	Memory usage of processes	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
7	`show cpu days hours minutes seconds`	CPU utilization	Y	Y	Y	Y
8	`show memory summary`	Memory usage of the device	Y	Y	Y	Y
9	`/sbin/dmesg`	Kernel event information	Y	Y	Y	Y
10	`cat /var/run/dmesg.boot`	Kernel event information (for Version 10.5 and later)	Y	Y	Y	Y
11	`cat /var/log/messages`	Internal information of the kernel and daemons	Y	Y	Y	Y
12	`/usr/local/diag/statShow`	Kernel internal statistics	Y	Y	Y	Y
13	`/usr/local/diag/pk_tmrd`	Operating time information (for Version 11.2 and later)	Y	Y	Y	Y
14	`fstat`	File descriptor information	Y	Y	Y	Y
15	`/usr/local/diag/rtsystat`	Internal device-related information	Y	Y	Y	Y
16	`/usr/local/diag/rtastat`	Path distribution-related information	Y	Y	Y	Y
17	`show netstat all-protocol-address numeric`	Layer 4-related statistics	Y	Y	Y	Y
18	`show netstat statistics`	Layer 3-related statistics	Y	Y	Y	Y
19	`show dumpfile`	Information on captured dump files	Y	Y	Y	Y
20	`ls -lTiR /dump0`	Dump file information	Y	Y	Y	Y
21	`ls -lTiR /usr/var/hardware`	Hardware dump file information (for Version 10.5 and later)	Y	Y	Y	Y
22	`ls -lTiR /usr/var/core`	`core` file information	Y	Y	Y	Y
23	`ls -lTiR /config`	`config` file information	Y	Y	Y	Y
24	`ls -lTiR /var`	Memory file system information (for Version 10.1.A and later)	Y	Y	Y	Y
25	`df -ik`	Partition information	Y	Y	Y	Y
26	`du -Pk /`	File system usage	Y	Y	Y	Y
27	`show logging`	Chronological log information for the active system	Y	Y	Y	Y
28	`show logging reference`	Reference log information for the active system	Y	Y	Y	Y
29	`show ntp associations`	Operating information of the NTP server	Y	Y	Y	Y
30	`/usr/bin/w -n`	Login-related information	Y	Y	Y	Y
31	`last -30`	Login history (for versions earlier than Version 10.1.A)	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
32	`show session`	Login session information	Y	Y	Y	Y
33	`/usr/sbin/pstat -t`	Terminal information	Y	Y	Y	Y
34	`stty -a -f /dev/tty00`	Console terminal information	Y	Y	Y	Y
35	`ls -lTiR /var/tmp/mmi*`	CLI information file list (for versions earlier than Version 10.1.A)	Y	Y	Y	Y
36	`cat /var/log/clitrace1`	CLI trace information 1	Y	Y	Y	Y
37	`cat /var/log/clitrace2`	CLI trace information 2	Y	Y	Y	Y
38	`cat /var/log/mmitrace`	Operation command trace information (for Version 10.5 and later)	Y	Y	Y	Y
39	`cat /var/log/kern.log`	Internal trace information of the kernel	Y	Y	Y	Y
40	`cat /var/log/daemon.log`	Daemon-related internal trace information	Y	Y	Y	Y
41	`cat /var/log/fixsb.log`	Internal trace information of the kernel (for Version 10.5 and later)	Y	Y	Y	Y
42	`cat /usr/var/pplog/ ppupdate.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
43	`cat /usr/var/pplog/ ppupdate2.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
44	`tail -n 30 /var/log/authlog`	Authentication trace information	Y	Y	Y	Y
45	`tail -n 30 /var/log/xferlog`	FTP trace information	Y	Y	Y	Y
46	`cat /var/log/ssh.log`	SSH log information	Y	Y	Y	Y
47	`show accounting`	Accounting information	Y	Y	Y	Y
48	`cat /var/tmp/gen/trace/ mng.trc`	Configuration command trace information 1	Y	Y	Y	Y
49	`tail -n 20 /var/tmp/gen/ trace/api.trc`	Configuration command trace information 2 (for versions earlier than Version 10.7)	Y	Y	Y	Y
50	`cat /var/tmp/gen/trace/ mng_sub.trc`	Configuration command trace information 3 (for Version 10.7 and later)	Y	Y	Y	Y
51	`tail -n 400 /var/tmp/gen/ trace/api.trc`	Configuration command trace information 4 (for Version 10.7 and later)	Y	Y	Y	Y
52	`tail -n 400 /var/tmp/gen/ trace/ctl.trc`	Configuration command trace information 5 (for Version 10.7 and later)	Y	Y	Y	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
53	`show netstat interface`	Kernel interface information		Y	Y	Y	Y
54	`show vlan list`	VLAN information list		Y	Y	Y	Y
55	`show port`	Port information		Y	Y	Y	Y
56	`show port statistics`	Port statistics		Y	Y	Y	Y
57	`show port protocol`	Protocol information for ports		Y	Y	Y	Y
58	`show port transceiver debug`	Transceiver details for ports		Y	Y	Y	Y
59	`show interfaces nif XXX_NIF line XXX_LINE debug`	Detailed statistics for ports		Y	Y	Y	Y
60	`show power inline`	PoE information		Y	Y	Y	Y
61	`show switch detail`	Detailed information of stacks (for AX3800S Version 11.10 and later, or AX3650S Version 11.8 and later)		Y	Y	Y	Y
62	`show running-config`	Configuration for operation		Y	Y	Y	Y
63	`show channel-group detail`	Link aggregation details		Y	Y	Y	Y
64	`show spanning-tree detail`	Spanning tree details		Y	Y	Y	Y
65	`show gsrp all`	Details for all GSRPs		Y	Y	Y	Y
66	`show axrp detail`	Ring Protocol details		Y	Y	Y	Y
67	`show switchport-backup`	Uplink redundancy information	For Version 11.2 and later and earlier than Version 11.4	N	N	N	Y
			For Version 11.4 and later	N	N	N	N
68	`show switchport-backup detail`	Uplink redundancy details (for Version 11.4 and later)		N	N	N	Y
69	`show switchport-backup statistics`	Uplink redundancy statistics (for Version 11.4 and later)		N	N	N	Y
70	`show efmoam detail`	IEEE 802.3ah/OAM functionality configuration information and port status		Y	Y	Y	Y
71	`show efmoam statistics`	IEEE 802.3ah/OAM functionality statistics		Y	Y	Y	Y
72	`show lldp detail`	Neighboring device information for the LLDP functionality		Y	Y	Y	Y
73	`show oadp detail`	Neighboring device information for the OADP functionality		Y	Y	Y	Y
74	`show loop-detection`	Information on L2 loop detection (for Version 10.7 and later)		N	N	N	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
75	`show loop-detection statistics`	Statistics on L2 loop detection (for Version 10.7 and later)		N	N	N	Y
76	`show loop-detection logging`	Log information for L2 loop detection (for Version 10.7 and later)		N	N	N	Y
77	`show channel-group statistics`	Link aggregation statistics		N	N	N	Y
78	`show channel-group statistics lacp`	LACP statistics for link aggregation		N	N	N	Y
79	`show spanning-tree statistics`	Spanning tree statistics		N	N	N	Y
80	`show vlan detail`	VLAN details		N	Y	Y	Y
81	`show vlan mac-vlan`	MAC VLAN information		N	N	N	Y
82	`show qos queueing`	Statistics on all queues	For versions prior to Version 10.6	N	Y	Y	Y
			For Version 10.6 and later	Y	Y	Y	Y
83	`show ip cache policy`	Status display of policy-based routing (For AX3800S Version 11.9 and later. Also for AX3650S and AX3640S Version 11.7 and later.)		Y	Y	Y	Y
84	`policy tool tech`	Internal trace of policy-based program (For AX3800S Version 11.9 and later. Also for AX3650S and AX3640S Version 11.7 and later.)		Y	Y	Y	Y
85	`show access-filter`	Statistics on filtering		N	Y	Y	Y
86	`show qos-flow`	QoS control function statistics		N	Y	Y	Y
87	`show lldp statistics`	LLDP functionality statistics		N	N	N	Y
88	`show oadp statistics`	OADP functionality statistics		N	N	N	Y
89	`show mac-address-table`	mac-address-table information		N	Y	Y	Y
90	`show fense server detail`	FENSE server information for the VAA function		N	N	N	Y
91	`show fense statistics`	VAA function statistics		N	N	N	Y
92	`show fense logging`	Operation log information for the VAA function		N	N	N	Y
93	`show dot1x logging`	Operation log messages logged for IEEE 802.1X authentication		N	N	N	Y
94	`show dot1x statistics`	Statistics on IEEE 802.1X authentication		N	N	N	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
95	`show dot1x detail`	Authentication status information on IEEE 802.X authentication	N	N	N	Y
96	`show igmp-snooping`	IGMP snooping information	N	N	N	Y
97	`show igmp-snooping group`	IGMP snooping group information	N	N	N	Y
98	`show igmp-snooping statistics`	IGMP snooping statistics	N	N	N	Y
99	`show mld-snooping`	MLD snooping information	N	N	N	Y
100	`show mld-snooping group`	MLD snooping group information	N	N	N	Y
101	`show mld-snooping statistics`	MLD snooping statistics	N	N	N	Y
102	`show netstat routing-table numeric`	Route-related information in the kernel (unicast)	N	Y	Y	N
103	`show netstat multicast numeric`	Route-related information in the kernel (multicast)	N	N	Y	N
104	`show ip multicast statistics`	IPv4 multicast statistics (for Version 10.5 and later)	N	N	Y	N
105	`show ipv6 multicast statistics`	IPv6 multicast statistics (for Version 10.5 and later)	N	N	Y	N
106	`show ip multicast resources`	Number of entries used for IPv4 multicast routing (for AX3800S series switches Version 11.6 and later or for AX3650S series switches Version 11.5 and later)	N	N	Y	N
107	`show ip igmp interface`	Information on interfaces with IGMP enabled	N	N	Y	N
108	`show ip igmp group`	Information on groups managed by IGMP	N	N	Y	N
109	`show ip pim interface (detail)`	Information on interfaces with IPv4 PIM enabled	N	N	Y	N
110	`show ip pim neighbor (detail)`	IPv4 PIM neighbor information	N	N	Y	N
111	`show ip pim bsr`	IPv4 PIM BSR information	N	N	Y	N
112	`show ip pim rp-mapping`	IPv4 PIM rendezvous point information	N	N	Y	N
113	`show ip mroute`	IPv4 multicast routing information	N	N	Y	N
114	`show ip mcache`	IPv4 multicast forwarding entries	N	N	Y	N
115	`show ipv6 multicast resources`	Number of entries used for IPv6 multicast routing (for AX3800S series switches Version 11.6 and later or for AX3650S series switches Version 11.5 and later)	N	N	Y	N

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
116	`show ipv6 mld interface`	Information on interfaces with MLD enabled	N	N	Y	N
117	`show ipv6 mld group`	Information on groups managed by MLD	N	N	Y	N
118	`show ipv6 pim interface (detail)`	Information on interfaces with IPv6 PIM enabled	N	N	Y	N
119	`show ipv6 pim neighbor (detail)`	IPv6 PIM neighbor information	N	N	Y	N
120	`show ipv6 pim bsr`	IPv6 PIM BSR information	N	N	Y	N
121	`show ipv6 pim rp-mapping`	IPv6 PIM rendezvous point information	N	N	Y	N
122	`show ipv6 mroute`	IPv6 multicast routing information	N	N	Y	N
123	`show ipv6 mcache`	IPv6 multicast forwarding entries	N	N	Y	N
124	`show vrrpstatus detail statistics`	VRRP virtual router status and statistics	N	Y	N	N
125	`show track detail`	VRRP fault-monitoring interface information	N	Y	N	N
126	`show ip interface ipv4-unicast`	Interface information on the Switch recognized by the unicast routing program	N	Y	N	N
127	`show processes memory unicast`	Available memory amount and memory usage for the unicast routing program	N	Y	N	N
128	`show processes cpu minutes unicast`	CPU usage for the unicast routing program	N	Y	N	N
129	`show dhcp giaddr all`	Destination IP address information for DHCP packets sent from a DHCP relay agent	N	Y	N	N
130	`show dhcp traffic`	DHCP relay agent statistics	N	Y	N	N
131	`show ip dhcp server statistics`	DHCP server statistics	N	Y	N	N
132	`show ip dhcp conflict`	Information on conflicted IP addresses detected by a DHCP server	N	Y	N	N
133	`show ipv6 dhcp server statistics`	IPv6 DHCP server statistics	N	Y	N	N
134	`show ipv6 dhcp traffic`	IPv6 DHCP relay statistics (for Version 11.4 and later)	N	Y	N	N
135	`show ip dhcp snooping statistics`	DHCP snooping statistics (for Version 11.4 and later)	Y	Y	Y	Y
136	`show ip arp inspection statistics`	Dynamic ARP inspection statistics (for Version 11.4 and later)	Y	Y	Y	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
137	`show ip dhcp snooping logging info`	DHCP snooping log information (for Version 11.4 and later)		N	N	N	Y
138	`dhsn debug`	DHCP snooping event information (for Version 11.4 and later)		N	N	N	Y
139	`show ip route summary`	Number of active and inactive routes maintained by routing protocols	For versions prior to Version 10.6	N	Y	N	N
			For Version 10.6 and later	Y	Y	Y	Y
140	`show ip rip statistics`	RIP statistics		N	Y	N	N
141	`show ip rip advertised-routes summary`	Number of routes advertised by RIP		N	Y	N	N
142	`show ip rip received-routes summary`	Number of routes learned by RIP		N	Y	N	N
143	`show ip ospf`	OSPF global information		N	Y	N	N
144	`show ip ospf discard-packets`	Information on packets discarded by OSPF		N	Y	N	N
145	`show ip ospf statistics`	Statistics on sent/received packets collected by OSPF		N	Y	N	N
146	`show ip ospf neighbor detail`	OSPF neighboring router details		N	Y	N	N
147	`show ip ospf virtual-links detail`	OSPF virtual link details		N	Y	N	N
148	`show ip ospf database database-summary`	Number of LSAs for each OSPF LS type		N	Y	N	N
149	`show ip bgp neighbor detail`	BGP4 peering information		N	Y	N	N
150	`show ip bgp notification-factor`	Messages that caused the disconnection of BGP4 connections		N	Y	N	N
151	`show ip bgp received-routes summary`	Number of routes received from BGP4 peers		N	Y	N	N
152	`show ip bgp advertised-routes summary`	Number of routes advertised to BGP4 peers		N	Y	N	N
153	`show ip vrf all`	Number of routes learned for various VRFs (for AX3800S series switches Version 11.6 and later or for AX3650S series switches Version 11.5 and later)		Y	Y	Y	Y
154	`show ipv6 interface ipv6-unicast`	Interface information on the Switch recognized by the unicast routing program		N	Y	N	N

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
155	`show ipv6 route summary`	Number of active and inactive routes maintained by the unicast routing program	For versions prior to Version 10.6	N	Y	N	N
			For Version 10.6 and later	Y	Y	Y	Y
156	`show ipv6 rip advertised-routes summary`	Number of routes advertised by RIPng		N	Y	N	N
157	`show ipv6 rip received-routes summary`	Number of routes learned by RIPng		N	Y	N	N
158	`show ipv6 rip statistics`	RIPng statistics		N	Y	N	N
159	`show ipv6 ospf`	OSPFv3 global information		N	Y	N	N
160	`show ipv6 ospf discard-packets`	Information on packets discarded by OSPFv3		N	Y	N	N
161	`show ipv6 ospf statistics`	Statistics on packets collected by OSPFv3		N	Y	N	N
162	`show ipv6 ospf neighbor detail`	OSPFv3 neighboring router status		N	Y	N	N
163	`show ipv6 ospf virtual-links detail`	OSPFv3 virtual link information		N	Y	N	N
164	`show ipv6 ospf database database-summary`	Number of LS-Databases for OSPFv3		N	Y	N	N
165	`show ipv6 bgp neighbor detail`	BGP4+ peering information		N	Y	N	N
166	`show ipv6 bgp notification-factor`	Packets that caused the disconnection of BGP4+ connections		N	Y	N	N
167	`show ipv6 bgp received-routes summary`	Number of routes received from BGP4+ peers		N	Y	N	N
168	`show ipv6 bgp advertised-routes summary`	Number of routes advertised to BGP4+ peers		N	Y	N	N
169	`show ipv6 vrf all`	Number of routes learned for various VRFs (for AX3800S series switches Version 11.6 and later or for AX3650S series switches Version 11.5 and later)		Y	Y	Y	Y
170	`show web-authentication user edit`	Display of registrations and changes in the internal Web authentication DB (for Version 10.3 and later)		N	N	N	Y
171	`show web-authentication user commit`	Display of entries registered in the internal Web authentication DB (for Version 10.3 and later)		N	N	N	Y
172	`show web-authentication statistics`	Display of Web authentication statistics (for Version 10.3 and later)		N	N	N	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
173	`show web-authentication login`	Display of authenticated-user information (account information) (for Version 10.3 and later)	N	N	N	Y
174	`show web-authentication logging`	Display of operation logs for Web authentication (for Version 10.3 and later)	N	N	N	Y
175	`show sflow detail`	Display of sFlow statistics (details) (for Version 10.4 and later)	Y	Y	Y	Y
176	`port snd/rcv statistics`	Statistics on sent/received data on ports	Y	Y	Y	Y
177	`internal SW HW event statistics0`	Internal software event statistics 0 (for Version 10.5 and later)	Y	Y	Y	Y
178	`internal SW HW event statistics1`	Internal software event statistics 1 (for Version 10.5 and later)	Y	Y	Y	Y
179	`show mac-authentication`	Display of MAC-based authentication settings (for Version 10.6 and later)	N	N	N	Y
180	`show mac-authentication statistics`	Display of MAC-based authentication statistics (for Version 10.6 and later)	N	N	N	Y
181	`show mac-authentication mac-address edit`	Display of registrations and changes in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
182	`show mac-authentication mac-address commit`	Display of entries registered in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
183	`show mac-authentication login`	Display of authenticated-user information (account information) (for Version 10.6 and later)	N	N	N	Y
184	`show mac-authentication logging`	Display of operation logs for MAC-based authentication (for Version 10.6 and later)	N	N	N	Y
185	`show power-control schedule`	Schedule information of power saving functionality (for Version 11.4 and later)	Y	Y	Y	Y
186	`swdev logging`	Display of SW subunit logs (for Version 11.1.C and later)	Y	Y	Y	Y
187	`SW MMU statistics0`	SW subunit MMU statistics 0 (for AX3650S series switches Version 11.5 and later)	Y	Y	Y	Y
188	`show environment temperature-logging`	Temperature history information (for Version 11.5 and later)	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
189	`show track-object detail`	Detailed information of tracking functionality for policy-based routing (For AX3800S Version 11.9 and later. Also for AX3650S and AX3640S Version 11.7 and later.)	Y	Y	Y	Y
190	`/usr/local/bin/trackobj -t | tail -n 1024`	Trace information of tracking functionality for policy-based routing (For AX3800S Version 11.9 and later. Also for AX3650S and AX3640S Version 11.7 and later.)	Y	Y	Y	Y
191	`/usr/local/bin/fdbmerge_show -s`	Information of MAC address table synchronization functionality (For AX3800S Version 11.10 and later, or for AX3650S Version 11.8 and later.)	Y	Y	Y	Y
192	`/usr/local/bin/fdbmerge_show`	Information of MAC address table synchronization functionality (For AX3800S Version 11.10 and later, or for AX3650S Version 11.8 and later.)	N	N	N	Y

Legend Y: Displayed; N: Not displayed

Note: Parentheses in the Command (displayed) column indicate that information specified by the parameter in the parentheses is displayed depending on the software version.

(3) AX2400S series switches

The following table lists the commands, the information that they display, and parameter information for AX2400S series switches.

Table A-3: Command details (AX2400S series switches)

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
1	`show version`	Software version and hardware information of the Switch	Y	Y	Y	Y
2	`show license`	Optional license information	Y	Y	Y	Y
3	`show system`	Operating status of the device	Y	Y	Y	Y
4	`show environment`	Fan/power supply unit/operating time information	Y	Y	Y	Y
5	`show process cpu`	CPU usage of processes	Y	Y	Y	Y
6	`show process memory`	Memory usage of processes	Y	Y	Y	Y
7	`show cpu days hours minutes seconds`	CPU utilization	Y	Y	Y	Y
8	`show memory summary`	Memory usage of the device	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
9	/sbin/dmesg	Kernel event information	Y	Y	Y	Y
10	cat /var/run/dmesg.boot	Kernel event information (for Version 10.5 and later)	Y	Y	Y	Y
11	cat /var/log/messages	Internal information of the kernel and daemons	Y	Y	Y	Y
12	/usr/local/diag/statShow	Kernel internal statistics	Y	Y	Y	Y
13	/usr/local/diag/pk_tmrd	Operating time information (for Version 11.2 and later)	Y	Y	Y	Y
14	fstat	File descriptor information	Y	Y	Y	Y
15	/usr/local/diag/rtsystat	Internal device-related information	Y	Y	Y	Y
16	/usr/local/diag/rtastat	Path distribution-related information	Y	Y	Y	Y
17	show netstat all-protocol-address numeric	Layer 4-related statistics	Y	Y	Y	Y
18	show netstat statistics	Layer 3-related statistics	Y	Y	Y	Y
19	show dumpfile	Information on captured dump files	Y	Y	Y	Y
20	ls -lTiR /dump0	Dump file information	Y	Y	Y	Y
21	ls -lTiR /usr/var/hardware	Hardware dump file information (for Version 10.5 and later)	Y	Y	Y	Y
22	ls -lTiR /usr/var/core	core file information	Y	Y	Y	Y
23	ls -lTiR /config	config file information	Y	Y	Y	Y
24	ls -lTiR /var	Memory file system information (for Version 10.1.A and later)	Y	Y	Y	Y
25	df -ik	Partition information	Y	Y	Y	Y
26	du -Pk /	File system usage	Y	Y	Y	Y
27	show logging	Chronological log information for the active system	Y	Y	Y	Y
28	show logging reference	Reference log information for the active system	Y	Y	Y	Y
29	show ntp associations	Operating information of the NTP server	Y	Y	Y	Y
30	/usr/bin/w -n	Login-related information	Y	Y	Y	Y
31	last -30	Login history (for versions earlier than Version 10.1.A)	Y	Y	Y	Y
32	show session	Login session information	Y	Y	Y	Y
33	/usr/sbin/pstat -t	Terminal information	Y	Y	Y	Y
34	stty -a -f /dev/tty00	Console terminal information	Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
35	`ls -lTiR /var/tmp/mmi*`	CLI information file list (for versions earlier than Version 10.1.A)	Y	Y	Y	Y
36	`cat /var/log/clitrace1`	CLI trace information 1	Y	Y	Y	Y
37	`cat /var/log/clitrace2`	CLI trace information 2	Y	Y	Y	Y
38	`cat /var/log/mmitrace`	Operation command trace information (for Version 10.5 and later)	Y	Y	Y	Y
39	`cat /var/log/kern.log`	Internal trace information of the kernel	Y	Y	Y	Y
40	`cat /var/log/daemon.log`	Daemon-related internal trace information	Y	Y	Y	Y
41	`cat /var/log/fixsb.log`	Internal trace information of the kernel (for Version 10.5 and later)	Y	Y	Y	Y
42	`cat /usr/var/pplog/ ppupdate.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
43	`cat /usr/var/pplog/ ppupdate2.log`	Log information created when software is updated (for Version 11.1 and later)	Y	Y	Y	Y
44	`tail -n 30 /var/log/authlog`	Authentication trace information	Y	Y	Y	Y
45	`tail -n 30 /var/log/xferlog`	FTP trace information	Y	Y	Y	Y
46	`cat /var/log/ssh.log`	SSH log information	Y	Y	Y	Y
47	`show accounting`	Accounting information	Y	Y	Y	Y
48	`cat /var/tmp/gen/trace/ mng.trc`	Configuration command trace information 1	Y	Y	Y	Y
49	`tail -n 20 /var/tmp/gen/ trace/api.trc`	Configuration command trace information 2 (for versions earlier than Version 10.7)	Y	Y	Y	Y
50	`cat /var/tmp/gen/trace/ mng_sub.trc`	Configuration command trace information 3 (for Version 10.7 and later)	Y	Y	Y	Y
51	`tail -n 400 /var/tmp/gen/ trace/api.trc`	Configuration command trace information 4 (for Version 10.7 and later)	Y	Y	Y	Y
52	`tail -n 400 /var/tmp/gen/ trace/ctl.trc`	Configuration command trace information 5 (for Version 10.7 and later)	Y	Y	Y	Y
53	`show netstat interface`	Kernel interface information	Y	Y	Y	Y
54	`show vlan list`	VLAN information list	Y	Y	Y	Y
55	`show port`	Port information	Y	Y	Y	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
56	`show port statistics`	Port statistics		Y	Y	Y	Y
57	`show port protocol`	Protocol information for ports		Y	Y	Y	Y
58	`show port transceiver debug`	Transceiver details for ports		Y	Y	Y	Y
59	`show interfaces nif XXX_NIF line XXX_LINE debug`	Detailed statistics for ports		Y	Y	Y	Y
60	`show running-config`	Configuration for operation		Y	Y	Y	Y
61	`show channel-group detail`	Link aggregation details		Y	Y	Y	Y
62	`show spanning-tree detail`	Spanning tree details		Y	Y	Y	Y
63	`show gsrp all`	Details for all GSRPs		Y	Y	Y	Y
64	`show axrp detail`	Ring Protocol details		Y	Y	Y	Y
65	`show switchport-backup`	Uplink redundancy information	For Version 11.2 and later and earlier than Version 11.4	N	N	N	Y
			For Version 11.4 and later	N	N	N	N
66	`show switchport-backup detail`	Uplink redundancy details (for Version 11.4 and later)		N	N	N	Y
67	`show switchport-backup statistics`	Uplink redundancy statistics (for Version 11.4 and later)		N	N	N	Y
68	`show efmoam detail`	IEEE 802.3ah/OAM functionality configuration information and port status		Y	Y	Y	Y
69	`show efmoam statistics`	IEEE 802.3ah/OAM functionality statistics		Y	Y	Y	Y
70	`show lldp detail`	Neighboring device information for the LLDP functionality		Y	Y	Y	Y
71	`show oadp detail`	Neighboring device information for the OADP functionality		Y	Y	Y	Y
72	`show loop-detection`	Information on L2 loop detection (for Version 10.7 and later)		N	N	N	Y
73	`show loop-detection statistics`	Statistics on L2 loop detection (for Version 10.7 and later)		N	N	N	Y
74	`show loop-detection logging`	Log information for L2 loop detection (for Version 10.7 and later)		N	N	N	Y
75	`show channel-group statistics`	Link aggregation statistics		N	N	N	Y
76	`show channel-group statistics lacp`	LACP statistics for link aggregation		N	N	N	Y

No.	Command (displayed)	Description		No parameter specified	unicast	multicast	layer-2
77	`show spanning-tree statistics`	Spanning tree statistics		N	N	N	Y
78	`show vlan detail`	VLAN details		N	Y	Y	Y
79	`show vlan mac-vlan`	MAC VLAN information		N	N	N	Y
80	`show qos queueing`	Statistics on all queues	For versions prior to Version 10.6	N	Y	Y	Y
			For Version 10.6 and later	Y	Y	Y	Y
81	`show access-filter`	Statistics on filtering		N	Y	Y	Y
82	`show qos-flow`	QoS control function statistics		N	Y	Y	Y
83	`show lldp statistics`	LLDP functionality statistics		N	N	N	Y
84	`show oadp statistics`	OADP functionality statistics		N	N	N	Y
85	`show mac-address-table`	mac-address-table information		N	Y	Y	Y
86	`show fense server detail`	FENSE server information for the VAA function		N	N	N	Y
87	`show fense statistics`	VAA function statistics		N	N	N	Y
88	`show fense logging`	Operation log information for the VAA function		N	N	N	Y
89	`show dot1x logging`	Operation log messages logged for IEEE 802.1X authentication		N	N	N	Y
90	`show dot1x statistics`	Statistics on IEEE 802.1X authentication		N	N	N	Y
91	`show dot1x detail`	Authentication status information on IEEE 802.X authentication		N	N	N	Y
92	`show igmp-snooping`	IGMP snooping information		N	N	N	Y
93	`show igmp-snooping group`	IGMP snooping group information		N	N	N	Y
94	`show igmp-snooping statistics`	IGMP snooping statistics		N	N	N	Y
95	`show mld-snooping`	MLD snooping information		N	N	N	Y
96	`show mld-snooping group`	MLD snooping group information		N	N	N	Y
97	`show mld-snooping statistics`	MLD snooping statistics		N	N	N	Y
98	`show ip dhcp snooping statistics`	DHCP snooping statistics (for Version 11.4 and later)		Y	Y	Y	Y
99	`show ip arp inspection statistics`	Dynamic ARP inspection statistics (for Version 11.4 and later)		Y	Y	Y	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
100	`show ip dhcp snooping logging info`	DHCP snooping log information (for Version 11.4 and later)	N	N	N	Y
101	`dhsn debug`	DHCP snooping event information (for Version 11.4 and later)	N	N	N	Y
102	`show web-authentication user edit`	Display of registrations and changes in the internal Web authentication DB (for Version 10.3 and later)	N	N	N	Y
103	`show web-authentication user commit`	Display of entries registered in the internal Web authentication DB (for Version 10.3 and later)	N	N	N	Y
104	`show web-authentication statistics`	Display of Web authentication statistics (for Version 10.3 and later)	N	N	N	Y
105	`show web-authentication login`	Display of authenticated-user information (account information) (for Version 10.3 and later)	N	N	N	Y
106	`show web-authentication logging`	Display of operation logs for Web authentication (for Version 10.3 and later)	N	N	N	Y
107	`show sflow detail`	Display of sFlow statistics (details) (for Version 10.4 and later)	Y	Y	Y	Y
108	`port snd/rcv statistics`	Statistics on sent/received data on ports	Y	Y	Y	Y
109	`internal SW HW event statistics0`	Internal software event statistics 0 (for Version 10.5 and later)	Y	Y	Y	Y
110	`internal SW HW event statistics1`	Internal software event statistics 1 (for Version 10.5 and later)	Y	Y	Y	Y
111	`show mac-authentication`	Display of MAC-based authentication settings (for Version 10.6 and later)	N	N	N	Y
112	`show mac-authentication statistics`	Display of MAC-based authentication statistics (for Version 10.6 and later)	N	N	N	Y
113	`show mac-authentication mac-address edit`	Display of registrations and changes in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
114	`show mac-authentication mac-address commit`	Display of entries registered in the internal MAC-based authentication DB (for Version 10.6 and later)	N	N	N	Y
115	`show mac-authentication login`	Display of authenticated-user information (account information) (for Version 10.6 and later)	N	N	N	Y

No.	Command (displayed)	Description	No parameter specified	unicast	multicast	layer-2
116	`show mac-authentication logging`	Display of operation logs for MAC-based authentication (for Version 10.6 and later)	N	N	N	Y
117	`show power-control schedule`	Schedule information of power saving functionality (for Version 11.4 and later)	Y	Y	Y	Y
118	`swdev logging`	Display of SW subunit logs (for Version 11.1.C and later)	Y	Y	Y	Y
119	`show environment temperature-logging`	Temperature history information (for Version 11.5 and later)	Y	Y	Y	Y

Legend: Y: Displayed, N: Not displayed

Note: Parentheses in the Command (displayed) column indicate that information specified by the parameter in the parentheses is displayed depending on the software version.

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