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AX2600S Series

Stack Installation Guide

Edition 1

Document No. NTS-23-R-001

ALAXALA Networks Corporation

Preface

This document provides an overview of stacks and system setup examples to help install the ALAXALA stack functionality in a system.

Related documents

- AX2600S Series product manuals
  (https://www.alaxala.com/en/techinfo/manual/#AX2600S)

Notes on using this document

The information in this document is based on the basic operations verified under the environment specified by ALAXALA Networks Corporation and does not guarantee the operation of functionality, performance, or reliability under all environment requirements. Please use this document as a supplement to product manuals. Unless otherwise stated, the OS software version as of the creation of this document is as follows:

AX3660S	Ver. 12.1.U
AX2630S	Ver. 2.4
AX2340S	Ver. 2.4

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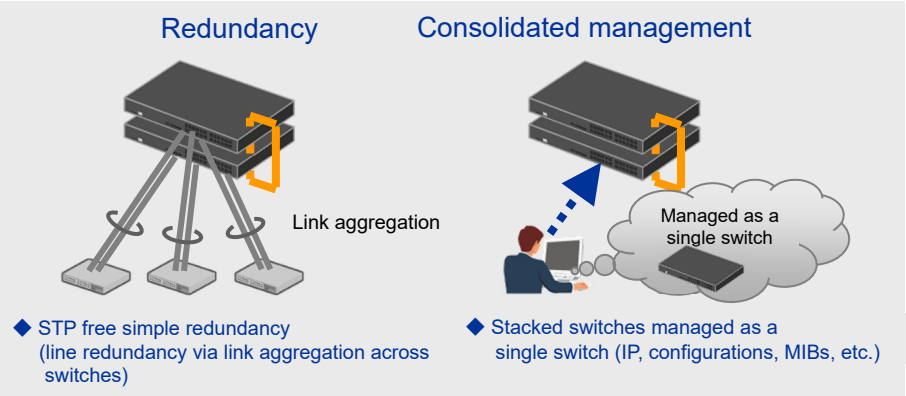
Contents

1. What is Stack?

1.1 Overview of Stackable Switches

A typical technique for layer 2 redundancy is to use a "protocol" such as STP. However, the mechanism of STP is complex and unstable as well as prone to loop faults and other problems. Therefore, a new mainstream technique has come out to provide "stack functionality"-based redundancy, which does not depend on any protocols. This technique provides simple and reliable redundancy, as it allows multiple switches to be managed as a single switch, causing no loop fault. A switch that supports stack functionality is called a "stackable switch".

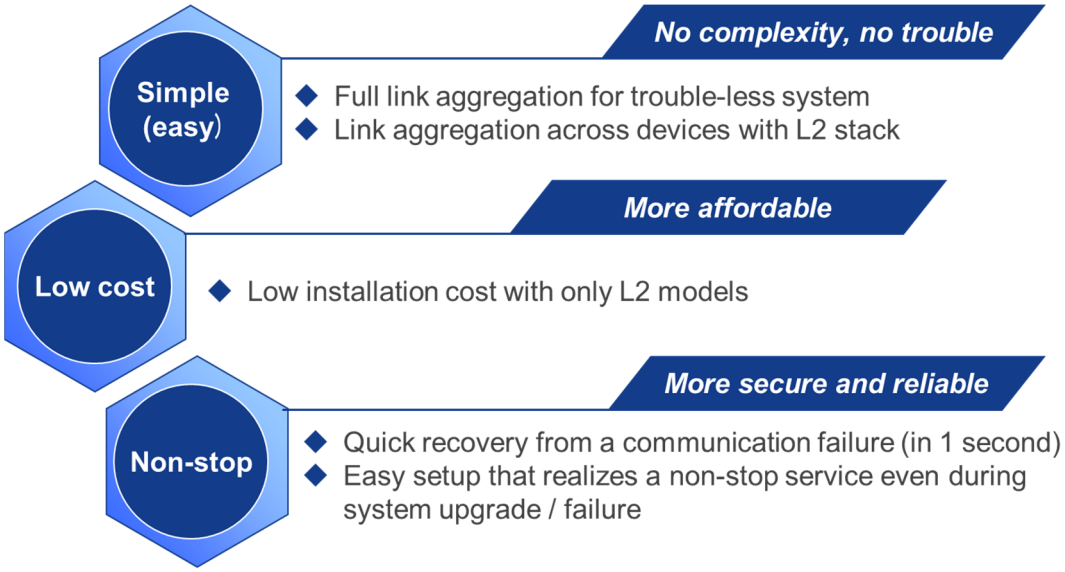
The “stackable switch” allows the consolidated management of switches by virtually managing multiple switches as a single switch. This consolidates the management of information including IPs, configurations, and MIBs (management information bases), making it easier to check connection status, detect problems and reduce the burden on the operator.



1.2 Highlights of the ALAXALA Stack Functionality

(1) Simple and stable redundancy
《 simple and low-cost operation providing non-stop service 》

The L2 stack functionality of the AX2600S Series allows simpler and easier system construction with low-cost options. Also, it achieves quick communication recovery without stopping service even in the event of a failure or system update.



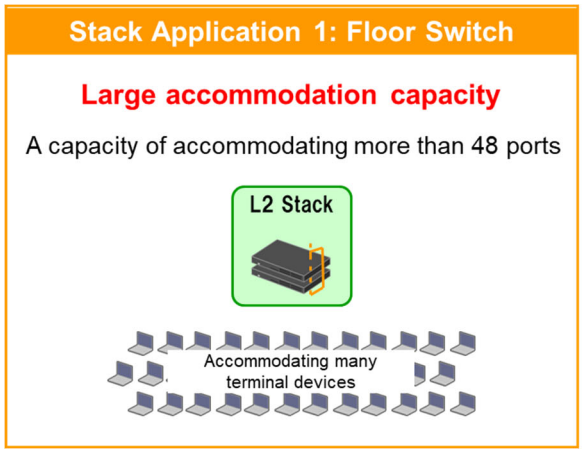
(2) Use cases
《 for floor switches and distribution switches 》

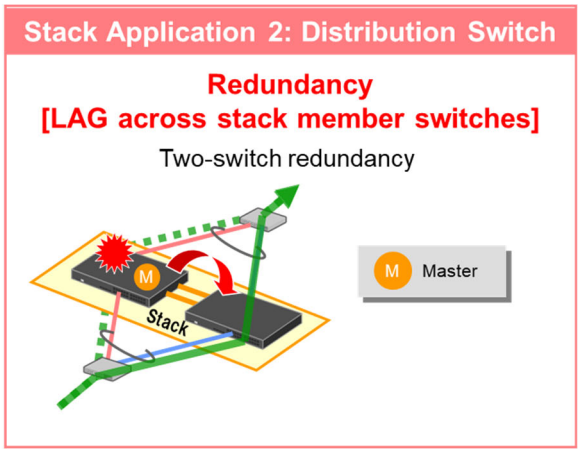
【Use case 1】 Floor switch

As a floor switch, the AX2600S allows flexible port increase. When you need a large port capacity, you can increase the number of ports by stacking switches.

【Use case 2】 Distribution switch

As a distribution switch, the AX2600S realizes STP-free simple redundancy. Unlike the unstable STP in the past, redundancy by link aggregation realizes a loop-free network logically, allowing you to use all links effectively (low-cost and high-quality redundancy).

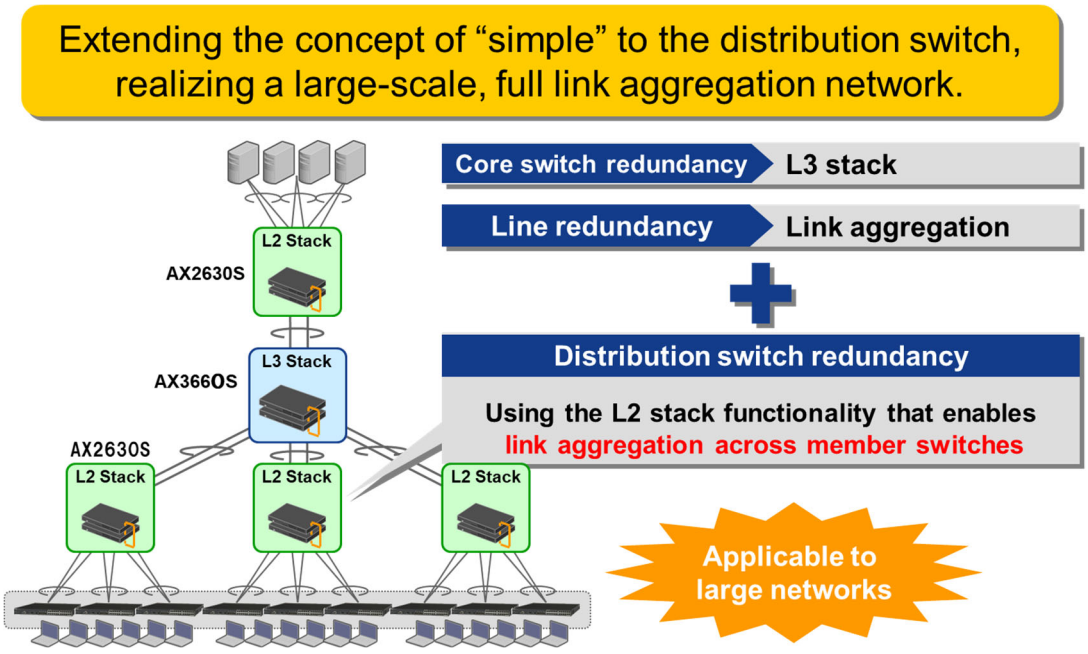




(3) Advanced high-quality network realized by L2 stack functionality
《 non-stop simple system adaptable to a variety of uses 》

- **Flexible redundancy of your choice**

  You can configure a full link aggregation network by using L2 stack in a simple redundant network. This enhances the flexibility of network redundancy adapting to each user's needs.



1.3 Product Lineup

The AX2600S Series product lineup is show below. The L2 stack is supported by all the models of the AX2600S Series. You need an option license (OP-STK) to use the L2 stack functionality.

◆ AX2600S Series

AX2630S-24T4X

10/100/1000BASE-T 24 ports
1000BASE-X SFP 6 ports
OR 10GBASE-R SFP+ 4 ports

AX2630S-48T4X

10/100/1000BASE-T 48 ports
1000BASE-X SFP 6 ports
OR 10GBASE-R SFP+ 4 ports

AX2630S-24P4X

10/100/1000BASE-T 24 ports
[PoE: 535W/720W(with additional PS)]
Class3(15W) : 24 ports (full PoE)
Class4(30W) : max. 17 ports
24-port full PoE (with additional PS)
1000BASE-X SFP 6 ports
OR 10GBASE-R SFP+ 4 ports

AX2630S-48P4X

10/100/1000BASE-T 48 ports
[PoE: 785W/1,440W(with additional PS)]
Class3(15W) : 48 ports (full PoE)
Class4(30W) : max. 26 ports
48-port full PoE(with additional PS)
1000BASE-X SFP 6 ports
OR 10GBASE-R SFP+ 4 ports

2. Stack Overview

2.1 Stack Components

This section explains the stack components and the stack terminology used in this document.
A stack consists of two member switches—one master switch and one backup switch. The master switch controls the other member switch, and they run virtually as a single switch.

In the stack configuration, ports for connecting the member switches (a master switch and a backup switch) are called "stack ports", and the lines connected to the ports are called "stack links."
A switch number is a number for identifying a member switch composing the stack and is unique to each member switch. In a stack configuration, to secure line redundancy, link aggregation is established between the upper-level and lower-level switches across the member switches.

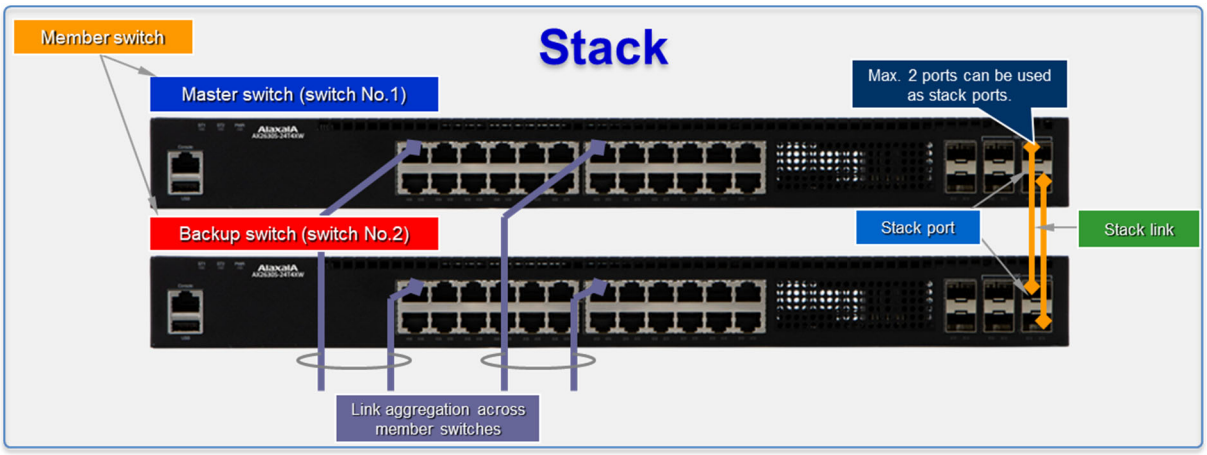


Table 2-1 Terminology

No.	Term	Description
1	Stack	A collection of multiple switches running virtually as a single switch
2	Stackable (switch)	A switch supporting stack functionality
3	Member switch	A switch that makes up a stack
4	Master (switch)	A stackable member switch responsible for controlling all the other member switches in the stack
5	Backup (switch)	A member switch that becomes the master if the original master relinquishes its role or is judged to be unable to continue to operate
6	Standalone	A switch where stack functionality is not running or such a state
7	Switch number	A number used to identify a member switch composing the stack
8	Stack port	A port used to connect member switches to configure a stack
9	Stack link	A line (or link) connecting two member switches via stack ports. It is recommended that two stack links be used for redundancy.
10	Master selection priority	Priority (numerical value) compared when selecting the master switch

2.2 Introduction to Stack

- **Stack specifications**

ALAXALA's stack is configured by connecting member switches via a general-purpose Ethernet line or a direct attach cable. No special cable is necessary for stacking. A stack can consist of up to two switches (different models can be used).

Table 2-2 Stack specifications

No.	Items	Descriptions
1	Stack cable	Use either of the following cables. ・General Ethernet cable 1000BASE-X, 10GBASE-R ・Direct attach cable 10GBASE-CU
2	Max. number of member switches	2
3	Models available for stacking	All models of the AX2600S Series (different switch models of the same series can be used together)

- **Stack ports**

Stack ports are ports connecting member switches that make up a stack, and up to two ports can be used per member switch.

Use the SFP/SFP+ shared ports as stack ports. Of these ports, the ports numbered 29 and 30 can be used as stack ports for the 24-port models, and those numbered 53 and 54 can be used for the 48-port models. To use the SFP/SFP+ shared ports as 10G interfaces, purchase a 10G up-link option license (OP-ULTG).

- **Stack link**

Stack links are lines connecting the stack ports of the two member switches. Up to two stack links can be used. Establish stack links by directly connecting them to the ports using Ethernet lines. Do not set any other network devices between the two member switches.

Table 2-3 Stack port specifications

Model	Max. number of member switches	Max. number of stack ports	Stack port number
AX2630S-24T4XW AX2630S-24P4XW	2 (same for all models)	2 (same for all models)	29, 30
AX2630S-48T4XW AX2630S-48P4XW			53, 54

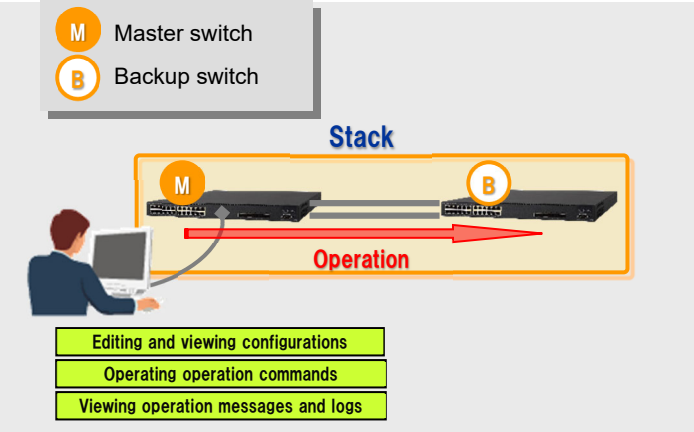
2.3 Overview of Stack Behavior

(1) Master switch role

The master switch controls all member switches of a stack and their functionality. Each member switch behaves according to the configuration in and control from the master switch.

The master switch represents the member switches. If the user logs in from a remote terminal, the user is always logged into the master switch. The user can perform the following operations from the master switch in which the user is logged:

- Editing and viewing configurations
- Operating all member switches
- Viewing operation messages and logs of all member switches



(2) Master switch selection

The master switch is selected according to three elements: switch status, master selection priority, and device MAC address of each member switch. The master switch is selected by the following standards:

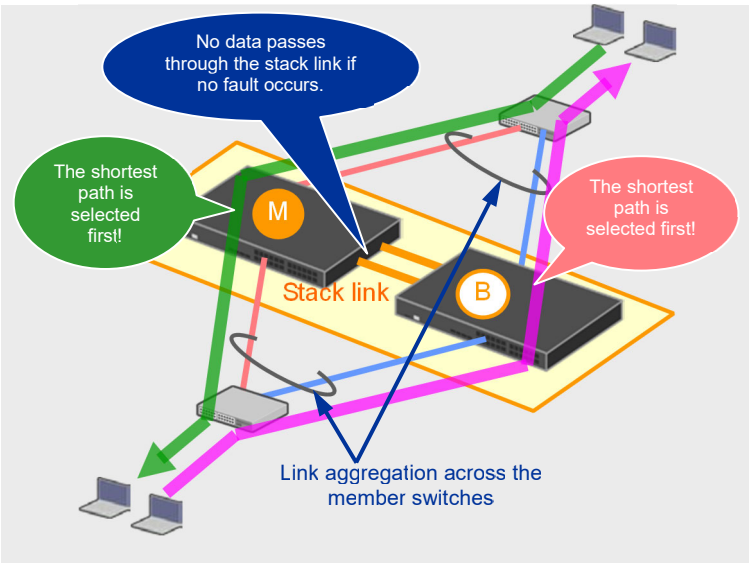
Table 2-4 Master switch selection

No.	Switch status	Master selection result
1	If the master switch already exists	The existing master switch is selected. However, if its master selection priority is 1 and the other member switch has a master selection priority of 2 or higher, the latter is selected as the master.
2	If there is no master switch	The backup switch is selected as the master. This case occurs if the master switch goes down due to a fault or other problem.
3	If there is no master nor backup switch	A member switch with the highest master selection priority is selected as the master. If both are set to the same priority, a member switch with the lowest device MAC address is selected as the master. This case occurs if two member switches are started at the same time.
4	If there are two master switches	A member switch with the highest master selection priority is selected as the master. If both are set to the same priority, a member switch with the lowest device MAC address is selected as the master. This case occurs if two stacks that are both a one-member switch stack are connected.

(3) Packet forwarding in a stack configuration

To use line redundancy in a stack, it is recommended you use link aggregation across the member switches so that forwarding can be continued even if a fault occurs.

In an ALAXALA stack, if forwarding paths are set to be redundant using link aggregation across the two member switches (see the figure below), packets are forwarded to the port of the member switch which received a packet first. If no fault occurs, packets are forwarded using the shortest path without going through the stack links.

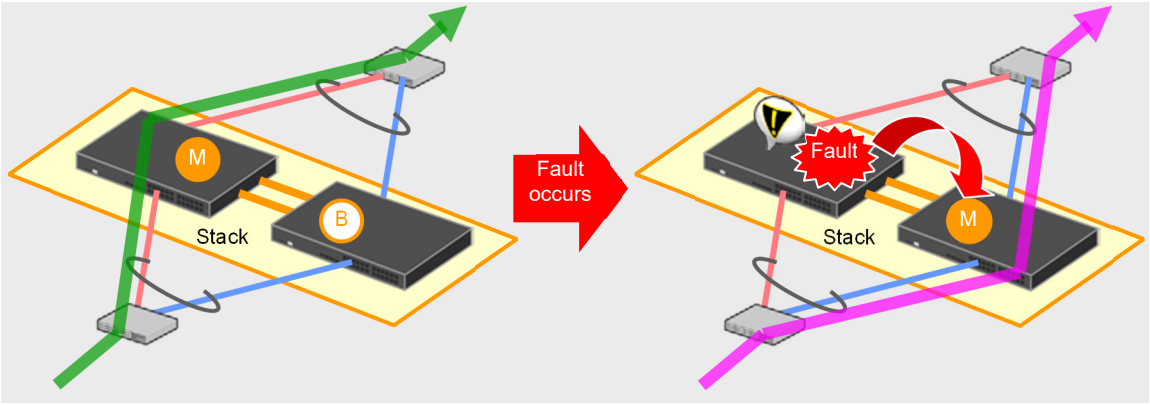


2.4 Overview of Stack Behavior During Fault

This section describes how a stack behaves if a fault occurs in (1) the master switch, (2) a line, and (3) a stack link, in this order.

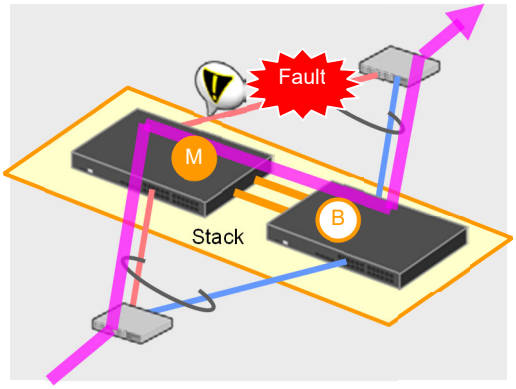
(1) Behavior if a fault occurs in the master switch

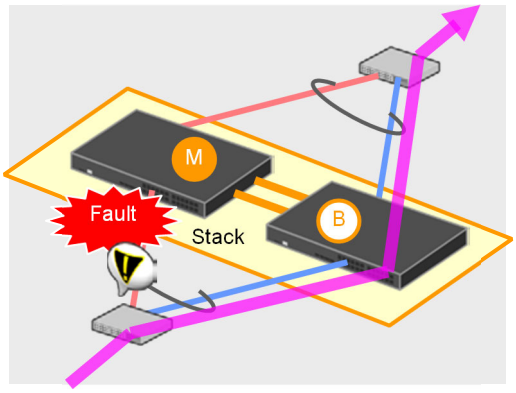
If the master switch stops due to a fault in it, the backup switch becomes the master and the stack continues to run. At the same time, communications going through the old master switch are now redirected to go through the new master switch. If the backup switch stops due to a fault in it, the stack status does not change and only communications going through the backup switch are now redirected to go through the master switch.



(2) Behavior if a line fault occurs

If a fault occurs in a line of link aggregation across the member switches, either of the following two behaviors (see below figures) occurs. In either case, the faulty line is bypassed and the link aggregation continues to operate in degraded mode. In this case, the stack status does not change and only the communication path changes.





(3) Behavior if a stack link fault occurs

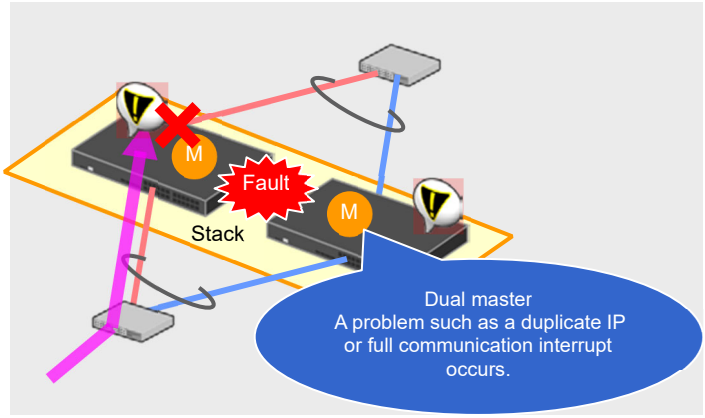
If all stack links fail, it becomes impossible for the master switch and backup switch to recognize one another. As a result, one stack is divided into two stacks, where the master switch remains the master and the backup switch becomes a new master. The system enters a dual master state.

In this state, since the two stacks use the same IP address and the same device MAC address, you may not be able to use the following functions due to a duplicate address.

- Remote login (telnet)
- SNMP, MIB/Trap
- Output to a syslog server
- IP communication (i.e., ping)
- Authentication functionality

If such a dual master state occurs, stop either of the member switches.

To avoid such a dual master state, configure a stack with two stack links so that the stack can continue to work even if one of its links is disconnected due to a fault. In this case, the stack status and communication paths do not change.



2.5 Supported Functionality

2.5.1 Functionality available with a stack

This section shows the support status for typical functionality in a stack. For details, see ***Section 7.1.3*** in the ***Configuration Guide Vol.1***.

Table 2-5 Supported stack functionality

Items			Support status	Remarks
Operation management	Login from console		✓	
	Login from remote terminals		✓	
	Operating and editing configurations		✓	
	Zero touch provisioning		–	
Network interface	Ethernet		#	Line test is not supported.
	Link aggregation	Static	✓	
		LACP	✓	
		Standby link	–	
Layer 2 functionality	MAC address learning		✓	
	VLAN		✓	
	VLAN tunneling		✓	
	Tag translation		✓	
	Inter-port relay blocking		✓	
	Spanning Tree Protocol		#	Cannot be used with Ring Protocol.
	Ring Protocol		#	
	IGMP snooping		✓	
	MLD snooping		–	
Filtering	Access list		✓	
	QoS		✓	
Security	Network authentication	IEEE 802.1X	✓	
		Web-based authentication	✓	
		MAC authentication	✓	
		Multi-step authentication	✓	
	DHCP Snooping		✓	
Redundancy-based high reliability	GSRP aware		✓	
	Up-link redundancy		✓	
Network monitoring features	L2 loop detection		✓	
	Storm control		✓	
Network management	Port mirroring		✓	
	Policy-based mirroring		✓	
	IEEE802.3ah/UDLD		✓	

[Legend] ✓: Supported #: Partially supported –: Not supported

2.5.2 Capacity limits for a stack

For information on the number of configuration settings available in stack operation (i.e., the number of link aggregations, MAC address tables, VLANs), see ***Section 3 Capacity requirements*** in the ***Configuration Guide Vol.1***.

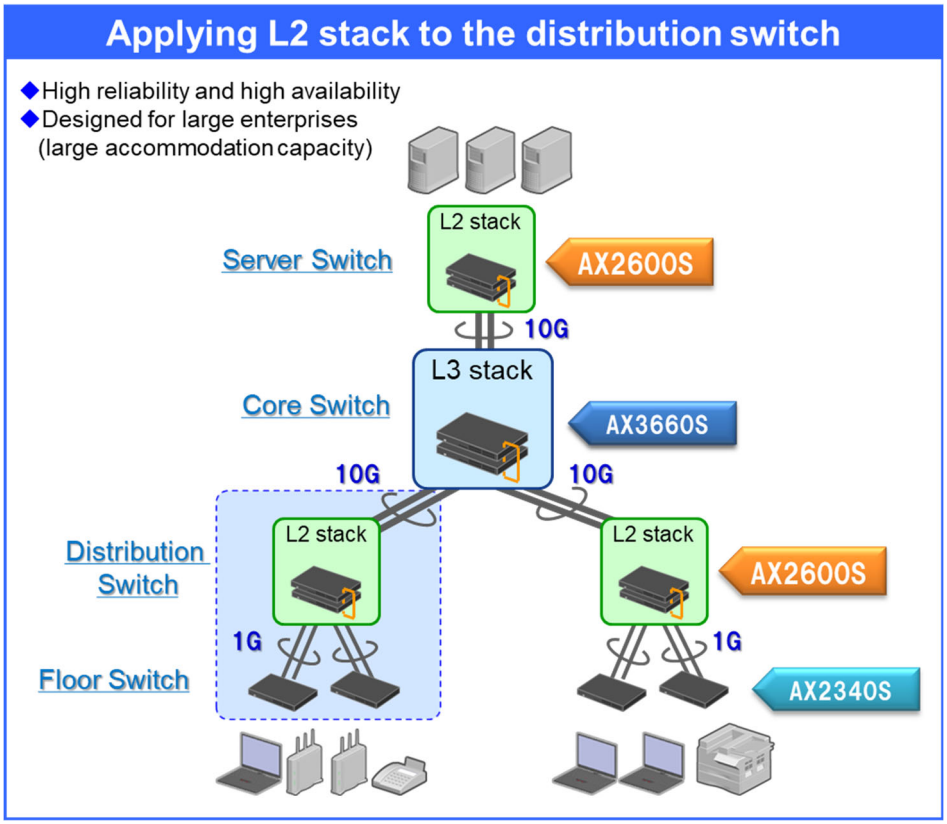
3. Stack Setup

This chapter provides some tips on setting up a system with a stack and how to set up such a system.

3.1 Applying L2 stack to the distribution switches

Below is a setup example of the AX2600S Series stack. This example shows an ALAXALA-recommended fault-tolerant network, assuming a large capacity network for big companies.

In this example, AX3660S switches are stacked (L3 stack) as a core switch, and AX2600S switches are stacked (L2 stack) as a server or distribution switch. 10G interfaces are used between the server switch and the core switch and between the core switch and the distribution switch. 1G interfaces are used between the distribution switch and each floor switch. In each section, line redundancy is established by using link aggregation across stack member switches.



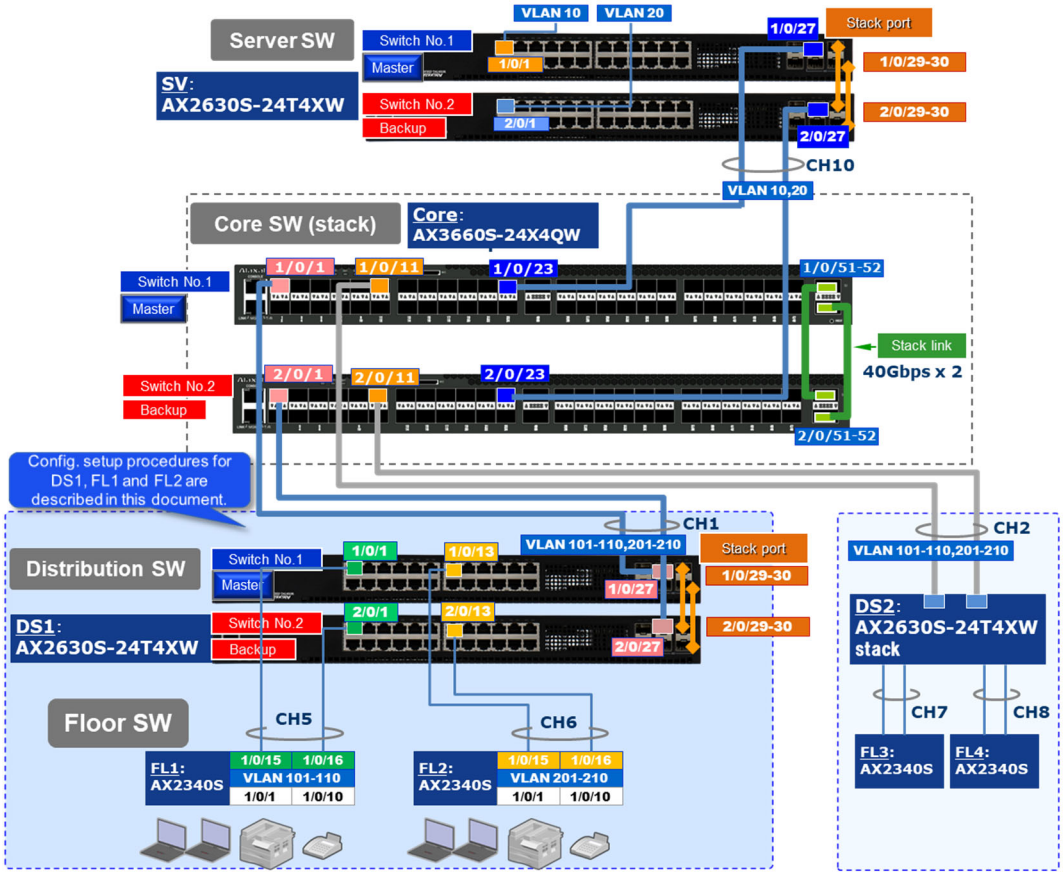
The table below shows the switch models and modules used in this example with required minimum quantities (not including PS, FAN, optical or UTP cables).

Switch application	Product		Descriptions	Qty.
Core switch	AX3660S-24X4QW		L3 switch [for a stack]	2
		QSFP-CU (50cm)	Direct attach cable [for stack links]	2
		SFPP-SR	SFP+ optical transceiver [for 10G up/down links]	6
Distribution switch	AX2630S-24T4XW		10G up-link model [for a stack]	4
		SFPP-CU (30cm)	Direct attach cable [for stack links]	4
		SFPP-SR	SFP+ optical transceiver [for 10G up-links]	4
		SFP-SX	SFP optical transceiver [for down-links]	8
Server switch	AX2630S-24T4XW		10G up-link model [for stack member switches]	2
		SFPP-CU (30cm)	Direct attach cable [for stack links]	2
		SFPP-SR	SFP+ transceiver [for 10G up-links]	2

Floor switch	AX2340S-24T4X	24-port UTP model	4
	SFP-SX	SFP transceiver	8

3.1.1 System configuration diagram

In the diagram below, you can see the physical connections and logical configurations used in the setup example. Also, the diagram shows how to configure a core switch (Core), a server switch (SV), distribution switches (DSx) and floor switches (FLx). For the setup of distribution switches (DSx) and floor switches (FLx), only the description for DS1 and FL1 and FL2 is given (setup for DS2, FL3 and FL4 is the same as for DS1, FL1 and FL2).



3.1.2 Configuration tips

The configuration tips for this setup example are as follows:

(1) Do not use a Spanning Tree Protocol in a stack.
(2) Use two ports for stack link redundancy.
(3) Use a long-distance transceiver when stacking the switches distanced from each other.
(4) Establish a stack link by directly connecting the member switches to each other.
(5) Deploy a stack to the system after completing the stack settings.
(6) Make a backup of device information for a stack.

Details are as follows.

(1) Do not use a Spanning Tree Protocol in a stack.

A network system with a stack uses link aggregation for line redundancy, thus it does not use a Spanning Tree Protocol.

If stack functionality is enabled in the AX2600S Series, disable the Spanning Tree Protocol, including for the upper-level switch (server switch) and the lower-level switch (floor switch).

(2) Use two ports for stack link redundancy.

If there is only one stack link and it fails, it becomes impossible for the master switch and backup switch to recognize each other, due to which you may not be able to use IP communication and authentications (i.e., telnet、SNMP、MIB/Trap, output to Syslog servers, ping).

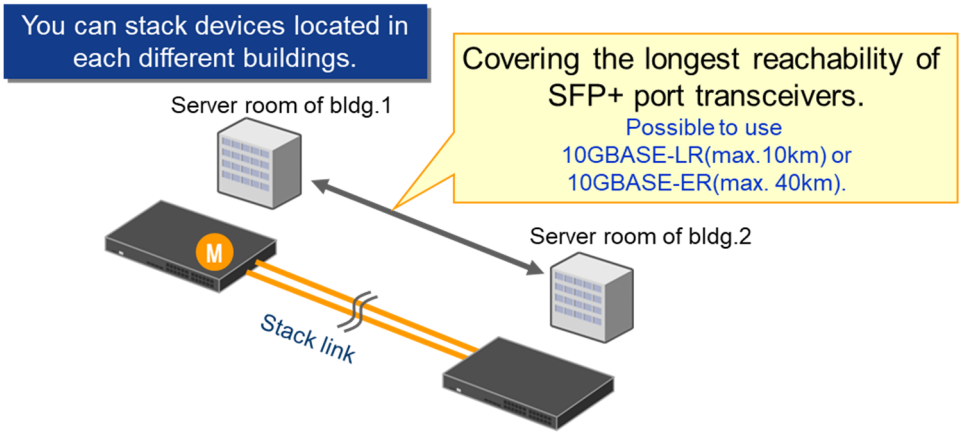
To avoid this, configure two ports as stack ports for stack link redundancy.

Up to two ports can be used as stack ports.

(3) Use a long-distance transceiver when stacking switches located in each different places.

Select the appropriate type of cables according to the actual installation and purpose. If the distance between the member switches is short (e.g., being installed in the same rack), use a low-cost direct-attach cable for a stack link.

On the other hand, if you connect the member switches located in each different buildings, use a long- distance optical transceiver so that you can configure a stack remotely.

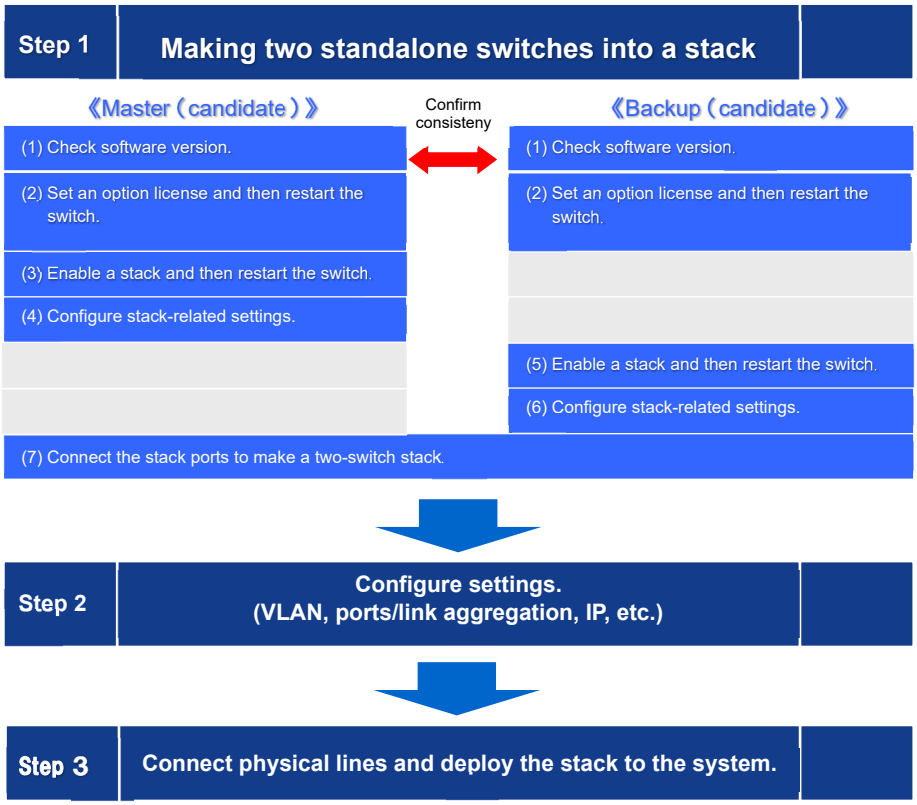


(4) Establish a stack link by directly connecting the member switches to each other.

Establish a stack link by directly connecting the member switches to each other using a line (direct attach cable, optical cable, or UTP cable). Do not set any other network devices (i.e., Layer 2 switches, hubs, or media converters) between the member switches (doing this may disable stack operation).

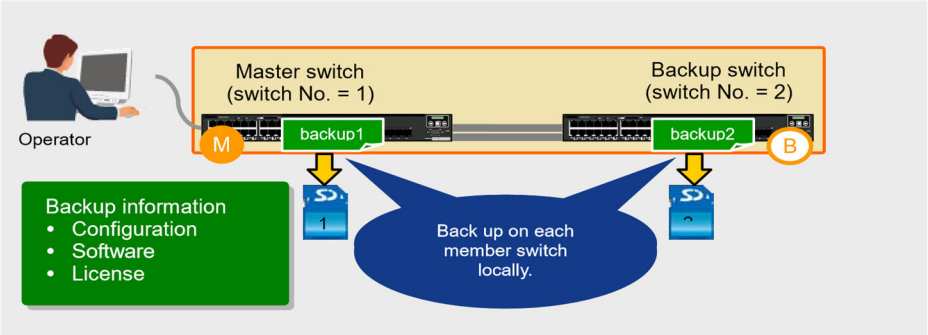
(5) Deploy a stack to the system after completing the stack settings.

To set up a system with a stack, make two standalone switches into a two-switch stack, configure the necessary settings, and then connect the member switches via physical line cables. An overview of the procedure is given below.



(6) Make a backup of device information for a stack.

The AX Series has backup-and-restore functionality. In a stack configuration, the backup and restore functionality eliminates the task of software version matching and configuration settings, easing the replacement of a switch in the event of hardware failure.
Therefore, when using a stack, use the backup functionality so that you can save a backup file of device information to each member switch beforehand.
For details, see the ***AX Series Stack Operation Guide (Operation and Maintenance)***.



3.1.3 Setup tips

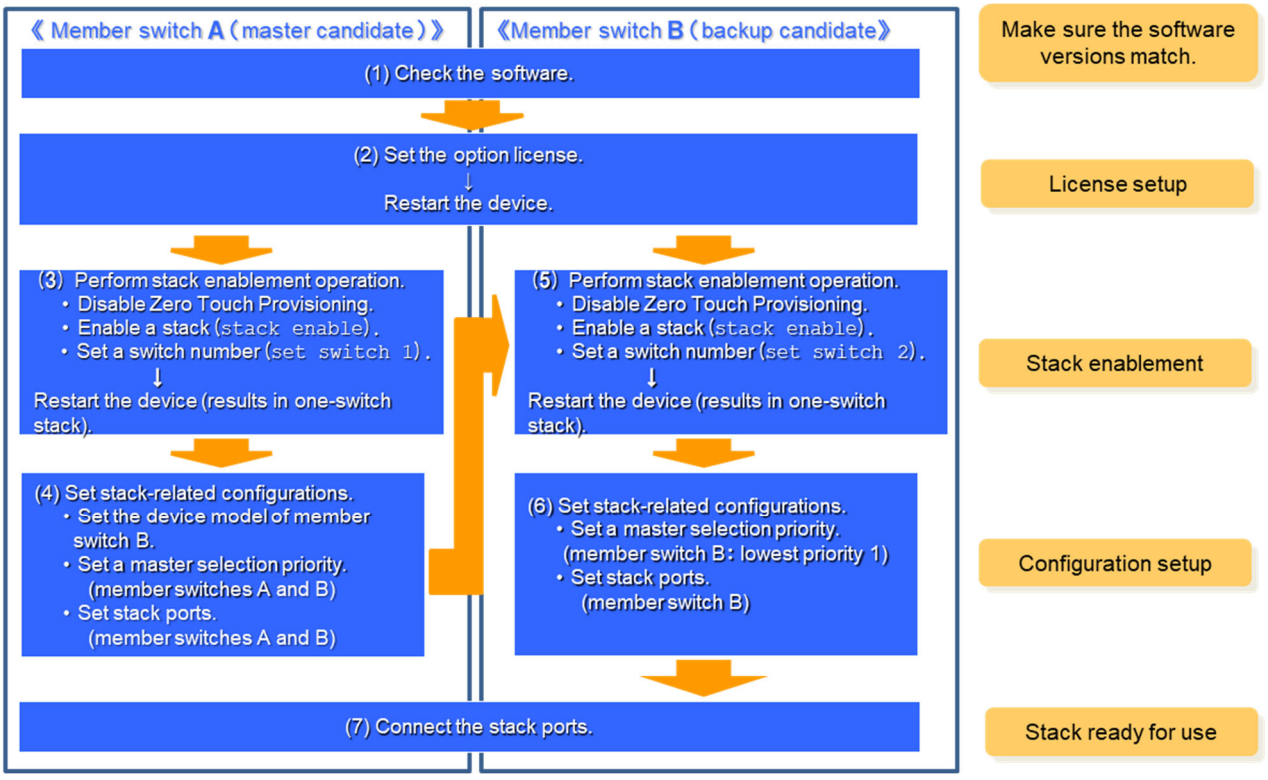
The setup tips for this configuration example are as follows.

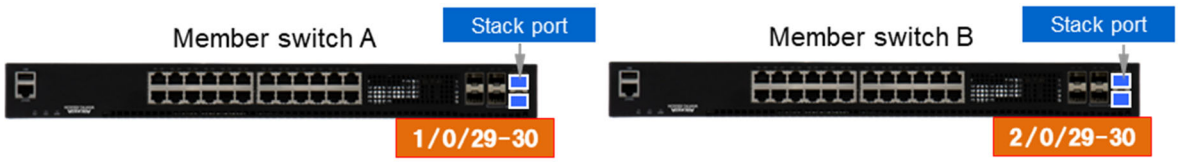
(1) Make standalone switches into a stack.
(2) Stack redundancy does not need link aggregation.
(3) Set line redundancy by configuring link aggregation across the member switches.
(4) Disable the Spanning Tree Protocol.
(5) Optimize the link-down detection time.

Details are as follows.

(1) Make standalone switches into a stack. AX2630S

The configuration tips for making a stack from the standalone switches are as follows. Note that the configuration setting is different between the master and the backup member switch.





《Master switch (candidate)》

Switch number	1
Device model	AX2630S-24T4XW
Stack port	1/0/29, 1/0/30
Master selection priority	20

《Backup switch (candidate)》

Switch number	2
Device model	AX2630S-24T4XW
Stack port	2/0/29, 2/0/30
Master selection priority	10

《Step ①：Confirm the software version.》 Master Backup

Confirm the software versions of the stack member switches. If the software versions are different, perform software update to make them the same.

Master Backup

《 Step ② : Set the option license. 》

Set the stack license (OP-STK) for the two stack member switches. In addition, you can install the 10G up-link license (OP-ULTG) if necessary. After setting the license, reboot the switches to enable the license.

《 Step ③ : Enable the stack functionality of member switch A. 》 Master

To activate stack member switch A, disable Zero Touch Provisioning, and then enable the stack and set **Switch number: 1** by using the operation command (***set*** command). After completing all these settings, reboot the device to enable the stack.

《 Step ④ : Set config for all member switches in member switch A.》 Master

The configuration of the backup switch is synchronized with that of the master switch. Therefore, configure all necessary stack settings (stack ports, switch model, and master selection priority for all member switches) in the master switch. To make member switch A the master switch, set the master selection priority of member switch A to a value greater than that of member switch B.

《Step ⑤ : Enable the stack functionality of member switch B.》 Backup

To activate stack member switch B, disable Zero Touch Provisioning, and then enable the stack and set **Switch number: 2** by using the operation command (***set*** command). After completing all these settings, reboot the device to enable the stack.

《Step ⑥ : On member switch B, set its stack port and priority.》 Backup

On stack member switch B, set its own items required to be a stack member (stack port, master selection priority). To make member switch B the backup switch, set its master selection priority to a value smaller than that of member switch A. The configuration set on switch B will be replaced with the configuration of member switch A (master switch) after the stack ports are connected.

《 Step ⑦ : Connect the stack ports of the switches to make a two-switch stack.》 Master Backup

Finally, after completing the above settings, establish a stack link between member switches A and B by connecting their stack ports. After this, a two-switch stack will be established, allowing member switch B (backup) to run in sync with the configuration of member switch A (master).

(2) Stack redundancy does not need link aggregation. AX2630S

Stack link redundancy can be achieved simply by specifying two stack ports and connecting cables to them, without being aware of link aggregation settings.

(3) Set line redundancy by configuring link aggregation across the member switches. AX2630S

To achieve line redundancy, configure link aggregation between the ports of the master switch (switch No. 1) and the backup switch (switch No. 2).

(4) Disable the Spanning Tree Protocol. AX2630S Other devices

Disable the Spanning Tree Protocol for all switches because it is not used in the stack network system. In the AX2600S Series, the Spanning Tree Protocol cannot be disabled just by rebooting the switch after enabling the stack functionality. You need to set the Spanning Tree Protocol to the disabling mode.

(5) Optimize the link-down detection time. AX2630S Other devices

Set the link-down detection time (**link debounce time**) value as low as possible without rendering a link unstable. This shortens the time of the degraded operation of link aggregation in case of a failure.

3.1.4 Configuration setting example

This section exemplifies configuration settings for system setup.

(1) Configuration setting example for the core switch (Stack with AX3660S x 2)

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Enabling a stack	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n): y	Enable the stack functionality. When a message prompting you to confirm the configuration changes and restart the switch appears, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# reload Operation command	Restart the switch manually.
Setting a stack	
(config)# interface range hundredgigabitethernet 1/0/51-52 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to `20`.
(config)# switch 2 provision 3660-24x4qw	Set the device model of member switch B.
(config)# interface range hundredgigabitethernet 2/0/51-52 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to `10`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch (candidate)	
Setting a switch number	
# set switch 2 Operation command The switch number was changed to 2. When device restart, the change in the switch number is reflected.	Set the switch number to `2`. The switch number is incorporated after the switch is restarted. This is an operation command. Execute this command in administrator mode.
Enabling a stack	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n): y	Enable the stack functionality. When a message prompting you to confirm the configuration changes and restart the switch appears, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# reload Operation command	Restart the switch manually.
Setting a stack	
(config)# interface range hundredgigabitethernet 2/0/51-52 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to `1`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.
Next, connect the stack ports of member switches A and B. Member switch B automatically restarts, building a two-switch stack configuration. For details, see the ***AX Series L3 Box-type Switches Stack Installation Guide***.

Configuration settings for the core (Core) switch	
Setting VLANs	
(config)# vlan 10,20,101-110,201-210	Specify the VLANs to be used. Data transfer VLANs: 10, 20, 101-110, 201-210
Setting port/channel groups	
(config)# interface range tengigabitethernet 1/0/23, tengigabitethernet 2/0/23 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 10 mode on (config-if-range)# exit (config)# interface range tengigabitethernet 1/0/1, tengigabitethernet 2/0/1 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 1 mode on (config-if-range)# exit (config)# interface range tengigabitethernet 1/0/11, tengigabitethernet 2/0/11 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 2 mode on (config-if-range)# exit	Configure the up-link port of the 10G interface. Configure channel group 10 for server switch (SV) connections. Configure the down-link port of the 10G interface. Configure channel group 1 for distribution switch (DS1) connections. Configure channel group 2 for distribution switch (DS2) connections. Set the link-down detection time to 0 milliseconds for each port. Set link aggregation to static mode.
Setting port channels	
(config)# interface port-channel 10 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 10,20 (config-if)# exit (config)# interface port-channel 1 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 101-110, 201-210 (config-if)# exit (config)# interface port-channel 2 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 101-110, 201-210 (config-if)# exit	Configure each port channel. Set each port channel to trunk mode and specify the VLANs to which the port channel belongs. Set the port channels as follows: Port channel 10: VLAN 10, 20 Port channel 1: VLAN 101-110, 201-210 Port channel 2: VLAN 201-210, 201-210
Setting IP addresses	
(config)# interface vlan 10 (config-if)# ip address 172.16.10.1 255.255.255.0 (config-if)# exit (config)# interface vlan 20 (config-if)# ip address 172.16.20.1 255.255.255.0 (config-if)# exit (config)# interface vlan 101 (config-if)# ip address 192.168.1.254 255.255.255.0 (config-if)# exit : (config)# interface vlan 110 (config-if)# ip address 192.168.10.254 255.255.255.0 (config-if)# exit (config)# interface vlan 201 (config-if)# ip address 192.169.1.254 255.255.255.0 (config-if)# exit : (config)# interface vlan 210 (config-if)# ip address 192.169.10.254 255.255.255.0 (config-if)# exit	Set IP addresses for the data transfer VLANs. VLAN10: IP address: 172.16.10.1/24 VLAN20: IP address: 172.16.20.1/24 VLAN101: IP address: 192.168.1.254/24 : VLAN110: IP address: 192.168.10.254/24 VLAN201: IP address: 192.169.1.254/24 : VLAN210: IP address: 192.169.10.254/24

(2) Configuration setting example for the distribution switch (Device DS1: AX2630S)

Before connecting cables to the stack ports, complete license setup and stack enablement/setup on each member switch.

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G up-link license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch A. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 1 Operation command The switch number was changed to 1. When device restart, the change in the switch number is reflected.	Set the switch number of member switch A to `1`. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch A. The stack functionality is enabled after the restart.
Setting a stack	
(config)# interface range tengigabitethernet 1/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to `20`.
(config)# switch 2 provision 2630-24t4xw	Set the device model of member switch B.
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to `10`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G up-link license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch B. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.

Configuration settings for member switch B: Backup switch(candidate)	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter y.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 2 The switch number was changed to 2. When device restart, the change in the switch number is reflected. Operation command	Set the switch number of member switch B to 2. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch B. The stack functionality will be enabled.
Setting a stack	
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to 1.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.

Next, connect the stack ports of member switches A and B. Member switch A, which has a higher master selection priority, is selected as the master. The device information including configuration settings will be deployed from the master switch to member switch B, building a two-switch stack configuration.

◆ Configuration settings for the distribution switch

Configuration settings for distribution switch DS1	
Setting VLANs	
(config)# vlan 101-110,201-210	Specify the VLANs to be used. Data transfer VLANs: 101-110, 201-210
Disabling the Spanning Tree Protocol	
(config)# spanning-tree disable	Disable the Spanning Tree Protocol.
Setting port/channel groups	
(config)# interface range tengigabitethernet 1/0/27, tengigabitethernet 2/0/27 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 1 mode on (config-if-range)# exit (config)# interface range gigabitethernet 1/0/1, gigabitethernet 2/0/1 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 5 mode on (config-if-range)# exit (config)# interface range gigabitethernet 1/0/13 gigabitethernet 2/0/13 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 6 mode on (config-if-range)# exit	Configure the up-link port of the 10G interface. Configure channel group 1 for core switch (Core) connections. Configure the down-link port of the 10G interface. Configure channel group 5 for floor switch (FL1) connections. Configure channel group 6 for floor switch (FL2) connections. Set the link-down detection time to 0 milliseconds for each port. Set link aggregation to static mode.
Setting port channels	

Configuration settings for distribution switch DS1	
(config)# interface port-channel 1 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 101-110,201-210 (config-if)# exit (config)# interface port-channel 5 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 101-110 (config-if)# exit (config)# interface port-channel 6 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 201-210 (config-if)# exit	Configure each port channel. Set each port channel to trunk mode and specify the VLANs to which the port channel belongs. Set the port channels as follows: Port channel 1: VLAN 101-110, 201-210 Port channel 5: VLAN 101-110 Port channel 6: VLAN 201-210

For distribution switch DS2, no configuration setting example is given here, as DS2 has almost the same configuration settings as DS1 except for channel group numbers. See the configuration setting example for device DS1.

(3) Configuration setting example for the server switch (device SV: AX2630S)

Before connecting cables to the stack ports, complete stack enablement/setup on each member switch.

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G up-link license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch A. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
set switch 1 Operation command The switch number was changed to 1. When device restart, the change in the switch number is reflected.	Set the switch number of member switch A to `1`. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch A. The stack functionality is enabled after the restart.
Setting a stack	
(config)# interface range tengigabitethernet 1/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to `20`.
(config)# switch 2 provision 2630-24t4xw	Set the device model of member switch B.
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to `10`.

Configuration settings for member switch A: Master switch(candidate)	
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G up-link license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch B. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter y.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 2 Operation command The switch number was changed to 2. When device restart, the change in the switch number is reflected.	Set the switch number of member switch B to 2. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch B. The stack functionality will be enabled.
Setting a stack	
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to 1.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.

Next, connect the stack ports of member switches A and B. Member switch A, which has a higher master selection priority, is selected as the master. The device information including configuration settings will be deployed from the master switch to member switch B, building a two-switch stack configuration.

Configuration settings for the server switch (SV)	
Setting VLANs	
(config)# vlan 10,20	Specify the VLANs to be used. Data transfer VLANs: 10, 20
Disabling the Spanning Tree Protocol	
(config)# spanning-tree disable	Disable the Spanning Tree Protocol.
Setting channel groups	

Configuration settings for the server switch (SV)	
(config)# interface range tengigabitethernet 1/0/27, tengigabitetherbet 2/0/27 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 10 mode on (config-if)# exit	Configure channel groups. Configure channel group 10 for core switch (Core) connections. Set the link-down detection time to 0 milliseconds. Set link aggregation to static mode.
Setting ports.	
(config)# interface port-channel 10 (config-if-range)# switchport mode trunk (config-if-range)# switchport trunk allowed vlan 10,20 (config-if)# exit (config)# interface gigabitethernet 1/0/1 (config-if)# switchport mode access (config-if)# switchport access vlan 10 (config-if)# exit (config)# interface gigabitethernet 2/0/1 (config-if)# switchport mode access (config-if)# switchport access vlan 20 (config-if)# exit	Configure each port. Set channel group 10 as the trunk port and configure VLANs 10 and 20 for data transfer. Specify the ports to be connected to the server. Configure the VLAN assigned to each port as an access port.

(4) Configuration setting example for a floor switch (device FL1：AX2340S)

Configuration settings for floor switch FL1	
Setting VLANs	
(config)# vlan 101-110	Specify the VLANs to be used. Data transfer VLANs: 101-110
Disabling the Spanning Tree Protocol	
(config)# spanning-tree disable	Disable the Spanning Tree Protocol.
Setting channel groups	
(config)# interface range gigabitethernet 1/0/15-16 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 5 mode on	Configure channel groups. Configure channel group 5 for distribution switch (DS1) connections. Set the link-down detection time to 0 milliseconds. Set link aggregation to static mode.
Setting ports	
(config)# interface port-channel 5 (config-if-range)# switchport mode trunk (config-if-range)# switchport trunk allowed vlan 101-110 (config)# interface gigabitethernet 1/0/1 (config-if)# switchport mode access (config-if)# switchport access vlan 101 : : (config)# interface gigabitethernet 1/0/10 (config-if)# switchport mode access (config-if)# switchport access vlan 110	Configure each port. Set channel group 5 as the trunk port and configure VLANs 101-110 for data transfer. Specify the ports to be connected to the terminals. Configure the VLAN assigned to each port as an access port.

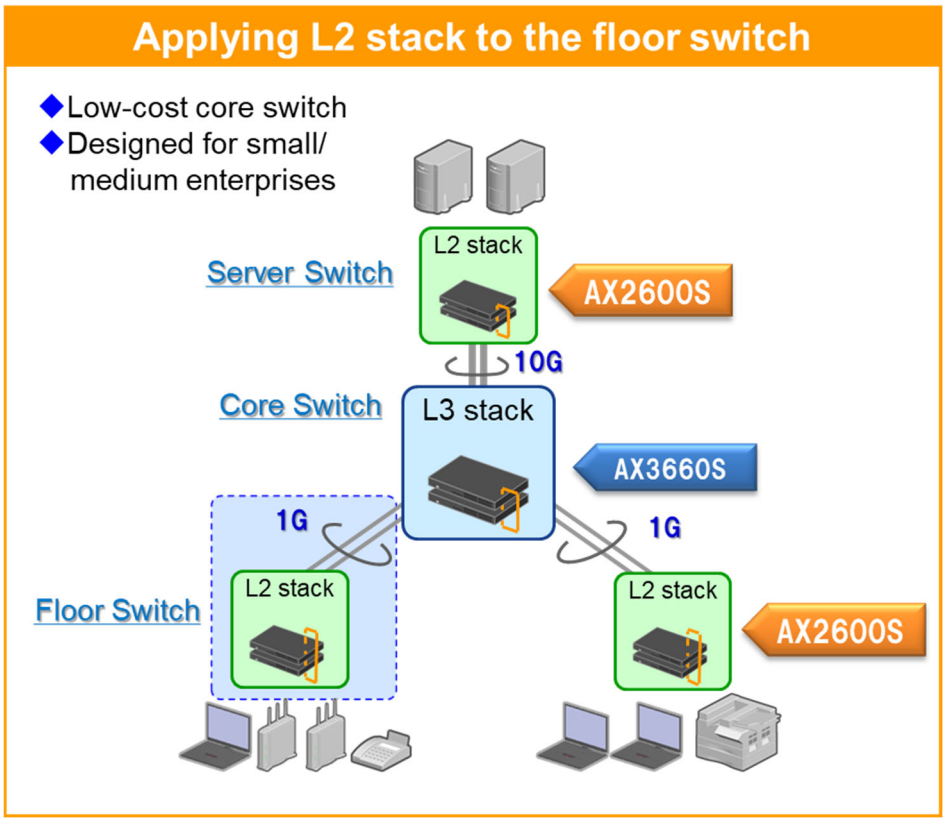
For floor switches FL2, FL3 and FL4, no configuration setting example is given here, as they have the same configuration settings as FL1 except for the VLANs to which their ports belong and the channel group numbers. See the configuration setting example for device FL1.

The configuration files for the devices explained above are provided with this document. For details, see (1) **Applying L2 stack to the distribution switch**.

3.2 Applying L2 Stack to the floor switches

The configuration example for applying the AX2600S Series stack to the floor switches is shown below. This example assumes a small capacity network for medium and small-scale companies.

In this example, AX3660S switches are stacked (L3 stack) as a core switch, and AX2600S switches are stacked (L2 stack) as a server or distribution switch. 10G interfaces are used between the server switch and the core switch. 1G interfaces are used between the core switch and each floor switch. In each section, line redundancy is established by using link aggregation across stack member switches.

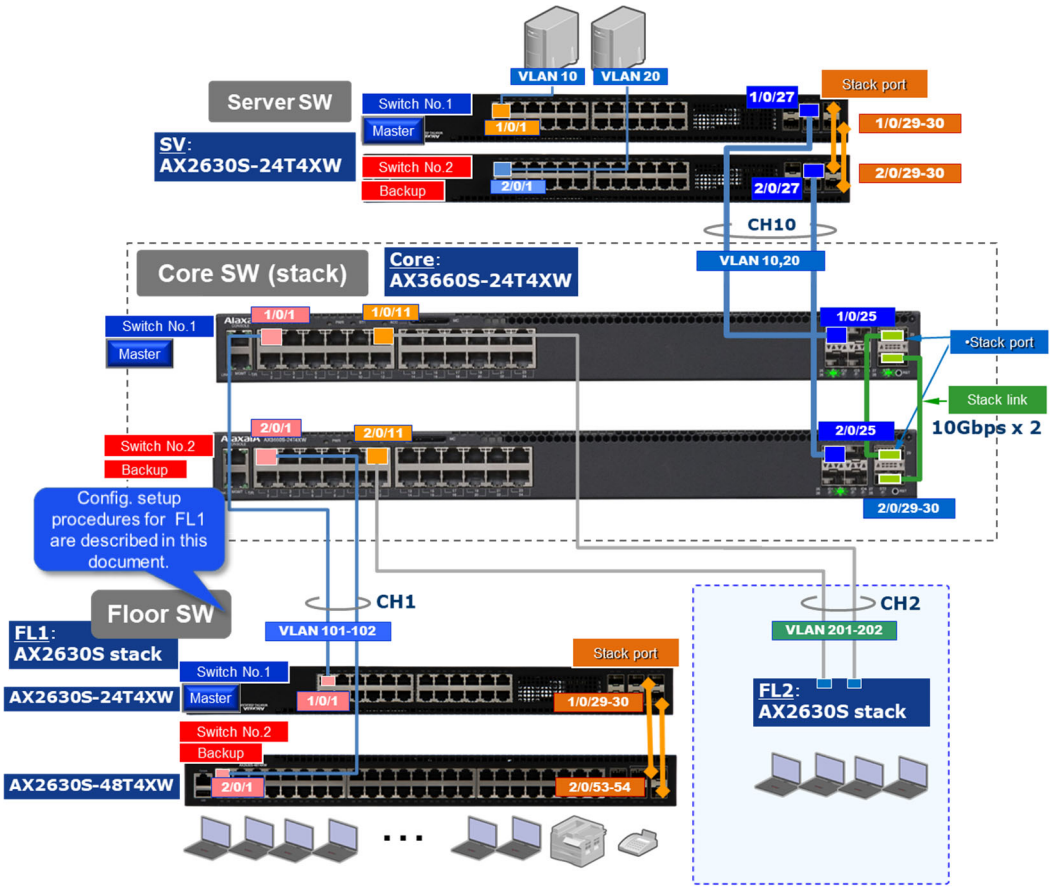


The table below shows the switch models and modules used in this example with required minimum quantities (not including PS, FAN, optical or UTP cables).

Switch application	Product		Descriptions	Qty.
Core switch	AX3660-24T4XW		L3 stack switch	2
		SFPP-CU (30cm)	Direct attach cable [for stack links]	2
		SFPP-SR	SFP+ optical transceiver [for 10G up-links]	2
Server switch	AX2630S-24T4XW		L2 stack switch	2
		SFPP-CU (30cm)	Direct attach cable [for stack links]	2
		SFPP-SR	SFP+ optical transceiver [10G up-links]	2
Floor switch	AX2630S-24T4XW		L2 stack switch [24-port model]	2
	AX2630S-48T4XW		L2 stack switch [48-port model]	2
		SFPP-CU (30cm)	Direct attach cable [for stack links]	4

3.2.1 System configuration diagram

In the diagram below, you can see the physical connections and logical configurations used in the setup example. Also, the diagram shows how to configure a core switch (Core), a server switch (SV), and floor switches (FLx). For the setup of floor switches (FL2), follow the steps described for FL1.



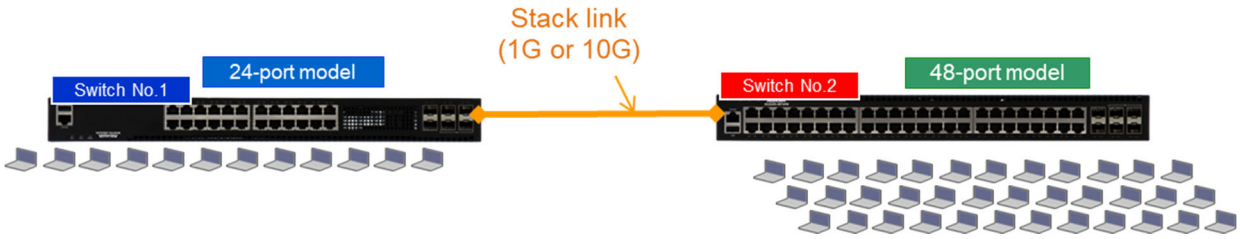
The configuration/setting tips in L2 stack here are the same as the tips described in **3.1.2 Configuration tips** and **3.1.3 Setup tips**, except for the floor switches. Note the following configuration tips when applying L2 stack to the floor switches.

3.2.2 Configuration tips

The configuration tips for this setup example are as follows.

(1) Possible to use different device models as the stack member switches.

In an AX2600S stack, you can use different device models as the stack members if you have licenses. Select appropriate models based on the floor switches capacity of accommodating terminal devices, required bandwidth of stack links/up-links, and so on.



3.2.3 Configuration setting example

This section exemplifies configuration settings for system setup.

(1) Configuration setting example for the core switch (Core: AX3660S x 2)

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Enabling a stack	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n): y	Enable the stack functionality. When a message prompting you to confirm the configuration changes and restart the switch appears, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# reload Operation command	Restart the switch manually.
Setting a stack	
(config)# interface range tengigabitethernet 1/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to `20`.
(config)# switch 2 provision 3660-24t4xw	Set the device model of member switch B.
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to `10`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
Setting a switch number	
# set switch 2 Operation command The switch number was changed to 2. When device restart, the change in the switch number is reflected.	Set the switch number to `2`. The switch number is incorporated after the switch is restarted. This is an operation command. Execute this command in administrator mode.
Enabling a stack	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n): y	Enable the stack functionality. When a message prompting you to confirm the configuration changes and restart the switch appears, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# reload Operation command	Restart the switch manually.
Setting a stack	
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to `1`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.
Next, connect the stack ports of member switches A and B. Member switch B automatically restarts, building a two-switch stack configuration. For details, see the ***AX Series L3 Box-type Switches Stack Installation Guide***.

◆ **Configuration settings for the core switch**

Configuration settings for the core (Core) switch	
Setting VLANs	
(config)# vlan 10,20,101-104,201-204	Specify the VLANs to be used. Data transfer VLANs: 10, 20, 101-104, 201-204
Setting port/channel groups	
(config)# interface range tengigabitethernet 1/0/25, tengigabitethernet 2/0/25 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 10 mode on (config-if-range)# exit (config)# interface range gigabitethernet 1/0/1, gigabitethernet 2/0/1 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 1 mode on (config-if-range)# exit (config)# interface range gigabitethernet 1/0/11, gigabitethernet 2/0/11 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 2 mode on (config-if-range)# exit	Configure the up-link port of the 10G interface. For ports 1/0/25 and 2/0/25, configure channel group 10 for server switch connections. Configure the down-link port of the 10G interface. For ports 1/0/1 and 2/0/1, configure channel group 1 for floor switch (FL1) connections. For ports 1/0/11 and 2/0/11, configure channel group 2 for floor switch (FL2) connections. Set the link-down detection time to 0 milliseconds for each port. Set link aggregation to static mode.
Setting port channels	
(config)# interface port-channel 10 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 10,20 (config-if)# exit (config)# interface port-channel 1 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 101-102 (config-if)# exit (config)# interface port-channel 2 (config-if)# switchport mode trunk (config-if)# switchport trunk allowed vlan 201-202 (config-if)# exit	Configure each port channel. Set each port channel to trunk mode and specify the VLANs to which the port channel belongs. Set the port channels as follows: Port channel 10: VLAN 10, 20 Port channel 1: VLAN 101-102 Port channel 2: VLAN 201-202
Setting IP addresses	
(config)# interface vlan 10 (config-if)# ip address 172.16.10.1 255.255.255.0 (config-if)# exit : (config)# interface vlan 101 (config-if)# ip address 192.168.1.254 255.255.255.0 (config-if)# exit : (config)# interface vlan 201 (config-if)# ip address 192.169.1.254 255.255.255.0 (config-if)# exit :	Set IP addresses for the data transfer VLANs. VLAN10: IP address：172.16.10.1/24 VLAN20: IP address：172.16.20.1/24 VLAN101: IP address：192.168.1.254/24 : VLAN102: IP address：192.168.2.254/24 VLAN201: IP address：192.169.1.254/24 : VLAN202: IP address：192.169.2.254/24

(2) Configuration setting example for the server switch (device SV: a stack using two AX2630S switches)

Before connecting cables to the stack ports, complete stack enablement/setup on each member switch.

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G uplink license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch A. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 1 Operation command The switch number was changed to 1. When device restart, the change in the switch number is reflected.	Set the switch number of member switch A to `1`. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch A. The stack functionality is enabled after the restart.
Setting a stack	
(config)# interface range tengigabitethernet 1/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to `20`.
(config)# switch 2 provision 2630-24t4xw	Set the device model of member switch B.
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to `10`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G uplink license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch B. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter `y`.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
# set switch 2 The switch number was changed to 2. When device restart, the change in the switch number is reflected. Operation command	Set the switch number of member switch B to 2. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch B. The stack functionality will be enabled.
Setting a stack	
(config)# interface range tengigabitethernet 2/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to 1.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.
Next, connect the stack ports of member switches A and B. Member switch A, which has a higher master selection priority, is selected as the master. The device information including configuration settings will be deployed from the master switch to member switch B, building a two-switch stack configuration.

Configuration settings for the server switch (SV)	
Setting VLANs	
(config)# vlan 10,20	Specify the VLANs to be used. Data transfer VLANs: 10, 20
Disabling the Spanning Tree Protocol	
(config)# spanning-tree disable	Disable the Spanning Tree Protocol.
Setting channel groups	
(config)# interface range tengigabitethernet 1/0/27, tengigabitetherbet 2/0/27 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 10 mode on (config-if)# exit	Configure channel groups. Configure channel group 10 for core switch (Core) connections. Set the link-down detection time to 0 milliseconds. Set link aggregation to static mode.
Setting ports.	
(config)# interface port-channel 10 (config-if-range)# switchport mode trunk (config-if-range)# switchport trunk allowed vlan 10,20 (config-if)# exit (config)# interface gigabitethernet 1/0/1 (config-if)# switchport mode access (config-if)# switchport access vlan 10 (config-if)# exit (config)# interface gigabitethernet 2/0/1 (config-if)# switchport mode access (config-if)# switchport access vlan 20 (config-if)# exit	Configure each port. Set channel group 10 as the trunk port and configure VLANs 10 and 20 for data transfer. Specify the ports to be connected to the server. Configure the VLAN assigned to each port as an access port.

(3) Configuration setting example for a floor switch (device FL1：a stack using two AX2630S switches)

Before connecting cables to the stack ports, complete stack enablement/setup on each member switch. In this example, a stack is configured using the two different models; Switch 1 (AX2630S-24T4XW) and Switch 2 (AX2630S-48T4XW).

◆ **Configuration settings for making standalone switches into a stack**

Configuration settings for member switch A: Master switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G uplink license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch A. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter y.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 1 Operation command The switch number was changed to 1. When device restart, the change in the switch number is reflected.	Set the switch number of member switch A to 1. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch A. The option license will be valid.
Setting a stack	
(config)# interface range tengigabitethernet 1/0/29-30 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch A (switch No. 1) as the stack port.
(config)# switch 1 priority 20	Set the master selection priority of member switch A (switch No. 1) to 20.
(config)# switch 2 provision 2630-48t4xw	Set the device model of member switch B.
(config)# interface range tengigabitethernet 2/0/53-54 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 10	Set the master selection priority of member switch B (switch No. 2) to 10.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

Configuration settings for member switch B: Backup switch(candidate)	
Setting a license	
# set license key-code <license ley> Operation command	Set an option license by executing the command. In this example, the stack license ***OP-STK*** and the 10G uplink license ***OP-ULTG*** are used.
# reload -f no-dump-image Operation command	Restart member switch B. The option license will be valid.
Enabling a stack	
(config)# no system zero-touch-provisioning	Disable Zero Touch Provisioning.

Configuration settings for member switch B: Backup switch(candidate)	
(config)# stack enable After this command execute, please save configuration editing now in startup-config, and please reboot a device. Do you wish to continue ? (y/n):**y**	Enable the stack functionality. When a warning message appears, telling that a stack will be enabled after the restart but configuration settings will be lost, enter y.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.
# set switch 2 Operation command The switch number was changed to 2. When device restart, the change in the switch number is reflected.	Set the switch number of member switch B to 2. The switch number is incorporated after the switch is restarted.
# reload -f no-dump-image Operation command	Restart member switch B. The option license will be valid.
Setting a stack	
(config)# interface range tengigabitethernet 2/0/53-54 (config-if-range)# switchport mode stack (config-if-range)# exit	Set the Ethernet interface of member switch B (switch No. 2) as the stack port.
(config)# switch 2 priority 1	Set the master selection priority of member switch B (switch No. 2) to 1.
(config)# save (config)# exit	Save the configuration. Exit the configuration command mode and enter the administrator mode.

This completes the configuration settings for making the two switches into a stack.

Next, connect the stack ports of member switches A and B. Member switch A, which has a higher master selection priority, is selected as the master. The device information including configuration settings will be deployed from the master switch to member switch B, building a two-switch stack configuration.以上で、

Configuration settings for floor switch FL1	
Setting VLANs	
(config)# vlan 101-102	Specify the VLANs to be used. Data transfer VLANs: 101, 102
Disabling the Spanning Tree Protocol	
(config)# spanning-tree disable	Disable the Spanning Tree Protocol.
Setting channel groups	
(config)# interface range gigabitethernet 1/0/1, gigabitethernet 2/0/1 (config-if-range)# link debounce time 0 (config-if-range)# channel-group 1 mode on (config-if)# exit	Configure channel groups. Configure channel group 1 for core switch (Core) connections. Set the link-down detection time to 0 milliseconds. Set link aggregation to static mode.
Setting ports	

Configuration settings for floor switch FL1	
(config)# interface port-channel 1 (config-if-range)# switchport mode trunk (config-if-range)# switchport trunk allowed vlan 101-102 (config-if)# exit (config)# interface range gigabitethernet 1/0/3-24 (config-if)# switchport mode access (config-if)# switchport access vlan 101 : (config)# interface range gigabitethernet 2/0/3-48 (config-if)# switchport mode access (config-if)# switchport access vlan 102 :	Configure each port. Set interface port channel 1 as the trunk port and configure VLANs 101-102 for data transfer. Specify the ports to be connected to the terminals. Configure the VLAN assigned to each port as an access port.

For floor switch FL2, no configuration setting example is given here, as FL2 has the same configuration settings as FL1 except for the VLANs to which its ports belong and the channel group numbers. See the configuration setting example for device FL1.

The configuration files for the devices explained above are provided with this document. For details, see (2) **Applying L2 stack to the floor switch**.

4. Operation Management

This chapter describes stack status checking. For other operation and maintenance-related information, see the separate ***AX2600 Series Stack Operation Guide (Operation and Maintenance)***, which describes the stack operation commands, software update procedures, member switch replacement, and the like.

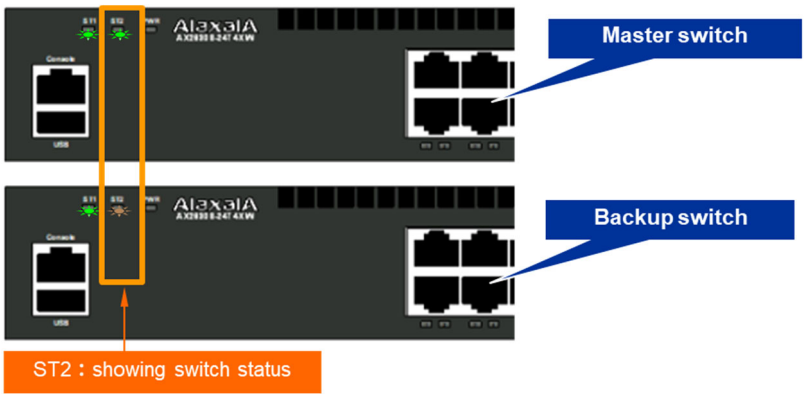
4.1 Status Checking

(1) Check by display panels

You can check the stack status by LED on the front panel of a switch. You can check it by whether or not LED (ST2) is lit. For standalone switches, all these LEDs are in power-off state.

LED name	Switch status	LED status
ST2	Initial state	Powered off
	Master	Lit in green
	Backup	Lit in orange

When there is MC in the device, its status is shown (stack status is not shown).
For details on LED (ST2) status, see the ***Hardware Installation Guide***.



(2) Check via console

To check the status of a member switch, you must enter device administrator mode and input the operation command `show switch [detail]`. Below are the sample outputs of switch/stack status information.

Status	Displayed item	Displayed information	Meaning
Stack operating status	Stack status	Enable	Running as a stack
		Disable	Running as standalone
Member switch status	Switch status	Master	Master switch
		Backup	Backup switch
		Init	Initializing

◆ Standalone state

```
# show switch
Date 2023/07/22 11:43:28 UTC
Stack status : Disable        Switch No : 1
                    …【Standalone state (stack functionality disabled)】
```

This is a sample output displayed when the stack functionality is disabled. In this case, the switch is running as a standalone switch.

◆ Stack enabled state

```
# show switch                    ····· Stack functionality is enabled.
Date 2023/07/22 11:48:04 UTC
Stack status : Enable          Switch No : 1
System MAC Address : 0012.e292.xxxx
No  Switch status  Model          Machine ID      Priority  Ver
 1  Master         2630-24t4xw    0012.e292.xxx0  20        1
     ··· Single-switch stack state
```

This is a sample output displayed when the stack functionality is enabled and the switch is restarted. In this case, the switch is running as a single-switch stack.

◆ Two-switch stack state

```
# show switch                    ·····Stack functionality is enabled.
Date 2023/07/22 12:05:31 UTC
Stack status : Enable          Switch No : 1 ··· Switch number
System MAC Address : 0012.e292.d980
No  Switch status  Model          Machine ID      Priority  Ver
 1  Master         2630-24t4xw    0012.e292.xxx0  20        1
 2  Backup         2630-24t4xw    0012.e242.xxx1  10        1
     ··· Two-switch stack state
```

This is a sample output displayed when the two switches are running as a two-switch stack. Switch No. 1 is running as the master switch, and switch No. 2 is running as the backup switch.

◆ Detailed member switch information

```
# show switch detail
Date 2023/07/22 12:05:48 UTC
Stack status : Enable          Switch No : 1
System MAC Address : 0012.e292.xxx0
No  Switch status  Model          Machine ID      Priority  Ver
 1  Master         2630-24t4xw    0012.e292.xxx0  20        1
 2  Backup         2630-24t4xw    0012.e242.xxx1  10        1
Port      Status           Neighbor(Port    Model          Machine ID)
1/0/29    Up(Forwarding)             2/0/29  2630-24t4xw    0012.e242.xxx1
1/0/30    Up(Forwarding)             2/0/30  2630-24t4xw    0012.e242.xxx1
2/0/29    Up(Forwarding)             1/0/29  2630-24t4xw    0012.e292.xxx0
2/0/30    Up(Forwarding)             1/0/30  2630-24t4xw    0012.e292.xxx0
  ··· Stack port status】          ··· Neighboring member switch information
```

If the [detail] option is specified, detailed information including stack port status and neighboring member switch information is displayed.

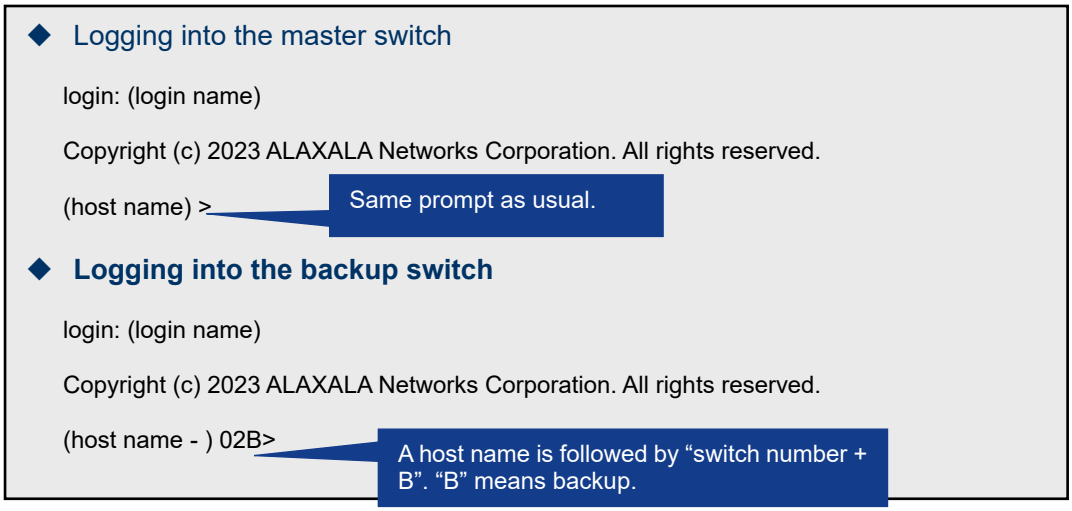
5. Considerations

(1) Configuration editing

To edit a configuration, be sure to use the master switch. When editing a configuration from the backup switch, connect to the master switch beforehand by the operation command `session`.

(2) Device login

When you connect to the system remotely, be sure to log into the master switch. When you log into the master or backup switch via console, the following command prompt is displayed.



Appendix: Configuration Files

The text files containing the configurations used in the stack system examples of Chapter 3 are provided with this document file (Adobe Reader 6.0 or later is needed to read the attached files). For details, see below.

(1) Applying L2 stack to the distribution switch

Switch application	Device name / target device	Config. Host name	File name
Core switch	C1 ：AX3660S	Core	1_C1-AX36S.txt
Server switch	SV1：AX2630S	SV	1_SV1-AX26S.txt
Distribution switch	DS1：AX2630S	DS1	1_DS1-AX26S.txt
	DS2：AX2630S	DS2	1_DS2-AX26S.txt
Floor switch	FL1：AX2340S	FL1	1_FL1-AX23S.txt
	FL2：AX2340S	FL2	1_FL2-AX23S.txt
	FL3：AX2340S	FL3	1_FL3-AX23S.txt
	FL4：AX2340S	FL4	1_FL4-AX23S.txt

(2) Applying L2 stack to the floor switch

Switch application	Device name / target device	Config. Host name	Switch application
Core switch	C1 ：AX3660S	Core	2_C1-AX36S.txt
Server switch	SV1：AX2630S	SV	2_SV1-AX26S.txt
Floor switch	FL1：AX2630S	FL1	2_FL1-AX26S.txt
	FL2：AX2630S	FL2	2_FL2-AX26S.txt

First edition issued, September 2023
Document No. NTS-23-R-001

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