Chassis Switches (S97S93S77) CSS Features and Configuration

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Foreword

- A single switch cannot support increasing access to a data center or provide high network reliability. To meet the forwarding requirements of the data center and improve network reliability, the CSS technology is used.

- This course introduces the CSS features and configuration of Huawei Chassis Switches.

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Objectives

- Upon completion of this course, you will be able to:

    - Describe the principles of CSS

    - Describe the CSS features on Huawei Chassis Switches

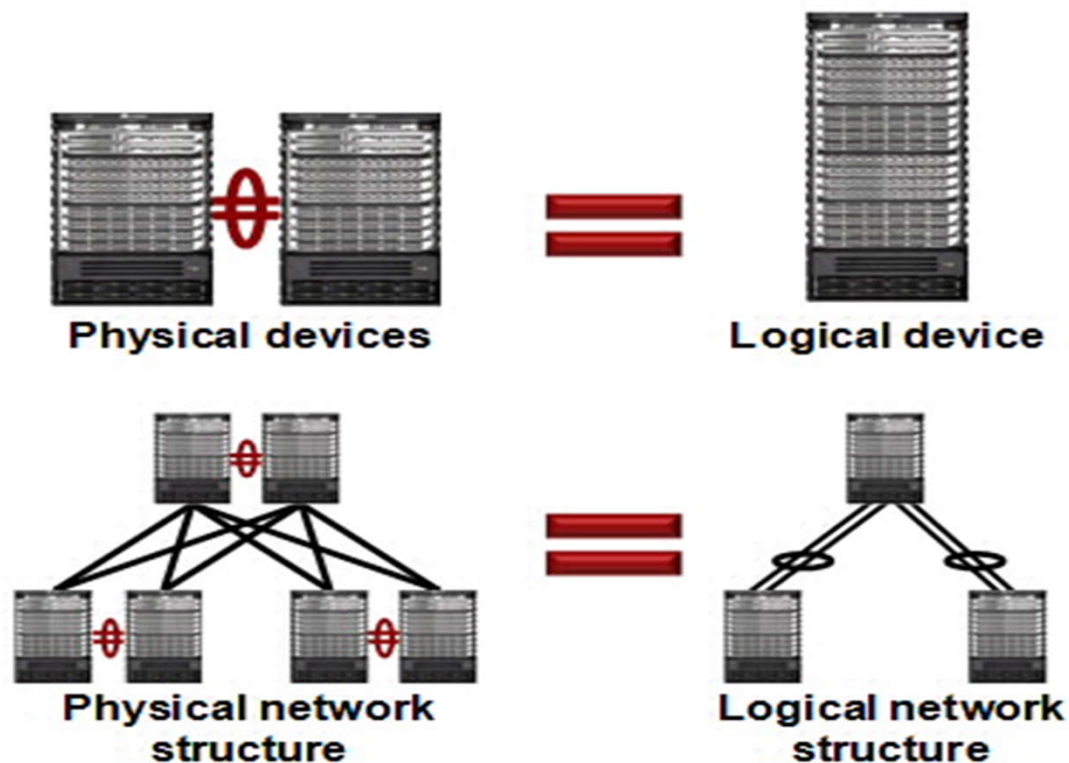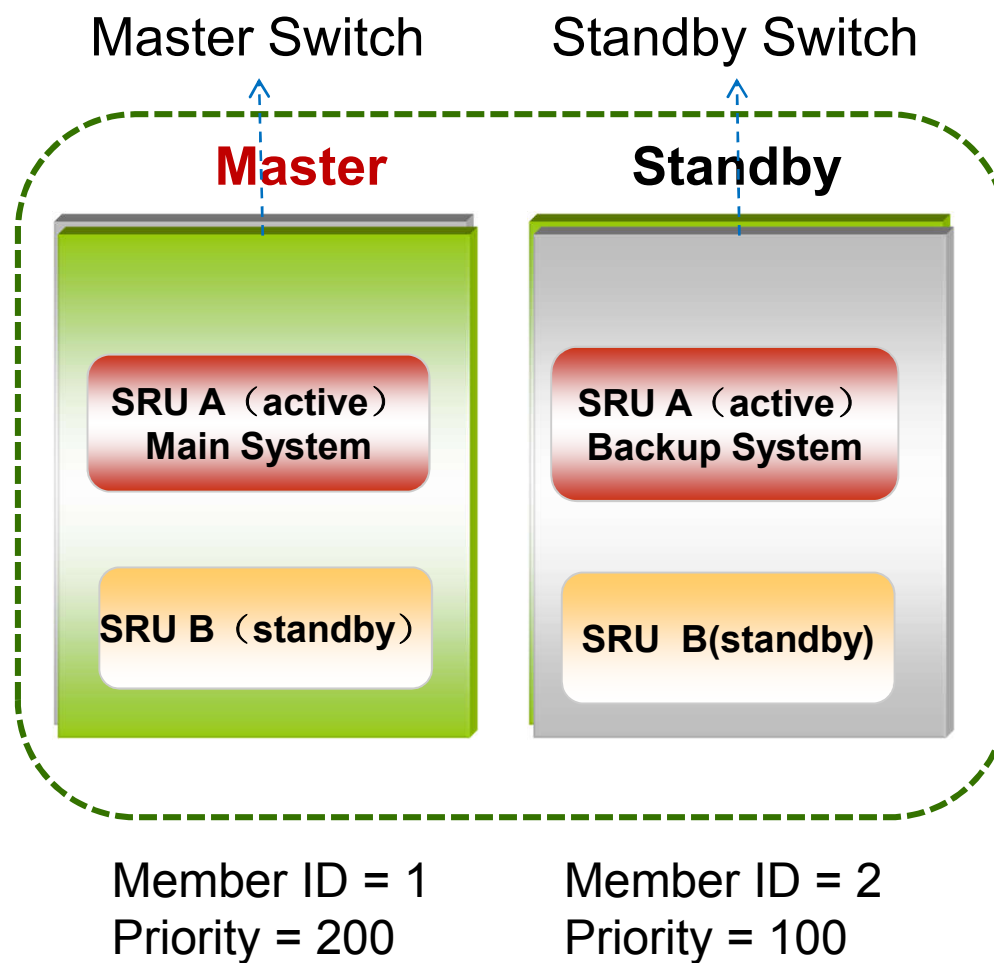   - Configure CSS features on Huawei Chassis Switches

Contents

- **Principles of CSS**

- CSS Features on Huawei Chassis Switches

- CSS Configuration

- CSS Application Scenarios

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CSS Overview

- Cluster switch system (CSS) allows multiple stacking-capable switches to function as a single logical switch.
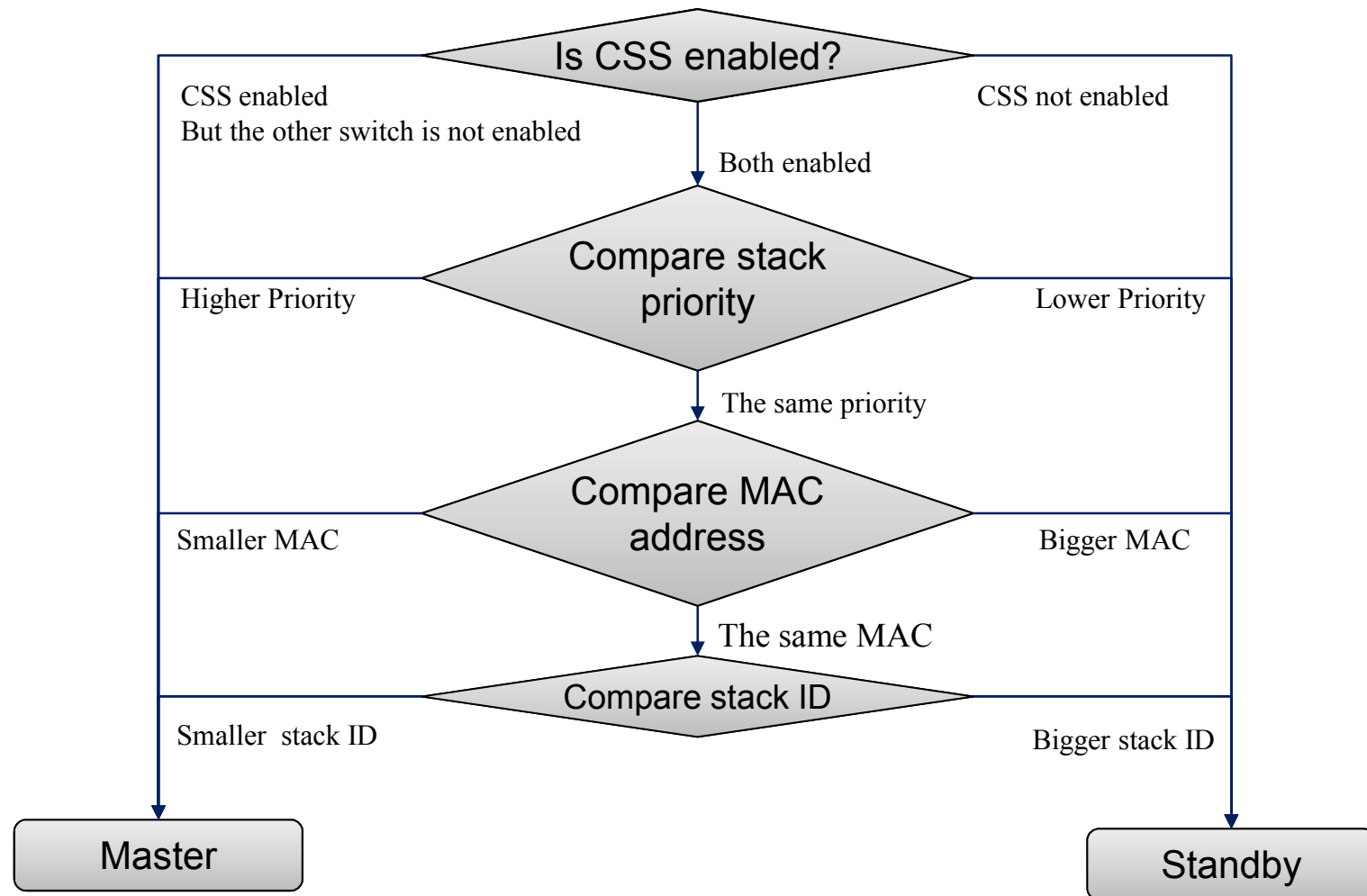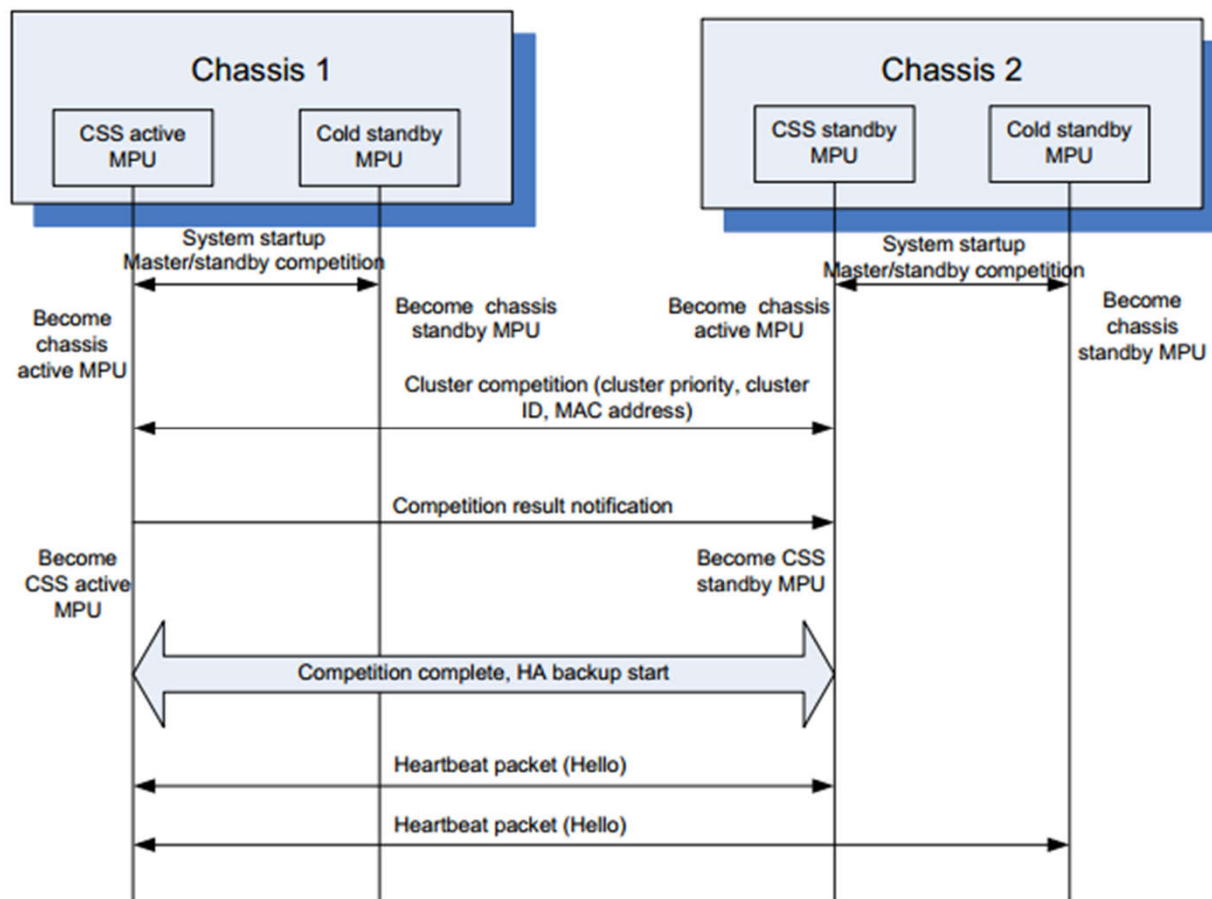

Physical devices = Logical device

Physical network structure = Logical network structure

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CSS Related Concepts

Master Switch   Standby Switch

Master   **Standby**

SRU A（active）
Main System

SRU B（standby）

SRU A（active）
Backup System

SRU B(standby)

Member ID = 1
Priority = 200

Member ID = 2
Priority = 100

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Setting Up a CSS

Flowchart:

Is CSS enabled?
- CSS enabled But the other switch is not enabled → Master
- CSS not enabled → Standby
- Both enabled ↓

Compare stack priority
- Higher Priority → Master
- Lower Priority → Standby
- The same priority ↓

Compare MAC address
- Smaller MAC → Master
- Bigger MAC → Standby
- The same MAC ↓

Compare stack ID
- Smaller stack ID → Master
- Bigger stack ID → Standby

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Figure 2-5 CSS setup process

When a CSS is set up

- Changes of IP address and MAC address

  - Master IP & MAC → CSS IP & MAC

- Changes of interface number

  - 3 sections to 4 sections

  - G1/0/1 → G2/1/0/1

- Changes of data forwarding

  - Traffic through CSS link

- Configuration files backup and recovery

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Preferential Forwarding of Local Traffic

CSS

CSS

—————— CSS Link

- - - - - ► Service Flow

◯ Eth-Trunk

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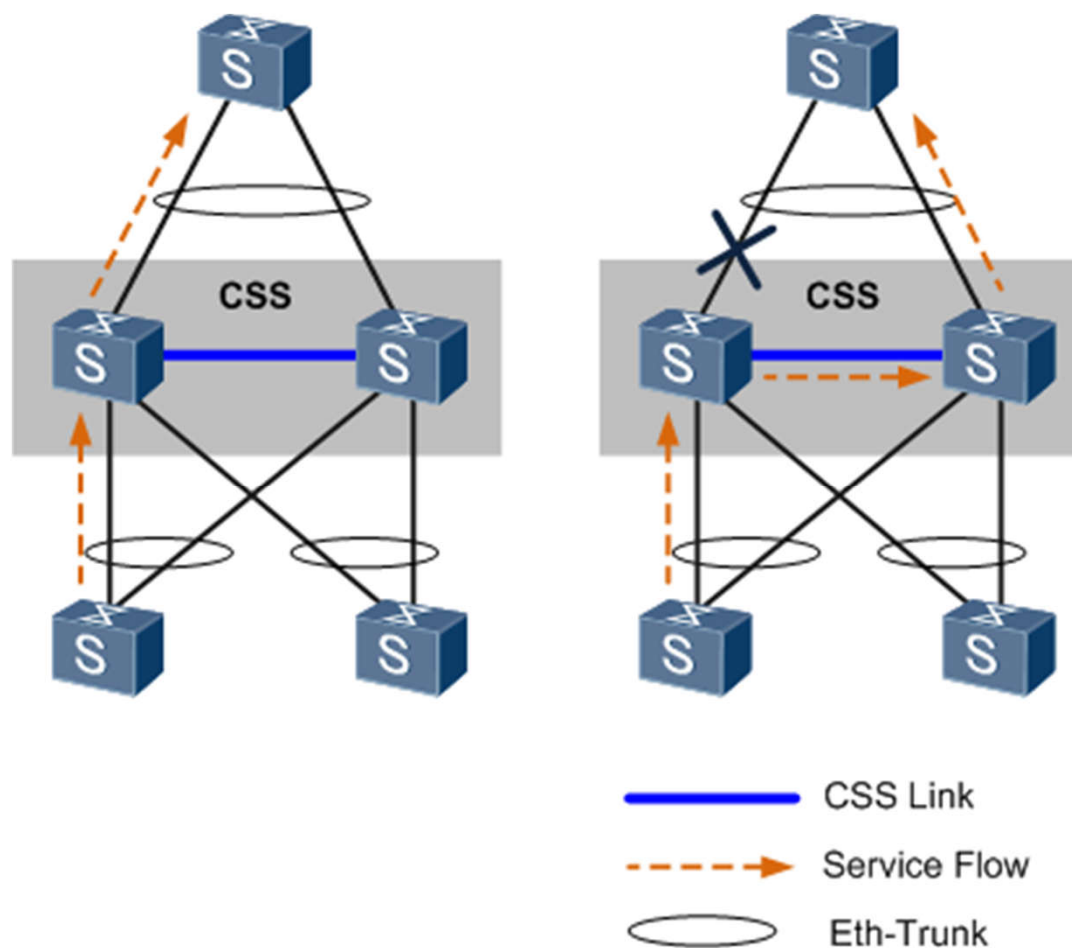
Backing Up and Restoring Configuration Files

- When a device enters the CSS state, it automatically backs up the previous configuration file. In this manner, the device can restore the previous configuration after the CSS function is disabled.

- Automatically backing up when enable CSS

  - .cfg $\rightarrow$ .cfg.bak

  - .zip $\rightarrow$ .zip.bak

- Manually restoring when disable CSS

Active/Standby Switchover
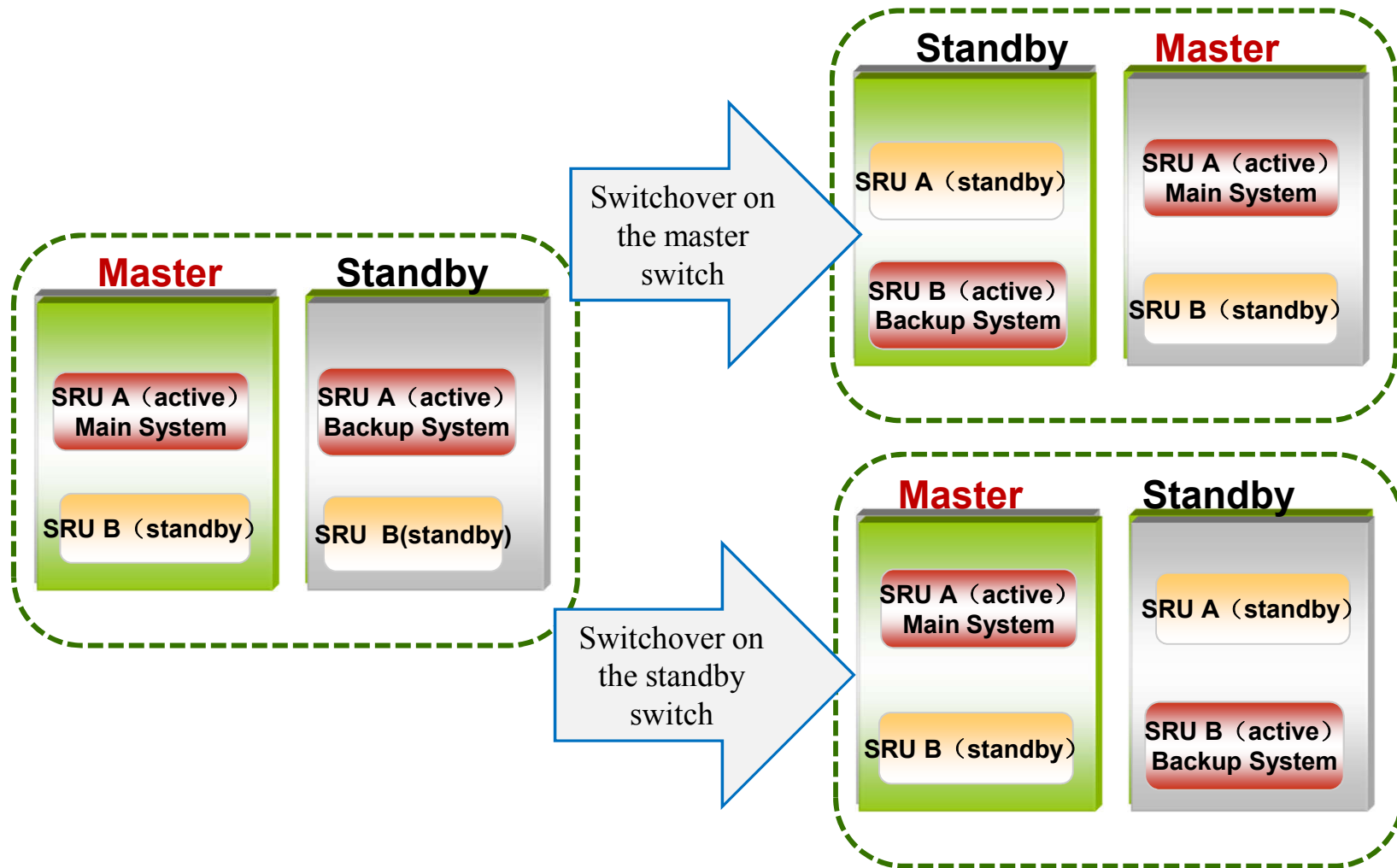
CSS Split

- After a CSS is set up, the master switch and the standby switch periodically send heartbeat packets to each other to maintain the CSS status. If a stack cable is faulty, communication between the two switches may fail. In this case, the heartbeat packets between the two switches time out and the CSS splits into two independent switches as shown.
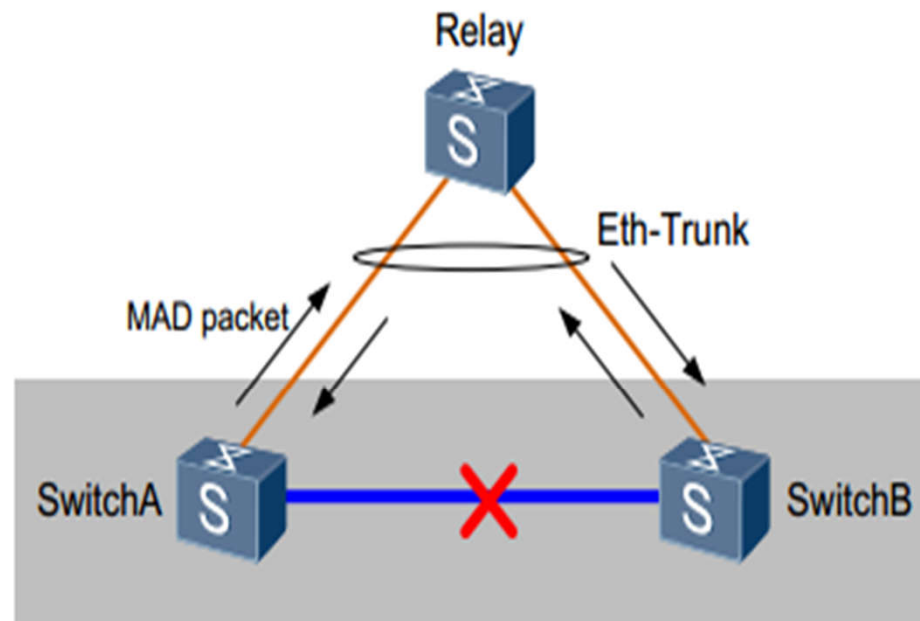
Multi-active Detection
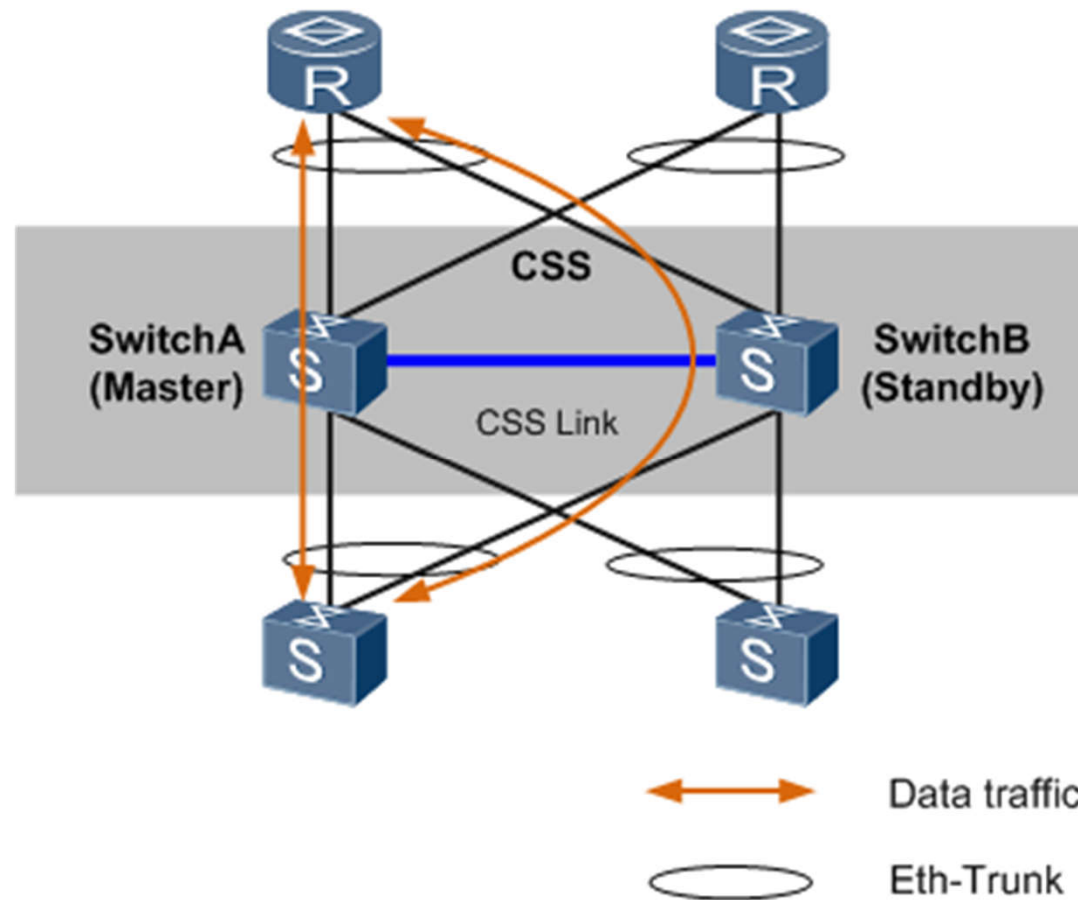
- MAD has two modes:
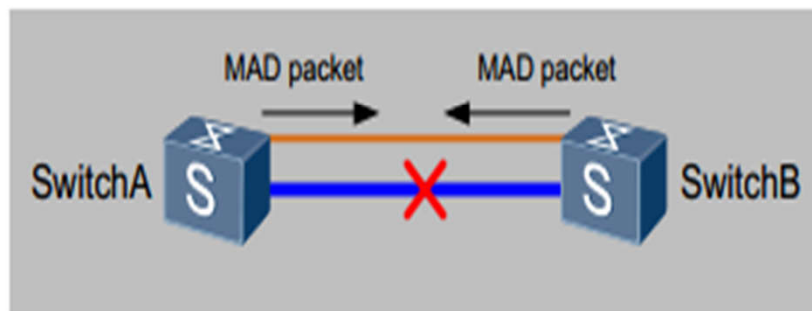
MAD in relay mode

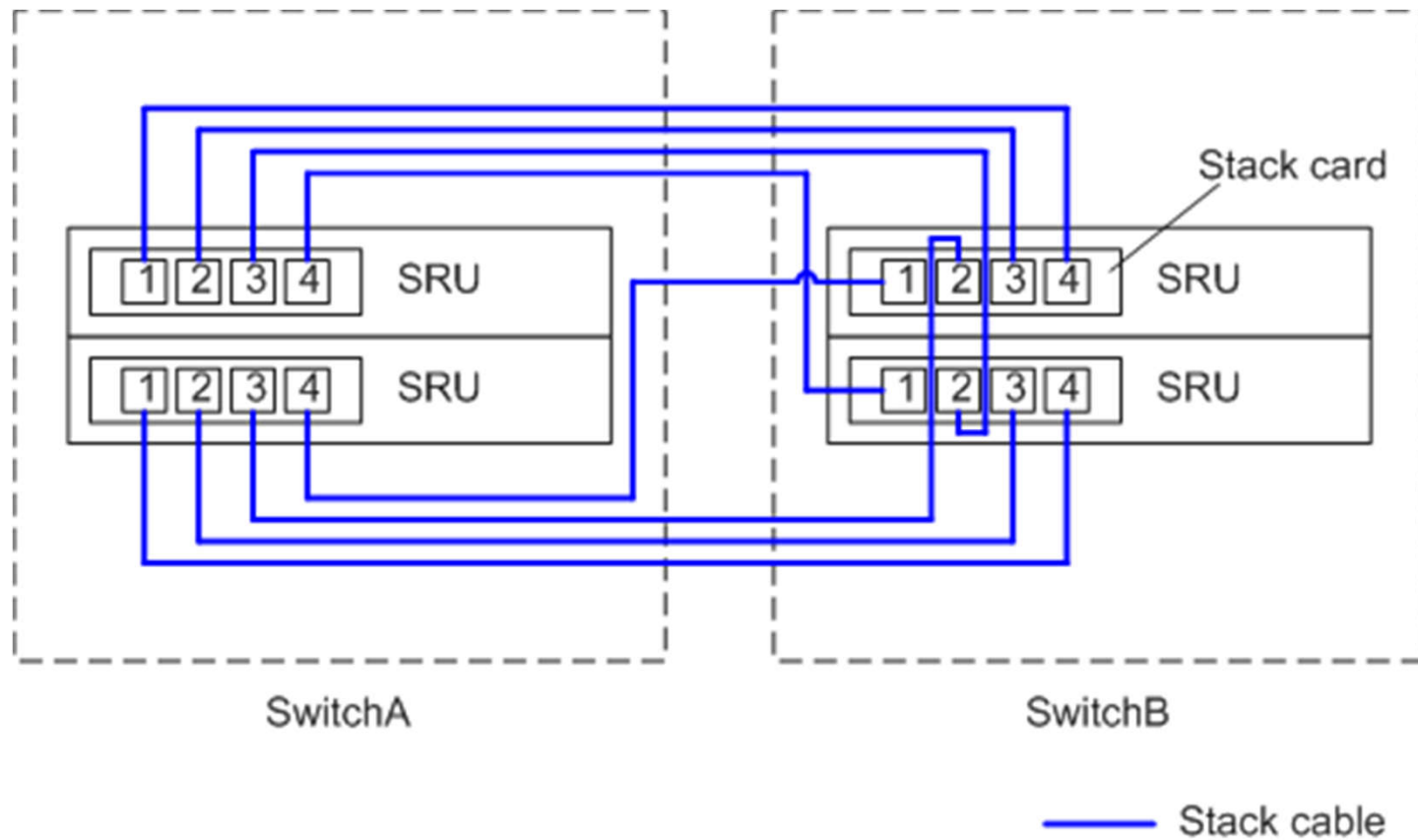MAD in direct mode

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Fast Upgrade

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- Principles of CSS

- **CSS Features on Huawei Chassis Switches**

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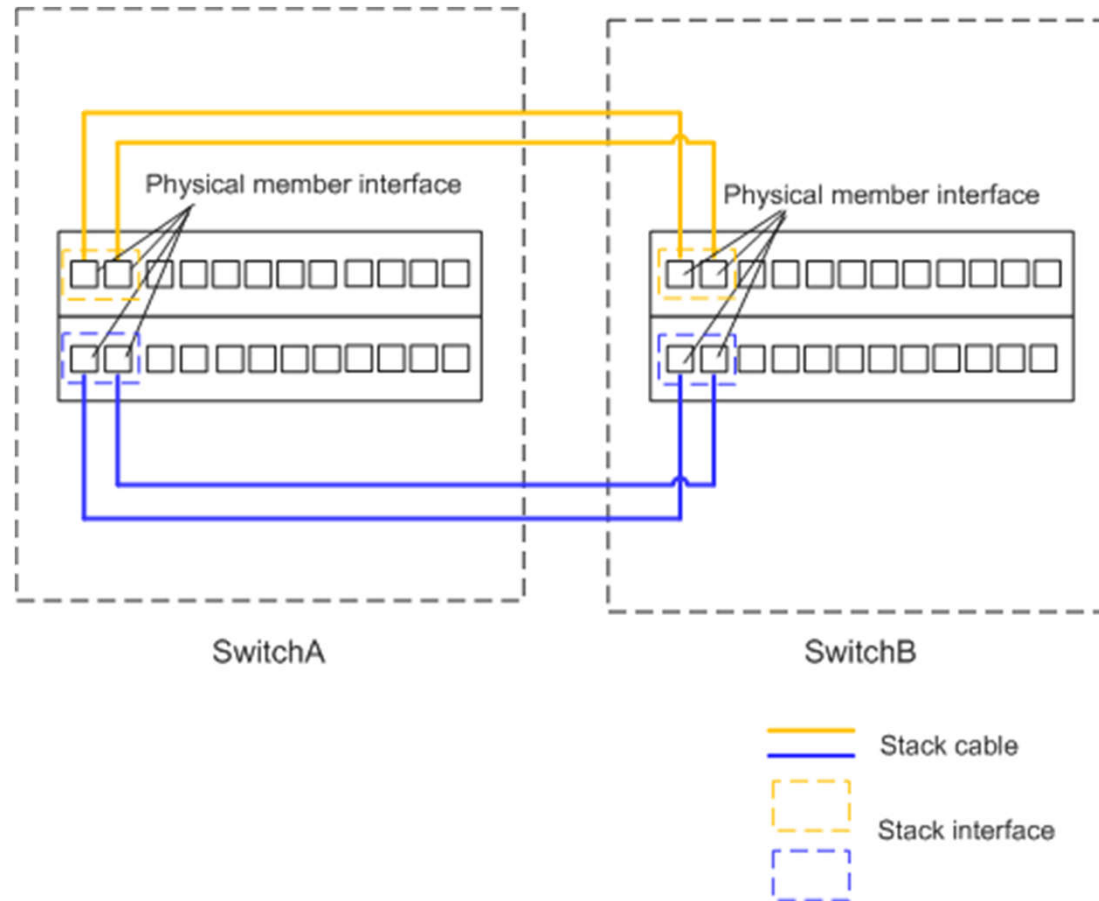
- CSS Application Scenarios

Connection of Stack Cables

- Member switches in a CSS can be connected in two modes: stack card connection and service interface connection.

  - S9703, S9303, S7703 do not support CSS

  - S9306, S9312 and S7706, S7712 support both stack card connection and service interface connection

  - S9706, S9712 support only service interface connection

  - A same series of switches support hybrid CSS:

    - A CSS formed by a S9706 and a S9712
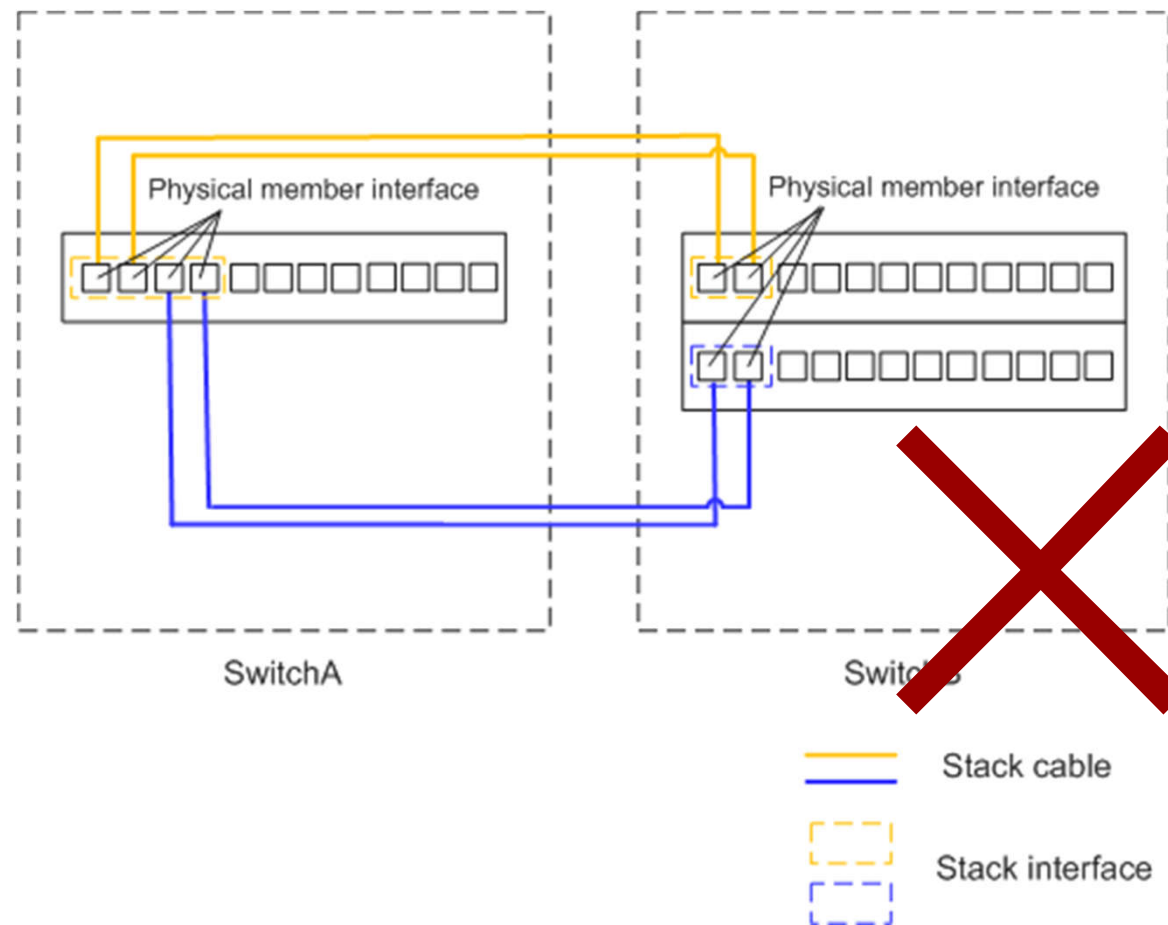
    - A CSS formed by a S7706 and a S7712

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Stack card connection

Service interface connection

SwitchA   SwitchB

Stack cable

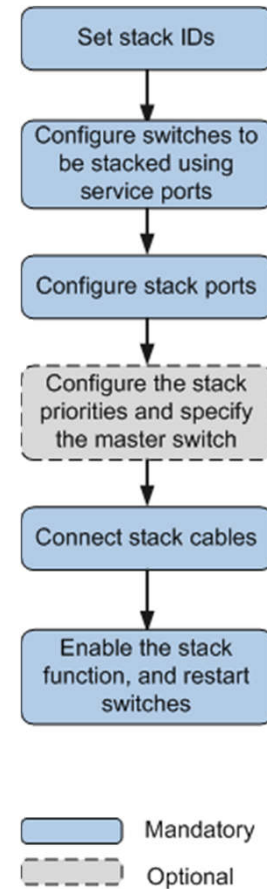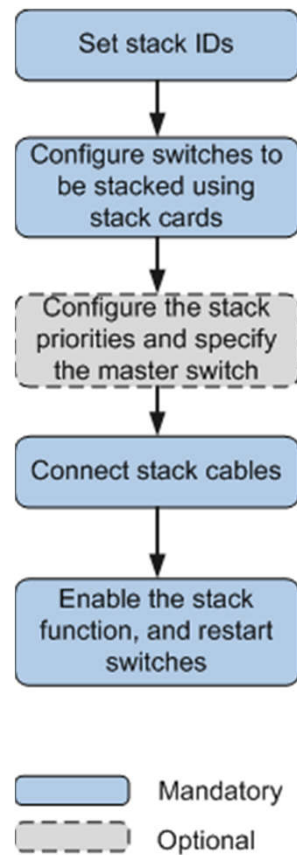Stack interface

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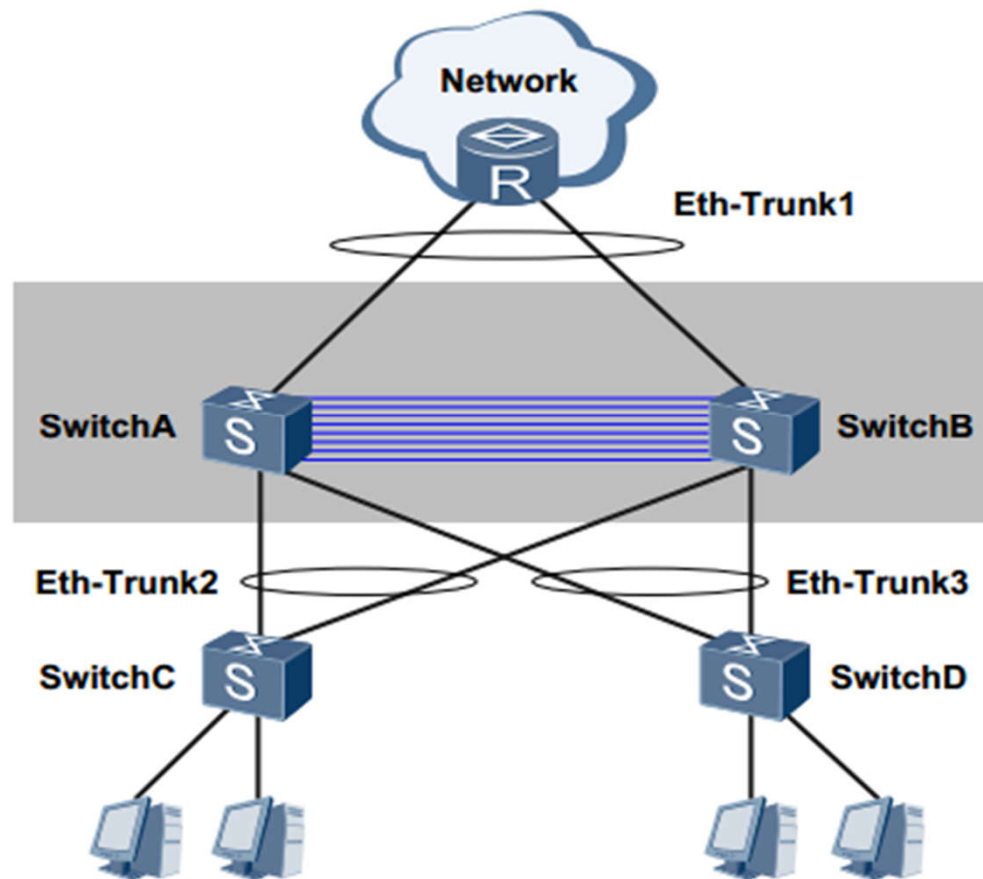# Connection Precautions

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- Principles of CSS

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Configuration Procedure

Set stack IDs
→
Configure switches to be stacked using stack cards
→
Configure the stack priorities and specify the master switch
→
Connect stack cables
→
Enable the stack function, and restart switches

Mandatory
Optional

Set stack IDs
→
Configure switches to be stacked using service ports
→
Configure stack ports
→
Configure the stack priorities and specify the master switch
→
Connect stack cables
→
Enable the stack function, and restart switches

Mandatory
Optional

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Configuring CSS Card Connection

Figure 4-1 Diagram of configuring CSS card connection

Configuring SwitchA

Set the stack priority of SwitchA to 200 and configure service interface connection.
[SwitchA] **set css id 1**
[SwitchA] **set css priority 200**
[SwitchA] **set css mode css-card**
Enable the CSS function on SwitchA and restart SwitchA.
[SwitchA] **css enable**
Warning: The CSS configuration takes effect only after the system is rebooted. T
he next CSS mode is lpu. Reboot now? [Y/N]:y

Configuring SwitchB

Set the stack ID of SwitchB to 2 and the stack priority to 100. Configure service interface connection.
[SwitchB] **set css id 2**
[SwitchB] set css priority 100
[SwitchB] set css mode css-card
[SwitchB] css enable
Warning: The CSS configuration takes effect only after the system is rebooted. T
he next CSS mode is lpu. Reboot now? [Y/N]:y

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Verifying the configuration

Check the CSS status.
```
<SwitchA> display css status all
Property Item         Property Value
Chassis ID            1
Priority              200
Enable switch         On
CSS master force      Off
CSS status            master
CSS mode              css-card
Property Item         Property Value
Chassis ID            2
Priority              100
Enable switch         On
CSS master force      Off
CSS status            backup
CSS mode              css-card
```

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Configuring a CSS Through Service Interface Connection
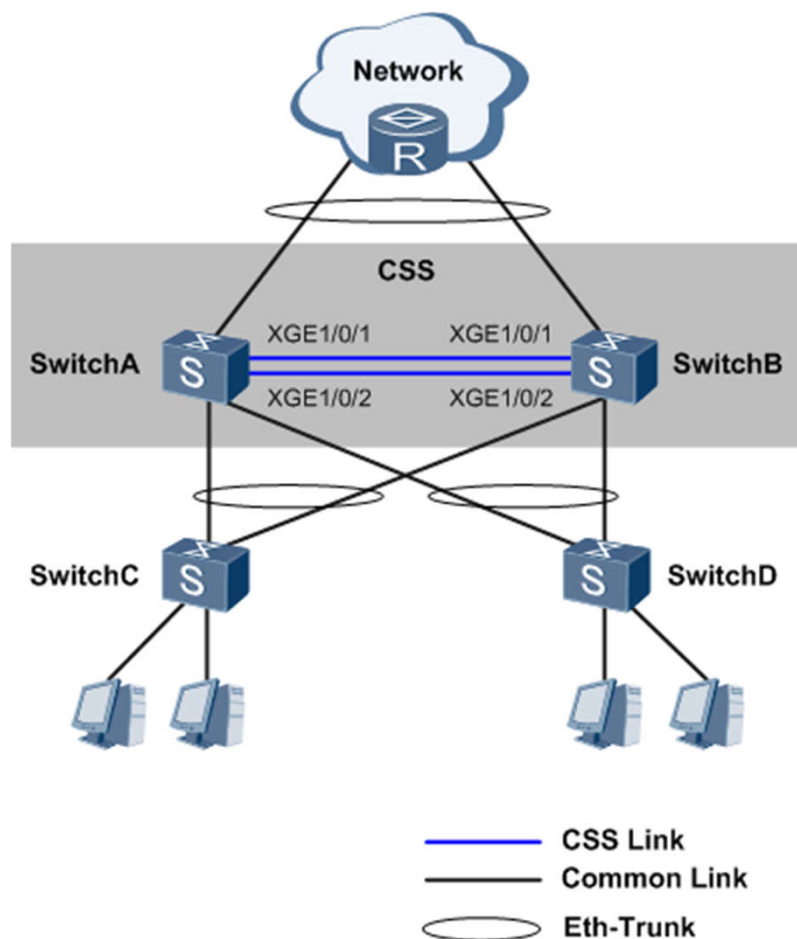
- As shown in the figure, SwitchA and SwitchB form a CSS and interfaces XGE1/0/1 and XGE1/0/2 are added to stack interfaces.

Configuration Roadmap

- Configure the stack ID, stack priority, and connection mode of a switch to form a CSS.

- Configure a stack interface to forward data packets between member switches.

- Enable the CSS function on switches to make the configuration take effect and set up a CSS successfully.

- Use stack cables or optical fibers to connect stack interfaces on devices and restart the devices.

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Configuring SwitchA

Set the stack priority of SwitchA to 200 and configure service interface connection.
[SwitchA] **set css id 1**
[SwitchA] **set css priority 200**
[SwitchA] **set css mode lpu**
Configure service interface XGE1/0/1 and XGE1/0/2 on SwitchA as physical member interfaces and add the interfaces to a stack interface.
[SwitchA] **interface css-port 1**
[SwitchA-css-port1/1] **port interface xgigabitethernet 1/0/1 to xgigabitethernet 1/0/2**
Enable the CSS function on SwitchA and restart SwitchA.
[SwitchA] **css enable**
Warning: The CSS configuration takes effect only after the system is rebooted. The next CSS mode is lpu. Reboot now? [Y/N]:y

Configuring SwitchB

Set the stack ID of SwitchB to 2 and the stack priority to 100. Configure service interface connection.
[SwitchB] **set css id 2**
[SwitchB] set css priority 100
[SwitchB] set css mode lpu
Configure service interface XGE1/0/1 and XGE1/0/2 on SwitchB as physical member interfaces and add the interfaces to a stack interface.
[SwitchB] interface css-port 1
[SwitchB-css-port1/1] port interface xgigabitethernet 1/0/1 to xgigabitethernet 1/0/2
Enable the CSS function on SwitchB and restart SwitchB.
[SwitchB] css enable
Warning: The CSS configuration takes effect only after the system is rebooted. The next CSS mode is lpu. Reboot now? [Y/N]:y

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Verifying the configuration

Check the CSS status.
```
<SwitchA> display css status all
Property Item          Property Value
Chassis ID          1
Priority           200
Enable switch        On
CSS master force       Off
CSS status          master
CSS mode           lpu
Property Item          Property Value
Chassis ID          2
Priority           100
Enable switch        On
CSS master force       Off
CSS status          backup
CSS mode           lpu
```

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Configuring DAD in Direct Mode
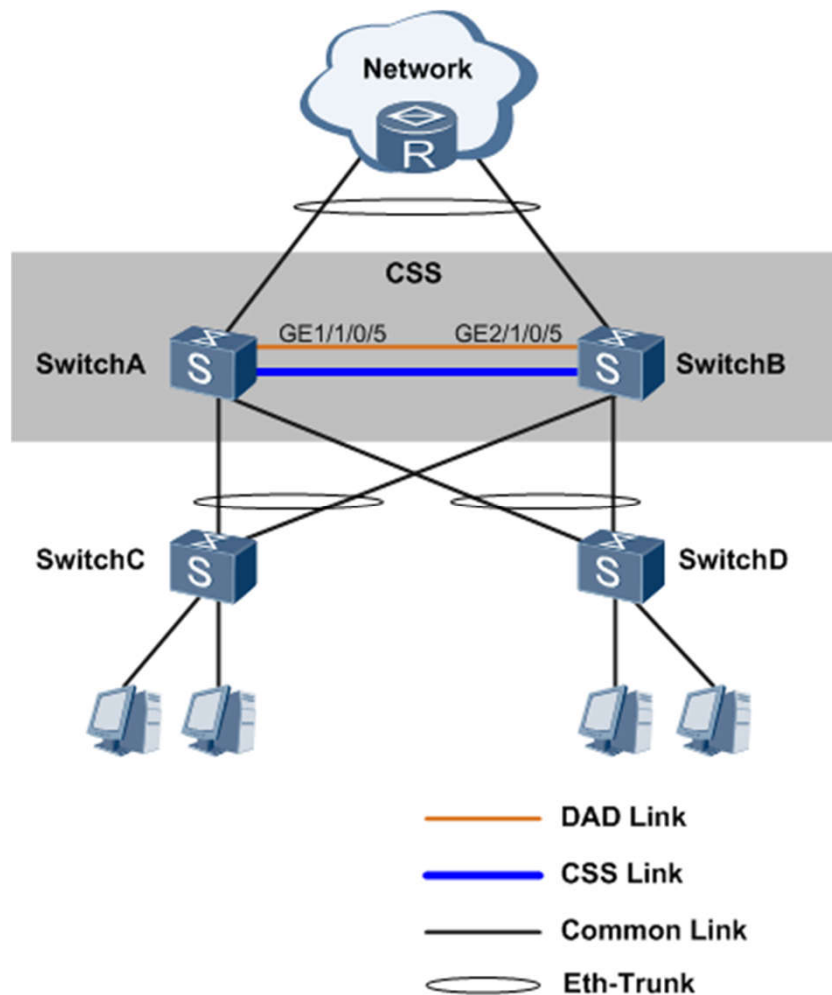
- As shown in the figure , SwitchA and SwitchB form a CSS. The stack IDs of SwitchA and SwitchB are 1 and 2 respectively. DAD in direct mode needs to be configured on interfaces G1/1/0/5 and G2/1/0/5.

Configuration procedure

```
# Configure DAD in direct mode on GigabitEthernet1/1/0/5.
<Quidway> system-view
[Quidway] interface gigabitethernet 1/1/0/5
[Quidway-GigabitEthernet1/1/0/5] dual-active detect mode direct
Warning: This command will block the port, and no other configs running on
 this  port is recommended. Continue?[Y/N]:y
# Configure DAD in direct mode on 1GigabitEthernet2/1/0/5.
<Quidway> system-view
[Quidway] interface gigabitethernet 2/1/0/5
[Quidway-GigabitEthernet2/1/0/5] dual-active detect mode direct
Warning: This command will block the port, and no other configs running on
 this  port is recommended. Continue?[Y/N]:y
```

When a CSS is setup, it is only need to configure on the master switch.

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Verifying the configuration

Check detailed DAD configuration.
<Quidway> display dual-active verbose
Current DAD status: Detect
Dual-active direct detect interfaces configured:
 GigabitEthernet1/1/0/5
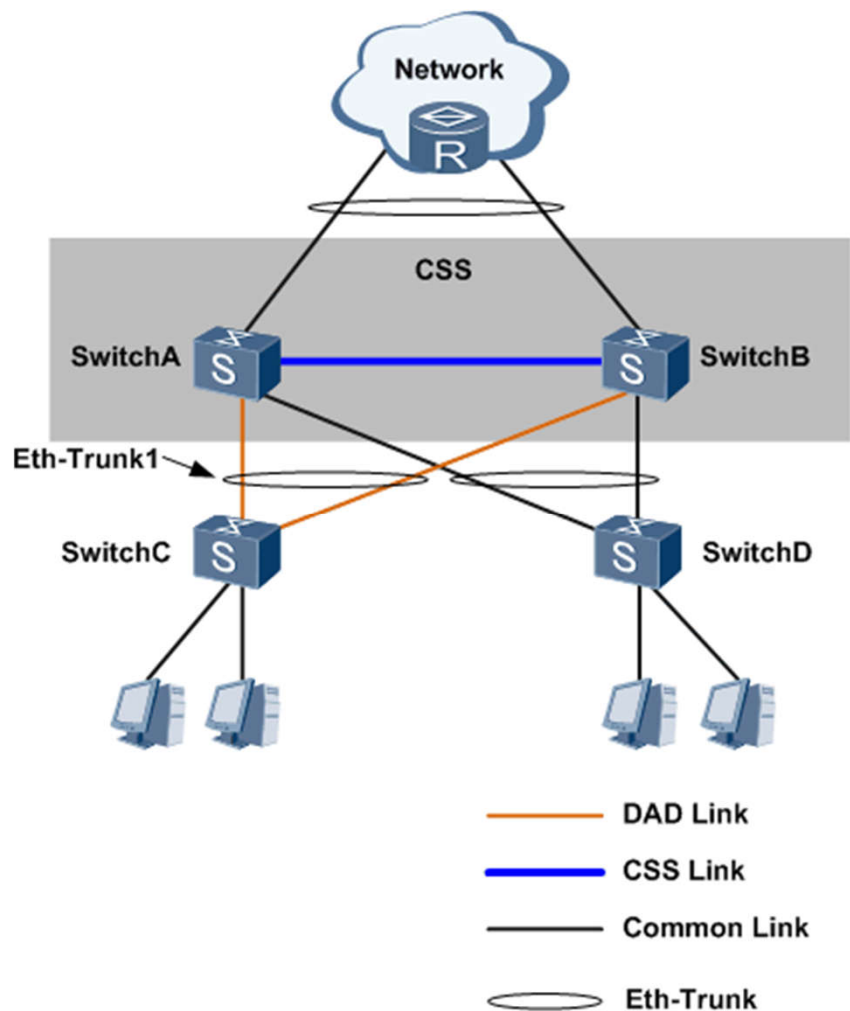 GigabitEthernet2/1/0/5
Dual-active relay detect interfaces configured:
Excluded ports(configurable):
Excluded ports(can not be configured):

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Configuring DAD in Relay Mode

- As shown in the figure , SwitchA and SwitchB forms a stack. SwitchA and SwitchB connect to upstream and downstream devices using Eth-Trunk interfaces. SwitchC is configured as a DAD proxy device. Eth-Trunk1 connects the stack to SwitchC.

Configuration procedure

> # Configure DAD in relay mode on Eth-Trunk1. Before this configuration, ensure that Eth-Trunk1 has been configured in the stack.
> <Quidway> system-view
> [Quidway] interface eth-trunk 1
> [Quidway-Eth-Trunk1] dual-active detect mode relay

Configure on the master switch of the CSS

> # Configure the relay function for SwitchC. Before this configuration, ensure that Eth-Trunk1 has been configured in the stack.
> [SwitchC] interface eth-trunk 1
> [SwitchC-Eth-Trunk1] dual-active relay

Configure on SwitchC

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Verifying the configuration

Check detailed DAD configuration.
<Quidway> display dual-active verbose
Current DAD status: Detect
Dual-active direct detect interfaces configured:
Dual-active relay detect interfaces configured:
 Eth-Trunk 1
Excluded ports(configurable):
Excluded ports(can not be configured):

Check information about SwitchC.
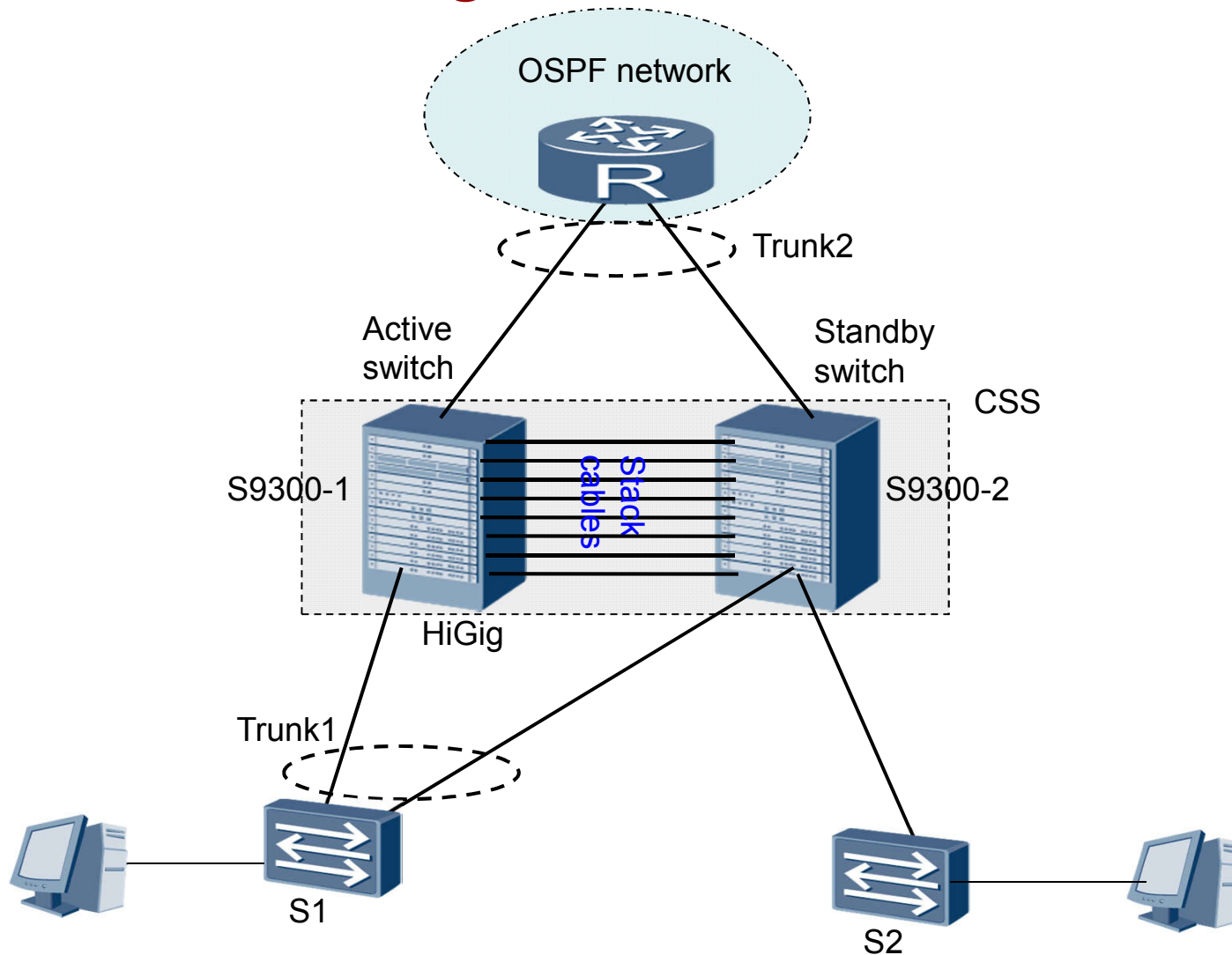<SwitchC> display dual-active proxy
Dual-active relay interfaces configured:
 Eth-Trunk1

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OSPF－2

OSPF－1

VLANIF 10

VLANIF 20

GE 1/0/0

GE 1/0/1

CSS

S9300-1

Stack cables

S9300-2

Trunk1

S1

S2

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