Contents

1 Configuring Supervisor Module Redundancy

1.1 Introduction

1.1.1 Overview

Redundancy (RDND) is a mechanism that improves device availability by backing up the operating status of services on the supervisor module (SM) in real time.

On a network device with the control plane separated from the forwarding plane, the control plane runs on a SM and the forwarding plane runs on a line card. During the running of the device, the control plane information of the master device is backed up to the slave device in real time. When the master device is suspended as planned (for example, software is upgraded) or unexpectedly (for example, a software or hardware failure occurs), the slave device can quickly take over the work and user configurations are not lost. In this way, the network can continue to normally run. During switchover, the forwarding plane continues with forwarding; during restart of the control plane, forwarding does not stop or links do not flap.

1.1.2 Principles

1. Basic Concepts

- Global master/slave/candidate

    In a VSU system that consists of box-type devices, each box-type device is equivalent to a SM and a line card. The system also selects a device as the global master device, another as the global slave device, and other devices as global candidate devices. When the master and slave devices fail, the candidate devices take their place and run in the VSU system.

  🛈   **Note**
- Generally, candidate devices do not participate in backup.
- A candidate device cannot directly replace the master device. When a candidate device has to become the master device, you must restart the candidate device.

- Prerequisites for the box-type stacking VSU system

    The box-type stacking VSU system works properly only when the software and hardware of all devices in the device system are compatible.

    During startup, batch synchronization must be performed between the master device and the slave device to ensure their state consistency. Before this process, the box-type stacking VSU system does not fully play its role.

- Status of the box-type stacking VSU system

    During master-slave backup, the master device has three states as follows:

    - alone, namely alone state. In this state, only one device is running in the system or master/slave switchover is not completed and no redundancy is created between the new master device and the new slave device.

○ batch, namely batch backup state. Redundancy is created between the master device and the slave device and batch backup is in progress.

○ realtime state, namely real-time backup state. Upon batch backup, the master and slave devices are in this state. Real-time backup is performed between the master device and the slave device. Only in this state manual switchover is allowed.

2. **Selection of Master and Slave Devices**

● Automatic selection of master and slave devices for the devices

Users are allowed to add or remove devices during running of devices. Based on the current condition of the system, a device automatically selects an engine for running, without affecting normal data exchange. The master SM makes a choice in the following circumstances:

○ If only one device exists in the box-type stacking VSU environment during startup of the device, the device is selected as the master device.

○ If two devices exist in the box-type stacking VSU environment during startup of the device, by default, the device 1 is selected as the master device, the device 2 as the slave one for backup purpose and a prompt is displayed.

○ If only one device exists in the box-type stacking VSU environment during startup of the device and another is added as the slave master during the running of the device. The device added later is used as the slave one for backup purpose and outputs prompts.

○ If two devices exist in the box-type stacking VSU environment during startup of the device and either is removed during the running of the device. If the removed device is the slave one, a prompt for the removal of the slave device is displayed. If the removed device is the master one, the other device becomes the master one and displays a prompt.

● Manual selection of the master and slave devices

Users can manually select the master and slave devices. In the box-type stacking VSU environment, users can manually perform master/slave switchover to make the global slave device become the global master device. If only two devices exist in the box-type stacking VSU environment, the original global master device becomes the new global slave one after reset. If more than two devices exist, one global candidate device is selected as the new global slave one and the original global master device becomes a global candidate one after reset.

3. **Information Synchronization of Device Members**

● Status synchronization

The master device synchronizes its running status to the slave device in real time. Thus, the slave device can take over the functions of the master device at any time, without any perceivable change.

● Configuration synchronization

During the running of the device, two system configuration files exist: **running-config**, which is dynamically generated during running and changes with the service configuration; **startup-config**, which is imported during the startup of the device. The **write** command is run to write **running-config** into **startup-config** or the **copy** command is run to copy the configuration files.

For some functions that are not directly related to uninterrupted forwarding, the synchronization of system configuration files ensures the consistency of user configurations during switchover.

In the case of the box-type stacking VSU system, the master device periodically synchronizes the **startup-config** and **running-config** files to the slave device and all candidate devices. Configurations are synchronized in the following operations:

o   When a user switches from the global configuration mode to privileged EXEC mode, the **running-config** file is synchronized.

o   When a user runs the **write** or **copy** command to save configurations, the **startup-config** file is synchronized.

o   For configurations issued over SNMP, the **startup-config** file is not automatically synchronized and the **running-config** file must be synchronized via CLI configuration.

1.2   Restrictions and Guidelines

●   For box-type devices, each device is equivalent to a SM and a line card. The VSU system of multiple box-type devices also provides the master-slave backup mechanism.

⚠   **Caution**

For box-type devices, box-type stacked VSUs are used to express the redundancy mechanism.

1.3   Configuration Task Summary

RDND configuration includes the following tasks:

All of the following configuration tasks are optional. Select the task as required.

●   (Optional) Configuring Manual Master/Slave Switchover

●   (Optional) Configuring an Automatic Synchronization Period

●   (Optional) Resetting Box-type Stacking VSU

1.4   Configuring RDND

1.4.1   Overview

●   The device automatically selects the master and slave devices based on the current system, or users do so manually.

●   In the box-type stacking VSU environment, the master device synchronizes status information and configuration files to the slave device in real time.

1.4.2   Configuring Manual Master/Slave Switchover

1.   Overview

If more than two devices exist in the system, you can manually perform master/slave switchover to change the slave device into the master device and select a new slave device from candidate devices (the original master device becomes a candidate device after reset).

2.   **Restrictions and Guidelines**

●   To ensure smooth data forwarding during switchover, perform batch synchronization performed between the master device and the slave device so that the two modules are in the same state. That is, manual switchover is allowed only when the redundancy of the box-type stacking VSU is in the real-time backup state. In addition, manual master/slave switchover is temporarily disabled by service modules during synchronization to ensure that configuration files are completely synchronized. Therefore, manual master/slave switchover is enabled on the master device and the slave master exists.

3.   **Procedure**

(1) Enter the privileged EXEC mode.

   enable

(2) Perform a master/slave switchover.

   redundancy forceswitch

1.4.3 Configuring an Automatic Synchronization Period

1.   **Overview**

By configuring an automatic synchronization cycle, you can adjust the interval for the master device to synchronize the configuration files (**startup-config** and **running-config**) to change the automatic synchronization period.

2.   **Restrictions and Guidelines**

It is recommended that a short synchronization period be configured so that the master device can frequently synchronize configurations to other member devices when configurations are modified. In this way, the configurations are not lost when services and data are forcibly switched to the slave device due to the failure of the master device.

3.   **Procedure**

(1) Enter the privileged EXEC mode.

   enable

(2) Enter the global configuration mode.

   configure terminal

(3) Enter the redundancy configuration mode.

   redundancy

(4) Configure a period for automatically synchronizing configuration files.

   auto-sync time-period *synchronization-interval-time*

   The default period for automatically synchronizing configuration files is 1 hour.

1.4.4 Resetting Box-type Stacking VSU

1.   **Overview**

●   Resetting only the slave device does not affect data forwarding. During the resetting of the slave device, forwarding is not interrupted or user session information is not lost.

- In standalone mode, running the **redundancy reload shelf** command makes the device reset; in VSU mode, this command is used to reset the device with a specified ID. If two or more devices exist in the system and the device where the global master SM resides is reset, the system performs master/slave switchover.

2. **Restrictions and Guidelines**

In the box-type stacking VSU mode, if the SMs of the system are not in the real-time backup state, resetting the device where the global master SM resides will cause the whole VSU system to reset.

3. **Procedure**

(1) Enter the privileged EXEC mode.

   enable

(2) Reset the box-type stacking VSU.

   redundancy reload { **peer** | **shelf** [*switch-id*] }

1.5 Monitoring

Run the **show** commands to check the running status of a configured function to verify the configuration effect.

Table 1-1   RDND Monitoring

Command	Purpose
show redundancy states	Displays the current redundancy status of the device.