CHAPTER 11

High-Availability Support

This chapter describes high-availability support for the Cisco Unified Border Element (SP Edition) distributed model on the Cisco ASR 1000 Series Aggregation Services Routers.

Cisco Unified Border Element (SP Edition) was formerly known as Integrated Session Border Controller and may be commonly referred to in this document as the session border controller (SBC).

For a complete description of the commands used in this chapter, see *Cisco Unified Border Element (SP Edition) Command Reference: Distributed Model* at:
http://www.cisco.com/en/US/docs/ios/sbc/command/reference/sbc_book.html

Contents

This chapter provides information about the following topics:

Cisco Unified Border Element (SP Edition) High Availability

The Cisco ASR 1000 Series Routers include the Cisco ASR 1002, Cisco ASR 1004, and Cisco ASR 1006 Routers. The different models support different types of redundancy. Cisco Unified Border Element (SP Edition) distributed model supports the redundancy available on each model.

On the Cisco ASR 1002 and Cisco ASR 1004 Routers, only software redundancy is available. These models have dual Cisco IOS software modules running on the same Route Processor, with one active and the other in standby mode.

The Cisco ASR 1006 Routers offer dual hardware redundancy and software redundancy.

Cisco Unified Border Element (SP Edition) high availability is provided in the standard image for the Cisco ASR 1000 Series Routers. There is no special configuration required.

For additional information, see "High Availability Overview" section in the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide* at *http://www.cisco.com/en/US/docs/routers/asr1000/configuration/guide/chassis/asrswcfg.html*. Also see the *Cisco IOS High Availability Configuration Guide* at http://www.cisco.com/en/US/products/ps6922/products_installation_and_configuration_guides_list.html for information on high availability features that are on other Cisco platforms and that work identically on the Cisco ASR 1000 Series Aggregation Services Routers.

Hardware Redundancy

Cisco Unified Border Element (SP Edition) distributed model supports use of a redundant or standby Route Processor (RP) and redundant Embedded Services Processor (ESP) on the Cisco ASR 1006 Router. The Cisco ASR 1006 Router has an ESP as well as an RP for dual hardware redundancy. If the active RP or active ESP hardware fails, the system performs a switchover to the standby RP or standby ESP. RP and ESP hardware redundancy support is independent. An RP failure does not require a switchover of the ESP hardware and an ESP failure does not require an RP switchover.

Hardware redundancy is available only on the Cisco ASR 1006 Router.

Software Redundancy

On the Cisco ASR 1000 Series Routers, Cisco IOS runs as one of many processes within the Cisco IOS XE operating system. This architecture is different than on traditional Cisco IOS, where all processes are run within Cisco IOS. The Cisco ASR 1000 Series Router architecture allows for software redundancy opportunities not available on other Cisco IOS platforms.

Cisco Unified Border Element (SP Edition) distributed model supports software redundancy by running a standby peer SBC module within the IOS process that resides in an active RP. If the SBC module fails, then Cisco Unified Border Element (SP Edition) switches over to the standby SBC module in the standby IOS process. The standby IOS process may reside on the same Route Processor as the active IOS process (Cisco ASR 1002 and Cisco ASR 1004 Routers) or it may be on a redundant, standby RP (Cisco ASR 1006 Router).

On the Cisco ASR 1002 and Cisco ASR 1004 Routers, a standby Cisco IOS process is running on the same Route Processor as the active Cisco IOS process. In the event of a Cisco IOS failure, the Router switches to the standby Cisco IOS process. No redundant Route Processor or redundant ESP is available on the Cisco ASR 1002 Series and Cisco ASR 1004 Series Routers.

On the Cisco ASR 1006 Routers, the data border element (DBE) can have a redundant Route Processor and a redundant ESP. In the event of failure of the active Cisco IOS process, the Router switches to the standby Cisco IOS process, running on a separate standby Route Processor. SBC redundancy at the ESP level is provided only if a standby, redundant ESP is used. SBC components running on the active ESP have identical peer components running on the standby ESP. In this case, if the SBC components running on the active ESP fail, then a switchover to the backup ESP occurs.

The following types of software redundancy are supported on Cisco Unified Border Element (SP Edition) distributed model:

- Route Processor Redundancy (RPR)
- Stateful Switchover (SSO)
- In-Service Software Upgrade (ISSU)

Route Processor Redundancy (RPR)

RPR allows you to run with a standby RP without state synchronization. In the event of a fatal error on the active RP, the system switches to the standby RP, which then completes its initialization. Because all the state information held by the formerly active RP is lost, the newly active RP has to configure itself and relearn all the state information.

Upon an RPR-based RP switchover event, all SBC calls already established (in a steady state) at the time of the switchover are lost. Some SBC calls in the process of being established at the time of the switchover are dropped as gracefully as possible. No new calls can be established briefly after the initial switchover event. An SBC call reconciliation takes place after an RPR-based RP switchover to ensure that both RP and Embedded Services Processor (ESP) are in sync.

RPR redundancy can allow for IOS fast software upgrades when ISSU is unavailable. In RPR mode, no Cisco IOS SBC state information is synchronized to the standby RP. Therefore, all calls are dropped upon an RPR-based switchover.

Note RPR is supported on the Cisco ASR 1000 Series Routers while RPR+ is not. You can use Stateful Switchover (SSO) instead of RPR+.

SSO Support

Cisco Unified Border Element (SP Edition) support for Stateful Switchover (SSO) allows for stateful IOS process switchovers where critical state information is synchronized between one Route Processor used as the active processor and the other RP used as the standby processor. When Cisco IOS is configured for SSO, the SBC module running on the active IOS process constantly “replicates” its internal state to its standby peer SBC module on the standby IOS process. In this way, the standby SBC module is kept in sync with the active IOS process and has all the state information necessary to retain active calls and resume call processing in the event the active IOS process fails and an SSO occurs.

For information on SSO, see *Cisco IOS High Availability Configuration Guide* at:

http://www.cisco.com/en/US/products/ps6922/products_installation_and_configuration_guides_list.html

ISSU Support

The Cisco Unified Border Element (SP Edition) distributed model supports In-Service Software Upgrade (ISSU) with a redundant RP or redundant IOS process. The ISSU process allows software to be updated or otherwise modified on a standby RP or standby IOS process while packet forwarding on the active RP or active IOS process continues. For the Cisco ASR 1000 Series Routers, ISSU compatibility depends on the software package being upgraded and the hardware configuration.

see “High Availability Overview” section in *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide* at:

http://www.cisco.com/en/US/docs/routers/asr1000/configuration/guide/chassis/asrswcfg.html for more information on ISSU compatibility.

For information on the ISSU process, see *Cisco IOS In Service Software Upgrade and Enhanced Fast Software Upgrade Process* document at:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sb_issu.html