



Cisco Unified Border Element (SP Edition) Redundancy—High Availability Support

This chapter describes high availability support for Cisco Unified Border Element (SP Edition) 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).



Note

For Cisco IOS XE Release 2.4 and later, this feature is supported in both the unified model and the distributed model.

Feature History for Cisco Unified Border Element (SP Edition) Redundancy—High Availability Support

Release	Modification
Cisco IOS XE Release 2.4	Added support for Cisco Unified Border Element (SP Edition) unified model.
Cisco IOS XE Release 2.1	This feature was introduced on the Cisco IOS XR on the data border element (DBE) for the distributed model.

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Integrated Session Border Controller 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. Integrated Session Border Controller supports the redundancy available on each model.

On the Cisco ASR 1002 and Cisco ASR 1004 Routers, only software redundancy is available. These routers have dual Cisco IOS software modules running on the same Route Processor, with one active and the other in standby mode. However, these routers can have hardware redundancy by using interchassis hardware redundancy.

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 the “High Availability Overview” section in the [Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide](#). Also see the [Cisco IOS High Availability Configuration Guide](#) 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

Integrated Session Border Controller 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.

Integrated Session Border Controller supports software redundancy by running a Standby peer SBC module within the Standby IOS process. If the Active SBC module fails, then the Active IOS process switches over to the Standby IOS process and the old Standby Integrated SBC module resumes processing as the Active. 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, both unified and distributed configurations can operate with 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.

Cisco Unified Border Element (SP Edition) 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):

- 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 or standby Cisco IOS process without state synchronization. In the event of a fatal error on the active RP (or active Cisco IOS process), the system switches to the standby RP (or standby Cisco IOS process), which then completes its initialization. Because all the state information held by the former “Active” is lost, the new “Active” 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. 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.

RPR redundancy can allow for Cisco IOS fast software upgrades when ISSU is unavailable. In RPR mode, no Cisco IOS SBC state information is synchronized to the “Standby.” 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

Integrated Session Border Controller support for Stateful Switchover (SSO) allows for stateful Cisco 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, or between active and standby Cisco IOS processes on the same RP. 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 the *Cisco IOS High Availability Configuration Guide* at the following URL: <http://www.cisco.com/en/US/docs/ios-xml/ios/ha/configuration/12-2sr/ha-12-2sr-book.html>

ISSU Support

Integrated Session Border Controller 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.

Although ISSU between a distributed-only version and a unified version of Cisco IOS XE software may be supported, the unified features introduced in Cisco IOS XE Release 2.4 are not available to the distributed-only version if you should do a software downgrade. In such cases, we advise you to unconfigure unified Cisco Unified Border Element (SP Edition) before performing a downgrade to a Cisco IOS XE software version that does not support unified Cisco Unified Border Element (SP Edition). The same restriction does not apply to a distributed-only Cisco Unified Border Element (SP Edition) configuration.

See the “High Availability Overview” section in the *Cisco ASR 1000 Aggregation Services Router Software Configuration Guide* for more, updated information on ISSU compatibility.

For information on the ISSU process, see the *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.