



## Implementing SBC Redundancy (High Availability)

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SBC fault tolerant redundancy is based on a 1:1 paired protection model. For each active service card running with the SBC, there should be another service card providing failure protection (that is, standby). The same services must be provisioned on both cards (one as the primary card, one as the standby card); in this instance, the service cards are described as “paired”.

From a Cisco IOX XR system perspective, service cards are always running in active mode. SBC services running on these cards, however, run as either a primary service or standby service.

Given that SBC functionality is split among two logical service entities—the signaling border element (SBE) service and data border element (DBE) service—these services run on Cisco IOX XR service cards as follows:

- In the Unified model, SBE and DBE run on the same service card. In this case, SBE and DBE services are implemented as a single Cisco IOS XR process.
- In the Distributed model, SBE and DBE services run as separate Cisco IOX XR processes (and there may be one or more distributed DBE(s) per SBE). When running in this mode:
  - SBE and DBE services may be provisioned on different cards within the same physical device to distribute the processing load across available service cards.
  - SBE and DBE may be located on different physical devices.

Where there is no standby service card available, a software failure results in a restart of the primary SBC process. If this succeeds, the SBC process loses all call states, but management and configuration information stored in SysDb is recovered and re-applied on restart.

When there is a standby SBC provisioned, the active SBC replicates the state to the standby to provide hot standby support. The SBC process is fate shared with the Media Packet forwarder component; if one component restarts, the other component will restart.



### Note

For a complete description of commands used in this chapter, refer to the *Cisco IOS XR Session Border Controller Command Reference*. To locate documentation for other commands that appear in this chapter, use the command reference master index, or search online.

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### Feature History for Implementing SBC Redundancy

Release	Modification
Release 3.3.0	This feature was introduced on the Cisco XR 12000 Series Router.
Release 3.4.0	No modification.

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Release 3.5.0	No modification.
Release 3.6.0	No modification.

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## Prerequisites for Implementing Redundancy

The following prerequisites are required to implement SBC redundancy:

- You must be in a user group associated with a task group that includes the proper task IDs for SBC commands being used. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.
- You must install and activate the package installation envelope (PIE) for the SBC software.  
For detailed information about PIE installation, refer to the *Upgrading and Managing Cisco IOS XR Software* module in the *Cisco IOS XR Getting Started Guide*.
- Before implementing interworking SBC redundancy, the SBC must already be created. See the procedures described in the “[SBC Configuration Prerequisites](#)” module.

## Information About Implementing Redundancy

SBC fault tolerance is based on a 1:1 paired-protection model. For each service card running active SBC components, there can be one service card providing failure protection. The same services must be provisioned on both cards (one as the primary card, one as the standby card), and the service cards are then said to be paired. Although from an Cisco IOX XR system perspective, service cards are always running in active mode, SBC services running on these cards run as either the primary service or the standby service.

## How to Implement Redundancy

Redundancy configurations are described in the following sections:

- [Configuring a Redundancy](#)
- [Deleting a Redundancy](#)

## Configuring a Redundancy

This task configures a redundancy.

### SUMMARY STEPS

1. **configure**
2. **hw-module service sbc location** *prefer-standby node-id*
3. **commit**
4. **sbc** *service-name*
5. **service-location preferred-active** *node-id preferred-standby node-id*
6. **commit**
7. **exit**
8. **interface sbc** *number*
9. **service-location preferred-active** *node-id [preferred-standby node-id]*
10. **commit**
11. **end**
12. **show services redundancy**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure</b>  <b>Example:</b> RP/0/0/CPU0:router# configure	Enables global configuration mode.
Step 2	<b>hw-module service sbc location</b> <i>prefer-standby node-id</i>  <b>Example:</b> RP/0/0/CPU0:router(config)# hw-module service sbc location 0/4/cpu0	Assigns the SBC service role to the preferred standby card.  <b>Note</b> Before proceeding to the next step, wait for the preferred standby card to boot up with the SBC service role configured.
Step 3	<b>commit</b>  <b>Example:</b> RP/0/0/CPU0:router(config)# commit	Saves configuration changes. Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 4	<b>sbc</b> <i>service-name</i>  <b>Example:</b> RP/0/0/CPU0:router(config)# sbc mysbc RP/0/0/CPU0:router(config-sbc)#	Enters the mode of an SBC service.  <ul style="list-style-type: none"> <li>• Use the <i>service-name</i> argument to define the name of the service.</li> </ul>

## ■ How to Implement Redundancy

	Command or Action	Purpose
Step 5	<pre>service-location preferred-active node-id [preferred standby node-id]</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-sbc)#  preferred-active 0/2/CPU0 preferred-standby  0/4/CPU0</p>	Enables a service card to run SBC function as a primary, and optionally, secondary location.
Step 6	<pre>commit</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-sbc)# commit</p>	Saves configuration changes. Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 7	<pre>exit</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-sbc)# exit  RP/0/0/CPU0:router(config)#</p>	Exits <b>sbc</b> mode to <b>config</b> mode.
Step 8	<pre>interface sbc number</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config)# interface sbc1  RP/0/0/CPU0:router(config-if)#</p>	Enters the mode of an SBC interface, creating it if necessary. The <i>number</i> argument must be a value between 1 and 2000.
Step 9	<pre>service-location preferred-active node-id [preferred-standby node-id]</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-if)# preferred-active  0/2/CPU0 preferred-standby 0/4/CPU0</p>	Enables a service card to run SBC function as a primary and, optionally, secondary location.
Step 10	<pre>commit</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-if)# commit</p>	Saves configuration changes. Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 11	<pre>end</pre> <p><b>Example:</b>  RP/0/0/CPU0:router(config-if)# end  RP/0/0/CPU0:router#</p>	Exits the configuration session.
Step 12	<pre>show services redundancy</pre> <p><b>Example:</b>  RP/0/0/CPU0:router# show services redundancy</p>	Shows the configured redundancy.

## Deleting a Redundancy

This task deletes a redundancy.

## SUMMARY STEPS

1. **configure**
2. **sbc** *service-name*
3. **service-location preferred-active** *node-id* [**preferred-standby** *node-id*]
4. **commit**
5. **exit**
6. **interface sbc** *number*
7. **service-location preferred-active** *node-id* [**preferred-standby** *node-id*]
8. **commit**
9. **end**
10. **show services redundancy**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure</b>  <b>Example:</b> RP/0/0/CPU0:router# configure	Enables global configuration mode.
Step 2	<b>sbc</b> <i>service-name</i>  <b>Example:</b> RP/0/0/CPU0:router(config)# sbc mysbc RP/0/0/CPU0:router(config-sbc)#	Enters the mode of an SBC service.  Use the <i>service-name</i> argument to define the name of the service.
Step 3	<b>service-location preferred-active</b> <i>node-id</i> [ <b>preferred-standby</b> <i>node-id</i> ]  <b>Example:</b> RP/0/0/CPU0:router(config-sbc)# preferred-active 0/2/CPU0	Enables a service card to run SBC function as a primary and, optionally, secondary location.
Step 4	<b>commit</b>  <b>Example:</b> RP/0/0/CPU0:router(config-sbc)# commit	Saves configuration changes. Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 5	<b>exit</b>  <b>Example:</b> RP/0/0/CPU0:router(config-sbc)# exit RP/0/0/CPU0:router(config)#	Exits <b>sbc</b> mode to <b>config</b> mode.
Step 6	<b>interface sbc</b> <i>number</i>  <b>Example:</b> RP/0/0/CPU0:router(config)# interface sbc1 RP/0/0/CPU0:router(config-if)#	Enters the mode of an SBC interface, creating it if necessary. The <i>number</i> argument must be a value between 1 and 2000.

	Command or Action	Purpose
Step 7	<pre>service-location preferred active node-id [preferred standby node-id]</pre> <p><b>Example:</b> RP/0/0/CPU0:router(config-if)# preferred-active 0/2/CPU0</p>	Enables a service card to run SBC function as a primary and, optionally, secondary location.
Step 8	<pre>commit</pre> <p><b>Example:</b> RP/0/0/CPU0:router(config-if)# commit</p>	Saves configuration changes. Use the <b>commit</b> command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 9	<pre>end</pre> <p><b>Example:</b> RP/0/0/CPU0:router(config-if)# end RP/0/0/CPU0:router#</p>	Exits the configuration session.
Step 10	<pre>show services redundancy</pre> <p><b>Example:</b> RP/0/0/CPU0:router# show services redundancy</p>	Shows the deleted redundancy.

## Configuration Examples of Implementing a Redundancy

This section provides the following configuration examples:

- [Configuring an SBC Redundancy: Example](#)
- [Deleting the SBC Redundancy: Example](#)

### Configuring an SBC Redundancy: Example

The following example describes a scenario in which redundant Multi-Service Blades (MSBs) are physically located with dual route processors (RPs) and one line card in a Cisco XR 12000 Series Router. Redundant MSBs can be put in adjacent slots or non-adjacent slots.

1. Configure the preferred standby card with the SBC service role:

```
config
hw-module service sbc location 0/4/cpu0
commit
```

2. Verify that the SBC service role is configured on the preferred standby card:

```
show service role location 0/4/cpu0
Node          Configured Role    Enacted Role      Enabled Services
-----
0/4/CPU0     SBC                SBC                SBC
```

3. Configure the SBC service redundancy:

```
config
sbc umsbcb-node5
```

```
service-location preferred-active 0/2/CPU0 preferred-standby 0/4/CPU0
commit
exit
```

#### 4. Configure SBC virtual interface redundancy:

```
interface sbc1
service-location preferred-active 0/2/CPU0 preferred-standby 0/4/CPU0
commit
```

#### 5. Verify the SBC redundancy:

```
show service redundancy
Service type      Name                               Pref. Active      Pref. Standby
-----
SBC                umsbcb-node5                      0/2/CPU0 Active   0/4/CPU0 Standby
```

## Deleting the SBC Redundancy: Example

The following example shows how to delete the SBC configuration created in the [“Configuring an SBC Redundancy: Example”](#) section:

#### 1. Delete the SBC redundancy:

```
config
sbc umsbcb-node5
service-location preferred-active 0/2/CPU0
commit
exit
```

#### 2. Delete the SBC virtual interface redundancy:

```
config
interface sbc1
service-location preferred-active 0/2/CPU0
commit
```

#### 3. Verify the SBC redundancy deletion:

```
RP/0/1/CPU0:node5#show service redundancy
Service type      Name                               Pref. Active      Pref. Standby
-----
SBC                umsbcb-node5                      0/2/CPU0 Active
```

## Additional References

The following sections provide references related to implementing SBC redundancy (high availability).

## Related Documents

Related Topic	Document Title
Cisco IOS XR master command reference	Cisco IOS XR Master Commands List
Cisco IOS XR SBC interface configuration commands	<i>Cisco IOS XR Session Border Controller Command Reference</i>

Related Topic	Document Title
Initial system bootup and configuration information for a router using the Cisco IOS XR Software	<i>Cisco IOS XR Getting Started Guide</i>
Cisco IOS XR command modes	<i>Cisco IOS XR Command Mode Reference</i>

## Standards

Standards	Title
No new or modified standards are supported by this feature, and support from existing standards has not been modified by this feature.	—

## MIBs

MIBs	MIBs Link
—	To locate and download MIBs using Cisco IOS XR software, use the Cisco MIB Locator found at the following URL and choose a platform under the Cisco Access Products menu: <a href="http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml">http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml</a>

## RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

## Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>

## Related Command Summary

This section provides an alphabetical list of the commands related to redundancy configuration on the Cisco XR 12000 Series Router. For more information about the commands, see the *Cisco IOS XR Session Border Controller Command Reference*.

Command	Purpose
<b>service-location preferred-active</b> <i>node-id</i> <b>preferred-standby</b> <i>node-id</i>	Enables a service card to run SBC function as a primary, and optionally, secondary location.
<b>interface sbc</b> <i>number</i>	Enters the mode of an SBC interface, creating it if necessary. The <i>number</i> argument must be a value between 1 and 2000.
<b>show services redundancy</b>	Shows the redundancies running on the system.

