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Chassis Cluster Feature Guide for Branch SRX Series Devices

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Junos® OS Chassis Cluster Feature Guide for Branch SRX Series Devices
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Supported Platforms

For the features described in this document, the following platforms are supported:

- SRX Series
- vSRX

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

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If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   system {
     scripts {
       commit {
         file ex-script.xsl;
       }
     }
   }
   interfaces {
     fxp0 {
       disable;
       unit 0 {
         family inet {
           address 10.0.0.1/24;
         }
       }
     }
   }
   ```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

   ```
   [edit]
   user@host# load merge /var/tmp/ex-script.conf
   load complete
   ```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   commit {
     file ex-script-snippet.xsl; }
   ```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

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```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

Table 1 on page xv defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xv defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**

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Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric *metric*>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [*community-ids*]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		    route default {
		      nexthop *address*;
		      retain;
		    }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.

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Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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- Find product documentation: http://www.juniper.net/techpubs/
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- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
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- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

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PART 1

Overview

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CHAPTER 1

Introduction to Chassis Cluster

Chassis Cluster Overview

Supported Platforms SRX Series, vSRX

High Availability Using Chassis Clusters

Modern networks require high availability. In order to accommodate this requirement, Juniper Networks SRX Series Services Gateways can be configured to operate in cluster mode, where a pair of devices can be connected together and configured to operate like a single node, providing device, interface, and service level redundancy.

When configured as a chassis cluster, the two nodes back up each other, with one node acting as the primary device and the other as the secondary device, ensuring stateful failover of processes and services in the event of system or hardware failure. If the primary device fails, the secondary device takes over processing of traffic.

How High Availability Is Achieved by Chassis Cluster

- The network node redundancy is achieved by grouping a pair of the same kind of supported SRX Series devices into a cluster.
- The devices must be running the same version of the Junos operating system (Junos OS).
- SRX Series devices must be the same model.

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- The control ports on the respective nodes are connected to form a control plane that synchronizes the configuration and kernel state to facilitate the high availability of interfaces and services.
- The data plane on the respective nodes is connected over the fabric ports to form a unified data plane. The fabric link allows for the management of cross-node flow processing and for the management of session redundancy.

Chassis Cluster Active/Active and Active/Passive Modes

A chassis cluster in active/active mode has transit traffic passing through both nodes of the cluster all of the time. Whereas a chassis cluster in active/passive mode only has transit traffic passing through the primary node while the backup node waits in hot standby.

The data plane software operates in active/active mode. In a chassis cluster, session information is updated as traffic traverses either device, and this information is transmitted between the nodes over the fabric link to guarantee that established sessions are not dropped when a failover occurs. In active/active mode, it is possible for traffic to ingress the cluster on one node and egress from the other node.

The control plane software operates in active or backup mode.

Chassis Cluster Functionality

Chassis cluster functionality includes:

- Resilient system architecture, with a single active control plane for the entire cluster and multiple Packet Forwarding Engines. This architecture presents a single device view of the cluster.
- Synchronization of configuration and dynamic runtime states between nodes within a cluster.
- Monitoring of physical interfaces, and failover if the failure parameters cross a configured threshold.
- Support for Generic Routing Encapsulation (GRE) tunnels used to route encapsulated IPv4/IPv6 traffic by means of an internal interface, gr-0/0/0. This interface is created by Junos OS at system bootup and is used only for processing GRE tunnels. See the *Interfaces Feature Guide for Security Devices*.

At any given instant, a cluster can be in one of the following states: hold, primary, secondary-hold, secondary, ineligible, and disabled. A state transition can be triggered because of any event, such as interface monitoring, SPU monitoring, failures, and manual failovers.

IPv6 Clustering Support

Starting with Junos OS Release 10.4, SRX Series devices running IP version 6 (IPv6) can be deployed in active/active (failover) chassis cluster configurations in addition to the existing support of active/passive (failover) chassis cluster configurations. An interface can be configured with an IPv4 address, IPv6 address, or both. Address book entries can

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include any combination of IPv4 addresses, IPv6 addresses, and Domain Name System (DNS) names.

Related Documentation

- Preparing Your Equipment for Chassis Cluster Formation on page 35
- Understanding Chassis Cluster Redundancy Groups on page 69
- Understanding Chassis Cluster Redundant Ethernet Interfaces on page 77

Chassis Cluster Supported Features

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550

Table 3 on page 5 lists the features that are supported on branch SRX Series devices in a chassis cluster.

Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Address Books and Address Sets	Address books	Yes	Yes	Yes	Yes
	Address sets	Yes	Yes	Yes	Yes
	Global address objects or sets	Yes	Yes	Yes	Yes
	Nested address groups	Yes	Yes	Yes	Yes
Administrator Authentication Support	Local authentication	Yes	Yes	Yes	Yes
	RADIUS	Yes	Yes	Yes	Yes
	TACACS+	Yes	Yes	Yes	Yes
Alarms	Chassis alarms	Yes	Yes	Yes	Yes
	Interface alarms	Yes	Yes	Yes	Yes
	System alarms	Yes	Yes	Yes	Yes

Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Application Identification [1]	Application identification–synchronizing in a chassis cluster	Yes	Yes	Yes	Yes
	Application firewall (AppFW)	Yes	Yes	Yes	Yes
	Application QoS (AppQoS)	Yes	Yes	Yes	Yes
	Application tracking (AppTrack)	Yes	Yes	Yes	Yes
	Custom application signatures and signature groups	Yes	Yes	Yes	Yes
	Heuristics-based detection	Yes	Yes	Yes	Yes
	IDP	Yes	Yes	Yes	Yes
	Jumbo frames	Yes	Yes	Yes	Yes
	Nested application identification	Yes	Yes	Yes	Yes
	Onbox application tracking statistics (AppTrack)	Yes	Yes	Yes	Yes
	SSL proxy	Yes	Yes	Yes	Yes
	Subscription license enforcement	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
ALGs	DNS ALG	Yes	Yes	Yes	Yes
	DNS doctoring support	Yes	Yes	Yes	Yes
	DNS, FTP, RTSP, and TFTP ALGs (Layer 2) with chassis clustering	Yes	Yes	Yes	Yes
	DSCP marking for SIP, H.323, MGCP, and SCCP ALGs	Yes	Yes	Yes	Yes
	FTP	Yes	Yes	Yes	Yes
	H.323	Yes	Yes	Yes	Yes
	H.323–Avaya H.323	Yes	Yes	Yes	Yes
	MGCP	Yes	Yes	Yes	Yes
	PPTP	Yes	Yes	Yes	Yes
	RPC–MS RPC	Yes	Yes	Yes	Yes
	RPC–Sun RPC	Yes	Yes	Yes	Yes
	RSH	Yes	Yes	Yes	Yes
	RTSP	Yes	Yes	Yes	Yes
	SIP–NEC SIP	Yes	Yes	Yes	Yes
	SIP–SCCP SIP	Yes	Yes	Yes	Yes
	SQL	Yes	Yes	Yes	Yes
	TALK TFTP	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Attack Detection and Prevention (Screens)	Bad IP option	Yes	Yes	Yes	Yes
	Block fragment traffic	Yes	Yes	Yes	Yes
	FIN flag without ACK flag	Yes	Yes	Yes	Yes
	ICMP flood protection	Yes	Yes	Yes	Yes
	ICMP fragment protection	Yes	Yes	Yes	Yes
	IP address spoof	Yes	Yes	Yes	Yes
	IP address sweep	Yes	Yes	Yes	Yes
	IP record route option	Yes	Yes	Yes	Yes
	IP security option	Yes	Yes	Yes	Yes
	IP stream option	Yes	Yes	Yes	Yes
	IP strict source route option	Yes	Yes	Yes	Yes
	IP timestamp option	Yes	Yes	Yes	Yes
	Land attack protection land	Yes	Yes	Yes	Yes
	Large size ICMP packet protection	Yes	Yes	Yes	Yes
	Loose source route option	Yes	Yes	Yes	Yes
	Ping of death attack protection	Yes	Yes	Yes	Yes
	Port scan	Yes	Yes	Yes	Yes
	Source IP-based session limit	Yes	Yes	Yes	Yes
	SYN-ACK-ACK proxy protection	Yes	Yes	Yes	Yes
	SYN and FIN flags	Yes	Yes	Yes	Yes
	SYN flood protection	Yes	Yes	Yes	Yes
	SYN fragment protection	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
	TCP address sweep	Yes	Yes	Yes	Yes
	TCP packet without flag	Yes	Yes	Yes	Yes
	Teardrop attack protection	Yes	Yes	Yes	Yes
	UDP address sweep	Yes	Yes	Yes	Yes
	UDP flood protection	Yes	Yes	Yes	Yes
	Unknown protocol	Yes	Yes	Yes	Yes
	WinNuke attack protection	Yes	Yes	Yes	Yes
Chassis Management	Allow chassis management	Yes	Yes	Yes	Yes
	CX111 3G adapter support	No	No	No	No
	IEEE 802.3af / 802.3at support	No	No	No	No
	Chassis cluster SPC insert	No	No	No	No
Class of Service	Classifiers	Yes	Yes	Yes	Yes
	Code-point aliases (IEEE 802.1)	Yes	Yes	Yes	Yes
	Egress interface shaping	Yes	Yes	Yes	Yes
	Forwarding classes	Yes	Yes	Yes	Yes
	Ingress interface	Yes	Yes	Yes	Yes
	Policer schedulers (hierarchical schedulers)	Yes	Yes	Yes	Yes
	Simple filters	No	No	No	No
	Transmission queues	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
DHCP	DHCP client	Yes	Yes	Yes	Yes
	DHCP relay agent	Yes	Yes	Yes	Yes
	DHCP server	Yes	Yes	Yes	Yes
	DHCP server address pools	Yes	Yes	Yes	Yes
	DHCP server static mapping	Yes	Yes	Yes	Yes
	DHCPv6[2]	Yes	Yes	Yes	Yes
Diagnostics Tools	CLI terminal	Yes	Yes	Yes	Yes
	J-Flow version 5 and version 8	Yes	Yes	Yes	Yes
	J-Flow version 9	No	No	No	No
	Flowd monitoring	Yes	Yes	Yes	Yes
	Ping host	Yes	Yes	Yes	Yes
	Ping MPLS	No	No	No	No
	Traceroute	Yes	Yes	Yes	Yes
Dynamic VPN	Package dynamic VPN client[3]	–	–	–	–
Ethernet Interfaces	10/100/1000 MB Ethernet interface	Yes	Yes	Yes	Yes
	10-Gigabit Ethernet Interface SFP+ slots	Yes	Yes	Yes	Yes
	40/100-Gigabit Ethernet interface MPC slots Gigabit	–	–	–	–
	Ethernet, Copper (10-Mbps, 100-Mbps, or 1000-Mbps port)	Yes	Yes	Yes	Yes
	Gigabit Ethernet interface	Yes	Yes	Yes	Yes
	Promiscuous mode on Ethernet interface	No	No	No	No

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Ethernet Link Aggregation	LACP/LAG cross IOC (inter-IOC)	–	–	–	–
	LACP (port priority) Layer 3 Mode	No	Yes	No	Yes
	LACP (port priority) Layer 2 Mode	No	Yes	No	Yes
	Layer 3 LAG on routed ports	Yes	Yes	Yes	Yes
	Static LAG (routing)	Yes	Yes	Yes	Yes
	Static LAG (switching)	Yes	Yes	Yes	Yes
	Switching mode	Yes	Yes	Yes	Yes
File Management	Deletion of backup software image	Yes	Yes	Yes	Yes
	Deletion of individual files	Yes	Yes	Yes	Yes
	Download of system files	Yes	Yes	Yes	Yes
	Encryption/decryption of configuration files	Yes	Yes	Yes	Yes
	Management of account files	Yes	Yes	Yes	Yes
Firewall Authentication	Firewall authentication on Layer 2 transparent authentication	Yes	Yes	Yes	Yes
	LDAP authentication server	Yes	Yes	Yes	Yes
	Local authentication server	Yes	Yes	Yes	Yes
	Pass-through authentication	Yes	Yes	Yes	Yes
	RADIUS authentication server	Yes	Yes	Yes	Yes
	SecurID authentication server	Yes	Yes	Yes	Yes
	Web authentication	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Flow-Based and Packet-Based Processing	Alarms and auditing	Yes	Yes	Yes	Yes
	End-to-end packet debugging	No	No	No	No
	Express Path support	No	No	No	No
	Flow-based processing	Yes	Yes	Yes	Yes
	Host bound fragmented traffic	No	No	No	No
	Network processor bundling	Yes	Yes	Yes	Yes
	Packet-based processing	No	No	No	No
	Selective stateless packet-based services	Yes	Yes	Yes	Yes
GPRS	GPRS (transparent mode and route mode)	No	No	No	No
GTPv2	IMSI prefix and APN filtering	No	No	No	No
	Message-length filtering	No	No	No	No
	Message-rate limiting	No	No	No	No
	Message-type filtering	No	No	No	No
	Packet sanity check	No	No	No	No
	Policy-based inspection	No	No	No	No
	Restart GTPv2 path	No	No	No	No
	Sequence-number and GTP-U validation	No	No	No	No
	Stateful inspection	No	No	No	No
	Traffic logging	No	No	No	No
	Tunnel cleanup	No	No	No	No

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
IDP	Alarms and auditing	Yes	Yes	Yes	Yes
	Cryptographic key handling	No	No	No	No
	DSCP marking	No	No	No	No
	IDP and application identification	Yes	Yes	Yes	Yes
	IDP and UAC coordinated threat control	Yes	Yes	Yes	Yes
	IDP class-of-service action	No	No	No	No
	IDP inline tap mode	No	No	No	No
	IDP logging	Yes	Yes	Yes	Yes
	IDP monitoring and debugging	Yes	Yes	Yes	Yes
	IDP policy	Yes	Yes	Yes	Yes
	IDP security packet capture	Yes	Yes	Yes	Yes
	IDP signature database	Yes	Yes	Yes	Yes
	IDP SSL inspection	No	No	No	No
	IPS rule base	Yes	Yes	Yes	Yes
	Jumbo frames	No	No	No	No
	Performance and capacity tuning for IDP	No	No	No	No
	SNMP MIB for IDP monitoring	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
IPsec	AH protocol	Yes	Yes	Yes	Yes
	Alarms and auditing	Yes	Yes	Yes	Yes
	Antireplay (packet replay attack prevention)	Yes	Yes	Yes	Yes
	Autokey management	Yes	Yes	Yes	Yes
	Dead peer detection (DPD)	Yes	Yes	Yes	Yes
	Dynamic IPsec VPNs	Yes	Yes	Yes	Yes
	External Extended Authentication (XAuth) to a RADIUS server for remote access connections	Yes	Yes	Yes	Yes
	Group VPN with dynamic policies (server functionality)	Yes	Yes	Yes	Yes
	IKEv1 and IKEv2	Yes	Yes	Yes	Yes
	Manual key management	Yes	Yes	Yes	Yes
	Policy-based and route-based VPNs	Yes	Yes	Yes	Yes
	Route-based VPN support	Yes	Yes	Yes	Yes
	Tunnel mode	Yes	Yes	Yes	Yes
	VPN monitoring (proprietary)	Yes	Yes	Yes	Yes
	Virtual router	Yes	Yes	Yes	Yes
IPv6	IPv6 support	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Layer 2 Mode	802.1x port-based network authentication	Yes	Yes	Yes	Yes
	Flexible Ethernet services	Yes	Yes	Yes	Yes
	IRB interface	Yes	Yes	Yes	Yes
	LLDP and LLDP-MED	Yes	Yes	Yes	Yes
	MAC limit (port security)	Yes	Yes	Yes	Yes
	Q-in-Q tunneling	No	No	No	No
	Spanning Tree Protocol	Yes	Yes	Yes	Yes
	VLAN retagging	Yes	Yes	Yes	Yes
	VLANs	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
MPLS	CCC and TCC	Yes	Yes	Yes	Yes
	CLNS Interprovider and carrier-of-carriers VPNs	Yes	Yes	Yes	Yes
	Filtering PIM register messages	Yes	Yes	Yes	Yes
	IGMP	Yes	Yes	Yes	Yes
	Layer 2 VPNs for Ethernet connections	Yes	Yes	Yes	Yes
	Layer 3 MPLS VPNs	Yes	Yes	Yes	Yes
	LDP	Yes	Yes	Yes	Yes
	MPLS VPNs with VRF tables on provider edge routers	Yes	Yes	Yes	Yes
	Multicast VPNs	Yes	Yes	Yes	Yes
	OSPF and IS-IS traffic engineering extensions	Yes	Yes	Yes	Yes
	P2MP LSPs	Yes	Yes	Yes	Yes
	Primary routing mode (dense mode for LAN and sparse mode for WAN)	No	No	No	No
	Protocol Independent Multicast (PIM) static RP	Yes	Yes	Yes	Yes
	RSVP	Yes	Yes	Yes	Yes
	Secondary and standby LSPs	Yes	Yes	Yes	Yes
	Session Announcement Protocol (SAP)	Yes	Yes	Yes	Yes
	Session Description Protocol (SDP)	Yes	Yes	Yes	Yes
	Standards-based fast reroute VPLS	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Multicast VPN	Basic multicast features in C-instance	No	No	No	No
	Multicast VPN membership discovery with BGP	No	No	No	No
	P2MP LSP support	No	No	No	No
	P2MP OAM to P2MP LSP ping	No	No	No	No
	Reliable multicast VPN routing information exchange	No	No	No	No

Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
NAT	Destination IP address translation	Yes	Yes	Yes	Yes
	Disabling source	Yes	Yes	Yes	Yes
	Interface source NAT pool port	Yes	Yes	Yes	Yes
	NAT address pool utilization threshold status	Yes	Yes	Yes	Yes
	NAT port randomization	Yes	Yes	Yes	Yes
	NAT traversal (NAT-T) for site-to-site IPsec VPNs (IPv4)	Yes	Yes	Yes	Yes
	Persistent NAT	Yes	Yes	Yes	Yes
	Persistent NAT binding for wildcard ports	Yes	Yes	Yes	Yes
	Persistent NAT hairpinning	Yes	Yes	Yes	Yes
	Pool translation	Yes	Yes	Yes	Yes
	Proxy ARP (IPv4)	Yes	Yes	Yes	Yes
	Proxy NDP (IPv6)	Yes	Yes	Yes	Yes
	Removal of persistent NAT query bindings	Yes	Yes	Yes	Yes
	Rule-based NAT	Yes	Yes	Yes	Yes
	Rule translation	Yes	Yes	Yes	Yes
	Source address and group address translation for multicast flows	Yes	Yes	Yes	Yes
	Source IP address translation	Yes	Yes	Yes	Yes
	Static NAT	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Network Operations and Troubleshooting Support	Event policies	Yes	Yes	Yes	Yes
	Event scripts	Yes	Yes	Yes	Yes
	Operation scripts	Yes	Yes	Yes	Yes
	XSLT commit scripts	Yes	Yes	Yes	Yes
Packet Capture	Packet capture	Yes	Yes	Yes	Yes
Public Key Infrastructure	Automated certificate enrollment using SCEP	Yes	Yes	Yes	Yes
	Automatic generation of self-signed certificates	Yes	Yes	Yes	Yes
	CRL update at user-specified interval	Yes	Yes	Yes	Yes
	Digital signature generation	Yes	Yes	Yes	Yes
	Entrust, Microsoft, and Verisign certificate authorities (CAs)	Yes	Yes	Yes	Yes
	IKE support	Yes	Yes	Yes	Yes
	Manual installation of DER-encoded and PEM-encoded CRLs	Yes	Yes	Yes	Yes
Remote Device Access	Reverse Telnet	Yes	Yes	Yes	Yes
RPM Probe	RPM probe	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Routing	BGP	Yes	Yes	Yes	Yes
	BGP extensions for IPv6	Yes	Yes	Yes	Yes
	Compressed Real-Time Transport Protocol (CRTP)	Yes	Yes	Yes	Yes
	Internet Group Management Protocol (IGMP)	Yes	Yes	Yes	Yes
	IPv4 options and broadcast Internet diagrams	Yes	Yes	Yes	Yes
	IPv6 routing, forwarding, global address configuration, and Internet Control Message Protocol (ICMP)	Yes	Yes	Yes	Yes
	IS-IS	Yes	Yes	Yes	Yes
	Multiple virtual routers	Yes	Yes	Yes	Yes
	Neighbor Discovery Protocol (NDP) and Secure Neighbor Discovery Protocol (SEND)	Yes	Yes	Yes	Yes
	OSPF v2	Yes	Yes	Yes	Yes
	OSPF v3	Yes	Yes	Yes	Yes
	RIP next generation (RIPng)	Yes	Yes	Yes	Yes
	RIP v1, v2	Yes	Yes	Yes	Yes
	Static routing	Yes	Yes	Yes	Yes
	Virtual Router Redundancy Protocol (VRRP)	Yes	Yes	Yes	Yes
Secure Web Access	CAs	Yes	Yes	Yes	Yes
	HTTP	Yes	Yes	Yes	Yes
	HTTPS	Yes	Yes	Yes	Yes
Security Policy	Security policy	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Security Zones	Functional zone	Yes	Yes	Yes	Yes
	Security zone	Yes	Yes	Yes	Yes
Session Logging	Acceleration of security and traffic logging	Yes	Yes	Yes	Yes
	Aggressive session aging	Yes	Yes	Yes	Yes
	Getting information about sessions	Yes	Yes	Yes	Yes
	Logging to a single server	Yes	Yes	Yes	Yes
	Session logging with NAT information	Yes	Yes	Yes	Yes
SMTP	SMTP	Yes	Yes	Yes	Yes
SNMP	SNMP v1, v2, v3	No	No	No	No
Stateless Firewall Filters	Stateless firewall filters (ACLs)	No	No	No	No
System Log Files	System log archival	Yes	Yes	Yes	Yes
	System log configuration	Yes	Yes	Yes	Yes
	Disabling system logs	Yes	Yes	Yes	Yes
	Filtering system log messages	Yes	Yes	Yes	Yes
	Multiple system log servers (control plane logs)	Yes	Yes	Yes	Yes
	Sending system log messages to a file	Yes	Yes	Yes	Yes
	Sending system log messages to a user terminal	Yes	Yes	Yes	Yes
	Viewing data plane logs	Yes	Yes	Yes	Yes
	Viewing system log messages	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
Transparent Mode	Bridge domain and transparent mode	No	No	No	No
	Class of service	No	No	No	No
UTM	Antispam	Yes	Yes	Yes	Yes
	Antivirus–Express	Yes	No	Yes	No
	Antivirus–Full	Yes	No	Yes	No
	Antivirus–Sophos	Yes	No	No	No
	Content filtering	Yes	Yes	Yes	Yes
	Stateful active/active cluster mode	No	No	No	No
	Web filtering–Enhanced	Yes	Yes	Yes	Yes
	Web filtering–Juniper Networks local	Yes	Yes	Yes	Yes
	Web filtering–Surf-control	Yes	Yes	Yes	Yes
	Web filtering–Websense redirect	Yes	Yes	No	No
Upgrading and Rebooting	Autorecovery	Yes	Yes	Yes	Yes
	Boot device configuration	Yes	Yes	Yes	Yes
	Boot device recovery	Yes	Yes	Yes	Yes
	Chassis components control	Yes	Yes	Yes	Yes
	Chassis restart	Yes	Yes	Yes	Yes
	Dual-root partitioning	Yes	Yes	Yes	Yes
	ISSU	No	No	No	No
	WELF support	Yes	Yes	Yes	Yes

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Table 3: Features Supported on a Branch SRX Series Device in a Chassis Cluster *(continued)*

Category	Feature	Active/Backup	Active/Backup Failover	Active/Active	Active/Active Failover
User Interfaces	CLI	Yes	Yes	Yes	Yes
	J-Web user interface	No	No	No	No
	Junos XML protocol	No	No	No	No
	Network and Security Manager	Yes	Yes	Yes	Yes
	Session and Resource Control (SRC) application	No	No	No	No

[1] When the application ID is identified before session failover, the same action taken before the failover is effective after the failover. That is, the action is published to AppSecure service modules and takes place based on the application ID of the traffic. If the application is in the process of being identified before a failover, the application ID is not identified and the session information will be lost. The application identification process will be applied on new sessions created on new primary node.

[2] DHCPv6 is supported on SRX Series devices running Junos OS Release 12.1 and later releases.

[3] Package Dynamic VPN client is supported on branch SRX Series devices until Junos OS Release 12.3X48.

Chassis Cluster Features Support

Table 4 on page 23 lists the chassis cluster features that are supported on branch SRX Series devices.

Table 4: Chassis Cluster Feature Support on Branch SRX Series Devices

Features	Branch SRX Series
Active/backup Routing Engine group (RG0)	Yes
Active/active data redundancy groups (RGx)	Yes
Aggregate Interfaces (link aggregation)	Yes
Autorecovery of fabric link	Yes
Chassis cluster extended cluster ID	Yes
Chassis cluster formation	Yes
Encrypted control link	No

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Table 4: Chassis Cluster Feature Support on Branch SRX Series Devices *(continued)*

Features	Branch SRX Series
Chassis clusters (active/backup and active/active)	Yes
Control link recovery	No
Control plane failover	Yes
Dampening time between back-to-back redundancy group failovers	Yes
Data plane failover	Yes
Dual control links (redundant link for failover)	No
Dual fabric links	Yes
IP monitoring	Yes
Flow forwarding	Yes
Graceful restart routing protocols	Yes
Graceful protocol restart for BGP	Yes
Graceful protocol restart for IS-IS	Yes
Graceful protocol restart for OSPF	Yes
Graceful Routing Engine switchover (GRES) (between nodes)	Yes
HA fabric forwarded packet reordering Interface	Yes
HA monitoring	Yes
In-band cluster upgrade (ICU)	Yes
Junos OS flow-based routing functionality	Yes
LACP support for Layer 3	Yes
Layer 2 Ethernet switching capability	Yes
Layer 2 transparent mode LAG	Yes
Layer 3 LAG	Yes
Local interface support (non-reth)	Yes
Low-Impact ISSU	No

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Table 4: Chassis Cluster Feature Support on Branch SRX Series Devices *(continued)*

Features	Branch SRX Series
Multicast in HA mode	Yes
Network Time Protocol (NTP) time synchronization in chassis cluster	Yes
Point-to-Point Protocol over Ethernet (PPPoE) over redundant Ethernet interface	Yes
Quality of service (QoS)	SRX550
Redundancy group 0 (backup for Routing Engine)	Yes
Redundancy groups 1 through 128	Yes
Redundant Ethernet interfaces	Yes
Redundant Ethernet or aggregate Ethernet interface monitoring	Yes
Redundant Ethernet interfaces	Yes
SPU monitoring	No
Synchronization–backup node configuration from primary node	Yes
Synchronization–configuration	Yes
Synchronization–Dynamic Routing Protocol (DRP)	Yes
Synchronization–policies	Yes
Synchronization– session state sync (RTO sync)	Yes
TCP support for DNS	Yes
Upstream device IP address monitoring on a backup interface	Yes
Virtual Router Redundancy Protocol (VRRP) version 3	No
WAN interfaces	No

Related Documentation

- Chassis Cluster Overview on page 3
- Chassis Cluster Limitations on page 25

Chassis Cluster Limitations

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

The SRX Series devices have the following chassis cluster limitations:

Chassis Cluster

- Group VPN is not supported.
- Unified ISSU is not supported.
- VRRP is not supported.
- Starting with Junos OS Release 12.1X45-D10 and later, sampling features such as flow monitoring, packet capture, and port mirroring are supported on reth interfaces.
  - On all SRX Series devices in a chassis cluster, flow monitoring for version 5 and version 8 is supported. However, flow monitoring for version 9 is not supported.

Flow and Processing

- If you use packet capture on reth interfaces, two files are created, one for ingress packets and the other for egress packets based on the reth interface name. These files can be merged outside of the device using tools such as Wireshark or Mergecap.
- If you use port mirroring on reth interfaces, the reth interface cannot be configured as the output interface. You must use a physical interface as the output interface. If you configure the reth interface as an output interface using the **set forwarding-options port-mirroring family inet output** command, the following error message is displayed.

  Port-mirroring configuration error.
  Interface type in reth1.0 is not valid for port-mirroring or next-hop-group config
- Any packet-based services such as MPLS and CLNS are not supported.
- On all SRX Series devices, the packet-based forwarding for MPLS and ISO protocol families is not supported.

NOTE: **Flowd monitoring is supported on SRX300, SRX320, SRX340, SRX345, SRX550, and SRX1500 devices.**

Installation and Upgrade

- For SRX300, SRX320, SRX340, SRX345, and SRX550 devices, the **reboot** parameter is not available, because the devices in a cluster are automatically rebooted following an in-band cluster upgrade (ICU).

Interfaces

- On the **lsq-0/0/0** interface, Link services MLPPP, MLFR, and CRTP are not supported.
- On the **lt-0/0/0** interface, CoS for RPM is not supported.
- The 3G dialer interface is not supported.
- Queuing on the ae interface is not supported.

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Layer 2 Switching

- On SRX Series device failover, access points on the Layer 2 switch reboot and all wireless clients lose connectivity for 4 to 6 minutes.

MIBs

- The Chassis Cluster MIB is not supported.

Monitoring

- The maximum number of monitoring IPs that can be configured per cluster is 64 for the branch SRX Series devices.
- On SRX300, SRX320, SRX340, SRX345, SRX550, and SRX1500 devices, logs cannot be sent to NSM when logging is configured in the stream mode. Logs cannot be sent because the security log does not support configuration of the source IP address for the fxp0 interface and the security log destination in stream mode cannot be routed through the fxp0 interface. This implies that you cannot configure the security log server in the same subnet as the fxp0 interface and route the log server through the fxp0 interface.

Related Documentation

- Preparing Your Equipment for Chassis Cluster Formation on page 35

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CHAPTER 2

Understanding Chassis Cluster License Requirements

Understanding Chassis Cluster Licensing Requirements

Supported Platforms SRX Series, vSRX

Some Junos OS software features require a license to activate the feature. To enable a licensed feature, you need to purchase, install, manage, and verify a license key that corresponds to each licensed feature.

There is no separate license required for chassis cluster. However, to configure and use the licensed feature in a chassis cluster setup, you must purchase one license per feature per device and the license needs to be installed on both nodes of the chassis cluster. Each license is tied to one software feature pack, and that license is valid for only one device.

For chassis cluster, you must install licenses that are unique to each device and cannot be shared between the devices. Both devices (which are going to form a chassis cluster) must have the valid, identical features licenses installed on them. If both devices do not have an identical set of licenses, then after a failover, a particular feature (that is, a feature that is not licensed on both devices) might not work or the configuration might not synchronize in chassis cluster formation.

Licensing is usually ordered when the device is purchased, and this information is bound to the chassis serial number. For example, Intrusion Detection and Prevention (IDP) is a licensed feature and the license for this specific feature is tied to the serial number of the device.

For information about how to purchase software licenses, contact your Juniper Networks sales representative at http://www.juniper.net/in/en/contact-us/.

Related Documentation

- Installing Licenses on the Devices in a Chassis Cluster on page 30
- Verifying Licenses for an SRX Series Device in a Chassis Cluster on page 32

Installing Licenses on the Devices in a Chassis Cluster

Supported Platforms SRX Series, vSRX

You can add a license key from a file or a URL, from a terminal, or from the J-Web user interface. Use the ***filename*** option to activate a perpetual license directly on the device. Use the ***url*** option to send a subscription-based license key entitlement (such as unified threat management [UTM]) to the Juniper Networks licensing server for authorization. If authorized, the server downloads the license to the device and activates it.

Before adding new licenses, complete the following tasks:

- Purchase the required licenses.
- Set the chassis cluster node ID and the cluster ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.
- Ensure that your SRX Series device has a connection to the Internet (if particular feature requires Internet or if (automatic) renewal of license through internet is to be used). For instructions on establishing basic connectivity, see the Getting Started Guide or Quick Start Guide for your device.

To install licenses on the primary node of an SRX Series device in a chassis cluster:

1. Run the **show chassis cluster status** command and identify which node is primary for redundancy group 0 on your SRX Series device.

   {primary:node0}
   user@host> show chassis cluster status redundancy-group 0

   ```
   Cluster ID: 9
   Node                  Priority          Status    Preempt  Manual failover

   Redundancy group: 0 , Failover count: 1
       node0                 254           primary        no       no
       node1                 1             secondary      no       no
   ```

   Output to this command indicates that node 0 is primary and node 1 is secondary.

2. From CLI operational mode, enter one of the following CLI commands:

   - To add a license key from a file or a URL, enter the following command, specifying the filename or the URL where the key is located:

     user@host> **request system license add *filename* | *url***

   - To add a license key from the terminal, enter the following command:

     user@host> **request system license add terminal**

3. When prompted, enter the license key, separating multiple license keys with a blank line.

   If the license key you enter is invalid, an error appears in the CLI output when you press Ctrl+d to exit license entry mode.

4. Verify the installed licenses.

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For more details, see *Working with License Keys for SRX Series Devices*.

To install licenses on the secondary node of an SRX Series device in a chassis cluster:

1. Initiate a failover to change node 1 (secondary node) to be the primary node:

   {primary:node0}

   user@host> request chassis cluster failover redundancy-group 0 node 1

   ```
    - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   - -
   Initiated manual failover for redundancy group 0
   ```

   NOTE: Initiating a failover to the secondary node is not required if you are installing licenses manually on the device. However, if you are installing the license directly from the Internet, you must initiate a failover.

2. Repeat the steps described in "Step-by-Step Procedure" on page 30 to install licenses on the secondary node.

3. Reboot the device for licenses to take effect.

NOTE: You must install the updated license on both nodes of the chassis cluster before the existing license expires.

NOTE: In a chassis cluster configuration, when one device has a license installed, and the other device does not have the same license installed, an error message is displayed when you try to configure that specific feature as shown in the following example:

[edit security utm feature-profile web-filtering type]

```
  'type juniper-enhanced'
    warning: requires 'wf_key_websense_ewf' license
<<<<<<<<<<<<<<<<<<<<<<<
configuration check succeeds
```

TIP: If you are not using any specific feature or license , you can delete the license from both devices in a chassis cluster. You need to connect to each node separately to delete the licenses. For details, see *Example: Deleting a License Key*.

Related Documentation

- Verifying Licenses for an SRX Series Device in a Chassis Cluster on page 32
- Understanding Chassis Cluster Licensing Requirements on page 29

Verifying Licenses for an SRX Series Device in a Chassis Cluster

Supported Platforms SRX Series, vSRX

Purpose You can verify the licenses installed on both the devices in a chassis cluster setup by using the **show system license installed** command to view license usage.

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Action Licenses details on node 0.

user@host> show system license installed

```
{primary:node0}
user@host> show system license
License usage:
                                 Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  logical-system                        1           26           0    permanent
  services-offload                      0            1           0    permanent

Licenses installed:
  License identifier: JUNOS363684
  License version: 2
  Valid for device: JN111A654AGB
  Features:
    services-offload - services offload mode
      permanent

  License identifier: JUNOS531744
  License version: 4
  Valid for device: JN111A654AGB
  Features:
    services-offload - services offload mode
      permanent

  License identifier: JUNOS558173
  License version: 4
  Valid for device: JN111A654AGB
  Features:
    logical-system-25 - Logical System Capacity
      permanent
```

Licenses details on node 1.

```
{secondary-hold:node1}
user@host> show system license
License usage:
                                 Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  idp-sig                               0            1           0    permanent
  logical-system                        1           26           0    permanent
  services-offload                      0            1           0    permanent

Licenses installed:
  License identifier: JUNOS209661
  License version: 2
  Valid for device: JN111AB4DAGB
  Features:
    idp-sig          - IDP Signature
      permanent

  License identifier: JUNOS336648
  License version: 2
  Valid for device: JN111AB4DAGB
  Features:
    logical-system-25 - Logical System Capacity
      permanent

  License identifier: JUNOS363685
```

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```
License version: 2
Valid for device: JN111AB4DAGB
Features:
  services-offload - services offload mode
    permanent

License identifier: JUNOS531745
License version: 4
Valid for device: JN111AB4DAGB
Features:
  services-offload - services offload mode
    permanent
```

Meaning Use the fields **License version** and **Features** to make sure that licenses installed on both the nodes are identical.

Related Documentation

- Installing Licenses on the Devices in a Chassis Cluster on page 30
- Understanding Chassis Cluster Licensing Requirements on page 29

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CHAPTER 3

Planning Your Chassis Cluster Configuration

Preparing Your Equipment for Chassis Cluster Formation

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

To form a chassis cluster, a pair of the same kind of supported SRX Series devices is combined to act as a single system that enforces the same overall security.

The following are the device-specific matches required to form a chassis cluster:

- SRX300, SRX320, SRX340, SRX345, and SRX550: Although the devices must be of the same type, they can contain different Physical Interface Modules (PIMs).

When a device joins a cluster, it becomes a node of that cluster. With the exception of unique node settings and management IP addresses, nodes in a cluster share the same configuration.

You can deploy up to 255 chassis clusters in a Layer 2 domain. Clusters and nodes are identified in the following way:

- A cluster is identified by a *cluster ID* (**cluster-id**) specified as a number from 1 through 255. Setting a cluster ID to 0 is equivalent to disabling a cluster. A cluster ID greater than 15 can only be set when the fabric and control link interfaces are connected back-to-back.

  The following message is displayed when you try to set a cluster ID greater than 15, and when fabric and control link interfaces are not connected back-to-back or are not connected on separated private VLANs:

```
{primary:node1}
user@host> set chassis cluster cluster-id 254 node 1 reboot
For cluster-ids greater than 15 and when deploying more than one cluster in a
single Layer 2 BROADCAST domain, it is mandatory that fabric and control links
 are either connected back-to-back or are connected on separate private VLANS.
```

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- A cluster node is identified by a *node ID* (**node**) specified as a number from 0 through 1.

Related Documentation

- Chassis Cluster Overview on page 3
- Understanding Chassis Cluster Fabric Interfaces on page 57

SRX Series Chassis Cluster Configuration Overview

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

Figure 1 on page 37 shows a chassis cluster flow diagram.

Note the following prerequisites for configuring a chassis cluster:

- On SRX Series branch devices, any existing configurations associated with interfaces that transform to the fxp0 management port and the control port should be removed. For more information, see "Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming" on page 47.
- Confirm that hardware and software are the same on both devices.
- Confirm that license keys are the same on both devices.

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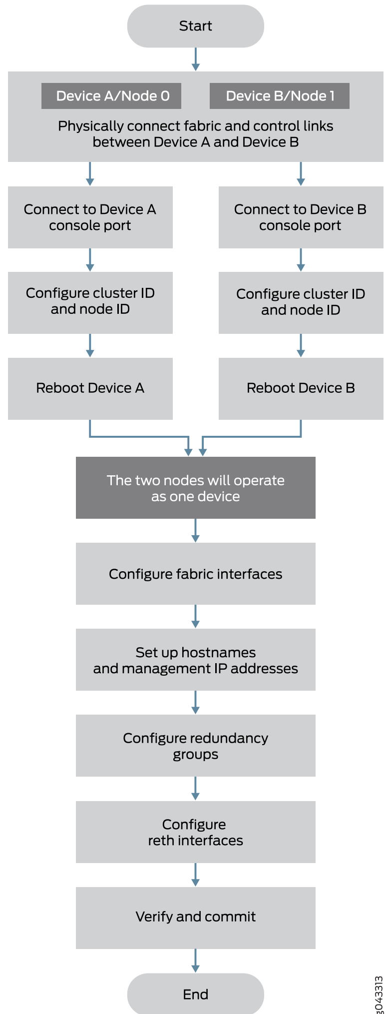
Figure 1: Chassis Cluster Flow Diagram



This section provides an overview of the basic steps to create an SRX Series chassis cluster.

NOTE: For SRX300, SRX320, SRX340, SRX345, and SRX550 chassis clusters, the placement and type of GPIMs, XGPIMs, XPIMs, and Mini-PIMs (as applicable) must match in the two devices.

To create an SRX Series chassis cluster:

1. Physically connect a pair of the same kind of supported SRX Series devices together. For more information, see "Connecting SRX Series Devices to Create a Chassis Cluster" on page 43.

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a. Create the fabric link between two nodes in a cluster by connecting any pair of Ethernet interfaces. For most SRX Series devices, the only requirement is that both interfaces be Gigabit Ethernet interfaces (or 10-Gigabit Ethernet interfaces). For SRX300, SRX320, SRX340, SRX345, and SRX550 devices, connect a pair of Gigabit Ethernet interfaces. For SRX1500 devices, fabric child must be of a similar type.

   When using dual fabric link functionality, connect the two pairs of Ethernet interfaces that you will use on each device. See "Understanding Chassis Cluster Dual Fabric Links" on page 151.

2. Connect the first device to be initialized in the cluster to the console port. This is the node that forms the cluster.

   For connection instructions, see the Getting Started Guide for your device.

3. Use CLI operational mode commands to enable clustering:

   a. Identify the cluster by giving it the cluster ID.

   b. Identify the node by giving it its own node ID and then reboot the system.

   See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51.

4. Connect to the console port on the other device and use CLI operational mode commands to enable clustering:

   a. Identify the cluster that the device is joining by setting the same cluster ID you set on the first node.

   b. Identify the node by giving it its own node ID and then reboot the system.

5. Configure the management interfaces on the cluster. See "Example: Configuring the Chassis Cluster Management Interface" on page 53.

6. Configure the cluster with the CLI. See:

   a. Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84

   b. Example: Configuring the Chassis Cluster Fabric Interfaces on page 61

   c. Example: Configuring Chassis Cluster Redundancy Groups on page 73

   d. Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79

   e. Example: Configuring Chassis Cluster Interface Monitoring on page 106

7. Initiate manual failover. See "Initiating a Chassis Cluster Manual Redundancy Group Failover" on page 146.

8. Configure conditional route advertisement over redundant Ethernet interfaces. See "Understanding Conditional Route Advertising in a Chassis Cluster" on page 159.

9. Verify the configuration. See "Verifying a Chassis Cluster Configuration" on page 99.

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Related Documentation

- Connecting SRX Series Devices to Create a Chassis Cluster on page 43
- Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices on page 51
- Example: Configuring the Chassis Cluster Management Interface on page 53
- Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84
- Verifying a Chassis Cluster Configuration on page 99

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PART 2

Setting Up Chassis Cluster in SRX Series Devices

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CHAPTER 4

Chassis Cluster Physical Setup

Connecting SRX Series Devices to Create a Chassis Cluster

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550

An SRX Series chassis cluster is created by physically connecting two identical cluster-supported SRX Series devices together using a pair of the same type of Ethernet connections. The connection is made for both a control link and a fabric (data) link between the two devices.

Control links in a chassis cluster are made using specific ports.

You must use the following ports to form the control link on the branch SRX Series devices:

- For SRX300 devices, connect the ge-0/0/1 on node 0 to the ge-1/0/1 on node 1.
- For SRX320 devices, connect the ge-0/0/1 on node 0 to the ge-3/0/1 on node 1.
- For SRX340 and SRX345 devices, connect the ge-0/0/1 on node 0 to the ge-5/0/1 on node 1.
- For SRX550 devices, connect the ge-0/0/1 on node 0 to the ge-9/0/1 on node 1.
- SRX1500 devices use dedicated control ports.

The fabric link connection must be any pair of either Gigabit Ethernet or 10-Gigabit Ethernet interfaces on all SRX Series devices.

To establish a fabric link:

- For SRX300 and SRX320 devices, connect any interface except ge-0/0/0 and ge-0/0/1.
- For SRX340 and SRX345 devices, connect any interface except fxp0 and ge-0/0/.

Figure 2 on page 44, Figure 3 on page 44, Figure 4 on page 44, Figure 5 on page 44, Figure 6 on page 44, and Figure 7 on page 45 show pairs of SRX Series devices with the fabric links and control links connected.

Figure 2: Connecting SRX Series Devices in a Cluster (SRX300 Devices)

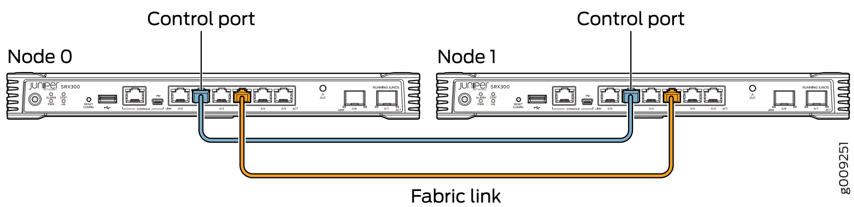

Figure 3: Connecting SRX Series Devices in a Cluster (SRX320 Devices)

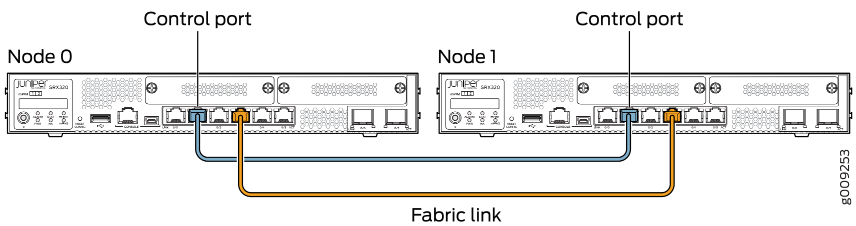

Figure 4: Connecting SRX Series Devices in a Cluster (SRX340 Devices)

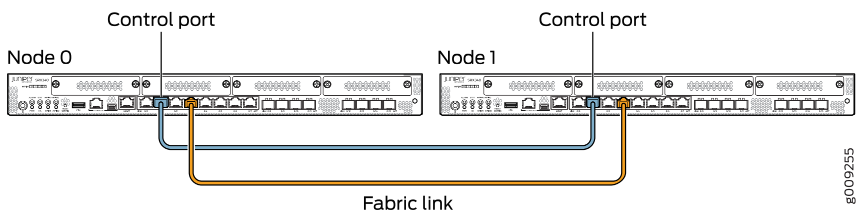

Figure 5: Connecting SRX Series Devices in a Cluster (SRX345 Devices)

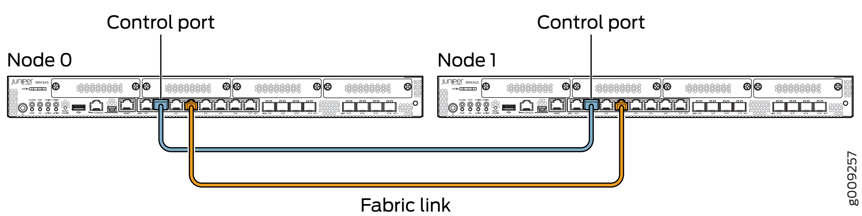

Figure 6: Connecting SRX Series Devices in a Cluster (SRX550 Devices)

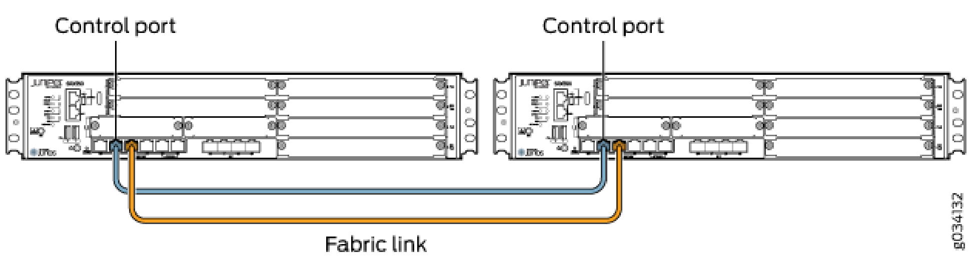

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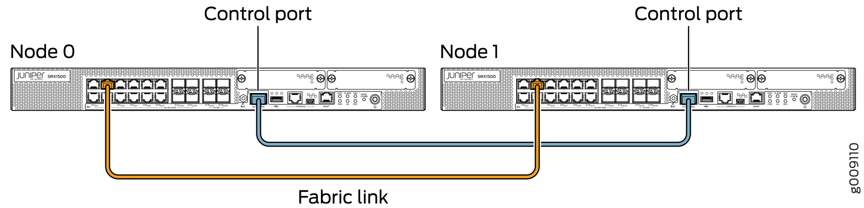
Figure 7: Connecting SRX Series Devices in a Cluster (SRX1500 Devices)



Related Documentation

- SRX Series Chassis Cluster Configuration Overview on page 36
- Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices on page 51
- Example: Configuring the Chassis Cluster Management Interface on page 53
- Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84

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CHAPTER 5

Setting Up Chassis Cluster Identification

Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

Normally, on SRX Series devices, the built-in interfaces are numbered as follows:

Table 5: SRX Series Built-in Interfaces

Devices	Built-In Interfaces				
For SRX300, SRX320, SRX340, SRX345, SRX550, and SRX1500 Devices	ge-0/0/0	ge-0/0/1	ge-0/0/2	ge-0/0/3	. . .

SRX1500 devices have 16 GE interfaces and 4 XE ports.

For chassis clustering, all SRX Series devices have a built-in management interface named fxp0. For most SRX Series devices, the fxp0 interface is a dedicated port.

For SRX340 and SRX345 devices, the fxp0 interface is a dedicated port. For SRX300 and SRX320 devices, after you enable chassis clustering and reboot the system, the built-in interface named ge-0/0/0 is repurposed as the management interface and is automatically renamed fxp0.

For SRX300, SRX320, SRX340, and SRX345 devices, after you enable chassis clustering and reboot the system, the build-in interface named ge-0/0/1is repurposed as the control interface and is automatically renamed fxp1.

For SRX550 devices, control interfaces are dedicated Gigabit Ethernet ports.

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After the devices are connected as a cluster, the slot numbering on one device changes and thus the interface numbering will change. The slot number for each slot in both nodes is determined using the following formula:

cluster slot number = (node ID * maximum slots per node) + local slot number

In chassis cluster mode, all FPC related configuration is performed under **edit chassis node *node-id* fpc** hierarchy. In non-cluster mode, the FPC related configuration is performed under **edit chassis fpc** hierarchy.

Table 6 on page 48 shows the slot numbering, as well as the physical port and logical interface numbering, for both of the SRX Series devices that become node 0 and node 1 of the chassis cluster after the cluster is formed.

Table 6: SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming

Model	Chassis	Maximum Slots Per Node	Slot Numbering in a Cluster	Management Physical Port/Logical Interface	Control Physical Port/Logical Interface	Fabric Physical Port/Logical Interface
1500	Node 0	1	0	fxp0	Dedicated Control port	Any Ethernet port
					em0	fab0
	Node 1		7	fxp0	Dedicated Control port	Any Ethernet port
					em0	fab1
550	Node 0	9 (PIM slots)	0 — 8	ge-0/0/0	ge-0/0/1	Any Ethernet port
				fxp0	fxp1	fab0
	Node 1		9 — 17	ge-9/0/0	ge-9/0/1	Any Ethernet port
				fxp0	fxp1	fab1
340 and 345	Node 0	5 (PIM slots)	0 — 4	fxp0	ge-0/0/1	Any Ethernet port
				fxp0	fxp1	fab0
	Node 1		5 — 9	fxp0	ge-5/0/1	Any Ethernet port
				fxp0	fxp1	fab1

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Table 6: SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming *(continued)*

Model	Chassis	Maximum Slots Per Node	Slot Numbering in a Cluster	Management Physical Port/Logical Interface	Control Physical Port/Logical Interface	Fabric Physical Port/Logical Interface
320	Node 0	3 (PIM slots)	0 — 2	ge-0/0/0	ge-0/0/1	Any Ethernet port
				fxp0	fxp1	fab0
	Node 1		3 — 5	ge-3/0/0	ge-3/0/1	Any Ethernet port
				fxp0	fxp1	fab1
300	Node 0	1(PIM slot)	0	ge-0/0/0	ge-0/0/1	Any Ethernet port
				fxp0	fxp1	fab0
	Node 1		1	ge-1/0/0	ge-1/0/1	Any Ethernet port
				fxp0	fxp1	fab1

NOTE: See the hardware documentation for your particular model (SRX Series Services Gateways) for details about SRX Series devices. See *Interfaces Feature Guide for Security Devices* for a full discussion of interface naming conventions.

After you enable chassis clustering, the two chassis joined together cease to exist as individuals and now represent a single system. As a single system, the cluster now has twice as many slots. (See Figure 8 on page 49, Figure 9 on page 50, Figure 10 on page 50, Figure 10 on page 50, Figure 11 on page 50, Figure 12 on page 50, and Figure 13 on page 50.)

Figure 8: Slot Numbering in an SRX Series Chassis Cluster (SRX300 Devices)

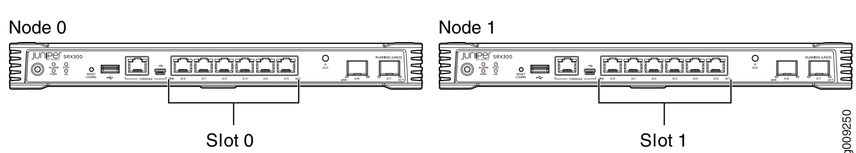


Figure 9: Slot Numbering in an SRX Series Chassis Cluster (SRX320 Devices)

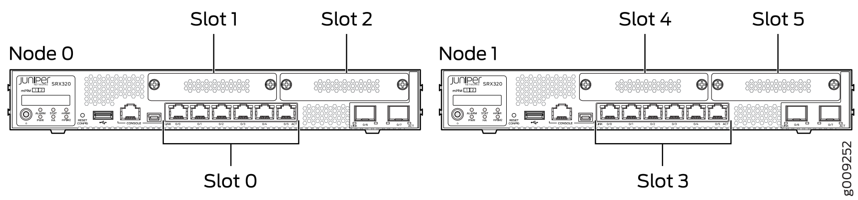


Figure 10: Slot Numbering in an SRX Series Chassis Cluster (SRX340 Devices)

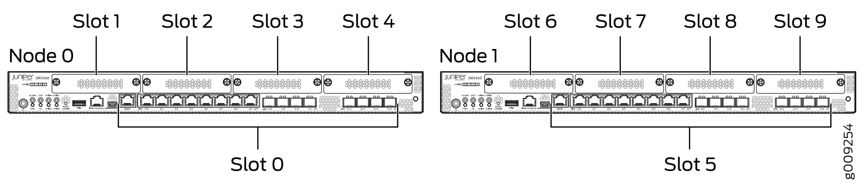


Figure 11: Slot Numbering in an SRX Series Chassis Cluster (SRX345 Devices)

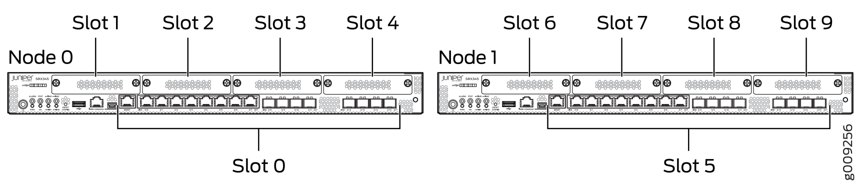


Figure 12: Slot Numbering in an SRX Series Chassis Cluster (SRX550 Devices)

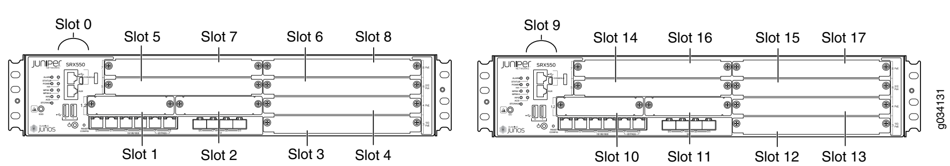
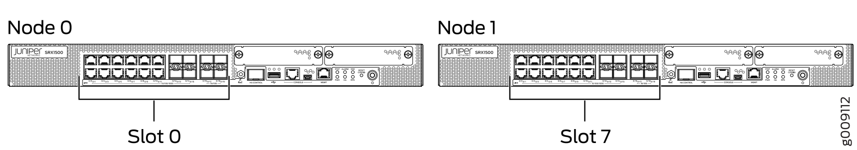


Figure 13: Slot Numbering in an SRX Series Chassis Cluster (SRX1500 Devices)



Related Documentation

- Example: Configuring an SRX Series Services Gateway for the Branch as a Chassis Cluster on page 87

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Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

This example shows how to set the chassis cluster node ID and chassis cluster ID , which you must configure after connecting two devices together. A chassis cluster ID identifies the cluster to which the devices belong, and a chassis cluster node ID identifies a unique node within the cluster. After wiring the two devices together, you use CLI *operational mode* commands to enable chassis clustering by assigning a cluster ID and node ID on each chassis in the cluster. The cluster ID is the same on both nodes.

Requirements

Before you begin, ensure that you can connect to each device through the console port.

Overview

The system uses the chassis cluster ID and chassis cluster node ID to apply the correct configuration for each node (for example, when you use the **apply-groups** command to configure the chassis cluster management interface). The chassis cluster ID and node ID statements are written to the EPROM, and the statements take effect when the system is rebooted.

In this example, you configure a chassis cluster ID of 1. You also configure a chassis cluster node ID of 0 for the first node, which allows redundancy groups to be primary on this node when priority settings for both nodes are the same, and a chassis cluster node ID of 1 for the other node.

NOTE: Chassis cluster supports automatic synchronization of configurations. When a secondary node joins a primary node and a chassis cluster is formed, the primary node configuration is automatically copied and applied to the secondary node. See "Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes" on page 181.

Configuration

Step-by-Step Procedure To specify the chassis cluster node ID and cluster ID, you need to set two devices to cluster mode and reboot the devices. You must enter the following operational mode commands on both devices:

1. Connect to the first device through the console port.

   user@host> **set chassis cluster cluster-id 1 node 0 reboot**

Successfully enabled chassis cluster. Going to reboot now.

2. Connect to the second device through the console port.

   user@host> **set chassis cluster cluster-id 1 node 1 reboot**
   Successfully enabled chassis cluster. Going to reboot now.

Verification

Verifying Chassis Cluster Status

Purpose Verify the status of a chassis cluster.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}[edit]
user@host>  show chassis cluster status

Cluster ID: 1
Node                 Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                  100         primary        no       no
    node1                  1           secondary      no       no

Redundancy group: 1 , Failover count: 1
    node0                  0           primary        no       no
    node1                  0           secondary      no       no
```

Related Documentation

- SRX Series Chassis Cluster Configuration Overview on page 36
- Example: Configuring the Chassis Cluster Management Interface on page 53
- Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84

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CHAPTER 6

Setting Up Chassis Cluster Management Interfaces

Management Interface on an Active Chassis Cluster

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

The fxp0 interfaces function like standard management interfaces on SRX Series devices and allow network access to each node in the cluster.

Most of SRX Series devices contain an fxp0 interface.

For most SRX Series chassis clusters, the fxp0 interface is a dedicated port. SRX340 and SRX345 devices contain an fxp0 interface. SRX300 and SRX320 devices do not have a dedicated port for fxp0. The fxp0 interface is repurposed from a built-in interface. The fxp0 interface is created when the system reboots the devices after you designate one node as the primary device and the other as the secondary device.

We recommend giving each node in a chassis cluster a unique IP address for the fxp0 interface of each node. This practice allows independent node management.

Related Documentation

- Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming on page 47

Example: Configuring the Chassis Cluster Management Interface

Supported Platforms SRX Series, vSRX

This example shows how to provide network management access to a chassis cluster.

Requirements

Before you begin, set the chassis cluster node ID and cluster ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.

Overview

You must assign a unique IP address to each node in the cluster to provide network management access. This configuration is not replicated across the two nodes.

NOTE: **If you try to access the nodes in a cluster over the network before you configure the fxp0 interface, you will lose access to the cluster.**

In this example, you configure the following information for IPv4:

- Node 0 name—node0-router
- IP address assigned to node 0—10.1.1.1/24
- Node 1 name—node1-router
- IP address assigned to node 1—10.1.1.2/24

In this example, you configure the following information for IPv6:

- Node 0 name—node0-router
- IP address assigned to node 0—2010:2010:201::2/64
- Node 1 name—node1-router
- IP address assigned to node 1—2010:2010:201::3/64

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

To configure a chassis cluster management interface for IPv4:

```
{primary:node0}[edit]
user@host#
set groups node0 system host-name node0-router
set groups node0 interfaces fxp0 unit 0 family inet address 10.1.1.1/24
set groups node1 system host-name node1-router
set groups node1 interfaces fxp0 unit 0 family inet address 10.1.1.2/24
```

To configure a chassis cluster management interface for IPv6:

```
{primary:node0}[edit]
```

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```
user@host#
set groups node0 system host-name node0-router
set groups node0 interfaces fxp0 unit 0 family inet6 address 2010:2010:201::2/64
set groups node1 system host-name node1-router
set groups node1 interfaces fxp0 unit 0 family inet6 address 2010:2010:201::3/64
```

Step-by-Step Procedure

To configure a chassis cluster management interface for IPv4:

1. Configure the name of node 0 and assign an IP address.

```
{primary:node0}[edit]
user@host# set groups node0 system host-name node0-router
user@host# set groups node0 interfaces fxp0 unit 0 family inet address 10.1.1.1/24
```

2. Configure the name of node 1 and assign an IP address.

```
{primary:node0}[edit]
set groups node1 system host-name node1-router
set groups node1 interfaces fxp0 unit 0 family inet address 10.1.1.2/24
```

3. If you are done configuring the device, commit the configuration.

```
{primary:node0}[edit]
user@host# commit
```

Step-by-Step Procedure

To configure a chassis cluster management interface for IPv6:

1. Configure the name of node 0 and assign an IP address.

```
{primary:node0}[edit]
user@host# set groups node0 system host-name node0-router
user@host# set groups node0 interfaces fxp0 unit 0 family inet6 address
  2010:2010:201::2/64
```

2. Configure the name of node 1 and assign an IP address.

```
{primary:node0}[edit]
user@host# set groups node1 system host-name node1-router
user@host# set groups node1 interfaces fxp0 unit 0 family inet6 address
  2010:2010:201::3/64
```

3. If you are done configuring the device, commit the configuration.

```
{primary:node0}[edit]
user@host# commit
```

Results

From configuration mode, confirm your configuration by entering the **show groups** and **show apply-groups** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
{primary:node0}[edit]
user@host# show groups
node0 {
  system {
    host-name node0-router;
  }
  interfaces {
    fxp0 {
```

```
            unit 0 {
                family inet {
                    address 10.1.1.1/24;
                }
            }
        }
    }
}
node1 {
    system {
        host-name node1-router;
    }
    interfaces {
        fxp0 {
            unit 0 {
                family inet {
                    address 10.1.1.2/24;
                }
            }
        }
    }
}
```

```
{primary:node0}[edit]
user@host# show apply-groups
## Last changed: 2010-09-16 11:08:29 UTC
apply-groups "${node}";
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Chassis Cluster Management Interface Configuration

Purpose Verify the chassis cluster management interface configuration.

Action To verify the configuration is working properly, enter the **show config** command.

Related Documentation

- Management Interface on an Active Chassis Cluster for Branch SRX Series Devices on page 53

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CHAPTER 7

Setting Up Fabric Interfaces on a Chassis Cluster

Understanding Chassis Cluster Fabric Interfaces

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

The data plane software, which operates in active/active mode, manages flow processing and session state redundancy and processes transit traffic. All packets belonging to a particular session are processed on the same node to ensure that the same security treatment is applied to them. The system identifies the node on which a session is active and forwards its packets to that node for processing. (After a packet is processed, the Packet Forwarding Engine transmits the packet to the node on which its egress interface exists if that node is not the local one.)

To provide for session (or flow) redundancy, the data plane software synchronizes its state by sending special payload packets called runtime objects (RTOs) from one node to the other across the fabric data link. By transmitting information about a session between the nodes, RTOs ensure the consistency and stability of sessions if a failover were to occur, and thus they enable the system to continue to process traffic belonging to existing sessions. To ensure that session information is always synchronized between the two nodes, the data plane software gives RTOs transmission priority over transit traffic.

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Understanding Chassis Cluster Fabric Links

The fabric is the data link between the nodes and is used to forward traffic between the chassis. Traffic arriving on a node that needs to be processed on the other is forwarded over the fabric data link. Similarly, traffic processed on a node that needs to exit through an interface on the other node is forwarded over the fabric.

The data link is referred to as the fabric interface. It is used by the cluster's Packet Forwarding Engines to transmit transit traffic and to synchronize the data plane software's dynamic runtime state. The fabric provides for synchronization of session state objects created by operations such as authentication, Network Address Translation (NAT), Application Layer Gateways (ALGs), and IP Security (IPsec) sessions.

When the system creates the fabric interface, the software assigns it an internally derived IP address to be used for packet transmission.

The fabric is a physical connection between two nodes of a cluster and is formed by connecting a pair of Ethernet interfaces back-to-back (one from each node).

Unlike for the control link, whose interfaces are determined by the system, you specify the physical interfaces to be used for the fabric data link in the configuration.

CAUTION: **After fabric interfaces have been configured on a chassis cluster, removing the fabric configuration on either node will cause the redundancy group 0 (RG0) secondary node to move to a disabled state. (Resetting a device to the factory default configuration removes the fabric configuration and thereby causes the RG0 secondary node to move to a disabled state.) After the fabric configuration is committed, do not reset either device to the factory default configuration.**

For SRX1500, the fabric link can be any pair of Ethernet interfaces spanning the cluster; the fabric link can be any pair of Gigabit Ethernet interface or any pair of 10-Gigabit Ethernet interface. For SRX300, SRX320, SRX340, and SRX345 devices, the fabric link can be any pair of Gigabit Ethernet interfaces.

For SRX Series chassis clusters made up of SRX550 devices, SFP interfaces on Mini-PIMs cannot be used as the fabric link.

For details about port and interface usage for management, control, and fabric links, see “Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming” on page 47.

The fabric data link does not support fragmentation. To accommodate this state, jumbo frame support is enabled by default on the link with an MTU size of 8940 bytes. To ensure that traffic that transits the data link does not exceed this size, we recommend that no other interfaces exceed the fabric data link's MTU size.

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Understanding Session RTOs

The data plane software creates RTOs for UDP and TCP sessions and tracks state changes. It also synchronizes traffic for IPv4 pass-through protocols such as Generic Routing Encapsulation (GRE) and IPsec.

RTOs for synchronizing a session include:

- Session creation RTOs on the first packet
- Session deletion and age-out RTOs
- Change-related RTOs, including:
  - TCP state changes
  - Timeout synchronization request and response messages
  - RTOs for creating and deleting temporary openings in the firewall (pinholes) and child session pinholes

Understanding Data Forwarding

For Junos OS, flow processing occurs on a single node on which the session for that flow was established and is active. This approach ensures that the same security measures are applied to all packets belonging to a session.

A chassis cluster can receive traffic on an interface on one node and send it out to an interface on the other node. (In active/active mode, the ingress interface for traffic might exist on one node and its egress interface on the other.)

This traversal is required in the following situations:

- When packets are processed on one node, but need to be forwarded out an egress interface on the other node
- When packets arrive on an interface on one node, but must be processed on the other node

  If the ingress and egress interfaces for a packet are on one node, but the packet must be processed on the other node because its session was established there, it must traverse the data link twice. This can be the case for some complex media sessions, such as voice-over-IP (VoIP) sessions.

Understanding Fabric Data Link Failure and Recovery

NOTE: Intrusion Detection and Prevention (IDP) services do not support failover. For this reason, IDP services are not applied for sessions that were present prior to the failover. IDP services are applied for new sessions created on the new primary node.

The fabric data link is vital to the chassis cluster. If the link is unavailable, traffic forwarding and RTO synchronization are affected, which can result in loss of traffic and unpredictable system behavior.

To eliminate this possibility, Junos OS uses fabric monitoring to check whether the fabric link, or the two fabric links in the case of a dual fabric link configuration, are alive by periodically transmitting probes over the fabric links. If Junos OS detects fabric faults, RG1+ status of the secondary node changes to ineligible. It determines that a fabric fault has occurred if a fabric probe is not received but the fabric interface is active. To recover from this state, both the fabric links need to come back to online state and should start exchanging probes. As soon as this happens, all the FPCs on the previously ineligible node will be reset. They then come to online state and rejoin the cluster.

NOTE: If you make any changes to the configuration while the secondary node is disabled, execute the **commit** command to synchronize the configuration after you reboot the node. If you did not make configuration changes, the configuration file remains synchronized with that of the primary node.

Starting with Junos OS Release 12.1X47-D10, recovery of the fabric link and synchronization take place automatically.

When both the primary and secondary nodes are healthy (that is, there are no failures) and the fabric link goes down, RG1+ redundancy group(s) on the secondary node becomes ineligible. When one of the nodes is unhealthy (that is, there is a failure), RG1+ redundancy group(s) on this node (either the primary or secondary node) becomes ineligible. When both nodes are unhealthy and the fabric link goes down, RG1+ redundancy group(s) on the secondary node becomes ineligible. When the fabric link comes up, the node on which RG1+ became ineligible performs a cold synchronization on all Services Processing Units and transitions to active standby.

NOTE:

- If RG0 is primary on an unhealthy node, then RG0 will fail over from an unhealthy to a healthy node. For example, if node 0 is primary for RG0+ and node 0 becomes unhealthy, then RG1+ on node 0 will transition to ineligible after 66 seconds of a fabric link failure and RG0+ fails over to node 1, which is the healthy node.
- Only RG1+ transitions to an ineligible state. RG0 continues to be in either a primary or secondary state.

Use the **show chassis cluster interfaces** CLI command to verify the status of the fabric link.

Related Documentation

- Understanding Chassis Cluster Dual Fabric Links on page 151
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61

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Example: Configuring the Chassis Cluster Fabric Interfaces

Supported Platforms SRX Series, vSRX

This example shows how to configure the chassis cluster fabric. The fabric is the back-to-back data connection between the nodes in a cluster. Traffic on one node that needs to be processed on the other node or to exit through an interface on the other node passes over the fabric. Session state information also passes over the fabric.

Requirements

Before you begin, set the chassis cluster ID and chassis cluster node ID. See *Example: Setting the Chassis Cluster Node ID and Cluster ID*.

Overview

In most SRX Series devices in a chassis cluster, you can configure any pair of Gigabit Ethernet interfaces or any pair of 10-Gigabit interfaces to serve as the fabric between nodes.

You cannot configure filters, policies, or services on the fabric interface. Fragmentation is not supported on the fabric link. The MTU size is 8980 bytes. We recommend that no interface in the cluster exceed this MTU size. Jumbo frame support on the member links is enabled by default.

This example illustrates how to configure the fabric link.

Only the same type of interfaces can be configured as fabric children, and you must configure an equal number of child links for **fab0** and **fab1**.

NOTE: If you are connecting each of the fabric links through a switch, you must enable the jumbo frame feature on the corresponding switch ports. If both of the fabric links are connected through the same switch, the RTO-and-probes pair must be in one virtual LAN (VLAN) and the data pair must be in another VLAN. Here too, the jumbo frame feature must be enabled on the corresponding switch ports.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set interfaces fab0 fabric-options member-interfaces ge-0/0/1
set interfaces fab1 fabric-options member-interfaces ge-7/0/1
```

Step-by-Step Procedure

To configure the chassis cluster fabric:

- Specify the fabric interfaces.

```
{primary:node0}[edit]
user@host# set interfaces fab0 fabric-options member-interfaces ge-0/0/1
{primary:node0}[edit]
user@host# set interfaces fab1 fabric-options member-interfaces ge-7/0/1
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show interfaces
...
fab0 {
  fabric-options {
    member-interfaces {
      ge-0/0/1;
    }
  }
}
  fab1 {
    fabric-options {
      member-interfaces {
        ge-7/0/1;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Chassis Cluster Fabric

Purpose

Verify the chassis cluster fabric.

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Action From operational mode, enter the **show interfaces terse | match fab** command.

```
{primary:node0}

user@host> show interfaces terse | match fab
ge-0/0/1.0              up    up   aenet    --> fab0.0
ge-7/0/1.0              up    up   aenet    --> fab1.0
fab0                    up    up
fab0.0                  up    up   inet     30.17.0.200/24
fab1                    up    up
fab1.0                  up    up   inet     30.18.0.200/24
```

Related Documentation

- Verifying Chassis Cluster Data Plane Interfaces on page 63
- Verifying Chassis Cluster Data Plane Statistics on page 63

Verifying Chassis Cluster Data Plane Interfaces

Supported Platforms SRX Series, vSRX

Purpose Display chassis cluster data plane interface status.

Action From the CLI, enter the **show chassis cluster data-plane interfaces** command:

```
{primary:node1}
user@host> show chassis cluster data-plane interfaces
fab0:
    Name                Status
    ge-2/1/9            up
    ge-2/2/5            up
fab1:
    Name                Status
    ge-8/1/9            up
    ge-8/2/5            up
```

Related Documentation

- Understanding Chassis Cluster Fabric Interfaces for Branch SRX Series on page 57
- *Understanding Chassis Cluster Fabric Interfaces for High-End SRX Series*
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61
- Verifying Chassis Cluster Data Plane Statistics on page 63
- Clearing Chassis Cluster Data Plane Statistics on page 64

Verifying Chassis Cluster Data Plane Statistics

Supported Platforms SRX Series, vSRX

Purpose Display chassis cluster data plane statistics.

Action From the CLI, enter the **show chassis cluster data-plane statistics** command:

```
{primary:node1}
user@host> show chassis cluster data-plane statistics

Services Synchronized:
```

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```
Service name                              RTOs sent    RTOs received
Translation context                       0            0
Incoming NAT                              0            0
Resource manager                          0            0
Session create                            0            0
Session close                             0            0
Session change                            0            0
Gate create                               0            0
Session ageout refresh requests           0            0
Session ageout refresh replies            0            0
IPSec VPN                                 0            0
Firewall user authentication              0            0
MGCP ALG                                  0            0
H323 ALG                                  0            0
SIP ALG                                   0            0
SCCP ALG                                  0            0
PPTP ALG                                  0            0
RTSP ALG                                  0            0
```

Related Documentation

- Understanding Chassis Cluster Fabric Interfaces for Branch SRX Series on page 57
- *Understanding Chassis Cluster Fabric Interfaces for High-End SRX Series*
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61
- Verifying Chassis Cluster Data Plane Interfaces on page 63
- Clearing Chassis Cluster Data Plane Statistics on page 64

Clearing Chassis Cluster Data Plane Statistics

Supported Platforms SRX Series, vSRX

To clear displayed chassis cluster data plane statistics, enter the **clear chassis cluster data-plane statistics** command from the CLI:

```
{primary:node1}
user@host> clear chassis cluster data-plane statistics

Cleared data-plane statistics
```

Related Documentation

- Understanding Chassis Cluster Fabric Interfaces for Branch SRX Series on page 57
- *Understanding Chassis Cluster Fabric Interfaces for High-End SRX Series*
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61
- Verifying Chassis Cluster Data Plane Statistics on page 63
- Verifying Chassis Cluster Data Plane Interfaces on page 63

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CHAPTER 8

Setting Up Control Plane Interfaces on a Chassis Cluster

Understanding Chassis Cluster Control Plane and Control Links

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

Understanding the Chassis Cluster Control Plane

The control plane software, which operates in active or backup mode, is an integral part of Junos OS that is active on the primary node of a cluster. It achieves redundancy by communicating state, configuration, and other information to the inactive Routing Engine on the secondary node. If the master Routing Engine fails, the secondary one is ready to assume control.

The control plane software:

- Runs on the Routing Engine and oversees the entire chassis cluster system, including interfaces on both nodes
- Manages system and data plane resources, including the Packet Forwarding Engine (PFE) on each node
- Synchronizes the configuration over the control link
- Establishes and maintains sessions, including authentication, authorization, and accounting (AAA) functions
- Manages application-specific signaling protocols
- Establishes and maintains management sessions, such as Telnet connections
- Handles asymmetric routing
- Manages routing state, Address Resolution Protocol (ARP) processing, and Dynamic Host Configuration Protocol (DHCP) processing

Information from the control plane software follows two paths:

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- On the primary node (where the Routing Engine is active), control information flows from the Routing Engine to the local Packet Forwarding Engine.
- Control information flows across the control link to the secondary node's Routing Engine and Packet Forwarding Engine.

The control plane software running on the master Routing Engine maintains state for the entire cluster, and only processes running on its node can update state information. The master Routing Engine synchronizes state for the secondary node and also processes all host traffic.

NOTE: For a single control link in a chassis cluster, the same control port should be used for the control link connection and for configuration on both nodes. For example, if port 0 is configured as a control port on node 0, then port 0 should be configured as a control port on node 1 with a cable connection between the two ports. For dual control links, control port 0 on node 0 should be connected to control port 0 on node 1 and control port 1 should be connected to control port 1 on node 1. Cross connections, that is, connecting port 0 on one node to port 1 on the other node and vice versa, do not work.

Understanding Chassis Cluster Control Links

The control interfaces provide the control link between the two nodes in the cluster and are used for routing updates and for control plane signal traffic, such as heartbeat and threshold information that triggers node failover. The control link is also used to synchronize the configuration between the nodes. When you submit configuration statements to the cluster, the configuration is automatically synchronized over the control link.

The control link relies on a proprietary protocol to transmit session state, configuration, and liveliness signals across the nodes.

SRX1500 devices use the dedicated control port.

For SRX300, SRX320, SRX340, SRX345, and SRX550 devices, the control link uses the ge-0/0/1 interface.

For details about port and interface usage for management, control, and fabric links, see Table 6 on page 48.

Related Documentation

- Verifying Chassis Cluster Control Plane Statistics on page 66
- Clearing Chassis Cluster Control Plane Statistics on page 67

Verifying Chassis Cluster Control Plane Statistics

Supported Platforms SRX Series, vSRX

Purpose Display chassis cluster control plane statistics.

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Action From the CLI, enter the **show chassis cluster control-plane statistics** command:

```
{primary:node1}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 124
        Heartbeat packets received: 125
Fabric link statistics:
    Child link 0
        Probes sent: 124
        Probes received: 125

{primary:node1}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258698
        Heartbeat packets received: 258693
    Control link 1:
        Heartbeat packets sent: 258698
        Heartbeat packets received: 258693
Fabric link statistics:
    Child link 0
        Probes sent: 258690
        Probes received: 258690
    Child link 1
        Probes sent: 258505
        Probes received: 258505
```

Related Documentation

- Clearing Chassis Cluster Control Plane Statistics on page 67

Clearing Chassis Cluster Control Plane Statistics

Supported Platforms SRX Series, vSRX

To clear displayed chassis cluster control plane statistics, enter the **clear chassis cluster control-plane statistics** command from the CLI:

```
{primary:node1}
user@host> clear chassis cluster control-plane statistics

Cleared control-plane statistics
```

Related Documentation

- Verifying Chassis Cluster Control Plane Statistics on page 66

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CHAPTER 9

Setting Up Chassis Cluster Redundancy Groups

Understanding Chassis Cluster Redundancy Groups

Supported Platforms SRX Series, vSRX

Chassis clustering provides high availability of interfaces and services through redundancy groups and primacy within groups.

A redundancy group is an abstract construct that includes and manages a collection of objects. A redundancy group contains objects on both nodes. A redundancy group is primary on one node and backup on the other at any time. When a redundancy group is said to be primary on a node, its objects on that node are active.

Redundancy groups are independent units of failover. Each redundancy group fails over from one node to the other independent of other redundancy groups. When a redundancy group fails over, all its objects fail over together.

Three things determine the primacy of a redundancy group: the priority configured for the node, the node ID (in case of tied priorities), and the order in which the node comes up. If a lower priority node comes up first, then it will assume the primacy for a redundancy group (and will stay as primary if preempt is not enabled). If preempt is added to a redundancy group configuration, the device with the higher priority in the group can initiate a failover to become master. By default, preemption is disabled. For more information on preemeption, see **preempt (Chassis Cluster)**.

A chassis cluster can include many redundancy groups, some of which might be primary on one node and some of which might be primary on the other. Alternatively, all redundancy groups can be primary on a single node. One redundancy group's primacy does not affect another redundancy group's primacy. You can create up to 128 redundancy groups.

NOTE: **The maximum number of redundancy groups is equal to the number of redundant Ethernet interfaces that you configure.**

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You can configure redundancy groups to suit your deployment. You configure a redundancy group to be primary on one node and backup on the other node. You specify the node on which the group is primary by setting priorities for both nodes within a redundancy group configuration. The node with the higher priority takes precedence, and the redundancy group's objects on it are active.

If a redundancy group is configured so that both nodes have the same priority, the node with the lowest node ID number always takes precedence, and the redundancy group is primary on it. In a two-node cluster, node 0 always takes precedence in a priority tie.

Understanding Chassis Cluster Redundancy Group 0: Routing Engines

When you initialize a device in chassis cluster mode, the system creates a redundancy group referred to as redundancy group 0. Redundancy group 0 manages the primacy and failover between the Routing Engines on each node of the cluster. As is the case for all redundancy groups, redundancy group 0 can be primary on only one node at a time. The node on which redundancy group 0 is primary determines which Routing Engine is active in the cluster. A node is considered the primary node of the cluster if its Routing Engine is the active one.

The redundancy group 0 configuration specifies the priority for each node. The following priority scheme determines redundancy group 0 primacy. Note that the three-second value is the interval if the default **heartbeat-threshold** and **heartbeat-interval** values are used.

- The node that comes up first (at least three seconds prior to the other node) is the primary node.
- If both nodes come up at the same time (or within three seconds of each other):
  - The node with the higher configured priority is the primary node.
  - If there is a tie (either because the same value was configured or because default settings were used), the node with the lower node ID (node 0) is the primary node.

The previous priority scheme applies to redundancy groups *x* (redundancy groups numbered 1 through 128) as well, provided preempt is not configured. (See “Example: Configuring Chassis Cluster Redundancy Groups” on page 73.)

You cannot enable preemption for redundancy group 0. If you want to change the primary node for redundancy group 0, you must do a manual failover.

CAUTION: **Be cautious and judicious in your use of redundancy group 0 manual failovers. A redundancy group 0 failover implies a Routing Engine failover, in which case all processes running on the primary node are killed and then spawned on the new master Routing Engine. This failover could result in loss of state, such as routing state, and degrade performance by introducing system churn.**

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Understanding Chassis Cluster Redundancy Groups 1 Through 128

You can configure one or more redundancy groups numbered 1 through 128, referred to as redundancy group *x*. The maximum number of redundancy groups is equal to the number of redundant Ethernet interfaces that you configure (see Table 8 on page 78). Each redundancy group *x* acts as an independent unit of failover and is primary on only one node at a time.

Each redundancy group *x* contains one or more redundant Ethernet interfaces. A redundant Ethernet interface is a pseudointerface that contains at minimum a pair of physical Gigabit Ethernet interfaces or a pair of Fast Ethernet interfaces. If a redundancy group is active on node 0, then the child links of all the associated redundant Ethernet interfaces on node 0 are active. If the redundancy group fails over to node 1, then the child links of all redundant Ethernet interfaces on node 1 become active.

The following priority scheme determines redundancy group *x* primacy, provided preempt is not configured. If preempt is configured, the node with the higher priority is the primary node. Note that the three-second value is the interval if the default **heartbeat-threshold** and **heartbeat-interval** values are used.

- The node that comes up first (at least three seconds prior to the other node) is the primary node.
- If both nodes come up at the same time (or within three seconds of each other):
  - The node with the higher configured priority is the primary node.
  - If there is a tie (either because the same value was configured or because default settings were used), the node with the lower node ID (node 0) is the primary node.

On SRX Series chassis clusters, you can configure multiple redundancy groups to load-share traffic across the cluster. For example, you can configure some redundancy groups *x* to be primary on one node and some redundancy groups *x* to be primary on the other node. You can also configure a redundancy group *x* in a one-to-one relationship with a single redundant Ethernet interface to control which interface traffic flows through.

The traffic for a redundancy group is processed on the node where the redundancy group is active. Because more than one redundancy group can be configured, it is possible that the traffic from some redundancy groups will be processed on one node while the traffic for other redundancy groups is processed on the other node (depending on where the redundancy group is active). Multiple redundancy groups make it possible for traffic to arrive over an ingress interface of one redundancy group and over an egress interface that belongs to another redundancy group. In this situation, the ingress and egress interfaces might not be active on the same node. When this happens, the traffic is forwarded over the fabric link to the appropriate node.

When you configure a redundancy group *x*, you must specify a priority for each node to determine the node on which the redundancy group *x* is primary. The node with the higher priority is selected as primary. The primacy of a redundancy group *x* can fail over from one node to the other. When a redundancy group *x* fails over to the other node, its

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redundant Ethernet interfaces on that node are active and their interfaces are passing traffic.

Table 7 on page 72 gives an example of redundancy group *x* in an SRX Series chassis cluster and indicates the node on which the group is primary. It shows the redundant Ethernet interfaces and their interfaces configured for redundancy group *x*.

NOTE: Some devices have both Gigabit Ethernet ports and Fast Ethernet ports.

Table 7: Example of Redundancy Groups in a Chassis Cluster

Group	Primary	Priority	Objects	Interface (Node 0)	Interface (Node 1)
Redundancy group 0	Node 0	Node 0: 254	Routing Engine on node 0	—	—
		Node 1: 2	Routing Engine on node 1	—	—
Redundancy group 1	Node 0	Node 0: 254	Redundant Ethernet interface 0	**ge-1/0/0**	**ge-5/0/0**
		Node 1: 2	Redundant Ethernet interface 1	**ge-1/3/0**	**ge-5/3/0**
Redundancy group 2	Node 1	Node 0: 2	Redundant Ethernet interface 2	**ge-2/0/0**	**ge-6/0/0**
		Node 1: 254	Redundant Ethernet interface 3	**ge-2/3/0**	**ge-6/3/0**
Redundancy group 3	Node 0	Node 0: 254	Redundant Ethernet interface 4	**ge-3/0/0**	**ge-7/0/0**
		Node 1: 2	Redundant Ethernet interface 5	**ge-3/3/0**	**ge-7/3/0**

As the example for a chassis cluster in Table 7 on page 72 shows:

- The Routing Engine on node 0 is active because redundancy group 0 is primary on node 0. (The Routing Engine on node 1 is passive, serving as backup.)
- Redundancy group 1 is primary on node 0. Interfaces **ge-1/0/0** and **ge-1/3/0** belonging to redundant Ethernet interface 0 and redundant Ethernet interface 1 are active and handling traffic.

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- Redundancy group 2 is primary on node 1. Interfaces **ge-6/0/0** and **ge-6/3/0** belonging to redundant Ethernet interface 2 and redundant Ethernet interface 3 are active and handling traffic.
- Redundancy group 3 is primary on node 0. Interfaces **ge-3/0/0** and **ge-3/3/0** belonging to redundant Ethernet interface 4 and redundant Ethernet interface 5 are active and handling traffic.

Related Documentation

- Example: Configuring Chassis Cluster Redundancy Groups on page 73

Example: Configuring Chassis Cluster Redundancy Groups

Supported Platforms SRX Series, vSRX

This example shows how to configure a chassis cluster redundancy group.

Requirements

Before you begin:

1. Set the chassis cluster node ID and cluster ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.
2. Configure the chassis cluster management interface. See "Example: Configuring the Chassis Cluster Management Interface" on page 53.
3. Configure the chassis cluster fabric. See "Example: Configuring the Chassis Cluster Fabric Interfaces" on page 61.

Overview

A chassis cluster redundancy group is an abstract entity that includes and manages a collection of objects. Each redundancy group acts as an independent unit of failover and is primary on only one node at a time.

In this example, you create two chassis cluster redundancy groups, 0 and 1:

- 0—Node 0 is assigned a priority of 100, and node 1 is assigned a priority of 1.
- 1—Node 0 is assigned a priority of 100, and node 1 is assigned a priority of 1.

The preempt option is enabled, and the number of gratuitous ARP requests that an interface can send to notify other network devices of its presence after the redundancy group it belongs to has failed over is 4.

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Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
[edit]
set chassis cluster redundancy-group 0 node 0 priority 100
set chassis cluster redundancy-group 0 node 1 priority 1
set chassis cluster redundancy-group 1 node 0 priority 100
set chassis cluster redundancy-group 1 node 1 priority 1
set chassis cluster redundancy-group 1 preempt
set chassis cluster redundancy-group 1 gratuitous-arp-count 4
```

Step-by-Step Procedure

To configure a chassis cluster redundancy group:

1. Specify a redundancy group's priority for primacy on each node of the cluster. The higher number takes precedence.

```
{primary:node0}[edit]
user@host# set chassis cluster redundancy-group 0 node 0 priority 100
user@host# set chassis cluster redundancy-group 0 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 node 0 priority 100
user@host# set chassis cluster redundancy-group 1 node 1 priority 1
```

2. Specify whether a node with a higher priority can initiate a failover to become primary for the redundancy group.

```
{primary:node0}[edit]
user@host# set chassis cluster redundancy-group 1 preempt
```

3. Specify the number of gratuitous ARP requests that an interface can send to notify other network devices of its presence after the redundancy group it belongs to has failed over.

```
{primary:node0}[edit]
user@host# set chassis cluster redundancy-group 1 gratuitous-arp-count 4
```

Results

From configuration mode, confirm your configuration by entering the **show chassis cluster status redundancy-group** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
{primary:node0}[edit]
user@host# show chassis cluster
chassis {
  cluster {
    redundancy-group 0 {
      node 0 priority 100;
      node 1 priority 1;
    }
    redundancy-group 1 {
      node 0 priority 100;
      node 1 priority 1;
      preempt;
```

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```
            gratuitous-arp-count 4;
          }
        }
      }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying Chassis Cluster Redundancy Group Status

Purpose Verify the status of a chassis cluster redundancy group.

Action From operational mode, enter the **show chassis cluster status redundancy-group** command.

```
{primary:node0}
user@host>show chassis cluster status redundancy-group 1

Cluster ID: 1
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 1 , Failover count: 1
    node0                   100         secondary    no       no
    node1                   1           primary      yes      no
```

Related Documentation

- Understanding Chassis Cluster Redundancy Groups on page 69

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CHAPTER 10

Setting Up Chassis Cluster Redundant Ethernet Interfaces

Understanding Chassis Cluster Redundant Ethernet Interfaces

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

A redundant Ethernet interface is a pseudointerface that includes at minimum one physical interface from each node of the cluster.

NOTE: **For SRX300, SRX320, SRX340, SRX345, SRX550, and SRX1500 devices, the total number of logical interfaces that you can configure across all the redundant Ethernet (reth) interfaces in a chassis cluster deployment is 1024.**

A redundant Ethernet interface must contain, at minimum, a pair of Fast Ethernet interfaces or a pair of Gigabit Ethernet interfaces that are referred to as child interfaces of the redundant Ethernet interface (the redundant parent). If two or more child interfaces from each node are assigned to the redundant Ethernet interface, a redundant Ethernet interface link aggregation group can be formed. A single redundant Ethernet interface might include a Fast Ethernet interface from node 0 and a Fast Ethernet interface from node 1 or a Gigabit Ethernet interface from node 0 and a Gigabit Ethernet interface from node 1.

NOTE: **A redundant Ethernet interface is referred to as a reth in configuration commands.**

The maximum number of redundant Ethernet interfaces that you can configure varies, depending on the device type you are using, as shown in Table 8 on page 78. Note that the number of redundant Ethernet interfaces configured determines the number of redundancy groups that can be configured.

Table 8: Maximum Number of Redundant Ethernet Interfaces Allowed

Device	Maximum Number of reth Interfaces
SRX300, SRX320, SRX340, SRX345	128
SRX550	58
SRX1500	128

A redundant Ethernet interface's child interface is associated with the redundant Ethernet interface as part of the child interface configuration. The redundant Ethernet interface child interface inherits most of its configuration from its parent.

NOTE: You can enable promiscuous mode on redundant Ethernet interfaces. When promiscuous mode is enabled on a Layer 3 Ethernet interface, all packets received on the interface are sent to the central point or Services Processing Unit (SPU), regardless of the destination MAC address of the packet. If you enable promiscuous mode on a redundant Ethernet interface, promiscuous mode is then enabled on any child physical interfaces.

To enable promiscuous mode on a redundant Ethernet interface, use the **promiscuous-mode** statement at the **[edit interfaces]** hierarchy.

A redundant Ethernet interface inherits its failover properties from the redundancy group *x* that it belongs to. A redundant Ethernet interface remains active as long as its primary child interface is available or active. For example, if **reth0** is associated with redundancy group 1 and redundancy group 1 is active on node 0, then **reth0** is up as long as the node 0 child of **reth0** is up.

Point-to-Point Protocol over Ethernet (PPPoE) over redundant Ethernet (reth) interface is supported on SRX300, SRX320, SRX340, SRX345, and SRX550 devices in chassis cluster mode. This feature allows an existing PPPoE session to continue without starting a new PPP0E session in the event of a failover.

NOTE: On all branch SRX Series devices, the number of child interfaces per node is restricted to eight on the reth interface and the number of child interfaces per reth interface is restricted to eight.

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NOTE: When using SRX Series devices in chassis cluster mode, we recommend that you do not configure any local interfaces (or combination of local interfaces) along with redundant Ethernet interfaces.

For example:

The following configuration of chassis cluster redundant Ethernet interfaces, in which interfaces are configured as local interfaces, is not supported:

```
ge-2/0/2 {
  unit 0 {
    family inet {
      address 1.1.1.1/24;
    }
  }
}
```

The following configuration of chassis cluster redundant Ethernet interfaces, in which interfaces are configured as part of redundant Ethernet interfaces, is supported:

```
interfaces {
  ge-2/0/2 {
    gigether-options {
      redundant-parent reth2;
    }
  }
  reth2 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family inet {
        address 1.1.1.1/24;
      }
    }
  }
}
```

Related Documentation

- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79
- Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups on page 165
- Understanding Conditional Route Advertising in a Chassis Cluster on page 159
- Preparing Your Equipment for Chassis Cluster Formation on page 35

Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses

Supported Platforms SRX Series, vSRX

This example shows how to configure chassis cluster redundant Ethernet interfaces. A redundant Ethernet interface is a pseudointerface that contains two or more physical interfaces, with at least one from each node of the cluster.

Requirements

Before you begin:

- Understand how to set the chassis cluster node ID and cluster ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.
- Set the number of redundant Ethernet interfaces.
- Understand how to set the chassis cluster fabric. See "Example: Configuring the Chassis Cluster Fabric Interfaces" on page 61.
- Understand how to set the chassis cluster node redundancy groups. See "Example: Configuring Chassis Cluster Redundancy Groups" on page 73.

Overview

After physical interfaces have been assigned to the redundant Ethernet interface, you set the configuration that pertains to them at the level of the redundant Ethernet interface, and each of the child interfaces inherits the configuration.

If multiple child interfaces are present, then the speed of all the child interfaces must be the same.

A redundant Ethernet interface is referred to as a reth in configuration commands.

NOTE: You can enable promiscuous mode on redundant Ethernet interfaces. When promiscuous mode is enabled on a Layer 3 Ethernet interface, all packets received on the interface are sent to the central point or Services Processing Unit regardless of the destination MAC address of the packet. If you enable promiscuous mode on a redundant Ethernet interface, promiscuous mode is then enabled on any child physical interfaces.

To enable promiscuous mode on a redundant Ethernet interface, use the promiscuous-mode statement at the [edit interfaces] hierarchy.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network

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configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/0 gigether-options redundant-parent reth1
set interfaces ge-7/0/0 gigether-options redundant-parent reth1
set interfaces fe-1/0/0 fast-ether-options redundant-parent reth2
set interfaces fe-8/0/0 fast-ether-options redundant-parent reth2
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth1 unit 0 family inet mtu 1500
set interfaces reth1 unit 0 family inet address 10.1.1.3/24
set security zones security-zone Trust interfaces reth1.0
```

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/0 gigether-options redundant-parent reth1
set interfaces ge-7/0/0 gigether-options redundant-parent reth1
set interfaces fe-1/0/0 fast-ether-options redundant-parent reth2
set interfaces fe-8/0/0 fast-ether-options redundant-parent reth2
set interfaces reth2 redundant-ether-options redundancy-group 1
set interfaces reth2 unit 0 family inet6 mtu 1500
set interfaces reth2 unit 0 family inet6 address 2010:2010:201::2/64
set security zones security-zone Trust interfaces reth2.0
```

Step-by-Step Procedure

To configure redundant Ethernet interfaces for IPv4:

1. Bind redundant child physical interfaces to reth1.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/0 gigether-options redundant-parent reth1
user@host# set interfaces ge-7/0/0 gigether-options redundant-parent reth1
```

2. Bind redundant child physical interfaces to reth2.

```
{primary:node0}[edit]
user@host# set interfaces fe-1/0/0 fast-ether-options redundant-parent reth2
user@host# set interfaces fe-8/0/0 fast-ether-options redundant-parent reth2
```

3. Add reth1 to redundancy group 1.

```
{primary:node0}[edit]
user@host# set interfaces reth1 redundant-ether-options redundancy-group 1
```

4. Set the MTU size.

```
{primary:node0}[edit]
user@host# set interfaces reth1 unit 0 family inet mtu 1500
```

NOTE: The maximum transmission unit (MTU) set on the reth interface can be different from the MTU on the child interface.

5. Assign an IP address to reth1.

```
{primary:node0}[edit]
user@host# set interfaces reth1 unit 0 family inet address 10.1.1.3/24
```

6. Associate reth1.0 to the trust security zone.

```
{primary:node0}[edit]
user@host# set security zones security-zone Trust interfaces reth1.0
```

Step-by-Step Procedure

To configure redundant Ethernet interfaces for IPv6:

1. Bind redundant child physical interfaces to reth1.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/0 gigether-options redundant-parent reth1
user@host# set interfaces ge-7/0/0 gigether-options redundant-parent reth1
```

2. Bind redundant child physical interfaces to reth2.

```
{primary:node0}[edit]
user@host# set interfaces fe-1/0/0 fast-ether-options redundant-parent reth2
user@host# set interfaces fe-8/0/0 fast-ether-options redundant-parent reth2
```

3. Add reth2 to redundancy group 1.

```
{primary:node0}[edit]
user@host# set interfaces reth2 redundant-ether-options redundancy-group 1
```

4. Set the MTU size.

```
{primary:node0}[edit]
user@host# set interfaces reth2 unit 0 family inet6 mtu 1500
```

5. Assign an IP address to reth2.

```
{primary:node0}[edit]
user@host# set interfaces reth2 unit 0 family inet6 address 2010:2010:201::2/64
```

6. Associate reth2.0 to the trust security zone.

```
{primary:node0}[edit]
user@host# set security zones security-zone Trust interfaces reth2.0
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces reth0** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show interfaces
interfaces {
  ...
  fe-1/0/0 {
    fastether-options {
      redundant-parent reth2;
    }
```


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```
        }
        fe-8/0/0 {
            fastether-options {
                redundant-parent reth2;
            }
        }
        ge-0/0/0 {
            gigether-options {
                redundant-parent reth1;
            }
        }
        ge-7/0/0 {
            gigether-options {
                redundant-parent reth1;
            }
        }
        reth1 {
            redundant-ether-options {
                redundancy-group 1;
            }
            unit 0 {
                family inet {
                    mtu 1500;
                    address 10.1.1.3/24;
                }
            }
        }
        reth2 {
            redundant-ether-options {
                redundancy-group 1;
            }
            unit 0 {
                family inet6 {
                    mtu 1500;
                    address 2010:2010:201::2/64;
                }
            }
        }
        ...
    }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Chassis Cluster Redundant Ethernet Interfaces on page 83
- Verifying Chassis Cluster Control Links on page 84

Verifying Chassis Cluster Redundant Ethernet Interfaces

Purpose Verify the configuration of the chassis cluster redundant Ethernet interfaces.

Action From operational mode, enter the **show interfaces | match reth1** command:

```
{primary:node0}
user@host> show interfaces | match reth1
ge-0/0/0.0               up     down aenet     --> reth1.0
ge-7/0/0.0               up     down aenet     --> reth0.0
reth1                    up     down
reth1.0                  up     down inet      10.1.1.3/24
```

Verifying Chassis Cluster Control Links

Purpose Verify information about the control interface in a chassis cluster configuration.

Action From operational mode, enter the **show chassis cluster interfaces** command:

```
{primary:node0}
user@host> show chassis cluster interfaces

Control link status: Down

Control interfaces:
    Index   Interface    Monitored-Status   Internal-SA
    0       em0          Down               Disabled
    1       em1          Down               Disabled

Fabric link status: Down

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0
    fab0

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    reth1          Up          1
```

Related Documentation

- Understanding Chassis Cluster Redundant Ethernet Interfaces on page 77

Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster

Supported Platforms SRX Series, vSRX

This example shows how to specify the number of redundant Ethernet interfaces for a chassis cluster. You must configure the redundant Ethernet interfaces count so that the redundant Ethernet interfaces that you configure are recognized.

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Requirements

Before you begin, set the chassis cluster ID and chassis cluster node ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.

Overview

Before you configure redundant Ethernet interfaces for a chassis cluster, you must specify the number of redundant Ethernet interfaces for the chassis cluster.

In this example, you set the number of redundant Ethernet interfaces for a chassis cluster to 2.

Configuration

Step-by-Step Procedure

To set the number of redundant Ethernet interfaces for a chassis cluster:

1. Specify the number of redundant Ethernet interfaces:

   {primary:node0}[edit]
   user@host# **set chassis cluster reth-count 2**

2. If you are done configuring the device, commit the configuration.

   [edit]
   user@host# **commit**

Verification

Verifying the Number of Redundant Ethernet Interfaces

Purpose Verify that the configuration is working properly.

Action To verify the configuration, enter the **show configuration chassis cluster** command.

Related Documentation

- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79

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CHAPTER 11

Configuring Chassis Cluster

Example: Configuring an SRX Series Services Gateway for the Branch as a Chassis Cluster

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

This example shows how to set up chassis clustering on an SRX Series for the branch device.

Requirements

Before you begin:

- Physically connect the two devices and ensure that they are the same models. For example, on the SRX1500 Services Gateway, connect the dedicated control ports on node 0 and node 1.

  NOTE: **For SRX300, SRX320, SRX340, and SRX345 devices, connect ge-0/0/1 on node 0 to ge-0/0/1 on node 1.**

- Set the two devices to cluster mode and reboot the devices. You must enter the following operational mode commands on both devices, for example:
  - On node 0:

    user@host> **set chassis cluster cluster-id 1 node 0 reboot**

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- On node 1:

  user@host> **set chassis cluster cluster-id 1 node 1 reboot**

  The cluster-id is the same on both devices, but the node ID must be different because one device is node 0 and the other device is node 1. The range for the cluster-id is 0 through 255 and setting it to 0 is equivalent to disabling cluster mode.

- After clustering occurs for the devices, continuing with the SRX1500 Services Gateway example, the **ge-0/0/0** interface on node 1 changes to **ge-7/0/0**.

  NOTE:
  After clustering occurs,

  - For SRX300 devices, the ge-0/0/1 interface on node 1 changes to ge-1/0/1.
  - For SRX320 devices, the ge-0/0/1 interface on node 1 changes to ge-3/0/1.
  - For SRX340 and SRX345 devices, the ge-0/0/1 interface on node 1 changes to ge-5/0/1.

  NOTE:
  After the reboot, the following interfaces are assigned and repurposed to form a cluster:

  - For SRX300 and SRX320 devices, ge-0/0/0 becomes fxp0 and is used for individual management of the chassis cluster.
  - SRX340 and SRX345 devices contain a dedicated port fxp0.
  - For all SRX300, SRX320, SRX340 and SRX345 devices, ge-0/0/1 becomes fxp1 and is used as the control link within the chassis cluster.
  - The other interfaces are also renamed on the secondary device.

  See "Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming" on page 47 for complete mapping of the SRX Series devices.

From this point forward, configuration of the cluster is synchronized between the node members and the two separate devices function as one device.

Overview

This example shows how to set up chassis clustering on an SRX Series device using the SRX1500 device as example.

The node 1 renumbers its interfaces by adding the total number of system FPCs to the original FPC number of the interface. See Table 9 on page 89 for interface renumbering on the SRX Series device.

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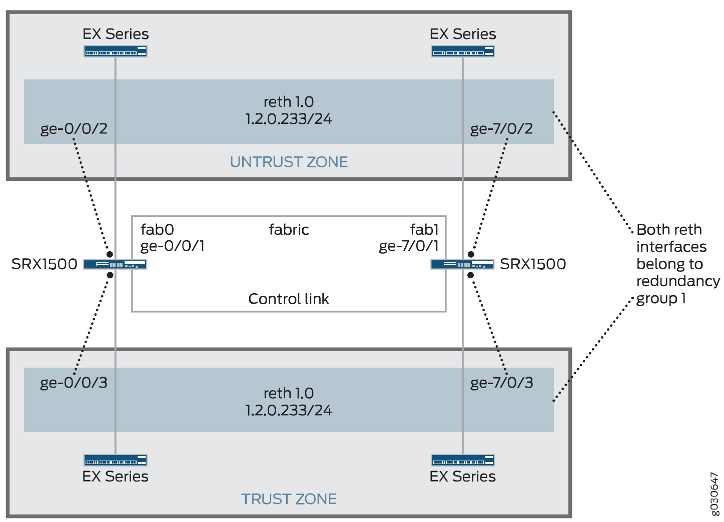
Table 9: SRX Series Services Gateways Interface Renumbering

SRX Series Services Gateway	Renumbering Constant	Node 0 Interface Name	Node 1 Interface Name
SRX300	1	**ge-0/0/0**	**ge-1/0/0**
SRX320	3	**ge-0/0/0**	**ge-3/0/0**
SRX340 SRX345	5	**ge-0/0/0**	**ge-5/0/0**
SRX550	9	**ge-0/0/0**	**ge-9/0/0**
SRX1500	7	**ge-0/0/0**	**ge-7/0/0**

After clustering is enabled, the system creates fxp0, fxp1, and em0 interfaces. Depending on the device, the fxp0, fxp1, and em0 interfaces that are mapped to a physical interface are not user defined. However, the fab interface is user defined.

Figure 14 on page 89 shows the topology used in this example.

Figure 14: SRX Series for the Branch Topology Example



Configuration

CLI Quick Configuration

To quickly configure a chassis cluster on an SRX1500 Services Gateway, copy the following commands and paste them into the CLI:

On {primary:node0}

```
[edit]
set groups node0 system host-name srx1500-1
set groups node0 interfaces fxp0 unit 0 family inet address 192.16.35.46/24
set groups node1 system host-name srx1500-2
```

```
set groups node1 interfaces fxp0 unit 0 family inet address 192.16.35.47/24
set groups node0 system backup-router <backup next-hop from fxp0> destination
  <management network/mask>
set groups node1 system backup-router <backup next-hop from fxp0> destination
  <management network/mask>
set apply-groups "${node}"
set interfaces fab0 fabric-options member-interfaces ge-0/0/1
set interfaces fab1 fabric-options member-interfaces ge-2/0/1
set chassis cluster redundancy-group 0 node 0 priority 100
set chassis cluster redundancy-group 0 node 1 priority 1
set chassis cluster redundancy-group 1 node 0 priority 100
set chassis cluster redundancy-group 1 node 1 priority 1
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/3 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/2 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-7/0/3 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-7/0/2 weight 255
set chassis cluster reth-count 2
set interfaces ge-0/0/2 gigether-options redundant-parent reth1
set interfaces ge-7/0/2 gigether-options redundant-parent reth1
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth1 unit 0 family inet address 1.2.0.233/24
set interfaces ge-0/0/3 gigether-options redundant-parent reth0
set interfaces ge-7/0/3 gigether-options redundant-parent reth0
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth0 unit 0 family inet address 10.16.8.1/24
set security zones security-zone Untrust interfaces reth1.0
set security zones security-zone Trust interfaces reth0.0
```

If you are configuring a Branch SRX Series device, see Table 10 on page 90 for command and interface settings for your device and substitute these commands into your CLI.

Table 10: SRX Series Services Gateways for the Branch Interface Settings

Command	SRX300	SRX320	SRX340 SRX345	SRX550
set interfaces fab0 fabric-options member-interfaces	ge-0/0/2	ge-0/0/2	ge-0/0/2	ge-0/0/2
set interfaces fab1 fabric-options member-interfaces	ge-1/0/2	ge-3/0/2	ge-5/0/2	ge-9/0/2
set chassis cluster redundancy-group 1 interface-monitor	ge-0/0/3 weight 255	ge-0/0/3 weight 255	ge-0/0/3 weight 255	ge-1/0/0 weight 255
set chassis cluster redundancy-group 1 interface-monitor	ge-0/0/4 weight 255	ge-0/0/4 weight 255	ge-0/0/4 weight 255	ge-10/0/0 weight 255
set chassis cluster redundancy-group 1 interface-monitor	ge-1/0/3 weight 255	ge-3/0/3 weight 255	ge-5/0/3 weight 255	ge-1/0/1 weight 255

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Table 10: SRX Series Services Gateways for the Branch Interface Settings *(continued)*

Command	SRX300	SRX320	SRX340 SRX345	SRX550
set chassis cluster redundancy-group 1 interface-monitor	ge-1/0/4 weight 255	ge-3/0/4 weight 255	ge-5/0/4 weight 255	ge-10/0/1 weight 255
set interfaces	ge-0/0/3 gigether-options redundant-parent reth0	ge-0/0/3 gigether-options redundant-parent reth0	ge-0/0/3 gigether-options redundant-parent reth0	ge-1/0/0 gigether-options redundant-parent reth1
set interfaces	ge-0/0/4 gigether-options redundant-parent reth1	ge-0/0/4 gigether-options redundant-parent reth1	ge-0/0/4 gigether-options redundant-parent reth1	ge-10/0/0 gigether-options redundant-parent reth1
set interfaces	ge-1/0/3 gigether-options redundant-parent reth0	ge-3/0/3 gigether-options redundant-parent reth0	ge-5/0/3 gigether-options redundant-parent reth0	ge-1/0/1 gigether-options redundant-parent reth0
set interfaces	ge-1/0/4 gigether-options redundant-parent reth1	ge-3/0/4 gigether-options redundant-parent reth1	ge-5/0/4 gigether-options redundant-parent reth1	ge-10/0/1 gigether-options redundant-parent reth0

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To configure a chassis cluster on an SRX Series for the branch device:

NOTE: Perform Steps 1 through 5 on the primary device (node 0). They are automatically copied over to the secondary device (node 1) when you execute a **commit** command. The configurations are synchronized because the control link and fab link interfaces are activated. To verify the configurations, use the **show interface terse** command and review the output.

1. Set up hostnames and management IP addresses for each device using configuration groups. These configurations are specific to each device and are unique to its specific node.

   user@host# **set groups node0 system host-name srx1500-1**
   user@host# **set groups node0 interfaces fxp0 unit 0 family inet address 192.16.35.46/24**
   user@host# **set groups node1 system host-name srx1500-2**
   user@host# **set groups node1 interfaces fxp0 unit 0 family inet address 192.16.35.47/24**

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Set the default route and backup router for each node.

user@host# **set groups node0 system backup-router <backup next-hop from fxp0> destination <management network/mask>**
user@host# **set groups node1 system backup-router <backup next-hop from fxp0> destination <management network/mask>**

Set the **apply-group** command so that the individual configurations for each node set by the previous commands are applied only to that node.

user@host# **set apply-groups "${node}"**

2. Define the interfaces used for the fab connection (data plane links for RTO sync) by using physical ports **ge-0/0/1** from each node. These interfaces must be connected back-to-back, or through a Layer 2 infrastructure.

   user@host# **set interfaces fab0 fabric-options member-interfaces ge-0/0/1**
   user@host# **set interfaces fab1 fabric-options member-interfaces ge-7/0/1**

3. Set up redundancy group 0 for the Routing Engine failover properties, and set up redundancy group 1 (all interfaces are in one redundancy group in this example) to define the failover properties for the redundant Ethernet interfaces.

   user@host# **set chassis cluster redundancy-group 0 node 0 priority 100**
   user@host# **set chassis cluster redundancy-group 0 node 1 priority 1**
   user@host# **set chassis cluster redundancy-group 1 node 0 priority 100**
   user@host# **set chassis cluster redundancy-group 1 node 1 priority 1**

4. Set up interface monitoring to monitor the health of the interfaces and trigger redundancy group failover.

   NOTE: We do not recommend Interface monitoring for redundancy group 0 because it causes the control plane to switch from one node to another node in case interface flap occurs.

   user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/3 weight 255**
   user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/2 weight 255**
   user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-7/0/3 weight 255**
   user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-7/0/2 weight 255**

   NOTE: Interface failover only occurs after the weight reaches 0.

5. Set up the redundant Ethernet (reth) interfaces and assign the redundant interface to a zone.

   user@host# **set chassis cluster reth-count 2**
   user@host# **set interfaces ge-0/0/2 gigether-options redundant-parent reth1**
   user@host# **set interfaces ge-7/0/2 gigether-options redundant-parent reth1**

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user@host# **set interfaces reth1 redundant-ether-options redundancy-group 1**
user@host# **set interfaces reth1 unit 0 family inet address 1.2.0.233/24**
user@host# **set interfaces ge-0/0/3 gigether-options redundant-parent reth0**
user@host# **set interfaces ge-7/0/3 gigether-options redundant-parent reth0**
user@host# **set interfaces reth0 redundant-ether-options redundancy-group 1**
user@host# **set interfaces reth0 unit 0 family inet address 10.16.8.1/24**
user@host# **set security zones security-zone Untrust interfaces reth1.0**
user@host# **set security zones security-zone Trust interfaces reth0.0**

Results From operational mode, confirm your configuration by entering the **show configuration** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
> show configuration
version x.xx.x;
groups {
    node0 {
        system {
            host-name SRX1500-1;
            backup-router 10.100.22.1 destination 66.129.243.0/24;
        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address 192.16.35.46/24;
                    }
                }
            }
        }
    }
    node1 {
        system {
            host-name SRX1500-2;
            backup-router 10.100.21.1 destination 66.129.243.0/24;        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address 192.16.35.47/24;
                    }
                }
            }
        }
    }
}
apply-groups "${node}";
chassis {
    cluster {
        reth-count 2;
        redundancy-group 0 {
            node 0 priority 100;
            node 1 priority 1;
        }
        redundancy-group 1 {
```

```
                node 0 priority 100;
                node 1 priority 1;
                interface-monitor {
                    ge-0/0/3 weight 255;
                    ge-0/0/2 weight 255;
                    ge-7/0/2 weight 255;
                    ge-7/0/3 weight 255;
                }
            }
        }
    }
    interfaces {
        ge-0/0/2 {
            gigether-options {
                redundant-parent reth1;
            }
            unit 0 {
                family inet {
                    address 2.2.2.2/30;
                }
            }
        }
        ge-0/0/3 {
            gigether-options {
                redundant-parent reth0;
            }
        }
        ge-7/0/2 {
            gigether-options {
                redundant-parent reth1;
            }
        }
        ge-7/0/3 {
            gigether-options {
                redundant-parent reth0;
            }
        }
        fab0 {
            fabric-options {
                member-interfaces {
                    ge-0/0/1;
                }
            }
        }
        fab1 {
            fabric-options {
                member-interfaces {
                    ge-2/0/1;
                }
            }
        }
        reth0 {
            redundant-ether-options {
                redundancy-group 1;
            }
            unit 0 {
                family inet {
                    address 10.16.8.1/24;
                }
            }
        }
```

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```
    reth1 {
        redundant-ether-options {
            redundancy-group 1;
        }
        unit 0 {
            family inet {
                address 1.2.0.233/24;
            }
        }
    }
}
...
security {
    zones {
        security-zone Untrust {
            interfaces {
                reth1.0;
            }
        }
        security-zone Trust {
            interfaces {
                reth0.0;
            }
        }
    }
    policies {
        from-zone Trust to-zone Untrust {
            policy 1 {
                match {
                    source-address any;
                    destination-address any;
                    application any;
                }
                then {
                    permit;
                }
            }
        }
    }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Chassis Cluster Status on page 96
- Verifying Chassis Cluster Interfaces on page 96
- Verifying Chassis Cluster Statistics on page 96
- Verifying Chassis Cluster Control Plane Statistics on page 97
- Verifying Chassis Cluster Data Plane Statistics on page 97
- Verifying Chassis Cluster Redundancy Group Status on page 98
- Troubleshooting with Logs on page 98

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Verifying Chassis Cluster Status

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host# show chassis cluster status
Cluster ID: 1
Node                        Priority     Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                    100         primary   no       no
    node1                    1           secondary no       no

Redundancy group: 1 , Failover count: 1
    node0                    0           primary   no       no
    node1                    0           secondary no       no
```

Verifying Chassis Cluster Interfaces

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link name: em0

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1

Interface Monitoring:
    Interface         Weight     Status     Redundancy-group
    ge-7/0/3          255        Up         1
    ge-7/0/2          255        Up         1
    ge-0/0/2          255        Up         1
    ge-0/0/3          255        Up         1
```

Verifying Chassis Cluster Statistics

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitored interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster statistics** command.

```
{primary:node0}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 2276
        Heartbeat packets received: 2280
        Heartbeat packets errors: 0
```

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```
Fabric link statistics:
    Child link 0
        Probes sent: 2272
        Probes received: 597
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            161          0
    Session close                             148          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Control Plane Statistics

Purpose Verify information about chassis cluster control plane statistics (heartbeats sent and received) and the fabric link statistics (probes sent and received).

Action From operational mode, enter the **show chassis cluster control-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 2294
        Heartbeat packets received: 2298
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 2290
        Probes received: 615
```

Verifying Chassis Cluster Data Plane Statistics

Purpose Verify information about the number of RTOs sent and received for services.

Action From operational mode, enter the **show chassis cluster data-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster data-plane statistics

Services Synchronized:
```

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```
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            161          0
    Session close                             148          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Redundancy Group Status

Purpose Verify the state and priority of both nodes in a cluster and information about whether the primary node has been preempted or whether there has been a manual failover.

Action From operational mode, enter the **chassis cluster status redundancy-group** command.

```
{primary:node0}
user@host> show chassis cluster status redundancy-group 1
Cluster ID: 1
    Node                   Priority     Status     Preempt  Manual failover

 Redundancy group: 1, Failover count: 1
    node0                  100           primary    no       no
    node1                  50            secondary no       no
```

Troubleshooting with Logs

Purpose Use these logs to identify any chassis cluster issues. You should run these logs on both nodes.

Action From operational mode, enter these **show log** commands.

```
user@host> show log jsrpd
user@host> show log chassisd
user@host> show log messages
user@host> show log dcd
user@host> show traceoptions
```

Related Documentation

- Understanding Chassis Cluster Redundancy Groups on page 69.
- Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming on page 47

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Verifying a Chassis Cluster Configuration

Supported Platforms SRX Series, vSRX

Purpose Display chassis cluster verification options.

Action From the CLI, enter the **show chassis cluster ?** command:

```
{primary:node1}
user@host> show chassis cluster ?
Possible completions:
  interfaces           Display chassis-cluster interfaces
  statistics           Display chassis-cluster traffic statistics
  status               Display chassis-cluster status
```

Related Documentation

- Verifying Chassis Cluster Statistics on page 99
- Clearing Chassis Cluster Statistics on page 101

Verifying Chassis Cluster Statistics

Supported Platforms SRX Series, vSRX

Purpose Display information about chassis cluster services and interfaces.

Action From the CLI, enter the **show chassis cluster statistics** command:

```
{primary:node1}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 798
        Heartbeat packets received: 784
Fabric link statistics:
    Child link 0
        Probes sent: 793
        Probes received: 0
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          0            0
    Session create                            0            0
    Session close                             0            0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RTSP ALG                                  0            0
```

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```
{primary:node1}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
    Control link 1:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
    Child link 1
        Probes sent: 258501
        Probes received: 258501
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          0            0
    Session create                            1            0
    Session close                             1            0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0

{primary:node1}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 82371
        Heartbeat packets received: 82321
    Control link 1:
        Heartbeat packets sent: 0
        Heartbeat packets received: 0
```

Related Documentation

- Verifying a Chassis Cluster Configuration on page 99
- Clearing Chassis Cluster Statistics on page 101

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Clearing Chassis Cluster Statistics

Supported Platforms SRX Series, vSRX

To clear displayed information about chassis cluster services and interfaces, enter the **clear chassis cluster statistics** command from the CLI:

```
{primary:node1}
user@host> clear chassis cluster statistics

Cleared control-plane statistics
Cleared data-plane statistics
```

Related Documentation

- Verifying a Chassis Cluster Configuration on page 99
- Verifying Chassis Cluster Statistics on page 99

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PART 3

Managing Chassis Cluster Operations

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CHAPTER 12

Monitoring Chassis Cluster

Understanding Chassis Cluster Redundancy Group Interface Monitoring

Supported Platforms SRX Series, vSRX

For a redundancy group to automatically failover to another node, its interfaces must be monitored. When you configure a redundancy group, you can specify a set of interfaces that the redundancy group is to monitor for status (or “health”) to determine whether the interface is up or down. A monitored interface can be a child interface of any of its redundant Ethernet interfaces. When you configure an interface for a redundancy group to monitor, you give it a weight.

Every redundancy group has a threshold tolerance value initially set to 255. When an interface monitored by a redundancy group becomes unavailable, its weight is subtracted from the redundancy group's threshold. When a redundancy group's threshold reaches 0, it fails over to the other node. For example, if redundancy group 1 was primary on node 0, on the threshold-crossing event, redundancy group 1 becomes primary on node 1. In this case, all the child interfaces of redundancy group 1's redundant Ethernet interfaces begin handling traffic.

To check the interface weight, use the below commands:

- show chassis cluster information
- show chassis cluster interfaces

NOTE: We do not recommend configuring data plane modules such as interface monitoring and IP monitoring on Redundancy Group 0 (RG0) for SRX Series devices in a chassis cluster.

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CAUTION: Be cautious and judicious in your use of redundancy group 0 manual failovers. A redundancy group 0 failover implies a Routing Engine (RE) failover, in which case all processes running on the primary node are killed and then spawned on the new master Routing Engine (RE). This failover could result in loss of state, such as routing state, and degrade performance by introducing system churn.

A redundancy group failover occurs because the cumulative weight of the redundancy group's monitored interfaces has brought its threshold value to 0. When the monitored interfaces of a redundancy group on both nodes reach their thresholds at the same time, the redundancy group is primary on the node with the lower node ID, in this case node 0.

NOTE:

- If you want to dampen the failovers occurring because of interface monitoring failures, use the **hold-down-interval** statement.
- If a failover occurs on Redundancy Group 0 (RG0), the interface monitoring on the RG0 secondary is disabled for 30 seconds. This prevents failover of other redundancy groups along with RG0 failover.

Related Documentation

- Example: Configuring Chassis Cluster Interface Monitoring on page 106
- Understanding Chassis Cluster Redundancy Groups on page 69
- Example: Configuring Chassis Cluster Redundancy Groups on page 73

Example: Configuring Chassis Cluster Interface Monitoring

Supported Platforms SRX Series, vSRX

This example shows how to specify that an interface be monitored by a specific redundancy group for automatic failover to another node. You assign a weight to the interface to be monitored also shows how to verify the process of the remaining threshold of a monitoring interface by configuring two interfaces from each node and mapping them to redundancy groups.

Requirements

Before you begin, create a redundancy group. See "Example: Configuring Chassis Cluster Redundancy Groups" on page 73.

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Overview

To retrieve the remaining redundancy group threshold after a monitoring interface is down, you can configure your system to monitor the health of the interfaces belonging to a redundancy group. When you assign a weight to an interface to be monitored, the system monitors the interface for availability. If a physical interface fails, the weight is deducted from the corresponding redundancy group's threshold. Every redundancy group has a threshold of 255. If the threshold hits 0, a failover is triggered, even if the redundancy group is in manual failover mode and the **preempt** option is not enabled.

In this example, you check the process of the remaining threshold of a monitoring interface by configuring two interfaces from each node and mapping them to Redundancy Group 1 (RG1), each with different weights. You use 130 and 140 for node 0 interfaces and 150 and 120 for node 1 interfaces. You configure one interface from each node and map the interfaces to Redundancy Group 2 (RG2), each with default weight of 255.

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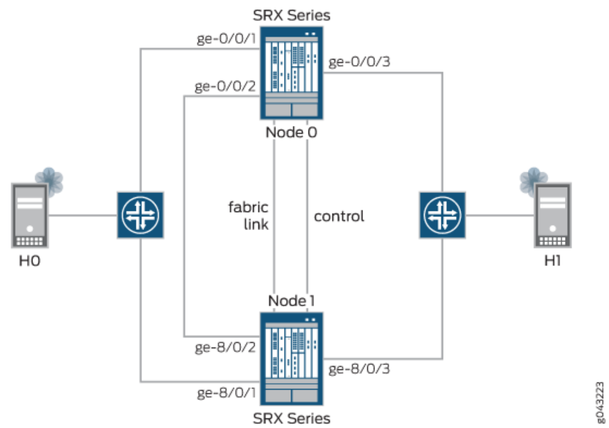
Figure 15 on page 108 illustrates the network topology used in this example.

Figure 15: SRX Series Chassis Cluster Interface Monitoring Topology Example



Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **edit** hierarchy level, and then enter **commit** from configuration mode.

```
set chassis cluster traceoptions flag all
set chassis cluster reth-count 3
set chassis cluster redundancy-group 0 node 0 priority 254
set chassis cluster redundancy-group 0 node 1 priority 1
set chassis cluster redundancy-group 1 node 0 priority 200
set chassis cluster redundancy-group 1 node 1 priority 100
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/1 weight 130
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/2 weight 140
set chassis cluster redundancy-group 1 interface-monitor ge-8/0/1 weight 150
set chassis cluster redundancy-group 1 interface-monitor ge-8/0/2 weight 120
set chassis cluster redundancy-group 2 node 0 priority 200
set chassis cluster redundancy-group 2 node 1 priority 100
set chassis cluster redundancy-group 2 interface-monitor ge-0/0/3 weight 255
set chassis cluster redundancy-group 2 interface-monitor ge-8/0/3 weight 255
set interfaces ge-0/0/1 gigether-options redundant-parent reth0
set interfaces ge-0/0/2 gigether-options redundant-parent reth1
set interfaces ge-0/0/3 gigether-options redundant-parent reth2
set interfaces ge-8/0/1 gigether-options redundant-parent reth0
set interfaces ge-8/0/2 gigether-options redundant-parent reth1
set interfaces ge-8/0/3 gigether-options redundant-parent reth2
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth0 unit 0 family inet address 10.1.1.1/8
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth1 unit 0 family inet address 11.1.1.1/8
set interfaces reth2 redundant-ether-options redundancy-group 2
set interfaces reth2 unit 0 family inet address 12.1.1.1/8
```

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Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the Junos OS *CLI User Guide*.

To configure chassis cluster interface monitoring:

1. Specify the traceoptions for chassis cluster.

   [edit chassis cluster]
   user@host# **set traceoptions flag all**

2. Specify the number of redundant Ethernet interfaces.

   [edit chassis cluster]
   user@host# **set reth-count 3**

3. Set up redundancy group 0 for the Routing Engine failover properties, and set up RG1 and RG2 (all interfaces are in one redundancy group in this example) to define the failover properties for the redundant Ethernet interfaces.

   [edit chassis cluster]
   user@host# **set redundancy-group 0 node 0 priority 254**
   user@host# **set redundancy-group 0 node 1 priority 1**
   user@host# **set redundancy-group 1 node 0 priority 200**
   user@host# **set redundancy-group 1 node 1 priority 100**
   user@host# **set redundancy-group 2 node 0 priority 200**
   user@host# **set redundancy-group 2 node 1 priority 100**

4. Set up interface monitoring to monitor the health of the interfaces and trigger redundancy group failover.

   NOTE: We do not recommend interface monitoring for RG0, because it causes the control plane to switch from one node to another node in case interface flap occurs.

   [edit chassis cluster]
   user@host# **Set redundancy-group 1 interface-monitor ge-0/0/1 weight 130**
   user@host# **Set redundancy-group 1 interface-monitor ge-0/0/2 weight 140**
   user@host# **Set redundancy-group 1 interface-monitor ge-8/0/1 weight 150**
   user@host# **Set redundancy-group 1 interface-monitor ge-0/0/2 weight 120**
   user@host# **Set redundancy-group 2 interface-monitor ge-0/0/3 weight 255**
   user@host# **Set redundancy-group 2 interface-monitor ge-8/0/3 weight 255**

   NOTE: Interface failover only occurs after the weight reaches zero.

5. Set up the redundant Ethernet (reth) interfaces and assign them to a zone.

   [edit interfaces]
   user@host# **Set ge-0/0/1 gigether-options redundant-parent reth0**
   user@host# **Set ge-0/0/2 gigether-options redundant-parent reth1**
   user@host# **Set ge-0/0/3 gigether-options redundant-parent reth2**
   user@host# **Set ge-8/0/1 gigether-options redundant-parent reth0**

```
user@host# Set ge-8/0/2 gigether-options redundant-parent reth1
user@host# Set ge-8/0/3 gigether-options redundant-parent reth2
user@host# Set reth0 redundant-ether-options redundancy-group 1
user@host# Set reth0 unit 0 family inet address 10.1.1.1/8
user@host# Set reth1 redundant-ether-options redundancy-group 1
user@host# Set reth1 unit 0 family inet address 11.1.1.1/8
user@host# Set reth2 redundant-ether-options redundancy-group 2
user@host# Set reth2 unit 0 family inet address 12.1.1.1/8
```

Results From configuration mode, confirm your configuration by entering the **show chassis** and **show interfaces** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis
  cluster {
    traceoptions {
      flag all;
    }
    reth-count 3;
    node 0; ## Warning: 'node' is deprecated
    node 1; ## Warning: 'node' is deprecated
    redundancy-group 0 {
      node 0 priority 254;
      node 1 priority 1;
    }
    redundancy-group 1 {
      node 0 priority 200;
      node 1 priority 100;
      interface-monitor {
        ge-0/0/1 weight 130;
        ge-0/0/2 weight 140;
        ge-8/0/1 weight 150;
        ge-8/0/2 weight 120;
      }
    }
    redundancy-group 2 {
      node 0 priority 200;
      node 1 priority 100;
      interface-monitor {
        ge-0/0/3 weight 255;
        ge-8/0/3 weight 255;
      }
    }
  }
[edit]
user@host# show interfaces
ge-0/0/1 {
  gigether-options {
    redundant-parent reth0;
  }
}
ge-0/0/2 {
  gigether-options {
    redundant-parent reth1;
```

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```
    }
  }
  ge-0/0/3 {
    gigether-options {
      redundant-parent reth2;
    }
  }
  ge-8/0/1 {
    gigether-options {
      redundant-parent reth0;
    }
  }
  ge-8/0/2 {
    gigether-options {
      redundant-parent reth1;
    }
  }
  ge-8/0/3 {
    gigether-options {
      redundant-parent reth2;
    }
  }
  reth0 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family inet {
        address 10.1.1.1/8;
      }
    }
  }
  reth1 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family inet {
        address 11.1.1.1/8;
      }
    }
  }
  reth2 {
    redundant-ether-options {
      redundancy-group 2;
    }
    unit 0 {
      family inet {
        address 12.1.1.1/8;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

The following sections walk you through the process of verifying and (in some cases) troubleshooting the interface status. The process shows you how to check the status of each interface in the redundancy group, check them again after they have been disabled, and looks for details about each interface, until you have circled through all interfaces in the redundancy group.

In this example, you verify the process of the remaining threshold of a monitoring interface by configuring two interfaces from each node and mapping them to RG1, each with different weights. You use 130 and 140 for node 0 interfaces and 150 and 120 for node 1 interfaces. You configure one interface from each node and map the interfaces to RG2, each with the default weight of 255.

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- Verifying Chassis Cluster Interfaces After Enabling Interface ge-0/0/3 on page 131
- Verifying Chassis Cluster Information After Enabling Interface ge-0/0/3 on page 132

Verifying Chassis Cluster Status

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 1
node0  200      primary        no      no       None
node1  100      secondary      no      no       None

Redundancy group: 2 , Failover count: 1
node0  200      primary        no      no       None
node1  100      secondary      no      no       None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node.

Verifying Chassis Cluster Interfaces

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index   Interface   Monitored-Status   Internal-SA
    0       em0         Up                 Disabled
    1       em1         Down               Disabled

Fabric link status: Up
```

```
Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/0           Up    / Up
    fab0
    fab1    ge-8/0/0           Up    / Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1
    reth2        Up          2

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0

Interface Monitoring:
    Interface          Weight    Status    Redundancy-group
    ge-8/0/2           120       Up        1
    ge-8/0/1           150       Up        1
    ge-0/0/2           140       Up        1
    ge-0/0/1           130       Up        1
    ge-8/0/3           255       Up        2
    ge-0/0/3           255       Up        2
```

Meaning The sample output confirms that monitoring interfaces are up and that the weight of each interface being monitored is displayed correctly as configured. These values do not change if the interface goes up or down. The weights only change for the redundant group and can be viewed when you use the **show chassis cluster information** command.

Verifying Chassis Cluster Information

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time               From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: primary, Weight: 255

        Time               From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
```


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```
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)

Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:34 hold           secondary      Hold timer expired

    Redundancy Group 1 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired

    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired

Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures
```

Meaning The sample output confirms that node 0 and node 1 are healthy, and the green LED on the device indicates that there are no failures. Also, the default weight of the redundancy group (255) is displayed. The default weight is deducted whenever an interface mapped to the corresponding redundancy group goes down.

Refer to subsequent verification sections to see how the redundancy group value varies when a monitoring interface goes down or comes up.

Verifying Interface ge-0/0/1 Status After Disabling Interface ge-0/0/1 of RG1 in Node 0 with a Weight of 130

Purpose Verify that the interface ge-0/0/1 is disabled on node 0.

Action From configuration mode, enter the **set interface ge-0/0/1 disable** command.

```
{primary:node0}
user@host# set interface ge-0/0/1 disable
user@host# commit

node0:
configuration check succeeds
node1:
```

```
commit complete
node0:
commit complete

{primary:node0}
user@host# show interfaces ge-0/0/1
disable;
gigether-options {
    redundant-parent reth0;
}
```

Meaning The sample output confirms that interface ge-0/0/1 is disabled.

Verifying Chassis Cluster Status After Disabling Interface ge-0/0/1 of RG1 in Node 0 with a Weight of 130

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 1
node0  200      primary        no      no       None
node1  100      secondary      no      no       None

Redundancy group: 2 , Failover count: 1
node0  200      primary        no      no       None
node1  100      secondary      no      no       None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node.

Verifying Chassis Cluster Interfaces After Disabling Interface ge-0/0/1 of RG1 in Node 0 with a Weight of 130

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

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Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index   Interface   Monitored-Status   Internal-SA
    0       em0         Up                 Disabled
    1       em1         Down               Disabled

Fabric link status: Up

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/0           Up    / Up
    fab0
    fab1    ge-8/0/0           Up    / Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Down        1
    reth1        Up          1
    reth2        Up          2

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0

Interface Monitoring:
    Interface          Weight    Status    Redundancy-group
    ge-8/0/2           120       Up        1
    ge-8/0/1           150       Up        1
    ge-0/0/2           140       Up        1
    ge-0/0/1           130       Down      1
    ge-8/0/3           255       Up        2
    ge-0/0/3           255       Up        2
```

Meaning The sample output confirms that monitoring interface ge-0/0/1 is down.

Verifying Chassis Cluster Information After Disabling Interface ge-0/0/1 of RG1 in Node 0 with a Weight of 130

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255
```

```
        Time            From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: primary, Weight: 125

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)

Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures

Failure Information:

    Interface Monitoring Failure Information:
        Redundancy Group 1, Monitoring status: Unhealthy
          Interface                 Status
          ge-0/0/1                  Down

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:34 hold           secondary      Hold timer expired

    Redundancy Group 1 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired

    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down
```

Meaning The sample output confirms that in node 0, the RG1 weight is reduced to 125 (that is, 255 minus 130) because monitoring interface ge-0/0/1 (weight of 130) went down. The monitoring status is unhealthy, the device LED is amber, and the interface status of ge-0/0/1 is down.

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NOTE: If interface ge-0/0/1 is brought back up, the weight of RG1 in node 0 becomes 255. Conversely, if interface ge-0/0/2 is also disabled, the weight of RG1 in node 0 becomes 0 or less (in this example, 125 minus 140 = -15) and triggers failover, as indicated in the next verification section.

Verifying Interface ge-0/0/2 Is Disabled

Purpose Verify that interface ge-0/0/2 is disabled on node 0.

Action From configuration mode, enter the **set interface ge-0/0/2 disable** command.

```
{primary:node0}
user@host# set interface ge-0/0/2 disable
user@host# commit

node0:
configuration check succeeds
node1:
commit complete
node0:
commit complete


{primary:node0}
user@host# show interfaces ge-0/0/2
disable;
gigether-options {
    redundant-parent reth1;
}
```

Meaning The sample output confirms that interface ge-0/0/2 is disabled.

Verifying Chassis Cluster Status After Disabling Interface ge-0/0/2

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
```

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```
node1   1         secondary       no       no        None

Redundancy group: 1 , Failover count: 2
node0   0         secondary       no       no        IF
node1   100       primary         no       no        None

Redundancy group: 2 , Failover count: 1
node0   200       primary         no       no        None
node1   100       secondary       no       no        None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node. On RG1, you see interface failure, because both interfaces mapped to RG1 on node 0 failed during interface monitoring.

Verifying Chassis Cluster Interfaces After Disabling Interface ge-0/0/2

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index   Interface   Monitored-Status   Internal-SA
    0       em0         Up                 Disabled
    1       em1         Down               Disabled

Fabric link status: Up

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/0           Up   / Up
    fab0
    fab1    ge-8/0/0           Up   / Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1
    reth2        Up          2

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0

Interface Monitoring:
    Interface         Weight    Status    Redundancy-group
    ge-8/0/2          120       Up        1
    ge-8/0/1          150       Up        1
    ge-0/0/2          140       Down      1
    ge-0/0/1          130       Down      1
    ge-8/0/3          255       Up        2
    ge-0/0/3          255       Up        2
```

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Meaning The sample output confirms that monitoring interfaces ge-0/0/1 and ge-0/0/2 are down.

Verifying Chassis Cluster Information After Disabling Interface ge-0/0/2

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: secondary, Weight: -15

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)
        Feb 24 23:31:36 primary        secondary-hold Monitor failed: IF
        Feb 24 23:31:37 secondary-hold secondary      Ready to become secondary

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down

Failure Information:

    Interface Monitoring Failure Information:
        Redundancy Group 1, Monitoring status: Failed
          Interface                 Status
          ge-0/0/2                  Down
          ge-0/0/1                  Down

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:34 hold           secondary      Hold timer expired
```

```
    Redundancy Group 1 , Current State: primary, Weight: 255

        Time             From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired
        Feb 24 23:31:36 secondary      primary        Remote is in secondary hold

    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time             From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down
```

Meaning The sample output confirms that in node 0, monitoring interfaces ge-0/0/1 and ge-0/0/2 are down. The weight of RG1 on node 0 reached zero value, which triggered RG1 failover during use of the **show chassis cluster status** command.

NOTE: For RG2, the default weight of 255 is set for redundant Ethernet interface 2 (reth2). When interface monitoring is required, we recommend that you use the default weight when you do not have backup links like those in RG1. That is, if interface ge-0/0/3 is disabled, it immediately triggers failover because the weight becomes 0 (255 minus 225), as indicated in the next verification section.

Verifying Interface Status After Disabling ge-0/0/3

Purpose Verify that interface ge-0/0/3 is disabled on node 0.

Action From configuration mode, enter the **set interface ge-0/0/3 disable** command.

```
{primary:node0}
user@host# set interface ge-0/0/3 disable
user@host# commit

node0:
configuration check succeeds
node1:
commit complete
node0:
commit complete


{primary:node0}
user@host# show interfaces ge-0/0/3
disable;
gigether-options {
    redundant-parent reth2;
}
```

Meaning The sample output confirms that interface ge-0/0/3 is disabled.

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Verifying Chassis Cluster Status After Disabling Interface ge-0/0/3

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 2
node0  0        secondary      no      no       IF
node1  100      primary        no      no       None

Redundancy group: 2 , Failover count: 2
node0  0        secondary      no      no       IF
node1  100      primary        no      no       None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node.

Verifying Chassis Cluster Interfaces After Disabling Interface ge-0/0/3

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index    Interface    Monitored-Status    Internal-SA
    0        em0          Up                  Disabled
    1        em1          Down                Disabled

Fabric link status: Up

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/0           Up    / Up
```

```
    fab0
    fab1    ge-8/0/0           Up    / Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1
    reth2        Up          2

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0

Interface Monitoring:
    Interface         Weight    Status    Redundancy-group
    ge-8/0/2          120       Up        1
    ge-8/0/1          150       Up        1
    ge-0/0/2          140       Down      1
    ge-0/0/1          130       Down      1
    ge-8/0/3          255       Up        2
    ge-0/0/3          255       Down      2
```

Meaning The sample output confirms that monitoring interfaces ge-0/0/1, ge-0/0/2, and ge-0/0/3 are down.

Verifying Chassis Cluster Information After Disabling Interface ge-0/0/3

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: secondary, Weight: -15

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)
        Feb 24 23:31:36 primary        secondary-hold Monitor failed: IF
        Feb 24 23:31:37 secondary-hold secondary      Ready to become secondary

    Redundancy Group 2 , Current State: secondary, Weight: 0

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
```

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```
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)
        Feb 24 23:35:57 primary        secondary-hold Monitor failed: IF
        Feb 24 23:35:58 secondary-hold secondary      Ready to become secondary

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down

Failure Information:

    Interface Monitoring Failure Information:
        Redundancy Group 1, Monitoring status: Failed
          Interface                 Status
          ge-0/0/2                  Down
          ge-0/0/1                  Down
        Redundancy Group 2, Monitoring status: Failed
          Interface                 Status
          ge-0/0/3                  Down

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:34 hold           secondary      Hold timer expired

    Redundancy Group 1 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired
       Feb 24 23:31:36 secondary      primary        Remote is in secondary hold


    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired
       Feb 24 23:35:57 secondary      primary        Remote is in secondary hold


Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down
```

Meaning The sample output confirms that in node 0, monitoring interfaces ge-0/0/1, ge-0/0/2, and ge-0/0/3 are down.

NOTE: In regard to RG1, making any interface in node 0 go up should trigger a failover only if the **preempt** option is enabled. In the example, **preempt** is not enabled. Therefore the node should return to normal, with no monitor failure showing for RG1.

Verifying That Interface ge-0/0/2 Is Enabled

Purpose Verify that interface ge-0/0/2 is enabled on node 0.

Action From configuration mode, enter the **delete interfaces ge-0/0/2 disable** command.

```
{primary:node0}
user@host# delete interfaces ge-0/0/2 disable
user@host# commit

node0:
configuration check succeeds
node1:
commit complete
node0:
commit complete
```

Meaning The sample output confirms that interface ge-0/0/2 disable is deleted.

Verifying Chassis Cluster Status After Enabling Interface ge-0/0/2

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 2
node0  200      secondary      no      no       None
node1  100      primary        no      no       None

Redundancy group: 2 , Failover count: 2
node0  0        secondary      no      no       IF
node1  100      primary        no      no       None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with as one device functioning as the primary node and the other as the secondary node.

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Verifying Chassis Cluster Interfaces After Enabling Interface ge-0/0/2

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index   Interface   Monitored-Status   Internal-SA
    0       em0         Up                 Disabled
    1       em1         Down               Disabled

Fabric link status: Up

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/0           Up   / Up
    fab0
    fab1    ge-8/0/0           Up   / Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1
    reth2        Up          2

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0

Interface Monitoring:
    Interface         Weight    Status    Redundancy-group
    ge-8/0/2          120       Up        1
    ge-8/0/1          150       Up        1
    ge-0/0/2          140       Up        1
    ge-0/0/1          130       Down      1
    ge-8/0/3          255       Up        2
    ge-0/0/3          255       Down      2
```

Meaning The sample output confirms that monitoring interfaces ge-0/0/1 and ge-0/0/3 are down. Monitoring interface ge-0/0/2 is up after the disable has been deleted.

Verifying Chassis Cluster Information After Enabling Interface ge-0/0/2

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information
```

```
node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: secondary, Weight: 125

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)
        Feb 24 23:31:36 primary        secondary-hold Monitor failed: IF
        Feb 24 23:31:37 secondary-hold secondary      Ready to become secondary

    Redundancy Group 2 , Current State: secondary, Weight: 0

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)
        Feb 24 23:35:57 primary        secondary-hold Monitor failed: IF
        Feb 24 23:35:58 secondary-hold secondary      Ready to become secondary

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down

Failure Information:

    Interface Monitoring Failure Information:
        Redundancy Group 1, Monitoring status: Unhealthy
          Interface                 Status
          ge-0/0/1                  Down
        Redundancy Group 2, Monitoring status: Failed
          Interface                 Status
          ge-0/0/3                  Down

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:34 hold           secondary      Hold timer expired

    Redundancy Group 1 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired
        Feb 24 23:31:36 secondary      primary        Remote is in secondary hold


    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:10 hold           secondary      Hold timer expired
```

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```
        Feb 24 23:35:57 secondary      primary       Remote is in secondary hold

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down
```

Meaning The sample output confirms that in node 0, monitoring interfaces ge-0/0/1 and ge-0/0/3 are down. Monitoring interface ge-0/0/2 is active after the disable has been deleted.

Verifying Chassis Cluster RG2 Preempt

Purpose Verify that the chassis cluster RG2 is preempted on node 0.

Action From configuration mode, enter the **set chassis cluster redundancy-group 2 preempt** command.

```
{primary:node0}
user@host# set chassis cluster redundancy-group 2 preempt
user@host# commit

node0:
configuration check succeeds
node1:
commit complete
node0:
commit complete
```

Meaning The sample output confirms that chassis cluster RG2 preempted on node 0.

NOTE: In the next section, you check that RG2 fails over back to node 0 when preempt is enabled when the disabled node 0 interface is brought online.

Verifying Chassis Cluster Status After Preempting RG2

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
```

```
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  254      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 2
node0  200      secondary      no      no       None
node1  100      primary        no      no       None

Redundancy group: 2 , Failover count: 2
node0  0        secondary      yes     no       IF
node1  100      primary        yes     no       None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node.

Verifying That Interface ge-0/0/3 Is Enabled

Purpose Verify that interface ge-0/0/3 is enabled on node 0.

Action From configuration mode, enter the **delete interfaces ge-0/0/3 disable** command.

```
{primary:node0}
user@host# delete interfaces ge-0/0/3 disable
user@host# commit

node0:
configuration check succeeds
node1:
commit complete
node0:
commit complete
```

Meaning The sample output confirms that interface ge-0/0/3 disable has been deleted.

Verifying Chassis Cluster Status After Enabling Interface ge-0/0/3

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 2
Node   Priority Status         Preempt Manual   Monitor-failures
```


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```
Redundancy group: 0 , Failover count: 1
node0  254       primary         no       no        None
node1  1         secondary       no       no        None

Redundancy group: 1 , Failover count: 2
node0  200       secondary       no       no        None
node1  100       primary         no       no        None

Redundancy group: 2 , Failover count: 3
node0  200       primary         yes      no        None
node1  100       secondary       yes      no        None
```

Meaning Use the **show chassis cluster status** command to confirm that devices in the chassis cluster are communicating properly, with one device functioning as the primary node and the other as the secondary node.

Verifying Chassis Cluster Interfaces After Enabling Interface ge-0/0/3

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
    Index    Interface    Monitored-Status    Internal-SA
    0        em0          Up                  Disabled
    1        em1          Down                Disabled

Fabric link status: Up

Fabric interfaces:
    Name     Child-interface      Status
                                  (Physical/Monitored)
    fab0     ge-0/0/0             Up    / Up
    fab0
    fab1     ge-8/0/0             Up    / Up
    fab1

Redundant-ethernet Information:
    Name          Status        Redundancy-group
    reth0         Up            1
    reth1         Up            1
    reth2         Up            2

Redundant-pseudo-interface Information:
    Name          Status        Redundancy-group
    lo0           Up            0

Interface Monitoring:
    Interface          Weight     Status     Redundancy-group
    ge-8/0/2           120        Up         1
    ge-8/0/1           150        Up         1
    ge-0/0/2           140        Up         1
    ge-0/0/1           130        Down       1
```

```
ge-8/0/3            255        Up         2
ge-0/0/3            255        Up         2
```

Meaning The sample output confirms that monitoring interface ge-0/0/1 is down. Monitoring interfaces ge-0/0/2, and ge-0/0/3 are up after deleting the disable.

Verifying Chassis Cluster Information After Enabling Interface ge-0/0/3

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitoring interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster information** command.

```
{primary:node0}
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 22:56:27 hold           secondary      Hold timer expired
        Feb 24 22:56:34 secondary      primary        Better priority (254/1)

    Redundancy Group 1 , Current State: secondary, Weight: 125

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:12 secondary      primary        Remote yield (0/0)
        Feb 24 23:31:36 primary        secondary-hold Monitor failed: IF
        Feb 24 23:31:37 secondary-hold secondary      Ready to become secondary

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Feb 24 23:16:12 hold           secondary      Hold timer expired
        Feb 24 23:16:13 secondary      primary        Remote yield (0/0)
        Feb 24 23:35:57 primary        secondary-hold Monitor failed: IF
        Feb 24 23:35:58 secondary-hold secondary      Ready to become secondary
        Feb 24 23:45:45 secondary      primary       Remote is in secondary hold


Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures

Failure Information:

    Interface Monitoring Failure Information:
        Redundancy Group 1, Monitoring status: Unhealthy
          Interface                 Status
          ge-0/0/1                  Down

node1:
--------------------------------------------------------------------------
Redundancy Group Information:
```

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```
    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time              From            To              Reason
        Feb 24 22:56:34 hold            secondary       Hold timer expired

    Redundancy Group 1 , Current State: primary, Weight: 255

        Time              From            To              Reason
        Feb 24 23:16:10 hold            secondary       Hold timer expired
       Feb 24 23:31:36 secondary       primary        Remote is in secondary hold


    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time              From            To              Reason
        Feb 24 23:16:10 hold            secondary       Hold timer expired
       Feb 24 23:35:57 secondary       primary        Remote is in secondary hold

        Feb 24 23:45:45 primary         secondary-hold Preempt (100/200)
        Feb 24 23:45:46 secondary-hold secondary       Ready to become secondary

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down
```

Meaning The sample output confirms that in node 0, monitoring interface ge-0/0/1 is down. RG2 on node 0 state is back to primary state (because of the preempt enable) with a healthy weight of 255 when interface ge-0/0/3 is back up.

Related Documentation

- Example: Configuring Chassis Cluster Redundancy Groups on page 73
- Understanding Chassis Cluster Redundancy Group Interface Monitoring on page 105
- Understanding Chassis Cluster Redundancy Group IP Address Monitoring for Branch SRX Series Devices on page 133
- *Understanding Chassis Cluster Redundancy Group IP Address Monitoring for High-End SRX Series Devices*
- Understanding Chassis Cluster Redundancy Group Failover on page 141
- Understanding Chassis Cluster Redundancy Groups on page 69
- Understanding SRX Series Chassis Cluster Slot Numbering and Physical Port and Logical Interface Naming for Branch SRX Series Devices on page 47
- *Understanding SRX Series Chassis Cluster Slot Numbering, Physical Port and Logical Interface Naming for High-End SRX Series Devices*

Understanding Chassis Cluster Redundancy Group IP Address Monitoring

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

Redundancy group IP address monitoring checks end-to-end connectivity and allows a redundancy group to fail over because of the inability of a redundant Ethernet interface (known as a *reth*) to reach a configured IP address. Redundancy groups on both devices in a cluster can be configured to monitor specific IP addresses to determine whether an upstream device in the network is reachable. The redundancy group can be configured such that if the monitored IP address becomes unreachable, the redundancy group will fail over to its backup to maintain service. The primary difference between this monitoring feature and interface monitoring is that IP address monitoring allows for failover when the interface is still up but the network device it is connected to is not reachable for some reason. It may be possible under those circumstances for the other node in the cluster to route traffic around the problem.

NOTE: If you want to dampen the failovers occurring because of IP address monitoring failures, use the **hold-down-interval** statement.

IP address monitoring configuration allows you to set not only the address to monitor and its failover weight but also a global IP address monitoring threshold and weight. Only after the IP address monitoring global-threshold is reached because of cumulative monitored address reachability failure will the IP address monitoring global-weight value be deducted from the redundant group's failover threshold. Thus, multiple addresses can be monitored simultaneously as well as monitored to reflect their importance to maintaining traffic flow. Also, the threshold value of an IP address that is unreachable and then becomes reachable again will be restored to the monitoring threshold. This will not, however, cause a failback unless the preempt option has been enabled.

When configured, the IP address monitoring failover value (global-weight) is considered along with interface monitoring—if set—and built-in failover monitoring, including SPU monitoring, cold-sync monitoring, and NPC monitoring (on supported platforms). The main IP addresses that should be monitored are router gateway addresses to ensure that valid traffic coming into the services gateway can be forwarded to the appropriate network router.

NOTE: Starting in Junos OS Release 12.1X46-D35, for all SRX Series devices, the reth interface supports proxy ARP.

One Services Processing Unit (SPU) or Packet Forwarding Engine (PFE) per node is designated to send Internet Control Message Protocol (ICMP) ping packets for the monitored IP addresses on the cluster. The primary PFE sends ping packets using Address Resolution Protocol (ARP) requests resolved by the Routing Engine (RE). The source for these pings is the redundant Ethernet interface MAC and IP addresses. The secondary PFE resolves ARP requests for the monitored IP address itself. The source for these pings is the physical child MAC address and a secondary IP address configured on the redundant Ethernet interface. For the ping reply to be received on the secondary interface, the I/O card (IOC), central PFE processor, or Flex IOC adds both the physical child MAC address and the redundant Ethernet interface MAC address to its MAC table. The secondary PFE responds with the physical child MAC address to ARP requests sent to the secondary IP address configured on the redundant Ethernet interface.

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The default interval to check the reachability of a monitored IP address is once per second. The interval can be adjusted using the **retry-interval** command. The default number of permitted consecutive failed ping attempts is 5. The number of allowed consecutive failed ping attempts can be adjusted using the **retry-count** command. After failing to reach a monitored IP address for the configured number of consecutive attempts, the IP address is determined to be unreachable and its failover value is deducted from the redundancy group's global-threshold.

Once the IP address is determined to be unreachable, its weight is deducted from the global-threshold. If the recalculated global-threshold value is not 0, the IP address is marked unreachable, but the global-weight is not deducted from the redundancy group's threshold. If the redundancy group IP monitoring global-threshold reaches 0 and there are unreachable IP addresses, the redundancy group will continuously fail over and fail back between the nodes until either an unreachable IP address becomes reachable or a configuration change removes unreachable IP addresses from monitoring. Note that both default and configured hold-down-interval failover dampening is still in effect.

Every redundancy group *x* has a threshold tolerance value initially set to 255. When an IP address monitored by redundancy group *x* becomes unavailable, its weight is subtracted from the redundancy group *x*'s threshold. When redundancy group *x*'s threshold reaches 0, it fails over to the other node. For example, if redundancy group 1 was primary on node 0, on the threshold-crossing event, redundancy group 1 becomes primary on node 1. In this case, all the child interfaces of redundancy group 1's redundant Ethernet interfaces begin handling traffic.

A redundancy group *x* failover occurs because the cumulative weight of the redundancy group *x*'s monitored IP addresses and other monitoring has brought its threshold value to 0. When the monitored IP addresses of redundancy group *x* on both nodes reach their thresholds at the same time, redundancy group *x* is primary on the node with the lower node ID, which is typically node 0.

NOTE: **Upstream device failure detection for the chassis cluster feature is supported on SRX300, SRX320, SRX340, SRX345, and SRX1500 devices.**

Monitoring can be accomplished only if the IP address is reachable on a redundant Ethernet interface (known as a reth in CLI commands and interface listings), and IP addresses cannot be monitored over a tunnel. For an IP address to be monitored through a redundant Ethernet interface on a secondary cluster node, the interface must have a secondary IP address configured. IP address monitoring cannot be used on a chassis cluster running in transparent mode.

NOTE: **Redundancy group IP address monitoring is not supported for IPv6 destinations.**

Related Documentation

- Understanding Chassis Cluster Redundancy Groups on page 69
- Understanding Chassis Cluster Redundancy Group Interface Monitoring on page 105

- Example: Configuring Chassis Cluster Redundancy Group IP Address Monitoring on page 136
- Understanding Chassis Cluster Redundancy Group Failover on page 141

Example: Configuring Chassis Cluster Redundancy Group IP Address Monitoring

Supported Platforms SRX Series, vSRX

This example shows how to configure redundancy group IP address monitoring for an SRX Series device in a chassis cluster.

- Requirements on page 136
- Overview on page 136
- Configuration on page 137
- Verification on page 138

Requirements

Before you begin:

- Set the chassis cluster node ID and cluster ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.
- Configure the chassis cluster management interface. See "Example: Configuring the Chassis Cluster Management Interface" on page 53.
- Configure the chassis cluster fabric. See "Example: Configuring the Chassis Cluster Fabric Interfaces" on page 61.

Overview

You can configure redundancy groups to monitor upstream resources by pinging specific IP addresses that are reachable through redundant Ethernet interfaces on either node in a cluster. You can also configure global threshold, weight, retry interval, and retry count parameters for a redundancy group. When a monitored IP address becomes unreachable, the weight of that monitored IP address is deducted from the redundancy group IP address monitoring global threshold. When the global threshold reaches 0, the global weight is deducted from the redundancy group threshold. The retry interval determines the ping interval for each IP address monitored by the redundancy group. The pings are sent as soon as the configuration is committed. The retry count sets the number of allowed consecutive ping failures for each IP address monitored by the redundancy group.

In this example, you configure the following settings for redundancy group 1:

- IP address to monitor—10.1.1.10
- IP address monitoring global-weight—100
- IP address monitoring global-threshold—200

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NOTE: The threshold applies cumulatively to all IP addresses monitored by the redundancy group.

- IP address retry-interval—3 seconds
- IP address retry-count—10
- Weight—150
- Redundant Ethernet interface—reth1.0
- Secondary IP address—10.1.1.101

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
user@host#
set chassis cluster redundancy-group 1 ip-monitoring global-weight 100
set chassis cluster redundancy-group 1 ip-monitoring global-threshold 200
set chassis cluster redundancy-group 1 ip-monitoring retry-interval 3
set chassis cluster redundancy-group 1 ip-monitoring retry-count 10
set chassis cluster redundancy-group 1 ip-monitoring family inet 10.1.1.10 weight 150
  interface reth1.0 secondary-ip-address 10.1.1.101
```

Step-by-Step Procedure

To configure redundancy group IP address monitoring:

1. Specify a global monitoring weight.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster redundancy-group 1 ip-monitoring global-weight
     100
   ```

2. Specify the global monitoring threshold.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster redundancy-group 1 ip-monitoring global-threshold
     200
   ```

3. Specify the retry interval.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster redundancy-group 1 ip-monitoring retry-interval 3
   ```

4. Specify the retry count.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster redundancy-group 1 ip-monitoring retry-count 10
   ```

5. Specify the IP address to be monitored, weight, redundant Ethernet interface, and secondary IP address.

   ```
   {primary:node0}[edit]
   ```

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user@host# **set chassis cluster redundancy-group 1 ip-monitoring family inet 10.1.1.10 weight 100 interface reth1.0 secondary-ip-address 10.1.1.101**

Results From configuration mode, confirm your configuration by entering the **show chassis cluster redundancy-group 1** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show chassis cluster redundancy-group 1
ip-monitoring {
  global-weight 100;
  global-threshold 200;
  family {
    inet {
      10.1.1.10 {
        weight 100;
        interface reth1.0 secondary-ip-address 10.1.1.101;
      }
    }
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Status of Monitored IP Addresses for a Redundancy Group

Purpose Verify the status of monitored IP addresses for a redundancy group.

Action From operational mode, enter the **show chassis cluster ip-monitoring status** command. For information about a specific group, enter the **show chassis cluster ip-monitoring status redundancy-group** command.

```
{primary:node0}
user@host> show chassis cluster ip-monitoring status
node0:
--------------------------------------------------------------------------

Redundancy group: 1
Global threshold: 200
Current threshold: -120

IP address                Status        Failure count  Reason    Weight
10.1.1.10                 reachable       0            n/a       220
10.1.1.101                reachable       0            n/a       100

node1:
--------------------------------------------------------------------------

Redundancy group: 1
Global threshold: 200
```

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```
Current threshold: -120

IP address                Status        Failure count  Reason    Weight
10.1.1.10                 reachable       0            n/a       220
10.1.1.101                reachable       0            n/a       100
```

Related Documentation

- Understanding Chassis Cluster Redundancy Group Interface Monitoring on page 105
- Understanding Chassis Cluster Redundancy Group IP Address Monitoring for Branch SRX Series Devices on page 133
- *Understanding Chassis Cluster Redundancy Group IP Address Monitoring for High-End SRX Series Devices*
- Understanding Chassis Cluster Redundancy Group Failover on page 141

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CHAPTER 13

Managing Chassis Cluster Redundancy Group Failover

Understanding Chassis Cluster Redundancy Group Failover

Supported Platforms SRX Series, vSRX

Chassis cluster employs a number of highly efficient failover mechanisms that promote high availability to increase your system's overall reliability and productivity.

A redundancy group is a collection of objects that fail over as a group. Each redundancy group monitors a set of objects (physical interfaces), and each monitored object is assigned a weight. Each redundancy group has an initial threshold of **255**. When a monitored object fails, the weight of the object is subtracted from the threshold value of the redundancy group. When the threshold value reaches zero, the redundancy group fails over to the other node. As a result, all the objects associated with the redundancy group fail over as well. Graceful restart of the routing protocols enables the SRX Series device to minimize traffic disruption during a failover.

Back-to-back failovers of a redundancy group in a short interval can cause the cluster to exhibit unpredictable behavior. To prevent such unpredictable behavior, configure a dampening time between failovers. On failover, the previous primary node of a redundancy group moves to the secondary-hold state and stays in the secondary-hold state until the hold-down interval expires. After the hold-down interval expires, the previous primary node moves to the secondary state. If a failure occurs on the new primary node during the hold-down interval, the system fails over immediately and overrides the hold-down interval.

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The default dampening time for a redundancy group 0 is 300 seconds (5 minutes) and is configurable to up to 1800 seconds with the **hold-down-interval** statement. For some configurations, such as those with a large number of routes or logical interfaces, the default interval or the user-configured interval might not be sufficient. In such cases, the system automatically extends the dampening time in increments of 60 seconds until the system is ready for failover.

Redundancy groups *x* (redundancy groups numbered 1 through 128) have a default dampening time of 1 second, with a range from 0 through 1800 seconds.

The hold-down interval affects manual failovers, as well as automatic failovers associated with monitoring failures.

On SRX Series devices, chassis cluster failover performance is optimized to scale with more logical interfaces. Previously, during redundancy group failover, gratuitous arp (GARP) is sent by the Juniper Services Redundancy Protocol (jsrpd) process running in the Routing Engine on each logical interface to steer the traffic to the appropriate node. With logical interface scaling, the Routing Engine becomes the checkpoint and GARP is directly sent from the Services Processing Unit (SPU).

Related Documentation

- Example: Configuring Chassis Cluster Redundancy Groups on page 73
- Understanding Chassis Cluster Redundancy Group Manual Failover on page 143
- Understanding SNMP Failover Traps for Chassis Cluster Redundancy Group Failover on page 145
- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146

Example: Configuring a Chassis Cluster with a Dampening Time Between Back-to-Back Redundancy Group Failovers

Supported Platforms SRX Series, vSRX

This example shows how to configure the dampening time between back-to-back redundancy group failovers for a chassis cluster. Back-to-back redundancy group failovers that occur too quickly can cause a chassis cluster to exhibit unpredictable behavior.

- Requirements on page 142
- Overview on page 143
- Configuration on page 143

Requirements

Before you begin:

- Understand redundancy group failover. See “Understanding Chassis Cluster Redundancy Group Failover” on page 141.
- Understand redundancy group manual failover. See “Understanding Chassis Cluster Redundancy Group Manual Failover” on page 143.

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Overview

The dampening time is the minimum interval allowed between back-to-back failovers for a redundancy group. This interval affects manual failovers and automatic failovers caused by interface monitoring failures.

In this example, you set the minimum interval allowed between back-to-back failovers to 420 seconds for redundancy group 0.

Configuration

Step-by-Step Procedure

To configure the dampening time between back-to-back redundancy group failovers:

1. Set the dampening time for the redundancy group.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster redundancy-group 0 hold-down-interval 420
   ```

2. If you are done configuring the device, commit the configuration.

   ```
   {primary:node0}[edit]
   user@host# commit
   ```

Verification

Purpose

Verify that the configuration is working properly.

Action

To verify the configuration, enter the **show configuration chassis cluster** command.

Related Documentation

- Understanding Chassis Cluster Redundancy Groups on page 69
- Example: Configuring Chassis Cluster Redundancy Groups on page 73
- Understanding Chassis Cluster Redundancy Group Manual Failover on page 143
- Understanding SNMP Failover Traps for Chassis Cluster Redundancy Group Failover on page 145
- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146

Understanding Chassis Cluster Redundancy Group Manual Failover

Supported Platforms SRX Series, vSRX

You can initiate a redundancy group *x* (redundancy groups numbered 1 through 128) failover manually. A manual failover applies until a failback event occurs.

For example, suppose that you manually do a redundancy group 1 failover from node 0 to node 1. Then an interface that redundancy group 1 is monitoring fails, dropping the threshold value of the new primary redundancy group to zero. This event is considered a failback event, and the system returns control to the original redundancy group.

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You can also initiate a redundancy group 0 failover manually if you want to change the primary node for redundancy group 0. You cannot enable preemption for redundancy group 0.

NOTE: If preempt is added to a redundancy group configuration, the device with the higher priority in the group can initiate a failover to become master. By default, preemption is disabled. For more information on preemeption, see preempt (Chassis Cluster).

When you do a manual failover for redundancy group 0, the node in the primary state transitions to the secondary-hold state. The node stays in the secondary-hold state for the default or configured time (a minimum of 300 seconds) and then transitions to the secondary state.

State transitions in cases where one node is in the secondary-hold state and the other node reboots, or the control link connection or fabric link connection is lost to that node, are described as follows:

- Reboot case—The node in the secondary-hold state transitions to the primary state; the other node goes dead (inactive).
- Control link failure case—The node in the secondary-hold state transitions to the ineligible state and then to a disabled state; the other node transitions to the primary state.
- Fabric link failure case—The node in the secondary-hold state transitions directly to the ineligible state.

NOTE: Starting with Junos OS Release 12.1X46D20 and Junos OS Release 12.1X47-D10, fabric monitoring is enabled by default. With this enabling, the node transitions directly to the ineligible state in case of fabric link failures.

Keep in mind that during an in-service software upgrade (ISSU), the transitions described here cannot happen. Instead, the other (primary) node transitions directly to the secondary state because Juniper Networks releases earlier than 10.0 do not interpret the secondary-hold state. While you start an ISSU, if one of the nodes has one or more redundancy groups in the secondary-hold state, you must wait for them to move to the secondary state before you can do manual failovers to make all the redundancy groups be primary on one node.

CAUTION: Be cautious and judicious in your use of redundancy group 0 manual failovers. A redundancy group 0 failover implies a Routing Engine failover, in which case all processes running on the primary node are killed and then spawned on the new master Routing Engine. This failover could result in loss of state, such as routing state, and degrade performance by introducing system churn.

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NOTE: In some Junos OS releases, for redundancy groups *x*, it is possible to do a manual failover on a node that has 0 priority. We recommend that you use the **show chassis cluster status** command to check the redundancy group node priorities before doing the manual failover. However, from Junos OS Releases 12.1X44-D25, 12.1X45-D20, 12.1X46-D10, and 12.1X47-D10 and later, the readiness check mechanism for manual failover is enhanced to be more restrictive, so that you cannot set manual failover to a node in a redundancy group that has 0 priority. This enhancement prevents traffic from being dropped unexpectedly due to a failover attempt to a 0 priority node, which is not ready to accept traffic.

Related Documentation

- Understanding Chassis Cluster Redundancy Group Failover on page 141
- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146
- Example: Configuring a Chassis Cluster with a Dampening Time Between Back-to-Back Redundancy Group Failovers on page 142
- Understanding SNMP Failover Traps for Chassis Cluster Redundancy Group Failover on page 145
- Understanding Chassis Cluster Redundant Ethernet Interfaces for Branch SRX Series Devices on page 77
- *Understanding Chassis Cluster Redundant Ethernet Interfaces for High-End SRX Series Devices*

Understanding SNMP Failover Traps for Chassis Cluster Redundancy Group Failover

Supported Platforms SRX Series, vSRX

Chassis clustering supports SNMP traps, which are triggered whenever there is a redundancy group failover.

The trap message can help you troubleshoot failovers. It contains the following information:

- The cluster ID and node ID
- The reason for the failover
- The redundancy group that is involved in the failover
- The redundancy group's previous state and current state

These are the different states that a cluster can be in at any given instant: hold, primary, secondary-hold, secondary, ineligible, and disabled. Traps are generated for the following state transitions (only a transition from a hold state does not trigger a trap):

- primary <–> secondary
- primary –> secondary-hold

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- secondary-hold –> secondary
- secondary –> ineligible
- ineligible –> disabled
- ineligible –> primary
- secondary –> disabled

A transition can be triggered because of any event, such as interface monitoring, SPU monitoring, failures, and manual failovers.

The trap is forwarded over the control link if the outgoing interface is on a node different from the node on the Routing Engine that generates the trap.

You can specify that a trace log be generated by setting the **traceoptions flag snmp** statement.

Related Documentation

- Understanding Chassis Cluster Redundancy Group Manual Failover on page 143
- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146
- Example: Configuring a Chassis Cluster with a Dampening Time Between Back-to-Back Redundancy Group Failovers on page 142
- Understanding Chassis Cluster Redundant Ethernet Interfaces for Branch SRX Series Devices on page 77
- *Understanding Chassis Cluster Redundant Ethernet Interfaces for High-End SRX Series Devices*

Initiating a Chassis Cluster Manual Redundancy Group Failover

Supported Platforms SRX Series, vSRX

You can initiate a failover manually with the **request** command. A manual failover bumps up the priority of the redundancy group for that member to 255.

Before you begin, complete the following tasks:

- Example: Configuring Chassis Cluster Redundancy Groups on page 73
- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79
- Example: Configuring a Chassis Cluster with a Dampening Time Between Back-to-Back Redundancy Group Failovers on page 142

CAUTION: Be cautious and judicious in your use of redundancy group 0 manual failovers. A redundancy group 0 failover implies a Routing Engine (RE) failover, in which case all processes running on the primary node are killed and then spawned on the new master Routing Engine (RE). This failover

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could result in loss of state, such as routing state, and degrade performance by introducing system churn.

NOTE: For redundancy groups *x* (redundancy groups numbered 1 through 128), it is possible to do a manual failover on a node that has 0 priority . We recommend that you check the redundancy group node priorities before doing the manual failover.

Use the **show** command to display the status of nodes in the cluster:

```
{primary:node0}
user@host> show chassis cluster status redundancy-group 0
Cluster ID: 9
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                   254         primary        no       no
    node1                   1           secondary      no       no
```

Output to this command indicates that node 0 is primary.

Use the **request** command to trigger a failover and make node 1 primary:

```
{primary:node0}
user@host> request chassis cluster failover redundancy-group 0 node 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Initiated manual failover for redundancy group 0
```

Use the **show** command to display the new status of nodes in the cluster:

```
{secondary-hold:node0}
user@host> show chassis cluster status redundancy-group 0
Cluster ID: 9
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 2
    node0                   254         secondary-hold no       yes
    node1                   255         primary        no       yes
```

Output to this command shows that node 1 is now primary and node 0 is in the secondary-hold state. After 5 minutes, node 0 will transition to the secondary state.

You can reset the failover for redundancy groups by using the **request** command. This change is propagated across the cluster.

```
{secondary-hold:node0}
user@host> request chassis cluster failover reset redundancy-group 0 node 0
node0:
--------------------------------------------------------------------------
No reset required for redundancy group 0.

node1:
--------------------------------------------------------------------------
Successfully reset manual failover for redundancy group 0
```

You cannot trigger a back-to-back failover until the 5-minute interval expires.

```
{secondary-hold:node0}
user@host> request chassis cluster failover redundancy-group 0 node 0
node0:
--------------------------------------------------------------------------
Manual failover is not permitted as redundancy-group 0 on node0 is in
secondary-hold state.
```

Use the **show** command to display the new status of nodes in the cluster:

```
{secondary-hold:node0}
user@host> show chassis cluster status redundancy-group 0
Cluster ID: 9
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 2
    node0                   254         secondary-hold no       no
    node1                   1           primary        no       no
```

Output to this command shows that a back-to-back failover has not occurred for either node.

After doing a manual failover, you must issue the **reset failover** command before requesting another failover.

When the primary node fails and comes back up, election of the primary node is done based on regular criteria (priority and preempt).

Related Documentation

- Understanding Chassis Cluster Redundancy Group Manual Failover on page 143
- Example: Configuring a Chassis Cluster with a Dampening Time Between Back-to-Back Redundancy Group Failovers on page 142
- Understanding SNMP Failover Traps for Chassis Cluster Redundancy Group Failover on page 145
- Understanding Chassis Cluster Redundant Ethernet Interfaces for Branch SRX Series Devices on page 77
- *Understanding Chassis Cluster Redundant Ethernet Interfaces for High-End SRX Series Devices*

Verifying Chassis Cluster Failover Status

Supported Platforms SRX Series, vSRX

Purpose Display the failover status of a chassis cluster.

Action From the CLI, enter the **show chassis cluster status** command:

```
{primary:node1}
user@host> show chassis cluster status
Cluster ID: 3
    Node name               Priority    Status    Preempt  Manual failover

 Redundancy-group: 0, Failover count: 1
```

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```
    node0                   254         primary   no       no
    node1                   2           secondary no       no

 Redundancy-group: 1, Failover count: 1
    node0                   254         primary   no       no
    node1                   1           secondary no       no

{primary:node1}
user@host> show chassis cluster status
Cluster ID: 15
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 5
    node0                   200         primary        no       no
    node1                   0           lost           n/a      n/a

Redundancy group: 1 , Failover count: 41
    node0                   101         primary        no       no
    node1                   0           lost           n/a      n/a

{primary:node1}
user@host> show chassis cluster status
Cluster ID: 15
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 5
    node0                   200         primary        no       no
    node1                   0           unavailable    n/a      n/a

Redundancy group: 1 , Failover count: 41
    node0                   101         primary        no       no
    node1                   0           unavailable    n/a      n/a
```

Related Documentation

- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146
- Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84
- Verifying a Chassis Cluster Configuration on page 99
- Verifying Chassis Cluster Statistics on page 99
- Clearing Chassis Cluster Failover Status on page 149

Clearing Chassis Cluster Failover Status

Supported Platforms SRX Series, vSRX

To clear the failover status of a chassis cluster, enter the **clear chassis cluster failover-count** command from the CLI:

```
{primary:node1}
user@host> clear chassis cluster failover-count
Cleared failover-count for all redundancy-groups
```

Related Documentation

- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146

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- Example: Configuring the Number of Redundant Ethernet Interfaces in a Chassis Cluster on page 84
- Verifying a Chassis Cluster Configuration on page 99
- Verifying Chassis Cluster Statistics on page 99
- Verifying Chassis Cluster Failover Status on page 148

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CHAPTER 14

Configuring Chassis Cluster Dual Fabric Links to Increase Redundancy and Performance

Understanding Chassis Cluster Dual Fabric Links

Supported Platforms SRX Series, vSRX

You can connect two fabric links between each device in a cluster, which provides a redundant fabric link between the members of a cluster. Having two fabric links helps to avoid a possible single point of failure.

When you use dual fabric links, the RTOs and probes are sent on one link and the fabric-forwarded and flow-forwarded packets are sent on the other link. If one fabric link fails, the other fabric link handles the RTOs and probes, as well as the data forwarding. The system selects the physical interface with the lowest slot, PIC, or port number on each node for the RTOs and probes.

For all SRX Series devices, you can connect two fabric links between two devices, effectively reducing the chance of a fabric link failure.

In most SRX Series devices in a chassis cluster, you can configure any pair of Gigabit Ethernet interfaces or any pair of 10-Gigabit interfaces to serve as the fabric between nodes.

For dual fabric links, both of the child interface types should be the same type. For example, both should be Gigabit Ethernet interfaces or 10-Gigabit interfaces.

NOTE: SRX300, SRX320, SRX340, and SRX345 devices support Gigabit Ethernet interfaces only.

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Related Documentation

- Understanding Chassis Cluster Fabric Interfaces on page 57
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61
- Verifying Chassis Cluster Data Plane Interfaces on page 63
- Verifying Chassis Cluster Data Plane Statistics on page 63
- Clearing Chassis Cluster Data Plane Statistics on page 64

Example: Configuring the Chassis Cluster Dual Fabric Links with Matching Slots and Ports

Supported Platforms SRX Series, vSRX

This example shows how to configure the chassis cluster fabric with dual fabric links with matching slots and ports. The fabric is the back-to-back data connection between the nodes in a cluster. Traffic on one node that needs to be processed on the other node or to exit through an interface on the other node passes over the fabric. Session state information also passes over the fabric.

Requirements

Before you begin, set the chassis cluster ID and chassis cluster node ID. See “Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices” on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.

Overview

In most SRX Series devices in a chassis cluster, you can configure any pair of Gigabit Ethernet interfaces or any pair of 10-Gigabit interfaces to serve as the fabric between nodes.

You cannot configure filters, policies, or services on the fabric interface. Fragmentation is not supported on the fabric link. The MTU size is 8980 bytes. We recommend that no interface in the cluster exceed this MTU size. Jumbo frame support on the member links is enabled by default.

This example illustrates how to configure the fabric link with dual fabric links with matching slots and ports on each node.

A typical configuration is where the dual fabric links are formed with matching slots/ports on each node. That is, **ge-3/0/0** on node 0 and **ge-10/0/0** on node 1 match, as do **ge-0/0/0** on node 0 and **ge-7/0/0** on node 1 (the FPC slot offset is 7).

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Only the same type of interfaces can be configured as fabric children, and you must configure an equal number of child links for **fab0** and **fab1**.

NOTE: If you are connecting each of the fabric links through a switch, you must enable the jumbo frame feature on the corresponding switch ports. If both of the fabric links are connected through the same switch, the RTO-and-probes pair must be in one virtual LAN (VLAN) and the data pair must be in another VLAN. Here, too, the jumbo frame feature must be enabled on the corresponding switch ports.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set interfaces fab0 fabric-options member-interfaces ge-0/0/0
set interfaces fab0 fabric-options member-interfaces ge-3/0/0
set interfaces fab1 fabric-options member-interfaces ge-7/0/0
set interfaces fab1 fabric-options member-interfaces ge-10/0/0
```

Step-by-Step Procedure

To configure the chassis cluster fabric with dual fabric links with matching slots and ports on each node:

- Specify the fabric interfaces.

```
{primary:node0}[edit]
user@host# set interfaces fab0 fabric-options member-interfaces ge-0/0/0
user@host# set interfaces fab0 fabric-options member-interfaces ge-3/0/0
user@host# set interfaces fab1 fabric-options member-interfaces ge-7/0/0
user@host# set interfaces fab1 fabric-options member-interfaces ge-10/0/0
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show interfaces
...
fab0 {
  fabric-options {
    member-interfaces {
      ge-0/0/0;
      ge-3/0/0;
    }
  }
```

```
}
  fab1 {
    fabric-options {
      member-interfaces {
        ge-7/0/0;
        ge-10/0/0;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Chassis Cluster Fabric

Purpose Verify the chassis cluster fabric.

Action From operational mode, enter the **show interfaces terse | match fab** command.

```
{primary:node0}

user@host> show interfaces terse | match fab
ge-0/0/0.0              up    up   aenet    --> fab0.0
ge-3/0/0.0              up    up   aenet    --> fab0.0
ge-7/0/0.0              up    up   aenet    --> fab1.0
ge-10/0/0.0             up    up   aenet    --> fab1.0
fab0                    up    up
fab0.0                  up    up   inet     30.17.0.200/24
fab1                    up    up
fab1.0                  up    up   inet     30.18.0.200/24
```

Related Documentation

- Understanding Chassis Cluster Dual Fabric Links for Branch SRX Series on page 151
- *Understanding Chassis Cluster Dual Fabric Links for High-End SRX Series*
- Example: Configuring Chassis Cluster Dual Fabric Links with Different Slots and Ports on page 154
- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61

Example: Configuring Chassis Cluster Dual Fabric Links with Different Slots and Ports

Supported Platforms SRX Series, vSRX

This example shows how to configure the chassis cluster fabric with dual fabric links with different slots and ports. The fabric is the back-to-back data connection between the nodes in a cluster. Traffic on one node that needs to be processed on the other node or to exit through an interface on the other node passes over the fabric. Session state information also passes over the fabric.

- Requirements on page 155
- Overview on page 155

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- Configuration on page 155
- Verification on page 156

Requirements

Before you begin, set the chassis cluster ID and chassis cluster node ID. See "Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices" on page 51 or *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*.

Overview

In most SRX Series devices in a chassis cluster, you can configure any pair of Gigabit Ethernet interfaces or any pair of 10-Gigabit interfaces to serve as the fabric between nodes.

You cannot configure filters, policies, or services on the fabric interface. Fragmentation is not supported on the fabric link. The MTU size is 8980 bytes. We recommend that no interface in the cluster exceed this MTU size. Jumbo frame support on the member links is enabled by default.

This example illustrates how to configure the fabric link with dual fabric links with different slots and ports on each node.

Make sure you physically connect the RTO-and-probes link to the RTO-and-probes link on the other node. Likewise, make sure you physically connect the data link to the data link on the other node.

That is, physically connect the following two pairs:

- The node 0 RTO-and-probes link ge-2/1/9 to the node 1 RTO-and-probes link ge-11/0/0
- The node 0 data link ge-2/2/5 to the node 1 data link ge-11/3/0

Only the same type of interfaces can be configured as fabric children, and you must configure an equal number of child links for fab0 and fab1.

NOTE: **If you are connecting each of the fabric links through a switch, you must enable the jumbo frame feature on the corresponding switch ports. If both of the fabric links are connected through the same switch, the RTO-and-probes pair must be in one virtual LAN (VLAN) and the data pair must be in another VLAN. Here too, the jumbo frame feature must be enabled on the corresponding switch ports.**

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set interfaces fab0 fabric-options member-interfaces ge-2/1/9
set interfaces fab0 fabric-options member-interfaces ge-2/2/5
set interfaces fab1 fabric-options member-interfaces ge-11/0/0
set interfaces fab1 fabric-options member-interfaces ge-11/3/0
```

Step-by-Step Procedure

To configure the chassis cluster fabric with dual fabric links with different slots and ports on each node:

- Specify the fabric interfaces.

```
{primary:node0}[edit]
user@host# set interfaces fab0 fabric-options member-interfaces ge-2/1/9
user@host# set interfaces fab0 fabric-options member-interfaces ge-2/2/5
user@host# set interfaces fab1 fabric-options member-interfaces ge-11/0/0
user@host# set interfaces fab1 fabric-options member-interfaces ge-11/3/0
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show interfaces
...
fab0 {
  fabric-options {
    member-interfaces {
      ge-2/1/9;
      ge-2/2/5;
    }
  }
}
  fab1 {
    fabric-options {
      member-interfaces {
        ge-11/0/0;
        ge-11/3/0;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Chassis Cluster Fabric

Purpose

Verify the chassis cluster fabric.

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Action From operational mode, enter the **show interfaces terse | match fab** command.

```
{primary:node0}

user@host>  show interfaces terse | match fab
ge-2/1/9.0              up    up   aenet    --> fab0.0
ge-2/2/5.0              up    up   aenet    --> fab0.0
ge-11/0/0.0             up    up   aenet    --> fab1.0
ge-11/3/0.0             up    up   aenet    --> fab1.0
fab0                    up    up
fab0.0                  up    up   inet     30.17.0.200/24
fab1                    up    up
fab1.0                  up    up   inet     30.18.0.200/24
```

Related Documentation

- Understanding Chassis Cluster Dual Fabric Links for Branch SRX Series on page 151
- *Understanding Chassis Cluster Dual Fabric Links for High-End SRX Series*
- Example: Configuring the Chassis Cluster Dual Fabric Links with Matching Slots and Ports on page 152

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CHAPTER 15

Configuring Route Advertisement over Redundant Ethernet Interfaces in a Chassis Cluster

Understanding Conditional Route Advertising in a Chassis Cluster

Supported Platforms SRX Series, vSRX

Route advertisement over redundant Ethernet interfaces in a chassis cluster is complicated by the fact that the active node in the cluster can change dynamically. Conditional route advertisement enables you to advertise routes in such a way that incoming traffic from the core network is attracted to the Border Gateway Protocol (BGP) interface that exists on the same node as the currently active redundant Ethernet interface. In this way, traffic is processed by the active node and does not traverse the fabric interface between nodes. You do this by manipulating the BGP attribute at the time routes are advertised by BGP.

The goal of conditional route advertisement in a chassis cluster is to ensure that incoming traffic from the upstream network arrives on the node that is on the currently active redundant Ethernet interface. To understand how this works, keep in mind that in a chassis cluster, each node has its own set of interfaces. Figure 16 on page 160 shows a typical scenario, with a redundant Ethernet interface connecting the corporate LAN, through a chassis cluster, to an external network segment.

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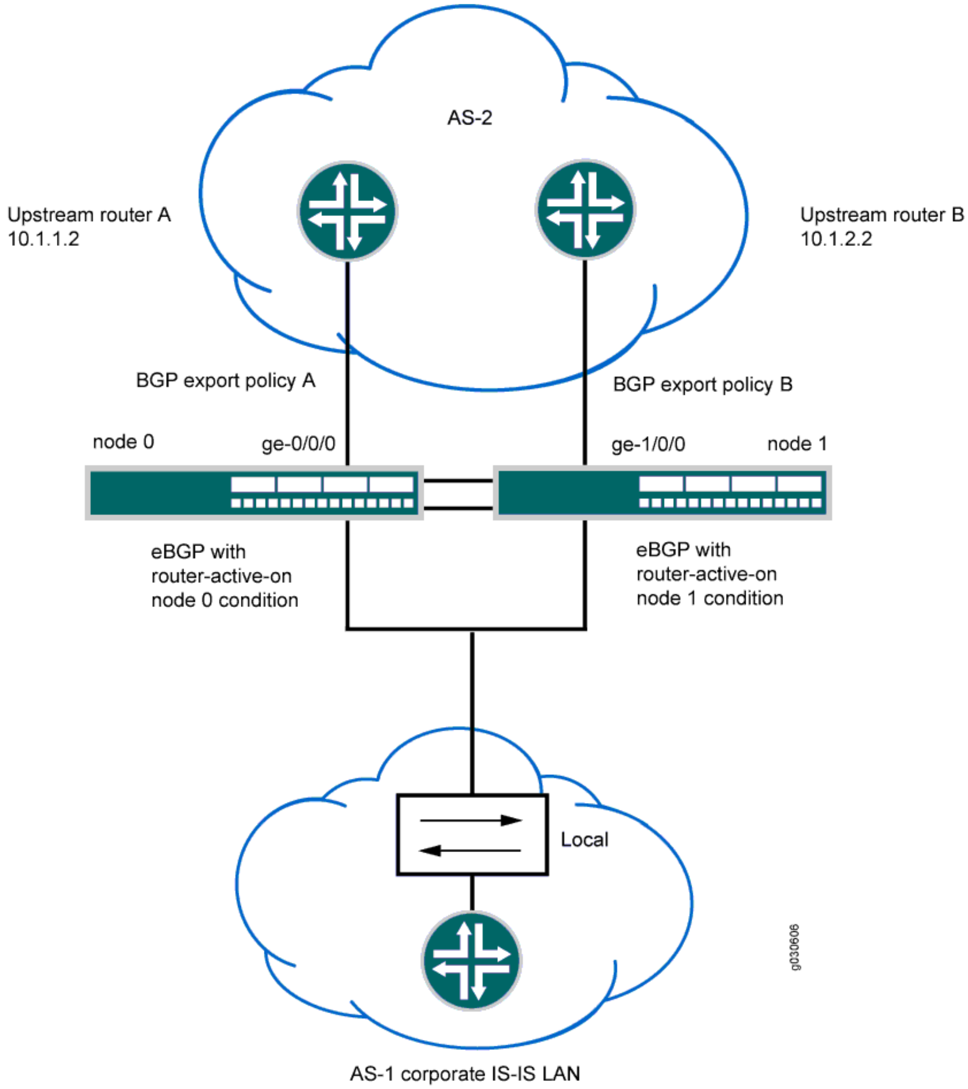
Figure 16: Conditional Route Advertising



Related Documentation

- Example: Configuring Conditional Route Advertising in a Chassis Cluster on page 160
- Verifying a Chassis Cluster Configuration on page 99
- Verifying Chassis Cluster Statistics on page 99

Example: Configuring Conditional Route Advertising in a Chassis Cluster

Supported Platforms SRX Series, vSRX

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This example shows how to configure conditional route advertising in a chassis cluster to ensure that incoming traffic from the upstream network arrives on the node that is on the currently active redundant Ethernet interface.

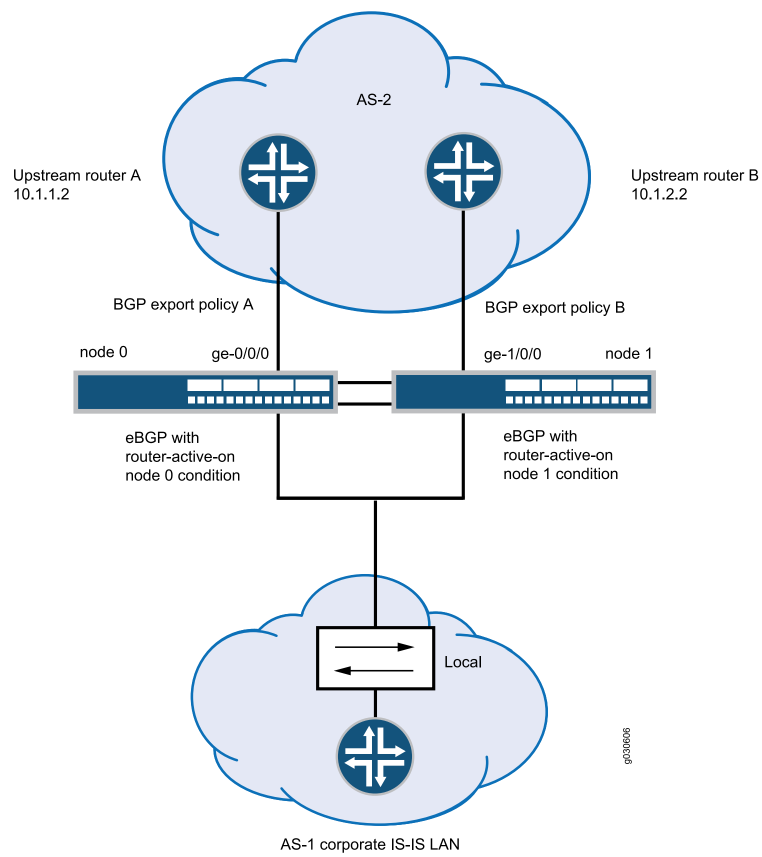
Requirements

Before you begin, understand conditional route advertising in a chassis cluster. See "Understanding Conditional Route Advertising in a Chassis Cluster" on page 159.

Overview

As illustrated in Figure 17 on page 162, routing prefixes learned from the redundant Ethernet interface through the IGP are advertised toward the network core using BGP. Two BGP sessions are maintained, one from interface t1-1/0/0 and one from t1-1/0/1 for BGP multihoming. All routing prefixes are advertised on both sessions. Thus, for a route advertised by BGP, learned over a redundant Ethernet interface, if the active redundant Ethernet interface is on the same node as the BGP session, you advertise the route with a "good" BGP attribute.

Figure 17: Conditional Route Advertising



To achieve this behavior, you apply a policy to BGP before exporting routes. An additional term in the policy match condition determines the current active redundant Ethernet interface child interface of the next hop before making the routing decision. When the active status of a child redundant Ethernet interface changes, BGP reevaluates the export policy for all routes affected.

The condition statement in this configuration works as follows. The command states that any routes evaluated against this condition will pass only if:

- The routes have a redundant Ethernet interface as their next-hop interface.

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- The current child interface of the redundant Ethernet interface is active at node 0 (as specified by the **route-active-on node0** keyword).

```
{primary:node0}[edit]
user@host# set policy-options condition reth-nh-active-on-0 route-active-on node0
```

Note that a route might have multiple equal-cost next hops, and those next hops might be redundant Ethernet interfaces, regular interfaces, or a combination of both. The route still satisfies the requirement that it has a redundant Ethernet interface as its next hop.

If you use the BGP export policy set for node 0 in the previous example command, only OSPF routes that satisfy the following requirements will be advertised through the session:

- The OSPF routes have a redundant Ethernet interface as their next hop.
- The current child interface of the redundant Ethernet interface is currently active at node 0.

You must also create and apply a separate policy statement for the other BGP session by using this same process.

In addition to the BGP MED attribute, you can define additional BGP attributes, such as origin-code, as-path, and community.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0 from protocol
  ospf
set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0 from condition
  reth-nh-active-on-0
set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0 then metric 10
set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0 then accept
set policy-options condition reth-nh-active-on-0 route-active-on node0
```

Step-by-Step Procedure

To configure conditional route advertising:

- Create the policies.

```
{primary:node0}[edit]
user@host# set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0
  from protocol ospf
{primary:node0}[edit]
user@host# set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0
  from condition reth-nh-active-on-0
{primary:node0}[edit]
user@host# set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0
  then metric 10
{primary:node0}[edit]
user@host# set policy-options policy-statement reth-nh-active-on-0 term ospf-on-0
  then accept
```

```
{primary:node0}[edit]
user@host# set policy-options condition reth-nh-active-on-0 route-active-on node0
```

Results From configuration mode, confirm your configuration by entering the **show policy-options** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
{primary:node0}[edit]
  user@host# show policy-options
  policy-statement reth-nh-active-on-0 {
    term ospf-on-0 {
      from {
        protocol ospf;
        condition reth-nh-active-on-0;
      }
      then {
        metric 10;
        accept;
      }
    }
}
  condition reth-nh-active-on-0 route-active-on node0;
```

If you are done configuring the device, enter **commit** from configuration mode.

Related Documentation

- Understanding Conditional Route Advertising in a Chassis Cluster on page 159
- Verifying a Chassis Cluster Configuration on page 99
- Verifying Chassis Cluster Statistics on page 99

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CHAPTER 16

Configuring Redundant Ethernet LAG Interfaces for Increasing High Availability and Overall Throughput

Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550, vSRX

Support for Ethernet link aggregation groups (LAGs) based on IEEE 802.3ad makes it possible to aggregate physical interfaces on a standalone device. LAGs on standalone devices provide increased interface bandwidth and link availability. Aggregation of links in a chassis cluster allows a redundant Ethernet interface to add more than two physical child interfaces thereby creating a redundant Ethernet interface LAG. A redundant Ethernet interface LAG can have up to eight links per redundant Ethernet interface per node (for a total of 16 links per redundant Ethernet interface).

The aggregated links in a redundant Ethernet interface LAG provide the same bandwidth and redundancy benefits of a LAG on a standalone device with the added advantage of chassis cluster redundancy. A redundant Ethernet interface LAG has two types of simultaneous redundancy. The aggregated links within the redundant Ethernet interface on each node are redundant; if one link in the primary aggregate fails, its traffic load is taken up by the remaining links. If enough child links on the primary node fail, the redundant Ethernet interface LAG can be configured so that all traffic on the entire redundant Ethernet interface fails over to the aggregate link on the other node. You can also configure interface monitoring for LACP-enabled redundancy group reth child links for added protection.

Aggregated Ethernet interfaces, known as local LAGs, are also supported on either node of a chassis cluster but cannot be added to redundant Ethernet interfaces. Local LAGs are indicated in the system interfaces list using an ae- prefix. Likewise any child interface of an existing local LAG cannot be added to a redundant Ethernet interface and vice versa. Note that it is necessary for the switch (or switches) used to connect the nodes in the cluster to have a LAG link configured and 802.3ad enabled for each LAG on both nodes so that the aggregate links are recognized as such and correctly pass traffic. The total maximum number of combined individual node LAG interfaces (ae) and redundant Ethernet (reth) interfaces per cluster is 128.

NOTE: **The redundant Ethernet interface LAG child links from each node in the chassis cluster must be connected to a different LAG at the peer devices. If a single peer switch is used to terminate the redundant Ethernet interface LAG, two separate LAGs must be used in the switch.**

Links from different PICs or IOCs and using different cable types (for example, copper and fiber-optic) can be added to the same redundant Ethernet interface LAG but the speed of the interfaces must be the same and all interfaces must be in full duplex mode. We recommend, however, that for purposes of reducing traffic processing overhead, interfaces from the same PIC or IOC be used whenever feasible. Regardless, all interfaces configured in a redundant Ethernet interface LAG share the same virtual MAC address.

NOTE: **SRX Series devices interface-monitoring feature now allows monitoring of redundant Ethernet/aggregated Ethernet interfaces.**

Redundant Ethernet interface configuration also includes a minimum-links setting that allows you to set a minimum number of physical child links on the primary node in a given redundant Ethernet interface that must be working for the interface to be up. The default minimum-links value is 1. Note that the minimum-links setting only monitors child links on the primary node. Redundant Ethernet interfaces do not use physical interfaces on the backup node for either ingress or egress traffic.

Note the following support details:

- Quality of service (QoS) is supported in a redundant Ethernet interface LAG. Guaranteed bandwidth is, however, duplicated across all links. If a link is lost, there is a corresponding loss of guaranteed bandwidth.
- Layer 2 transparent mode and Layer 2 security features are supported in redundant Ethernet interface LAGs.
- Link Aggregation Control Protocol (LACP) is supported in chassis cluster deployments, where aggregated Ethernet interfaces and redundant Ethernet interfaces are supported simultaneously.
- Chassis cluster management, control, and fabric interfaces cannot be configured as redundant Ethernet interface LAGs or added to a redundant Ethernet interface LAG.

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- Network processor (NP) bundling can coexist with redundant Ethernet interface LAGs on the same cluster. However, assigning an interface simultaneously to a redundant Ethernet interface LAG and a network processor bundle is not supported.

NOTE: IOC2 cards do not have network processors but IOC1 cards do have them.

- Single flow throughput is limited to the speed of a single physical link regardless of the speed of the aggregate interface.

NOTE: On SRX300, SRX320, SRX340, SRX345, and SRX550 devices, the speed mode and link mode configuration is available for member interfaces of a reth interface.

NOTE: For more information about Ethernet interface link aggregation and LACP, see the “Aggregated Ethernet” information in the *Interfaces Feature Guide for Security Devices*.

Related Documentation

- Understanding Chassis Cluster Redundant Ethernet Interfaces on page 77
- Example: Configuring Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups on page 167
- Example: Configuring Chassis Cluster Minimum Links on page 178
- Understanding Conditional Route Advertising in a Chassis Cluster on page 159
- Preparing Your Equipment for Chassis Cluster Formation on page 35

Example: Configuring Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups

Supported Platforms SRX Series, vSRX

This example shows how to configure a redundant Ethernet interface link aggregation group for a chassis cluster. Chassis cluster configuration supports more than one child interface per node in a redundant Ethernet interface. When at least two physical child interface links from each node are included in a redundant Ethernet interface configuration, the interfaces are combined within the redundant Ethernet interface to form a redundant Ethernet interface link aggregation group.

Requirements

Before you begin:

- Configure chassis cluster redundant interfaces. See "Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses" on page 79.
- Understand chassis cluster redundant Ethernet interface link aggregation groups. See "Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for Branch SRX Series Devices" on page 165 or *Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for High-End SRX Series Devices*.

Overview

NOTE: For aggregation to take place, the switch used to connect the nodes in the cluster must enable IEEE 802.3ad link aggregation for the redundant Ethernet interface physical child links on each node. Because most switches support IEEE 802.3ad and are also LACP capable, we recommend that you enable LACP on SRX Series devices. In cases where LACP is not available on the switch, you should not enable LACP on SRX Series devices.

In this example, you assign six Ethernet interfaces to reth1 to form the Ethernet interface link aggregation group:

- ge-1/0/1—reth1
- ge-1/0/2—reth1
- ge-1/0/3—reth1
- ge-12/0/1—reth1
- ge-12/0/2—reth1
- ge-12/0/3—reth1

NOTE: A maximum of eight physical interfaces per node in a cluster, for a total of 16 child interfaces, can be assigned to a single redundant Ethernet interface when a redundant Ethernet interface LAG is being configured.

NOTE: Junos OS supports LACP and LAG on a redundant Ethernet interface, which is called RLAG.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network

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configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set interfaces ge-1/0/1 gigether-options redundant-parent reth1
set interfaces ge-1/0/2 gigether-options redundant-parent reth1
set interfaces ge-1/0/3 gigether-options redundant-parent reth1
set interfaces ge-12/0/1 gigether-options redundant-parent reth1
set interfaces ge-12/0/2 gigether-options redundant-parent reth1
set interfaces ge-12/0/3 gigether-options redundant-parent reth1
```

Step-by-Step Procedure

To configure a redundant Ethernet interface link aggregation group:

- Assign Ethernet interfaces to reth1.

```
{primary:node0}[edit]
user@host# set interfaces ge-1/0/1 gigether-options redundant-parent reth1
user@host# set interfaces ge-1/0/2 gigether-options redundant-parent reth1
user@host# set interfaces ge-1/0/3 gigether-options redundant-parent reth1
user@host# set interfaces ge-12/0/1 gigether-options redundant-parent reth1
user@host# set interfaces ge-12/0/2 gigether-options redundant-parent reth1
user@host# set interfaces ge-12/0/3 gigether-options redundant-parent reth1
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces reth1** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
user@host# show interfaces reth1
...
ge-1/0/1 {
  gigether-options {
    redundant-parent reth1;
  }
}
ge-1/0/2 {
  gigether-options {
    redundant-parent reth1;
  }
}
ge-1/0/3 {
  gigether-options {
    redundant-parent reth1;
  }
}
ge-12/0/1 {
  gigether-options {
    redundant-parent reth1;
  }
}
ge-12/0/2 {
  gigether-options {
```

```
        redundant-parent reth1;
      }
    }
    ge-12/0/3 {
      gigether-options {
        redundant-parent reth1;
      }
    }
    ...
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying the Redundant Ethernet Interface LAG Configuration

Purpose Verify the redundant Ethernet interface LAG configuration.

Action From operational mode, enter the **show interfaces terse | match reth** command.

```
{primary:node0}
user@host> show interfaces terse | match reth
ge-1/0/1.0              up    down aenet    --> reth1.0
ge-1/0/2.0              up    down aenet    --> reth1.0
ge-1/0/3.0              up    down aenet    --> reth1.0
ge-12/0/1.0             up    down aenet    --> reth1.0
ge-12/0/2.0             up    down aenet    --> reth1.0
ge-12/0/3.0             up    down aenet    --> reth1.0
reth0                   up    down
reth0.0                 up    down inet     10.100.37.214/24
reth1                   up    down
reth1.0                 up    down inet
```

Related Documentation

- Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for Branch SRX Series Devices on page 165
- *Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for High-End SRX Series Devices*
- Understanding Chassis Cluster Redundant Ethernet Interface LAG Failover on page 170
- Understanding LACP on Chassis Clusters on page 173
- Example: Configuring LACP on Chassis Clusters on page 175
- Example: Configuring Chassis Cluster Minimum Links on page 178

Understanding Chassis Cluster Redundant Ethernet Interface LAG Failover

Supported Platforms SRX Series, vSRX

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To control failover of redundant Ethernet (reth) interfaces, it is important to configure the weights of interface monitoring according to the **minimum-links** setting. This configuration requires that the weights be equally distributed among the monitored links such that when the number of active physical interface links falls below the **minimum-links** setting, the computed weight for that redundancy group falls to zero or below zero. This triggers a failover of the redundant Ethernet interfaces link aggregation group (LAG) once the number of physical links falls below the **minimum-links** value.

Consider a reth0 interface LAG with four underlying physical links and the **minimum-links** value set as 2. In this case, a failover is triggered only when the number of active physical links is less than 2.

NOTE:

- Interface-monitor and minimum-links values are used to monitor LAG link status and correctly calculate failover weight.
- The minimum-links value is used to keep the redundant Ethernet link status. However, to trigger a failover, interface-monitor must be set.

Configure the underlying interface attached to the redundant Ethernet LAG.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/4 gigether-options redundant-parent reth0
user@host# set interfaces ge-0/0/5 gigether-options redundant-parent reth0
user@host# set interfaces ge-0/0/6 gigether-options redundant-parent reth0
user@host# set interfaces ge-0/0/7 gigether-options redundant-parent reth0
```

Specify the minimum number of links for the redundant Ethernet interface as 2.

```
{primary:node0}[edit]
user@host# set interfaces reth0 redundant-ether-options minimum-links 2
```

Set up interface monitoring to monitor the health of the interfaces and trigger redundancy group failover.

The following scenarios provide examples of how to monitor redundant Ethernet LAG failover:

Scenario 1: Monitored Interface Weight Is 255

Specify the monitored interface weight as 255 for each underlying interface.

```
{primary:node0}[edit]
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-0/0/4 weight
  255
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-0/0/5 weight
  255
```

user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/6 weight 255**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/7 weight 255**

In this case, although there are three active physical links and the redundant Ethernet LAG could have handled the traffic because of **minimum-links** configured, one physical link is still down, which triggers a failover based on the computed weight.

Scenario 2: Monitored Interface Weight Is 75

Specify the monitored interface weight as 75 for each underlying interface.

{primary:node0}[edit]
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/4 weight 75**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/5 weight 75**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/6 weight 75**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/7 weight 75**

In this case, when three physical links are down, the redundant Ethernet interface will go down due to **minimum-links** configured. However, the failover will not happen, which in turn will result in traffic outage.

Scenario 3: Monitored Interface Weight Is 100

Specify the monitored interface weight as 100 for each underlying interface.

{primary:node0}[edit]
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/4 weight 100**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/5 weight 100**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/6 weight 100**
user@host# **set chassis cluster redundancy-group 1 interface-monitor ge-0/0/7 weight 100**

In this case, when the three physical links are down, the redundant Ethernet interface will go down because of the **minimum-links** value. However, at the same time a failover would be triggered because of interface monitoring computed weights, ensuring that there is no traffic disruption.

Of all the three scenarios, scenario 3 illustrates the most ideal way to manage redundant Ethernet LAG failover.

Related Documentation

- Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for Branch SRX Series Devices on page 165
- *Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for High-End SRX Series Devices*

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Understanding LACP on Chassis Clusters

Supported Platforms SRX Series

You can combine multiple physical Ethernet ports to form a logical point-to-point link, known as a link aggregation group (LAG) or bundle, such that a media access control (MAC) client can treat the LAG as if it were a single link.

LAGs can be established across nodes in a chassis cluster to provide increased interface bandwidth and link availability.

The Link Aggregation Control Protocol (LACP) provides additional functionality for LAGs. LACP is supported in standalone deployments, where aggregated Ethernet interfaces are supported, and in chassis cluster deployments, where aggregated Ethernet interfaces and redundant Ethernet interfaces are supported simultaneously.

You configure LACP on a redundant Ethernet interface by setting the LACP mode for the parent link with the **lacp** statement. The LACP mode can be off (the default), active, or passive.

This topic contains the following sections:

Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups

A redundant Ethernet interface has active and standby links located on two nodes in a chassis cluster. All active links are located on one node, and all standby links are located on the other node. You can configure up to eight active links and eight standby links per node.

When at least two physical child interface links from each node are included in a redundant Ethernet interface configuration, the interfaces are combined within the redundant Ethernet interface to form a redundant Ethernet interface LAG.

Having multiple active redundant Ethernet interface links reduces the possibility of failover. For example, when an active link is out of service, all traffic on this link is distributed to other active redundant Ethernet interface links, instead of triggering a redundant Ethernet active/standby failover.

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Aggregated Ethernet interfaces, known as local LAGs, are also supported on either node of a chassis cluster but cannot be added to redundant Ethernet interfaces. Likewise, any child interface of an existing local LAG cannot be added to a redundant Ethernet interface, and vice versa. The total maximum number of combined individual node LAG interfaces (ae) and redundant Ethernet (reth) interfaces per cluster is 128.

However, aggregated Ethernet interfaces and redundant Ethernet interfaces can coexist, because the functionality of a redundant Ethernet interface relies on the Junos OS aggregated Ethernet framework.

For more information, see "Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for Branch SRX Series Devices" on page 165 or *Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for High-End SRX Series Devices*.

Minimum Links

Redundant Ethernet interface configuration includes a **minimum-links** setting that allows you to set a minimum number of physical child links in a redundant Ethernet interface LAG that must be working on the primary node for the interface to be up. The default **minimum-links** value is 1. When the number of physical links on the primary node in a redundant Ethernet interface falls below the **minimum-links** value, the interface will be down even if some links are still working. For more information, see "Example: Configuring Chassis Cluster Minimum Links" on page 178.

Sub-LAGs

LACP maintains a point-to-point LAG. Any port connected to the third point is denied. However, a redundant Ethernet interface does connect to two different systems or two remote aggregated Ethernet interfaces by design.

To support LACP on both redundant Ethernet interface active and standby links, a redundant Ethernet interface can be modeled to consist of two sub-LAGs, where all active links form an active sub-LAG and all standby links form a standby sub-LAG.

In this model, LACP selection logic is applied and limited to one sub-LAG at a time. In this way, two redundant Ethernet interface sub-LAGs are maintained simultaneously while all the LACP advantages are preserved for each sub-LAG.

It is necessary for the switches used to connect the nodes in the cluster to have a LAG link configured and 802.3ad enabled for each LAG on both nodes so that the aggregate links will be recognized as such and correctly pass traffic.

NOTE: The redundant Ethernet interface LAG child links from each node in the chassis cluster must be connected to a different LAG at the peer devices. If a single peer switch is used to terminate the redundant Ethernet interface LAG, two separate LAGs must be used in the switch.

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Supporting Hitless Failover

With LACP, the redundant Ethernet interface supports hitless failover between the active and standby links in normal operation. The term *hitless* means that the redundant Ethernet interface state remains up during a failover.

The lacpd process manages both the active and standby links of the redundant Ethernet interfaces. A redundant Ethernet interface state remains up when the number of active up links is more than the number of minimum links configured. Therefore, to support hitless failover, the LACP state on the redundant Ethernet interface standby links must be collected and distributed before failover occurs.

Managing Link Aggregation Control PDUs

The protocol data units (PDUs) contain information about the state of the link. By default, aggregated and redundant Ethernet links do not exchange link aggregation control PDUs.

You can configure PDUs exchange in the following ways:

- Configure Ethernet links to actively transmit link aggregation control PDUs
- Configure Ethernet links to passively transmit PDUs, sending out link aggregation control PDUs only when they are received from the remote end of the same link

The local end of a child link is known as the actor and the remote end of the link is known as the partner. That is, the actor sends link aggregation control PDUs to its protocol partner that convey what the actor knows about its own state and that of the partner's state.

You configure the interval at which the interfaces on the remote side of the link transmit link aggregation control PDUs by configuring the **periodic** statement on the interfaces on the local side. It is the configuration on the local side that specifies the behavior of the remote side. That is, the remote side transmits link aggregation control PDUs at the specified interval. The interval can be **fast** (every second) or **slow** (every 30 seconds).

For more information, see "Example: Configuring LACP on Chassis Clusters" on page 175.

By default, the actor and partner transmit link aggregation control PDUs every second. You can configure different periodic rates on active and passive interfaces. When you configure the active and passive interfaces at different rates, the transmitter honors the receiver's rate.

Related Documentation

- Example: Configuring LACP on Chassis Clusters on page 175

Example: Configuring LACP on Chassis Clusters

Supported Platforms SRX Series

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This example shows how to configure LACP on chassis clusters.

Requirements

Before you begin:

- Add the aggregated Ethernet interfaces using the device count. See *Example: Configuring the Number of Aggregated Ethernet Interfaces on a Device*.
- Associate physical interfaces with the aggregated Ethernet Interfaces. See *Example: Associating Physical Interfaces with Aggregated Ethernet Interfaces*.
- Configure the aggregated Ethernet link speed. See *Example: Configuring Aggregated Ethernet Link Speed*.
- Configure the aggregated Ethernet minimum links speed. See *Example: Configuring Aggregated Ethernet Minimum Links*.
- Configure the LACP on standalone devices. See *Example: Configuring LACP on Standalone Devices*.

Overview

In this example, you set LACP to passive mode for the reth0 interface. You set the LACP mode for the reth1 interface to active and set the link aggregation control PDU transmit interval to slow, which is every 30 seconds.

Configuration

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To configure LACP on chassis clusters:

1. Set the first LACP on primary node1.

   ```
   [edit interfaces]
   user@host# set reth0 redundant-ether-options lacp passive
   ```

2. Set the second LACP.

   ```
   [edit interfaces]
   user@host# set reth1 redundant-ether-options lacp active
   user@host# set reth1 redundant-ether-options lacp periodic slow
   ```

3. If you are done configuring the device, commit the configuration.

   ```
   [edit interfaces]
   user@host# commit
   ```

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Verification

Verifying LACP on Redundant Ethernet Interfaces

Purpose Display LACP status information for redundant Ethernet interfaces.

Action From operational mode, enter the **show lacp interfaces reth0** command.

```
user@host> show lacp interfaces reth0
Aggregated interface: reth0
    LACP state:       Role   Exp   Def  Dist  Col  Syn  Aggr  Timeout  Activity
      ge-11/0/0      Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/0    Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/1      Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/1    Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/2      Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/2    Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/3      Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-11/0/3    Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/0       Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/0     Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/1       Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/1     Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/2       Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/2     Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/3       Actor    No    No   Yes  Yes  Yes   Yes     Fast    Active
      ge-3/0/3     Partner    No    No   Yes  Yes  Yes   Yes     Fast    Active
    LACP protocol:        Receive State  Transmit State          Mux State
      ge-11/0/0                 Current   Fast periodic Collecting distributing
      ge-11/0/1                 Current   Fast periodic Collecting distributing
      ge-11/0/2                 Current   Fast periodic Collecting distributing
      ge-11/0/3                 Current   Fast periodic Collecting distributing
      ge-3/0/0                  Current   Fast periodic Collecting distributing
      ge-3/0/1                  Current   Fast periodic Collecting distributing
      ge-3/0/2                  Current   Fast periodic Collecting distributing
      ge-3/0/3                  Current   Fast periodic Collecting distributing
{primary:node1}
```

The output shows redundant Ethernet interface information, such as the following:

- The LACP state—Indicates whether the link in the bundle is an actor (local or near-end of the link) or a partner (remote or far-end of the link).
- The LACP mode—Indicates whether both ends of the aggregated Ethernet interface are enabled (active or passive)—at least one end of the bundle must be active.
- The periodic link aggregation control PDU transmit rate.
- The LACP protocol state—Indicates the link is up if it is collecting and distributing packets.

Related Documentation

- Understanding LACP on Chassis Clusters on page 173
- *Verifying LACP on Redundant Ethernet Interfaces*

Example: Configuring Chassis Cluster Minimum Links

Supported Platforms SRX Series, vSRX

This example shows how to specify a minimum number of physical links assigned to a redundant Ethernet interface on the primary node that must be working for the interface to be up.

Requirements

Before you begin:

- Configure redundant Ethernet interfaces. See “Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses” on page 79.
- Understand redundant Ethernet interface link aggregation groups. See “Example: Configuring Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups” on page 167.

Overview

When a redundant Ethernet interface has more than two child links, you can set a minimum number of physical links assigned to the interface on the primary node that must be working for the interface to be up. When the number of physical links on the primary node falls below the minimum-links value, the interface will be down even if some links are still working.

In this example, you specify that three child links on the primary node and bound to reth1 (minimum-links value) be working to prevent the interface from going down. For example, in a redundant Ethernet interface LAG configuration in which six interfaces are assigned to reth1, setting the minimum-links value to 3 means that all reth1 child links on the primary node must be working to prevent the interface’s status from changing to down.

NOTE: **Although it is possible to set a minimum-links value for a redundant Ethernet interface with only two child interfaces (one on each node), we do not recommend it.**

Configuration

Step-by-Step Procedure

To specify the minimum number of links:

1. Specify the minimum number of links for the redundant Ethernet interface.

   ```
   {primary:node0}[edit]
   ```

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user@host# **set interfaces reth1 redundant-ether-options minimum-links 3**

2. If you are done configuring the device, commit the configuration.

   {primary:node0}[edit]
   user@host# **commit**

Verification

Verifying the Chassis Cluster Minimum Links Configuration

Purpose To verify the configuration is working properly, enter the **show interface reth1** command.

Action From operational mode, enter the show **show interfaces reth1** command.

{primary:node0}[edit]
user@host> show interfaces reth1

```
Physical interface: reth1, Enabled, Physical link is Down
  Interface index: 129, SNMP ifIndex: 548
  Link-level type: Ethernet, MTU: 1514, Speed: Unspecified, BPDU Error: None,
  MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
  Flow control: Disabled, Minimum links needed: 3, Minimum bandwidth needed: 0
  Device flags   : Present Running
  Interface flags: Hardware-Down SNMP-Traps Internal: 0x0
  Current address: 00:10:db:ff:10:01, Hardware address: 00:10:db:ff:10:01
  Last flapped   : 2010-09-15 15:54:53 UTC (1w0d 22:07 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)

  Logical interface reth1.0 (Index 68) (SNMP ifIndex 550)
    Flags: Hardware-Down Device-Down SNMP-Traps 0x0 Encapsulation: ENET2
    Statistics        Packets        pps         Bytes          bps
    Bundle:
        Input :             0          0             0            0
        Output:             0          0             0            0
    Security: Zone: untrust
    Allowed host-inbound traffic : bootp bfd bgp dns dvmrp igmp ldp msdp nhrp
    ospf pgm pim rip router-discovery rsvp sap vrrp dhcp finger ftp tftp
    ident-reset http https ike netconf ping reverse-telnet reverse-ssh rlogin
    rpm rsh snmp snmp-trap ssh telnet traceroute xnm-clear-text xnm-ssl lsping
    ntp sip
    Protocol inet, MTU: 1500
      Flags: Sendbcast-pkt-to-re
```

Related Documentation

- Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups Branch SRX Series Devices on page 165
- *Understanding Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups for High-End SRX Series Devices*
- Example: Configuring Chassis Cluster Redundant Ethernet Interface Link Aggregation Groups on page 167
- Understanding Conditional Route Advertising in a Chassis Cluster on page 159

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CHAPTER 17

Simplifying Chassis Cluster Management

Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes

Supported Platforms SRX Series, vSRX

When you set up an SRX Series chassis cluster, the SRX Series devices must be identical, including their configuration. The chassis cluster synchronization feature automatically synchronizes the configuration from the primary node to the secondary node when the secondary joins the primary as a cluster. By eliminating the manual work needed to ensure the same configurations on each node in the cluster, this feature reduces expenses.

If you want to disable automatic chassis cluster synchronization between the primary and secondary nodes, you can do so by entering the **set chassis cluster configuration-synchronize no-secondary-bootup-auto** command in configuration mode.

At any time, to reenable automatic chassis cluster synchronization, use the **delete chassis cluster configuration-synchronize no-secondary-bootup-auto** command in configuration mode.

To see whether the automatic chassis cluster synchronization is enabled or not, and to see the status of the synchronization, enter the **show chassis cluster information configuration-synchronization** operational command.

Either the entire configuration from the primary node is applied successfully to the secondary node, or the secondary node retains its original configuration. There is no partial synchronization.

NOTE: If you create a cluster with cluster IDs greater than 16, and then decide to roll back to a previous release image that does not support extended cluster IDs, the system comes up as standalone.

NOTE: If you have a cluster set up and running with an earlier release of Junos OS, you can upgrade to Junos OS Release 12.1X45-D10 and re-create a cluster with cluster IDs greater than 16. However, if for any reason you decide to revert to the previous version of Junos OS that did not support extended cluster IDs, the system comes up with standalone devices after you reboot. However, if the cluster ID set is less than 16 and you roll back to a previous release, the system will come back with the previous setup.

Related Documentation

- Verifying Chassis Cluster Configuration Synchronization Status on page 182
- NTP Time Synchronization on SRX Series Devices on page 183
- Simplifying Network Management by Synchronizing the Primary and Backup Routing Engines with NTP on page 183

Verifying Chassis Cluster Configuration Synchronization Status

Supported Platforms SRX Series, vSRX

Purpose Display the configuration synchronization status of a chassis cluster.

Action From the CLI, enter the **show chassis cluster information configuration-synchronization** command:

```
{primary:node0}
user@host> show chassis cluster information configuration-synchronization

node0:
--------------------------------------------------------------------------

Configuration Synchronization:
    Status:
        Activation status: Enabled
        Last sync operation: Auto-Sync
        Last sync result: Not needed
        Last sync mgd messages:

    Events:
        Mar  5 01:48:53.662 : Auto-Sync: Not needed.

node1:
--------------------------------------------------------------------------

Configuration Synchronization:
    Status:
        Activation status: Enabled
        Last sync operation: Auto-Sync
        Last sync result: Succeeded
```

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```
        Last sync mgd messages:
            mgd: rcp: /config/juniper.conf: No such file or directory
            mgd: commit complete

    Events:
        Mar  5 01:48:55.339 : Auto-Sync: In progress. Attempt: 1
        Mar  5 01:49:40.664 : Auto-Sync: Succeeded. Attempt: 1
```

Related Documentation

- Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes on page 181
- NTP Time Synchronization on SRX Series Devices on page 183
- Simplifying Network Management by Synchronizing the Primary and Backup Routing Engines with NTP on page 183
- **show chassis cluster information configuration-synchronization on page 336**

NTP Time Synchronization on SRX Series Devices

Supported Platforms SRX Series, vSRX

Network Time Protocol (NTP) is used to synchronize the time between the Packet Forwarding Engine and the Routing Engine in a standalone device and between two devices in a chassis cluster.

In both standalone and chassis cluster modes, the primary Routing Engine runs the NTP process to get the time from the external NTP server. Although the secondary Routing Engine runs the NTP process in an attempt to get the time from the external NTP server, this attempt fails because of network issues. For this reason, the secondary Routing Engine uses NTP to get the time from the primary Routing Engine.

Use NTP to:

- Send the time from the primary Routing Engine to the secondary Routing Engine through the chassis cluster control link.
- Get the time from an external NTP server to the primary or a standalone Routing Engine.
- Get the time from the Routing Engine NTP process to the Packet Forwarding Engine.

Related Documentation

- Simplifying Network Management by Synchronizing the Primary and Backup Routing Engines with NTP on page 183

Simplifying Network Management by Synchronizing the Primary and Backup Routing Engines with NTP

Supported Platforms SRX Series, vSRX

This example shows how to simplify management by synchronizing the time between two SRX Series devices operating in a chassis cluster. Using a Network Time Protocol

(NTP) server, you synchronize the primary Routing Engine with the secondary Routing Engine through the management port.

Requirements

This example uses the following hardware and software components:

- SRX Series devices operating in a chassis cluster
- Junos OS Release 12.1X47-D10 or later

Before you begin:

- Understand the basics of the Network Time Protocol. See Time Management Routing Guide for Administration Devices.

Overview

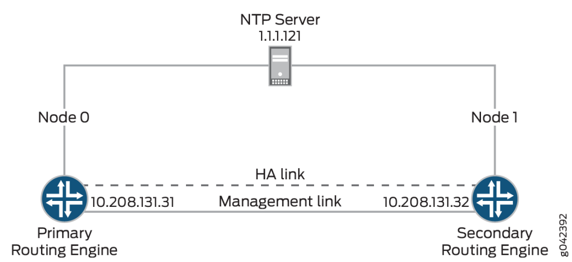
When SRX Series devices are operating in chassis cluster mode, the backup Routing Engine cannot access the external NTP server through the revenue port. The following two examples synchronize the time from the peer Routing Engine or from the NTP server, both using the management port:

- Synchronizing Time from the Peer Routing Engine with the Management Port (fxp0)
- Synchronizing Time from the NTP Server with the Management Port (fxp0)

Topology

Figure 18 on page 184 shows the time synchronization from the peer Routing Engine using the management port, fxp0.

Figure 18: Synchronizing Time from the Peer Routing Engine Using fxp0



With this configuration, both Routing Engines in a chassis cluster will have two NTP servers (one Routing Engine points to the external server, and the other Routing Engine points to the peer Routing Engine fxp0 address). In the primary Routing Engine, both NTP servers are reachable, and the NTP process selects the best server for synchronizing time.

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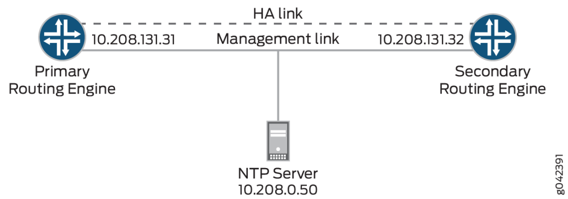
The secondary Routing Engine can reach only one NTP server (pointing to the peer fxp0 address), so this server is used for synchronizing time.

Figure 19 on page 185 shows the time synchronization from the NTP server using the management port, fxp0.

Figure 19: Synchronizing Time from the NTP Server Using fxp0



In this configuration, the NTP server address is 10.208.0.50, which is reachable through the management port. The management ports of both Routing Engines in chassis cluster mode are enabled. In this configuration, both Routing Engines can access the NTP server to synchronize time.

Configuration

CLI Quick Configuration

To quickly configure this example, and synchronize the time from the peer Routing Engine using the management port, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set system ntp server 1.1.1.121
set groups node0 system ntp server 10.208.131.32
set groups node1 system ntp server 10.208.131.31
```

NOTE: 10.208.131.32 is the fxp0 IP address of node 0, and 10.208.131.31 is the fxp0 IP address of node 1.

To quickly configure this example, and synchronize the time from the NTP server using the management port, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set system ntp server 10.208.0.50
```

Synchronizing Time from the Peer Routing Engine Using the Management Port (fxp0)

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To synchronize the time from the peer Routing Engine using the management port:

1. Configure the NTP server.

   ```
   [edit system]
   user@host#set ntp server 1.1.1.121
   ```

2. Configure the NTP server address for node 0.

   ```
   [edit groups]
   user@host#set node0 system ntp server 10.208.131.32
   ```

3. Configure the NTP server address for node 1.

   ```
   [edit groups]
   user@host#set node1 system ntp server 10.208.131.31
   ```

Synchronizing Time from the NTP Server Using the Management Port (fxp0)

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To synchronize the time from the NTP server using the management port:

- Configure the NTP server address.

  ```
  [edit system]
  user@host#set ntp server 10.208.0.50
  ```

Results

From configuration mode, confirm your configuration by entering the **show system ntp** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
{primary:node0}[edit]
user@host# show system ntp
server 1.1.1.121
{primary:node0}[edit]
user@host# show groups node0 system ntp
server 10.208.131.32;
{primary:node0}[edit]
user@host# show groups node1 system ntp
```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server 10.208.131.31;

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying the NTP Configuration on the Primary Node on page 187
- Verifying the NTP Configuration on the Secondary Node on page 188

Verifying the NTP Configuration on the Primary Node

Purpose Verify that the configuration is working properly.

Action From operational mode, enter the **show ntp associations** command:

```
user@host> show ntp associations
 remote       refid       st t   when  poll  reach    delay    offset   jitter
==============================================================================
*1-1-1-121-dynami 10.208.0.50      4 -    63    64    65    4.909  -12.067   2.014
+10.208.131.32    129.96.0.1      6 -     1    64   377    0.251   -1.828   2.021
```

From operational mode, enter the **show ntp status** command:

```
user@host> show ntp status
status=0664 leap_none, sync_ntp, 6 events, event_peer/strat_chg,
version="ntpd 4.2.0-a Fri Mar 21 00:50:30 PDT 2014 (1)",
processor="i386", system="JUNOS12.1I20140320_srx_12q1_x47.1-637245",
leap=00, stratum=5, precision=-20, rootdelay=209.819,
rootdispersion=513.087, peer=14596, refid=1.1.1.121,
reftime=d6dbb2f9.b3f41ff7  Tue, Mar 25 2014 15:47:05.702, poll=6,
clock=d6dbb47a.72918b20  Tue, Mar 25 2014 15:53:30.447, state=4,
offset=-6.066, frequency=-55.135, jitter=4.343, stability=0.042
```

Meaning The output on the primary node shows the NTP association as follows:

- **remote**—Address or name of the remote NTP peer.
- **refid**—Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.
- **st**—Stratum of the remote peer.
- **t**—Type of peer: b (broadcast), l (local), m (multicast), or u (unicast).
- **when**—When the last packet from the peer was received.
- **poll**—Polling interval, in seconds.
- **reach**—Reachability register, in octal.
- **delay**—Current estimated delay of the peer, in milliseconds.
- **offset**—Current estimated offset of the peer, in milliseconds.
- **jitter**—Magnitude of jitter, in milliseconds.

The output on the primary node shows the NTP status as follows:

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- **status**—System status word, a code representing the status items listed.
- **x events**—Number of events that have occurred since the last code change. An event is often the receipt of an NTP polling message.
- **version**—A detailed description of the version of NTP being used.
- **processor**—Current hardware platform and version of the processor.
- **system**—Detailed description of the name and version of the operating system in use.
- **leap**—Number of leap seconds in use.
- **stratum**—Stratum of the peer server. Anything greater than 1 is a secondary reference source, and the number roughly represents the number of hops away from the stratum 1 server. Stratum 1 is a primary reference, such as an atomic clock.
- **precision**—Precision of the peer clock, how precisely the frequency and time can be maintained with this particular timekeeping system.
- **rootdelay**—Total roundtrip delay to the primary reference source, in seconds.
- **rootdispersion**—Maximum error relative to the primary reference source, in seconds.
- **peer**—Identification number of the peer in use.
- **refid**—Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.
- **reftime**—Local time, in timestamp format, when the local clock was last updated. If the local clock has never been synchronized, the value is zero.
- **poll**—NTP broadcast message polling interval, in seconds.
- **clock**—Current time on the local router clock.
- **state**—Current mode of NTP operation, where 1 is symmetric active, 2 is symmetric passive, 3 is client, 4 is server, and 5 is broadcast.
- **offset**—Current estimated offset of the peer, in milliseconds. Indicates the time difference between the reference clock and the local clock.
- **frequency**—Frequency of the clock.
- **jitter**—Magnitude of jitter, in milliseconds.
- **stability**—Measurement of how well this clock can maintain a constant frequency.

Verifying the NTP Configuration on the Secondary Node

Purpose Verify that the configuration is working properly.

Action From operational mode, enter the **show ntp associations** command:

```
user@host> show ntp associations
remote     refid    st  t     when  poll  reach  delay    offset   jitter
==============================================================================
 1-1-1-121-dynami .INIT.        16 -     - 1024    0     0.000    0.000  4000.00
+10.208.131.31   1.1.1.121       5 -    14    64  377    0.244   -0.929   1.510
*129.96.0.1      1.1.1.121       5 u    32    64  377    0.417    0.760   1.204
```

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From operational mode, enter the **show ntp status** command:

```
user@host> show ntp status
status=0664 leap_none, sync_ntp, 6 events, event_peer/strat_chg,
version="ntpd 4.2.0-a Thu Mar 13 01:53:03 PDT 2014 (1)",
processor="i386", system="JUNOS12.1I20140312_srx_12q1_x47.2-635305",
leap=00, stratum=12, precision=-20, rootdelay=2.408,
rootdispersion=892.758, peer=51948, refid=1.1.1.121,
reftime=d6d646bb.853d2f42  Fri, Mar 21 2014 13:03:55.520, poll=6,
clock=d6d647bc.e8f28b2f  Fri, Mar 21 2014 13:08:12.909, state=4,
offset=-1.126, frequency=-62.564, jitter=0.617, stability=0.002
```

Meaning The output on the secondary node shows the NTP association as follows:

- **remote**—Address or name of the remote NTP peer.
- **refid**—Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.
- **st**—Stratum of the remote peer.
- **t**—Type of peer: b (broadcast), l (local), m (multicast), or u (unicast).
- **when**—When the last packet from the peer was received.
- **poll**—Polling interval, in seconds.
- **reach**—Reachability register, in octal.
- **delay**—Current estimated delay of the peer, in milliseconds.
- **offset**—Current estimated offset of the peer, in milliseconds.
- **jitter**—Magnitude of jitter, in milliseconds.

The output on the secondary node shows the NTP status as follows:

- **status**—System status word, a code representing the status items listed.
- **x events**—Number of events that have occurred since the last code change. An event is often the receipt of an NTP polling message.
- **version**—A detailed description of the version of NTP being used.
- **processor**—Current hardware platform and version of the processor.
- **system**—Detailed description of the name and version of the operating system in use.
- **leap**—Number of leap seconds in use.
- **stratum**—Stratum of the peer server. Anything greater than 1 is a secondary reference source, and the number roughly represents the number of hops away from the stratum 1 server. Stratum 1 is a primary reference, such as an atomic clock.
- **precision**—Precision of the peer clock, how precisely the frequency and time can be maintained with this particular timekeeping system.
- **rootdelay**—Total roundtrip delay to the primary reference source, in seconds.
- **rootdispersion**—Maximum error relative to the primary reference source, in seconds.

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- **peer**—Identification number of the peer in use.
- **refid**—Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.
- **reftime**—Local time, in timestamp format, when the local clock was last updated. If the local clock has never been synchronized, the value is zero.
- **poll**—NTP broadcast message polling interval, in seconds.
- **clock**—Current time on the local router clock.
- **state**—Current mode of NTP operation, where 1 is symmetric active, 2 is symmetric passive, 3 is client, 4 is server, and 5 is broadcast.
- **offset**—Current estimated offset of the peer, in milliseconds. Indicates the time difference between the reference clock and the local clock.
- **frequency**—Frequency of the clock.
- **jitter**—Magnitude of jitter, in milliseconds.
- **stability**—Measurement of how well this clock can maintain a constant frequency.

Related Documentation

- Time Management Routing Guide for Administration Devices
- NTP Time Synchronization on SRX Series Devices on page 183
- Verifying Chassis Cluster Configuration Synchronization Status on page 182

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PART 4

Additional Chassis Cluster Configurations

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CHAPTER 18

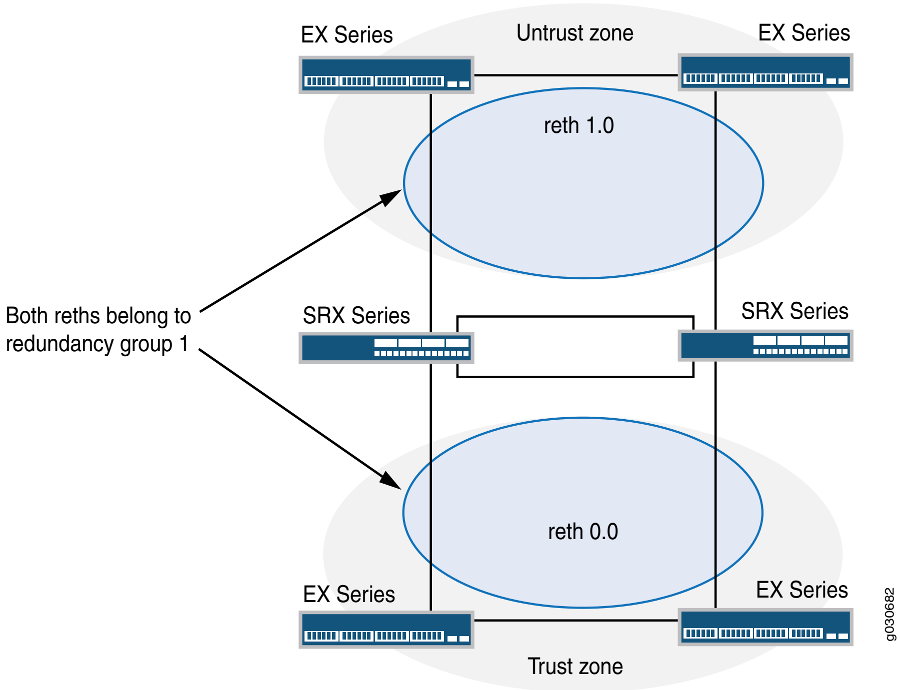
Configuring Active/Passive Chassis Cluster Deployments

Understanding Active/Passive Chassis Cluster Deployment

Supported Platforms SRX Series, vSRX

In this case, a single device in the cluster is used to route all traffic while the other device is used only in the event of a failure (see Figure 20 on page 194). When a failure occurs, the backup device becomes master and controls all forwarding.

Figure 20: Active/Passive Chassis Cluster Scenario



An active/passive chassis cluster can be achieved by using redundant Ethernet interfaces (reths) that are all assigned to the same redundancy group. If any of the interfaces in an active group in a node fails, the group is declared inactive and all the interfaces in the group fail over to the other node.

This configuration minimizes the traffic over the fabric link because only one node in the cluster forwards traffic at any given time.

Related Documentation

- Example: Configuring an Active/Passive Chassis Cluster Pair (CLI) on page 194
- Example: Configuring an Active/Passive Chassis Cluster Pair (J-Web) on page 205

Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)

Supported Platforms SRX Series, vSRX

This example shows how to configure active/passive chassis clustering for devices.

- Requirements on page 194
- Overview on page 195
- Configuration on page 197
- Verification on page 202

Requirements

Before you begin:

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1. Physically connect a pair of devices together, ensuring that they are the same models.
2. Create a fabric link by connecting a Gigabit Ethernet interface on one device to another Gigabit Ethernet interface on the other device.
3. Create a control link by connecting the control port of the two SRX1500 devices.
4. Connect to one of the devices using the console port. (This is the node that forms the cluster.) and set the cluster ID and node number.

   user@host> **set chassis cluster cluster-id 1 node 0 reboot**

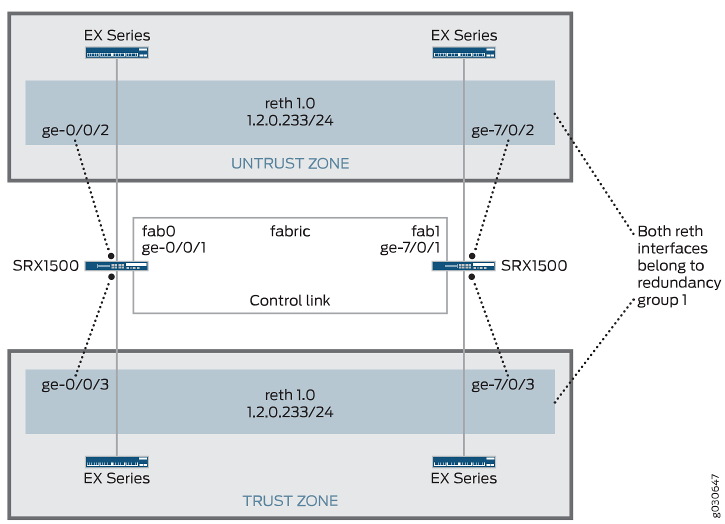
5. Connect to the other device using the console port and set the cluster ID and node number.

   user@host> **set chassis cluster cluster-id 1 node 1 reboot**

Overview

In this example, a single device in the cluster is used to route all traffic, and the other device is used only in the event of a failure. (See Figure 21 on page 195.) When a failure occurs, the backup device becomes master and controls all forwarding.

Figure 21: Active/Passive Chassis Cluster Topology



You can create an active/passive chassis cluster by configuring redundant Ethernet interfaces (reths) that are all assigned to the same redundancy group. This configuration minimizes the traffic over the fabric link because only one node in the cluster forwards traffic at any given time.

In this example, you configure group (applying the configuration with the **apply-groups** command) and chassis cluster information. Then you configure security zones and security policies. See Table 11 on page 196 through Table 14 on page 197.

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Table 11: Group and Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters

Groups	node0	• Hostname: srx1500-A
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 192.168.3.110/24

	node1	• Hostname: srx1500-B
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 192.168.3.111/24

Table 12: Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters
Fabric links	fab0	Interface: ge-0/0/1
	fab1	Interface: ge-7/0/1
Heartbeat interval	–	1000
Heartbeat threshold	–	3

Redundancy group	0	• Priority:
		  ◦ Node 0: 254
		  ◦ Node 1: 1

	1	• Priority:
		  ◦ Node 0: 254
		  ◦ Node 1: 1

		Interface monitoring • ge-0/0/4 • ge-7/0/4 • ge-0/0/5 • ge-7/0/5
Number of redundant Ethernet interfaces	–	2
Interfaces	ge-0/0/4	Redundant parent: reth1
	ge-7/0/4	Redundant parent: reth1
	ge-0/0/5	Redundant parent: reth0
	ge-7/0/5	Redundant parent: reth0

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Table 12: Chassis Cluster Configuration Parameters *(continued)*

Feature	Name	Configuration Parameters
	reth0	Redundancy group: 1
		• Unit 0 • 10.16.8.1/24
	reth1	Redundancy group: 1
		• Unit 0 • 11.2.0.233/24

Table 13: Security Zone Configuration Parameters

Name	Configuration Parameters
trust	The reth1.0 interface is bound to this zone.
untrust	The reth0.0 interface is bound to this zone.

Table 14: Security Policy Configuration Parameters

Purpose	Name	Configuration Parameters

This security policy permits traffic from the trust zone to the untrust zone.	ANY	• Match criteria:
		  ◦ source-address any
		  ◦ destination-address any
		  ◦ application any
		• Action: permit

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
[edit]
set groups node0 system host-name srx1500-A
set groups node0 interfaces fxp0 unit 0 family inet address 192.168.3.110/24
set groups node1 system host-name srx1500-B
set groups node1 interfaces fxp0 unit 0 family inet address 192.168.3.111/24
set apply-groups "${node}"
set interfaces fab0 fabric-options member-interfaces ge-0/0/1
set interfaces fab1 fabric-options member-interfaces ge-7/0/1
set chassis cluster heartbeat-interval 1000
set chassis cluster heartbeat-threshold 3
set chassis cluster redundancy-group 0 node 0 priority 100
set chassis cluster redundancy-group 0 node 1 priority 1
set chassis cluster redundancy-group 1 node 0 priority 100
```

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```
set chassis cluster redundancy-group 1 node 1 priority 1
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/4 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-7/0/4 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/5 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-7/0/5 weight 255
set chassis cluster reth-count 2
set interfaces ge-0/0/5 gigether-options redundant-parent reth1
set interfaces ge-7/0/5 gigether-options redundant-parent reth1
set interfaces ge-0/0/4 gigether-options redundant-parent reth0
set interfaces ge-7/0/4 gigether-options redundant-parent reth0
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth0 unit 0 family inet address 10.16.8.1/24
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth1 unit 0 family inet address 1.2.0.233/24
set security zones security-zone untrust interfaces reth1.0
set security zones security-zone trust interfaces reth0.0
set security policies from-zone trust to-zone untrust policy ANY match source-address
  any
set security policies from-zone trust to-zone untrust policy ANY match destination-address
  any
set security policies from-zone trust to-zone untrust policy ANY match application any
set security policies from-zone trust to-zone untrust policy ANY then permit
```

Step-by-Step Procedure

To configure an active/passive chassis cluster:

1. Configure the management interface.

```
{primary:node0}[edit]
user@host# set groups node0 system host-name srx1500-A
user@host# set groups node0 interfaces fxp0 unit 0 family inet address
  192.168.3.110/24
user@host# set groups node1 system host-name srx1500-B
user@host# set groups node1 interfaces fxp0 unit 0 family inet address
  192.168.3.111/24
user@host# set apply-groups “${node}”
```

2. Configure the fabric interface.

```
{primary:node0}[edit]
user@host# set interfaces fab0 fabric-options member-interfaces ge-0/0/1
user@host# set interfaces fab1 fabric-options member-interfaces ge-7/0/1
```

3. Configure heartbeat settings.

```
{primary:node0}[edit]
user@host# set chassis cluster heartbeat-interval 1000
user@host# set chassis cluster heartbeat-threshold 3
```

4. Configure redundancy groups.

```
{primary:node0}[edit]
user@host# set chassis cluster redundancy-group 0 node 0 priority 100
user@host# set chassis cluster redundancy-group 0 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 node 0 priority 100
user@host# set chassis cluster redundancy-group 1 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-0/0/4
  weight 255
```

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```
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-7/0/4
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-0/0/5
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-7/0/5
  weight 255
```

5. Configure redundant Ethernet interfaces.

```
{primary:node0}[edit]
user@host# set chassis cluster reth-count 2
user@host# set interfaces ge-0/0/5 gigether-options redundant-parent reth1
user@host# set interfaces ge-7/0/5 gigether-options redundant-parent reth1
user@host# set interfaces ge-0/0/4 gigether-options redundant-parent reth0
user@host# set interfaces ge-7/0/4 gigether-options redundant-parent reth0
user@host# set interfaces reth0 redundant-ether-options redundancy-group 1
user@host# set interfaces reth0 unit 0 family inet address 10.16.8.1/24
user@host# set interfaces reth1 redundant-ether-options redundancy-group 1
user@host# set interfaces reth1 unit 0 family inet address 1.2.0.233/24
```

6. Configure security zones.

```
{primary:node0}[edit]
user@host# set security zones security-zone untrust interfaces reth1.0
user@host# set security zones security-zone trust interfaces reth0.0
```

7. Configure security policies.

```
{primary:node0}[edit]
user@host# set security policies from-zone trust to-zone untrust policy ANY match
  source-address any
user@host# set security policies from-zone trust to-zone untrust policy ANY match
  destination-address any
user@host# set security policies from-zone trust to-zone untrust policy ANY match
  application any
user@host# set security policies from-zone trust to-zone untrust policy ANY then
  permit
```

Results

From configuration mode, confirm your configuration by entering the **show configuration** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
user@host> show configuration
version x.xx.x;
groups {
  node0 {
    system {
      host-name srx1500-A;
    }
    interfaces {
      fxp0 {
        unit 0 {
          family inet {
```

```
                address 192.168.3.110/24;
              }
            }
          }
        }
      }
      node1 {
        system {
          host-name srx1500-B;
          interfaces {
            fxp0 {
              unit 0 {
                family inet {
                  address 192.168.3.111/24;
                }
              }
            }
          }
        }
      }
      apply-groups "${node}";
      chassis {
        cluster {
          reth-count 2;
          heartbeat-interval 1000;
          heartbeat-threshold 3;
          redundancy-group 0 {
            node 0 priority 100;
            node 1 priority 1;
          }
          redundancy-group 1 {
            node 0 priority 100;
            node 1 priority 1;
            interface-monitor {
              ge–0/0/4 weight 255;
              ge–7/0/4 weight 255;
              ge–0/0/5 weight 255;
              ge–7/0/5 weight 255;
            }
          }
        }
      }
      interfaces {
        ge–0/0/4 {
          gigether–options {
            redundant–parent reth0;
          }
        }
        ge–7/0/4{
          gigether–options {
            redundant–parent reth0;
          }
        }
        ge–0/0/5 {
          gigether–options {
            redundant–parent reth1;
```


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```
            }
        }
        ge–7/0/5 {
            gigether–options {
                redundant–parent reth1;
            }
        }
        fab0 {
            fabric–options {
                member–interfaces {
                    ge–0/0/1;
                }
            }
        }
        fab1 {
            fabric–options {
                member–interfaces {
                    ge–7/0/1;
                }
            }
        }
        reth0 {
            redundant–ether–options {
                redundancy–group 1;
            }
            unit 0 {
                family inet {
                    address 10.16.8.1/24;
                }
            }
        }
        reth1 {
            redundant–ether–options {
                redundancy–group 1;
            }
            unit 0 {
                family inet {
                    address 1.2.0.233/24;
                }
            }
        }
    }
...
security {
    zones {
        security–zone untrust {
            interfaces {
                reth1.0;
            }
        }
        security–zone trust {
            interfaces {
                reth0.0;
            }
        }
    }
```

```
        policies {
            from-zone trust to-zone untrust {
                policy ANY {
                    match {
                        source-address any;
                        destination-address any;
                        application any;
                    }
                    then {
                        permit;
                    }
                }
            }
        }
    }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying Chassis Cluster Status

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Cluster ID: 1
Node                         Priority     Status     Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                    100          primary    no       no
    node1                    1            secondary  no       no

Redundancy group: 1 , Failover count: 1
    node0                    100          primary    no       no
    node1                    1            secondary  no       no
```

Verifying Chassis Cluster Interfaces

Purpose Verify information about chassis cluster interfaces.

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Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link name: fxp1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1

Interface Monitoring:
    Interface         Weight    Status    Redundancy-group
    ge-0/0/4          255       Up        1
    ge-7/0/4          255       Up        1
    ge-0/0/5          255       Up        1
    ge-7/0/5          255       Up        1
```

Verifying Chassis Cluster Statistics

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitored interfaces in the cluster.

Action From operational mode, enter the **show chassis cluster statistics** command.

```
{primary:node0}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 2276
        Heartbeat packets received: 2280
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 2272
        Probes received: 597
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            161          0
    Session close                             148          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
```

```
    GPRS GTP                                    0             0
```

Verifying Chassis Cluster Control Plane Statistics

Purpose Verify information about chassis cluster control plane statistics (heartbeats sent and received) and the fabric link statistics (probes sent and received).

Action From operational mode, enter the **show chassis cluster control-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
```

Verifying Chassis Cluster Data Plane Statistics

Purpose Verify information about the number of RTOs sent and received for services.

Action From operational mode, enter the **show chassis cluster data-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster data-plane statistics

Services Synchronized:
    Service name                                RTOs sent     RTOs received
    Translation context                         0             0
    Incoming NAT                                0             0
    Resource manager                            6             0
    Session create                              161           0
    Session close                               148           0
    Session change                              0             0
    Gate create                                 0             0
    Session ageout refresh requests             0             0
    Session ageout refresh replies              0             0
    IPSec VPN                                   0             0
    Firewall user authentication                0             0
    MGCP ALG                                    0             0
    H323 ALG                                    0             0
    SIP ALG                                     0             0
    SCCP ALG                                    0             0
    PPTP ALG                                    0             0
    RPC ALG                                     0             0
    RTSP ALG                                    0             0
    RAS ALG                                     0             0
    MAC address learning                        0             0
    GPRS GTP                                    0             0
```

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Verifying Chassis Cluster Redundancy Group Status

Purpose

Verify the state and priority of both nodes in a cluster and information about whether the primary node has been preempted or whether there has been a manual failover.

Action

From operational mode, enter the **chassis cluster status redundancy-group** command.

```
{primary:node0}
user@host> show chassis cluster status redundancy-group 1
Cluster ID: 1
    Node                Priority     Status     Preempt  Manual failover

 Redundancy-Group: 1, Failover count: 1
    node0               100           primary    no        no
    node1               1             secondary  no        no
```

Troubleshooting with Logs

Purpose

Use these logs to identify any chassis cluster issues. You should run these logs on both nodes.

Action

From operational mode, enter these **show** commands.

```
user@host> show log jsrpd
user@host> show log chassisd
user@host> show log messages
user@host> show log dcd
user@host> show traceoptions
```

Related Documentation

- Understanding Active/Passive Chassis Cluster Deployment on page 193
- Example: Configuring an Active/Passive Chassis Cluster Pair (J-Web) on page 205

Example: Configuring an Active/Passive Chassis Cluster Pair (J-Web)

Supported Platforms SRX Series, vSRX

1. Enable clustering. See Step 1 in "Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)" on page 194.
2. Configure the management interface. See Step 2 in "Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)" on page 194.
3. Configure the fabric interface. See Step 3 in "Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)" on page 194.
4. Configure the redundancy groups.
   - Select **Configure>Chassis Cluster**.
   - Enter the following information, and then click **Apply**:

     Redundant ether-Interface Count: **2**

     Heartbeat Interval: **1000**

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Heartbeat Threshold: **3**

Nodes: **0**

Group Number: **0**

Priorities: **100**

- Enter the following information, and then click **Apply**:

  Nodes: **0**

  Group Number: **1**

  Priorities: **1**

- Enter the following information, and then click **Apply**:

  Nodes: **1**

  Group Number: **0**

  Priorities: **100**

5. Configure the redundant Ethernet interfaces.
   - Select **Configure>Chassis Cluster**.
   - Select **ge-0/0/4**.
   - Enter **reth1** in the Redundant Parent box.
   - Click **Apply**.
   - Select **ge-7/0/4**.
   - Enter **reth1** in the Redundant Parent box.
   - Click **Apply**.
   - Select **ge-0/0/5**.
   - Enter **reth0** in the Redundant Parent box.
   - Click **Apply**.
   - Select **ge-7/0/5**.
   - Enter **reth0** in the Redundant Parent box.
   - Click **Apply**.
   - See Step 5 in "Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)" on page 194 for the last four configuration settings.
6. Configure the security zones. See Step 6 in "Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)" on page 194.

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7. Configure the security policies. See Step 7 in “Example: Configuring an Active/Passive Chassis Cluster Pair (CLI)” on page 194.

8. Click **OK** to check your configuration and save it as a candidate configuration, then click **Commit Options**>**Commit**.

Related Documentation

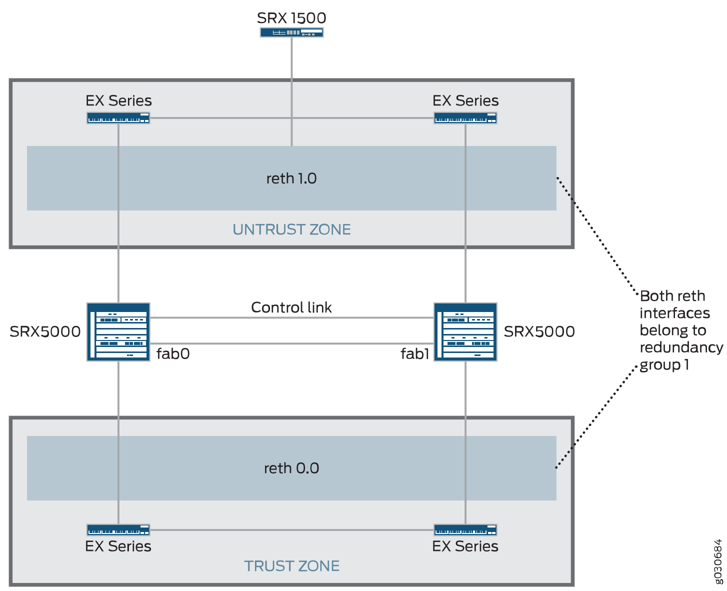
- Understanding Active/Passive Chassis Cluster Deployment on page 193
- Example: Configuring an Active/Passive Chassis Cluster Pair (CLI) on page 194

Understanding Active/Passive Chassis Cluster Deployment with an IPsec Tunnel

Supported Platforms SRX Series, vSRX

In this case, a single device in the cluster terminates in an IPsec tunnel and is used to process all traffic while the other device is used only in the event of a failure (see Figure 22 on page 207). When a failure occurs, the backup device becomes master and controls all forwarding.

Figure 22: Active/Passive Chassis Cluster with IPsec Tunnel Scenario (SRX Series Devices)



An active/passive chassis cluster can be achieved by using redundant Ethernet interfaces (reths) that are all assigned to the same redundancy group. If any of the interfaces in an active group in a node fails, the group is declared inactive and all the interfaces in the group fail over to the other node.

This configuration provides a way for a site-to-site IPsec tunnel to terminate in an active/passive cluster where a redundant Ethernet interface is used as the tunnel endpoint. In the event of a failure, the redundant Ethernet interface in the backup SRX Series device becomes active, forcing the tunnel to change endpoints to terminate in the new active SRX Series device. Because tunnel keys and session information are synchronized between the members of the chassis cluster, a failover does not require the tunnel to be renegotiated and all established sessions are maintained.

NOTE: Dynamic tunnels cannot load-balance across different SPCs.

Related Documentation

- Understanding Active/Passive Chassis Cluster Deployment on page 193
- Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel on page 208
- Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel (J-Web) on page 223

Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel

Supported Platforms SRX Series, vSRX

This example shows how to configure active/passive chassis clustering with an IPsec tunnel for SRX Series devices.

Requirements

Before you begin:

- Get two SRX5000 models with identical hardware configurations, one SRX1500 edge router, and four EX Series Ethernet switches.
- Physically connect the two devices (back-to-back for the fabric and control ports) and ensure that they are the same models. You can configure both the fabric and control ports on the SRX5000 line.
- Set the two devices to cluster mode and reboot the devices. You must enter the following operational mode commands on both devices, for example:
  - On node 0:

    user@host> **set chassis cluster cluster-id 1 node 0 reboot**
  - On node 1:

    user@host> **set chassis cluster cluster-id 1 node 1 reboot**

  The cluster ID is the same on both devices, but the node ID must be different because one device is node 0 and the other device is node 1. The range for the cluster ID is 1 through 255. Setting a cluster ID to 0 is equivalent to disabling a cluster.

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Cluster ID greater than 15 can only be set when the fabric and control link interfaces are connected back-to-back.

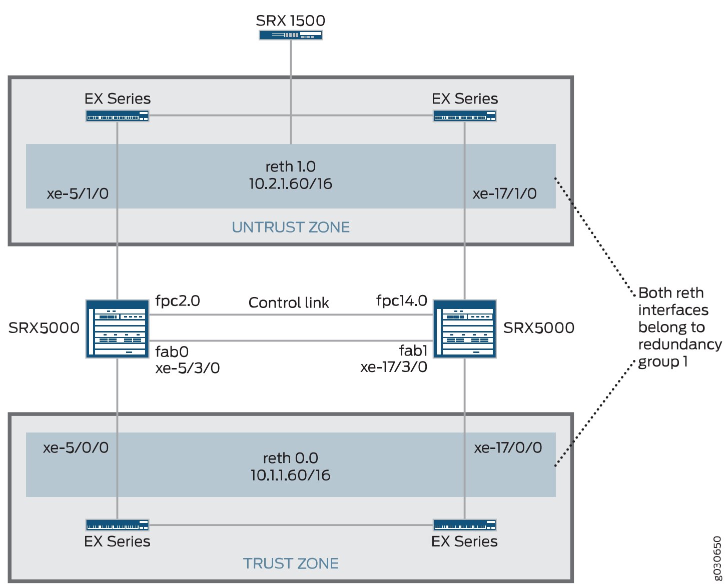
- Get two SRX5000 models with identical hardware configurations, one SRX1500 edge router, and four EX Series Ethernet switches.
- Physically connect the two devices (back-to-back for the fabric and control ports) and ensure that they are the same models. You can configure both the fabric and control ports on the SRX5000 line.

From this point forward, configuration of the cluster is synchronized between the node members and the two separate devices function as one device. Member-specific configurations (such as the IP address of the management port of each member) are entered using configuration groups.

Overview

In this example, a single device in the cluster terminates in an IPsec tunnel and is used to process all traffic, and the other device is used only in the event of a failure. (See Figure 23 on page 209.) When a failure occurs, the backup device becomes master and controls all forwarding.

Figure 23: Active/Passive Chassis Cluster with IPsec Tunnel Topology (SRX Series Devices)



In this example, you configure group (applying the configuration with the **apply-groups** command) and chassis cluster information. Then you configure IKE, IPsec, static route, security zone, and security policy parameters. See Table 15 on page 210 through Table 21 on page 212.

Table 15: Group and Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters

Groups	node0	• Hostname: SRX5800-1
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 172.19.100.50/24

	node1	• Hostname: SRX5800-2
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 172.19.100.51/24

Table 16: Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters
Fabric links	fab0	Interface: xe-5/3/0
	fab1	Interface: xe-17/3/0
Number of redundant Ethernet interfaces	–	2
Heartbeat interval	–	1000
Heartbeat threshold	–	3

Redundancy group	0	• Priority:
		  ◦ Node 0: 254
		  ◦ Node 1: 1

	1	• Priority:
		  ◦ Node 0: 254
		  ◦ Node 1: 1
		•

		Interface monitoring • xe-5/0/0 • xe-5/1/0 • xe-17/0/0 • xe-17/1/0
Interfaces	xe-5/1/0	Redundant parent: reth1
	xe-5/1/0	Redundant parent: reth1
	xe-5/0/0	Redundant parent: reth0

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Table 16: Chassis Cluster Configuration Parameters *(continued)*

Feature	Name	Configuration Parameters
	xe-17/0/0	Redundant parent: reth0
	reth0	Redundancy group: 1
		• Unit 0 • 10.1.1.60/16
	reth1	Redundancy group: 1
		• Multipoint • Unit 0 • 10.10.1.1/30
	st0	
		• Unit 0 • 10.10.1.1/30

Table 17: IKE Configuration Parameters

Feature	Name	Configuration Parameters
Proposal	proposal-set standard	-
Policy	preShared	• Mode: main • Proposal reference: proposal-set standard • IKE Phase 1 policy authentication method: pre-shared-key ascii-text
Gateway	SRX1500-1	• IKE policy reference: perShared • External interface: reth0.0 • Gateway address: 10.1.1.90 NOTE: On all high-end SRX Series devices, only reth interfaces are supported for IKE external interface configuration in IPsec VPN. Other interface types can be configured, but IPsec VPN might not work. On all branch SRX Series devices, reth interfaces and the lo0 interface are supported for IKE external interface configuration in IPsec VPN. Other interface types can be configured, but IPsec VPN might not work. On all high-end SRX Series devices, the lo0 logical interface cannot be configured with RG0 if used as an IKE gateway external interface.

Table 18: IPsec Configuration Parameters

Feature	Name	Configuration Parameters
Proposal	proposal-set standard	–

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Table 18: IPsec Configuration Parameters *(continued)*

Feature	Name	Configuration Parameters
Policy	std	–
VPN	SRX1500-1	• IKE gateway reference: SRX1500-1 • IPsec policy reference: std • Bind to interface: st0.0 • VPN monitoring: vpn-monitor optimized • Tunnels established: establish-tunnels immediately NOTE: The manual VPN name and the site-to-site gateway name cannot be the same.

Table 19: Static Route Configuration Parameters

Name	Configuration Parameters
0.0.0.0/0	Next hop: 10.2.1.1
10.3.0.0/16	Next hop: 10.10.1.2

Table 20: Security Zone Configuration Parameters

Name	Configuration Parameters
trust	• All system services are allowed. • All protocols are allowed. • The reth0.0 interface is bound to this zone.
untrust	• All system services are allowed. • All protocols are allowed. • The reth1.0 interface is bound to this zone.
vpn	• All system services are allowed. • All protocols are allowed. • The st0.0 interface is bound to this zone.

Table 21: Security Policy Configuration Parameters

Purpose	Name	Configuration Parameters

This security policy permits traffic from the trust zone to the untrust zone.	ANY	• Match criteria:
		  ◦ source-address any
		  ◦ destination-address any
		  ◦ application any
		• Action: permit

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Table 21: Security Policy Configuration Parameters *(continued)*

Purpose	Name	Configuration Parameters

This security policy permits traffic from the trust zone to the vpn zone.	vpn-any	• Match criteria:
		  ◦ source-address any
		  ◦ destination-address any
		  ◦ application any
		• Action: permit

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set chassis cluster control-ports fpc 2 port 0
set chassis cluster control-ports fpc 14 port 0
set groups node0 system host-name SRX5800-1
set groups node0 interfaces fxp0 unit 0 family inet address 172.19.100.50/24
set groups node1 system host-name SRX5800-2
set groups node1 interfaces fxp0 unit 0 family inet address 172.19.100.51/24
set apply-groups “${node}”
set interfaces fab0 fabric-options member-interfaces xe-5/3/0
set interfaces fab1 fabric-options member-interfaces xe-17/3/0
set chassis cluster reth-count 2
set chassis cluster heartbeat-interval 1000
set chassis cluster heartbeat-threshold 3
set chassis cluster node 0
set chassis cluster node 1
set chassis cluster redundancy-group 0 node 0 priority 254
set chassis cluster redundancy-group 0 node 1 priority 1
set chassis cluster redundancy-group 1 node 0 priority 254
set chassis cluster redundancy-group 1 node 1 priority 1
set chassis cluster redundancy-group 1 preempt
set chassis cluster redundancy-group 1 interface-monitor xe-5/0/0 weight 255
set chassis cluster redundancy-group 1 interface-monitor xe-5/1/0 weight 255
set chassis cluster redundancy-group 1 interface-monitor xe-17/0/0 weight 255
set chassis cluster redundancy-group 1 interface-monitor xe-17/1/0 weight 255
set interfaces xe-5/1/0 gigether-options redundant-parent reth1
set interfaces xe-17/1/0 gigether-options redundant-parent reth1
set interfaces xe-5/0/0 gigether-options redundant-parent reth0
set interfaces xe-17/0/0 gigether-options redundant-parent reth0
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth0 unit 0 family inet address 10.1.1.60/16
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth1 unit 0 family inet address 10.2.1.60/16
set interfaces st0 unit 0 multipoint family inet address 10.10.1.1/30
set security ike policy preShared mode main
set security ike policy preShared proposal-set standard
set security ike policy preShared pre-shared-key ascii-text "$ABC123"## Encrypted
  password
```

```
set security ike gateway SRX1500-1 ike-policy preShared
set security ike gateway SRX1500-1 address 10.1.1.90
set security ike gateway SRX1500-1 external-interface reth0.0
set security ipsec policy std proposal-set standard
set security ipsec vpn SRX1500-1 bind-interface st0.0
set security ipsec vpn SRX1500-1 vpn-monitor optimized
set security ipsec vpn SRX1500-1 ike gateway SRX1500-1
set security ipsec vpn SRX1500-1 ike ipsec-policy std
set security ipsec vpn SRX1500-1 establish-tunnels immediately
set routing-options static route 0.0.0.0/0 next-hop 10.2.1.1
set routing-options static route 10.3.0.0/16 next-hop 10.10.1.2
set security zones security-zone untrust host-inbound-traffic system-services all
set security zones security-zone untrust host-inbound-traffic protocols all
set security zones security-zone untrust interfaces reth1.0
set security zones security-zone trust host-inbound-traffic system-services all
set security zones security-zone trust host-inbound-traffic protocols all
set security zones security-zone trust interfaces reth0.0
set security zones security-zone vpn host-inbound-traffic system-services all 144
set security zones security-zone vpn host-inbound-traffic protocols all
set security zones security-zone vpn interfaces st0.0
set security policies from-zone trust to-zone untrust policy ANY match source-address
  any
set security policies from-zone trust to-zone untrust policy ANY match destination-address
  any
set security policies from-zone trust to-zone untrust policy ANY match application any
set security policies from-zone trust to-zone vpn policy vpn-any then permit
```

Step-by-Step Procedure

To configure an active/passive chassis cluster pair with an IPsec tunnel:

1. Configure control ports.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster control-ports fpc 2 port 0
   user@host# set chassis cluster control-ports fpc 14 port 0
   ```

2. Configure the management interface.

   ```
   {primary:node0}[edit]
   user@host# set groups node0 system host-name SRX5800-1
   user@host# set groups node0 interfaces fxp0 unit 0 family inet address
     172.19.100.50/24
   user@host#set groups node1 system host-name SRX5800-2
   user@host# set groups node1 interfaces fxp0 unit 0 family inet address
     172.19.100.51/24
   user@host# set apply-groups "${node}"
   ```

3. Configure the fabric interface.

   ```
   {primary:node0}[edit]
   user@host# set interfaces fab0 fabric-options member-interfaces xe-5/3/0
   user@host# set interfaces fab1 fabric-options member-interfaces xe-17/3/0
   ```

4. Configure redundancy groups.

   ```
   {primary:node0}[edit]
   user@host# set chassis cluster reth-count 2
   user@host# set chassis cluster heartbeat-interval 1000
   user@host# set chassis cluster heartbeat-threshold 3
   ```

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```
user@host# set chassis cluster node 0
user@host# set chassis cluster node 1
user@host# set chassis cluster redundancy-group 0 node 0 priority 254
user@host# set chassis cluster redundancy-group 0 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 node 0 priority 254
user@host# set chassis cluster redundancy-group 1 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 preempt
user@host# set chassis cluster redundancy-group 1 interface-monitor xe-5/0/0
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor xe-5/1/0
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor xe-17/0/0
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor xe-17/1/0
  weight 255
```

5. Configure redundant Ethernet interfaces.

```
{primary:node0}[edit]
user@host# set interfaces xe-5/1/0 gigether-options redundant-parent reth1
user@host# set interfaces xe-17/1/0 gigether-options redundant-parent reth1
user@host# set interfaces xe-5/0/0 gigether-options redundant-parent reth0
user@host# set interfaces xe-17/0/0 gigether-options redundant-parent reth0
user@host# set interfaces reth0 redundant-ether-options redundancy-group 1
user@host# set interfaces reth0 unit 0 family inet address 10.1.1.60/16
user@host# set interfaces reth1 redundant-ether-options redundancy-group 1
user@host# set interfaces reth1 unit 0 family inet address 10.2.1.60/16
```

6. Configure IPsec parameters.

```
{primary:node0}[edit]
user@host# set interfaces st0 unit 0 multipoint family inet address 10.10.1.1/30
user@host# set security ike policy preShared mode main
user@host# set security ike policy preShared proposal-set standard
user@host# set security ike policy preShared pre-shared-key ascii-text "$ABC123"##
  Encrypted password
user@host# set security ike gateway SRX1500-1 ike-policy preShared
user@host# set security ike gateway SRX1500-1 address 10.1.1.90
user@host# set security ike gateway SRX1500-1 external-interface reth0.0
user@host# set security ipsec policy std proposal-set standard
user@host# set security ipsec vpn SRX1500-1 bind-interface st0.0
user@host# set security ipsec vpn SRX1500-1 vpn-monitor optimized
user@host# set security ipsec vpn SRX1500-1 ike gateway SRX1500-1
user@host# set security ipsec vpn SRX1500-1 ike ipsec-policy std
user@host# set security ipsec vpn SRX1500-1 establish-tunnels immediately
```

7. Configure static routes.

```
{primary:node0}[edit]
user@host# set routing-options static route 0.0.0.0/0 next-hop 10.2.1.1
user@host# set routing-options static route 10.3.0.0/16 next-hop 10.10.1.2
```

8. Configure security zones.

```
{primary:node0}[edit]
user@host# set security zones security-zone untrust host-inbound-traffic
  system-services all
user@host# set security zones security-zone untrust host-inbound-traffic protocols
  all
```

user@host# **set security zones security-zone untrust interfaces reth1.0**
user@host# **set security zones security-zone trust host-inbound-traffic system-services all**
user@host# **set security zones security-zone trust host-inbound-traffic protocols all**
user@host# **set security zones security-zone trust interfaces reth0.0**
user@host# **set security zones security-zone vpn host-inbound-traffic system-services all**
user@host# **set security zones security-zone vpn host-inbound-traffic protocols all**
user@host# **set security zones security-zone vpn interfaces st0.0**

9. Configure security policies.

{primary:node0}[edit]
user@host# **set security policies from-zone trust to-zone untrust policy ANY match source-address any**
user@host# **set security policies from-zone trust to-zone untrust policy ANY match destination-address any**
user@host# **set security policies from-zone trust to-zone untrust policy ANY match application any**
user@host# **set security policies from-zone trust to-zone vpn policy vpn-any then permit**

Results From operational mode, confirm your configuration by entering the **show configuration** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
user@host> show configuration
version x.xx.x;
groups {
    node0 {
        system {
            host-name SRX58001;
        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address 172.19.100.50/24;
                    }
                }
            }
        }
    }
    node1 {
        system {
            host-name SRX58002;
        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address 172.19.100.51/24;
                    }
```

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```
                }
            }
        }
    }
}
apply-groups "${node}";
system {
        root-authentication {
        encrypted-password "$ABC123";
        }
}
chassis {
    cluster {
        reth-count 2;
        heartbeat-interval 1000;
        heartbeat-threshold 3;
        control-ports {
            fpc 2 port 0;
            fpc 14 port 0;
        }
        redundancy-group 0 {
            node 0 priority 254;
            node 1 priority 1;
        }
        redundancy-group 1 {
            node 0 priority 254;
            node 1 priority 1;
            preempt;
            interface-monitor {
                xe-6/0/0 weight 255;
                xe-6/1/0 weight 255;
                xe-18/0/0 weight 255;
                xe-18/1/0 weight 255;
            }
        }
    }
}
interfaces {
    xe-5/0/0 {
        gigether-options {
            redundant-parent reth0;
        }
    }
    xe-5/1/0 {
        gigether-options {
            redundant-parent reth1;
        }
    }
    xe-17/0/0 {
        gigether-options {
            redundant-parent reth0;
        }
    }
    xe-17/1/0 {
        gigether-options {
            redundant-parent reth1;
        }
    }
    fab0 {
        fabric-options {
            member-interfaces {
```

```
                    xe-5/3/0;
                }
            }
        }
        fab1 {
            fabric-options {
                member-interfaces {
                    xe-17/3/0;
                }
            }
        }
        reth0 {
            redundant-ether-options {
                redundancy-group 1;
            }
            unit 0 {
                family inet {
                    address 10.1.1.60/16;
                }
            }
        }
        reth1 {
            redundant-ether-options {
                redundancy-group 1;
            }
            unit 0 {
                family inet {
                    address 10.2.1.60/16;
                }
            }
        }
        st0 {
            unit 0 {
                multipoint;
                family inet {
                    address 5.4.3.2/32;
                }
            }
        }
    }
    routing-options {
        static {
            route 0.0.0.0/0 {
                next-hop 10.2.1.1;
        }
            route 10.3.0.0/16 {
                next-hop 10.10.1.2;
            }
        }
    }
    security {
        zones {
            security-zone trust {
                host-inbound-traffic {
                    system-services {
                        all;
                    }
                }
                interfaces {
                    reth0.0;
                }
```

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```
            }
            security-zone untrust
                host-inbound-traffic {
                    system-services {
                        all;
                    }
                }
                    protocols {
                        all;
                    }
                interfaces {
                    reth1.0;
                }
            }

            security-zone vpn {
                host-inbound-traffic {
                    system-services {
                        all;
                    }
                }
                    protocols {
                        all;
                    }
                interfaces {
                    st0.0;
                }

            }
        }
        policies {
            from-zone trust to-zone untrust {
                policy ANY {
                    match {
                        source-address any;
                        destination-address any;
                        application any;
                    }
                    then {
                        permit;
                    }
                }
            }
            from-zone trust to-zone vpn {
                policy vpn {
                    match {
                        source-address any;
                        destination-address any;
                        application any;
                    }
                    then {
                        permit;
                    }
                }
            }
        }
    }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying Chassis Cluster Status

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
show chassis cluster status
Cluster ID: 1
Node                      Priority     Status     Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                   1          primary    no       no
    node1                   254        secondary no        no

Redundancy group: 1 , Failover count: 1
    node0                   1          primary    yes      no
    node1                   254        secondary yes       no
```

Verifying Chassis Cluster Interfaces

Purpose Verify the chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link name: fxp1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          1

Interface Monitoring:
    Interface         Weight     Status     Redundancy-group
    xe-5/0/0          255        Up         1
    xe-5/1/0          255        Up         1
    xe-17/0/0         255        Up         1
    xe-17/1/0         255        Up         1
```


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Verifying Chassis Cluster Statistics

Purpose Verify information about chassis cluster services and control link statistics (heartbeats sent and received), fabric link statistics (probes sent and received), and the number of RTOs sent and received for services.

Action From operational mode, enter the **show chassis cluster statistics** command.

```
{primary:node0}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            161          0
    Session close                             148          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Control Plane Statistics

Purpose Verify information about chassis cluster control plane statistics (heartbeats sent and received) and the fabric link statistics (probes sent and received).

Action From operational mode, enter the **show chassis cluster control-panel statistics** command.

```
{primary:node0}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
```

```
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
```

Verifying Chassis Cluster Data Plane Statistics

Purpose Verify information about the number of RTOs sent and received for services.

Action From operational mode, enter the **show chassis cluster data-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster data-plane statistics

Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            161          0
    Session close                             148          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Redundancy Group Status

Purpose Verify the state and priority of both nodes in a cluster and information about whether the primary node has been preempted or whether there has been a manual failover.

Action From operational mode, enter the **chassis cluster status redundancy-group** command.

```
{primary:node0}
user@host> show chassis cluster status redundancy-group 1
Cluster ID: 1
    Node                Priority     Status     Preempt  Manual failover

 Redundancy-Group: 1, Failover count: 1
    node0               0            primary    yes      no
    node1               254          secondary  yes      no
```


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Troubleshooting with Logs

Purpose Use these logs to identify any chassis cluster issues. You should run these logs on both nodes.

Action From operational mode, enter these **show** commands.

user@host> **show log jsrpd**
user@host> **show log chassisd**
user@host> **show log messages**
user@host> **show log dcd**
user@host> **show traceoptions**

Related Documentation

- Understanding Active/Passive Chassis Cluster Deployment on page 193
- Understanding Active/Passive Chassis Cluster Deployment with an IPsec Tunnel on page 207
- Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel (J-Web) on page 223

Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel (J-Web)

Supported Platforms SRX Series, vSRX

1. Enable clusters. See Step 1 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
2. Configure the management interface. See Step 2 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
3. Configure the fabric interface. See Step 3 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
4. Configure the redundancy groups.
   - Select **Configure>System Properties>Chassis Cluster**.
   - Enter the following information, and then click **Apply**:

     Redundant ether-Interfaces Count: **2**

     Heartbeat Interval: **1000**

     Heartbeat Threshold: **3**

     Nodes: **0**

     Group Number: **0**

     Priorities: **254**
   - Enter the following information, and then click **Apply**:

     Nodes: **0**

Group Number: **1**

Priorities: **254**

- Enter the following information, and then click **Apply**:

  Nodes: **1**

  Group Number: **0**

  Priorities: **1**

- Enter the following information, and then click **Apply**:

  Nodes: **1**

  Group Number: **1**

  Priorities: **1**

  Preempt: Select the check box.

  Interface Monitor—Interface: **xe-5/0/0**

  Interface Monitor—Weight: **255**

  Interface Monitor—Interface: **xe-5/1/0**

  Interface Monitor—Weight: **255**

  Interface Monitor—Interface: **xe-17/0/0**

  Interface Monitor—Weight: **255**

  Interface Monitor—Interface: **xe-17/1/0**

  Interface Monitor—Weight: **255**

5. Configure the redundant Ethernet interfaces.

   - Select **Configure>System Properties>Chassis Cluster**.
   - Select **xe-5/1/0**.
   - Enter **reth1** in the Redundant Parent box.
   - Click **Apply**.
   - Select **xe-17/1/0**.
   - Enter **reth1** in the Redundant Parent box.
   - Click **Apply**.
   - Select **xe-5/0/0**.
   - Enter **reth0** in the Redundant Parent box.
   - Click **Apply**.
   - Select **xe-17/0/0**.
   - Enter **reth0** in the Redundant Parent box.

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- Click **Apply**.
- See Step 5 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.

6. Configure the IPsec configuration. See Step 6 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
7. Configure the static routes .
   - Select **Configure>Routing>Static Routing**.
   - Click **Add**.
   - Enter the following information, and then click **Apply**:

     Static Route Address: **0.0.0.0/0**

     Next-Hop Addresses: **10.2.1.1**
   - Enter the following information, and then click **Apply**:

     Static Route Address: **10.3.0.0/16**

     Next-Hop Addresses: **10.10.1.2**
8. Configure the security zones. See Step 8 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
9. Configure the security policies. See Step 9 in "Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel" on page 208.
10. Click **OK** to check your configuration and save it as a candidate configuration, then click **Commit Options**>**Commit**.

Related Documentation

- Understanding Active/Passive Chassis Cluster Deployment with an IPsec Tunnel on page 207
- Example: Configuring an Active/Passive Chassis Cluster Pair with an IPsec Tunnel on page 208

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CHAPTER 19

Enabling Multicast Routing or Asymmetric Routing

Understanding Multicast Routing on a Chassis Cluster

Supported Platforms SRX Series, vSRX

Multicast routing support across nodes in a chassis cluster allows multicast protocols, such as Protocol Independent Multicast (PIM) versions 1 and 2, Internet Group Management Protocol (IGMP), Session Announcement Protocol (SAP), and Distance Vector Multicast Routing Protocol (DVMRP), to send traffic across interfaces in the cluster. Note, however, that the multicast protocols should not be enabled on the chassis management interface (**fxp0**) or on the fabric interfaces (**fab0** and **fab1**). Multicast sessions will be synched across the cluster and will be maintained during redundant group failovers. During failover, as with other types of traffic, there might be some multicast packet loss.

Multicast data forwarding in a chassis cluster uses the incoming interface to determine whether or not the session remains active. Packets will be forwarded to the peer node if a leaf session's outgoing interface is on the peer instead of on the incoming interface's node. Multicast routing on a chassis cluster supports tunnels for both incoming and outgoing interfaces.

Multicast traffic has an upstream (toward source) and downstream (toward subscribers) direction in traffic flows. The devices replicate (fanout) a single multicast packet to multiple networks that contain subscribers. In the chassis cluster environment, multicast packet fanouts can be active on either nodes.

If the incoming interface is active on the current node and backup on the peer node, then the session is active on the current node and backup on the peer node.

Multicast configuration on a chassis cluster is the same as multicast configuration on a standalone device. See the *Junos OS Routing Protocols Library for Security Devices* for more information.

Understanding PIM Data Forwarding

Protocol Independent Multicast (PIM) is used between devices to track the multicast packets to be forwarded to each other.

A PIM session encapsulates multicast data into a PIM unicast packet. A PIM session creates the following sessions:

- Control session
- Data session

The data session saves the control session ID. The control session and the data session are closed independently. The incoming interface is used to determine whether the PIM session is active or not. If the outgoing interface is active on the peer node, packets are transferred to the peer node for transmission.

Understanding Multicast and PIM Session Synchronization

Synchronizing multicast and PIM sessions helps to prevent packet loss due to failover because the sessions do not need to be set up again when there is a failover.

In PIM sessions, the control session is synchronized to the backup node, and then the data session is synchronized.

In multicast sessions, the template session is synchronized to the peer node, then all the leaf sessions are synchronized, and finally the template session is synchronized again.

Related Documentation

- Understanding Asymmetric Routing Chassis Cluster Deployment on page 228
- Example: Configuring an Asymmetric Chassis Cluster Pair on page 230

Understanding Asymmetric Routing Chassis Cluster Deployment

Supported Platforms SRX Series, vSRX

In this case, chassis cluster makes use of its asymmetric routing capability (see Figure 24 on page 229). Traffic received by a node is matched against that node's session table. The result of this lookup determines whether or not that node should process the packet or forward it to the other node over the fabric link. Sessions are anchored on the egress node for the first packet that created the session. If traffic is received on the node in which the session is not anchored, those packets are forwarded over the fabric link to the node where the session is anchored.

NOTE: The anchor node for the session can change if there are changes in routing during the session.

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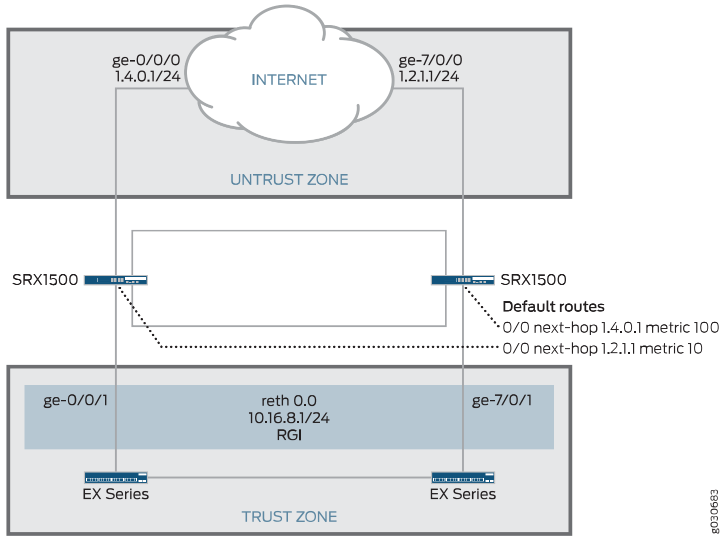
Figure 24: Asymmetric Routing Chassis Cluster Scenario



In this scenario, two Internet connections are used, with one being preferred. The connection to the trust zone is done by using a redundant Ethernet interface to provide LAN redundancy for the devices in the trust zone. This scenario describes two failover cases in which sessions originate in the trust zone with a destination of the Internet (untrust zone).

- Understanding Failures in the Trust Zone Redundant Ethernet Interface on page 229
- Understanding Failures in the Untrust Zone Interfaces on page 229

Understanding Failures in the Trust Zone Redundant Ethernet Interface

Under normal operating conditions, traffic flows from the trust zone interface **ge-0/0/1**, belonging to **reth0.0**, to the Internet. Because the primary Internet connection is on node 0, sessions are both created in node 0 and synced to node 1. However, session are only active on node 0.

A failure in interface **ge-0/0/1** triggers a failover of the redundancy group, causing interface **ge-7/0/1** in node 1 to become active. After the failover, traffic arrives at node 1. After session lookup, the traffic is sent to node 0 because the session is active on this node. Node 0 then processes the traffic and forwards it to the Internet. The return traffic follows a similar process. The traffic arrives at node 0 and gets processed for security purposes—for example, antispam scanning, antivirus scanning, and application of security policies—on node 0 because the session is anchored to node 0. The packet is then sent to node 1 through the fabric interface for egress processing and eventual transmission out of node 1 through interface **ge-7/0/1**.

Understanding Failures in the Untrust Zone Interfaces

In this case, sessions are migrated from node to node. Under normal operating conditions, traffic is processed by only node 0. A failure of interface **ge-0/0/0** on node 0 causes a change in the routing table, so that it now points to interface **ge-7/0/0** in node 1. After the failure, sessions in node 0 become inactive, and the passive sessions in node 1 become active. Traffic arriving from the trust zone is still received on interface **ge-0/0/1**, but is forwarded to node 1 for processing. After traffic is processed in node 1, it is forwarded to the Internet through interface **ge-7/0/0**.

In this chassis cluster configuration, redundancy group 1 is used to control the redundant Ethernet interface connected to the trust zone. As configured in this scenario, redundancy group 1 fails over only if interface **ge-0/0/1** or **ge-7/0/1** fails, but not if the interfaces connected to the Internet fail. Optionally, the configuration could be modified to permit redundancy group 1 to monitor all interfaces connected to the Internet and fail over if an Internet link were to fail. So, for example, the configuration can allow redundancy group 1 to monitor **ge-0/0/0** and make **ge-7/0/1** active for **reth0** if the **ge-0/0/0** Internet link fails. (This option is not described in the following configuration examples.)

Related Documentation

- Understanding Multicast Routing on a Chassis Cluster on page 227
- Example: Configuring an Asymmetric Chassis Cluster Pair on page 230

Example: Configuring an Asymmetric Chassis Cluster Pair

Supported Platforms SRX Series, vSRX

This example shows how to configure a chassis cluster pair of devices to allow asymmetric routing. Configuring asymmetric routing for a chassis cluster allows traffic received on either device to be processed seamlessly.

Requirements

Before you begin:

1. Physically connect a pair of devices together, ensuring that they are the same models.
   a. To create the fabric link, connect a Gigabit Ethernet interface on one device to another Gigabit Ethernet interface on the other device.
   b. To create the control link, connect the control port of the two SRX1500 devices.
2. Connect to one of the devices using the console port. (This is the node that forms the cluster.)
   a. Set the cluster ID and node number.

      user@host> **set chassis cluster cluster-id 1 node 0 reboot**
3. Connect to the other device using the console port.
   a. Set the cluster ID and node number.

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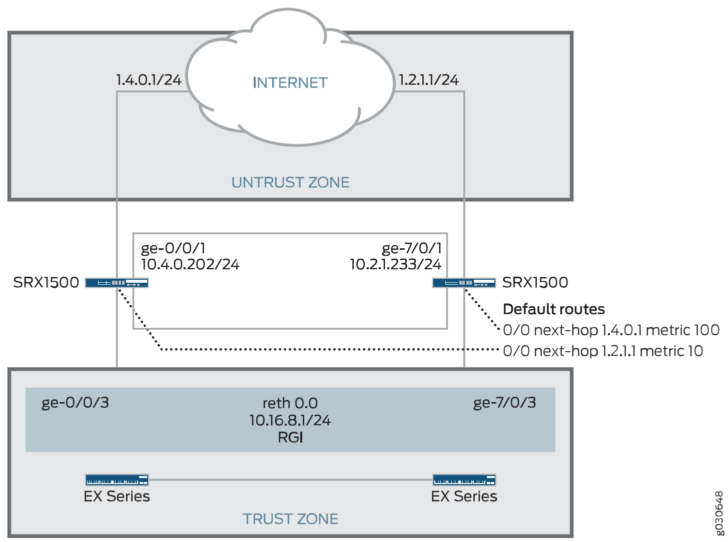
user@host> **set chassis cluster cluster-id 1 node 1 reboot**

Overview

In this example, a chassis cluster provides asymmetric routing. As illustrated in Figure 25 on page 231, two Internet connections are used, with one being preferred. The connection to the trust zone is provided by a redundant Ethernet interface to provide LAN redundancy for the devices in the trust zone.

Figure 25: Asymmetric Routing Chassis Cluster Topology



In this example, you configure group (applying the configuration with the **apply-groups** command) and chassis cluster information. Then you configure security zones and security policies. See Table 22 on page 231 through Table 25 on page 233.

Table 22: Group and Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters

Groups	node0	• Hostname: srxseries-1
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 192.168.100.50/24

	node1	• Hostname: srxseries-2
		• Interface: fxp0
		  ◦ Unit 0
		  ◦ 192.168.100.51/24

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Table 23: Chassis Cluster Configuration Parameters

Feature	Name	Configuration Parameters
Fabric links	fab0	Interface: ge-0/0/7
	fab1	Interface: ge-7/0/7
Heartbeat interval	–	1000
Heartbeat threshold	–	3

Redundancy group	1	• Priority:
		  ◦ Node 0: 100
		  ◦ Node 1: 1

		Interface monitoring • ge-0/0/3 • ge-7/0/3
Number of redundant Ethernet interfaces	–	1
Interfaces	ge-0/0/1	• Unit 0 • 1.4.0.202/24
	ge-7/0/1	• Unit 0 • 1.2.1.233/24
	ge-0/0/3	• Redundant parent: reth0
	ge-7/0/3	• Redundant parent: reth0
	reth0	• Unit 0 • 10.16.8.1/24

Table 24: Security Zone Configuration Parameters

Name	Configuration Parameters
trust	The reth0.0 interface is bound to this zone.
untrust	The ge-0/0/1 and ge-7/0/1 interfaces are bound to this zone.

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Table 25: Security Policy Configuration Parameters

Purpose	Name	Configuration Parameters

This security policy permits traffic from the trust zone to the untrust zone.	ANY	• Match criteria:
		  ◦ source-address any
		  ◦ destination-address any
		  ◦ application any
		• Action: permit

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
{primary:node0}[edit]
set groups node0 system host-name srxseries-1
set groups node0 interfaces fxp0 unit 0 family inet address 192.168.100.50/24
set groups node1 system host-name srxseries-2
set groups node1 interfaces fxp0 unit 0 family inet address 192.168.100.51/24
set apply-groups "${node}"
set interfaces fab0 fabric-options member-interfaces ge-0/0/7
set interfaces fab1 fabric-options member-interfaces ge-7/0/7
set chassis cluster reth-count 1
set chassis cluster heartbeat-interval 1000
set chassis cluster heartbeat-threshold 3
set chassis cluster redundancy-group 1 node 0 priority 100
set chassis cluster redundancy-group 1 node 1 priority 1
set chassis cluster redundancy-group 1 interface-monitor ge-0/0/3 weight 255
set chassis cluster redundancy-group 1 interface-monitor ge-7/0/3 weight 255
set interfaces ge-0/0/1 unit 0 family inet address 1.4.0.202/24
set interfaces ge-0/0/3 gigether-options redundant-parent reth0
set interfaces ge-7/0/1 unit 0 family inet address 1.2.1.233/24
set interfaces ge-7/0/3 gigether-options redundant-parent reth0
set interfaces reth0 unit 0 family inet address 10.16.8.1/24
set routing-options static route 0.0.0.0/0 qualified-next-hop 1.4.0.1 metric 10
set routing-options static route 0.0.0.0/0 qualified-next-hop 1.2.1.1 metric 100
set security zones security-zone untrust interfaces ge-0/0/1.0
set security zones security-zone untrust interfaces ge-7/0/1.0
set security zones security-zone trust interfaces reth0.0
set security policies from-zone trust to-zone untrust policy ANY match source-address
  any
set security policies from-zone trust to-zone untrust policy ANY match destination-address
  any
set security policies from-zone trust to-zone untrust policy ANY match application any
set security policies from-zone trust to-zone untrust policy ANY then permit
```

Step-by-Step Procedure

To configure an asymmetric chassis cluster pair:

1. Configure the management interface.

```
{primary:node0}[edit]
```

```
user@host# set groups node0 system host-name srxseries-1
user@host# set groups node0 interfaces fxp0 unit 0 family inet address
  192.168.100.50/24
user@host# set groups node1 system host-name srxseries-2
user@host#set groups node1 interfaces fxp0 unit 0 family inet address
  192.168.100.51/24
user@host# set apply-groups "${node}"
```

2. Configure the fabric interface.

```
{primary:node0}[edit]
user@host# set interfaces fab0 fabric-options member-interfaces ge-0/0/7
user@host# set interfaces fab1 fabric-options member-interfaces ge-7/0/7
```

3. Configure the number of redundant Ethernet interfaces.

```
{primary:node0}[edit]
user@host# set chassis cluster reth-count 1
```

4. Configure the redundancy groups.

```
{primary:node0}[edit]
user@host# set chassis cluster heartbeat-interval 1000
user@host# set chassis cluster heartbeat-threshold 3
user@host# set chassis cluster node 0
user@host# set chassis cluster node 1
user@host# set chassis cluster redundancy-group 1 node 0 priority 100
user@host# set chassis cluster redundancy-group 1 node 1 priority 1
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-0/0/3
  weight 255
user@host# set chassis cluster redundancy-group 1 interface-monitor ge-7/0/3
  weight 255
```

5. Configure the redundant Ethernet interfaces.

```
{primary:node0}[edit]
user@host# set interfaces ge-0/0/1 unit 0 family inet address 1.4.0.202/24
user@host# set interfaces ge-0/0/3 gigether-options redundant-parent reth0
user@host# set interfaces ge-7/0/1 unit 0 family inet address 1.2.1.233/24
user@host# set interfaces ge-7/0/3 gigether-options redundant-parent reth0
user@host# set interfaces reth0 unit 0 family inet address 10.16.8.1/24
```

6. Configure the static routes (one to each ISP, with preferred route through ge-0/0/1).

```
{primary:node0}[edit]
user@host# set routing-options static route 0.0.0.0/0 qualified-next-hop 1.4.0.1
  metric 10
user@host# set routing-options static route 0.0.0.0/0 qualified-next-hop 1.2.1.1
  metric 100
```

7. Configure the security zones.

```
{primary:node0}[edit]
user@host# set security zones security-zone untrust interfaces ge-0/0/1.0
user@host# set security zones security-zone untrust interfaces ge-7/0/1.0
user@host# set security zones security-zone trust interfaces reth0.0
```

8. Configure the security policies.

```
{primary:node0}[edit]
```

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user@host# **set security policies from-zone trust to-zone untrust policy ANY match source-address any**
user@host# **set security policies from-zone trust to-zone untrust policy ANY match destination-address any**
user@host# **set security policies from-zone trust to-zone untrust policy ANY match application any**
user@host# **set security policies from-zone trust to-zone untrust policy ANY then permit**

Results From operational mode, confirm your configuration by entering the **show configuration** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

For brevity, this **show** command output includes only the configuration that is relevant to this example. Any other configuration on the system has been replaced with ellipses (...).

```
user@host> show configuration
version x.xx.x;
groups {
  node0 {
    system {
      host-name srxseries-1;
    }
    interfaces {
      fxp0 {
        unit 0 {
          family inet {
            address 192.168.100.50/24;
          }
        }
      }
    }
  }
  node1 {
    system {
      host-name srxseries-2;
      interfaces {
        fxp0 {
          unit 0 {
            family inet {
              address 192.168.100.51/24;
            }
          }
        }
      }
    }
  }
  apply-groups "${node}";
  chassis {
    cluster {
      reth-count 1;
      heartbeat-interval 1000;
      heartbeat-threshold 3;
      redundancy-group 1 {
```

```
            node 0 priority 100;
            node 1 priority 1;
            interface-monitor {
                ge-0/0/3 weight 255;
                ge-7/0/3 weight 255;
            }
        }
    }
}
interfaces {
    ge-0/0/3 {
        gigether–options {
            redundant–parent reth0;
        }
    }
    ge-7/0/3 {
        gigether–options {
            redundant–parent reth0;
        }
    }
    ge–0/0/1 {
        unit 0 {
            family inet {
            address 1.4.0.202/24;
            }
        }
    }
    ge–7/0/1 {
        unit 0 {
            family inet {
            address 1.2.1.233/24;
            }
        }
    }
    fab0 {
        fabric–options {
            member–interfaces {
                ge–0/0/7;
            }
        }
    }
    fab1 {
        fabric–options {
            member–interfaces {
                ge–7/0/7;
            }
        }
    }
    reth0 {
        gigether–options {
            redundancy–group 1;
        }
        unit 0 {
            family inet {
                address 10.16.8.1/24;
            }
```

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```
        }
      }
    }
  ...
  routing-options {
    static {
      route 0.0.0.0/0 {
        next-hop 1.4.0.1;
        metric 10;
      }
    }
  }
  routing-options {
    static {
      route 0.0.0.0/0 {
        next-hop 1.2.1.1;
        metric 100;
      }
    }
  }
  security {
    zones {
      security–zone untrust {
        interfaces {
          ge-0/0/1.0;
          ge-7/0/1.0;
        }
      }
      security–zone trust {
        interfaces {
          reth0.0;
        }
      }
    }
    policies {
      from-zone trust to-zone untrust {
        policy ANY {
          match {
            source-address any;
            destination-address any;
            application any;
          }
          then {
            permit;
          }
        }
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying Chassis Cluster Status

Purpose Verify the chassis cluster status, failover status, and redundancy group information.

Action From operational mode, enter the **show chassis cluster status** command.

```
{primary:node0}
user@host> show chassis cluster status
Cluster ID: 1
Node                       Priority     Status    Preempt  Manual failover

Redundancy group: 1 , Failover count: 1
    node0                   100         primary   no       no
    node1                   1           secondary no       no
```

Verifying Chassis Cluster Interfaces

Purpose Verify information about chassis cluster interfaces.

Action From operational mode, enter the **show chassis cluster interfaces** command.

```
{primary:node0}
user@host> show chassis cluster interfaces
Control link name: fxp1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1

Interface Monitoring:
    Interface          Weight    Status    Redundancy-group
    ge-0/0/3           255       Up        1
    ge-7/0/3           255       Up        1
```

Verifying Chassis Cluster Statistics

Purpose Verify information about the statistics of the different objects being synchronized, the fabric and control interface hellos, and the status of the monitored interfaces in the cluster.

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Action From operational mode, enter the **show chassis cluster statistics** command.

```
{primary:node0}
user@host> show chassis cluster statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 228
        Heartbeat packets received: 2370
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 2272
        Probes received: 597
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            160          0
    Session close                             147          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Control Plane Statistics

Purpose Verify information about chassis cluster control plane statistics (heartbeats sent and received) and the fabric link statistics (probes sent and received).

Action From operational mode, enter the **show chassis cluster control-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster control-plane statistics

Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
```

Verifying Chassis Cluster Data Plane Statistics

Purpose Verify information about the number of RTOs sent and received for services.

Action From operational mode, enter the **show chassis cluster data-plane statistics** command.

```
{primary:node0}
user@host> show chassis cluster data-plane statistics

Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          6            0
    Session create                            160          0
    Session close                             147          0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

Verifying Chassis Cluster Redundancy Group Status

Purpose Verify the state and priority of both nodes in a cluster and information about whether the primary node has been preempted or whether there has been a manual failover.

Action From operational mode, enter the **chassis cluster status redundancy-group** command.

```
{primary:node0}
user@host> show chassis cluster status redundancy-group 1
Cluster ID: 1
    Node                   Priority     Status     Preempt  Manual failover

 Redundancy-Group: 1, Failover count: 1
    node0                  100           primary    no       no
    node1                  1             secondary no        no
```

Troubleshooting with Logs

Purpose Use these logs to identify any chassis cluster issues. You should run these logs on both nodes.

Action From operational mode, enter these **show** commands.

user@host> **show log jsrpd**

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user@host> **show log chassisd**
user@host> **show log messages**
user@host> **show log dcd**
user@host> **show traceoptions**

Related Documentation

- Understanding Multicast Routing on a Chassis Cluster on page 227
- Understanding Asymmetric Routing Chassis Cluster Deployment on page 228

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CHAPTER 20

Configuring Chassis Cluster Layer 2 Ethernet Switching

Layer 2 Ethernet Switching Capability in Chassis Cluster Mode

Supported Platforms SRX550, vSRX

Understanding Layer 2 Ethernet Switching Capability in Chassis Cluster on SRX Series Devices

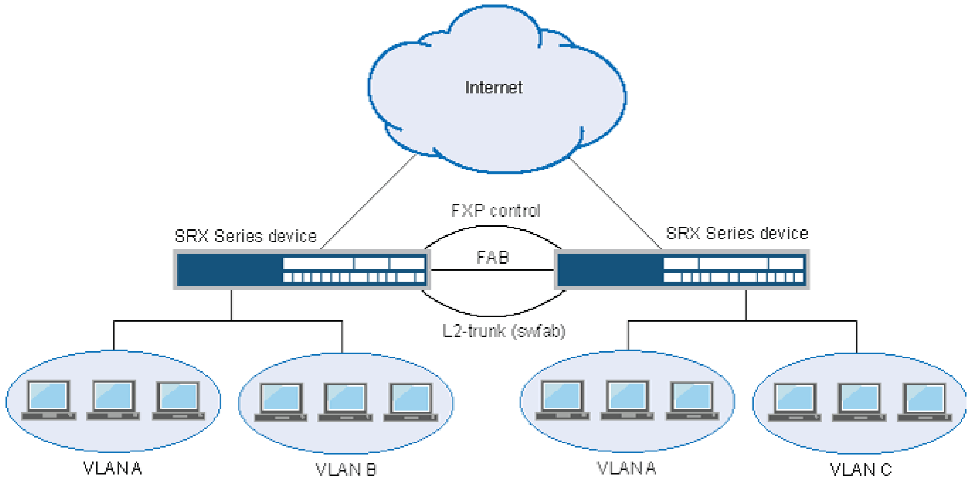
Ethernet ports support various Layer 2 features such as Spanning Tree Protocols (xSTP), DOT1X, Link Aggregation (LAG), Internet Group Membership Protocol (IGMP), GARP VLAN Registration Protocol (GVRP), Link Layer Discovery Protocol (LLDP), and snooping. The enhanced feature extends Layer 2 switching capability to devices in a chassis cluster. This feature allows users to use Ethernet switching features on both nodes of a chassis cluster. The Ethernet ports on either of the nodes can be configured for family Ethernet switching. Users can configure a Layer 2 VLAN domain with member ports from both the nodes and the Layer 2 switching protocols on both the devices.

NOTE: On SRX550 devices, Layer 2 Ethernet switching is supported in chassis cluster mode.

NOTE: On SRX300, SRX320, SRX340, SRX345, and SRX1500 devices, Layer 2 Ethernet switching is not supported in chassis cluster mode.

Figure 26 on page 244 shows the Layer 2 switching across chassis cluster nodes:

Figure 26: Layer 2 Ethernet Switching Across Chassis Cluster Nodes



To ensure that Layer 2 switching works seamlessly across chassis cluster nodes, a dedicated physical link connecting the nodes is required. This type of link is called a *switching fabric interface (swfab)*. Its purpose is to carry Layer 2 traffic between the nodes.

NOTE: Configuring a LAG with members across nodes is not supported.

WARNING: If a swfab interface is not configured on both the nodes and if you try to configure Ethernet switching-related features on the nodes, behavior of the nodes might be unpredictable.

Understanding Chassis Cluster Failover and New Primary Election

When chassis cluster failover occurs, a new primary node is elected and the Ethernet Switching Daemon (ESWD) runs in a different node. During failover, the chassis control subsystem is restarted. Also during failover, the traffic outage occurs until the PICs are up and the VLAN entries are reprogrammed. After failover, all Layer 2 protocols reconverge because Layer 2 protocols states are not maintained in the secondary node.

NOTE: The Q-in-Q feature in chassis cluster mode is not supported because of chip limitation for swfab interface configuration in Broadcom chipsets.

Related Documentation

- Example: Configuring Switch Fabric Interfaces to Enable Switching in Chassis Cluster Mode (CLI) on page 245
- Example: Configuring IRB and VLAN with Members Across Two Nodes (CLI) on page 246
- Example: Configuring Aggregated Ethernet Device with LAG and LACP (CLI) on page 248

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Example: Configuring Switch Fabric Interfaces to Enable Switching in Chassis Cluster Mode (CLI)

Supported Platforms SRX1500, SRX550, vSRX

This example shows how to configure swfab to enable switching in chassis cluster mode.

Requirements

The physical link used as the switch fabric members must be directly connected. Switching supported ports must be used for swfab interfaces.

Before you begin, read through the following example to understand the configuration of chassis cluster fabric:

- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61

Overview

New pseudointerfaces swfab0 and swfab1 will be created for Layer 2 fabric functionality. Users need to configure dedicated Ethernet ports on each side of the node to be associated with the swfab interface.

Configuration

Step-by-Step Procedure

To configure swfab interfaces:

1. Configure swfab0 and swfab1 to associate switch fabric interfaces to enable switching across the nodes. Note that swfab0 corresponds to node 0 and swfab1corresponds to node 1.

```
{primary:node0} [edit]
user@host# set interfaces swfab0 fabric-options member-interfaces ge-0/0/6
user@host# set interfaces swfab0 fabric-options member-interfaces ge-0/0/7
user@host# set interfaces swfab1 fabric-options member-interfaces ge-5/0/6
user@host# set interfaces swfab1 fabric-options member-interfaces ge-5/0/7
```

2. If you are done configuring the device, commit the configuration.

```
{primary:node0} [edit]
user@host# commit
```

Verification

Purpose Verify that the user will be allowed to configure multiple ports as members of swfab ports.

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Action From configuration mode, enter the **show interfaces swfab0** command to view the configured interfaces for each port.

```
user@host# show interfaces swfab0
fabric-options{
 member-interfaces {
   ge-0/0/6;
   ge-0/0/7;
}
}
```

From the configuration mode, enter the **show chassis cluster ethernet-switching interfaces** command to view the appropriate member interfaces.

```
user@host# show chassis cluster ethernet-switching interfaces
swfab0:
    Name               Status
    ge-0/0/6             up
    ge-0/0/7      up
  swfab1:
    Name               Status
    ge-5/0/6             up
  ge-5/0/7      up
```

Related Documentation

- SRX Series Chassis Cluster Configuration Overview on page 36

Example: Configuring IRB and VLAN with Members Across Two Nodes (CLI)

Supported Platforms SRX1500, SRX550, vSRX

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example shows configuration of IRB and configuration of VLAN with members across node 0 and node 1.

Configuration

Step-by-Step Procedure To configure VLAN, follow the steps from 1 to 4 and then commit the configuration. To configure IRB, follow the steps from 1 to 8.

1. Configure Ethernet switching on the node0 interface.

   {primary:node0} [edit]
   user@host# **set interfaces ge-2/0/0 unit 0 family ethernet-switching**

2. Configure Ethernet switching on the node1 interface.

   {primary:node0} [edit]
   user@host# **set interfaces ge-11/0/0 unit 0 family ethernet-switching**

3. Create VLAN vlan10 with vlan-id 10.

   {primary:node0} [edit]
   user@host# **set vlans vlan10 vlan-id 10**

4. Add ports from both nodes to the VLAN.

   {primary:node0} [edit]
   user@host# **set vlans vlan10 interface ge-2/0/0**
   user@host# **set vlans vlan10 interface ge-11/0/0**

5. Assign an IP address to the VLAN.

   {primary:node0} [edit]
   user@host# **set interfaces vlan unit 10 family inet address 45.45.45.1/24**

6. Associate Layer 3 VLAN interface to vlan10.

   {primary:node0} [edit]
   user@host# **set vlans vlan10 l3-interface vlan.10**

7. Check the configuration by entering the **show vlans** and **show interfaces** commands.

```
user@host# show vlans
vlan10 {
    vlan-id 10;
    interface {
        ge-2/0/0.0;
        ge-11/0/0.0;
    }
    l3-interface vlan.10;
}
```

```
user@host# show interfaces
ge-2/0/0 {
    unit 0 {
        family ethernet-switching;
    }
}
ge-11/0/0 {
    unit 0 {
        family ethernet-switching;
    }
}
vlan {
    unit 10 {
        family inet {
            address 45.45.45.1/24;
        }
    }
}
```

8. If you are done configuring the device, commit the configuration.

   [edit]
   user@host# **commit**

Verification

Verifying VLAN and IRB

Purpose To verify that the configurations of VLAN and IRB are working properly.

Action From configuration mode, enter the **show interfaces terse ge-2/0/0** command to view the node 0 interface.

```
user@host# run show interfaces terse ge-2/0/0
Interface               Admin Link Proto    Local                 Remote
ge-2/0/0                up    up
ge-2/0/0.0              up    up   eth-switch
```

From configuration mode, enter the **show interfaces terse ge-11/0/0** command to view the node 1 interface.

```
user@host# run show interfaces terse ge-11/0/0
Interface               Admin Link Proto    Local                 Remote
ge-11/0/0               up    up
ge-11/0/0.0             up    up   eth-switch
```

From configuration mode, enter the **show vlans** command to view the VLAN interface.

```
user@host# run show vlans
Name           Tag     Interfaces
default         1      None
vlan10          10     ge-2/0/0.0*, ge-11/0/0.0*
```

Related Documentation

- SRX Series Chassis Cluster Configuration Overview on page 36

Example: Configuring Aggregated Ethernet Device with LAG and LACP (CLI)

Supported Platforms SRX1500, SRX550, vSRX

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example shows the configuration of aggregated Ethernet (ae) devices with LAG and LACP.

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Configuration

Step-by-Step Procedure

To configure LAG:

1. Configure the number of ae devices with LAG interface that you need to create.

   [edit]
   user@host# **set chassis aggregated-devices ethernet device-count 5**

2. Add a port to the ae device with LAG.

   [edit]
   user@host# **set interfaces ge-2/0/1 gigether-options 802.3ad ae0**
   user@host# **set interfaces ge-2/0/2 gigether-options 802.3ad ae0**

3. Configure LACP for the ae device with LAG.

   [edit]
   user@host# **set interfaces ae0 aggregated-ether-options lacp active**

4. Configure family Ethernet switching for the ae device with LAG.

   [edit]
   user@host# **set interfaces ae0 unit 0 family ethernet-switching**

5. Configure VLAN.

   [edit]
   user@host# **set vlans vlan20 vlan-id 20**

6. Add the ae interface to the VLAN.

   [edit]
   user@host# **set vlans vlan20 interface ae0**

7. Check the configuration by entering the **show vlans** and **show interfaces** commands

```
user@host# show vlans
vlan20 {
    vlan-id 20;
    interface {
        ae0.0;
    }
}

user@host# show interfaces
ge-2/0/1 {
    gigether-options {
        802.3ad ae0;
    }
}
ge-2/0/2 {
    gigether-options {
        802.3ad ae0;
    }
}
ae0 {
    aggregated-ether-options {
        lacp {
            active;
        }
    }
    unit 0 {
```

```
            family ethernet-switching;
        }
    }
```

8. If you are done configuring the device, commit the configuration.

   [edit]
   user@host# **commit**

> NOTE: Likewise, you can configure other devices with LAG and LACP.

Verification

Verifying Aggregated Ethernet Device with LAG and LACP

Purpose Verify that you can configure ae devices with LAG and LACP.

Action From configuration mode, enter the **show lacp interfaces** to view the LACP interfaces.

```
user@host# run show lacp interfaces
Aggregated interface: ae0
    LACP state:       Role   Exp   Def  Dist  Col  Syn  Aggr  Timeout  Activity
      ge-2/0/1      Actor    No     No   Yes  Yes  Yes   Yes     Fast    Active
      ge-2/0/1    Partner    No     No   Yes  Yes  Yes   Yes     Fast    Active
      ge-2/0/2      Actor    No     No   Yes  Yes  Yes   Yes     Fast    Active
      ge-2/0/2    Partner    No     No   Yes  Yes  Yes   Yes     Fast    Active
    LACP protocol:        Receive State  Transmit State          Mux State
      ge-2/0/1                Current   Fast periodic Collecting distributing
      ge-2/0/2                Current   Fast periodic Collecting distributing
```

From configuration mode, enter the **show vlans** command to view the VLAN interfaces.

```
user@host# run show vlans
Name           Tag     Interfaces
default         1      None
vlan20          20     ae0.0
```

From configuration mode, enter the **show interfaces (interface name)** command to view the status of the ge-2/0/1 and ge-2/0/2 interfaces.

```
user@host# run show interfaces ge-2/0/1 terse
Interface               Admin Link Proto    Local                 Remote
ge-2/0/1                up    up
ge-2/0/1.0              up    up   aenet    --> ae0.0
```

```
user@host# run show interfaces ge-2/0/2 terse
Interface               Admin Link Proto    Local                 Remote
ge-2/0/2                up    up
ge-2/0/2.0              up    up   aenet    --> ae0.0
```

Related Documentation
- SRX Series Chassis Cluster Configuration Overview on page 36

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PART 5

Upgrading or Disabling Chassis Cluster

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CHAPTER 21

Upgrading Both Devices Separately

Upgrading Individual Devices in a Chassis Cluster Separately

Supported Platforms SRX Series, vSRX

Devices in a chassis cluster can be upgraded separately one at a time; some models allow one device after the other to be upgraded using failover and an in-service software upgrade (ISSU) to reduce the operational impact of the upgrade.

To upgrade each device in a chassis cluster separately:

NOTE: **During this type of chassis cluster upgrade, a service disruption of about 3 to 5 minutes occurs.**

1. Load the new image file on node 0.
2. Perform the image upgrade without rebooting the node by entering:

   user@host> **request system software add *image_name***
3. Load the new image file on node 1.
4. Repeat Step 2.
5. Reboot both nodes simultaneously.

Related Documentation

- *Upgrading Both Devices in a Chassis Cluster Using an ISSU for High-End SRX Series Devices*
- Upgrading Devices in a Chassis Cluster Using ICU for Branch SRX Series Devices on page 255

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CHAPTER 22

Upgrading Both Devices Using ICU

Upgrading Devices in a Chassis Cluster Using ICU

Supported Platforms SRX1500, SRX1500, SRX300, SRX300, SRX300, SRX300, SRX300, SRX320, SRX320, SRX320, SRX320, SRX320, SRX340, SRX340, SRX340, SRX340, SRX340, SRX345, SRX345, SRX345, SRX345, SRX345, SRX550, SRX550, SRX550, SRX550, SRX550, vSRX

Upgrading Both Devices in a Chassis Cluster Using ICU

Supported Platforms

Starting from Junos OS 15.1X49-D50 onwards, in-band cluster upgrade (ICU) is supported in SRX1500 devices.

For SRX300, SRX320, SRX340, SRX345, and SRX550 devices, the devices in a chassis cluster can be upgraded with a minimal service disruption of approximately 30 seconds using in-band cluster upgrade (ICU) with the no-sync option. The chassis cluster ICU feature allows both devices in a cluster to be upgraded from supported Junos OS versions.

The impact on traffic is as follows:

- Drop in traffic (30 seconds approximately)
- Loss of security flow sessions

NOTE: **ICU is not supported on SRX1500 devices.**

Before you begin, note the following:

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- ICU is available with the no-sync option only.
- This feature is available only on Junos OS Releases 11.2 R2 and later.
- Before starting ICU, you should ensure that sufficient disk space is available. See *Upgrading ICU Using a Build Available Locally on a Primary Node in a Chassis Cluster* and *Upgrading ICU Using a Build Available on an FTP Server*.
- This feature cannot be used to downgrade to a build earlier than Junos OS 11.2 R2.

The upgrade is initiated with the Junos OS build locally available on the primary node of the device or on an FTP server.

NOTE:

- The primary node, RG0, changes to the secondary node after an ICU upgrade.
- During ICU, the chassis cluster redundancy groups are failed over to the primary node to change the cluster to active/passive mode.
- ICU states can be checked from the syslog or with the console/terminal logs.
- ICU requires that both nodes be running a dual-root partitioning scheme. ICU will not continue if it fails to detect dual-root partitioning on either of the nodes.

Upgrading ICU Using a Build Available Locally on a Primary Node in a Chassis Cluster

Supported Platforms

NOTE: Ensure that sufficient disk space is available for the Junos OS package in the /var/tmp location in the secondary node of the cluster.

To upgrade ICU using a build locally available on the primary node of a cluster:

1. Copy the Junos OS package build to the primary node at any location, or mount a network file server folder containing the Junos OS build.
2. Start ICU by entering the following command:

   user@host> request system software in-service-upgrade image_name no-sync

Upgrading ICU Using a Build Available on an FTP Server

Supported Platforms

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NOTE: Ensure that sufficient disk space is available for the Junos OS package in the **/var/tmp** location in both the primary and the secondary nodes of the cluster.

To upgrade ICU using a build available on an FTP server:

1. Place the Junos OS build on an FTP server.
2. Start ICU by entering the following command:

   user@root> request system software in-service-upgrade <ftp url for junos image> no-sync

   ```
   user@root> request system software in-service-upgrade
   ftp://<user>:<password>@<server>:/<path> no-sync
   ```

   This command upgrades the Junos OS and reboots both nodes in turn.

NOTE: The upgrade process displays the following warning message to reboot the system:

WARNING: A reboot is required to load this software correctly. Use the **request system reboot** command when software installation is complete.

This warning message can be ignored because the ICU process automatically reboots both the nodes.

Aborting an Upgrade in a Chassis Cluster During an ICU

Supported Platforms

You can abort an ICU at any time by issuing the following command on the primary node:

request system software abort in-service-upgrade

NOTE: Issuing an **abort** command during or after the secondary node reboots puts the cluster in an inconsistent state. The secondary node boots up running the new Junos OS build, while the primary continues to run the older Junos OS build.

NOTE: This command is not supported on SRX1500 devices.

To recover from the chassis cluster inconsistent state, perform the following actions sequentially on the secondary node:

1. Issue an **abort** command:

   request system software abort in-service-upgrade

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2. Roll back the Junos OS build by entering the following command:

   request system software rollback node < node-id >

3. Reboot the secondary node immediately by using the following command:

   request system reboot

NOTE: You must execute the above steps sequentially to complete the recovery process and avoid cluster instability.

Table 26 on page 258 lists the options and their descriptions for the **request system software in-service-upgrade** command.

Table 26: request system software in-service-upgrade Output Fields

Options	Description
no-sync	Disables the flow state from syncing up when the old secondary node has booted with a new Junos OS image.
no-tcp-syn-check	Creates a window wherein the TCP SYN check for the incoming packets will be disabled. The default value for the window is 7200 seconds (2 hours).
no-validate	Disables the validation of the configuration at the time of the installation. The system behavior is similar to **software add**.
unlink	Removes the package from the local media after installation.

NOTE:

- During ICU, if an abort command is executed, ICU will abort only after the current operation finishes. This is required to avoid any inconsistency with the devices.

  For example, if formatting and upgrade of a node is in progress, ICU aborts after this operation finishes.

- After an abort, ICU will try to roll back the build on the nodes if the upgrading nodes step was completed.

Related Documentation

- Verifying a Chassis Cluster Configuration on page 99

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CHAPTER 23

Disabling Chassis Cluster

Disabling Chassis Cluster

Supported Platforms SRX Series, vSRX

To disable chassis cluster, enter the following command:

```
{primary:node1}
user@host# set chassis cluster disable reboot
Successfully disabled chassis cluster. Going to reboot now.
```

After the system reboots, the chassis cluster is disabled.

NOTE: After the chassis cluster is disabled using this CLI command, you do not have a similar CLI option to enable it back.

You can also use the below CLI commands to disable chassis cluster:

- To disable cluster on node0:

  ```
  user@host# set chassis cluster cluster-id 0 node 0 reboot
  ```

- To disable cluster on node1:

  ```
  user@host# set chassis cluster cluster-id 0 node 1 reboot
  ```

NOTE: Setting cluster-id to zero disables clustering on a device.

Related Documentation

- Upgrading Individual Devices in a Chassis Cluster Separately on page 253
- *Upgrading Both Devices in a Chassis Cluster Using an ISSU for High-End SRX Series Devices*
- Upgrading Devices in a Chassis Cluster Using ICU for Branch SRX Series Devices on page 255

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PART 6

Configuration Statements and Operational Commands

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CHAPTER 24

Configuration Statements

Chassis Configuration Statement Hierarchy

Supported Platforms SRX Series, vSRX

Use the statements in the **chassis** configuration hierarchy to configure alarms, aggregated devices, clusters, the Routing Engine, and other chassis properties.

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        link-protection {
          non-revertive;
        }
        system-priority number;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    ds1 {
      ais (ignore | red | yellow);
      ylw (ignore | red | yellow);
    }
    ethernet {
      link-down (ignore | red | yellow);
    }
    integrated-services {
      failure (ignore | red | yellow);
    }
    management-ethernet {
      link-down (ignore | red | yellow);
    }
    serial {
      cts-absent (ignore | red | yellow);
```

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```
      dcd-absent (ignore | red | yellow);
      dsr-absent (ignore | red | yellow);
      loss-of-rx-clock (ignore | red | yellow);
      loss-of-tx-clock (ignore | red | yellow);
    }
    services {
      hw-down (ignore | red | yellow);
      linkdown (ignore | red | yellow);
      pic-hold-reset (ignore | red | yellow);
      pic-reset (ignore | red | yellow);
      rx-errors (ignore | red | yellow);
      sw-down (ignore | red | yellow);
      tx-errors (ignore | red | yellow);
    }
    t3 {
      ais (ignore | red | yellow);
      exz (ignore | red | yellow);
      ferf (ignore | red | yellow);
      idle (ignore | red | yellow);
      lcv (ignore | red | yellow);
      lof (ignore | red | yellow);
      los (ignore | red | yellow);
      pll (ignore | red | yellow);
      ylw (ignore | red | yellow);
    }
  }
  cluster {
    configuration-synchronize {
      no-secondary-bootup-auto;
    }
    control-link-recovery;
    heartbeat-interval milliseconds;
    heartbeat-threshold number;
    network-management {
      cluster-master;
    }
    redundancy-group  group-number {
      gratuitous-arp-count number;
      hold-down-interval number;
      interface-monitor interface-name {
        weight number;
      }
      ip-monitoring {
        family {
          inet {
            ipv4-address {
              interface {
                logical-interface-name;
                secondary-ip-address ip-address;
              }
              weight number;
            }
          }
        }
        global-threshold number;
        global-weight number;
```

```
        retry-count number;
        retry-interval seconds;
      }
      node (0 | 1 ) {
        priority number;
      }
      preempt;
    }
    reth-count number;
    traceoptions {
      file {
        filename;
        files number;
        match regular-expression;
        (world-readable | no-world-readable);
        size maximum-file-size;
      }
      flag flag;
      level {
        (alert | all | critical | debug | emergency | error | info | notice | warning);
      }
      no-remote-trace;
    }
  }
  config-button {
    no-clear;
    no-rescue;
  }
  craft-lockout;
  fpc slot-number {
    offline;
    pic slot-number {
      aggregate-ports;
      framing {
        (e1 | e3 | sdh | sonet | t1 | t3);
      }
      ingress-policer-overhead bytes
      max-queues-per-interface (4 | 8);
      mlfr-uni-nni-bundles number;
      no-multi-rate;
      np-cache;
      port slot-number {
        framing (e1 | e3 | sdh | sonet | t1 | t3);
        speed (oc12-stm4 | oc3-stm1 | oc48-stm16);
      }
      q-pic-large-buffer (large-scale | small-scale);
      services-offload {
        low-latency;
        per-session-statistics;
      }
      shdsl {
        pic-mode (1-port-atm | 2-port-atm | 4-port-atm | efm);
      }
      sparse-dlcis;
      traffic-manager {
        egress-shaping-overhead number;
```

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```
            ingress-shaping-overhead number;
            mode (egress-only | ingress-and-egress);
          }
          tunnel-queuing;
        }
        services-offload;
      }
      ioc-npc-connectivity {
        ioc slot-number {
          npc (npc-slot-number | none);
        }
      }
      maximum-ecmp (16 | 32 | 64);
      network-services (ethernet | IP);
      routing-engine {
        bios {
          no-auto-upgrade;
        }
        on-disk-failure {
          disk-failure-action (halt | reboot);
        }
        usb-wwan {
          port 1;
        }
      }
      usb {
        storage {
          disable;
        }
      }
    }
```

Related Documentation

- cluster (Chassis) on page 270
- ip-monitoring on page 284

Security Configuration Statement Hierarchy

Supported Platforms SRX Series, vSRX

Use the statements in the **security** configuration hierarchy to configure actions, certificates, dynamic virtual private networks (VPNs), firewall authentication, flow, forwarding options, group VPNs, Intrusion Detection Prevention (IDP), Internet Key Exchange (IKE), Internet Protocol Security (IPsec), logging, Network Address Translation (NAT), public key infrastructure (PKI), policies, resource manager, rules, screens, secure shell known hosts, trace options, user identification, unified threat management (UTM), and zones. Statements that are exclusive to the SRX Series devices running Junos OS are described in this section.

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Each of the following topics lists the statements at a sub-hierarchy of the **[edit security]** hierarchy.

- *[edit security address-book] Hierarchy Level*
- *[edit security alarms] Hierarchy Level*
- *[edit security alg] Hierarchy Level*
- *[edit security analysis] Hierarchy Level*
- *[edit security application-firewall] Hierarchy Level*
- *[edit security application-tracking] Hierarchy Level*
- *[edit security certificates] Hierarchy Level*
- *[edit security datapath-debug] Hierarchy Level*
- *[edit security dynamic-vpn] Hierarchy Level*
- *[edit security firewall-authentication] Hierarchy Level*
- *[edit security flow] Hierarchy Level*
- *[edit security forwarding-options] Hierarchy Level*
- *[edit security forwarding-process] Hierarchy Level*
- *[edit security gprs] Hierarchy Level*
- *[edit security group-vpn] Hierarchy Level*
- *[edit security idp] Hierarchy Level*
- *[edit security ike] Hierarchy Level*
- *[edit security ipsec] Hierarchy Level*
- *[edit security log] Hierarchy Level*
- *[edit security nat] Hierarchy Level*
- *[edit security pki] Hierarchy Level*
- *[edit security policies] Hierarchy Level*
- *[edit security resource-manager] Hierarchy Level*
- *[edit security screen] Hierarchy Level*
- *[edit security softwires] Hierarchy Level*
- *[edit security ssh-known-hosts] Hierarchy Level*
- *[edit security traceoptions] Hierarchy Level*
- *[edit security user-identification] Hierarchy Level*
- *[edit security utm] Hierarchy Level*
- *[edit security zones] Hierarchy Level*

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Related Documentation
- *CLI User Guide*
- CLI Explorer

apply-groups (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax apply-groups *[${node}]*

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 9.0.

Description Apply node-specific parameters to each node in a chassis cluster.

Options ***${node}*** —Each node (node0 or node1) in a chassis cluster.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- cluster (Chassis) on page 270

cluster (Chassis)

Supported Platforms SRX Series, vSRX

Syntax

```
cluster {
  configuration-synchronize {
    no-secondary-bootup-auto;
  }
  control-link-recovery;
  heartbeat-interval milliseconds;
  heartbeat-threshold number;
  network-management {
    cluster-master;
  }
  redundancy-group group-number {
    gratuitous-arp-count number;
    hold-down-interval number;
    interface-monitor interface-name {
      weight number;
    }
    ip-monitoring {
      family {
        inet {
          ipv4-address {
            interface {
              logical-interface-name;
              secondary-ip-address ip-address;
            }
            weight number;
          }
        }
      }
      global-threshold number;
      global-weight number;
      retry-count number;
      retry-interval seconds;
    }
    node (0 | 1 ) {
      priority number;
    }
    preempt;
  }
  reth-count number;
  traceoptions {
    file {
      filename;
      files number;
      match regular-expression;
      (world-readable | no-world-readable);
      size maximum-file-size;
    }
    flag flag;
    level {
      (alert | all | critical | debug | emergency | error | info | notice | warning);
    }
```

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```
    no-remote-trace;
  }
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 9.0.

Description Configure a chassis cluster.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- ip-monitoring on page 284

configuration-synchronize (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
configuration-synchronize {
  no-secondary-bootup-auto;
}
```

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 12.1X47-D10.

Description Disables the automatic chassis cluster synchronization between the primary and secondary nodes. To reenable automatic chassis cluster synchronization, use the **delete chassis cluster configuration-synchronize no-secondary-bootup-auto** command in configuration mode.

Options **no-secondary-bootup-auto**—Disable the automatic chassis cluster synchronization between the primary and secondary nodes.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes on page 181
- request chassis cluster configuration-synchronize on page 314
- show chassis cluster information configuration-synchronization on page 336

control-link-recovery

Supported Platforms SRX Series, vSRX

Syntax control-link-recovery;

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 9.5.

Description Enable control link recovery to be done automatically by the system. After the control link recovers, the system checks whether it receives at least 30 consecutive heartbeats on the control link. This is to ensure that the control link is not flapping and is perfectly healthy. Once this criterion is met, the system issues an automatic reboot on the node that was disabled when the control link failed. When the disabled node reboots, the node rejoins the cluster. There is no need for any manual intervention.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- interface (Chassis Cluster) on page 282

device-count (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax device-count *number*;

Hierarchy Level [edit chassis aggregated-devices ethernet]
[edit chassis aggregated-devices sonnet]

Release Information Statement introduced in Junos OS Release 10.2.

Description Configure the number of aggregated logical devices.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270
- Example: Configuring Aggregated Ethernet Device with LAG and LACP (CLI) on page 248

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ethernet (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
ethernet {
  device-count number;
  lacp {
    link-protection {
      non-revertive;
    }
    system-priority number;
  }
}
```

Hierarchy Level [edit chassis aggregated-devices]

Release Information Statement introduced in Junos OS Release 10.2.

Description Configure properties for aggregated Ethernet devices.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270
- Example: Configuring Aggregated Ethernet Device with LAG and LACP (CLI) on page 248

fabric-options

Supported Platforms SRX Series, vSRX

Syntax

```
fabric-options {
  member-interfaces member-interface-name ;
}
```

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 8.5.

Description Configure fabric interface specific options in chassis clusters.

NOTE: When you run the **system autoinstallation** command, the command will configure unit 0 logical interface for all the active state physical interfaces. However, few commands like **fabric-options** do not allow its physical interface to be configured with a logical interface. If the **system autoinstallation** and the **fabric-options** commands are configured together the following message is displayed **incompatible with 'system autoinstallation'**.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring the Chassis Cluster Fabric Interfaces on page 61
- member-interfaces on page 286

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gigether-options (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
gigether-options {
  802.3ad {
    backup | primary
    lacp {
    port-priority number;
    }
  }
  auto-negotiation {
    remote-fault;
  }
  flow-control | no-flow-control;
  ieee-802-3az-eee ;
  ignore-l3-incompletes;
  loopback | no-loopback
  loopback-remote
  no-auto-negotiation;
  redundant-parent interface-name;
}
```

Hierarchy Level [edit interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.2.

Description Configure Gigabit Ethernet specific interface properties.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Chassis Cluster Redundant Ethernet Interfaces*
- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79

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global-threshold

Supported Platforms SRX Series, vSRX

Syntax global-threshold *number*;

Hierarchy Level [edit chassis cluster redundancy-group ***group-number*** ip-monitoring]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify the failover value for all IP addresses monitored by the redundancy group. When IP addresses with a configured total weight in excess of the threshold have become unreachable, the weight of IP monitoring is deducted from the redundancy group threshold.

Options *number* —Value at which the IP monitoring weight will be applied against the redundancy group failover threshold.

Range: 0 through 255

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- ip-monitoring on page 284

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global-weight

Supported Platforms SRX Series, vSRX

Syntax global-weight *number*;

Hierarchy Level [edit chassis cluster redundancy-group *group-number* ip-monitoring]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify the relative importance of all IP address monitored objects to the operation of the redundancy group. Every monitored IP address is assigned a weight. If the monitored address becomes unreachable, the weight of the object is deducted from the global-threshold of IP monitoring objects in its redundancy group. When the global-threshold reaches 0, the global-weight is deducted from the redundancy group. Every redundancy group has a default threshold of 255. If the threshold reaches 0, a failover is triggered. Failover is triggered even if the redundancy group is in manual failover mode and preemption is not enabled.

Options *number* —Combined weight assigned to all monitored IP addresses. A higher weight value indicates a greater importance.

Range: 0 through 255

Default: 255

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- ip-monitoring on page 284

gratuitous-arp-count

Supported Platforms SRX Series, vSRX

Syntax gratuitous-arp-count *number*;

Hierarchy Level [edit chassis cluster redundancy-group group-number]

Release Information Statement introduced in Junos OS Release 9.0.

Description Specify the number of gratuitous Address Resolution Protocol (ARP) requests to send on an active interface after failover.

Options ***number***—Number of gratuitous ARP requests that a newly elected primary device in a chassis cluster sends out to announce its presence to the other network devices.

Range: 1 through 16

Default: 4

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- redundancy-group (Chassis Cluster) on page 290

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heartbeat-interval

Supported Platforms SRX Series, vSRX

Syntax heartbeat-interval *milliseconds*;

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 9. Statement updated in Junos OS Release 10.4.

Description Set the interval between the periodic signals broadcast to the devices in a chassis cluster to indicate that the active node is operational.

The **heartbeat-interval** option works in combination with the **heartbeat-threshold** option to define the wait time before failover is triggered in a chassis cluster. The default values of these options produce a wait time of 3 seconds. In a large configuration approaching full capacity on an SRX5400 or SRX5600 or SRX5800 device, however, we recommend that you increase the failover wait time to 5 seconds.

For example, a **heartbeat-threshold** of 3 and a **heartbeat-interval** of 1000 milliseconds result in a total wait of 3 seconds before failover is triggered. To increase this wait to 5 seconds, you could increase the **heartbeat-threshold**, the **heartbeat-interval**, or both. A **heartbeat-threshold** of 5 and a **heartbeat-interval** of 1000 milliseconds would yield a wait time of 5 seconds. Setting the **heartbeat-threshold** to 4 and the **heartbeat-interval** to 1250 milliseconds would also yield a wait time of 5 seconds.

NOTE: In a chassis cluster scaling environment, the **heartbeat-threshold** must always be set to 8.

Options *milliseconds* —Time interval between any two heartbeat messages.

Range: 1000 through 2000 milliseconds

Default: 1000 milliseconds

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

heartbeat-threshold

Supported Platforms SRX Series, vSRX

Syntax heartbeat-threshold *number*;

Hierarchy Level [edit **chassis cluster**]

Release Information Statement introduced in Junos OS Release 9.0. Statement updated in Junos OS Release 10.4.

Description Set the number of consecutive missed heartbeat signals that a device in a chassis cluster must exceed to trigger failover of the active node.

The **heartbeat-threshold** option works in combination with the **heartbeat-interval** option to define the wait time before failover is triggered in a chassis cluster. The default values of these options produce a wait time of 3 seconds. In a large configuration approaching full capacity on an SRX5400 or SRX5600 or SRX5800 device, however, we recommend that you increase the failover wait time to 5 seconds.

For example, a **heartbeat-threshold** of 3 and a **heartbeat-interval** of 1000 milliseconds result in a total wait of 3 seconds before failover is triggered. To increase this wait to 5 seconds, you could increase the **heartbeat-threshold**, the **heartbeat-interval**, or both. A **heartbeat-threshold** of 5 and a **heartbeat-interval** of 1000 milliseconds would yield a wait time of 5 seconds. Setting the **heartbeat-threshold** to 4 and the **heartbeat-interval** to 1250 milliseconds would also yield a wait time of 5 seconds.

Options *number* —Number of consecutive missed heartbeats.

Range: 3 through 8

Default: 3

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

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hold-down-interval

Supported Platforms SRX Series, vSRX

Syntax hold-down-interval *number*;

Hierarchy Level [edit chassis cluster redundancy-group *group-number*]

Release Information Statement introduced in Junos OS Release 10.0.

Description Set the minimum interval to be allowed between back-to-back failovers for the specified redundancy group (affects manual failovers, as well as automatic failovers associated with monitoring failures).

For redundancy group 0, this setting prevents back-to-back failovers from occurring less than 5 minutes (300 seconds) apart. Note that a redundancy group 0 failover implies a Routing Engine failure.

For some configurations, such as ones with a large number of routes or logical interfaces, the default or specified interval for redundancy group 0 might not be sufficient. In such cases, the system automatically extends the dampening time in increments of 60 seconds until the system is ready for failover.

Options *number*—Number of seconds specified for the interval.

Range: For redundancy group 0, 300 through 1800 seconds; for redundancy group 1 through 128, 0 through 1800 seconds.

Default: For redundancy group 0, 300 seconds; for redundancy group 1 through 128, 1 second.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

interface (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
interface {
  logical-interface-name;
  secondary-ip-address ip-address;
}
```

Hierarchy Level [edit chassis cluster redundancy-group ***group-number*** ip-monitoring family *family-name* *IP–address*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify the redundant Ethernet interface, including its logical-unit-number, through which the monitored IP address must be reachable. The specified redundant Ethernet interface can be in any redundancy group. Likewise specify a secondary IP address to be used as a ping source for monitoring the IP address through the secondary node's redundant Ethernet interface link.

Options

- **reth*X.logical-unit-number***—Redundant Ethernet interface through which the monitored IP address must be reachable. You must specify the redundant Ethernet interface logical-unit-number. Note that you must also configure a secondary ping source IP address (see below).

Range: **reth0.*logical-unit-number*** through **reth128.*logical-unit-number*** (device dependent)

NOTE: **If the redundant Ethernet interface belongs to a VPN routing and forwarding (VRF) routing instance type, then the IP monitoring feature will not work.**

- **secondary-ip-address *IP–address***—Specify the IP address that will be used as the source IP address of ping packets for IP monitoring from the secondary child link of the redundant Ethernet interface. An IP address for sourcing the ping packets on the primary link of the redundant Ethernet interface must be configured before you can configure secondary-ip-address. For legacy support reasons, monitoring on an IP address without identifying a redundant Ethernet interface and without configuring a secondary ping source IP address is permitted but not recommended.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

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interface-monitor

Supported Platforms SRX Series, vSRX

Syntax

```
interface-monitor interface-name {
  weight number;
}
```

Hierarchy Level [edit **chassis cluster redundancy-group** *group-number*]

Release Information Statement introduced in Junos OS Release 9.0.

Description Specify a redundancy group interface to be monitored for failover and the relative weight of the interface.

Options ***interface-name*** —Name of the physical interface to monitor.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

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ip-monitoring

Supported Platforms SRX Series, vSRX

Syntax

```
ip-monitoring {
  family {
    inet {
      ipv4-address {
        interface {
          logical-interface-name;
          secondary-ip-address ip-address;
        }
        weight number;
      }
    }
  }
  global-threshold number;
  global-weight number;
  retry-count number;
  retry-interval seconds;
}
```

Hierarchy Level [edit **chassis cluster redundancy-group** *group-number*]

Release Information Statement updated in Junos OS Release 10.1.

Description Specify a global IP address monitoring threshold and weight, and the interval between pings (**retry-interval**) and the number of consecutive ping failures (**retry-count**) permitted before an IP address is considered unreachable for all IP addresses monitored by the redundancy group. Also specify IP addresses, a monitoring weight, a redundant Ethernet interface number, and a secondary IP monitoring ping source for each IP address, for the redundancy group to monitor.

Options **family inet *IPv4 address***—The address to be continually monitored for reachability.

> NOTE: All monitored object failures, including IP monitoring, are deducted from the redundancy group threshold priority. Other monitored objects include interface monitor, SPU monitor, cold-sync monitor, and NPC monitor (on supported platforms).

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- interface (Chassis Cluster) on page 282
- global-threshold on page 276
- global-weight on page 277

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- **weight on page 304**
- Example: Configuring Chassis Cluster Redundancy Group IP Address Monitoring on page 136

lacp (Interfaces)

Supported Platforms SRX Series

Syntax

```
lacp {
  port-priority port-number;
}
```

Hierarchy Level [edit interfaces *interface-name* redundant-ether-options]

Release Information Statement introduced in Junos OS Release 10.2.

Description For redundant Ethernet interfaces in a chassis cluster only, configure Link Aggregation Control Protocol (LACP).

Options

- **active**—Initiate transmission of LACP packets.
- **passive**—Respond to LACP packets.

Default: If you do not specify **lacp** as either **active** or **passive**, LACP remains off (the default).

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding LACP on Standalone Devices*

link-protection (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
link-protection {
  non-revertive;
}
```

Hierarchy Level [edit chassis aggregated-devices ethernet lacp]

Release Information Statement introduced in Junos OS Release 10.2.

Description Enable Link Aggregation Control Protocol (LACP) link protection at the global (chassis) level.

Options **non-revertive**—Disable the ability to switch to a better priority link (if one is available) once a link is established as active and a collection or distribution is enabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270
- Example: Configuring Aggregated Ethernet Device with LAG and LACP (CLI) on page 248

member-interfaces

Supported Platforms SRX Series, vSRX

Syntax member-interfaces ***member-interface-name***;

Hierarchy Level [edit interfaces *interface-name* fabric-options]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify the member interface name. Member interfaces that connect to each other must be of the same type.

Options ***member-interface-name*** —Member interface name.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Interfaces*

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network-management

Supported Platforms SRX Series, vSRX

Syntax

```
network-management {
  cluster-master;
}
```

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 11.1.

Description Define parameters for network management. To manage an SRX Series Services Gateway cluster through a non-fxp0 interface, use this command to define the node as a virtual chassis in NSM. This command establishes a single DMI connection from the primary node to the NSM server. This connection is used to manage both nodes in the cluster. Note that the non-fxp0 interface (regardless of which node it is present on) is always controlled by the primary node in the cluster. The output of a *<get-system-information>* RPC returns a *<chassis-cluster>* tag in all SRX Series devices. When NSM receives this tag, it models SRX Series clusters as devices with autonomous control planes.

Options **cluster-master**—Enable in-band management on the primary cluster node through NSM.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

node (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
node (0 | 1 ) {
  priority number;
}
```

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 9.0.

Description Identify the device in a chassis cluster. The node 0 device in the cluster has the chassis ID 1, and the node 1 device in the cluster has the chassis ID 2.

Options *node-number* —Cluster node number.

Range: 0 through 1

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

node (Chassis Cluster Redundancy Group)

Supported Platforms SRX Series, vSRX

Syntax

```
node (0 | 1 ) {
  priority number;
}
```

Hierarchy Level [edit **chassis cluster redundancy-group** *group-number*]

Release Information Statement introduced in Junos OS Release 9.0.

Description Identify each cluster node in a redundancy group and set its relative priority for mastership.

Options *node-number* —Cluster node number, set with the **chassis cluster node** *node-number* statement.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- redundancy-group (Chassis Cluster) on page 290

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preempt (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax preempt;

Hierarchy Level [edit chassis cluster redundancy-group *group-number*]

Release Information Statement introduced in Junos OS Release 9.0.

Description Enable chassis cluster node preemption within a redundancy group. If **preempt** is added to a redundancy group configuration, the device with the higher priority in the group can initiate a failover to become master. By default, preemption is disabled.

Initiating a failover with the **request chassis cluster failover node** or **request chassis cluster failover redundancy-group** command overrides the priority settings and preemption.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- redundancy-group (Chassis Cluster) on page 290

priority (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax priority *number*;

Hierarchy Level [edit chassis cluster redundancy-group *group-number* node *node-number*]

Release Information Statement introduced in Junos OS Release 9.0.

Description Define the priority of a node (device) in a redundancy group. Initiating a failover with the **request chassis cluster failover node** or **request chassis cluster failover redundancy-group** command overrides the priority settings.

Options *priority-number* —Priority value of the node. The eligible node with the highest priority is elected master.

Range: 1 through 254

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- redundancy-group (Chassis Cluster) on page 290

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redundancy-group (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
redundancy-group group-number {
  gratuitous-arp-count number;
  hold-down-interval number;
  interface-monitor interface-name {
    weight number;
  }
  ip-monitoring {
    family {
      inet {
        ipv4-address {
          interface {
            logical-interface-name;
            secondary-ip-address ip-address;
          }
          weight number;
        }
      }
    }
    global-threshold number;
    global-weight number;
    retry-count number;
    retry-interval seconds;
  }
  node (0 | 1 ) {
    priority number;
  }
  preempt;
}
```

Hierarchy Level [edit chassis cluster]

Release Information Statement introduced in Junos OS Release 9.0.

Description Define a redundancy group. Except for redundancy group 0, a redundancy group is a logical interface consisting of two physical Ethernet interfaces, one on each chassis. One interface is active, and the other is on standby. When the active interface fails, the standby interface becomes active. The logical interface is called a redundant Ethernet interface (**reth**).

Redundancy group 0 consists of the two Routing Engines in the chassis cluster and controls which Routing Engine is primary. You must define redundancy group 0 in the chassis cluster configuration.

Options ***group-number*** —Redundancy group identification number.

Range: 0 through 128

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NOTE: The maximum number of redundancy groups is equal to the number of redundant Ethernet interfaces that you configure.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- ip-monitoring on page 284

redundancy-interface-process

Supported Platforms SRX Series, vSRX

Syntax
```
redundancy-interface-process {
  command binary-file-path;
  disable;
  failover (alternate-media | other-routing-engine);
}
```

Hierarchy Level [edit system processes]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify as an active or backup process of an application server, configure to process traffic for more than one logical application server.

Options
- **command** ***binary-file-path***—Path to the binary process.
- **disable**—Disable the redundancy interface management process.
- **failover**—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - **alternate-media**—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - **other-routing-engine**—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- cluster (Chassis) on page 270

redundant-ether-options

Supported Platforms SRX Series, vSRX

Syntax

```
redundant-ether-options {
  (flow-control | no-flow-control);
  lacp {
    (active | passive);
    periodic (fast | slow);
  }
  link-speed speed;
  (loopback | no-loopback);
  minimum-links number;
  redundancy-group number;
  source-address-filter mac-address;
  (source-filtering | no-source-filtering);
}
```

Hierarchy Level **[edit interfaces *interface-name*]**

Release Information Statement introduced in Junos OS Release 9.2.

Description Configure Ethernet redundancy options for a chassis cluster.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Example: Enabling Eight Queue Class of Service on Redundant Ethernet Interfaces*
- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79

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redundant-parent (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax redundant-parent *redundant-ethernet-interface-name*;

Hierarchy Level [edit interfaces *interface-name* gigether-options]
[edit interfaces *interface-name* fastether-options]

Release Information Statement introduced in Junos OS Release 10.2.

Description Assign local (child) interfaces to the redundant Ethernet (reth) interfaces. A redundant Ethernet interface contains a pair of Fast Ethernet interfaces or a pair of Gigabit Ethernet interfaces that are referred to as child interfaces of the redundant Ethernet interface (the redundant parent).

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79

redundant-pseudo-interface-options

Supported Platforms SRX Series, vSRX

Syntax

```
redundant-pseudo-interface-options {
  redundancy-group redundancy-group;
}
```

Hierarchy Level [edit interfaces lo0]

Release Information Statement introduced in Junos OS Release 12.1X44-D10.

Description Configure the loopback pseudointerface in a redundancy group.

An Internet Key Exchange (IKE) gateway operating in chassis cluster, needs an external interface to communicate with a peer device. When an external interface (a reth interface or a standalone interface) is used for communication; the interface might go down when the physical interfaces are down. Instead, use loopback interfaces as an alternative to physical interfaces.

Options **redundancy-group *redundancy-group-number***— Configure the redundancy group number.

Range: 0 through 255

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Loopback Interface for a High Availability VPN*

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reth-count (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax reth-count *number*;

Hierarchy Level [edit **chassis cluster**]

Release Information Statement introduced in Junos OS Release 9.0.

Description Specify the number of redundant Ethernet (**reth**) interfaces allowed in the chassis cluster. Note that the number of **reth** interfaces configured determines the number of redundancy groups that can be configured.

Options *number* —Number of redundant Ethernet interfaces allowed.

Range: 1 through 128

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

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reth (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax

```
reth <0 |1> {
  accounting-profile;
  description;
  disable;
  encapsulation;
  gratuitous-arp-reply;
  hierarchical-scheduler {
    implicit-hierarchy;
    maximum-hierarchy-levels;
  }
  mac;
  mtu;
  native-vlan-id;
  no-gratuitous-arp-reply;
  no-gratuitous-arp-request;
  (per-unit-scheduler | no-per-unit-scheduler);
  promiscuous-mode;
  redundant-ether-options {
    (flow-control | no-flow-control);
    lacp {
      (active | passive);
      periodic (fast | slow);
    }
    link-speed speed;
    (loopback | no-loopback);
    minimum-links number;
    redundancy-group number;
  }
  traceoptions {
    flag (all | event | ipc | media);
    }
  }
  (traps | no-traps);
  unit unit-number {
    accounting-profile name;
    alias;
    bandwidth bandwidth;
    description text;
    disable;
    encapsulation (dix | ether-vpls-fr | frame-relay-ppp | ppp-over-ether | vlan-bridge |
      vlan-ccc | vlan-vpls |vlan-tcc);
    family {
      ethernet-switching {
        bridge-domain-type (svlan| bvlan);
        inner-vlan [members];
        inter-switch-link;
        interface-mode (access | trunk);
        recovery-timeout seconds;
        storm-control;
        vlan [members];
        vlan-auto-sense;
```

```
    vlan-rewrite {
      translate {
        from-vlan-id;
        to-vlan-id ;
      }
    }
  }
  inet {
    accounting {
      destination-class-usage;
      source-class-usage {
        input;
        output;
      }
    }
    address (source–address/prefix) {
      arp destination-address ;
      }
      broadcast address;
      preferred;
      primary;
      vrrp-group group-id {
        (accept-data | no-accept-data);
        advertise-interval seconds;
        advertisements-threshold number;
        authentication-key key-value;
        authentication-type (md5 | simple);
        fast-interval milliseconds;
        inet6-advertise-interval milliseconds
        (preempt <hold-timeseconds> | no-preempt );
        preferred;
        priority value;
        track {
          interface interface-name {
            bandwidth-threshold bandwidth;
            priority-cost value;
          }
          priority-hold-time seconds;
          route route-address{
            routing-instance routing-instance;
            priority-cost value;
          }
        }
        virtual-address [address];
        virtual-link-local-address address;
        vrrp-inherit-from {
          active-group value;
          active-interface interface-name;
        }
      }
      web-authentication {
        http;
        https;
        redirect-to-https;
      }
    }
```

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```
dhcp {
   client-identifier {
      (ascii string | hexadecimal string);
   }
   lease-time (length | infinite);
   retransmission-attempt value;
   retransmission-interval seconds;
   server-address server-address;
   update-server;
   vendor-id vendor-id ;
}
dhcp-client {
   client-identifier {
      prefix {
         host-name;
         logical-system-name;
         routing-instance-name;
      }
      use-interface-description (device | logical);
      user-id (ascii string| hexadecimal string);
   }
   lease-time (length | infinite);
   retransmission-attempt value;
   retransmission-interval seconds;
   server-address server-address;
   update-server;
   vendor-id vendor-id ;
}
filter {
   group number;
   input filter-name;
   input-list [filter-name];
   output filter-name;
   output-list [filter-name];
}
mtu value;
no-neighbor-learn;
no-redirects;
policer {
   input input-name;
}
primary;
rpf-check {
   fail-filter filter-name;
   mode {
      loose;
   }
}
sampling {
   input;
   output;
}
simple-filter;
unconditional-src-learn;
unnumbered-address {
   interface-name;
```

```
        preferred-source-address preferred-source-address;
      }
    }
    inet6 {
      accounting {
        destination-class-usage;
        source-class-usage {
          input;
          ouput;
        }
      }
      address source–address/prefix {
        eui-64;
        ndp address {
          (mac mac-address | multicast-mac multicast-mac-address);
          publish;
        }
        preferred;
        primary;
        vrrp-inet6-group group_id {
          (accept-data | no-accept-data);
          advertisements-threshold number;
          authentication-key value;
          authentication-type (md5 | simple);
          fast-interval milliseconds;
          inet6-advertise-interval milliseconds;
          (preempt <hold-time seconds>| no-preempt );
          priority value;
          track {
            interface interface-name {
              bandwidth-threshold value;
              priority-cost value;
            }
            priority-hold-time seconds;
            route route-address{
              routing-instance routing-instance;
            }
          }
          vrrp-inherit-from {
            active-group value;
            active-interface interface-name;
          }
        }
        web-authentication {
          http;
          https;
          redirect-to-https;
        }
      }
      (dad-disable | no-dad-disable);
      filter {
        group number;
        input filter-name;
        input-list [filter-name];
        output filter-name;
        output-list [filter-name];
```


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```
            }
            mtu value;
            nd6-stale-time seconds;
            no-neighbor-learn;
            no-redirects;
            rpf-check {
              fail-filter filter-name;
              mode {
                loose;
              }
            }
            sampling {
              input;
              output;
            }
            unnumbered-address;
          }
          iso {
            address source-address;
            mtu value;
          }
          vpls {
            filter {
              group number;
              input filter-name;
              input-list [filter-name];
              output filter-name;
              output-list [filter-name];
            }
            policer {
              input input-name;
              output output-name;
            }
          }
        }
        native-inner-vlan-id value;
        (no-traps | traps);
        proxy-arp (restricted | unrestricted);
        traps;
        vlan-id vlan-id;
        vlan-id-list vlan-id-list;
        vlan-id-range vlan-id1-vlan-id2;
      }
      vlan-tagging;
    }
```

Hierarchy Level [edit interfaces]

Release Information Statement introduced in Junos OS Release 10.2.

Description Configure a redundant Ethernet interface (reth) for chassis cluster. It is a pseudointerface that includes at minimum of one physical interface from each node of the cluster.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring Chassis Cluster Redundant Ethernet Interfaces for IPv4 and IPv6 Addresses on page 79
- cluster (Chassis) on page 270
- redundant-ether-options on page 292
- lacp (Interfaces) on page 285

retry-count (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax retry-count *number*;

Hierarchy Level [edit chassis cluster redundancy-group ***group-number*** ip-monitoring]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify the number of consecutive ping attempts that must fail before an IP address monitored by the redundancy group is declared unreachable. (See **retry-interval** for a related redundancy group IP address monitoring variable.)

Options ***count***—Number of consecutive ping attempt failures before a monitored IP address is declared unreachable.

Range: 1 through 15

Default: 5

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- cluster (Chassis) on page 270

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retry-interval (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax retry-interval *interval*;

Hierarchy Level [edit chassis cluster redundancy-group *group-number* ip-monitoring]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify the ping packet send frequency (in seconds) for each IP address monitored by the redundancy group. (See **retry-count** for a related IP address monitoring configuration variable.)

Options *interval*—Pause time between each ping sent to each IP address monitored by the redundancy group.

Range: 1 to 30 seconds

Default: 1 second

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- ip-monitoring on page 284

route-active-on

Supported Platforms SRX Series, vSRX

Syntax route-active-on (node0 | node1);

Hierarchy Level [edit policy-options condition *condition-name*]

Release Information Statement introduced in Junos OS Release 9.0.

Description For chassis cluster configurations, identify the device (node) on which a route is active.

Options **node0** | **node1**—Node in a chassis cluster.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

traceoptions (Chassis Cluster)

Supported Platforms SRX Series, vSRX

Syntax

```
traceoptions {
  file {
    filename;
    files number;
    match regular-expression;
    (world-readable | no-world-readable);
    size maximum-file-size;
  }
  flag flag;
  level {
    (alert | all | critical | debug | emergency | error | info | notice | warning);
  }
  no-remote-trace;
}
```

Hierarchy Level [edit **chassis cluster**]

Release Information Statement modified in Junos OS Release 9.5.

Description Define chassis cluster redundancy process tracing operations.

Options

- **file** ***filename*** —Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**.
- **files** ***number*** —(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed to ***trace-file*** **.0,** then ***trace-file.1*** **,** and so on, until the maximum number of trace files is reached. The oldest archived file is overwritten.
- If you specify a maximum number of files, you also must specify a maximum file size with the size option and a filename.

Range: 2 through 1000 files

Default: 10 files

- **match** ***regular-expression*** —(Optional) Refine the output to include lines that contain the regular expression.
- **size** ***maximum-file-size*** —(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named ***trace-file*** reaches this size, it is renamed ***trace-file*** **.0**. When the **trace-file** again reaches its maximum size, ***trace-file*** **.0** is renamed ***trace-file*** **.1** and ***trace-file*** is renamed ***trace-file*** **.0**. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.
- If you specify a maximum file size, you also must specify a maximum number of trace files with the files option and filename.

Syntax: ***x*** **k** to specify KB, ***x*** **m** to specify MB, or ***x*** **g** to specify GB

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Range: 0 KB through 1 GB

Default: 128 KB

- **world-readable | no-world-readable**—(Optional) By default, log files can be accessed only by the user who configures the tracing operation. The **world-readable** option enables any user to read the file. To explicitly set the default behavior, use the **no-world-readable** option.
- **flag**—Trace operation or operations to perform on chassis cluster redundancy processes. To specify more than one trace operation, include multiple **flag** statements.
  - **all**—Trace all the events
    - **configuration**—Trace configuration events
    - **routing-socket**—Trace logging of rtsock activity
    - **snmp**—Trace SNMP events

Required Privilege Level

trace—To view this statement in the configuration.
trace-control—To add this statement to the configuration.

Related Documentation

- cluster (Chassis) on page 270

weight

Supported Platforms SRX Series, vSRX

Syntax

```
interface-monitor interface-name {
  weight number;
}
```

Hierarchy Level [edit chassis cluster **redundancy-group** ***group-number*** interface-monitor ***interface***]
[edit chassis cluster **redundancy-group** ***group-number*** ip-monitoring *IP–address*]

Release Information Statement modified in Junos OS Release 10.1.

Description Specify the relative importance of the object to the operation of the redundancy group. This statement is primarily used with interface monitoring and IP address monitoring objects. The failure of an object—such as an interface—with a greater weight brings the group closer to failover. Every monitored object is assigned a weight.

- interface-monitor objects—If the object fails, its weight is deducted from the threshold of its redundancy group;
- ip-monitoring objects—If a monitored IP address becomes unreachable for any reason, the weight assigned to that monitored IP address is deducted from the redundancy group's global-threshold for IP address monitoring.

Every redundancy group has a default threshold of 255. If the threshold reaches 0, a failover is triggered. Failover is triggered even if the redundancy group is in manual failover mode and preemption is not enabled.

Options ***number*** —Weight assigned to the interface or monitored IP address. A higher weight value indicates a greater importance.

Range: 0 through 255

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- cluster (Chassis) on page 270

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CHAPTER 25

Operational Commands

- clear chassis cluster control-plane statistics
- clear chassis cluster data-plane statistics
- clear chassis cluster failover-count
- clear chassis cluster ip-monitoring failure-count
- clear chassis cluster ip-monitoring failure-count ip-address
- clear chassis cluster statistics
- request chassis cluster configuration-synchronize
- request chassis cluster failover node
- request chassis cluster failover redundancy-group
- request chassis cluster failover reset
- request chassis fpc
- request system software in-service-upgrade (Maintenance)
- set chassis cluster cluster-id node reboot
- show chassis cluster control-plane statistics
- show chassis cluster data-plane interfaces
- show chassis cluster data-plane statistics
- show chassis cluster ethernet-switching interfaces
- show chassis cluster ethernet-switching status
- show chassis cluster information
- show chassis cluster information configuration-synchronization
- show chassis cluster interfaces
- show chassis cluster ip-monitoring status redundancy-group
- show chassis cluster statistics
- show chassis cluster status
- show chassis environment (Security)
- show chassis ethernet-switch
- show chassis fabric plane
- show chassis fabric plane-location

- show chassis fabric summary
- show chassis hardware (View)
- show chassis routing-engine (View)
- show configuration chassis cluster traceoptions

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clear chassis cluster control-plane statistics

Supported Platforms	SRX Series, vSRX
Syntax	**clear chassis cluster control-plane statistics**
Release Information	Command introduced in Junos OS Release 9.3.
Description	Clear the control plane statistics of a chassis cluster.
Required Privilege Level	clear
Related Documentation	• show chassis cluster control-plane statistics on page 324
List of Sample Output	clear chassis cluster control-plane statistics on page 307
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear chassis cluster control-plane statistics

```
user@host> clear chassis cluster control-plane statistics
Cleared control-plane statistics
```

clear chassis cluster data-plane statistics

Supported Platforms SRX Series, vSRX

Syntax **clear chassis cluster data-plane statistics**

Release Information Command introduced in Junos OS Release 9.3.

Description Clear the data plane statistics of a chassis cluster.

Required Privilege Level clear

Related Documentation

- show chassis cluster data-plane statistics on page 327

List of Sample Output clear chassis cluster data-plane statistics on page 308

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear chassis cluster data-plane statistics

```
user@host> clear chassis cluster data-plane statistics
Cleared data-plane statistics
```

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clear chassis cluster failover-count

Supported Platforms SRX Series, vSRX

Syntax **clear chassis cluster failover-count**

Release Information Command introduced in Junos OS Release 9.3.

Description Clear the failover count of all redundancy-groups.

Required Privilege Level clear

Related Documentation

- request chassis cluster failover node on page 315
- request chassis cluster failover reset on page 317
- show chassis cluster status on page 350

List of Sample Output

show chassis cluster status on page 309
clear chassis cluster failover-count on page 309
show chassis cluster status on page 309

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

The following example displays the redundancy groups before and after the failover-counts are cleared.

show chassis cluster status

```
user@host> show chassis cluster status

Cluster ID: 3
Node name          Priority     Status     Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
   node0             200          secondary   no         no
   node1             100          primary     no         no

Redundancy group: 1 , Failover count: 2
   node0             100          primary     no         no
   node1             10           secondary   no         no
```

clear chassis cluster failover-count

```
user@host> clear chassis cluster failover-count
Cleared failover-count for all redundancy-groups
```

show chassis cluster status

```
user@host> show chassis cluster status

Cluster ID: 3
Node name         Priority    Status     Preempt  Manual failover
```

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```
Redundancy group: 0 , Failover count: 0
  node0           200       secondary    no       no
  node1           100       primary      no       no

Redundancy group: 1 , Failover count: 0
  node0           100       primary      no       no
  node1           10        secondary    no       no
```

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clear chassis cluster ip-monitoring failure-count

Supported Platforms SRX Series, vSRX

Syntax clear chassis cluster ip-monitoring failure-count

Release Information Command introduced in Junos OS Release 10.1.

Description Clear the failure count for all IP addresses.

Required Privilege Level clear

Related Documentation

- clear chassis cluster failover-count on page 309
- clear chassis cluster ip-monitoring failure-count ip-address on page 312

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

user@host> **clear chassis cluster ip-monitoring failure-count**

```
node0:
--------------------------------------------------------------------------
Cleared failure count for all IPs

node1:
--------------------------------------------------------------------------
Cleared failure count for all IPs
```

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clear chassis cluster ip-monitoring failure-count ip-address

Supported Platforms SRX Series, vSRX

Syntax clear chassis cluster ip-monitoring failure-count ip-address 1.1.1.1

Release Information Command introduced in Junos OS Release 10.1.

Description Clear the failure count for a specified IP address.

NOTE: Entering an IP address at the end of this command is optional. If you do not specify an IP address, the failure count for all monitored IP addresses is cleared.

Required Privilege Level clear

Related Documentation

- clear chassis cluster failover-count on page 309
- clear chassis cluster ip-monitoring failure-count on page 311

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

user@host> **clear chassis cluster ip-monitoring failure-count ip-address 1.1.1.1**

```
node0:
--------------------------------------------------------------------------
Cleared failure count for IP: 1.1.1.1

node1:
--------------------------------------------------------------------------
Cleared failure count for IP: 1.1.1.1
```

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clear chassis cluster statistics

Supported Platforms	SRX Series, vSRX
Syntax	**clear chassis cluster statistics**
Release Information	Command introduced in Junos OS Release 9.3.
Description	Clear the control plane and data plane statistics of a chassis cluster.
Required Privilege Level	clear
Related Documentation	• show chassis cluster statistics on page 346
List of Sample Output	clear chassis cluster statistics on page 313
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear chassis cluster statistics

```
user@host> clear chassis cluster statistics
Cleared control-plane statistics
Cleared data-plane statistics
```

request chassis cluster configuration-synchronize

Supported Platforms SRX Series, vSRX

Syntax request chassis cluster configuration-synchronize

Release Information Command introduced in Junos OS Release 12.1X47-D10.

Description Synchronizes the configuration from the primary node to the secondary node when the secondary node joins the primary node in a cluster.

Required Privilege Level maintenance

Related Documentation

- Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes on page 181
- Verifying Chassis Cluster Configuration Synchronization Status on page 182
- NTP Time Synchronization on SRX Series Devices on page 183

List of Sample Output request chassis cluster configuration-synchronize on page 314

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cluster configuration-synchronize

```
user@host> request chassis cluster configuration-synchronize
Performing configuration synchronization from remote node.
```

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request chassis cluster failover node

Supported Platforms SRX Series, vSRX

Syntax

```
request chassis cluster failover node node-number
redundancy-group group-number
```

Release Information Command introduced in Junos OS Release 9.0.

Description For chassis cluster configurations, initiate manual failover in a redundancy group from one node to the other, which becomes the primary node, and automatically reset the priority of the group to 255. The failover stays in effect until the new primary node becomes unavailable, the threshold of the redundancy group reaches 0, or you use the **request chassis cluster failover reset** command.

After a manual failover, you must use the **request chassis cluster failover reset** command before initiating another failover.

Options

- **node** ***node-number***-Number of the chassis cluster node to which the redundancy group fails over.
- **Range:** 0 through 1
- **redundancy-group** ***group-number*** —Number of the redundancy group on which to initiate manual failover. Redundancy group 0 is a special group consisting of the two Routing Engines in the chassis cluster.

  Range: 0 through 255

Required Privilege Level maintenance

Related Documentation

- clear chassis cluster failover-count on page 309
- request chassis cluster failover reset on page 317
- show chassis cluster status on page 350

List of Sample Output request chassis cluster failover node 0 redundancy-group 1 on page 315

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cluster failover node 0 redundancy-group 1

```
user@host> request chassis cluster failover node 0 redundancy-group 1
Initiated manual failover for redundancy group 1
```

request chassis cluster failover redundancy-group

Supported Platforms

Syntax request chassis cluster failover redundancy-group *redundancy-group-number*

Release Information Command introduced in Junos OS Release 9.0.

Description For chassis cluster configurations, initiate manual failover in a redundancy group from one node to the other, which becomes the primary node, and automatically reset the priority of the group to 255. The failover stays in effect until the new primary node becomes unavailable, the threshold of the redundancy group reaches 0, or you use the **request chassis cluster failover reset** command.

After a manual failover, you must use the **request chassis cluster failover reset** command before initiating another failover.

Options

- **node** ***node-number***-Number of the chassis cluster node to which the redundancy group fails over.
- **Range:** 0 through 1
- **redundancy-group** ***group-number*** —Number of the redundancy group on which to initiate manual failover. Redundancy group 0 is a special group consisting of the two Routing Engines in the chassis cluster.

  Range: 0 through 255

Required Privilege Level maintenance

Related Documentation

- Initiating a Chassis Cluster Manual Redundancy Group Failover on page 146
- Verifying Chassis Cluster Failover Status on page 148

List of Sample Output request chassis cluster failover redundancy-group 0 node 1 on page 316

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cluster failover redundancy-group 0 node 1

```
user@host> request chassis cluster failover redundancy-group 0 node 1
{primary:node0}
user@host> request chassis cluster failover redundancy-group 0 node 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Initiated manual failover for redundancy group 0
```

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request chassis cluster failover reset

Supported Platforms SRX Series, vSRX

Syntax request chassis cluster failover reset
redundancy-group *group-number*

Release Information Command introduced in Junos OS Release 9.0.

Description In chassis cluster configurations, undo the previous manual failover and return the redundancy group to its original settings.

Options **redundancy-group *group-number*** —Number of the redundancy group on which to reset manual failover. Redundancy group 0 is a special group consisting of the two Routing Engines in the chassis cluster.

Range: 0 through 255

Required Privilege Level maintenance

Related Documentation

- clear chassis cluster failover-count on page 309
- request chassis cluster failover node on page 315
- show chassis cluster status on page 350

List of Sample Output request chassis cluster failover reset redundancy-group 0 on page 317

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cluster failover reset redundancy-group 0

```
user@host> request chassis cluster failover reset redundancy-group 0
```

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request chassis fpc

Supported Platforms SRX Series

Syntax request chassis fpc (offline | online | restart) slot *slot-number*

Release Information Command modified in Junos OS Release 9.2.

Description Control the operation of the Flexible PIC Concentrator (FPC).

> NOTE: The SRX5K-SPC-2-10-40 (SPC1) and SRX5K-SPC-4-15-320 (SPC2) does not support the **request chassis fpc** command.

Options **offline**—Take the FPC offline.

online—Bring the FPC online.

restart—Restart the FPC.

slot *slot-number*—Specify the FPC slot number.

Required Privilege Level maintenance

Related Documentation
- *show chassis fpc (View)*

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis fpc

```
user@host> request chassis fpc online slot 0
FPC 0 already online
```

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request system software in-service-upgrade (Maintenance)

Supported Platforms SRX300, SRX320, SRX340, SRX345, SRX5400, SRX550, SRX5600, SRX5800

Syntax

request system software in-service-upgrade *image_name*
<no-copy>
<no-sync>
<no-tcp-syn-check>
<no-validate>
<reboot>
<unlink>

Release Information For SRX5400, SRX5600, and SRX5800 devices, command introduced in Junos OS Release 9.6 and support for **reboot** as a required parameter added in Junos OS Release 11.2R2. For SRX5400 devices, the command is introduced in Junos OS Release 12.1X46-D20. For SRX300, SRX320, SRX340, and SRX345 devices, command introduced in Junos OS Release 15.1X49-D40.

Description The in-service software upgrade (ISSU) feature allows a chassis cluster pair to be upgraded from supported Junos OS versions with a traffic impact similar to that of redundancy group failovers. Before upgrading, you should perform failovers so that all redundancy groups are active on only one device. We recommend that graceful restart for routing protocols be enabled before you initiate an ISSU.

For SRX300, SRX320, SRX340, SRX345, and SRX550 devices, you must use the **no-sync** parameter to perform an in-band cluster upgrade (ICU). This allows a chassis cluster pair to be upgraded with a minimal service disruption of approximately 30 seconds.

Options

- *image_name*—Location and name of the software upgrade package to be installed.
- **no-copy**—(Optional) Installs the software upgrade package but does not save the copies of package files.
- **no-sync**—Stops the flow state from synchronizing when the old secondary node has booted with a new Junos OS image.

  This parameter applies to SRX300, SRX320, SRX340, SRX345, and SRX550 devices only. It is required for an ICU.
- **no-tcp-syn-check**—(Optional) Creates a window wherein the TCP SYN check for the incoming packets is disabled. The default value for the window is 7200 seconds (2 hours).

  This parameter applies to SRX300, SRX320, SRX340, SRX345, and SRX550 devices only.
- **no-validate**—(Optional) Disables the configuration validation step at installation. The system behavior is similar to that of the **request system software add** command.

  This parameter applies to SRX300, SRX320, SRX340, SRX345, and SRX550 devices only.
- **reboot**—Reboots each device in the chassis cluster pair after installation is completed.

This parameter applies to SRX5400, SRX5600, and SRX5800 devices only. It is required for an ISSU. (The devices in a cluster are automatically rebooted following an ICU.)

- **unlink**—(Optional) Removes the software package after successful installation.

Required Privilege Level maintenance

Related Documentation

- Chassis Configuration Statement Hierarchy on page 264

List of Sample Output request system software in-service-upgrade (High-End SRX Series Devices) on page 320
request system software in-service-upgrade (Branch SRX Series Devices) on page 321

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system software in-service-upgrade (High-End SRX Series Devices)

```
user@host> request system software in-service-upgrade
/var/tmp/junos-srx1k3k-11.2R2.5-domestic.tgz no-copy reboot
Chassis ISSU Started
node0:
--------------------------------------------------------------------------
Chassis ISSU Started
ISSU: Validating Image
Inititating in-service-upgrade

node0:
--------------------------------------------------------------------------
Inititating in-service-upgrade
Checking compatibility with configuration
mgd: commit complete
Validation succeeded
ISSU: Preparing Backup RE
Finished upgrading secondary node node0
Rebooting Secondary Node

node0:
--------------------------------------------------------------------------
Shutdown NOW!
[pid 3257]
ISSU: Backup RE Prepare Done
Waiting for node0 to reboot.
node0 booted up.
Waiting for node0 to become secondary
node0 became secondary.
Waiting for node0 to be ready for failover
ISSU: Preparing Daemons
Secondary node0 ready for failover.
Failing over all redundancy-groups to node0
ISSU: Preparing for Switchover
Initiated failover for all the redundancy groups to node1
Waiting for node0 take over all redundancy groups

Exiting in-service-upgrade window

node0:
```

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```
----------------------------------------------------------------------------
Exiting in-service-upgrade window
Exiting in-service-upgrade window
Chassis ISSU Aborted

node0:
----------------------------------------------------------------------------
Chassis ISSU Ended
ISSU completed successfully, rebooting...
Shutdown NOW!
[pid 4294]
```

Sample Output

request system software in-service-upgrade (Branch SRX Series Devices)

```
user@host> request system software in-service-upgrade
/var/tmp/junos-srxsme-11.2R2.2-domestic.tgz no-sync
ISSU: Validating package
WARNING: in-service-upgrade shall reboot both the nodes
         in your cluster. Please ignore any subsequent
         reboot request message
ISSU: start downloading software package on secondary node
Pushing bundle to node1
NOTICE: Validating configuration against junos-srxsme-11.2R2.2-domestic.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
Formatting alternate root (/dev/ad0s1a)...
/dev/ad0s1a: 630.5MB (1291228 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 157.62MB, 10088 blks, 20224 inodes.
super-block backups (for fsck -b #) at:
 32, 322848, 645664, 968480
Checking compatibility with configuration
Initializing...
Verified manifest signed by PackageProduction_11_2_0
Verified junos-11.2R2.2-domestic signed by PackageProduction_11_2_0
Using junos-11.2R2.2-domestic from
/altroot/cf/packages/install-tmp/junos-11.2R2.2-domestic
Copying package ...
Saving boot file package in /var/sw/pkg/junos-boot-srxsme-11.2R2.2.tgz
Verified manifest signed by PackageProduction_11_2_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
cp: /cf/var/validate/chroot/var/etc/resolv.conf and /etc/resolv.conf are identical
 (not copied).
cp: /cf/var/validate/chroot/var/etc/hosts and /etc/hosts are identical (not
copied).
mgd: commit complete
Validation succeeded
Installing package '/altroot/cf/packages/install-tmp/junos-11.2R2.2-domestic' ...
Verified junos-boot-srxsme-11.2R2.2.tgz signed by PackageProduction_11_2_0
Verified junos-srxsme-11.2R2.2-domestic signed by PackageProduction_11_2_0
Saving boot file package in /var/sw/pkg/junos-boot-srxsme-11.2R2.2.tgz
JUNOS 11.2R2.2 will become active at next reboot
WARNING: A reboot is required to load this software correctly
WARNING:     Use the 'request system reboot' command
WARNING:         when software installation is complete
Saving state for rollback ...
ISSU: finished upgrading on secondary node node1
ISSU: start upgrading software package on primary node
NOTICE: Validating configuration against junos-srxsme-11.2R2.2-domestic.tgz.
NOTICE: Use the 'no-validate' option to skip this if desired.
```

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```
Formatting alternate root (/dev/ad0s1a)...
/dev/ad0s1a: 630.9MB (1292176 sectors) block size 16384, fragment size 2048
        using 4 cylinder groups of 157.75MB, 10096 blks, 20224 inodes.
super-block backups (for fsck -b #) at:
 32, 323104, 646176, 969248
Checking compatibility with configuration
Initializing...
Verified manifest signed by PackageProduction_11_2_0
Verified junos-11.2R2.2-domestic signed by PackageProduction_11_2_0
Using junos-11.2R2.2-domestic from
/altroot/cf/packages/install-tmp/junos-11.2R2.2-domestic
Copying package ...
Saving boot file package in /var/sw/pkg/junos-boot-srxsme-11.2R2.2.tgz
Verified manifest signed by PackageProduction_11_2_0
Hardware Database regeneration succeeded
Validating against /config/juniper.conf.gz
cp: /cf/var/validate/chroot/var/etc/resolv.conf and /etc/resolv.conf are identical
 (not copied).
cp: /cf/var/validate/chroot/var/etc/hosts and /etc/hosts are identical (not
copied).
mgd: commit complete
Validation succeeded
Installing package '/altroot/cf/packages/install-tmp/junos-11.2R2.2-domestic' ...
Verified junos-boot-srxsme-11.2R2.2.tgz signed by PackageProduction_11_2_0
Verified junos-srxsme-11.2R2.2-domestic signed by PackageProduction_11_2_0
Saving boot file package in /var/sw/pkg/junos-boot-srxsme-11.2R2.2.tgz
JUNOS 11.2R2.2 will become active at next reboot
WARNING: A reboot is required to load this software correctly
WARNING:     Use the 'request system reboot' command
WARNING:         when software installation is complete
Saving state for rollback ...
ISSU: failover all redundancy-groups 1...n to primary node
node0:
--------------------------------------------------------------------------
Successfully reset all redundancy-groups priority back to configured ones.
Redundancy-groups-0 will not be reset and the primaryship remains unchanged.

node1:
--------------------------------------------------------------------------
Successfully reset all redundancy-groups priority back to configured ones.
Redundancy-groups-0 will not be reset and the primaryship remains unchanged.

node0:
--------------------------------------------------------------------------
Initiated manual failover for all redundancy-groups to node0
Redundancy-groups-0 will not failover and the primaryship remains unchanged.
ISSU: rebooting Secondary Node

node1:
--------------------------------------------------------------------------
Shutdown NOW!
[pid 7023]
ISSU: Waiting for secondary node node1 to reboot.
ISSU: node 1 went down
ISSU: Waiting for node 1 to come up
ISSU: node 1 came up
ISSU: secondary node node1 booted up.
Shutdown NOW!
[pid 45056]
```

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set chassis cluster cluster-id node reboot

Supported Platforms SRX Series, vSRX

Syntax set chassis cluster cluster-id *cluster-id* node *node* reboot

Release Information Support for extended cluster identifiers (more than 15 identifiers) added in Junos OS Release 12.1X45-D10.

Description This operational mode command sets the chassis cluster identifier (ID) and node ID on each device, and reboots the devices to enable clustering. The system uses the chassis cluster ID and chassis cluster node ID to apply the correct configuration for each node (for example, when you use the **apply-groups** command to configure the chassis cluster management interface). The chassis cluster ID and node ID statements are written to the EPROM, and the statements take effect when the system is rebooted.

Setting a cluster ID to 0 is equivalent to disabling a cluster. A cluster ID greater than 15 can only be set when the fabric and control link interfaces are connected back-to-back.

NOTE: If you have a cluster set up and running with an earlier release of Junos OS, you can upgrade to Junos OS Release 12.1X45-D10 or later and re-create a cluster with cluster IDs greater than 16. If for any reason you decide to revert to the previous version of Junos OS that did not support extended cluster IDs, the system comes up with standalone devices after you reboot. If the cluster ID set is less than 16 and you roll back to a previous release, the system comes back with the previous setup.

Options cluster-id *cluster-id* —Identifies the cluster within the Layer 2 domain.

Range: 0 through 255

node *node* —Identifies a node within a cluster.

Range: 0 to 1

Required Privilege Level maintenance

Related Documentation

- Example: Setting the Chassis Cluster Node ID and Cluster ID for Branch SRX Series Devices on page 51
- *Example: Setting the Chassis Cluster Node ID and Cluster ID for High-End SRX Series Devices*
- *Understanding the Interconnect Logical System and Logical Tunnel Interfaces*
- *Example: Configuring Logical Systems in an Active/Passive Chassis Cluster (Master Administrators Only)*

Output Fields When you enter this command, you are provided feedback on the status of your request.

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show chassis cluster control-plane statistics

Supported Platforms SRX Series, vSRX

Syntax **show chassis cluster control-plane statistics**

Release Information Command introduced in Junos OS Release 9.3. Output changed to support dual control ports in Junos OS Release 10.0.

Description Display information about chassis cluster control plane statistics.

Required Privilege Level view

Related Documentation

- clear chassis cluster control-plane statistics on page 307

List of Sample Output show chassis cluster control-plane statistics on page 325
show chassis cluster control-plane statistics (SRX5000 line devices) on page 325

Output Fields Table 27 on page 324 lists the output fields for the **show chassis cluster control-plane statistics** command. Output fields are listed in the approximate order in which they appear.

Table 27: show chassis cluster control-plane statistics Output Fields

Field Name	Field Description
Control link statistics	Statistics of the control link used by chassis cluster traffic. Statistics for **Control link 1** are displayed when you use dual control links (SRX5000 lines only). • **Heartbeat packets sent**—Number of heartbeat messages sent on the control link. • **Heartbeat packets received**—Number of heartbeat messages received on the control link. • **Heartbeat packet errors**—Number of heartbeat packets received with errors on the control link.
Fabric link statistics	Statistics of the fabric link used by chassis cluster traffic. Statistics for **Child Link 1** are displayed when you use dual fabric links. • **Probes sent**—Number of probes sent on the fabric link. • **Probes received**—Number of probes received on the fabric link.
Switch fabric link statistics	Statistics of the switch fabric link used by chassis cluster traffic. • **Probe state**—State of the probe, **UP** or **DOWN**. • **Probes sent**—Number of probes sent. • **Probes received**—Number of probes received. • **Probe recv error** —Error in receiving probe. • **Probe send error**—Error in sending probe.

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Sample Output

show chassis cluster control-plane statistics

```
user@host> show chassis cluster control-plane statistics
Control link statistics:
    Control link 0:
        Heartbeat packets sent: 11646
        Heartbeat packets received: 8343
        Heartbeat packet errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 11644
        Probes received: 8266
   Switch fabric link statistics:
    Probe state : DOWN
    Probes sent: 8145
    Probes received: 8013
    Probe recv errors: 0
    Probe send errors: 0
```

Sample Output

show chassis cluster control-plane statistics (SRX5000 line devices)

```
user@host> show chassis cluster control-plane statistics
Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258698
        Heartbeat packets received: 258693
        Heartbeat packet errors: 0
   Control link 1:
        Heartbeat packets sent: 258698
        Heartbeat packets received: 258693
        Heartbeat packet errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258690
        Probes received: 258690
    Child link 1
        Probes sent: 258505
        Probes received: 258505
```

show chassis cluster data-plane interfaces

Supported Platforms SRX Series, vSRX

Syntax **show chassis cluster data-plane interfaces**

Release Information Command introduced in Junos OS Release 10.2.

Description Display the status of the data plane interface (also known as a fabric interface) in a chassis cluster configuration.

Required Privilege Level view

Related Documentation
- cluster (Chassis) on page 270

List of Sample Output show chassis cluster data-plane interfaces on page 326

Output Fields Table 28 on page 326 lists the output fields for the **show chassis cluster data-plane interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 28: show chassis cluster data-plane interfaces Output Fields

Field Name	Field Description
fab0/fab1	Name of the logical fabric interface. • **Name**—Name of the physical Ethernet interface. • **Status**—State of the fabric interface: **up** or **down**.

Sample Output

show chassis cluster data-plane interfaces

```
user@host> show chassis cluster data-plane interfaces
fab0:
    Name                Status
    ge-2/1/9            up
    ge-2/2/5            up
fab1:
    Name                Status
    ge-8/1/9            up
    ge-8/2/5            up
```

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show chassis cluster data-plane statistics

Supported Platforms	SRX Series, vSRX
Syntax	**show chassis cluster data-plane statistics**
Release Information	Command introduced in Junos OS Release 9.3.
Description	Display information about chassis cluster data plane statistics.
Required Privilege Level	view
Related Documentation	• clear chassis cluster data-plane statistics on page 308
List of Sample Output	show chassis cluster data-plane statistics on page 328
Output Fields	Table 29 on page 327 lists the output fields for the **show chassis cluster data-plane statistics** command. Output fields are listed in the approximate order in which they appear.

Table 29: show chassis cluster data-plane statistics Output Fields

Field Name	Field Description
Services Synchronized	• **Service name**—Name of the service. • **Rtos sent**—Number of runtime objects (RTOs) sent. • **Rtos received**—Number of RTOs received. • **Translation context**—Messages synchronizing Network Address Translation (NAT) translation context. • **Incoming NAT**—Messages synchronizing incoming Network Address Translation (NAT) service. • **Resource manager**—Messages synchronizing resource manager groups and resources. • **Session create**—Messages synchronizing session creation. • **Session close**—Messages synchronizing session close. • **Session change**—Messages synchronizing session change. • **Gate create**—Messages synchronizing creation of pinholes (temporary openings in the firewall). • **Session ageout refresh request**—Messages synchronizing request session after age-out. • **Session ageout refresh reply**—Messages synchronizing reply session after age-out. • **IPsec VPN**—Messages synchronizing VPN session. • **Firewall user authentication**—Messages synchronizing firewall user authentication session. • **MGCP ALG**—Messages synchronizing MGCP ALG sessions. • **H323 ALG**—Messages synchronizing H.323 ALG sessions. • **SIP ALG**—Messages synchronizing SIP ALG sessions. • **SCCP ALG**—Messages synchronizing SCCP ALG sessions. • **PPTP ALG**—Messages synchronizing PPTP ALG sessions. • **RTSP ALG**—Messages synchronizing RTSP ALG sessions.

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Sample Output

show chassis cluster data-plane statistics

```
user@host> show chassis cluster data-plane statistics
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          0            0
    Session create                            0            0
    Session close                             0            0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPsec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RTSP ALG                                  0            0
```


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show chassis cluster ethernet-switching interfaces

Supported Platforms SRX1500, SRX550, vSRX

Syntax show chassis cluster ethernet-switching interfaces

Release Information Command introduced in Junos OS Release 11.1.

Description Display the status of the switch fabric interfaces (swfab) in a chassis cluster.

Required Privilege Level view

Related Documentation

- cluster (Chassis) on page 270
- *Layer 2 Bridging and Transparent Mode for Security Devices*

List of Sample Output show chassis cluster ethernet-switching interfaces on page 329

Output Fields Table 30 on page 329 lists the output fields for the **show chassis cluster ethernet-switching interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 30: show chassis cluster ethernet-switching interfaces Output Fields

Field Name	Field Description
swfab0/swfab1	Name of the switch fabric interface. • Name—Name of the physical interface. • Status—State of the swfab interface: up or down.

Sample Output

show chassis cluster ethernet-switching interfaces

```
user@host> show chassis cluster ethernet-switching interfaces
swfab0:
    Name                Status
    ge-0/0/9            up
    ge-0/0/10           up
swfab1:
    Name                Status
    ge-5/0/9            up
    ge-5/0/10           up
```

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show chassis cluster ethernet-switching status

Supported Platforms SRX1500, SRX550, vSRX

Syntax show chassis cluster ethernet-switching status

Release Information Command introduced in Junos OS Release 11.1.

Description Display the Ethernet switching status of the chassis cluster.

Required Privilege Level view

Related Documentation

- cluster (Chassis) on page 270
- *Layer 2 Bridging and Transparent Mode for Security Devices*

List of Sample Output show chassis cluster ethernet-switching status on page 331

Output Fields Table 31 on page 330 lists the output fields for the **show chassis cluster ethernet-switching status** command. Output fields are listed in the approximate order in which they appear.

Table 31: show chassis cluster ethernet-switching status Output Fields

Field Name	Field Description
Cluster ID	ID number (1-255) of a cluster. Setting a cluster ID to 0 is equivalent to disabling a cluster. More than 16 cluster IDs will work only if the fabric and control link interfaces are connected back-to-back. NOTE: If you create a cluster with cluster IDs greater than 16, and then decide to roll back to a previous release image that does not support extended cluster IDs, the system comes up as standalone. NOTE: If you have a cluster set up and running with an earlier release of Junos OS, you can upgrade to Junos OS Release 12.1X45-D10 and re-create a cluster with cluster IDs greater than 16. However, if for any reason you decide to revert to the previous version of Junos OS that did not support extended cluster IDs, the system comes up with standalone devices after you reboot.
Redundancy-Group	ID number (1-255) of a redundancy group in the chassis cluster.
Node name	Node (device) in the chassis cluster (**node0** or **node1**).
Priority	Assigned priority for the redundancy group on that node.

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Table 31: show chassis cluster ethernet-switching status Output Fields *(continued)*

Field Name	Field Description
Status	State of the redundancy group (**Primary**, **Secondary**, **Lost**, or **Unavailable**). • **Primary**—Redundancy group is active and passing traffic. • **Secondary**—Redundancy group is passive and not passing traffic. • **Lost**—Node loses contact with the other node through the control link. Most likely to occur when both nodes are in a cluster and due to control link failure, one node cannot exchange heartbeats, or when the other node is rebooted. • **Unavailable**—Node has not received a single heartbeat over the control link from the other node since the other node booted up. Most likely to occur when one node boots up before the other node, or if only one node is present in the cluster.
Preempt	• **Yes**: Mastership can be preempted based on priority. • **No**: Change in priority will not preempt mastership.
Manual failover	• **Yes**: If mastership is set manually through the CLI. • **No**: Mastership is not set manually through the CLI.

Sample Output

show chassis cluster ethernet-switching status

```
user@host> show chassis cluster ethernet-switching status
Cluster ID: 10
Node                  Priority          Status    Preempt  Manual failover

Redundancy group: 0 , Failover count: 1
    node0                   1           primary        no       no
    node1                   0           lost           n/a      n/a

Switch fabric link statistics:
    Probe state : DOWN
    Probes sent: 8145
    Probes received: 8013
    Probe recv errors: 0
    Probe send errors: 0
```

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show chassis cluster information

Supported Platforms SRX Series, vSRX

Syntax show chassis cluster information

Release Information Command introduced in Junos OS Release 12.1X47-D10.

Description Display chassis cluster messages. The messages indicate each node's health condition and details of the monitored failure.

Required Privilege Level view

Related Documentation

- show chassis cluster status on page 350

List of Sample Output show chassis cluster information on page 332
show chassis cluster information on page 333

Output Fields Table 32 on page 332 lists the output fields for the **show chassis cluster information** command. Output fields are listed in the approximate order in which they appear.

Table 32: show chassis cluster information Output Fields

Field Name	Field Description
Node	Node (device) in the chassis cluster (**node0** or **node1**).
Redundancy Group Information	• Redundancy Group—ID number (0 - 255) of a redundancy group in the cluster. • Current State—State of the redundancy group: **primary**, **secondary**, **hold**, or **secondary-hold**. • Weight—Relative importance of the redundancy group. • Time—Time when the redundancy group changed the state. • From—State of the redundancy group before the change. • To—State of the redundancy group after the change. • Reason—Reason for the change of state of the redundancy group.
Chassis cluster LED information	• Current LED color—Current color state of the LED. • Last LED change reason—Reason for change of state of the LED.

Sample Output

show chassis cluster information

```
user@host> show chassis cluster information

node0:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255
```


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```
        Time             From           To             Reason
        Mar 27 17:44:19 hold           secondary      Hold timer expired
        Mar 27 17:44:27 secondary      primary        Better priority (200/200)

    Redundancy Group 1 , Current State: primary, Weight: 255

        Time             From           To             Reason
        Mar 27 17:44:19 hold           secondary      Hold timer expired
        Mar 27 17:44:27 secondary      primary        Remote yield (0/0)

    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time             From           To             Reason
        Mar 27 17:44:19 hold           secondary      Hold timer expired
        Mar 27 17:44:27 secondary      primary        Remote yield (0/0)
        Mar 27 17:50:24 primary        secondary-hold Preempt/yield(100/200)
        Mar 27 17:50:25 secondary-hold secondary      Ready to become secondary

Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time             From           To             Reason
        Mar 27 17:44:27 hold           secondary      Hold timer expired

    Redundancy Group 1 , Current State: secondary, Weight: 255

        Time             From           To             Reason
        Mar 27 17:44:27 hold           secondary      Hold timer expired
        Mar 27 17:50:23 secondary      primary        Remote yield (100/0)
        Mar 27 17:50:24 primary        secondary-hold Preempt/yield(100/200)
        Mar 27 17:50:25 secondary-hold secondary      Ready to become secondary

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time             From           To             Reason
        Mar 27 17:44:27 hold           secondary      Hold timer expired
        Mar 27 17:50:23 secondary      primary        Remote yield (200/0)

Chassis cluster LED information:
    Current LED color: Green
    Last LED change reason: No failures
```

Sample Output

show chassis cluster information

user@host> **show chassis cluster information**

The following output is specific to monitoring abnormal (unhealthy) case.

```
node0:
--------------------------------------------------------------------------
Redundancy Group Information:
```

```
    Redundancy Group 0 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Apr  1 11:07:38 hold           secondary      Hold timer expired
        Apr  1 11:07:41 secondary      primary        Only node present
        Apr  1 11:29:20 primary        secondary-hold Manual failover
        Apr  1 11:34:20 secondary-hold secondary      Ready to become secondary

    Redundancy Group 1 , Current State: primary, Weight: 0

        Time            From           To             Reason
        Apr  1 11:07:38 hold           secondary      Hold timer expired
        Apr  1 11:07:41 secondary      primary        Only node present

    Redundancy Group 2 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Apr  1 11:07:38 hold           secondary      Hold timer expired
        Apr  1 11:07:41 secondary      primary        Only node present

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down

Failure Information:

    IP Monitoring Failure Information:
    Redundancy Group 1, Monitoring Status: Failed
    IP Address        Status       Reason
    1.1.1.1           Unreachable  redundancy-group state unknown

node1:
--------------------------------------------------------------------------
Redundancy Group Information:

    Redundancy Group 0 , Current State: primary, Weight: 255

        Time            From           To             Reason
        Apr  1 11:08:40 hold           secondary      Hold timer expired
        Apr  1 11:29:20 secondary      primary       Remote is in secondary hold


    Redundancy Group 1 , Current State: secondary, Weight: 0

        Time            From           To             Reason
        Apr  1 11:08:40 hold           secondary      Hold timer expired

    Redundancy Group 2 , Current State: secondary, Weight: 255

        Time            From           To             Reason
        Apr  1 11:08:40 hold           secondary      Hold timer expired

Chassis cluster LED information:
    Current LED color: Amber
    Last LED change reason: Monitored objects are down

Failure Information:

    IP Monitoring Failure Information:
    Redundancy Group 1, Monitoring Status: Failed
```

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```
IP Address        Status       Reason
1.1.1.1           Unreachable  redundancy-group state unknown
```

show chassis cluster information configuration-synchronization

Supported Platforms SRX Series, vSRX

Syntax show chassis cluster information configuration-synchronization

Release Information Command introduced in Junos OS Release 12.1X47-D10.

Description Display chassis cluster messages. The messages indicate the redundancy mode, automatic synchronization status, and if automatic synchronization is enabled on the device.

Required Privilege Level view

Related Documentation

- Understanding Automatic Chassis Cluster Synchronization Between Primary and Secondary Nodes on page 181
- NTP Time Synchronization on SRX Series Devices on page 183
- Simplifying Network Management by Synchronizing the Primary and Backup Routing Engines with NTP on page 183
- **request chassis cluster configuration-synchronize on page 314**

List of Sample Output **show chassis cluster information configuration-synchronization on page 336**

Output Fields Table 33 on page 336 lists the output fields for the **show chassis cluster information configuration-synchronization** command. Output fields are listed in the approximate order in which they appear.

Table 33: show chassis cluster information configuration-synchronization Output Fields

Field Name	Field Description
Node name	Node (device) in the chassis cluster (**node0** or **node1**).
Status	• Activation status—State of automatic configuration synchronization: **Enabled** or **Disabled**. • Last sync operation—Status of the last synchronization. • Last sync result—Result of the last synchronization. • Last sync mgd messages—Management daemon messages of the last synchronization.
Events	The timestamp of the event, the automatic configuration synchronization status, and the number of synchronization attempts.

Sample Output

show chassis cluster information configuration-synchronization

```
user@host> show chassis cluster information configuration-synchronization

node0:
```

```
---------------------------------------------------------------------------
Configuration Synchronization:
   Status:
     Activation status: Enabled
     Last sync operation: Auto-Sync
     Last sync result: Not needed
     Last sync mgd messages:
   Events:
     Feb 25 22:21:49.174 : Auto-Sync: Not needed
node1:
---------------------------------------------------------------------------
Configuration Synchronization:
   Status:
     Activation status: Enabled
     Last sync operation: Auto-Sync
     Last sync result: Succeeded
     Last sync mgd messages:
       mgd: rcp: /config/juniper.conf: No such file or directory
       Network security daemon: warning: You have enabled/disabled inet6 flow.
       Network security daemon: You must reboot the system for your change to
take effect.
      Network security daemon: If you have deployed a cluster, be sure to reboot
 all nodes.
       mgd: commit complete
   Events:
     Feb 25 23:02:33.467 : Auto-Sync: In progress. Attempt: 1
     Feb 25 23:03:13.200 : Auto-Sync: Succeeded. Attempt: 1
```

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show chassis cluster interfaces

Supported Platforms SRX Series, vSRX

Syntax **show chassis cluster interfaces**

Release Information Command modified in Junos OS Release 9.0. Output changed to support dual control ports in Junos OS Release 10.0. Output changed to support control interfaces in Junos OS Release 11.2. Output changed to support redundant pseudo interfaces in Junos OS Release 12.1X44-D10. For high-end SRX Series devices, output changed to support the internal security association (SA) option in Junos OS Release 12.1X45-D10.

Description Display the status of the control interface in a chassis cluster configuration.

Required Privilege Level view

Related Documentation

- cluster (Chassis) on page 270

List of Sample Output

show chassis cluster interfaces on page 339
show chassis cluster interfaces (SRX5000 line devices) on page 340
show chassis cluster interfaces on page 340
show chassis cluster interfaces(SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 (SCB3) with enhanced midplanes and SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3)) on page 341

Output Fields Table 34 on page 338 lists the output fields for the **show chassis cluster interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 34: show chassis cluster interfaces Output Fields

Field Name	Field Description
Control link status	State of the chassis cluster control interface: **up** or **down**.
Control interfaces	• **Index**—Index number of the chassis cluster control interface. • **Name**—Name of the chassis cluster control interface. • **Monitored-Status**—Monitored state of the interface: **up** or **down**. • **Internal SA**—State of the internal SA option on the chassis cluster control link: **enabled** or **disabled**. NOTE: This field is available only on high-end SRX Series devices.
Fabric link status	State of the fabric interface: **up** or **down**.
Fabric interfaces	• **Name**—Name of the fabric interface. • **Child-interface**—Name of the child fabric interface. • **Status**—State of the interface: **up** or **down**.

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Table 34: show chassis cluster interfaces Output Fields *(continued)*

Field Name	Field Description
Redundant-ethernet Information	• **Name**—Name of the redundant Ethernet interface. • **Status**—State of the interface: **up** or **down**. • **Redundancy-group**—Identification number (1–255) of the redundancy group associated with the redundant Ethernet interface.
Redundant-pseudo-interface Information	• **Name**—Name of the redundant pseudointerface. • **Status**—State of the redundant pseudointerface: **up** or **down**. • **Redundancy-group**—Identification number (1–255) of the redundancy group associated with the redundant pseudointerface.
Interface Monitoring	• **Interface**—Name of the interface to be monitored. • **Weight**—Relative importance of the interface to redundancy group operation. • **Status**—State of the interface: **up** or **down**. • **Redundancy-group**—Identification number of the redundancy group associated with the interface.

Sample Output

show chassis cluster interfaces

```
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
      Index   Interface        Monitored-Status
      0       em0              Up
      1       em1              Down

Fabric link status: Up

Fabric interfaces:
    Name    Child-interface    Status
    fab0    ge-0/1/0           Up
    fab0
    fab1    ge-6/1/0           Up
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          1
    reth1        Up          2
    reth2        Down        Not configured
    reth3        Down        Not configured
    reth4        Down        Not configured
    reth5        Down        Not configured
    reth6        Down        Not configured
    reth7        Down        Not configured
    reth8        Down        Not configured
    reth9        Down        Not configured
    reth10       Down        Not configured
    reth11       Down        Not configured

Redundant-pseudo-interface Information:
```

```
    Name         Status       Redundancy-group
     lo0           Up               1

Interface Monitoring:
    Interface          Weight     Status     Redundancy-group
    ge-0/1/9           100        Up         0
    ge-0/1/9           100        Up
```

Sample Output

show chassis cluster interfaces (SRX5000 line devices)

```
user@host> show chassis cluster interfaces
Control link status: Up

Control interfaces:
      Index    Interface     Monitored-Status   Internal SA
      0        em0           Up                 enabled
      1        em1           Down               enabled

Fabric link status: Up

Fabric interfaces:
    Name     Child-interface    Status
    fab0     ge-0/1/0           Up
    fab0
    fab1     ge-6/1/0           Up
    fab1

Redundant-ethernet Information:
    Name          Status      Redundancy-group
    reth0         Up          1
    reth1         Up          2
    reth2         Down        Not configured
    reth3         Down        Not configured
    reth4         Down        Not configured
    reth5         Down        Not configured
    reth6         Down        Not configured
    reth7         Down        Not configured
    reth8         Down        Not configured
    reth9         Down        Not configured
    reth10        Down        Not configured
    reth11        Down        Not configured

Redundant-pseudo-interface Information:
    Name         Status       Redundancy-group
     lo0           Up               1

Interface Monitoring:
    Interface          Weight     Status     Redundancy-group
    ge-0/1/9           100        Up         0
    ge-0/1/9           100        Up
```

Sample Output

show chassis cluster interfaces

```
user@host> show chassis cluster interfaces
```

The following output is specific to fabric monitoring failure:

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```
Control link status: Up

Control interfaces:
    Index   Interface    Monitored-Status   Internal-SA
    0       fxp1         Up                 Disabled

Fabric link status: Down

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0    ge-0/0/2           Down / Down
    fab0
    fab1    ge-9/0/2           Up   / Up
    fab1

Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0
```

Sample Output

show chassis cluster interfaces (SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 (SCB3) with enhanced midplanes and SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3))

`user@host>` **show chassis cluster interfaces**

The following output is specific to SRX5400, SRX5600, and SRX5800 devices in a chassis cluster cluster, when the PICs containing fabric links on the SRX5K-MPC3-40G10G (IOC3) are powered off to turn on alternate PICs. If no alternate fabric links are configured on the PICs that are turned on, RTO synchronous communication between the two nodes stops and the chassis cluster session state will not back up, because the fabric link is missing.

```
Control link status: Up

Control interfaces:
    Index   Interface   Monitored-Status   Internal-SA
    0       em0         Up                 Disabled
    1       em1         Down               Disabled

Fabric link status: Down

Fabric interfaces:
    Name    Child-interface    Status
                               (Physical/Monitored)
    fab0                                    <<< fab child missing once PIC off
lined
    fab0
    fab1    xe-10/2/7          Up   / Down
    fab1

Redundant-ethernet Information:
    Name         Status      Redundancy-group
    reth0        Up          Not configured
    reth1        Down        1
```

```
Redundant-pseudo-interface Information:
    Name         Status      Redundancy-group
    lo0          Up          0
```

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show chassis cluster ip-monitoring status redundancy-group

Supported Platforms SRX Series, vSRX

Syntax **show chassis cluster ip-monitoring status <redundancy-group *group-number*>**

Release Information Command introduced in Junos OS Release 9.6. Support for global threshold, current threshold, and weight of each monitored IP address added in Junos OS Release 12.1X47-D10.

Description Display the status of all monitored IP addresses for a redundancy group.

Options

- none— Display the status of monitored IP addresses for all redundancy groups on the node.
- **redundancy-group *group-number*** — Display the status of monitored IP addresses under the specified redundancy group.

Required Privilege Level view

Related Documentation

- *redundancy-group (Interfaces)*
- clear chassis cluster failover-count on page 309
- request chassis cluster failover node on page 315
- request chassis cluster failover reset on page 317

List of Sample Output show chassis cluster ip-monitoring status on page 344
show chassis cluster ip-monitoring status redundancy-group on page 345

Output Fields Table 35 on page 343 lists the output fields for the **show chassis cluster ip-monitoring status** command.

Table 35: show chassis cluster ip-monitoring status Output Fields

Field Name	Field Description
Redundancy-group	ID number (0 - 255) of a redundancy group in the cluster.
Global threshold	Failover value for all IP addresses monitored by the redundancy group.
Current threshold	Value equal to the global threshold minus the total weight of the unreachable IP address.
IP Address	Monitored IP address in the redundancy group.
Status	Current reachability state of the monitored IP address. Values for this field are: **reachable**, **unreachable**, and **unknown**. The status is “unknown” if Packet Forwarding Engines (PFEs) are not yet up and running.

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Table 35: show chassis cluster ip-monitoring status Output Fields *(continued)*

Field Name	Field Description
Failure count	Number of attempts to reach an IP address.
Reason	Explanation for the reported status. See Table 36 on page 344.
Weight	Combined weight (0 - 255) assigned to all monitored IP addresses. A higher weight value indicates greater importance.

Expanded reason output fields for unreachable IP addresses added in Junos OS Release 10.1. You might see any of the following reasons displayed.

Table 36: show chassis cluster ip-monitoring status redundancy group Reason Fields

Reason	Reason Description
No route to host	The router could not resolve the ARP, which is needed to send the ICMP packet to the host with the monitored IP address.
No auxiliary IP found	The redundant Ethernet interface does not have an auxiliary IP address configured.
Reth child not up	A child interface of a redundant Ethernet interface is down.
redundancy-group state unknown	Unable to obtain the state (primary, secondary, secondary-hold, disable) of a redundancy-group.
No reth child MAC address	Could not extract the MAC address of the redundant Ethernet child interface.
Secondary link not monitored	The secondary link might be down (the secondary child interface of a redundant Ethernet interface is either down or non-functional).
Unknown	The IP address has just been configured and the router still does not know the status of this IP. or Do not know the exact reason for the failure.

Sample Output

show chassis cluster ip-monitoring status

```
user@host> show chassis cluster ip-monitoring status
node0:
--------------------------------------------------------------------------

Redundancy group: 1
Global threshold: 200
Current threshold: -120

IP address                 Status        Failure count  Reason     Weight
10.254.5.44                reachable       0            n/a        220
2.2.2.1                    reachable       0            n/a        100
```


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```
node1:
--------------------------------------------------------------------------

Redundancy group: 1
Global threshold: 200
Current threshold: -120

IP address                 Status        Failure count  Reason     Weight
10.254.5.44                reachable       0            n/a        220
2.2.2.1                    reachable       0            n/a        100
```

Sample Output

show chassis cluster ip-monitoring status redundancy-group

```
user@host> show chassis cluster ip-monitoring status redundancy-group 1
node0:
--------------------------------------------------------------------------

Redundancy group: 1

IP address                 Status        Failure count  Reason
10.254.5.44                reachable       0            n/a
2.2.2.1                    reachable       0            n/a
1.1.1.5                    reachable       0            n/a
1.1.1.4                    reachable       0            n/a
1.1.1.1                    reachable       0            n/a

node1:
--------------------------------------------------------------------------

Redundancy group: 1

IP address                 Status        Failure count  Reason
10.254.5.44                reachable       0            n/a
2.2.2.1                    reachable       0            n/a
1.1.1.5                    reachable       0            n/a
1.1.1.4                    reachable       0            n/a
1.1.1.1                    reachable       0            n/a
```

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show chassis cluster statistics

Supported Platforms SRX Series, vSRX

Syntax **show chassis cluster statistics**

Release Information Command modified in Junos OS Release 9.0. Output changed to support dual control ports in Junos OS Release 10.0.

Description Display information about chassis cluster services and interfaces.

Required Privilege Level view

Related Documentation
- clear chassis cluster statistics on page 313

List of Sample Output
show chassis cluster statistics on page 347
show chassis cluster statistics (SRX5000 line devices) on page 348
show chassis cluster statistics (SRX5000 line devices) on page 349

Output Fields Table 37 on page 346 lists the output fields for the **show chassis cluster statistics** command. Output fields are listed in the approximate order in which they appear.

Table 37: show chassis cluster statistics Output Fields

Field Name	Field Description
Control link statistics	Statistics of the control link used by chassis cluster traffic. Statistics for **Control link 1** are displayed when you use dual control links (SRX5000 lines only). Note that the output for the SRX5000 lines will always show **Control link 0** and **Control link 1** statistics, even though only one control link is active or working. • **Heartbeat packets sent**—Number of heartbeat messages sent on the control link. • **Heartbeat packets received**—Number of heartbeat messages received on the control link. • **Heartbeat packet errors**—Number of heartbeat packets received with errors on the control link.
Fabric link statistics	Statistics of the fabric link used by chassis cluster traffic. Statistics for **Child Link 1** are displayed when you use dual fabric links. • **Probes sent**—Number of probes sent on the fabric link. • **Probes received**—Number of probes received on the fabric link.

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Table 37: show chassis cluster statistics Output Fields *(continued)*

Field Name	Field Description
Services Synchronized	• **Service name**—Name of the service. • **Rtos sent**—Number of runtime objects (RTOs) sent. • **Rtos received**—Number of RTOs received. • **Translation context**—Messages synchronizing Network Address Translation (NAT) translation context. • **Incoming NAT**—Messages synchronizing incoming Network Address Translation (NAT) service. • **Resource manager**—Messages synchronizing resource manager groups and resources. • **Session create**—Messages synchronizing session creation. • **Session close**—Messages synchronizing session close. • **Session change**—Messages synchronizing session change. • **Gate create**—Messages synchronizing creation of pinholes (temporary openings in the firewall). • **Session ageout refresh request**—Messages synchronizing request session after age-out. • **Session ageout refresh reply**—Messages synchronizing reply session after age-out. • **IPsec VPN**—Messages synchronizing VPN session. • **Firewall user authentication**—Messages synchronizing firewall user authentication session. • **MGCP ALG**—Messages synchronizing MGCP ALG sessions. • **H323 ALG**—Messages synchronizing H.323 ALG sessions. • **SIP ALG**—Messages synchronizing SIP ALG sessions. • **SCCP ALG**—Messages synchronizing SCCP ALG sessions. • **PPTP ALG**—Messages synchronizing PPTP ALG sessions. • **RTSP ALG**—Messages synchronizing RTSP ALG sessions. • **MAC address learning**—Messages synchronizing MAC address learning.

Sample Output

show chassis cluster statistics

```
user@host> show chassis cluster statistics
Control link statistics:
    Control link 0:
        Heartbeat packets sent: 798
        Heartbeat packets received: 784
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 793
        Probes received: 0
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          0            0
    Session create                            0            0
    Session close                             0            0
    Session change                            0            0
    Gate create                               0            0
```

```
    Session ageout refresh requests          0            0
    Session ageout refresh replies           0            0
    IPsec VPN                                0            0
    Firewall user authentication             0            0
    MGCP ALG                                 0            0
    H323 ALG                                 0            0
    SIP ALG                                  0            0
    SCCP ALG                                 0            0
    PPTP ALG                                 0            0
    RTSP ALG                                 0            0
    MAC address learning                     0            0
```

Sample Output

show chassis cluster statistics (SRX5000 line devices)

```
user@host> show chassis cluster statistics
Control link statistics:
    Control link 0:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
    Control link 1:
        Heartbeat packets sent: 258689
        Heartbeat packets received: 258684
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
    Child link 1
        Probes sent: 258501
        Probes received: 258501
Services Synchronized:
    Service name                             RTOs sent    RTOs received
    Translation context                      0            0
    Incoming NAT                             0            0
    Resource manager                         0            0
    Session create                           1            0
    Session close                            1            0
    Session change                           0            0
    Gate create                              0            0
    Session ageout refresh requests          0            0
    Session ageout refresh replies           0            0
    IPSec VPN                                0            0
    Firewall user authentication             0            0
    MGCP ALG                                 0            0
    H323 ALG                                 0            0
    SIP ALG                                  0            0
    SCCP ALG                                 0            0
    PPTP ALG                                 0            0
    RPC ALG                                  0            0
    RTSP ALG                                 0            0
    RAS ALG                                  0            0
    MAC address learning                     0            0
    GPRS GTP                                 0            0
```

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Sample Output

show chassis cluster statistics (SRX5000 line devices)

```
user@host> show chassis cluster statistics
Control link statistics:
    Control link 0:
        Heartbeat packets sent: 82371
        Heartbeat packets received: 82321
        Heartbeat packets errors: 0
    Control link 1:
        Heartbeat packets sent: 0
        Heartbeat packets received: 0
        Heartbeat packets errors: 0
Fabric link statistics:
    Child link 0
        Probes sent: 258681
        Probes received: 258681
    Child link 1
        Probes sent: 258501
        Probes received: 258501
Services Synchronized:
    Service name                              RTOs sent    RTOs received
    Translation context                       0            0
    Incoming NAT                              0            0
    Resource manager                          0            0
    Session create                            1            0
    Session close                             1            0
    Session change                            0            0
    Gate create                               0            0
    Session ageout refresh requests           0            0
    Session ageout refresh replies            0            0
    IPSec VPN                                 0            0
    Firewall user authentication              0            0
    MGCP ALG                                  0            0
    H323 ALG                                  0            0
    SIP ALG                                   0            0
    SCCP ALG                                  0            0
    PPTP ALG                                  0            0
    RPC ALG                                   0            0
    RTSP ALG                                  0            0
    RAS ALG                                   0            0
    MAC address learning                      0            0
    GPRS GTP                                  0            0
```

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show chassis cluster status

Supported Platforms SRX Series, vSRX

Syntax
show chassis cluster status
<redundancy-group *group-number* >

Release Information Command modified in Junos OS Release 9.2. Support for dual control ports added in Junos OS Release 10.0. Support for monitoring failures added in Junos OS Release 12.1X47-D10.

Description Display the failover status of a chassis cluster.

Options
- none—Display the status of all redundancy groups in the chassis cluster.
- **redundancy-group** ***group-number*** —(Optional) Display the status of the specified redundancy group.

Required Privilege Level view

Related Documentation
- redundancy-group (Chassis Cluster) on page 290
- clear chassis cluster failover-count on page 309
- request chassis cluster failover node on page 315
- request chassis cluster failover reset on page 317

List of Sample Output
show chassis cluster status on page 351
show chassis cluster status redundancy-group 1 on page 352

Output Fields Table 38 on page 350 lists the output fields for the **show chassis cluster status** command. Output fields are listed in the approximate order in which they appear.

Table 38: show chassis cluster status Output Fields

Field Name	Field Description
Cluster ID	ID number (1-15) of a cluster is applicable for releases upto 12.1X45-D10. ID number (1-255) is applicable for releases 12.1X45-D10 and later. Setting a cluster ID to 0 is equivalent to disabling a cluster.
Redundancy-Group	ID number (1-128) of a redundancy group in the chassis cluster.
Node name	Node (device) in the chassis cluster (**node0** or **node1**).
Priority	Assigned priority for the redundancy group on that node.

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Table 38: show chassis cluster status Output Fields *(continued)*

Field Name	Field Description
Status	State of the redundancy group (**Primary**, **Secondary**, **Lost**, or **Unavailable**). • **Primary**—Redundancy group is active and passing traffic. • **Secondary**—Redundancy group is passive and not passing traffic. • **Lost**—Node loses contact with the other node through the control link. Most likely to occur when both nodes are in a cluster and due to control link failure, one node cannot exchange heartbeats, or when the other node is rebooted. • **Unavailable**—Node has not received a single heartbeat over the control link from the other node since the other node booted up. Most likely to occur when one node boots up before the other node, or if only one node is present in the cluster.
Preempt	• **Yes**: Mastership can be preempted based on priority. • **No**: Change in priority will not preempt the mastership.
Manual failover	• **Yes**: If the Mastership is set manually through the CLI with the **request chassis cluster failover node** or **request chassis cluster failover redundancy-group** command. This overrides **Priority** and **Preempt**. • **No**: Mastership is not set manually through the CLI.
Monitor-failures	• **None**: Cluster working properly. • **Monitor Failure code**: Cluster is not working properly and the respective failure code is displayed.

Sample Output

Displays chassis cluster status with all redundancy groups.

show chassis cluster status

```
user@host> show chassis cluster status

Monitor Failure codes:
  CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 1
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 0 , Failover count: 1
node0  200      primary        no      no       None
node1  1        secondary      no      no       None

Redundancy group: 1 , Failover count: 1
node0  101      primary        no      no       None
node1  1        secondary      no      no       None
```

Sample Output

Displays chassis cluster status with redundancy group 1 only.

show chassis cluster status redundancy-group 1

```
user@host> show chassis cluster status redundancy-group 1

Monitor Failure codes:
    CS  Cold Sync monitoring        FL  Fabric Connection monitoring
    GR  GRES monitoring             HW  Hardware monitoring
    IF  Interface monitoring        IP  IP monitoring
    LB  Loopback monitoring         MB  Mbuf monitoring
    NH  Nexthop monitoring          NP  NPC monitoring
    SP  SPU monitoring              SM  Schedule monitoring
    CF  Config Sync monitoring

Cluster ID: 1
Node   Priority Status         Preempt Manual   Monitor-failures

Redundancy group: 1 , Failover count: 1
node0  101      primary        no      no       None
node1  1        secondary      no      no       None
```


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show chassis environment (Security)

Supported Platforms SRX Series, vSRX

Syntax show chassis environment

Release Information Command introduced in Junos OS Release 9.2.

Description Display environmental information about the services gateway chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

Options **none**—Display environmental information about the device.

cb ***slot-number***—Display chassis environmental information for the Control Board.

fpc ***fpc-slot***—Display chassis environmental information for a specified Flexible PIC Concentrator.

fpm—Display chassis environmental information for the craft interface (FPM).

pem ***slot-number***—Display chassis environmental information for the specified Power Entry Module.

routing-engine ***slot-number***—Display chassis environmental information for the specified Routing Engine.

Required Privilege Level view

Related Documentation

- show chassis hardware (View) on page 372

List of Sample Output show chassis environment on page 353

Output Fields Table 39 on page 353 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 39: show chassis environment Output Fields

Field Name	Field Description
Temp	Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F).
Fan	Fan status: **OK**, **Testing** (during initial power-on), **Failed**, or **Absent**.

Sample Output

show chassis environment

```
user@host> show chassis environment
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         OK         40 degrees C / 104 degrees F
```

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```
PEM 1                          OK          40 degrees C / 104 degrees F
PEM 2                          OK          40 degrees C / 104 degrees F
PEM 3                          OK          45 degrees C / 113 degrees F
Routing Engine 0               OK          31 degrees C / 87 degrees F
Routing Engine 0 CPU           OK          27 degrees C / 80 degrees F
Routing Engine 1               Absent
Routing Engine 1 CPU           Absent
CB 0 Intake                    OK          28 degrees C / 82 degrees F
CB 0 Exhaust A                 OK          27 degrees C / 80 degrees F
CB 0 Exhaust B                 OK          29 degrees C / 84 degrees F
CB 0 ACBC                      OK          29 degrees C / 84 degrees F
CB 0 SF A                      OK          36 degrees C / 96 degrees F
CB 0 SF B                      OK          31 degrees C / 87 degrees F
CB 1 Intake                    OK          27 degrees C / 80 degrees F
CB 1 Exhaust A                 OK          26 degrees C / 78 degrees F
CB 1 Exhaust B                 OK          29 degrees C / 84 degrees F
CB 1 ACBC                      OK          27 degrees C / 80 degrees F
CB 1 SF A                      OK          36 degrees C / 96 degrees F
CB 1 SF B                      OK          31 degrees C / 87 degrees F
CB 2 Intake                    Absent
CB 2 Exhaust A                 Absent
CB 2 Exhaust B                 Absent
CB 2 ACBC                      Absent
CB 2 XF A                      Absent
CB 2 XF B                      Absent
FPC 0 Intake                   OK          47 degrees C / 116 degrees F
FPC 0 Exhaust A                OK          44 degrees C / 111 degrees F
FPC 0 Exhaust B                OK          52 degrees C / 125 degrees F
FPC 0 xlp0 TSen                OK          51 degrees C / 123 degrees F
FPC 0 xlp0 Chip                OK          46 degrees C / 114 degrees F
FPC 0 xlp1 TSen                OK          51 degrees C / 123 degrees F
FPC 0 xlp1 Chip                OK          47 degrees C / 116 degrees F
FPC 0 xlp2 TSen                OK          44 degrees C / 111 degrees F
FPC 0 xlp2 Chip                OK          42 degrees C / 107 degrees F
FPC 0 xlp3 TSen                OK          48 degrees C / 118 degrees F
FPC 0 xlp3 Chip                OK          43 degrees C / 109 degrees F
FPC 1 Intake                   OK          41 degrees C / 105 degrees F
FPC 1 Exhaust A                OK          41 degrees C / 105 degrees F
FPC 1 Exhaust B                OK          51 degrees C / 123 degrees F
FPC 1 LU TSen                  OK          46 degrees C / 114 degrees F
FPC 1 LU Chip                  OK          45 degrees C / 113 degrees F
FPC 1 XM TSen                  OK          46 degrees C / 114 degrees F
FPC 1 XM Chip                  OK          52 degrees C / 125 degrees F
FPC 1 xlp0 TSen                OK          49 degrees C / 120 degrees F
FPC 1 xlp0 Chip                OK          42 degrees C / 107 degrees F
FPC 1 xlp1 TSen                OK          49 degrees C / 120 degrees F
FPC 1 xlp1 Chip                OK          44 degrees C / 111 degrees F
FPC 1 xlp2 TSen                OK          38 degrees C / 100 degrees F
FPC 1 xlp2 Chip                OK          39 degrees C / 102 degrees F
FPC 1 xlp3 TSen                OK          44 degrees C / 111 degrees F
FPC 1 xlp3 Chip                OK          42 degrees C / 107 degrees F
FPC 2 Intake                   OK          29 degrees C / 84 degrees F
FPC 2 Exhaust A                OK          34 degrees C / 93 degrees F
FPC 2 Exhaust B                OK          40 degrees C / 104 degrees F
FPC 2 I3 0 TSensor             OK          42 degrees C / 107 degrees F
FPC 2 I3 0 Chip                OK          41 degrees C / 105 degrees F
FPC 2 I3 1 TSensor             OK          40 degrees C / 104 degrees F
FPC 2 I3 1 Chip                OK          39 degrees C / 102 degrees F
FPC 2 I3 2 TSensor             OK          38 degrees C / 100 degrees F
FPC 2 I3 2 Chip                OK          37 degrees C / 98 degrees F
FPC 2 I3 3 TSensor             OK          35 degrees C / 95 degrees F
```


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```
            FPC 2 I3 3 Chip               OK          35 degrees C / 95 degrees F
            FPC 2 IA 0 TSensor            OK          45 degrees C / 113 degrees F
            FPC 2 IA 0 Chip               OK          42 degrees C / 107 degrees F
            FPC 2 IA 1 TSensor            OK          41 degrees C / 105 degrees F
            FPC 2 IA 1 Chip               OK          43 degrees C / 109 degrees F
            FPC 9 Intake                  OK          29 degrees C / 84 degrees F
            FPC 9 Exhaust A               OK          41 degrees C / 105 degrees F
            FPC 9 Exhaust B               OK          48 degrees C / 118 degrees F
            FPC 9 LU TSen                 OK          48 degrees C / 118 degrees F
            FPC 9 LU Chip                 OK          47 degrees C / 116 degrees F
            FPC 9 XM TSen                 OK          48 degrees C / 118 degrees F
            FPC 9 XM Chip                 OK          54 degrees C / 129 degrees F
            FPC 9 xlp0 TSen               OK          45 degrees C / 113 degrees F
            FPC 9 xlp0 Chip               OK          42 degrees C / 107 degrees F
            FPC 9 xlp1 TSen               OK          49 degrees C / 120 degrees F
            FPC 9 xlp1 Chip               OK          46 degrees C / 114 degrees F
            FPC 9 xlp2 TSen               OK          37 degrees C / 98 degrees F
            FPC 9 xlp2 Chip               OK          40 degrees C / 104 degrees F
            FPC 9 xlp3 TSen               OK          45 degrees C / 113 degrees F
            FPC 9 xlp3 Chip               OK          41 degrees C / 105 degrees F
            FPC 10 Intake                 OK          32 degrees C / 89 degrees F
            FPC 10 Exhaust A              OK          44 degrees C / 111 degrees F
            FPC 10 Exhaust B              OK          53 degrees C / 127 degrees F
            FPC 10 LU 0 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 LU 0 Chip              OK          52 degrees C / 125 degrees F
            FPC 10 LU 1 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 LU 1 Chip              OK          44 degrees C / 111 degrees F
            FPC 10 LU 2 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 LU 2 Chip              OK          50 degrees C / 122 degrees F
            FPC 10 LU 3 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 LU 3 Chip              OK          58 degrees C / 136 degrees F
            FPC 10 XM 0 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 XM 0 Chip              OK          53 degrees C / 127 degrees F
            FPC 10 XF 0 TSen              OK          43 degrees C / 109 degrees F
            FPC 10 XF 0 Chip              OK          64 degrees C / 147 degrees F
            FPC 10 PLX Switch TSen        OK          43 degrees C / 109 degrees F
            FPC 10 PLX Switch Chip        OK          44 degrees C / 111 degrees F
            FPC 11 Intake                 OK          32 degrees C / 89 degrees F
            FPC 11 Exhaust A              OK          41 degrees C / 105 degrees F
            FPC 11 Exhaust B              OK          56 degrees C / 132 degrees F
            FPC 11 LU 0 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 LU 0 Chip              OK          50 degrees C / 122 degrees F
            FPC 11 LU 1 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 LU 1 Chip              OK          47 degrees C / 116 degrees F
            FPC 11 LU 2 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 LU 2 Chip              OK          52 degrees C / 125 degrees F
            FPC 11 LU 3 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 LU 3 Chip              OK          60 degrees C / 140 degrees F
            FPC 11 XM 0 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 XM 0 Chip              OK          56 degrees C / 132 degrees F
            FPC 11 XF 0 TSen              OK          45 degrees C / 113 degrees F
            FPC 11 XF 0 Chip              OK          65 degrees C / 149 degrees F
            FPC 11 PLX Switch TSen        OK          45 degrees C / 113 degrees F
            FPC 11 PLX Switch Chip        OK          46 degrees C / 114 degrees F
      Fans  Top Fan Tray Temp             OK          34 degrees C / 93 degrees F
            Top Tray Fan 1                OK          Spinning at normal speed
            Top Tray Fan 2                OK          Spinning at normal speed
            Top Tray Fan 3                OK          Spinning at normal speed
            Top Tray Fan 4                OK          Spinning at normal speed
            Top Tray Fan 5                OK          Spinning at normal speed
            Top Tray Fan 6                OK          Spinning at normal speed
```

```
Top Tray Fan 7                 OK         Spinning at normal speed
Top Tray Fan 8                 OK         Spinning at normal speed
Top Tray Fan 9                 OK         Spinning at normal speed
Top Tray Fan 10                OK         Spinning at normal speed
Top Tray Fan 11                OK         Spinning at normal speed
Top Tray Fan 12                OK         Spinning at normal speed
Bottom Fan Tray Temp           OK         31 degrees C / 87 degrees F
Bottom Tray Fan 1              OK         Spinning at normal speed
Bottom Tray Fan 2              OK         Spinning at normal speed
Bottom Tray Fan 3              OK         Spinning at normal speed
Bottom Tray Fan 4              OK         Spinning at normal speed
Bottom Tray Fan 5              OK         Spinning at normal speed
Bottom Tray Fan 6              OK         Spinning at normal speed
Bottom Tray Fan 7              OK         Spinning at normal speed
Bottom Tray Fan 8              OK         Spinning at normal speed
Bottom Tray Fan 9              OK         Spinning at normal speed
Bottom Tray Fan 10             OK         Spinning at normal speed
Bottom Tray Fan 11             OK         Spinning at normal speed
Bottom Tray Fan 12             OK         Spinning at normal speed
  OK
```


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show chassis ethernet-switch

Supported Platforms SRX Series, vSRX

Syntax show chassis ethernet-switch

Release Information Command introduced in Junos OS Release 9.2.

Description SRX Series devices display information about the ports on the Control Board (CB) Ethernet switch.

Required Privilege Level view

Related Documentation
- cluster (Chassis) on page 270

List of Sample Output show chassis ethernet-switch on page 357

Output Fields Table 40 on page 357 lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

Table 40: show chassis ethernet-switch Output Fields

Field Name	Field Description
Link is good on port n connected to device or **Link is good on Fast Ethernet port n connected to device**	Information about the link between each port on the CB's Ethernet switch and one of the following devices: • FPC0 (Flexible PIC Concentrator 0) through FPC7 • Local controller • Routing Engine • Other Routing Engine (on a system with two Routing Engines) • SPMB (Switch Processor Mezzanine Board)
Speed is	Speed at which the Ethernet link is running.
Duplex is	Duplex type of the Ethernet link: **full** or **half**.
Autonegotiate is Enabled (or Disabled)	By default, built-in Fast Ethernet ports on a PIC autonegotiate whether to operate at 10 Mbps or 100 Mbps. All other interfaces automatically choose the correct speed based on the PIC type and whether the PIC is configured to operate in multiplexed mode.

Sample Output

show chassis ethernet-switch

```
user@host> show chassis ethernet-switch
node0:
--------------------------------------------------------------------------
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
```

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```
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 1 connected to device: FPC1
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 2 connected to device: FPC2
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 3 connected to device: FPC3
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 4 connected to device: FPC4
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is down on GE port 5 connected to device: FPC5

  Link is down on GE port 6 connected to device: FPC6

  Link is good on GE port 7 connected to device: FPC7
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 8 connected to device: FPC8
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is good on GE port 9 connected to device: FPC9
    Speed is 1000Mb
    Duplex is full
    Autonegotiate is Enabled
    Flow Control TX is Disabled
    Flow Control RX is Disabled

  Link is down on GE port 10 connected to device: FPC10

  Link is down on GE port 11 connected to device: FPC11
```


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```
Link is good on GE port 12 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 13 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 14 connected to device: Debug-GigE

node1:
--------------------------------------------------------------------------
Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 2 connected to device: FPC2
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC3
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC4
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 5 connected to device: FPC5

Link is down on GE port 6 connected to device: FPC6

Link is good on GE port 7 connected to device: FPC7
  Speed is 1000Mb
  Duplex is full
```

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```
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 10 connected to device: FPC10

Link is down on GE port 11 connected to device: FPC11

Link is good on GE port 12 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 13 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 14 connected to device: Debug-GigE
```

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show chassis fabric plane

Supported Platforms SRX Series, vSRX

Syntax show chassis fabric plane

Release Information Command introduced in Junos OS Release 9.2.

Description Show state of fabric management plane.

Required Privilege Level view

Related Documentation

- show chassis fabric plane-location on page 367

List of Sample Output show chassis fabric plane(SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4) on page 362

Output Fields Table 41 on page 361 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 41: show chassis fabric plane Output Fields

Field Name	Field Description	Level of output
Plane	Number of the plane.	none

Plane state	State of each plane:
	• **ACTIVE**—SIB is operational and running.
	• **FAULTY**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  ◦ On-board fabric ASIC is not operational.
	  ◦ Fiber-optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
		none

FPC	Slot number of each Flexible PIC Concentrator (FPC).	none
PFE	Slot number of each Packet Forwarding Engine and the state of the links to the FPC: • **Links ok**: Link between SIB and FPC is active. • **Link error**: Link between SIB and FPC is not operational. • **Unused**: No FPC is present.	none

Table 41: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

State	State of the fabric plane:
	• **Online**: Fabric plane is operational and running and links on the SIB are operational.
	• **Offline**: Fabric plane state is **Offline** because the plane does not have four or more F2S and one F13 online.
	• **Empty**: Fabric plane state is **Empty** if all SIBs in the plane are absent.
	• **Spare**: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.
	• **Check**: Fabric plane is in alarmed state due to the following reason and the cause of the error must be resolved:
	  • One or more SIBs (belonging to the fabric plane) in the **Online** or **Spare** states has transitioned to the **Check** state. **Check** state of the SIB can be caused by link errors or destination errors.
	• **Fault**: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the **Fault** state. A SIB can be in the **Fault** state because of the following reasons:
	  • On-board fabric ASIC is not operational.
	  • Fiber-optic connector faults.
	  • FPC connector faults.
	  • SIB midplane connector faults.
	  • Link errors have exceeded the threshold.
		none

Sample Output

show chassis fabric plane (SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4)

```
user@host> show chassis fabric plane
node0:
--------------------------------------------------------------------------
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 9
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
```

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```
Plane 1
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 9
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 9
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 9
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 4
  Plane state: SPARE
      FPC 0
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
```

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```
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 7
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
        FPC 10
            PFE 0 :Links ok
Plane 5
  Plane state: SPARE
        FPC 0
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 7
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 9
            PFE 0 :Links ok
        FPC 10
            PFE 0 :Links ok

node1:
--------------------------------------------------------------------------
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
        FPC 3
            PFE 0 :Links ok
        FPC 4
            PFE 0 :Links ok
        FPC 7
            PFE 0 :Links ok
        FPC 8
            PFE 0 :Links ok
        FPC 10
            PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
        FPC 0
            PFE 0 :Links ok
        FPC 1
            PFE 0 :Links ok
        FPC 2
            PFE 0 :Links ok
        FPC 3
            PFE 0 :Links ok
```

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```
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
      FPC 0
          PFE 0 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
Plane 4
  Plane state: SPARE
      FPC 0
          PFE 0 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 10
```

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```
          PFE 0 :Links ok
Plane 5
  Plane state: SPARE
      FPC 0
          PFE 0 :Links ok
      FPC 1
          PFE 0 :Links ok
      FPC 2
          PFE 0 :Links ok
      FPC 3
          PFE 0 :Links ok
      FPC 4
          PFE 0 :Links ok
      FPC 7
          PFE 0 :Links ok
      FPC 8
          PFE 0 :Links ok
      FPC 10
          PFE 0 :Links ok
```


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show chassis fabric plane-location

Supported Platforms SRX Series, vSRX

Syntax show chassis fabric plane-location

Release Information Command introduced in Junos OS Release 9.2.

Description Show fabric plane location.

Required Privilege Level view

Related Documentation

- show chassis fabric plane on page 361

List of Sample Output show chassis fabric plane-location(SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4) on page 367

Output Fields Table 42 on page 367 lists the output fields for the **show chassis fabric plane-location** command. Output fields are listed in the approximate order in which they appear.

Table 42: show chassis fabric plane-location Output Fields

Field Name	Field Description
Plane *n*	Plane number.
Control Board *n*	Control Board number.

Sample Output

show chassis fabric plane-location (SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4)

```
user@host> show chassis fabric plane-location
node0:
--------------------------------------------------------------------------
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
Plane 4                         Control Board 2
Plane 5                         Control Board 2

node1:
--------------------------------------------------------------------------
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
Plane 4                         Control Board 2
Plane 5                         Control Board 2
```

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show chassis fabric summary

Supported Platforms SRX Series, vSRX

Syntax show chassis fabric summary

Release Information Command introduced in Junos OS Release 9.2.

Description Show summary fabric management state.

Options This command has no options.

Required Privilege Level view

Related Documentation

- show chassis fabric plane on page 361
- show chassis fabric plane-location on page 367

List of Sample Output show chassis fabric summary(SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4) on page 370

Output Fields Table 43 on page 369 lists the output fields for the **show chassis fabric summary** command. Output fields are listed in the approximate order in which they appear.

Table 43: show chassis fabric summary Output Fields

Field Name	Field Description
Plane	Plane number.

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Table 43: show chassis fabric summary Output Fields *(continued)*

Field Name	Field Description

State	State of the SIB or FPC:
	• **Online**—Switch Interface Board (SIB) is operational and running.
	• **Empty**—SIB is powered down.
	• **Check**—SIB is in the **Check** state because of the following reasons:
	  ◦ SIB is not inserted properly.
	  ◦ Some destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine.
	  ◦ Some link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime:
	    ▪ Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Plane disabled** as status for this link.
	    ▪ Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The **show chassis fabric fpcs** command shows **Link error** as the status for this link.
	For information about link and destination errors, issue the **show chassis fabric fpcs** commands.
	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails.

Errors	Indicates whether there is any error on the SIB. • **None**—No errors • **Link Errors**—Fabric link errors were found on the SIB RX link. • **Cell drops**—Fabric cell drops were found on the SIB ASIC. • **Link, Cell drops**—Both link errors and cell drops were detected on at least one of the FPC's fabric links. NOTE: The **Errors** column is empty only when the FPC or SIB is offline.
Uptime	Elapsed time the plane has been online.

Sample Output

show chassis fabric summary (SRX5600 and SRX5800 devices with SRX5000 line SCB II (SRX5K-SCBE) and SRX5K-RE-1800X4)

```
user@host> show chassis fabric summary
node0:
--------------------------------------------------------------------------
Plane   State    Uptime
 0      Online   14 minutes, 10 seconds
 1      Online   14 minutes, 5 seconds
 2      Online   14 minutes
 3      Online   13 minutes, 55 seconds
```

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```
 4      Spare    13 minutes, 50 seconds
 5      Spare    13 minutes, 44 seconds

node1:
--------------------------------------------------------------------------
Plane   State    Uptime
 0      Online   14 minutes, 7 seconds
 1      Online   14 minutes, 2 seconds
 2      Online   13 minutes, 57 seconds
 3      Online   13 minutes, 51 seconds
 4      Spare    13 minutes, 46 seconds
 5      Spare    13 minutes, 41 seconds
```

show chassis hardware (View)

Supported Platforms SRX Series

Syntax **show chassis hardware**
<**clei-models** | **detail** | **extensive** | **models** | **node** (*node-id* | **all** | **local** | **primary**)>

Release Information Command introduced in Junos OS Release 9.2. Command modified in Junos OS Release 9.2 to include **node** option.

Description Display chassis hardware information.

Options

- **clei-models**—(Optional) Display Common Language Equipment Identifier Code (CLEI) barcode and model number for orderable field-replaceable units (FRUs).
- **detail** | **extensive**—(Optional) Display the specified level of output.
- **models**—(Optional) Display model numbers and part numbers for orderable FRUs.
- **node**—(Optional) For chassis cluster configurations, display chassis hardware information on a specific node (device) in the cluster.
  - ***node-id*** —Identification number of the node. It can be 0 or 1.
  - **local**—Display information about the local node.
  - **primary**—Display information about the primary node.

Required Privilege Level view

Related Documentation

- *Juniper Networks Devices Processing Overview*
- *Interface Naming Conventions*

Output Fields Table 44 on page 372 lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 44: show chassis hardware Output Fields

Field Name	Field Description
Item	Chassis component—Information about the backplane; power supplies; fan trays; Routing Engine; each Physical Interface Module (PIM)—reported as FPC and PIC—and each fan, blower, and impeller.
Version	Revision level of the chassis component.
Part Number	Part number for the chassis component.
Serial Number	Serial number of the chassis component. The serial number of the backplane is also the serial number of the device chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the device chassis.

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Table 44: show chassis hardware Output Fields *(continued)*

Field Name	Field Description
Assb ID or Assembly ID	Identification number that describes the FRU hardware.
FRU model number	Model number of FRU hardware component.
CLEI code	Common Language Equipment Identifier code. This value is displayed only for hardware components that use ID EEPROM format v2. This value is not displayed for components that use ID EEPROM format v1.
EEPROM Version	ID EEPROM version used by hardware component: 0x01 (version 1) or 0x02 (version 2).

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Table 44: show chassis hardware Output Fields *(continued)*

Field Name	Field Description
Description	Brief description of the hardware item: • Type of power supply. • Switch Control Board (SCB) Starting with Junos OS Release 12.1X47-D15, the SRX5K-SCBE (SCB2) is introduced. • There are three SCB slots in SRX5800 devices. The third slot can be used for an SCB or an FPC. When an SRX5K-SCB was used , the third SCB slot was used as an FPC. SCB redundancy is provided in chassis cluster mode. • With an SCB2, a third SCB is supported. If a third SCB is plugged in, it provides intra-chassis fabric redundancy. • The Ethernet switch in the SCB2 provides the Ethernet connectivity among all the FPCs and the Routing Engine. The Routing Engine uses this connectivity to distribute forwarding and routing tables to the FPCs. The FPCs use this connectivity to send exception packets to the Routing Engine. • Fabric connects all FPCs in the data plane. The Fabric Manager executes on the Routing Engine and controls the fabric system in the chassis. Packet Forwarding Engines on the FPC and fabric planes on the SCB are connected through HSL2 channels. • SCB2 supports HSL2 with both 3.11 Gbps and 6.22 Gbps (SerDes) link speed and various HSL2 modes. When an FPC is brought online, the link speed and HSL2 mode are determined by the type of FPC. Starting with Junos OS Release 15.1X49-D10, the SRX5K-SCB3 (SCB3) with enhanced midplanes is introduced. • All existing SCB software that is supported by SCB2 is supported on SCB3. • SRX5K-RE-1800X4 (RE2). Mixed Routing Engine use is not supported. • SCB3 works with the SRX5K-MPC (IOC2), SRX5K-MPC3-100G10G (IOC3), SRX5K-MPC3-40G10G (IOC3), and SRX5K-SPC-4-15-320 (SPC2) with current midplanes and the new enhanced midplanes. • Mixed SCB use is not supported. If an SCB2 and an SCB3 are used, the system will only power on the master Routing Engine's SCB and will power off the other SCBs. Only the SCB in slot 0 will be powered on and a system log is generated. • SCB3 supports up to 400 Gbps per slot with old midplanes and up to 500 Gbps per slot with new midplanes. • SCB3 supports fabric intra-chassis redundancy. • SCB3 supports the same chassis cluster function as the SRX5K-SCB (SCB1) and the SRX5K-SCBE (SCB2), except for in-service software upgrade (ISSU) and in-service hardware upgrade (ISHU). • SCB3 has a second external Ethernet port. • Fabric bandwidth increasing mode is not supported.

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Table 44: show chassis hardware Output Fields *(continued)*

Field Name	Field Description
	• Type of Flexible PIC Concentrator (FPC), Physical Interface Card (PIC), Modular Interface Cards (MICs), and PIMs. • IOCs Starting with Junos OS Release 15.1X49-D10, the SRX5K-MPC3-100G10G (IOC3) and the SRX5K-MPC3-40G10G (IOC3) are introduced. ◦ IOC3 has two types of IOC3 MPCs, which have different built-in MICs: the 24x10GE + 6x40GE MPC and the 2x100GE + 4x10GE MPC. ◦ IOC3 supports SCB3 and SRX5000 line backplane and enhanced backplane. ◦ IOC3 can only work with SRX5000 line SCB2 and SCB3. If an SRX5000 line SCB is detected, IOC3 will be offline, an FPC misconfiguration alarm will be raised, and a system log message is generated. ◦ IOC3 interoperates with SCB2 and SCB3. ◦ IOC3 interoperates with the SRX5K-SPC-4-15-320 (SPC2) and the SRX5K-MPC (IOC2). ◦ The maximum power consumption for one IOC3 is 645W. An enhanced power module must be used. ◦ The IOC3 does not support the following command to set a PIC to go offline or online: **request chassis pic fpc-slot <fpc-slot> pic-slot <pic-slot> <offline | online>** . ◦ IOC3 supports 240 Gbps of throughput with the enhanced SRX5000 line backplane. ◦ Chassis cluster functions the same as for the SRX5000 line IOC2. ◦ IOC3 supports intra-chassis and inter-chassis fabric redundancy mode. ◦ IOC3 supports ISSU and ISHU in chassis cluster mode. ◦ IOC3 supports intra-FPC and and Inter-FPC Express Path (previously known as *services offloading*) with IPv4. ◦ NAT of IPv4 and IPv6 in normal mode and IPv4 for Express Path mode. ◦ All four PICs on the 24x10GE + 6x40GE cannot be powered on. A maximum of two PICs can be powered on at the same time. Use the **set chassis fpc <slot> pic <pic> power off** command to choose the PICs you want to power on. NOTE: Fabric bandwidth increasing mode is not supported on IOC3. • SRX Clustering Module (SCM) • Fan tray • For hosts, the Routing Engine type. ◦ Starting with Junos OS Release 12.1X47-D15, the SRX5K-RE-1800X4 (RE2) Routing Engine is introduced. ◦ The RE2 has an Intel Quad core Xeon processor, 16 GB of DRAM, and a 128-GB solid-state drive (SSD). The number 1800 refers to the speed of the processor (1.8 GHz). The maximum required power for this Routing Engine is 90W. NOTE: The RE2 provides significantly better performance than the previously used Routing Engine, even with a single core.

show chassis hardware

show chassis hardware

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                CM0715AK0021      SRX1500
Midplane         REV 08   750-058562   ACMA4255          SRX1500
CB 0             REV 08   711-053838   ACMA7529          CPU Board SRX700E
Routing Engine 0          BUILTIN      BUILTIN           SRX Routing Engine
FPC 0            REV 07   711-053832   ACMA3311          FEB
  PIC 0                   BUILTIN      BUILTIN           12x1G-T-4x1G-SFP-4x10G
    Xcvr 12      REV 01   740-014132   61521013          SFP-T
    Xcvr 13      REV 02   740-013111   A281604           SFP-T
    Xcvr 14      REV 02   740-011613   NRN30NV           SFP-SX
    Xcvr 15      REV 02   740-011613   NRN2PWV           SFP-SX
    Xcvr 16      REV 01   740-021308   AJA17B5           SFP+-10G-SR
    Xcvr 17      REV 01   740-021308   MSP056B           SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   AS920WJ           SFP+-10G-SR
    Xcvr 19      REV 01   740-031980   AS92W5N           SFP+-10G-SR
Power Supply 0   REV 01   740-055217   1EDP42500JZ       PS 400W 90-264V AC in
Fan Tray 0                                              SRX1500 0, Front to Back
 Airflow - AFO
Fan Tray 1                                              SRX1500 1, Front to Back
 Airflow - AFO
Fan Tray 2                                              SRX1500 2, Front to Back
 Airflow - AFO
Fan Tray 3                                              SRX1500 3, Front to Back
 Airflow - AFO
```

show chassis hardware (SRX5600 and SRX5800 devices for SRX5K-MPC)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN12170EAAGA      SRX 5800
Midplane         REV 01   710-041799   ACAX3849          SRX 5800 Backplane
FPM Board        REV 01   710-024632   CAAX7297          Front Panel Display
PDM              Rev 03   740-013110   QCS170250DU       Power Distribution Modu
le
PEM 0            Rev 03   740-034724   QCS17020203F      PS 4.1kW; 200-240V AC i
n
PEM 1            Rev 03   740-034724   QCS17020203C      PS 4.1kW; 200-240V AC i
n
PEM 2            Rev 04   740-034724   QCS17100200A      PS 4.1kW; 200-240V AC i
n
PEM 3            Rev 03   740-034724   QCS17080200M      PS 4.1kW; 200-240V AC i
n
Routing Engine 0 REV 11   740-023530   9012047437        SRX5k RE-13-20
CB 0             REV 09   710-024802   CAAX7202          SRX5k SCB
CB 1             REV 09   710-024802   CAAX7157          SRX5k SCB
FPC 0            REV 07   750-044175   CAAD0791          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Cp
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 1            REV 07   750-044175   CAAD0751          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
```

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```
  PIC 1                   BUILTIN      BUILTIN          SPU Flow
  PIC 2                   BUILTIN      BUILTIN          SPU Flow
  PIC 3                   BUILTIN      BUILTIN          SPU Flow
FPC 2            REV 28   750-020751   CAAW1817         SRX5k DPC 4X 10GE
  CPU            REV 04   710-024633   CAAZ5269         SRX5k DPC PMB
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
    Xcvr 0       REV 02   740-014289   T10A00404        XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
  PIC 2                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
  PIC 3                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
FPC 6            REV 02   750-044175   ZY2552           SRX5k SPC II
  CPU                     BUILTIN      BUILTIN          SRX5k DPC PPC
FPC 9            REV 10   750-044175   CAAP5932         SRX5k SPC II
  CPU                     BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN          SPU Flow
  PIC 1                   BUILTIN      BUILTIN          SPU Flow
  PIC 2                   BUILTIN      BUILTIN          SPU Flow
  PIC 3                   BUILTIN      BUILTIN          SPU Flow
FPC 10           REV 22   750-043157   ZH8192           SRX5k IOC II   CPU
      REV 08    711-043360    YX3879           SRX5k MPC PMB
  MIC 0          REV 01   750-049488   YZ2084           10x 10GE SFP+
    PIC 0                 BUILTIN      BUILTIN          10x 10GE SFP+
      Xcvr 0     REV 01   740-031980   AMB0HG3          SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   AM20B6F          SFP+-10G-SR
  MIC 1          REV 19   750-049486   CAAH3504         1x 100GE CFP
    PIC 2                 BUILTIN      BUILTIN          1x 100GE CFP
      Xcvr 0     REV 01   740-035329   X000D375         CFP-100G-SR10
FPC 11           REV 07.04.07 750-043157 CAAJ8771       SRX5k IOC II   CPU
      REV 08    711-043360    CAAJ3881         SRX5k MPC PMB
  MIC 0          REV 19   750-049486   CAAH0979         1x 100GE CFP
    PIC 0                 BUILTIN      BUILTIN          1x 100GE CFP
      Xcvr 0     REV 01   740-035329   UP1020Z          CFP-100G-SR10
  MIC 1          REV 08   750-049487   CAAM1160         2x 40GE QSFP+
    PIC 2                 BUILTIN      BUILTIN          2x 40GE QSFP+
      Xcvr 0     REV 01   740-032986   QB151094         QSFP+-40G-SR4
      Xcvr 1     REV 01   740-032986   QB160509         QSFP+-40G-SR4
Fan Tray 0       REV 04   740-035409   ACAE0875         Enhanced Fan Tray
Fan Tray 1       REV 04   740-035409   ACAE0876         Enhanced Fan Tray
```

show chassis hardware (with 20-Gigabit Ethernet MIC with SFP)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN108DA5AAGA     SRX 5800
Midplane         REV 02   710-013698   TR0037           SRX 5600 Midplane
FPM Board        REV 02   710-014974   JY4635           Front Panel Display
PDM             Rev 02   740-013110   QCS10465005      Power Distribution Module
PEM 0            Rev 03   740-023514   QCS11154040      PS 1.7kW; 200-240VAC in
PEM 2            Rev 02   740-023514   QCS10504014      PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 05   740-015113   1000681023       RE-S-1300
CB 0             REV 05   710-013385   JY4775           SRX5k SCB
FPC 1            REV 17   750-020751   WZ6349           SRX5k DPC 4X 10GE
  CPU            REV 02   710-024633   WZ0718           SRX5k DPC PMB
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
    Xcvr 0                NON-JNPR     C724XM088        XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
    Xcvr 0       REV 02   740-011571   C831XJ08S        XFP-10G-SR
  PIC 2                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
  PIC 3                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) RichQ
FPC 3            REV 22   750-043157   ZH8189           SRX5k IOC II
```

```
  CPU             REV 06   711-043360   YX3912          SRX5k MPC PMB
  MIC 0           REV 01   750-055732   CACF9115        20x 1GE(LAN) SFP
    PIC 0                  BUILTIN      BUILTIN         10x 1GE(LAN) SFP
      Xcvr 2      REV 02   740-013111   B358549         SFP-T
      Xcvr 9      REV 02   740-011613   PNB1FQS         SFP-SX
    PIC 1                  BUILTIN      BUILTIN         10x 1GE(LAN) SFP
      Xcvr 9      REV 02   740-011613   PNB1FFF         SFP-SX
FPC 5             REV 01   750-027945   JW9665          SRX5k FIOC
  CPU
FPC 8             REV 08   750-023996   XA7234          SRX5k SPC
  CPU             REV 02   710-024633   XA1599          SRX5k DPC PMB
  PIC 0                    BUILTIN      BUILTIN         SPU Cp-Flow
  PIC 1                    BUILTIN      BUILTIN         SPU Flow
Fan Tray 0        REV 03   740-014971   TP0902          Fan Tray
Fan Tray 1        REV 01   740-014971   TP0121          Fan Tray
```

show chassis hardware (SRX5600 and SRX5800 devices with SRX5000 line SRX5K-SCBE (SCB2) and SRX5K-RE-1800X4 (RE2))

```
user@host> show chassis hardware
node0:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number   Description
Chassis                                 JN122A040AGA    SRX5800
Midplane          REV 01   710-041799   ACRA7817        SRX5800 Backplane
FPM Board         REV 01   760-058099   CACA2100        Front Panel Display
PDM               Rev 03   740-013110   QCS1739517Z     Power Distribution Modu

                                      le
PEM 0             Rev 05   740-034724   QCS17460203K    PS 4.1kW; 200-240V AC i

                                      n
PEM 1             Rev 04   740-034724   QCS172302017    PS 4.1kW; 200-240V AC i

                                      n
Routing Engine 0  REV 01   740-056658   9013040855      SRX5k RE-1800X4
Routing Engine 1
CB 0              REV 01   750-056587   CACG1424        SRX5k SCB II
CB 1              REV 01   750-056587   CACC9307        SRX5k SCB II
CB 2              REV 01   750-056587   CAAZ1128        SRX5k SCB II
FPC 0             REV 10   750-056758   CACS2667        SRX5k SPC II
  CPU                      BUILTIN      BUILTIN         SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN         SPU Cp
  PIC 1                    BUILTIN      BUILTIN         SPU Flow
  PIC 2                    BUILTIN      BUILTIN         SPU Flow
  PIC 3                    BUILTIN      BUILTIN         SPU Flow
FPC 1             REV 18   750-054877   CACH4092        SRX5k SPC II
  CPU                      BUILTIN      BUILTIN         SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN         SPU Flow
  PIC 1                    BUILTIN      BUILTIN         SPU Flow
  PIC 2                    BUILTIN      BUILTIN         SPU Flow
  PIC 3                    BUILTIN      BUILTIN         SPU Flow
FPC 2             REV 10   750-056758   CACV0038        SRX5k SPC II
  CPU                      BUILTIN      BUILTIN         SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN         SPU Flow
  PIC 1                    BUILTIN      BUILTIN         SPU Flow
  PIC 2                    BUILTIN      BUILTIN         SPU Flow
  PIC 3                    BUILTIN      BUILTIN         SPU Flow
FPC 3             REV 10   750-043157   CACB6877        SRX5k IOC II
  CPU             REV 04   711-043360   CACH6074        SRX5k MPC PMB
```

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```
  MIC 0         REV 19   750-049486   CAAH3504         1x 100GE CFP
    PIC 0                BUILTIN      BUILTIN          1x 100GE CFP
      Xcvr 0    REV 01   740-035329   UP1020Z          CFP-100G-SR10
  MIC 1         REV 04   750-049488   CACB6429         10x 10GE SFP+
    PIC 2                BUILTIN      BUILTIN          10x 10GE SFP+
      Xcvr 0    REV 01   740-031980   AP21RJ5          SFP+-10G-SR
      Xcvr 1    REV 01   740-031980   AP21RLJ          SFP+-10G-SR
      Xcvr 2    REV 01   740-030658   AD1148A0AYC      SFP+-10G-USR
      Xcvr 3    REV 01   740-031980   B11E02718        SFP+-10G-SR
FPC 4           REV 10   750-056758   CACW0706         SRX5k SPC II
  CPU                    BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                  BUILTIN      BUILTIN          SPU Flow
  PIC 1                  BUILTIN      BUILTIN          SPU Flow
  PIC 2                  BUILTIN      BUILTIN          SPU Flow
  PIC 3                  BUILTIN      BUILTIN          SPU Flow
FPC 7           REV 10   750-056758   CACS2725         SRX5k SPC II
  CPU                    BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                  BUILTIN      BUILTIN          SPU Flow
  PIC 1                  BUILTIN      BUILTIN          SPU Flow
  PIC 2                  BUILTIN      BUILTIN          SPU Flow
  PIC 3                  BUILTIN      BUILTIN          SPU Flow
FPC 8           REV 11   750-043157   CABN4955         SRX5k IOC II
  CPU           REV 04   711-043360   CACT9926         SRX5k MPC PMB
  MIC 0         REV 19   750-049486   CAAH0979         1x 100GE CFP
    PIC 0                BUILTIN      BUILTIN          1x 100GE CFP
      Xcvr 0    REV 01   740-035329   UP2077V          CFP-100G-SR10
FPC 9           REV 10   750-056758   CACW0755         SRX5k SPC II
  CPU                    BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                  BUILTIN      BUILTIN          SPU Flow
  PIC 1                  BUILTIN      BUILTIN          SPU Flow
  PIC 2                  BUILTIN      BUILTIN          SPU Flow
  PIC 3                  BUILTIN      BUILTIN          SPU Flow
FPC 10          REV 07   750-044175   CAAD0747         SRX5k SPC II
  CPU                    BUILTIN      BUILTIN          SRX5k DPC PPC
Fan Tray 0      REV 04   740-035409   ACAE2294         Enhanced Fan Tray
Fan Tray 1      REV 04   740-035409   ACAE2099         Enhanced Fan Tray

node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1235BC7AGA      SRX5800
Midplane         REV 01   710-024803   ACRC3244          SRX5800 Backplane
FPM Board        REV 01   710-024632   CACA2108          Front Panel Display
PDM             Rev 03   740-013110   QCS1739519B      Power Distribution Module
PEM 0            Rev 04   740-034724   QCS17230201Z      PS 4.1kW; 200-240V AC
in
PEM 1            Rev 05   740-034724   QCS174502014      PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 01   740-056658   9009153221        SRX5k RE-1800X4
Routing Engine 1
CB 0             REV 01   750-056587   CACC9541          SRX5k SCB II
CB 1             REV 01   750-056587   CACG1447          SRX5k SCB II
CB 2             REV 01   750-056587   CACH9058          SRX5k SCB II
FPC 0            REV 18   750-054877   CACH4004          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Cp
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 1            REV 18   750-054877   CACH4082          SRX5k SPC II
```

```
CPU                        BUILTIN      BUILTIN           SRX5k DPC PPC
PIC 0                      BUILTIN      BUILTIN           SPU Flow
PIC 1                      BUILTIN      BUILTIN           SPU Flow
PIC 2                      BUILTIN      BUILTIN           SPU Flow
PIC 3                      BUILTIN      BUILTIN           SPU Flow
FPC 2            REV 10    750-056758   CACW0713          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Flow
  PIC 1                    BUILTIN      BUILTIN           SPU Flow
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
FPC 3            REV 11    750-043157   CACA8792          SRX5k IOC II
  CPU            REV 04    711-043360   CACA8809          SRX5k MPC PMB
  MIC 0          REV 19    750-049486   CAAH3485          1x 100GE CFP
    PIC 0                  BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01    740-035329   UNM0G3C           CFP-100G-SR10
  MIC 1          REV 04    750-049488   CABX0782          10x 10GE SFP+
    PIC 2                  BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 0     REV 01    740-031980   AMB0HX3           SFP+-10G-SR
      Xcvr 1     REV 01    740-031980   ANT0E6V           SFP+-10G-SR
      Xcvr 2     REV 01    740-031980   ANR0ZVY           SFP+-10G-SR
      Xcvr 3     REV 01    740-031980   AP308ZU           SFP+-10G-SR
FPC 4            REV 10    750-044175   CAAS8024          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Flow
  PIC 1
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
FPC 7            REV 10    750-056758   CACS5126          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Flow
  PIC 1                    BUILTIN      BUILTIN           SPU Flow
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
FPC 8            REV 11    750-043157   CACA8798          SRX5k IOC II
  CPU            REV 04    711-043360   CACA8826          SRX5k MPC PMB
  MIC 0          REV 19    750-049486   CAAH0996          1x 100GE CFP
    PIC 0                  BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01    740-035329   UP30A6N           CFP-100G-SR10
FPC 9            REV 07    750-044175   CAAD0745          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Flow
  PIC 1                    BUILTIN      BUILTIN           SPU Flow
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
FPC 10           REV 18    750-054877   CACD2570          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
Fan Tray 0       REV 04    740-035409   ACAE2122          Enhanced Fan Tray
Fan Tray 1       REV 04    740-035409   ACAE2254          Enhanced Fan Tray
```

show chassis hardware (SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 (SCB3) with enhanced midplanes and SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3)

```
user@host> show chassis hardware
node0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1250870AGB      SRX5600
Midplane        REV 01    760-063936   ACRE2578         Enhanced SRX5600 Midplane
```

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```
FPM Board        REV 02   710-017254   KD9027           Front Panel Display
PEM 0            Rev 03   740-034701   QCS13090900T     PS 1.4-2.6kW; 90-264V A

                                    C in
PEM 1            Rev 03   740-034701   QCS13090904T     PS 1.4-2.6kW; 90-264V A

                                    C in
Routing Engine 0 REV 01   740-056658   9009196496       SRX5k RE-1800X4
CB 0             REV 01   750-062257   CAEC2501         SRX5k SCB3
FPC 0            REV 10   750-056758   CADC8067         SRX5k SPC II
  CPU                     BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN          SPU Cp
  PIC 1                   BUILTIN      BUILTIN          SPU Flow
  PIC 2                   BUILTIN      BUILTIN          SPU Flow
  PIC 3                   BUILTIN      BUILTIN          SPU Flow
FPC 2            REV 01   750-062243   CAEE5924         SRX5k IOC3 24XGE+6XLG
  CPU            REV 01   711-062244   CAEB4890         SRX5k IOC3 PMB
  PIC 0                   BUILTIN      BUILTIN          12x 10GE SFP+
  PIC 1                   BUILTIN      BUILTIN          12x 10GE SFP+
  PIC 2                   BUILTIN      BUILTIN          3x 40GE QSFP+
    Xcvr 0       REV 01   740-038623   MOC13156230449   QSFP+-40G-CU1M
    Xcvr 2       REV 01   740-038623   MOC13156230449   QSFP+-40G-CU1M
  PIC 3                   BUILTIN      BUILTIN          3x 40GE QSFP+
  WAN MEZZ       REV 01   750-062682   CAEE5817         24x 10GE SFP+ Mezz
FPC 4            REV 11   750-043157   CACY1595         SRX5k IOC II
  CPU            REV 04   711-043360   CACZ8879         SRX5k MPC PMB
  MIC 1          REV 04   750-049488   CACM6062         10x 10GE SFP+
    PIC 2                 BUILTIN      BUILTIN          10x 10GE SFP+
      Xcvr 7     REV 01   740-021308   AD1439301TU      SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AD1439301SD      SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AD1439301TS      SFP+-10G-SR
FPC 5            REV 05   750-044175   ZZ1371           SRX5k SPC II
  CPU                     BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN          SPU Flow
  PIC 1                   BUILTIN      BUILTIN          SPU Flow
  PIC 2                   BUILTIN      BUILTIN          SPU Flow
  PIC 3                   BUILTIN      BUILTIN          SPU Flow
Fan Tray                                                Enhanced Fan Tray

node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN124FEC0AGB     SRX5600
Midplane        REV 01   760-063936   ACRE2946         Enhanced SRX5600 Midplane
FPM Board        test     710-017254   test             Front Panel Display
PEM 0            Rev 01   740-038514   QCS114111003     DC 2.6kW Power Entry
Module
PEM 1            Rev 01   740-038514   QCS12031100J     DC 2.6kW Power Entry
Module
Routing Engine 0 REV 01   740-056658   9009186342       SRX5k RE-1800X4
CB 0             REV 01   750-062257   CAEB8178         SRX5k SCB3
FPC 0            REV 07   750-044175   CAAD0769         SRX5k SPC II
  CPU                     BUILTIN      BUILTIN          SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN          SPU Cp
  PIC 1                   BUILTIN      BUILTIN          SPU Flow
  PIC 2                   BUILTIN      BUILTIN          SPU Flow
  PIC 3                   BUILTIN      BUILTIN          SPU Flow
FPC 4            REV 11   750-043157   CACY1592         SRX5k IOC II
```

```
  CPU            REV 04   711-043360   CACZ8831          SRX5k MPC PMB
  MIC 1          REV 04   750-049488   CACN0239          10x 10GE SFP+
    PIC 2                 BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 7     REV 01   740-031980   ARN23HW           SFP+-10G-SR
      Xcvr 8     REV 01   740-031980   ARN2FVW           SFP+-10G-SR
      Xcvr 9     REV 01   740-031980   ARN2YVM           SFP+-10G-SR
FPC 5            REV 10   750-056758   CADA8736          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
Fan Tray                                                 Enhanced Fan Tray
```

show chassis hardware detail

show chassis hardware detail (SRX5600 and SRX5800 devices with SRX5000 line SRX5K-SCBE (SCB2) and (SRX5K-RE-1800X4 (RE2)

```
user@host> show chassis hardware detail
node0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN122A040AGA      SRX5800
Midplane         REV 01   710-041799   ACRA7817          SRX5800 Backplane
FPM Board        REV 01   760-058099   CACA2100          Front Panel Display
PDM             Rev 03   740-013110   QCS1739517Z       Power Distribution Module
PEM 0            Rev 05   740-034724   QCS17460203K      PS 4.1kW; 200-240V AC
in
PEM 1            Rev 04   740-034724   QCS172302017      PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 01   740-056658   9013040855        SRX5k RE-1800X4
  ad0     3998 MB  Virtium - TuffDrive VCF P1T0200269450529 741 Compact Flash
  ad1    114304 MB  VSFA18PI128G-KC     32779-073         Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1
CB 0             REV 01   750-056587   CACG1424          SRX5k SCB II
CB 1             REV 01   750-056587   CACC9307          SRX5k SCB II
CB 2             REV 01   750-056587   CAAZ1128          SRX5k SCB II
FPC 0            REV 10   750-056758   CACS2667          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Cp
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 1            REV 18   750-054877   CACH4092          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 2            REV 10   750-056758   CACV0038          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
```

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```
  PIC 2                 BUILTIN      BUILTIN           SPU Flow
  PIC 3                 BUILTIN      BUILTIN           SPU Flow
FPC 3            REV 10   750-043157   CACB6877          SRX5k IOC II
  CPU            REV 04   711-043360   CACH6074          SRX5k MPC PMB
  MIC 0          REV 19   750-049486   CAAH3504          1x 100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01   740-035329   UP1020Z           CFP-100G-SR10
  MIC 1          REV 04   750-049488   CACB6429          10x 10GE SFP+
    PIC 2                 BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 0     REV 01   740-031980   AP21RJ5           SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   AP21RLJ           SFP+-10G-SR
      Xcvr 2     REV 01   740-030658   AD1148A0AYC       SFP+-10G-USR
      Xcvr 3     REV 01   740-031980   B11E02718         SFP+-10G-SR
FPC 4            REV 10   750-056758   CACW0706          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 7            REV 10   750-056758   CACS2725          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 8            REV 11   750-043157   CABN4955          SRX5k IOC II
  CPU            REV 04   711-043360   CACT9926          SRX5k MPC PMB
  MIC 0          REV 19   750-049486   CAAH0979          1x 100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01   740-035329   UP2077V           CFP-100G-SR10
FPC 9            REV 10   750-056758   CACW0755          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 10           REV 07   750-044175   CAAD0747          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
Fan Tray 0       REV 04   740-035409   ACAE2294          Enhanced Fan Tray
Fan Tray 1       REV 04   740-035409   ACAE2099          Enhanced Fan Tray

node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1235BC7AGA      SRX5800
Midplane         REV 01   710-024803   ACRC3244          SRX5800 Backplane
FPM Board        REV 01   710-024632   CACA2108          Front Panel Display
PDM             Rev 03   740-013110   QCS1739519B      Power Distribution Module
PEM 0            Rev 04   740-034724   QCS17230201Z      PS 4.1kW; 200-240V AC
in
PEM 1            Rev 05   740-034724   QCS174502014      PS 4.1kW; 200-240V AC
in
Routing Engine 0 REV 01   740-056658   9009153221        SRX5k RE-1800X4
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200298450703 72 Compact Flash
  ad1   114304 MB  VSFA18PI128G-KC     32779-073         Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
```

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  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
Routing Engine 1
CB 0             REV 01   750-056587   CACC9541          SRX5k SCB II
CB 1             REV 01   750-056587   CACG1447          SRX5k SCB II
CB 2             REV 01   750-056587   CACH9058          SRX5k SCB II
FPC 0            REV 18   750-054877   CACH4004          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Cp
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 1            REV 18   750-054877   CACH4082          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 2            REV 10   750-056758   CACW0713          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 3            REV 11   750-043157   CACA8792          SRX5k IOC II
  CPU            REV 04   711-043360   CACA8809          SRX5k MPC PMB
  MIC 0          REV 19   750-049486   CAAH3485          1x 100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01   740-035329   UNM0G3C           CFP-100G-SR10
  MIC 1          REV 04   750-049488   CABX0782          10x 10GE SFP+
    PIC 2                 BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 0     REV 01   740-031980   AMB0HX3           SFP+-10G-SR
      Xcvr 1     REV 01   740-031980   ANT0E6V           SFP+-10G-SR
      Xcvr 2     REV 01   740-031980   ANR0ZVY           SFP+-10G-SR
      Xcvr 3     REV 01   740-031980   AP308ZU           SFP+-10G-SR
FPC 4            REV 10   750-044175   CAAS8024          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 7            REV 10   750-056758   CACS5126          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 8            REV 11   750-043157   CACA8798          SRX5k IOC II
  CPU            REV 04   711-043360   CACA8826          SRX5k MPC PMB
  MIC 0          REV 19   750-049486   CAAH0996          1x 100GE CFP
    PIC 0                 BUILTIN      BUILTIN           1x 100GE CFP
      Xcvr 0     REV 01   740-035329   UP30A6N           CFP-100G-SR10
FPC 9            REV 07   750-044175   CAAD0745          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 10           REV 18   750-054877   CACD2570          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
Fan Tray 0       REV 04   740-035409   ACAE2122          Enhanced Fan Tray
Fan Tray 1       REV 04   740-035409   ACAE2254          Enhanced Fan Tray
```

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show chassis hardware detail (SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 SCB3 with enhanced midplanes and (SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3))

```
user@host> show chassis hardware detail
node0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1250870AGB      SRX5600
Midplane        REV 01   760-063936   ACRE2578         Enhanced SRX5600 Midplane
FPM Board        REV 02   710-017254   KD9027            Front Panel Display
PEM 0            Rev 03   740-034701   QCS13090900T      PS 1.4-2.6kW; 90-264V
AC in
PEM 1            Rev 03   740-034701   QCS13090904T      PS 1.4-2.6kW; 90-264V
AC in
Routing Engine 0 REV 01   740-056658   9009196496        SRX5k RE-1800X4
  ad0    3831 MB  UGB30SFA4000T2       SFA4000T2 000027A0 Compact Flash
  ad1   114304 MB  VSFA18PI128G-KC     32779-043         Disk 1
  usb0 (addr 1)  product 0x0000 0      vendor 0x0000     uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
CB 0             REV 01   750-062257   CAEC2501          SRX5k SCB3
FPC 0            REV 10   750-056758   CADC8067          SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Cp
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
FPC 2            REV 01   750-062243   CAEE5924          SRX5k IOC3 24XGE+6XLG
  CPU            REV 01   711-062244   CAEB4890          SRX5k IOC3 PMB
  PIC 0                   BUILTIN      BUILTIN           12x 10GE SFP+
  PIC 1                   BUILTIN      BUILTIN           12x 10GE SFP+
  PIC 2                   BUILTIN      BUILTIN           3x 40GE QSFP+
    Xcvr 0       REV 01   740-038623   MOC13156230449    QSFP+-40G-CU1M
    Xcvr 2       REV 01   740-038623   MOC13156230449    QSFP+-40G-CU1M
  PIC 3                   BUILTIN      BUILTIN           3x 40GE QSFP+
  WAN MEZZ       REV 01   750-062682   CAEE5817          24x 10GE SFP+ Mezz
FPC 4            REV 11   750-043157   CACY1595          SRX5k IOC II
  CPU            REV 04   711-043360   CACZ8879          SRX5k MPC PMB
  MIC 1          REV 04   750-049488   CACM6062          10x 10GE SFP+
    PIC 2                 BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 7     REV 01   740-021308   AD1439301TU       SFP+-10G-SR
      Xcvr 8     REV 01   740-021308   AD1439301SD       SFP+-10G-SR
      Xcvr 9     REV 01   740-021308   AD1439301TS       SFP+-10G-SR
FPC 5            REV 05   750-044175   ZZ1371            SRX5k SPC II
  CPU                     BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                   BUILTIN      BUILTIN           SPU Flow
  PIC 1                   BUILTIN      BUILTIN           SPU Flow
  PIC 2                   BUILTIN      BUILTIN           SPU Flow
  PIC 3                   BUILTIN      BUILTIN           SPU Flow
Fan Tray                                                 Enhanced Fan Tray

node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN124FEC0AGB      SRX5600
```

```
Midplane         REV 01   760-063936   ACRE2946         Enhanced SRX5600 Midplane
FPM Board         test     710-017254   test              Front Panel Display
PEM 0             Rev 01   740-038514   QCS114111003      DC 2.6kW Power Entry
Module
PEM 1             Rev 01   740-038514   QCS12031100J      DC 2.6kW Power Entry
Module
Routing Engine 0 REV 01   740-056658   9009186342        SRX5k RE-1800X4
  ad0     3998 MB  Virtium - TuffDrive VCF P1T0200313161216 109 Compact Flash
  ad1   28843 MB  UGB94BPH32H0S2-KCI   11000160387       Disk 1
  usb0 (addr 1)  product 0x0000 0     vendor 0x0000     uhub0
  usb0 (addr 2)  product 0x0020 32    vendor 0x8087     uhub1
  DIMM 0          SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1          SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2          SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3          SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
CB 0              REV 01   750-062257   CAEB8178          SRX5k SCB3
FPC 0             REV 07   750-044175   CAAD0769          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Cp
  PIC 1                    BUILTIN      BUILTIN           SPU Flow
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
FPC 4             REV 11   750-043157   CACY1592          SRX5k IOC II
  CPU             REV 04   711-043360   CACZ8831          SRX5k MPC PMB
  MIC 1           REV 04   750-049488   CACN0239          10x 10GE SFP+
    PIC 2                  BUILTIN      BUILTIN           10x 10GE SFP+
      Xcvr 7      REV 01   740-031980   ARN23HW           SFP+-10G-SR
      Xcvr 8      REV 01   740-031980   ARN2FVW           SFP+-10G-SR
      Xcvr 9      REV 01   740-031980   ARN2YVM           SFP+-10G-SR
FPC 5             REV 10   750-056758   CADA8736          SRX5k SPC II
  CPU                      BUILTIN      BUILTIN           SRX5k DPC PPC
  PIC 0                    BUILTIN      BUILTIN           SPU Flow
  PIC 1                    BUILTIN      BUILTIN           SPU Flow
  PIC 2                    BUILTIN      BUILTIN           SPU Flow
  PIC 3                    BUILTIN      BUILTIN           SPU Flow
Fan Tray                                                  Enhanced Fan Tray
```

show chassis hardware extensive node 1

show chassis hardware extensive node 1 (SRX5600 and SRX5800 devices with SRX5000 line SRX5K-SCBE (SCB2) and SRX5K-RE-1800X4)

```
user@host> show chassis hardware extensive node 1
node1:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN1235BC7AGA      SRX5800
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
                                 S/N:               JN1235BC7AGA
 Assembly ID:   0x051a           Assembly Version:  00.00
 Date:          00-00-0000       Assembly Flags:    0x00
 ID: SRX5800
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 1a 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 32 33 35 42 43 37 41 47 41 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

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```
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 01   710-024803   ACRC3244          SRX5800 Backplane
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-024803        S/N:               S/N ACRC3244
 Assembly ID:  0x091a            Assembly Version:  01.01
 Date:         02-26-2014        Assembly Flags:    0x00
 Version:      REV 01
 ID: SRX5800 Backplane           FRU Model Number:  SRX5800-BP-A
 Board Information Record:
  Address 0x00: ad 01 08 00 4c 96 14 d3 28 00 00 ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 1a 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 34 38 30 33 00 00
  Address 0x20: 53 2f 4e 20 41 43 52 43 33 32 34 34 00 1a 02 07
  Address 0x30: de ff ff ff ad 01 08 00 4c 96 14 d3 28 00 00 ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 38 30 30 2d 42 50 2d 41 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 01   710-024632   CACA2108          Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          710-024632        S/N:               S/N CACA2108
 Assembly ID:  0x096f            Assembly Version:  01.01
 Date:         02-05-2014        Assembly Flags:    0x00
 Version:      REV 01
 ID: Front Panel Display         FRU Model Number:  SRX5800-CRAFT-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 6f 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 34 36 33 32 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 41 32 31 30 38 00 05 02 07
  Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 38 30 30 2d 43 52 41 46 54 2d 41 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PDM             Rev 03   740-013110   QCS1739519B       Power Distribution Module

 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-013110        S/N:               QCS1739519B
 Assembly ID:  0x0416            Assembly Version:  01.03
 Date:         10-26-2013        Assembly Flags:    0x00
 Version:      Rev 03
 ID: Power Distribution Module
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 16 01 03 52 65 76 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 31 33 31 31 30 00 00
  Address 0x20: 51 43 53 31 37 33 39 35 31 39 42 00 00 1a 0a 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 0            Rev 04   740-034724   QCS17230201Z      PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
```

```
 P/N:          740-034724        S/N:               QCS17230201Z
 Assembly ID:  0x044b            Assembly Version:  01.04
 Date:         06-04-2013        Assembly Flags:    0x00
 Version:      Rev 04
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  SRX5800-PWR-4100-AC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 4b 01 04 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 34 37 32 34 00 00
  Address 0x20: 51 43 53 31 37 32 33 30 32 30 31 5a 00 04 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 38 30 30 2d 50 57 52 2d 34 31 30 30 2d
  Address 0x60: 41 43 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1            Rev 05   740-034724   QCS174502014      PS 4.1kW; 200-240V AC
in
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          740-034724        S/N:               QCS174502014
 Assembly ID:  0x044b            Assembly Version:  01.05
 Date:         11-06-2013        Assembly Flags:    0x00
 Version:      Rev 05
 ID: PS 4.1kW; 200-240V AC in    FRU Model Number:  SRX5800-PWR-4100-AC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 4b 01 05 52 65 76 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 34 37 32 34 00 00
  Address 0x20: 51 43 53 31 37 34 35 30 32 30 31 34 00 06 0b 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 38 30 30 2d 50 57 52 2d 34 31 30 30 2d
  Address 0x60: 41 43 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 01   740-056658   9009153221        SRX5k RE-1800X4
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          740-056658        S/N:               9009153221
 Assembly ID:  0x0c1a            Assembly Version:  01.01
 Date:         07-22-2013        Assembly Flags:    0x00
 Version:      REV 01            CLEI Code:         PROTOXCLEI
 ID: SRX5k RE-1800X4             FRU Model Number:  SRX5K-RE-1800X4
 Board Information Record:
  Address 0x00: 54 32 30 32 37 45 43 2d 34 34 47 42 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0c 1a 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 36 36 35 38 00 00
  Address 0x20: 39 30 30 39 31 35 33 32 32 31 00 00 00 16 07 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 45 43 2d 34 34 47 42
  Address 0x40: 00 00 00 00 01 50 52 4f 54 4f 58 43 4c 45 49 53
  Address 0x50: 52 58 35 4b 2d 52 45 2d 31 38 30 30 58 34 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 64 ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200298450703 72 Compact Flash
  ad1   114304 MB  VSFA18PI128G-KC     32779-073         Disk 1
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 1         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 2         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
  DIMM 3         VL31B5263F-F8SD DIE REV-0 PCB REV-0     MFR ID-ce80
```

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```
Routing Engine 1
CB 0             REV 01   750-056587   CACC9541         SRX5k SCB II
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
 P/N:           750-056587        S/N:               S/N CACC9541
 Assembly ID:   0x0c19            Assembly Version:  01.01
 Date:          03-07-2014        Assembly Flags:    0x00
 Version:       REV 01            CLEI Code:         PROTOXCLEI
 ID: SRX5k SCB II                 FRU Model Number:  SRX5K-SCBE
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 19 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 35 36 35 38 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 43 39 35 34 31 00 07 03 07
  Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 53
  Address 0x50: 52 58 35 4b 2d 53 43 42 45 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 08 ff ff ff ff ff ff ff ff ff ff ff ff
CB 1             REV 01   750-056587   CACG1447         SRX5k SCB II
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
 P/N:           750-056587        S/N:               S/N CACG1447
 Assembly ID:   0x0c19            Assembly Version:  01.01
 Date:          03-07-2014        Assembly Flags:    0x00
 Version:       REV 01            CLEI Code:         PROTOXCLEI
 ID: SRX5k SCB II                 FRU Model Number:  SRX5K-SCBE
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 19 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 35 36 35 38 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 47 31 34 34 37 00 07 03 07
  Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 53
  Address 0x50: 52 58 35 4b 2d 53 43 42 45 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 08 ff ff ff ff ff ff ff ff ff ff ff ff
CB 2             REV 01   750-056587   CACH9058         SRX5k SCB II
 Jedec Code:    0x7fb0            EEPROM Version:    0x02
 P/N:           750-056587        S/N:               S/N CACH9058
 Assembly ID:   0x0c19            Assembly Version:  01.01
 Date:          03-06-2014        Assembly Flags:    0x00
 Version:       REV 01            CLEI Code:         PROTOXCLEI
 ID: SRX5k SCB II                 FRU Model Number:  SRX5K-SCBE
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 19 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 35 36 35 38 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 43 48 39 30 35 38 00 06 03 07
  Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 53
  Address 0x50: 52 58 35 4b 2d 53 43 42 45 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 08 ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware extensive node 1
(SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 (SCB3) with enhanced midplanes and SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3))

`user@host>` **show chassis hardware extensive node 1**

```
node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN124FEC0AGB      SRX5600
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
                                 S/N:               JN124FEC0AGB
 Assembly ID:  0x051b            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x08
 ID: SRX5600
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 1b 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 32 34 46 45 43 30 41 47 42 08 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 01   760-063936   ACRE2946          Enhanced SRX5600 Midpla

                                     ne
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          760-063936        S/N:               ACRE2946
 Assembly ID:  0x0914            Assembly Version:  01.01
 Date:         03-19-2015        Assembly Flags:    0x08
 Version:      REV 01            CLEI Code:         CLEI-CODE
 ID: SRX5600 Midplane            FRU Model Number:  SRX5600X-CHAS
 Board Information Record:
  Address 0x00: ad 01 08 00 88 a2 5e 12 68 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 14 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 36 33 39 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 52 45 32 39 34 36 08 13 03 07
  Address 0x30: df ff ff ff ad 01 08 00 88 a2 5e 12 68 00 ff ff
  Address 0x40: ff ff ff ff 01 43 4c 45 49 2d 43 4f 44 45 20 53
  Address 0x50: 52 58 35 36 30 30 58 2d 43 48 41 53 20 20 20 20
  Address 0x60: 20 20 20 20 20 20 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ba ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        test     710-017254   test              Front Panel Display
 Jedec Code:   0x7fb0            EEPROM Version:    0x02
 P/N:          710-017254        S/N:               test
 Assembly ID:  0x01ff            Assembly Version:  01.00
 Date:         06-18-2007        Assembly Flags:    0x00
 Version:      test
 ID: Front Panel Display
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 01 ff 01 00 74 65 73 74 00 00 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 32 35 34 00 00
  Address 0x20: 74 65 73 74 00 00 00 00 00 00 00 00 00 12 06 07
  Address 0x30: d7 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0            Rev 01   740-038514   QCS114111003      DC 2.6kW Power Entry
Module
```

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```
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          740-038514       S/N:               QCS114111003
 Assembly ID:  0x044c           Assembly Version:  01.01
 Date:         10-14-2011       Assembly Flags:    0x00
 Version:      Rev 01
 ID: DC 2.6kW Power Entry Module FRU Model Number:  SRX5600-PWR-2400-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 4c 01 01 52 65 76 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 38 35 31 34 00 00
  Address 0x20: 51 43 53 31 31 34 31 31 31 30 30 33 00 0e 0a 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 36 30 30 2d 50 57 52 2d 32 34 30 30 2d
  Address 0x60: 44 43 2d 53 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1            Rev 01   740-038514   QCS12031100J      DC 2.6kW Power Entry
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          740-038514       S/N:               QCS12031100J
 Assembly ID:  0x044c           Assembly Version:  01.01
 Date:         01-17-2012       Assembly Flags:    0x00
 Version:      Rev 01
 ID: DC 2.6kW Power Entry Module FRU Model Number:  SRX5600-PWR-2400-DC-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 4c 01 01 52 65 76 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 38 35 31 34 00 00
  Address 0x20: 51 43 53 31 32 30 33 31 31 30 30 4a 00 11 01 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 53
  Address 0x50: 52 58 35 36 30 30 2d 50 57 52 2d 32 34 30 30 2d
  Address 0x60: 44 43 2d 53 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 01   740-056658   9009186342        SRX5k RE-1800X4
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-056658       S/N:               9009186342
 Assembly ID:  0x0c1a           Assembly Version:  01.01
 Date:         02-05-2014       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         COUCATTBAA
 ID: SRX5k RE-1800X4            FRU Model Number:  SRX5K-RE-1800X4
 Board Information Record:
  Address 0x00: 54 32 30 32 37 45 43 2d 34 34 47 42 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0c 1a 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 36 36 35 38 00 00
  Address 0x20: 39 30 30 39 31 38 36 33 34 32 00 00 00 05 02 07
  Address 0x30: de ff ff ff 54 32 30 32 37 45 43 2d 34 34 47 42
  Address 0x40: 00 00 00 00 01 43 4f 55 43 41 54 54 42 41 41 53
  Address 0x50: 52 58 35 4b 2d 52 45 2d 31 38 30 30 58 34 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 64 ff ff ff ff ff ff ff ff ff ff ff ff
  ad0    3998 MB  Virtium - TuffDrive VCF P1T0200313161216 109 Compact Flash
  ad1   28843 MB  UGB94BPH32H0S2-KCI   11000160387       Disk 1
  usb0 (addr 1)  product 0x0000 0      vendor 0x0000     uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
```

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```
  DIMM 3        SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
CB 0            REV 01   750-062257   CAEB8178          SRX5k SCB3
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-062257       S/N:               CAEB8178
 Assembly ID:  0x0c59           Assembly Version:  01.01
 Date:         03-19-2015       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         CLEI-CODE
 ID: SRX5k SCB3                 FRU Model Number:  SRX5K-SCB3
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0c 59 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 36 32 32 35 37 00 00
  Address 0x20: 53 2f 4e 20 43 41 45 42 38 31 37 38 00 13 03 07
  Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4c 45 49 2d 43 4f 44 45 20 53
  Address 0x50: 52 58 35 4b 2d 53 43 42 33 20 20 20 20 20 20 20
  Address 0x60: 20 20 20 20 20 20 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 63 ff ff ff ff ff ff ff ff ff ff ff ff
FPC 2           REV 01   750-062243   CAED0386          SRX5k IOC3 24XGE+6XLG
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          750-062243       S/N:               CAED0386
 Assembly ID:  0x0c57           Assembly Version:  01.01
 Date:         04-28-2015       Assembly Flags:    0x00
 Version:      REV 01
 ID: SRX5k IOC3 24XGE+6XLG
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ae 01 f2 06 00 ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 fe 0c 57 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 36 32 32 34 33 00 00
  Address 0x20: 53 2f 4e 20 43 41 45 44 30 33 38 36 00 1c 04 07
  Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ae 01
  Address 0x40: f2 06 00 ff 01 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  CPU           REV 01   711-062244   CADX8554          SRX5k IOC3 PMB
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-062244       S/N:               CADX8554
 Assembly ID:  0x0c5a           Assembly Version:  01.01
 Date:         04-28-2015       Assembly Flags:    0x00
 Version:      REV 01
 ID: SRX5k IOC3 PMB
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0c 5a 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 36 32 32 34 34 00 00
  Address 0x20: 53 2f 4e 20 43 41 44 58 38 35 35 34 00 1c 04 07
  Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 2a 47 7e 50 10 05 76 5c
  PIC 0                  BUILTIN      BUILTIN           12x 10GE SFP+
 Jedec Code:   0x0000           EEPROM Version:    0x00
 P/N:          BUILTIN          S/N:               BUILTIN
 Assembly ID:  0x0ab5           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: 12x 10GE SFP+
```

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```
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 0a b5 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 c0 02 a9 3c 00 00 00 00 0a b6 00 00
 PIC 1                 BUILTIN      BUILTIN           12x 10GE SFP+
Jedec Code:   0x0000            EEPROM Version:    0x00
P/N:          BUILTIN           S/N:               BUILTIN
Assembly ID:  0x0ab5            Assembly Version:  00.00
Date:         00-00-0000        Assembly Flags:    0x00
ID: 12x 10GE SFP+
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 0a b5 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 c0 02 e9 b4 00 00 00 00 0a b5 00 00
 PIC 2                 BUILTIN      BUILTIN           3x 40GE QSFP+
Jedec Code:   0x0000            EEPROM Version:    0x00
P/N:          BUILTIN           S/N:               BUILTIN
Assembly ID:  0x0ab6            Assembly Version:  00.00
Date:         00-00-0000        Assembly Flags:    0x00
ID: 3x 40GE QSFP+
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 0a b6 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x70: 00 00 00 00 c0 03 e8 c4 33 24 3a 38 00 00 00 02
 PIC 3                 BUILTIN      BUILTIN           3x 40GE QSFP+
Jedec Code:   0x0000            EEPROM Version:    0x00
P/N:          BUILTIN           S/N:               BUILTIN
Assembly ID:  0x0ab6            Assembly Version:  00.00
Date:         00-00-0000        Assembly Flags:    0x00
ID: 3x 40GE QSFP+
Board Information Record:
 Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
 Address 0x00: 00 00 00 00 0a b6 00 00 00 00 00 00 00 00 00 00
 Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
 Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

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```
      Address 0x70: 00 00 00 00 c0 02 ab 1c 00 00 00 00 0a b5 00 00
      WAN MEZZ       REV 01   750-062682   CAEA4788          24x 10GE SFP+ Mezz
     Jedec Code:   0x7fb0           EEPROM Version:    0x01
     P/N:          750-062682       S/N:               CAEA4788
     Assembly ID:  0x0c76           Assembly Version:  01.01
     Date:         04-28-2015       Assembly Flags:    0x00
     Version:      REV 01
     ID: 24x 10GE SFP+ Mezz
     Board Information Record:
      Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
     I2C Hex Data:
      Address 0x00: 7f b0 01 ff 0c 76 01 01 52 45 56 20 30 31 00 00
      Address 0x10: 00 00 00 00 37 35 30 2d 30 36 32 36 38 32 00 00
      Address 0x20: 53 2f 4e 20 43 41 45 41 34 37 38 38 00 1c 04 07
      Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
      Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
    FPC 4            REV 11   750-043157   CACY1592          SRX5k IOC II
     Jedec Code:   0x7fb0           EEPROM Version:    0x02
     P/N:          750-043157       S/N:               CACY1592
     Assembly ID:  0x0bd1           Assembly Version:  04.11
     Date:         07-30-2014       Assembly Flags:    0x00
     Version:      REV 11           CLEI Code:         COUIBCWBAA
     ID: SRX5k IOC II               FRU Model Number:  SRX5K-MPC
     Board Information Record:
      Address 0x00: ff ff ff ff ff ff ff ff ff ff ae 01 f2 06 00 ff
     I2C Hex Data:
      Address 0x00: 7f b0 02 ff 0b d1 04 0b 52 45 56 20 31 31 00 00
      Address 0x10: 00 00 00 00 37 35 30 2d 30 34 33 31 35 37 00 00
      Address 0x20: 53 2f 4e 20 43 41 43 59 31 35 39 32 00 1e 07 07
      Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ae 01
      Address 0x40: f2 06 00 ff 01 43 4f 55 49 42 43 57 42 41 41 53
      Address 0x50: 52 58 35 4b 2d 4d 50 43 00 00 00 00 00 00 00 00
      Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
      Address 0x70: ff ff ff 92 ff ff ff ff ff ff ff ff ff ff ff ff
      CPU            REV 04   711-043360   CACZ8831          SRX5k MPC PMB
     Jedec Code:   0x7fb0           EEPROM Version:    0x01
     P/N:          711-043360       S/N:               CACZ8831
     Assembly ID:  0x0bd2           Assembly Version:  01.04
     Date:         07-28-2014       Assembly Flags:    0x00
     Version:      REV 04
     ID: SRX5k MPC PMB
     Board Information Record:
      Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
     I2C Hex Data:
      Address 0x00: 7f b0 01 ff 0b d2 01 04 52 45 56 20 30 34 00 00
      Address 0x10: 00 00 00 00 37 31 31 2d 30 34 33 33 36 30 00 00
      Address 0x20: 53 2f 4e 20 43 41 43 5a 38 38 33 31 00 1c 07 07
      Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
      Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
      Address 0x70: ff ff ff ff 00 00 00 00 49 fa 60 10 40 05 76 5c
      MIC 1          REV 04   750-049488   CACN0239          10x 10GE SFP+
     Jedec Code:   0x7fb0           EEPROM Version:    0x02
     P/N:          750-049488       S/N:               CACN0239
     Assembly ID:  0x0a88           Assembly Version:  02.04
     Date:         02-26-2014       Assembly Flags:    0x00
     Version:      REV 04           CLEI Code:         COUIBCXBAA
```

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```
  ID: 10x 10GE SFP+               FRU Model Number:  SRX-MIC-10XG-SFPP
  Board Information Record:
   Address 0x00: 34 01 03 03 ff ff ff ff ff ff ff ff ff ff ff ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0a 88 02 04 52 45 56 20 30 34 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 34 39 34 38 38 00 00
   Address 0x20: 53 2f 4e 20 43 41 43 4e 30 32 33 39 00 1a 02 07
   Address 0x30: de ff ff ff 34 01 03 03 ff ff ff ff ff ff ff ff
   Address 0x40: ff ff ff ff 01 43 4f 55 49 42 43 58 42 41 41 53
   Address 0x50: 52 58 2d 4d 49 43 2d 31 30 58 47 2d 53 46 50 50
   Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 9f c0 03 e4 14 55 8a 95 a8 00 00 00 02
     PIC 2                BUILTIN      BUILTIN           10x 10GE SFP+
       Xcvr 7     REV 01   740-031980   ARN23HW           SFP+-10G-SR
       Xcvr 8     REV 01   740-031980   ARN2FVW           SFP+-10G-SR
       Xcvr 9     REV 01   740-031980   ARN2YVM           SFP+-10G-SR
 FPC 5            REV 10   750-056758   CADA8736          SRX5k SPC II
  Jedec Code:   0x7fb0            EEPROM Version:    0x02
  P/N:          750-056758        S/N:               CADA8736
  Assembly ID:  0x0b4f            Assembly Version:  01.10
  Date:         09-01-2014        Assembly Flags:    0x00
  Version:      REV 10            CLEI Code:         COUCATLBAB
  ID: SRX5k SPC II                FRU Model Number:  SRX5K-SPC-4-15-320
  Board Information Record:
   Address 0x00: ff ff ff ff ff ff ff ff ff ff ae 01 f2 06 00 ff
  I2C Hex Data:
   Address 0x00: 7f b0 02 ff 0b 4f 01 0a 52 45 56 20 31 30 00 00
   Address 0x10: 00 00 00 00 37 35 30 2d 30 35 36 37 35 38 00 00
   Address 0x20: 53 2f 4e 20 43 41 44 41 38 37 33 36 00 01 09 07
   Address 0x30: de ff ff ff ff ff ff ff ff ff ff ff ff ff ae 01
   Address 0x40: f2 06 00 ff 01 43 4f 55 43 41 54 4c 42 41 42 53
   Address 0x50: 52 58 35 4b 2d 53 50 43 2d 34 2d 31 35 2d 33 32
   Address 0x60: 30 00 00 00 00 00 43 00 00 ff ff ff ff ff ff ff
   Address 0x70: ff ff ff 50 ff ff ff ff ff ff ff ff ff ff ff ff
   CPU                    BUILTIN      BUILTIN           SRX5k DPC PPC
   PIC 0                  BUILTIN      BUILTIN           SPU Cp
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a20            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: SPU Cp
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
   Address 0x00: 00 00 00 00 0a 20 00 00 00 00 00 00 00 00 00 00
   Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 41 73 73 65
   Address 0x20: 42 55 49 4c 54 49 4e 00 41 73 73 65 00 00 00 00
   Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   Address 0x70: 00 00 00 00 de ad be ef 46 10 f0 d8 40 43 43 c0
   PIC 1                  BUILTIN      BUILTIN           SPU Flow
  Jedec Code:   0x0000            EEPROM Version:    0x00
  P/N:          BUILTIN           S/N:               BUILTIN
  Assembly ID:  0x0a21            Assembly Version:  00.00
  Date:         00-00-0000        Assembly Flags:    0x00
  ID: SPU Flow
  Board Information Record:
   Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  I2C Hex Data:
```

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```
  Address 0x00: 00 00 00 00 0a 21 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 41 73 73 65
  Address 0x20: 42 55 49 4c 54 49 4e 00 41 73 73 65 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 de ad be ef 46 13 5b d0 40 43 43 c0
  PIC 2                    BUILTIN      BUILTIN          SPU Flow
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a21            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: SPU Flow
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 21 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 41 73 73 65
  Address 0x20: 42 55 49 4c 54 49 4e 00 41 73 73 65 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 de ad be ef 46 0c 66 40 40 43 43 c0
  PIC 3                    BUILTIN      BUILTIN          SPU Flow
 Jedec Code:   0x0000            EEPROM Version:    0x00
 P/N:          BUILTIN           S/N:               BUILTIN
 Assembly ID:  0x0a21            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 ID: SPU Flow
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 21 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 41 73 73 65
  Address 0x20: 42 55 49 4c 54 49 4e 00 41 73 73 65 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 de ad be ef 46 0e db 00 40 43 43 c0
Fan Tray                                                 Enhanced Fan Tray
                                 FRU Model Number:  SRX5600-HC-FAN
```

show chassis hardware clei-models

show chassis hardware clei-models (SRX5600 and SRX5800 devices with SRX5000 line SRX5K-SCBE (SCB2) and SRX5K-RE-1800X4 (RE2)

```
user@host> show chassis hardware clei-models node 1
node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 01   710-024803                     SRX5800-BP-A
FPM Board        REV 01   710-024632                     SRX5800-CRAFT-A
PEM 0            Rev 04   740-034724                     SRX5800-PWR-4100-AC
PEM 1            Rev 05   740-034724                     SRX5800-PWR-4100-AC
Routing Engine 0 REV 01   740-056658   COUCATTBAA        SRX5K-RE-1800X4
CB 0             REV 01   750-056587   COUCATSBAA        SRX5K-SCBE
```

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```
CB 1             REV 01   750-056587   COUCATSBAA         SRX5K-SCBE
CB 2             REV 01   750-056587   COUCATSBAA         SRX5K-SCBE
FPC 0            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 1            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 2            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 3            REV 11   750-043157   COUIBCWBAA         SRX5K-MPC
  MIC 0          REV 05   750-049486   COUIBCYBAA         SRX-MIC-1X100G-CFP
  MIC 1          REV 04   750-049488   COUIBCXBAA         SRX-MIC-10XG-SFPP
FPC 4            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 7            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 8            REV 11   750-043157   COUIBCWBAA         SRX5K-MPC
  MIC 0          REV 05   750-049486   COUIBCYBAA         SRX-MIC-1X100G-CFP
FPC 9            REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 10           REV 18   750-054877   COUCATLBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
Fan Tray 0       REV 04   740-035409                      SRX5800-HC-FAN
Fan Tray 1       REV 04   740-035409                      SRX5800-HC-FAN
```

show chassis hardware clei-models (SRX5400, SRX5600, and SRX5800 devices with SRX5000 line SRX5K-SCB3 (SCB3) with enhanced midplanes and SRX5K-MPC3-100G10G (IOC3) or SRX5K-MPC3-40G10G (IOC3))

```
user@host> show chassis hardware clei-models
node0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code          FRU model number
Midplane         REV 01   760-063936   CLEI-CODE          SRX5600X-CHAS
FPM Board        REV 02   710-017254                      CRAFT-MX480-S
PEM 0            Rev 03   740-034701                      SRX5600-PWR-2520-AC-S
PEM 1            Rev 03   740-034701                      SRX5600-PWR-2520-AC-S
Routing Engine 0 REV 01   740-056658   COUCATTBAA         SRX5K-RE-1800X4
CB 0             REV 01   750-062257   CLEI-CODE          SRX5K-SCB3
FPC 0            REV 10   750-056758   COUCATLBAB         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 2            REV 01   750-062243
FPC 4            REV 11   750-043157   COUIBCWBAA         SRX5K-MPC
  MIC 1          REV 04   750-049488   COUIBCXBAA         SRX-MIC-10XG-SFPP
FPC 5            REV 05   750-044175   PROTOXCLEI         750-044175
  CPU                     BUILTIN
Fan Tray                                                  SRX5600-HC-FAN

node1:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code          FRU model number
Midplane         REV 01   760-063936   CLEI-CODE          SRX5600X-CHAS
PEM 0            Rev 01   740-038514                      SRX5600-PWR-2400-DC-S
PEM 1            Rev 01   740-038514                      SRX5600-PWR-2400-DC-S
Routing Engine 0 REV 01   740-056658   COUCATTBAA         SRX5K-RE-1800X4
CB 0             REV 01   750-062257   CLEI-CODE          SRX5K-SCB3
FPC 0            REV 07   750-044175   COUCASFBAA         SRX5K-SPC-4-15-320
  CPU                     BUILTIN
FPC 4            REV 11   750-043157   COUIBCWBAA         SRX5K-MPC
  MIC 1          REV 04   750-049488   COUIBCXBAA         SRX-MIC-10XG-SFPP
```

```
FPC 5            REV 10   750-056758   COUCATLBAB       SRX5K-SPC-4-15-320
  CPU                     BUILTIN
Fan Tray                                                SRX5600-HC-FAN
```


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show chassis routing-engine (View)

Supported Platforms SRX Series, vSRX

Syntax show chassis routing-engine

Release Information Command introduced in Junos OS Release 9.5.

Description Display the Routing Engine status of the chassis cluster.

Required Privilege Level view

Related Documentation

- cluster (Chassis) on page 270
- *request system snapshot (Maintenance)*

List of Sample Output

show chassis routing-engine (Sample 1 - SRX550) on page 400
show chassis routing-engine (Sample 2- vSRX) on page 400

Output Fields Table 45 on page 399 lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 45: show chassis routing-engine Output Fields

Field Name	Field Description
Temperature	Routing Engine temperature. (Not available for vSRX deployments.)
CPU temperature	CPU temperature. (Not available for vSRX deployments.)
Total memory	Total memory available on the system.
Control plane memory	Memory available for the control plane.
Data plane memory	Memory reserved for data plane processing.
CPU utilization	Current CPU utilization statistics on the control plane core.
User	Current CPU utilization in user mode on the control plane core.
Background	Current CPU utilization in nice mode on the control plane core.
Kernel	Current CPU utilization in kernel mode on the control plane core.
Interrupt	Current CPU utilization in interrupt mode on the control plane core.
Idle	Current CPU utilization in idle mode on the control plane core.
Model	Routing Engine model.

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Table 45: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
Start time	Routing Engine start time.
Uptime	Length of time the Routing Engine has been up (running) since the last start.
Last reboot reason	Reason for the last reboot of the Routing Engine.
Load averages	The average number of threads waiting in the run queue or currently executing over 1-, 5-, and 15-minute periods.

Sample Output

show chassis routing-engine (Sample 1 - SRX550)

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature                 38 degrees C / 100 degrees F
    CPU temperature             36 degrees C / 96 degrees F
    Total memory               512 MB Max   435 MB used ( 85 percent)
      Control plane memory     344 MB Max   296 MB used ( 86 percent)
      Data plane memory        168 MB Max   138 MB used ( 82 percent)
    CPU utilization:
      User                       8 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  0 percent
      Idle                      88 percent
    Model                          RE-SRX5500-LOWMEM
    Serial ID                      AAAP8652
    Start time                     2009-09-21 00:04:54 PDT
    Uptime                         52 minutes, 47 seconds
    Last reboot reason             0x200:chassis control reset
    Load averages:                 1 minute   5 minute  15 minute
                                       0.12       0.15       0.10
```

Sample Output

show chassis routing-engine (Sample 2- vSRX)

```
user@host> show chassis routing-engine
Routing Engine status:
    Total memory              1024 MB Max   358 MB used ( 35 percent)
      Control plane memory    1024 MB Max   358 MB used ( 35 percent)
    5 sec CPU utilization:
      User                       2 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  6 percent
      Idle                      88 percent
    Model                          VSRX RE
    Start time                     2015-03-03 07:04:18 UTC
    Uptime                         2 days, 11 hours, 51 minutes, 11 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.07       0.04       0.06
```

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show configuration chassis cluster traceoptions

Supported Platforms SRX Series, vSRX

Syntax show configuration chassis cluster traceoptions

Release Information Command introduced in Junos OS Release 12.1.

Description Display tracing options for the chassis cluster redundancy process.

Required Privilege Level view

Related Documentation

- cluster (Chassis) on page 270
- traceoptions (Chassis Cluster) on page 302

List of Sample Output show configuration chassis cluster traceoptions on page 402

Output Fields Table 46 on page 402 lists the output fields for the **show configuration chassis cluster traceoptions** command. Output fields are listed in the approximate order in which they appear.

Table 46: show configuration chassis cluster traceoptions Output Fields

Field Name	Field Description
file	Name of the file that receives the output of the tracing operation.
size	Size of each trace file.
files	Maximum number of trace files.

Sample Output

show configuration chassis cluster traceoptions

```
user@host> show configuration chassis cluster traceoptions
file chassis size 10k files 300;
level all;
```

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PART 7

Index

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Symbols

A

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