Secure Domain Router Commands on Cisco IOS XR Software

Secure domain routers (SDRs) provide a means of partitioning a router into multiple, independent routers. SDRs perform routing functions in the same manner as a physical router, but share resources with the rest of the system. For example, the applications, configurations, protocols, and routing tables assigned to an SDR belong to that SDR only, but other functions such as chassis control, switch fabric, and partitioning are shared with the rest of the system.

For detailed information about secure domain router concepts, configuration tasks, and examples, refer to the *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

Note Secure domain routers (SDRs) were previously known as logical routers (LRs). The name was changed for Release 3.3.0.

location (SDR)

To assign a node to a secure domain router (SDR), use the **location** command in SDR configuration mode. To remove a node from an SDR and return the node to the owner SDR, use the **no** form of this command.

location *partially-qualified-nodeid* [**primary**]

no location *partially-qualified-nodeid*

Syntax Description

partially-qualified-nodeid	Node to be assigned to the specified secure domain router. Refer to the Usage Guidelines for the syntax required in each router platform.
primary	(Optional, Cisco CRS-1 only). Configures the node as the DSDRSC for a secure domain router. This keyword is not supported on Cisco XR 12000 Series Routers.

Defaults

All nodes are assigned to the owner SDR.

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR). Added support for the **primary** keyword (optional, Cisco CRS-1 only).
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **location** command to assign a node to an SDR. By default, all nodes belong to the owner SDR. When a node is assigned to a non-owner SDR, it is automatically removed from the owner SDR inventory.

Use the **no** form of the **location** command to remove a node from an SDR. Removing a node from an SDR implicitly returns it to the owner SDR. When a node has been removed from an SDR, it can be reassigned to another SDR. To remove the designated secure domain router system controller (DSDRSC), you must first remove all other nodes in the SDR. You cannot remove the designated system controller (DSC) from the owner SDR.

Note Removing all nodes from an SDR deletes the secure domain router from the configuration.

Cisco CRS-1 Usage Notes

- Use the **location** command with the **primary** keyword to assign a route processor (RP) pair or a single distributed route processor (DRP) as the DSDRSC. If the **primary** keyword is not used, the node is assigned to the SDR, but it is not the DSDRSC.
- You cannot assign a single RP to an SDR in the Cisco CRS-1. RPs must be added in redundant pairs. The value of the *partially-qualified-nodeid* argument for RPs is entered in the *rack/RP*/** notation. This command assigns the redundant RP pair as the DSDRSC. One RP is automatically elected as the DSDRSC, and the second RP acts as the standby DSDRSC.
- To assign a single DRP to an SDR, use the **location** command with the *partially-qualified-nodeid* argument. To assign a single DRP node as the DSDRSC, enter the **location** command with the *partially-qualified-nodeid* argument and the **primary** keyword.
- To assign a redundant DRP pair to an SDR, use the **pair (SDR)** command as described on page 721. We recommend the use of DRP pairs as the DSDRSC for all non-owner SDRs.
- If an RP is already assigned to the SDR as the DSDRSC, it must be removed before a DRP can be assigned as the DSDRSC.

Cisco XR 12000 Series Router Usage Notes

- Enter the value of the *partially-qualified-nodeid* argument to specify a single node. The value of the *nodeid* argument is entered in the *rack/slot/** notation. Node IDs are always specified at the slot level, so the wildcard (*) is used to specify the CPU.
- The first RP you assign to the SDR will become the DSDRSC. To add a redundant standby RP to the configuration, install a second RP in the adjacent redundancy slot and add it to the SDR configuration. See *Configuring Secure Domain Routers on Cisco IOS XR Software* for information.
- DRPs are not supported in Cisco XR 12000 Series Routers.

Task ID

Task ID	Operations
system	read, write

Examples

Cisco CRS-1 Router Examples

In the following example, a new SDR *rname2* is created in a Cisco CRS-1 router. The **location** command is used to add an RP pair as the primary node (DSDRSC). An additional node in rack 1, slot 0 is then added to the configuration.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# location 1/RP*/* primary
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# location 1/0/*
RP/0/RP0/CPU0:router (admin-config-sdr:rname2)# end
```

The following example shows how to remove a node from SDR *rname2* in a Cisco CRS-1 router:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
```

```
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# no location 1/0/*
RP/0/RP0/CPU0:router (admin-config-sdr:rname2)# end
```

Cisco XR 12000 Series Router Examples

The following example shows how to create an SDR on a Cisco XR 12000 Series Router, and assign RPs in adjacent redundancy slots to be the DSDRSC:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/2/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/3/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# commit
RP/0/0/CPU0:router(admin-config-sdr:rname)# end
```

The following example shows how to add a node to an SDR in a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/0/CPU0:router (admin-config-sdr:rname2)# end
```

The following example shows how to remove a node to an SDR in a Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# no location 0/5/*
RP/0/0/CPU0:router (admin-config-sdr:rname2)# end
```

Related Commands

Command	Description
pair (SDR)	Adds or removes a DRP pair from an SDR configuration.
sdr	Creates or modifies an existing secure domain router.

pair (SDR)

To assign a distributed route processor (DRP) pair to a secure domain router (SDR) in a Cisco CRS-1 router, use the **pair** command in SDR configuration mode. To remove a DRP pair from the configuration, use the **no** form of this command.

pair *pair-name* [**primary**]

no pair *pair-name*

Syntax Description

pair-name	Specifies a DRP pair to be assigned to the specified secure domain router. The *pair-name* argument is the name assigned to the DRP pair. For instructions to create a DRP pair name, see the **pairing (drp)** command in the *Distributed Route Processor Commands on Cisco IOS XR Software*.
primary	(Optional) Specifies the named DRP pair as the primary and standby designated secure domain router system controllers (DSDRSC).

Defaults

No default behavior or values

Command Modes

SDR configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced on the Cisco CRS-1 router.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **pair** *pair-name* command to assign a DRP pair to an SDR. Enter the command **pair** *pair-name* and the **primary** keyword to assign the DRP pair as the DSDRSCs (primary and standby DSDRSCs).

To assign a DRP pair to an SDR, you must first create a DRP pair name as described in *Distributed Route Processor Commands on Cisco IOS XR Software* and *Configuring Secure Domain Routers on Cisco IOS XR Software*. When the DRP pair is created, you can add the *pair-name* to the SDR.

When a DRP pair is assigned to a non-owner SDR, it is automatically removed from the owner SDR inventory. When a DRP pair is removed from a non-owner SDR configuration, it is automatically returned to the owner SDR inventory.

RPs have precedence over DRPs for DSDRSC configuration. If an SDR already includes an RP, the RP must become the DSDRSC.

Use the **no** form of the **pair** command to remove the DRP pair from an SDR. Removing a DRP pair from an SDR implicitly returns it to the owner SDR. When a DRP pair has been removed from an SDR, it can be reassigned to another SDR.

Note This command is not supported on Cisco XR 12000 Series Routers.

Task ID

Task ID	Operations
system	read, write

Examples

The following example shows how to enter SDR configuration mode and add a DRP pair as the DSDRSC. The command **show configuration** is used in SDR configuration mode to display the SDR configuration.

```
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# pair drp1 primary
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# show configuration
Building configuration...
sdr rname2
 pair drp1 primary
!
end
```

The following example shows how to enter SDR configuration mode and remove a DRP pair from the SDR configuration:

```
RP/0/RP0/CPU0:router(admin-config)# sdr rname2
RP/0/RP0/CPU0:router(admin-config-sdr:rname2)# no pair drp1
```

Related Commands

Command	Description
location (SDR)	Adds or removes a node from an SDR configuration.
sdr	Creates or modifies an existing secure domain router.
location (drp)	Assigns nodes to a DRP pair.
pairing (drp)	Creates a DRP pair and enters DRP pairing configuration mode.

sdr

To create a secure domain router (SDR) and enter SDR configuration mode, use the **sdr** command in administration configuration mode. To remove a secure domain router from the configuration, use the **no** form of this command.

sdr *sdr-name*

no sdr *sdr-name*

Syntax Description

sdr-name	Name of the SDR to be created or modified.

Defaults

The system comes configured as a single secure domain router known as the *owner SDR*.

Command Modes

Administration configuration

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco XR 12000 Series Router.
Release 3.3.0	The term logical router (LR) was changed to secure domain router (SDR). This command was supported on the Cisco CRS-1.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **sdr** command to create an SDR or modify an existing SDR.

Note The *sdr-name* argument creates an SDR if the SDR specified for the *sdr-name* argument does not exist.

By default, a router running Cisco IOS XR software contains one SDR, the owner SDR. You cannot create the owner SDR, because it always exists—nor can you completely remove it, because it is necessary for managing the router.

After the **sdr** command is used, the router enters SDR configuration mode. From SDR configuration mode, you can add nodes to the SDR or remove nodes from the SDR using the **location (SDR)** command. In the Cisco CRS-1, you can also add or remove DRP pairs using the **pair (SDR)** command.

Use the **no** form of the command to remove a non-owner SDR configuration. When an SDR is removed from the router configuration, all nodes included in the SDR configuration are returned to the owner SDR inventory. The owner SDR cannot be removed.

Maximum SDR Configurations in Cisco IOS XR Software Release

- The Cisco CRS-1 supports a maximum of eight SDRs, including one owner SDR and up to seven non-owner SDRs.
- For the Cisco XR 12000 Series Router, we recommend a maximum of four SDRs, including one owner SDR and up to three non-owner SDRs.

Task ID

Task ID	Operations
system	read, write

Examples

The following example shows how to enter SDR configuration mode to configure an SDR. This example is for a Cisco XR 12000 Series Router.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# configure
RP/0/0/CPU0:router(admin-config)# sdr rname
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/0/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# location 0/5/*
RP/0/0/CPU0:router(admin-config-sdr:rname)# end
```

The following example shows how to remove an SDR from the configuration. All nodes belonging to the configuration are returned to the owner SDR inventory, and the SDR name is deleted. This example is for a Cisco CRS-1 router.

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# configure
RP/0/RP0/CPU0:router(admin-config)# no sdr rname
RP/0/RP0/CPU0:router (admin-config)# end
```

Related Commands

Command	Description
location (SDR)	Adds or removes a node from an SDR configuration.
pair (SDR)	Adds or removes a DRP pair from an SDR configuration.
location (drp)	Assigns nodes to a DRP pair.
pairing (drp)	Creates a DRP pair and enters DRP pairing configuration mode.

show sdr

To display information about the currently defined secure domain routers (SDRs), use the **show sdr** command in EXEC mode or administration EXEC mode.

Administration EXEC Mode

show sdr [**name** *sdr-name* [**detail**] | **summary**]

EXEC Mode

show sdr [**detail**]

Syntax Description

name *sdr-name*	(Optional. Administration EXEC mode only) Specific SDR.
detail	(Optional) Displays more detailed information for a specific SDR.
summary	(Optional. Administration EXEC mode only) Displays summary information about all SDRs in the system.

Defaults

Administration EXEC Mode

- Displays information for the owner SDR.
- If you are logged into a specific SDR as the admin user, then information about the local SDR is displayed.

EXEC Mode

- Displays information about the local SDR.

Command Modes

EXEC
Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show sdr** command in administration EXEC mode to display the inventory of nodes in the owner SDR or in a specific named SDR. The **show sdr** command in EXEC mode displays the inventory of nodes in the current SDR.

Task ID

Task ID	Operations
system	read

Examples

The following example shows sample output from the **show sdr** command in EXEC mode:

```
RP/0/RP0/CPU0:P1_CRS-8# show sdr

SDR Inventory
--------------

Type        NodeName   NodeState          RedState    PartnerName
-------------------------------------------------------------------
LC(2)       0/1/CPU0   IOS XR RUN         NONE        NONE
DRP(1)      0/4/CPU0   IOS XR RUN         Active      NONE
DRP(1)      0/4/CPU1   IOS XR RUN         Active      NONE
LC(2)       0/6/CPU0   IOS XR RUN         NONE        NONE
RP(0)       0/RP0/CPU0 IOS XR RUN         Active      0/RP1/CPU0
RP(0)       0/RP1/CPU0 IOS XR RUN         Standby     0/RP0/CPU0
```

Table 84 describes the significant fields shown in the display.

Table 84 show sdr Field Descriptions

Field	Description
Type	Type of card, which can be Linecard, RP or DRP.
NodeName	Name of the node, expressed in the *rack*/*slot*/*module* notation.
NodeState	Run state of the card, which can be failure, present, booting, running, and so on.
RedState	Redundancy state of the card, which can be active, standby, or none.
PartnerName	Partner of the card, expressed in the *rack*/*slot*/*module* notation.

The following example shows sample output from the **show sdr** command in administration EXEC mode with the **summary** keyword:

```
RP/0/RP0/CPU0:P1_CRS-8(admin)# show sdr summary

SDRs Configured:
SDR-Names             SDRid dSDRSC      StbydSDRSC  Primary1    Primary2    MacAddr
-------------------------------------------------------------------------------------------
Owner                 0     0/RP0/CPU0  0/RP1/CPU0  0/RP0/CPU0  0/RP1/CPU0   0011.92da.b400
RACK1-RPs             1     1/RP0/CPU0  1/RP1/CPU0  1/RP0/CPU0  1/RP1/CPU0   0011.92da.b401
DRP_ACROSS_RK         2     0/13/CPU0   1/9/CPU0    1/9/CPU0    0/13/CPU0    0011.92da.b402
PRECONFIG-R1          3     NONE        NONE        0/2/CPU0    NONE         0011.92da.b403
R2-PRECONFIG          4     NONE        NONE        0/4/CPU0    NONE         0011.92da.b404
```

Table 85 describes the significant fields shown in the display.

Table 85 show sdr summary Field Descriptions

Field	Description
SDRid	Identifier of the SDR.
dSDRSC	Designated secure domain router shelf controller. This refers to the controller of the SDR.

Table 85 show sdr summary Field Descriptions (continued)

Field	Description
StbydSDRSC	Standby DSDRSC. This refers to the standby controller of the SDR.
Primary1	Configured primary node.
Primary2	Configured primary node pair.
MacAddr	MAC address associated with the SDR.

Related Commands

Command	Description
sdr	Creates or modifies an existing secure domain router.