Software Entitlement Commands on Cisco IOS XR Software

For detailed information about software entitlement concepts, configuration tasks, and examples, refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

clear license

To delete all licenses from the router persistent storage, use the **clear license** command in administration EXEC mode.

clear license

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

The **clear license** command removes all licenses from the router persistent storage.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

In the following example, all licenses are removed from the router:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# clear license
```

clear license log

To clear the operational or administrative logs for the license system, use the **clear license log** command in administration EXEC mode.

clear license log {**operational** | **administration**}

Syntax Description

operational	Clears the operational logs for the license system.
administration	Clears the administration logs for the license system.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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 **clear license log** command to clear either the operational or administrative logs for the license system. To view the logs, use the **show license log** command. The license log does not persist between reloads.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example illustrates how to use the **clear license log** command to clear the operational logs:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# clear license log operational
```

Related Commands

Command	Description
show license log	Displays the operational or administrative logs for the license system.

hw-module linecard throughput (Cisco XR 12000 Series Router)

To configure the throughput for a Cisco XR 12000 SIP-401 or Cisco XR 12000 SIP-501, use the **hw-module linecard throughput** command in global configuration mode. To revert to the default linecard throughput, use the **no** form of this command.

hw-module linecard throughput location *node-id throughput*

no hw-module linecard throughput location *node-id*

Syntax Description

location *node-id*	Specifies the node to configure. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.
throughput	Specifies the throughput, in Gbps, at which the SIP should operate.

Defaults

The default throughput for the Cisco XR 12000 SIP-501 is 5 Gbps.
The default throughput for the Cisco XR 12000 SIP-401 is 2.5 Gbps.

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced on the Cisco XR 12000 Series Router.
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*.

The default throughput for the Cisco XR 12000 SIP-401 is 2.5 Gbps; for the Cisco XR 12000 SIP-501 is 5 Gbps. To raise the allowable throughput of your SIP to a maximum of 10 Gbps, you must have an available license on the router, and use the **hw-module linecard throughput** command.

You can configure a Cisco XR 12000 SIP-401 to run at 5 Gbps, using a single 2.5 G to 5 G license. You can configure the Cisco XR 12000 SIP-401 to run at 10 Gbps, using a single 2.5 G to 10 G license, or using a 2.5 G to 5 G license together with a 5 G to 10 G license. A Cisco XR 12000 SIP-501 can be configured to run at 10 Gbps, using a single 5 G to 10 G license. A Cisco XR 12000 SIP cannot be configured to run at a rate less than its default rate.

You should install permanent licenses for all SIPs that you want to operate at an increased throughput. Refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

Task ID

Task ID	Operations
interface	read, write

Examples

The following example shows how to configure a SIP to operate at 10 Gbps:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# hw-module linecard throughput location 0/6/CPU0 10g
```

Related Commands

Command	Description
show hw-module linecard throughput	Displays the throughput of all nodes in the router.

hw-module linecard throughput (CRS-1)

To configure the throughput for a modular services card (MSC), use the **hw-module linecard throughput** command in global configuration mode. To revert to the default throughput, use the **no** form of this command.

hw-module linecard throughput {**20g** | **40g**} **location** *node-id*

no hw-module linecard throughput {**20g** | **40g**} **location** *node-id*

Syntax Description

20g | **40g**	Specifies whether the node should operate at 40 Gbps or 20 Gbps.
location *node-id*	Specifies the node to configure. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.

Defaults

The default throughput is 20 Gbps.

Command Modes

Global configuration

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*.

The default throughput is 20 Gbps. If you upgrade your release from one that does not support software entitlement to one that does, and you have MSCs in your router operating at 40 Gbps, an implicit license is added to your router so that you can continue to operate at 40 Gbps for a limited period of time. You must, however, use the **hw-module linecard throughput** command to enable the MSC thoughput to 40 Gbps. Otherwise, your cards continue to operate at 20 Gbps.

Implicit licenses expire after a set period of time. You should install permanent licenses for all MSCs that you want to operate at 40 Gbps. Refer to the *Software Entitlement on Cisco IOS XR Software* module in *Cisco IOS XR System Management Configuration Guide*.

Task ID

Task ID	Operations
interface	read, write

Examples

The following example shows how to configure a node to operate at 40 Gbps:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# hw-module linecard throughput 40 location 0/6/0
```

Related Commands

Command	Description
show hw-module linecard throughput	Displays the throughput of all nodes in the router.

license add

To add a license to a secure domain router (SDR) license pool, use the **license add** command in administration EXEC mode.

license add *license-name* [**sdr** *sdr-name*]

Syntax Description

license-name	Name and location of the license file to be added. The license file can be local to the system or a remote file on a TFTP server.
sdr *sdr-name*	(Optional) Adds the license to the specified SDR license pool. The default is owner. The *sdr-name* argument is the name assigned to the SDR.

Defaults

License is added to the owner SDR.

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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 **license add** command to add a license to an SDR license pool. The license file can be local to the system or a remote file on a TFTP server. The license file is stored in persistent storage on the router.

To acquire a license file, you must provide a manufacturing supplied product authorization key (PAK) and the license unique device identifier (UDI) of the chassis to the license registration tool located at the following URL: https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet. To obtain the UDI of your chassis, use the **show license udi** command.

By default, there is one license pool available. You can create specific license pools using the **license pool create** command. If a license is available for a specific SDR license pool, it cannot be used in another SDR, unless it is moved from one SDR license pool to another. Use the **license move** command.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

In the following example, a software license is added to the owner SDR:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license add disk1:/P1-CRS-8_TBA09370035_
20070207195224661.lic

License command "license add disk1:/P1-CRS-8_TBA09370035_20070207195224661.lic sdr Owner"
completed successfully.
```

Related Commands

Command	Description
license move	Moves a license from one SDR license pool to another.
license pool create	Creates a license pool for the specified secure domain router (SDR).
show license udi	Displays the unique device identifier (UDI) information for the router.

license backup

To back up all licenses contained on the persistent storage of the router, use the **license backup** command in administration EXEC mode.

license backup *backup-file*

Syntax Description

backup-file	Name and location of the backup file to be created or modified. This can be a local file, or a remote file on a TFTP or rcp server.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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 **license backup** command to back up the licenses stored in the persistent storage on the router. We recommend this so that you can restore the licenses at one time while recovering from a failed disk situation. The destination location can be local to the system; in other words, a flash disk or hard disk. Alternatively, it can be a remote file on a TFTP or rcp server. The license information includes the licenses as well as the operational information, such as the slot the licenses are allocated to and the current license operation identifier.

If the backup file already exists, you are prompted to confirm before the file is overwritten.

When licenses are backed up, they can be restored as required using the **license restore** command.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to back up the licenses on a router:

```
RP/0/0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license backup disk1:/license_back
```

```
License command "license backup disk1:/license_back" completed successfully.
```

Related Commands

Command	Description
license restore	Restores licenses on the router from a previously created backup file.
show license backup	Displays the backup license file.

license move

To move a license from one secure domain router (SDR) license pool to another, use the **license move** command in administration EXEC mode.

license move *feature-id* {**all** | *count*} **sdr** *source-sdr-name* **sdr** *dest-sdr-name*

Syntax Description

feature-id	Identifier for the feature entitled in the licenses to be moved. You can display available licenses using the **show license** command.
all	Specifies to move all available licenses with the specific feature identifier.
count	Number of licenses to move.
sdr *source-sdr-name*	Specifies the SDR license pool from which to move the specified licenses. The *source-sdr-name* argument is the name assigned to the SDR.
sdr *dest-sdr-name*	Specifies the SDR license pool to which the license should be moved. The *source-sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

By default, there is only one license pool available. If you have created multiple license pools, you can use the **license move** command to move the license to a different SDR license pool.

The **license move** command is used only to move licenses between SDR license pools on the same router. To move licenses between routers, you must first remove the license from the original router using the **license remove** command, and then add it to the new router using the **license add** command. To move licenses between routers, you also need to generate a new license key on Cisco.com. The license registration tool is located at the following URL: https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet.

Licenses can be moved only if they are in the available state. In other words, you have to clear the feature configuration before a license can be released back to the appropriate license pool.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to move a license from one license pool to another:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g sdr owner sdr mysdr
```

Related Commands

Command	Description
license add	Adds a license to a secure domain router (SDR) license pool.
show license	Displays all licenses on the router.

license move slot

To move a license from one slot to another, use the **license move slot** command in EXEC or administration EXEC mode.

license move *feature-id* **slot** [*count*] **from** {*node-id* | **allocated**} **to** {*node-id* | **available**}

Syntax Description

feature-id	Identifier for the feature entitled in the licenses to be moved. You can display available licenses using the **show license** command.
count	Number of licenses to move. This argument cannot be used in conjunction with the **allocated** and **available** keywords.
from	Specifies from where to move the specified licenses.
node-id	Specific node from which to move the license.
allocated	Specifies to move all allocated licenses with the specific feature identifier. This keyword must be used in conjunction with the **available** keyword.
to	Specifies to where to move the specified licenses.
node-id	Specific node to which to move the license.
available	Specifies to move the specified allocated licenses into the available state. This keyword must be used in conjunction with the **allocated** keyword.

Defaults

One license is moved.

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **license move slot** command moves slot-based licenses from one slot to another slot on the same router.

Use the **allocated** keyword to move all allocated licenses into the available state. The **allocated** keyword must be used in conjunction with the **available** keyword. If no allocated licenses are available that match the feature identifier, the **license move slot** command revokes used licenses on the given slot.

If licenses are going to be revoked on the source card, a warning prompt is displayed.

Licenses can be moved only if they are in the available state. In other words, you have to clear the feature configuration before a license can be released back to the appropriate license pool.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to move a license from one slot to another:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g slot 1 from 0/1/cpu0 to 0/4/cpu0
```

The following example shows how to move all licenses to the available state:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license move crs-msc-40g slot from allocated to available
```

Related Commands

Command	Description
license add	Adds a license to a secure domain router (SDR) license pool.
show license	Displays all licenses on the router.

license pool create

To create a new secure domain router (SDR) license pool, use the **license pool create** command in administration EXEC mode.

license pool create sdr *sdr-name*

Syntax Description

sdr *sdr-name*	Creates a license pool on the specified SDR. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

Before the **license pool create** command can be used, the SDR must exist.

By default, there is only one license pool available. You can create a license pool for each SDR on the router. If there were any licenses in use on nodes in the SDR prior to creating the pool, the licenses are automatically moved to the newly created license pool.

When a license is associated with a specific SDR license pool, you cannot use it for entitlement on another SDR. To move a license from one license pool to another, use the **license move** command. Use the **license add** command to add licenses to the newly created license pool.

To remove an SDR license pool, use the **license pool remove** command.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to create a new license pool for an SDR:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license pool create sdr mysdr
```

```
License command "license pool create mysdr" completed successfully.
```

Related Commands

Command	Description
license add	Adds a license to a secure domain router (SDR) license pool.
license move	Moves a license from one SDR license pool to another.
license pool remove	Removes an SDR license pool.

license pool remove

To remove a secure domain router (SDR) license pool, use the **license pool remove** command in administration EXEC mode.

license pool remove sdr *sdr-name*

Syntax Description

sdr *sdr-name*	Creates a license pool on the SDR specified by *sdr-name*. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

By default, there is only one license pool available. If you have created multiple license pools, you can use the **license pool remove** command to remove them as desired. You cannot remove the default license pool in the owner SDR.

If you remove a license pool that contains licenses, the licenses are automatically returned to the owner SDR license pool.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to remove an SDR license pool:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# license pool remove sdr mysdr

License command "license pool remove sdr mysdr" completed successfully.
```

Related Commands

Command	Description
license pool create	Creates a license pool for the specified secure domain router (SDR).

license restore

To restore the licenses on a router using an earlier backup copy, use the **license restore** command in administration EXEC mode.

license restore *backup-file*

Syntax Description

backup-file	Name and location of the backup file to be used for the license restore. This can be a local file, or a remote file on a TFTP or rcp server.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

The **license restore** command restores the licenses on the router using an earlier backup copy that was created using the **license backup** command. The source location can be local to the system, in other words, a flash disk or hard disk. Alternatively, it can be a remote file on a TFTP or rcp server.

Before the licenses are restored, the license manager verifies the following:

- The backup format is valid.
- The licenses are issued for the chassis where the CLI is being run.
- The license operation identifier in the backup file matches the one on the router EEPROM.

Task ID

Task ID	Operations
pkg-mgmt	execute

Examples

The following example shows how to move a license from one license pool to another:

```
RP/0/0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)# license restore disk1:/license_back
```

```
Info: This command will erase all existing licenses.
Info: It is strongly recommended to backup existing licenses first.
Do you wish to proceed? [yes/no]: y

License command "license restore disk1:/license_back" completed successfully.
```

Related Commands

Command	Description
license backup	Backs up all licenses contained on the persistent storage of the router.

show hw-module linecard throughput

To display the throughput of modular services cards (MSCs) in the Cisco CRS-1 router, or SPA interface processors (SIPs) in the Cisco XR 12000 Series Router, use the **show hw-module linecard throughput** command in EXEC mode.

show hw-module linecard throughput [**location** *node-id*]

Syntax Description

location *node-id*	Specifies the node for which to display the throughput. The *node-id* argument is expressed in *rack*/*slot*/*module* notation.

Defaults

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1.
Release 3.6.0	This command was first supported on the Cisco XR 12000 Series Router.
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 hw-module linecard throughput** command on the Cisco CRS-1 to determine if MSCs are running at 40 Gbps or 20 Gbps throughput. Use the **show hw-module linecard throughput** command on the Cisco XR 12000 Series Router to determine at what throughput SIPs are operating.

Task ID

Task ID	Operations
interface	read
drivers	read

Examples

The following example displays sample output from the **show linecard throughput** command on the Cisco CRS-1:

```
RP/0/RP0/CPU0:router# show hw-module linecard throughput

 -------------------- Throughput --------------------
 Location        Configured      Lic Acquired    Operating

 0/6/CPU0         no config          No            20G

 0/1/CPU0         no config          Yes           40G
```

The following example displays sample output from the show linecard throughput command on the Cisco XR 12000 Series Router:

```
RP/0/0/CPU0:router# show hw-module linecard throughput

                    ---------------------- Throughput ----------------------
Location            Lic Acquired    Operating       Configured      Default

0/4/CPU0            No              10G             --              10G
0/2/CPU0            No              10G             --              10G
0/3/CPU0            Yes             10G             10G             2.5G
0/1/CPU0            Yes              5G              5G             2.5G
0/5/CPU0            Yes             10G             10G              5G
0/6/CPU0            No              2.5G            --              2.5G
0/7/CPU0            No               5G             --               5G
```

Table 23 describes the significant fields shown in the display.

Table 23 show hw-module linecard throughput Field Descriptions

Field	Description
Location	Indicates the specific card location.
Configured	Indicates whether or not the feature is configured on this card.
Lic Acquired	Indicates whether or not a license is acquired for the card.
Operating	Indicates if the MSC is operating at 40 Gbps or 20 Gbps for the Cisco CRS-1; indicates if the linecard is operating at 5 Gbps or 10 Gbps for the Cisco XR 12000 Series Router.
Default	(Cisco XR 12000 Series Router only) Indicates the default bandwidth for the card.

Related Commands

Command	Description
hw-module linecard throughput (Cisco XR 12000 Series Router)	Configures a SPA interface processor (SIP) card to operate at either 5 Gbps or 10 Gbps.
hw-module linecard throughput (CRS-1)	Configures a modular services card (MSC) to operate at either 20 Gbps or 40 Gbps.

show license

To display all license information, use the **show license** command in EXEC or administration EXEC mode.

show license [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license** command displays all license information. Alternatively, you can display license information for a specific feature identifier, slot location, or SDR by using the available options.

If the feature process has supplied an opaque string while checking out the license, that string is displayed next to the feature identifier in the command output.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license

FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 81 days])
  Total licenses 2
  Available for use         0
  Allocated to location     2
  Active                    0
    Pool: Owner
      Total licenses in pool: 2
      Status: Available     0    Operational:    2
      Locations with licenses: (Active/Allocated) [SDR]
              0/0/CPU0        (0/1) [Owner]
              0/1/CPU0        (0/1) [Owner]
```

Table 24 describes the significant fields shown in the display.

Table 24 show license Field Descriptions

Field	Description
FeatureID	Feature to which the licenses apply. The type of license is designated as one of the following: • Permanent licenses—Enable a designated feature permanently as long as the license resides on the router. • Evaluation or metered licenses—Enable a feature for a limited period of time. • Implicit licenses—Metered licenses that are included with the software image (upgrade or initial installation).
Total licenses	Number of licenses on the router.
Available for use	Number of licenses that are not currently active.
Allocated to location	Number of licenses allocated to a slot but not used.
Active	Number of licenses currently checked out or being used by applications.
Pool	License pool to which the licenses belong.
Total licenses in pool	Number of licenses in the specific pool.

Table 24 show license Field Descriptions (continued)

Field	Description
Status	Indicates the number of licenses in each state. Licenses can have the following states: Available—The license is available in the pool and can be assigned to a slot/feature process. For example, a recently added 40-Gbps license to the router is available before it gets checked out by a card. Allocated—The license is assigned to a slot but is unused. In other words, the feature process is not using the license. For example, a 40-Gbps license is allocated to slot 5 if the license was previously used but the card is currently in the shutdown state. Active—The feature process has checked out a license. Generally this happens when the feature is actively using the license. For example, if a card is in IOS XR RUN state and is passing traffic at 40 Gbps, a 40-Gbps license is in the used state in that slot. Operational—All licenses that are either active or allocated. Expired—the license has expired. This is applicable only for evaluation licenses or licenses granted by Cisco.
Locations with licenses	Slot where the licenses are being used, followed by an indication of whether the license is active or allocated, and to which license pool it belongs.

show license active

To display license information for all licenses that are currently checked out or being used by an application, use the **show license active** command in EXEC or administration EXEC mode.

show license active [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license active** command displays all license information regarding licenses that are currently checked out or being used by an application. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license active** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license active

FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 90 days])
  Status: Active       2
    SDR: Owner
    Operational:    2
    Location: 0/1/CPU0           1
              0/6/CPU0           1
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license allocated

To display license information for all licenses allocated to a slot but not used, use the **show license allocated** command in EXEC or administration EXEC mode.

show license allocated [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license allocated** command displays all license information regarding licenses that are allocated to a slot but are not currently being used. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license allocated** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license allocated

FeatureID: CRS-MSC-40G (Slot based, Permanent)
```

```
  Status: Allocated    1
    SDR: Owner
      Status: Operational:    1
      Locations with licenses: (Active/Allocated)
              0/1/CPU0        (0/1)

FeatureID: XC-L3VPN (Slot based, Permanent)
  No allocated licenses.
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license available

To display all licenses that are not currently in use or allocated to specific slots, use the **show license available** command in EXEC or administration EXEC mode.

show license available {*feature-id* | **location** *node-id* | **sdr** *sdr-name*}

Syntax Description

feature-id	Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	Specifies the location of the card. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
sdr *sdr-name*	Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license available** command displays all licenses that currently are not being used or allocated to a specific slot. You can display only licenses with a specific feature identifier, slot location, or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license available** command with only implicit licenses available:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license available
```

```
FeatureID: CRS-MSC-40G (Slot based, Implicit[Remaining time: 90 days])
  Status: Available    0
    SDR: Owner
      Status: Available    0
    Location: 0/1/CPU0           1
              0/6/CPU0           1
```

The following example displays sample output from the **show license available** command with permanent licenses installed:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license available

FeatureID: CRS-MSC-40G (Slot based, Permanent)
  Status: Available    7
    SDR: Owner
      Status: Available    7

FeatureID: XC-L3VPN (Slot based, Permanent)
  Status: Available    8
    SDR: Owner
      Status: Available    8
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license backup

To display the backup license file, use the **show license backup** command in administration EXEC mode.

show license backup *file-name*

Syntax Description

file-name	Name of the backup license file.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

The **show license backup** command displays the UDI information and license summary of a backup database, so that you can confirm the contents of a particular backup file before restoring it. Create the backup license file using the **license backup** command. Restore licenses from a backup using the **license restore** command.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license evaluation** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license backup disk1:/license_back

Local Chassis UDI Information:
  S/N         : TBA09370035
  Operation ID:   5
Licenses      :
FeatureID    Type                    #installed
CRS-MSC-40G  Slot based,    Permanent          2
XC-L3VPN     Slot based,    Permanent          1
```

Table 25 describes the significant fields shown in the display.

Table 25 show license backup Field Descriptions

Field	Description
S/N	Chassis serial number.
Operation ID	License operation ID number. The license operation ID is incremented by the license manager every time there is a successful license add or remove operation.
FeatureID	Feature to which the licenses apply.
Type	Type of license: slot-based or chassis-based; permanent, evaluation, or implicit.
#installed	Number of such licenses installed.

Related Commands

Command	Description
license backup	Backs up all licenses contained on the persistent storage of the router.
license restore	Restores licenses on the router from a previously created backup file.

show license evaluation

To display information about any evaluation licenses currently allocated, available, or in use, use the **show license evaluation** command in EXEC or administration EXEC mode.

show license evaluation [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license evaluation** command displays information regarding any evaluation licenses that are currently allocated, available, or in use, including the number of days left until they expire. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license evaluation** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license evaluation
```

```
FeatureID: XC-L3VPN (Non slot based, Evaluation[Valid])
  Valid for 2day(s) from 15:13:16 Nov 17 2006
  Remaining time: 1day(s) 21:07:46
  Status: Available     6  Allocated     0  Active        0
    SDR: Owner
      Status: Available     6   Operational:    0
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license expired

To display information regarding evaluation licenses that have expired, use the **show license expired** command in EXEC or administration EXEC mode.

show license expired [*feature-id* | **location** *node-id* | **sdr** *sdr-name*]

Syntax Description

feature-id	(Optional) Identifier for the feature entitled in the licenses to be displayed.
location *node-id*	(Optional) Specifies the location of the card. The *node-id* argument is entered in the *rack/slot/module* notation.
sdr *sdr-name*	(Optional) Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license expired** command displays information regarding evaluation licenses that have expired. You can display the information for a specific feature identifier, slot location, or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license expired** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license expired

FeatureID: XC-L3VPN (Non slot based, Evaluation[Expired])
```

```
  Status: Available     6  Allocated     0  Active        0
    SDR: Owner
      Status: Available     6   Operational:    0
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license log

To display the operational or administrative logs for the license system, use the **show license log** command in EXEC or administration EXEC mode.

show license log {**operational** | **administration**} {*request-id* | *feature-id* | **sdr** *sdr-name*}

Syntax Description

operational	Displays the operational logs for the license system.
administration	Displays the administration logs for the license system.
request-id	Identifier of a particular log entry.
feature-id	Identifier for the feature entitled in the licenses to be displayed.
sdr *sdr-name*	Displays the licenses in the specified secure domain router (SDR) license pool. The *sdr-name* argument is the name assigned to the SDR.

Defaults

No default behavior or values

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
Release 3.6.0	Support was added for EXEC mode.
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*.

The **show license log** command displays the operational or administrative logs for the license system. The administrative log displays all licenses that are added, removed, or moved along with a timestamp and username of the person who initiated the request. This log persists across reloads. The operation log displays when a license was checked out or released by a feature. The license release can be done by the license manager if it detects that the feature is not responding. This log does not persist between reloads.

You can display license information for a specific feature identifier or SDR by using the available options.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license log** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license log operational
#ID     :SDR     :FeatureID       :NodeID    :Time:   Log
1       :Owner   :CRS-MSC-40G     :0/6/CPU0  :Tue Feb  6 21:33:16 2007: license_acquire:
opaque_string , result(No error)
2       :Owner   :CRS-MSC-40G     :0/1/CPU0  :Tue Feb  6 21:33:16 2007: license_acquire:
opaque_string , result(No error)
```

See Table 24 on page 276 for a description of the significant fields shown in the display.

show license pools

To display the currently configured set of license pools, use the **show license pools** command in administration EXEC mode.

show license pools [**detail**]

Syntax Description

detail	(Optional) Displays the locations of the licenses in each pool.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

The **show license pools** command displays all license pools, and the features that are enabled with the licenses in each pool. By default, all licenses are contained in the owner SDR pool. If you have created SDR license pools with the **license pool create** command, you can place licenses in separate pools.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license pools** command. In this example, the owner SDR has both 40-Gbps and Layer_3 VPN licenses, while the SDR sdr2 has only 40-Gbps licenses.

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license pools

Pool Name       Feature
================================================
Owner           CRS-MSC-40G XC-L3VPN
sdr2            CRS-MSC-40G
```

Table 26 describes the significant fields shown in the display.

Table 26 show license pools Field Descriptions

Field	Description
Owner	SDR license pool.
Feature	Feature that is enabled in the specified license pool.

Related Commands

Command	Description
license pool create	Creates a license pool for the specified secure domain router (SDR).

show license udi

To display unique device identifier (UDI) information for the router, use the **show license udi** command in administration EXEC mode.

show license udi

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command Modes

Administration EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.
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*.

The **show license udi** command displays the complete UDI of the router to which any license will be associated. The UDI comprises the chassis serial number, along with a license operation ID number. The UDI is used to acquire a license file using the license registration tool on CCO. The license tool is located at the following URL: https://tools.cisco.com/SWIFT/Licensing/RegistrationServlet.

Task ID

Task ID	Operations
pkg-mgmt	read

Examples

The following example displays sample output from the **show license udi** command:

```
RP/0/0/CPU0:router# admin
RP/0/0/CPU0:router(admin)# show license udi

Local Chassis UDI Information:
  PID         : CRS-8-LCC
  S/N         : TBA09370035
  Operation ID: 1
```

Table 27 describes the significant fields shown in the display.

Table 27 show license udi Field Descriptions

Field	Description
PID	Product ID number.
S/N	Chassis serial number.
Operation ID	License operation ID number. The license operation ID is incremented by the license manager every time there is a successful license add or remove operation.