

Licensing on 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

The Cisco Software License Activation feature is a set of processes and components to activate Cisco IOS software feature sets by obtaining and validating fee-based Cisco software licenses.

For information on software license activation and concepts, see the Cisco IOS Software Activation Conceptual Overview.

For information on obtaining and installing licenses, see Configuring the Cisco IOS Software Activation Feature.

About the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

By default, no license is enabled on any port of the IM. To *enable* the license on a port, you must first *install* the license on the router. Licenses can be enabled on a per-port basis. 1-Port OC-192 or 8-Port Low Rate CEM Interface Module can be enabled with any of the following license types:

- OC-3
- OC-12
- OC-48
- OC-192

The lower rates (OC-3, OC-12, and OC-48) can be enabled on any slot from port 0 to port 7. OC-192 can be enabled only on port 8.

One port can be enabled with more than one type of license; however, each license can be associated with only one port. A license once assigned to a port cannot be assigned to any other port unless it is freed from the previous port.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release.

Use Cisco Feature Navigator to find information about platform support and Cisco IOS, Catalyst OS, and Cisco IOS XE software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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Prerequisites for Licensing on the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

- To enable a license on a port, you must first install it on the router.

Restrictions for Licensing on the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

- An OC-192 license cannot be enabled on port 0 to port 7. Port 8 cannot be enabled for any of the lower rates (OC3, OC-12, and OC-48) .
- Licenses cannot be used interchangeably. That is, four OC-3 licenses cannot be used in place of one OC-12 license. To configure a spcific rate, you must enable the same rate license on that port.
- Evaluation licences cannot be used along with permanent licences to enable ports on OC-3, OC-12, OC-48 and OC-192 interface module.
- One port can be enabled with more than one type of license. However, one license can be associated only with one port. Once assigned to a port, the same license cannot be assigned to any other port unless it is disassociated from the previous port.

Information About Licensing the Cisco ASR 900 Series Routers

For information on software activation and license procedures, see Software Activation Configuration Guide, Cisco IOS XE Release 3S (Cisco ASR 903).

Licensing the 1-port OC-192 or 8-port Low Rate CEM Interface Module

The benefits of licensing the ports are:

- Pay-as-you-grow model to enhance the ports by purchasing licenses as required.

- Ability to shift license from one port to another.
- Ability to release a license when the interface module is removed from a slot and reinstall the license when inserted again.

Note If an IM is removed, it is possible that the licenses on that IM are utilized by other IMs.

- Support for high availability and OIR of interface modules.

The following guidelines apply while licensing the ports:

- You must provide a license type to enable the license on the 1-port OC-192 or 8-port Low Rate CEM Interface Module.
- The validity of the license is checked only when you configure the controller rate. The configuration is allowed only if the same rate is enabled on the port. For example, if OC-3 license is enabled on a port, only OC-3 rate is can be configured on the same port; OC-12, OC-48, and OC-192 rates cannot be onfigured on that port.

Moving Licenses Across Ports

The licenses are not tied to a port and can moved across the ports and interface modules.

For example, if there are four licenses, and we have two interface modules (IM) and four ports, the licenses are distributed as follows.

```
platform enable controller mediatype 0/0/0 oc3 <<IM in slot 0
platform enable controller mediatype 0/0/1 oc12 <<IM in slot 0

platform enable controller mediatype 0/1/0 oc48 <<IM in slot 1
platform enable controller mediatype 0/1/2 oc3 <<IM in slot 1
```

Let's assume we no longer require the OC-12 license in 0/0/1. To remove this license from slot 0:

```
Router# no platform enable controller mediatype 0/0/1 oc12
```

The above command, allows the OC-12 license to be added to the free pool. To enable this license on another port, for example 0/1/3:

```
Router# platform enable controller mediatype 0/1/3 oc12
```

Interface Module Online Insertion and Removal (OIR)

If an OIR is performed on the enabled controller port of the interface module, the license used by the interface module is released. All the port licenses are given to free pool and can now be given to any other port.

If the interface module is inserted again, and if there are licenses in the free pool, the license that was valid before the OIR is re-enabled (assuming that there are non-zero usable ports). However, if before re-insertion the free license is aquired by another IM and the license is not available in the free pool, the IM port is moved into *shut* state and an error is displayed.

To *unshut* this port:

- Either remove all configuration at rate level
- Or enable the license on the port that has the same rate

OC-3 and OC-12 Interface Module Stateful Switchover (SSO)

If the license is installed on an active port and enabled on the active RSP module, the license information is synchronized with the standby RSP module. On SSO, the license ports enabled on the active RSP are activated on the standby RSP module.

An port license ISSU upgrade from an unsupported release to a supported release may impact the traffic flow on the router. If the controllers before the ISSU are in UP state, after an upgrade the controllers might remain in DOWN state, until the license in installed and enabled on the ports

Reload of Cisco ASR 903

A router reload may not be required after the license in installed on the ports. However, if the router is reloaded, the ports that are enabled prior to the reload will retain the license and configuration.

Installing and Upgrading Licenses on the 1-Port OC-192 or 8-Port Low Rate CEM Interface Module

Before you begin

To install or upgrade a license by using the **license install** command, you must have already received the license file from the Cisco Product License Registration portal at http://www.cisco.com/go/license (or you already backed up the license by using the **license save** command).

If you use Microsoft Entourage and receive the license file from Cisco in an e-mail attachment, the license file will contain UTF-8 marking. These extra bytes in the license file cause it to be unusable during license installation. To work around this issue, you can use a text editor to remove the extra characters and then install the license file. For more information about UTF-8 encoding, go to this URL: http://www.w3.org/International/questions/qa-utf8-bom.

Note The installation process does not install duplicate licenses. This message appears when duplicate licenses are detected:

```
Installing...Feature:xxx-xxx-xxx...Skipped:Duplicate
```

Note A standby device reboots twice when there is a mismatch of licenses.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**show license udi** **Example:** `Device# show license udi`	Displays all the UDI values that can be licensed in a system. • You need the UDI of the device as part of the process to obtain a license.
Step 3	Convert the PAK to a license by entering the PAK and the UDI into the Cisco Product License Registration portal: http://www.cisco.com/go/license.	After entering the appropriate information, you will receive an e-mail containing the license information that you can use to install the license: • Copy the license file received from the Cisco Product License Registration portal to the appropriate file system on the device. or • Click the **Install** button on the web page.
Step 4	**license install** *stored-location-url* **Example:** `Router# license install bootflash:*.lic`	Installs the license. Accept the end-user license agreement if prompted.
Step 5	**show license detail** **Example:** `Router# show license detail`	Displays the license information and verifies the number of licenses obtained.
Step 6	**end** **Example:** `Router# end`	Returns to privileged EXEC mode.

What to do next

You need to enable the ports on the interface module slot for the license to take effect.

Enabling Licenses on the Port

After installing and verifying the licenses on the router, enable the ports on the router.

Note The **no platform enable controller** disables the ports on the interface module.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**platform enable controller Mediatype** *slot/subslot/port license-type* **Example:** `Router(config)# platform enable controller Mediatype 0/4/0 oc3`	Enables the ports on slot where the 1-port OC-192 or 8-port Low Rate CEM Interface Module is present. **Note** Do not use **controller sonet** to enable the 1-port OC-192 or 8-port Low Rate CEM Interface Module. • **controller Mediatype**—Configures a specific controller. • *license-type*—Type of license. Valid values are oc3, oc12, oc48, and oc192.
Step 4	**end** **Example:** `Router# end`	Returns to privileged EXEC mode.

Enabling Rate Configuration for a License

While configuring rate license ensure that it is the same rate as that of controller license.

The following is a sample configuration that depicts this scenario.

```
Router# configure terminal
Router(config)# platform enable controller MediaType 0/4/4 oc3 >>license is enabled for oc3
license received successfully on MediaType 0/4/4 for oc3
Router(config)# controller MEdiaType 0/4/4
Router(config-controller)# mode SONET
Router(config-controller)# exit
Router(config)# controller SONET 0/4/4
Router(config-controller)# rate oc12  >>rate is configured for oc12 whereas license is
enabled for OC3
license is not enabled for this rate.
% Unable to configure this rate.
Router(config-controller)# rate oc3  >>rate is configured for oc3
Router(config-controller)#
```

Disabling the License



Note Ensure that you have disabled the rate configuration before disabling the license.

This section describes disabling the rate configuration as well disabling the license configuration.

To display the enabled licenses, run the following command:

```
Router# show running-config | sec 0/4/4
platform enable controller MediaType 0/4/4 oc3
platform enable controller MediaType 0/4/4 oc12
```

The above output indicates that port 0/4/4 has two licensesOC3 and OC12. The port is configured with *rate* = OC3.

```
Router(config)# no platform enable controller MediaType 0/4/4 oc12
>>License successfully disabled as it is not in use
Router(config)# no platform enable controller MediaType 0/4/4 oc3
  Controller rate configured needs this license
  unconfigure rate before disabling this license  >>license failed to disable.
Router(config)# controller SONET 0/4/4
Router(config-controller)# STS-1 1
Router(config-ctrlr-sts1)# no vtg 1 t1 1 cem-group 23 unfr  >>Removes all the configuration
 after rate configuration
Router(config-ctrlr-sts1)# no mode vt-15
Router(config)# controller MEdiaType 0/4/4
Router(config-controller)# no mode SONET     >>Disables rate configuration
Router(config-controller)#exit
Router(config)# no platform enable controller MEdiaType 0/4/4 oc3
 License disabling successful.
```

Online Insertion and Removal of the Interface Module

The 1-port OC-192 or 8-port Low Rate CEM Interface Module can be removed and inserted from the chassis slot while the system is online.

When removing the interface module:

- All licenses enabled on the module's ports are also removed and released to free pool.
- These free licenses can now be enabled on the same or a different module's ports on a first-come-first-served basis.

When insertting an interface module, if free licenses exist, they are acquired and the previous configuration works.

If there are no free licenses available, the IM port is moved into *shut* state and an error is displayed.

ExampleOIR of Interface Module

ScenarioThere is one license installed on the router for OC3. The interface module is inserted in slot 0/4. The OC3 license is installed on port 0/4/0 by using the command **platform enable controller controller Mediatype 0/4/0 oc3**. The following output displays this license.

```
Router# show license detail
Index: 15       Feature: oc3                                Version: 1.0
        License Type: Permanent
        License State: Active, Not in Use
       License Count: 1/1/0  (Active/In-use/Violation) >>license is "in-use" by port 0/4/0

        License Priority: Medium
        Store Index: 4
        Store Name: Primary License Storage.
```

The interface module is now removed from slot 0/4. The display the new state, run the following command:

```
Router# show license detail
Index: 15       Feature: oc3                                Version: 1.0
        License Type: Permanent
        License State: Active, Not in Use
        License Count: 1/0/0  (Active/In-use/Violation)  >>license is freed.
        License Priority: Medium
        Store Index: 4
        Store Name: Primary License Storage.
```

Now, insert a different OC-192 Interface Module or 8-port Low Rate CEM Interface Module in a different slot, say 0/3 by using the command **platform enable controller controller Mediatype 0/3/0 oc3**.

Run the **show license detail** command to view the details:

```
Index: 15       Feature: oc3                                Version: 1.0
        License Type: Permanent
        License State: Active, Not in Use
       License Count: 1/1/0  (Active/In-use/Violation)  >>license is now used by port 0/3/0

        License Priority: Medium
        Store Index: 4
        Store Name: Primary License Storage.
```

Re-insert the first interface module in slot 0/4

Verifying the Licenses

- **show license detail**

  Use the **show license detail** command to view the license on the ports. The following are sample ouput for in-use an not-in-use licenses.

  ```
  Router# show license detail
  Index: 4        Feature: oc3                                Version: 1.0
          License Type: Permanent
          License State: Active, Not in Use
          License Count: 13/0/0 (Active/In-use/Violation)
          License Priority: Medium
          Store Index: 2
          Store Name: Primary License Storage
  ```

```
Router# show license detail
Index: 15       Feature: oc3                                Version: 1.0
        License Type: Permanent
        License State: Active, In Use
        License Count: 1/1/0  (Active/In-use/Violation0
        License Priority: Medium
        Store Index: 4
        Store Name: Primary License Storage
```

- **show license udi**

  Use the **show license udi** command to view the UDI details of the license.

```
Router# show license udi
SlotID   PID                  SN                      UDI
-------------------------------------------------------------------------------
*6       ASR-903              FOX1637P0UB     ASR-903:FOX1637P0UB
```

- **show platform hardware license-port license detail**

  To verify the association between controller ports and licenses, use the **show platform hardware license-port license detail**

```
Router# show platform hardware license-port license detail
OC3 IM output
==============
The following are the port license details for IM in slot 3
###############################################

The port 0/3/0 is A licensed port

The port 0/3/1 is NOT A licensed port
This port is OIR'd, and is NOT A licensed port before OIR
```