Clustering Switches

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

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

Restrictions for Configuring RTU Licenses

The following are the restrictions for configuring and using RTU licenses.

- AP count licenses can be ordered and pre-activated on your switch.
- Imaged based licenses can be upgraded. AP count licenses can be deactivated and moved between switches and controllers.
- To activate a license, you must reboot your switch after configuring the new license level. The AP-count license does not require a reboot to activate.
- An expired evaluation license can not be reactivated after reboot.
- Stack members of a switch stack must run the same license level. If the license level is different, the switch will not join the stack until it is changed and rebooted from the active switch of the stack.
- Adder AP-count licenses are installed in the factory.

Information About Configuring RTU Licenses

Right-To-Use Licensing

Right-to-use (RTU) licensing allows you to order and activate a specific license type and level, and then to manage license usage on your switch. The types of licenses available to order by duration are:

- Permanent licenses—Purchased with a specific feature set with no expiration date.
- Evaluation licenses—Pre-installed on the switch and is valid for only a 90 day in-use period.

To activate a permanent or evaluation license, you are required to accept the End-User License Agreement (EULA).

A permanent license can be moved from one device to another. To activate a license, you must reboot your switch.

If you activate the evaluation license, it will expire in 90 days. An evaluation license is a manufacturing image on your switch and is not transferable to another switch. Once activated, this type of license cannot be deactivated until it expires. After your evaluation period expires, at the next reload your switch image will return to its default license and network operations are not impacted.

Right-To-Use Image-Based Licenses

Right-to-use image licenses support a set of features based on a specific image-based license:

- LAN Base—Layer 2 features.
- IP Base—Layer 2 and Layer 3 features.
- IP Services—Layer 2, Layer 3, and IPv6 features. (Applicable only to switches and not controllers.)

The default image license for the switches is as follows:

- Catalyst 2960-CX switches: LAN Base
- Catalyst 3560-CX switches: IP Base

Right-To-Use License States

After you configure a specific license type and level, you can manage your licenses by monitoring the license state.

Table 1: RTU License States

License State	Description
Active, In Use	EULA was accepted and the license is in use after device reboot.
Active, Not In Use	EULA was accepted and the switch is ready to use when the license is enabled.

License State	Description
Not Activated	EULA was not accepted.

Guidelines to follow when monitoring your image based license state:

- A purchased permanent license is set to *Active, In Use* state only after a switch reboot.
- If more than one license was purchased, a reboot will activate the license with the highest feature set. For instance, the IP Services license is activated and not the LAN Base license.
- Remaining licenses purchased after switch reboot, stay in **Active, Not In Use** state.

Note For the AP count license, to change the state to Active, In Use, you must first make sure that the evaluation AP count license is deactivated.

Mobility Controller Mode

AP-count licenses are used only when the switch is in Mobility Controller mode. The MC is the gatekeeper for tracking the AP-count licenses and allows an access point to join or not.

Management of AP-count licenses is performed by the in mobility controller mode configurable through the CLI.

Right-To-Use Adder AP-Count Rehosting Licenses

Revoking a license from one device and installing it on another is called rehosting. You might want to rehost a license to change the purpose of a device.

To rehost a license, you must deactivate the adder ap-count license from one device and activate the same license on another device.

Evaluation licenses cannot be rehosted.

How to Configure RTU Licenses

Activating an Image Based License

To activate image based licenses, complete the following task:

Procedure

	Command or Action	Purpose
Step 1	**license right-to-use activate** {**ipbase** | **ipservices** | **lanbase**} {**all** | **evaluation all** } [**slot** *slot-number*] [**acceptEULA**]	Activates the license level. Activation can happen on all switches and also include the EULA acceptance.

	Command or Action	Purpose
	Example: `Switch# license right-to-use activate ipservices all acceptEULA`	**Note** If you do not accept EULA, the modified configuration will not take effect after reload. The default license (or a license that was not deactivated) becomes active after reload.

Step 2	**reload** [*LINE* | **at** | **cancel** | **in** | **slot** *stack-member-number* | **standby-cpu**]
	
	Example:
	`Switch# reload slot 1`
	`Proceed with reload? [confirm] y`
		Reloads a specific stack member to complete the activation process for the RTU adder AP-count license.
		
		Note The reminder to accept the EULA is displayed after reload if it was not accepted earlier.
		
		When changing license level, you are not required to save the configuration. But, it is a good practice to ensure all the configuration is stored properly before reload. Changing from a higher license level to a lower license level on reboot will remove CLIs that are not applicable. Ensure that all features in the lower license level that are actively used are not removed.

Step 3	**show license right-to-use usage** [**slot** *slot-number*]
	
	Example:
	
	`Switch# show license right-to-use usage`
	
	`Slot# License Name Type`
	`usage-duration(y:m:d) In-Use EULA`
	`---`
	`1 ipservices Permanent`
	`0 :10:27 yes yes`
	`1 ipservices Evaluation`
	`0 :0 :0 no no`
	`1 ipbase Permanent`
	`0 :0 :9 no yes`
	`1 ipbase Evaluation`
	`0 :0 :0 no no`
	`1 lanbase Permanent`
	`0 :11:12 no yes`
	`---`
	
	`Switch#`
		Displays detailed usage information.

Activating an AP-Count License

Procedure

	Command or Action	Purpose
Step 1	**license right-to-use activate**{**apcount** *ap-number* **slot** *slot-num*} | **evaluation**} [**acceptEULA**] **Example:** `Switch# license right to use activate apcount 5 slot 1 acceptEULA`	Activates one or more adder AP-count licenses and immediately accepts the EULA.

Step 2	**show license right-to-use usage** [**slot** *slot-number*]
	Example:
	`Switch# show license right-to-use usage`
	`Slot# License Name Type usage-duration(y:m:d) In-Use EULA`
	`1 ipservices permanent 0 :3 :29 yes yes`
	`1 ipservices evaluation 0 :0 :0 no no`
	`1 ipbase permanent 0 :0 :0 no no`
	`1 ipbase evaluation 0 :0 :0 no no`
	`1 lanbase permanent 0 :0 :0 no no`
	`1 apcount evaluation 0 :3 :11 no no`
	`1 apcount base 0 :0 :0 no yes`
	`1 apcount adder 0 :0 :17 yes yes`
	`Switch#`
		Displays detailed usage information.

Obtaining an Upgrade or Capacity Adder License

You can use the capacity adder licenses to increase the number of access points supported by the device.

Procedure

	Command or Action	Purpose
Step 1	**license right-to-use** {**activate** | **deactivate**} **apcount** {*ap-number* | **evaluation** } **slot** *slot-num* [**acceptEULA**] **Example:** `Switch# license right to use activate apcount 5 slot 2 acceptEULA`	Activates one or more adder AP-count licenses and immediately accepts the EULA.

Rehosting a License

To rehost a license, you have to deactivate the license from one device and then activate the same license on another device.

Procedure

	Command or Action	Purpose
Step 1	**license right-to-use deactivate [license-level] apcount** *ap-number* **slot** *slot-num* **Example:** `Switch# license right-to-use deactivate apcount 1 slot 1`	Deactivates the license on one device. The "ipbase" license level is considered as the example here.
Step 2	**license right-to-use activate [license-level] slot** *slot-num* [**acceptEULA**] **Example:** `Switch# license right to use activate ipbase slot 2 acceptEULA`	Activates the license on another device. The "ipbase" license level is considered as the example here.

Monitoring and Maintaining RTU Licenses

Command	Purpose
show license right-to-use default	Displays the default license information.
show license right-to-use detail	Displays detailed information of all the licenses in the switch stack.
show license right-to-use eula {evaluation | permanent}	Displays the end user license agreement.
show license right-to-use mismatch	Displays the license information that does not match.
show license right-to-use slot *slot-number*	Displays the license information for a specific slot in a switch stack.

Command	Purpose
show license right-to-use summary	Displays a summary of the license information on the entire switch stack.
show license right-to-use usage [**slot** *slot-number*]	Displays detailed information about usage for all licenses in the switch stack.
show switch	Displays detailed information of every member in a switch stack including the state of the license.

Configuration Examples for RTU Licensing

Examples: Activating RTU Image Based Licenses

This example shows how to activate an IP Services image license and accept the EULA for a specific slot:

```
Switch# license right-to-use activate ipservices slot 1 acceptEULA
% switch-1:stack-mgr:Reboot the switch to invoke the highest activated License level
```

This example shows how to activate a license for evaluation:

```
Switch# license right-to-use activate ipservices evaluation acceptEULA
% switch-1:stack-mgr:Reboot the switch to invoke the highest activated License level
```

Examples: Displaying RTU Licensing Information

Example: Displaying RTU License Details

This example shows all the detailed information for the RTU licenses on slot 1:

Example: Displaying RTU License Mismatch

This example shows the license information of the switches in a stack and a mismatch state of a member switch. The member must match the active.

```
Switch# show switch

Switch/Stack Mac Address : 1c1d.8625.7700 - Local Mac Address
                                                    H/W   Current
Switch#   Role        Mac Address     Priority Version  State
-----------------------------------------------------------------------------
*1       Active   1c1d.8625.7700     15     V02     Ready
 2       Standby  bc16.f55c.ab80     7      V04     Ready
```

```
3       Member   580a.2095.da00     1      V03     Lic-Mismatch
```

Note To resolve the license mismatch, first check the RTU license summary:

```
Switch# show license right-to-use
```

Then change the license level of the mismatched switched so that it is the same license level of the active switch. This example shows that the IP Base license was activated for the member switch to match the active switch.

```
Switch# license right-to-use activate ipbase slot 3 acceptEULA
```

Example: Displaying RTU Licensing Usage