Cisco ASR 9001-S 120G Upgrade License Configuration

The Cisco ASR 9001-S Router is a 60 Gbps capacity router with a 40 GE maximum, pluggable ethernet port (MPA0) and two 10 GE fixed SFP+ ports (SFP+0 and SFP+1) enabled on it. The remaining ports MPA1, SFP+2, and SFP+3 are disabled by default. To enable these ports and thus achieve a full bandwidth of 120 Gbps, you need to install the Cisco ASR 9001-S 120G Upgrade License (A9K-9001-120G-LIC).

This document provides detailed information about configuring Cisco ASR 9001-S 120G Upgrade License on the Cisco ASR 9001-S Router.

Revision History

Date	Notes
May 2013	Initial release of this licensing document.

License Overview

On a device, some ports and features are active by default. These are known as base functionality and do not require that a license be purchased for their use. However, to activate additional ports and features, you need to purchase licenses.

A license is a permit for a software feature to be made functional or enabled on a device. The "pay as you grow" model enables you to upgrade your hardware and software capacity by using a license key. As a result, the upfront deployment cost is reduced and additional capacities or features can be purchased as needed. You

need not complete a return merchandise authorization (RMA) process to add new hardware. Instead, you can purchase the license, have it electronically delivered, and use the license key to enable the feature.

Based on your order, new devices are shipped with pre-installed licenses for specific functionalities. New or upgraded Cisco devices must be registered, and you must have a product authorization key (PAK) to obtain new licenses from Cisco. New licenses must be added to enable additional functionalities.

The Dynamic Configuration Tool (DCT) assists you in ordering the Cisco ASR 9001-S 120G Upgrade License.

Understanding Common Licensing Terms

These sections describe Cisco software's common licensing terms:

Product Authorization Key

Accessing Cisco licensing portals require a Product Authorization Key (PAK), which is provided when you order and purchase the right to use a feature set for a particular device. The PAK is an 11-character alphanumeric key printed on the purchase order document that is shipped with your device hardware. The PAK serves as a receipt and is an important component used in the process of obtaining, upgrading, and activating a license. The registration process too requires the PAK.

You can also purchase, what is known as a bulk PAK that fulfill multiple licenses on a device.

Unique Device Identifier

Every Cisco device is provided with a unique device identifier (UDI). The UDI is printed on a label located on the back of most Cisco hardware devices.

Licenses are associated with the UDI. The UDI information present on the license file is compared with the actual UDI of the device during license installation. If they do not match, an UDI mismatch error is displayed.

The UDI has three main components: product ID (PID), version ID (VID), and serial number (SN). However, the license uses only the PID and SN for product identification.

To view the PID and SN using CTC, at the Node view, click **Inventory** tab. The PID and SN are displayed in the 'Product ID' and 'Serial #' columns, respectively. The PID and SN can also be retrieved using the TL1 interface command, RTRV-INV.

Note Ensure that correct UDI information, comprising PID and SN, is used when the license is registered.

Cisco Software License Validation

The Cisco software licensing (CSL) uses a system of validation keys to provide a simple mechanism for deploying new feature sets.

The Cisco licensing portal issues a license key to enable the specified number of ports or features, and the license is locked to the device UDI. This is known as a node-locked license.

Software End-User License Agreement

As part of the licensing process, you must accept the terms and conditions provided in the end-user license agreement. You must accept the agreement when you first use a new device.

Read the terms and conditions of the end-user license agreement located at this URL:

http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html

Watchtower Device Certificate

The Watchtower Device Certificate (WDC) is used to ascertain the physical authenticity of the device. The WDC is hard-coded on the device.

Cisco ASR 9001-S 120G Upgrade License

The Cisco ASR 9001-S 120G Upgrade License is a permanent license that enables disabled ports on Cisco ASR 9001-S Router upon activation. This license upgrade helps users to increase the bandwidth of the Cisco ASR 9001-S Router from 60 Gbps to 120 Gbps.

Permanent licenses do not have an expiry date; that is, they do not have any limitation in the usage period associated with them. Permanent licenses provide the necessary permissions required to access licensed ports and provision licensed features on the device. All permanent licenses are device-locked and validated by the Cisco licensing infrastructure. After a permanent license is installed, you do not need to upgrade the license for subsequent releases.

The Cisco ASR 9001-S 120G Upgrade License can be added to the router using the command **license add** *path-to-license_file_name*. This license file needs to be generated using the chassis serial number and feature ID (A9K-9001-120G-LIC). The Cisco ASR 9001-S 120G Upgrade License is restricted to function on an individual chassis basis.

Register Cisco Product Licenses

Purpose	This procedure explains how to register Cisco product licenses.
Tools/Equipment	None
Prerequisite Procedures	None
Required/As Needed	As Needed
Onsite/Remote	Onsite or Remote

Procedure

Step 1 Collect the PAK and unique device identifier (UDI) information for the devices you need to register. Ensure that the correct UDI (PID and serial number) is used during license registration. For more information about PAK and UDI, see Unique Device Identifier, on page 2.

Step 2 Access the Cisco Product License Registration portal to provide license registration information. You must have a Cisco.com account before you can access the portal. You need to provide information on the web page in the following sequence:

a) Enter a PAK Number—Provide the PAK information in the "Product Authorization Key (PAK)" section of the web page and click **Submit**.

b) Validate Features—Validate the product information and click **All Done**.

c) Designate Licensee—Enter the Product ID and Serial Number, and select the **Agreement** check box. Click **Continue**.

   Note Do not enter any "=" symbol in the Product ID.

d) Finish and Submit—Verify the information summary and click **Submit**.

Step 3 The Cisco Product License Registration portal e-mails you the license file. The license file has the information about the number of licenses, features, and Stock Keeping Unit (SKUs) supported. The SKU identifies the set of licensed features on the card.

Step 4 Install the license file and deploy the license to your device using CTC. For more information on installing licenses, see Installing the License, on page 4.

Stop. You have completed this procedure.

Installing the License

The Cisco Software License Activation feature includes Cisco IOS XR EXEC commands that allow the executing of basic licensing tasks from the CLI.

To install a license using Cisco IOS XR commands, perform these tasks:

Procedure

	Command or Action	Purpose

Step 1	**license** *feature-id* **location all**
	
	Example:
	`Router(admin-config)# license A9K-9001-120G-LIC location all`
	
	`How to verify the configured license in the configuration:`
	
	`RP/0/RSP0/CPU0:ASR9001-S#admin show run license A9K-9001-120G-LIC`
	`Mon Dec 23 23:25:22.532 UTC`
	`license A9K-9001-120G-LIC`
	`location all`
	`!`
		(In admin-config mode) Ensures that the license for a particular feature ID is available at all locations of the Cisco ASR 9001-S Router.

	Command or Action	**Purpose**
Step 2	exit **Example:** `Router(admin-config)# `**`exit`**	Exits from the admin-config mode.
Step 3	**license add** *license_location_from_tftp_or_disk* **Example:** `Router(admin)# `**`license add`** **`tftp://<tftpserver>/ASR-9001-LS_TES168970IL_20120923224429988.lic`**	Installs the upgrade license at the Cisco ASR 9001-S Router.
Step 4	Reload or TURBOBOOT the Cisco ASR 9001-S Router.	Reload the Cisco ASR-9001-S Router or TURBOBOOT it, this is necessary since the License checks happen during the boot procedures, so either TURBOBOOT or RELOAD is mandatory to enable license updates.

How to TURBOBOOT

After adding the license, it is mandatory to reboot the router. Either a TURBOBOOT or reload of the Cisco ASR 9001-S Router will enable license updates. Use these example commands to TURBOBOOT the router:

```
Reload Procedure
RP/0/RSP0/CPU0:A9001-S-xth#reload
Mon Dec 23 14:50:33.090 EDT
Standby card not present or not Ready for failover. Proceed?[confirm]
<confirm with enter to reload>

Turboboot procedure:

rommon> TURBOBOOT=on
rommon> TFTP_SERVER=10.0.0.1
rommon> IP_ADDRESS=192.168.0.2
rommon> IP_SUBNET_MASK=255.255.255.0
rommon> DEFAULT_GATEWAY=192.168.0.1
rommon> TFTP_FILE=asr9k-mini-px.vm-4.3.2
rommon> sync
rommon> boot tftp:
```

Verifying License Activation

After the Cisco ASR 9001-S Router boots up, use these commands in EXEC mode to verify the license activation:

- **show license**—displays details of all licenses in the chassis.

• **show platform**—displays status of all components in the platform.

Show License

This is the sample output from the **show license** command before activating the license:

```
Router# show license

 Thu Jan  3 23:51:45.971 UTC
 Info : There are no features or licenses to display.
```

This is the sample output from the **show license** command after activating the license:

```
Router# show license

RP/0/RSP0/CPU0:ASR9001-S#show license
Mon Dec 23 23:22:26.498 UTC

FeatureID: A9K-9001-120G-LIC (Slot based, Permanent)
  Total licenses 2
  Available for use         0
  Allocated to location     0
  Active                    2
  Store name            Permanent
  Store index               1
    Pool: Owner
      Total licenses in pool: 2
      Status: Available     0    Operational:     2
      Locations with licenses: (Active/Allocated) [SDR]
            0/0/CPU0         (1/0) [Owner]
            0/RSP0/CPU0      (1/0) [Owner]
```

Make sure that the number of Total Licenses, Total licenses in poool and Operational all report the value **2**

Show Platform

✎

Note   Use this command to ensure that the ethernet plug in bay1 (MPA1) is up after activating the license.

This is the sample output from the **show platform** command before activating the license:

```
Router# show platform

Fri Jan  4 22:26:27.326 UTC
Node           Type                      State            Config State
----------------------------------------------------------------------
0/RSP0/CPU0    ASR9001-RP(Active)        IOS XR RUN       PWR,NSHUT,MON
0/0/CPU0       ASR9001-LC-S              IOS XR RUN       PWR,NSHUT,MON
0/0/0          A9K-MPA-20X1GE            OK               PWR,NSHUT,MON
0/0/1          A9K-MPA-2X10GE            NOT ALLOW ONLIN  NPWR,NSHUT,MON >>> Reflects
Disabled
```

This is the sample output from the **show platform** command after activating the license:

```
Router# show platform

Fri Jan  4 22:46:27.326 UTC
Node           Type                      State            Config State
----------------------------------------------------------------------
0/RSP0/CPU0    ASR9001-RP(Active)        IOS XR RUN       PWR,NSHUT,MON
0/0/CPU0       ASR9001-LC-S              IOS XR RUN       PWR,NSHUT,MON
0/0/0          A9K-MPA-20X1GE            OK               PWR,NSHUT,MON
0/0/1          A9K-MPA-2X10GE            OK               PWR,NSHUT,MON>>>>>>> Reflects
```

```
Enabled
```

Removing the License

Because the license to upgrade the Cisco ASR 9001-S Router to the Cisco ASR 9001 Router is permanent, hence and therefore granted forever, removal or uninstallation of the license is not recommended. A permanent license enables a feature on the router indefinitely. Users install the license to enable additional ports; it is, therefore, not expected that the license would be released, and the bandwidth be brought down to half the existing bandwidth.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation*, at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html.

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