Cisco Smart Licensing

A new licensing model, based on a single technology, has been designed for Cisco called Smart Licensing that is intended to provide Enterprise Level Agreement-like capabilities for all Cisco products. The Cisco Smart Licensing is based on the Trust but Verify model.

Your software release may not support all the features that are documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. The Feature Information Table at the end of this document provides information about the documented features and lists the releases in which each feature is supported.

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

Contents

Hardware Compatibility Matrix for the Cisco cBR Series Routers

Note The hardware components that are introduced in a given Cisco IOS-XE Release are supported in all subsequent releases unless otherwise specified.

Table 1: Hardware Compatibility Matrix for the Cisco cBR Series Routers

Cisco CMTS Platform	Processor Engine	Interface Cards

Cisco cBR-8 Converged Broadband Router	**Cisco IOS-XE Release 16.5.1 and Later Releases**
	
	Cisco cBR-8 Supervisor:
	  • PID—CBR-SUP-250G
	  • PID—CBR-CCAP-SUP-160G
		Cisco IOS-XE Release 16.5.1 and Later Releases
		
		Cisco cBR-8 CCAP Line Cards:
		  • PID—CBR-LC-8D30-16U30
		  • PID—CBR-LC-8D31-16U30
		  • PID—CBR-RF-PIC
		  • PID—CBR-RF-PROT-PIC
		  • PID—CBR-CCAP-LC-40G
		  • PID—CBR-CCAP-LC-40G-R
		  • PID—CBR-CCAP-LC-G2-R
		  • PID—CBR-SUP-8X10G-PIC
		  • PID—CBR-2X100G-PIC
		
		Digital PICs:
		  • PID—CBR-DPIC-8X10G
		  • PID—CBR-DPIC-2X100G
		
		Cisco cBR-8 Downstream PHY Module:
		  • PID—CBR-D31-DS-MOD
		
		Cisco cBR-8 Upstream PHY Modules:
		  • PID—CBR-D31-US-MOD

Prerequisites for Cisco Smart Licensing

- You must configure the DNS server using the **ip name-server** global configuration command.

- You must configure the IP DNS-based hostname-to-address translation using the **ip domain-lookup** global configuration command.

- Cisco Smart Licensing is enabled by default on the Cisco cBR router. However, you must ensure that the CiscoTAC-1 call-home profile points to the Cisco Smart Software Manager at the following URL using the **show call-home profile CiscoTAC-1** command:

  https://tools.cisco.com/its/service/oddce/services/DDCEService

  The following is a sample output of the **show call-home profile CiscoTAC-1** command:

```
Router# show call-home profile CiscoTAC-1

Load for five secs: 10%/1%; one minute: 9%; five minutes: 8%
Time source is NTP, 16:49:35.525 PDT Thu Oct 29 2015

Profile Name: CiscoTAC-1
    Profile status: ACTIVE
    Profile mode: Anonymous Reporting Only
    Reporting Data: Smart Call Home, Smart Licensing
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: http
    Email address(es): callhome@cisco.com
    HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

    Periodic configuration info message is scheduled every 19 day of the month at 11:41


    Periodic inventory info message is scheduled every 19 day of the month at 11:26

    Alert-group             Severity
    ----------------------  ------------
    crash                   debug
    diagnostic              minor
    environment             minor
    inventory               normal

    Syslog-Pattern          Severity
    ----------------------  ------------
    .*                      major
```

- Ensure that you can ping the DNS server. If you are unable to ping the server, verify the connectivity to the NME port on the Cisco cBR router.

Note If you are using a Virtual Routing and Forwarding (VRF) instance, ensure that you can ping the VRF instance.

Information About Cisco Smart Licensing

Cisco Smart Licensing is software-based licensing that consists of tools and processes to authorize the customers for the usage and reporting of the Cisco products. The feature has the capability to capture the customer order and communicate with the Cisco Cloud License Service through Smart Call Home transport media to complete the product registration and authorization. If the Cisco products stop communicating with the Cisco Cloud License Service for 90 days, the cable interfaces in the Cisco products will be locked, which means the customer can no longer enable/disable the cable interfaces.

The Cisco Smart Licensing feature is aimed at giving users an experience of a single, standardized licensing solution for all Cisco products.

In the Cisco Smart Licensing Model, you can activate licensed features (also known as entitlements) without the use of a special software key or upgrade license file. You can activate the new functionality using the appropriate product commands and configurations and the functionality is activated. A software reboot is not required for the Cisco cBR router.

The Cisco cBR router supports software activation using Cisco Smart Licensing. The Cisco Smart Licensing is enabled by default on the Cisco cBR router.

Note The **no http secure server-identity-check** option was default in versions 16.7.2 and earlier, and was not configurable. Ensure that you configure the **no http secure server-identity-check** option after upgrading to maintain parity with images earlier than 16.7.3. The default option is **http secure server-identity-check**.

A LCHA license is needed for each working linecard that is protected by the protect linecard.

Downstream License

The DOCSIS 3.1 license scheme provides support to identify the DOCSIS 3.1 channels and their width. The DOCSIS 3.1 entitlement is DOCSIS 3.1 Downstream Channel License.

Note Configuration of DOCSIS 3.1 Downstream OFDM channel consumes both DOCSIS 3.0 and DOCSIS 3.1 license in a 1:1 ratio with license units of 6 MHz.

Out of Compliance Enforcement

The following two events are responsible for triggering a DOCSIS configuration lock enforcement.

Eval-Expired (Evaluation Period Expired)

When a router is not registered with Smart License Manager for more than ninety days.

Auth-Expired (authorization Period Expired)

When a registered router fails to communicate with the Smart License Manager for more than ninety days.

When either of the above mentioned events occur, the Smart Agent sends a notification to the platform. The platform, upon receiving such notification, **locks** the following CLI commands:

* **[no] cable upstream shutdown** *upstream-port-number*

* **contoller upstream-cable** *slot/subslot/controller-port-number*

* **rf-chan***channel-number*

Any attempt to configure the above mentioned CLIs in this condition would fail and a warning message will be displayed. Under this condition all other CLIs are configurable, some of which may be required to configure Cisco License Call Home, connect to cisco and register the device to come out of either of the above two events and enter into authorized or Out of Compliance (OOC) state.

You can copy the modified configuration file to the startup configuration file and reload the device to make that configuration effective. However, when the device is in enforced state, you can only copy the running configuration file to the startup configuration file.

> **Note** Any attempt to copy any other file fails and a warning message is displayed.

How to Configure Cisco Smart Licensing

This section contains the following:

Using Cisco Smart Licensing Agent on the Router

Step 1 Set up a Cisco Smart Account. See Setting Up a Cisco Smart Account, on page 5.

Step 2 Log in to the Cisco Smart Software Manager.

Step 3 (Optional) Create a virtual account. See Creating Virtual Accounts, on page 12.

> **Note** A single default virtual account is always available.

Step 4 Create a product instance registration token. See Creating a Product Instance Registration Token, on page 13.

Step 5 Register the router with the Cisco Licensing Cloud using the product instance registration token. See Registering the Router with the Cisco Licensing Cloud Using the Registration Token, on page 14.

Step 6 Log in to the Cisco Smart Software Manager for managing licenses.

For more information, see the *Cisco Smart Software Manager User Guide*, which is accessible from the Cisco Smart Software Manager tool.

Setting Up a Cisco Smart Account

Cisco Smart Account enables you to fully utilize the license management features of the smart-enabled products.

Before you begin

• Ensure that you have a CCO ID.

Step 1 Log in to Cisco Software Workspace (CSW) with your CCO ID.

**Step 2** Hover the cursor over the *Administration* tab and click **Create Smart Accounts**.

Figure 1: Creating Smart Account

Step 3   Perform one of the following to select the Account Approver:

- To select yourself as the Approver, click the **Yes, I will be the Approver for the account** radio button.
- To select other person as the Approver, click the **No, the person specified below will be the Approver for the account** radio button and specify the person's e-mail ID.

> **Note**   The specified Approver must have the authority to enter legal agreements. The Approver serves as the primary owner and nominates account administrators.

Figure 2: Selecting the Approver

Step 4   If you are the Approver, perform the following:

a) Enter the Account Name, Company/Organization Name, Country, and State/Province/Region information.
b) (Optional) Click **Edit**. In the *Edit Account Identifier* window, enter a valid Proposed Domain Identifier and Contact Phone Number. Click **OK**.

> **Note**   The default domain identifier is the Approver e-mail domain. If you edit the domain identifier, the change goes through a manual approval process.

c) Click **Continue** to select the legal address to be linked to your Cisco Smart Account.

Figure 3: Setting Up Account Information When You Are The Approver

Step 5 If you are not the Approver, perform the following:

a) Enter the Account Name and an optional Message to Approver.

b) (Optional) Click **Edit**. In the *Edit Account Identifier* window, enter a valid Proposed Domain Identifier. Click **OK**.

Note The default domain identifier is the Approver e-mail domain. If you edit the domain identifier, the change goes through a manual approval process.

c) Click **Continue**.

Figure 4: Setting Up Account Information When You Are Not The Approver

Step 6 If you are not the Approver, the Approver will receive an e-mail and must perform the following:

a) Click **Complete Smart Account Setup** in the received e-mail.

Figure 5: Complete Smart Account Setup Link in E-mail

b) Click the appropriate radio button to accept, decline, or nominate another Approver. To nominate another Approver, enter the person's e-mail address. Click **Continue**.

> **Note**   If the Approver declines, the Cisco Smart Account is deleted. If the Approver nominates another approver, the new Approver must accept the role.

Figure 6: Accepting the Account Approver Role

c) After accepting the Approver role, click the appropriate radio button to select the Account Domain Identifier or specify a different Account Domain Identifier.

Figure 7: Completing the Account Information

d) Enter the Account Name and click **Continue**.

The Approver role is accepted and Cisco Smart Account is pending Account Domain approval.

Step 7 After the Account Domain is approved, the Approver will receive an e-mail and must perform the following:

a) Click **Complete Smart Account Setup** in the received e-mail.

Figure 8: Cisco Smart Account Identifier Approved E-mail

b) Enter the Account Name, Company/Organization Name, Country, and State/Province/Region information.

Figure 9: Completing the Account Information and Company/Organization Information

c) Click **Continue** to select the legal address to be linked to the Cisco Smart Account.

d) Select the Company/Organization Primary Address using the Refine Search option and click **Continue**.

Figure 10: Selecting the Company/Organization Primary Address

e) (Optional) Enter the e-mail addresses of the Additional Account Approvers and Additional Account Administrators.

The initial Approver automatically becomes an Administrator. Additional Administrators can be created or assigned separately from the Approver creation process.

Figure 11: Nominating Additional Account Approvers and Administrators

f) Click **Continue**.
g) Review the agreement and check the **I agree to the terms above** check box to accept.
h) Click **Accept and Create Account** to create the Cisco Smart Account.

Figure 12: Accepting the Agreement and Creating the Cisco Smart Account

You will receive an e-mail confirming the creation of the Cisco Smart Account.

Creating Virtual Accounts

This procedure is optional. Virtual accounts are collections of licenses and product instances. You can create virtual accounts in Cisco Smart Software Manager to organize the licenses for your company into logical entities. A single virtual account is available by default.

Before you begin

Set up a Cisco Smart Account. See Setting Up a Cisco Smart Account, on page 5.

Step 1   Log in to the Cisco Smart Software Manager.

Step 2   Click the + (plus) symbol to create a virtual account.

Figure 13: Creating a Virtual Account
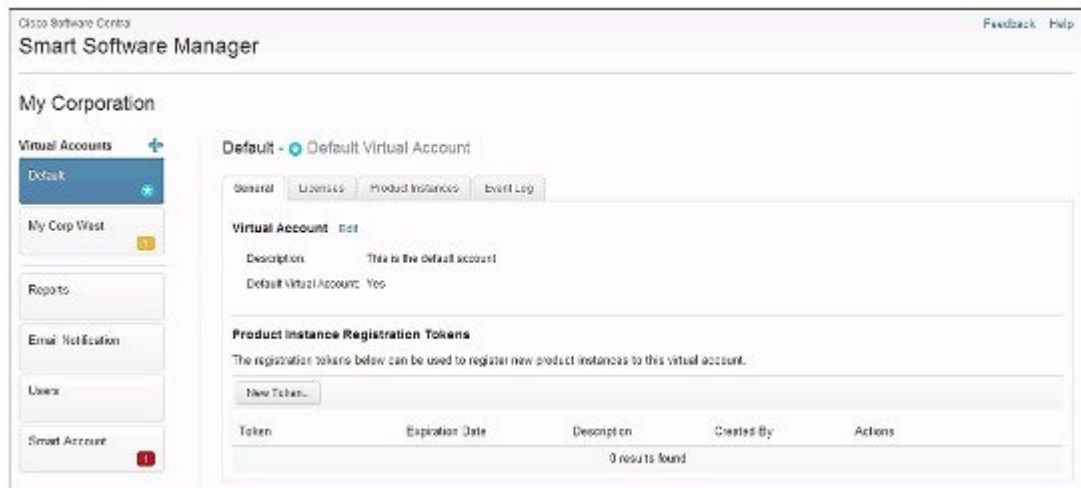
Step 3   In the **New Virtual Account** dialog box, enter the Name and Description.

Figure 14: New Virtual Account Dialog Box
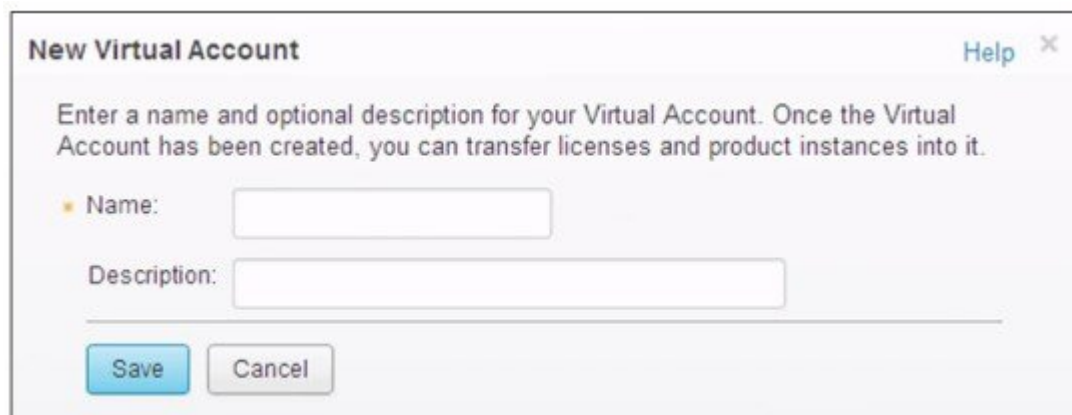
Step 4   Click **Save**.

Creating a Product Instance Registration Token

Product instance registration tokens are used to register and consume a product for Cisco Smart Licensing. You must generate a token to register the product and add the product instance to a specified virtual account. Registration tokens can be valid from 1 to 365 days.

Step 1   Log in to the Cisco Smart Software Manager.

Step 2   Click an existing virtual account.

Step 3   In the **General** tab, click **New Token**.

Figure 15: Creating a New Registration Token
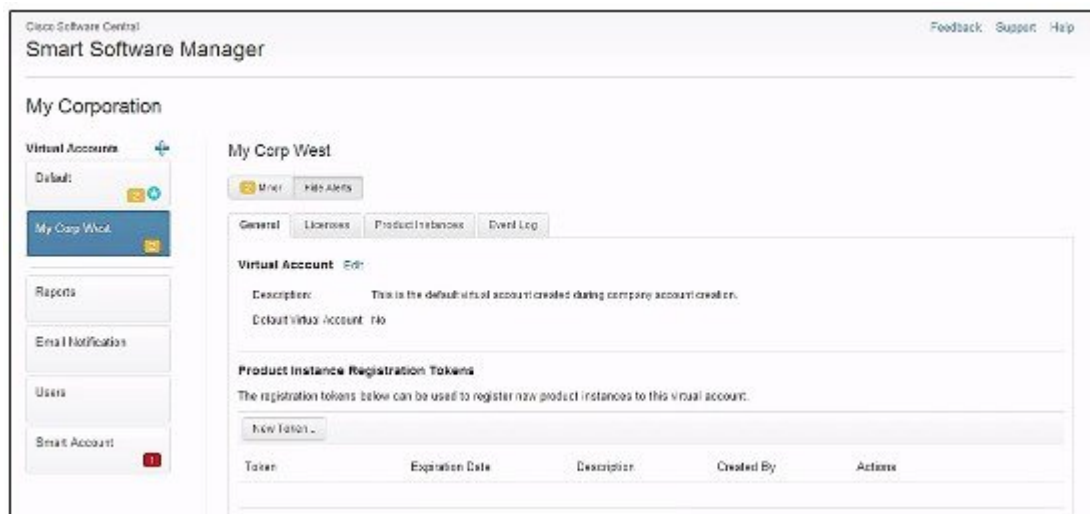
Step 4   In the **Create Registration Token** dialog box, enter the Description and Expire After information and click **Create Token**.

Figure 16: Create Registration Token Dialog Box

What to do next

Register the router with the Cisco Licensing Cloud. For more details, see the Registering the Router with the Cisco Licensing Cloud Using the Registration Token, on page 14 section.

Registering the Router with the Cisco Licensing Cloud Using the Registration Token

The router registration is performed only once for each product instance.

✎

Note   Ensure that you have the product instance registration token.

To register the router with the Cisco Licensing Cloud using a registration token, use the following commands:

```
enable
license smart register idtoken id-token
```

For example:

```
Router#license smart register idtoken
YjBkOWM5YTItMDFiOS00ZjBmLTllY2YtODEzMzg1YTMyZDVhLTEz
ODE0MjE0%0ANzc5NDF8U1BDUTAySWFRTmJqa1NnbmlzRUIyaGlYU
053L0pHZTNvUW9VTFpE%0AekxCOD0%3D%0A
```

The system contacts the Cisco Smart Licensing servers to obtain authorization for Smart Licensing.

The license agent registers the product with Cisco and receives an identity certificate. This certificate is saved and automatically used for all future communications with Cisco. The license agent automatically renews the registration information with Cisco every 30 days.

Note Smart licensing may fail if IPv6 is configured on any interface, and the router does not have IPv6 connectivity to the Internet or Cisco Smart Software Agent (at tools.cisco.com). Log file error messages similar to the following may appear.

(These messages may also appear as a result of other conditions being true.)

```
%SMART_LIC-3-AGENT_REG_FAILED: Smart Agent for Licensing Registration with Cisco licensing
 cloud failed: Fail to send out Call Home HTTP message.
%SMART_LIC-3-COMM_FAILED: Communications failure with Cisco licensing cloud: Fail to send
out Call Home HTTP message.
```

If connectivity fails due to this issue, see the Re-establishing Connectivity to Cisco Smart Call Home Server section.

After connectivity is established, register the router with the Cisco Licensing Cloud.

Re-establishing Connectivity to Cisco Smart Call Home Server

This section describes what to do when the router fails to connect to the Cisco Smart Call Home Server and IPv6 is configured.

The following scenarios are applicable:

- If the interface is configured using the **ip http client source-interface interface** CLI and has the IPv6 address, the router establishes a session with the remote server with IPv6 connectivity.

- If the interface is configured using the **ip http client source-interface interface** command and has the IPv4 address, the router establishes a session with the remote server with IPv4 connectivity.

- If the interface is configured using **ip http client source-interface interface**command, and has an IPv6 address and an IPv4 address, the router establishes a session with the remote server with IPv6 connectivity.

- If the interface is not configured using the **ip http client source-interface interface**, the router establishes a session with the remote server with the IPv6 address.

For Cisco IOS XE Everest 16.5.1 or later, if an IPv6 address is available for an interface and the device cannot connect to the Internet or Cisco Smart Software Agent, configure the interface to only use IPv4 for smart licensing, by running the following configuration mode command.

```
ip http client source-interface interface
```

How to Configure Cisco Smart Licensing using Transport Gateway Solution

The steps below describe how to configure Cisco smart licensing using transport gateway solution.

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	**crypto pki trustpoint** Example: Router(config)# **crypto pki trustpoint cisco**	Declare the trustpoint that the router should use.
Step 4	**enrollment terminal** Example: Router(ca-trustpoint)# **enrollment terminal**	Specify manual cut-and-paste certificate enrollment.
Step 5	**revocation-check** *method* Example: Router(ca-trustpoint)# **revocation-check none**	Check the revocation status of a certificate. Method **none** means certificate checking is not required.
Step 6	**crypto pki authenticate** Example: Router(config)# **crypto pki authenticate cisco**	Authenticate the certification authority.
Step 7	**no reporting smart-licensing-data** Example: Router(config)# **call-home** Router(cfg-call-home)# **profile CiscoTAC-1** Router(cfg-call-home-profile)# **no reporting smart-licensing-data**	Configure the default profile to not to communicate with tools.cisco.com.
Step 8	**destination address http** *address* Example: Router(config)# **call-home** Router(cfg-call-home)# **profile Custom-Profile-1** Router(cfg-call-home-profile)# **reporting smart-licensing-data** Router(cfg-call-home-profile)# **destination transport-method http** Router(cfg-call-home-profile)# **no destination transport-method email** Router(cfg-call-home-profile)# **destination address http** https://TDS.IP.HERE:8443/Transportgateway/services/DeviceRequestHandler	Configure the custom profile to communicate with the transport server, here we use Custom Profile 1 as the name of the custom profile.

Configuring 100G Licenses for Supervisor 250G

The Cisco cBR Smart Account supports both 100G WAN licenses and 10G WAN licenses.

You need to configure the Cisco cBR to consume 100G WAN licenses for Supervisor 250G. This would accommodate existing 10G WAN licenses for 100G port, in addition to the 100G WAN license.

Starting from Cisco cBR release IOS-XE 16.8.1, there will be two types of WAN licenses in the Smart Account for WAN ports on the Cisco cBR Supervisor 250G module:

- 100G WAN license: By default, the Smart Account will consume the 100G WAN license for 100G WAN port.

- 10G WAN license: Can be applied to 10G and 100G WAN ports.

Overview of 100G License for Supervisor 250G

With the 100G WAN licenses, you can facilitate the ordering and management of WAN license for Supervisor 250G. This would help avoid the overhead of maintaining multiple 10G WAN licenses, and you can manage a single 100G WAN license for one 100G port of Supervisor 250G, instead of ten individual 10G WAN licenses.

However, there is no auto-conversion between 10G WAN licenses and 100G WAN licenses. They must be ordered and managed separately. If you are an existing customer using 10G WAN license for Supervisor 250G and have not purchased any 100G WAN licenses, the Cisco Smart Licensing will report out of compliance when attempting to upgrade to Cisco cBR release IOS-XE 16.8.1.

For information on configuring the Cisco cBR to consume 10G WAN licenses on 100G port for Supervisor 250G, see .

Note
- In Supervisor 160, there is no 100G WAN interface and WAN 100G License. The display is same as the previous release.

- The 100G license feature does not support an ISSU downgrade. This might cause a standby SUP crash.

Applying 10G WAN License to the 100G WAN Ports

Ensure that you go through for an understanding of the feature and the restrictions.

The Smart Account will consume the 100G WAN license for 100G WAN port by default. To apply the 10G WAN licenses for the 100G WAN port, complete the following step.

SUMMARY STEPS

1. You can apply the 10G WAN license to the 100G WAN ports using the following command:

DETAILED STEPS

	Command or Action	**Purpose**

Step 1	You can apply the 10G WAN license to the 100G WAN ports using the following command:
	
	 Example:
	
	 `Router(config)# cable license 100G-conversion`
	
	 To disable the 10G WAN license for 100G WAN ports, run the command with the *no* option. This would enable the 100G WAN ports to consume 100G WAN license.
	
	 `Router(config)# no cable license 100G-conversion`	

Displaying the License Information

You can use the following command options to display the license information, based on wether the license has been configured or not:

SUMMARY STEPS

1. Run either of the following command options to display license information.

   - By default, or with the *no* option, the ports will consume a 100G WAN license for a 100G WAN port.

     For example if the **no cable license 100G-conversion** command has been issued, the responses to the **show cable license wan** and **show license summary** commands would be in the following format:

```
Router(config)# show cable license wan
-------------------------------------------
Entitlement:  WAN License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Enforced state: No Enforcement

-------------------------------------------
Entitlement:  WAN 100G License
Consumed count: 2
Consumed count reported to SmartAgent: 2
Enforced state: No Enforcement

Router(config)# show license summary
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: CBR8_DEV_1
  Virtual Account: cbr8-dev-test
  Export-Controlled Functionality: Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 13 00:47:13 2018 CST

License Authorization:
  Status: AUTHORIZED
```

```
          Last Communication Attempt: SUCCEEDED
          Next Communication Attempt: Jan 14 11:34:13 2018 CST

      License Usage:
        License                    Entitlement tag              Count Status
        --------------------------------------------------------------------------
          regid.2017-09.com.ci... (WAN_100G_License)               2 AUTHORIZED
```

- With the **cable license 100G-conversion** command, it will consume 10G WAN license for 100G WAN port.

  For example if the **cable license 100G-conversion** command has been issued, the responses to the **show cable license wan** and **show license summary** commands would be in the following format:

```
Router(config)# show cable licenses wan
-------------------------------------------
Entitlement:  WAN License
Consumed count: 20
Consumed count reported to SmartAgent: 20
Enforced state: No Enforcement


-------------------------------------------
Entitlement:  WAN 100G License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Enforced state: No Enforcement

Router(config)# show license summary
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: CBR8_DEV_1
  Virtual Account: cbr8-dev-test
  Export-Controlled Functionality: Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 13 00:47:13 2018 CST

License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Jan 14 11:25:01 2018 CST

License Usage:
  License                    Entitlement tag              Count Status
  --------------------------------------------------------------------------
    regid.2014-11.com.ci... (WAN_License)                   20 AUTHORIZED
```

DETAILED STEPS

	Command or Action	Purpose
Step 1	Run either of the following command options to display license information. • By default, or with the *no* option, the ports will consume a 100G WAN license for a 100G WAN port.	

Command or Action	Purpose

For example if the **no cable license 100G-conversion** command has been issued, the responses to the **show cable license wan** and **show license summary** commands would be in the following format:
 	
```Router(config)# show cable license wan```
```---```
```Entitlement: WAN License```
```Consumed count: 0```
```Consumed count reported to SmartAgent: 0```
```Enforced state: No Enforcement```
 	
```---```
```Entitlement: WAN 100G License```
```Consumed count: 2```
```Consumed count reported to SmartAgent: 2```
```Enforced state: No Enforcement```
 	
```Router(config)# show license summary```
 	
```Smart Licensing is ENABLED```
 	
```Registration:```
``` Status: REGISTERED```
``` Smart Account: CBR8_DEV_1```
``` Virtual Account: cbr8-dev-test```
``` Export-Controlled Functionality: Allowed```
``` Last Renewal Attempt: None```
``` Next Renewal Attempt: Jun 13 00:47:13 2018```
```CST```
 	
```License Authorization:```
``` Status: AUTHORIZED```
``` Last Communication Attempt: SUCCEEDED```
``` Next Communication Attempt: Jan 14 11:34:13```
``` 2018 CST```
 	
```License Usage:```
``` License   Entitlement tag```
```   Count Status```
 	
```_____```
 	
``` regid.2017-09.com.ci... (WAN_100G_License)```
```   2 AUTHORIZED```
 	
• With the **cable license 100G-conversion** command, it will consume 10G WAN license for 100G WAN port.
 	
For example if the **cable license 100G-conversion** command has been issued, the responses to the **show cable license wan** and **show license summary** commands would be in the following format:
 	
```Router(config)# show cable licenses wan```
```---```
```Entitlement: WAN License```	

Command or Action	Purpose

``
Consumed count: 20
Consumed count reported to SmartAgent: 20
Enforced state: No Enforcement
 	
-- 	
Entitlement: WAN 100G License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Enforced state: No Enforcement
 	
Router(config)# show license summary
Smart Licensing is ENABLED
 	
Registration:
  Status: REGISTERED
  Smart Account: CBR8_DEV_1
  Virtual Account: cbr8-dev-test
  Export-Controlled Functionality: Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 13 00:47:13 2018
CST
 	
License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Jan 14 11:25:01
 2018 CST
 	
License Usage:
  License   Entitlement tag
          Count Status
 	
_____
 	
  regid.2014-11.com.ci... (WAN_License)
             20 AUTHORIZED
``	

Feature Information for 100G License for Supervisor 250G

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the https://cfnng.cisco.com/ link. An account on the Cisco.com page is not required.

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Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 2: Feature Information for 100G License for Supervisor 250G

Feature Name	Releases	Feature Information
100G License for Supervisor 250G	Cisco IOS-XE Release 16.8.1	This feature was integrated into Cisco IOS-XE Release 16.8.1 on theCisco cBR Series Converged Broadband Routers.

Verifying Cisco Smart Licensing Configuration

Use the following commands to verify the Cisco Smart Licensing Configuration on the Cisco cBR router:

- **show license all**—Displays all the license information.

  The following is a sample output of this command:

```
Router# show license all

Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Virtual Account: auto-test-1
  Initial Registration: SUCCEEDED on Mar  5 02:01:03 2015 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Sep  1 02:03:51 2015 UTC
  Registration Expires: Never

License Authorization:
  Status: OUT OF COMPLIANCE on Mar  5 03:34:54 2015 UTC
  Last Communication Attempt: SUCCEEDED on Mar  5 03:35:57 2015 UTC
  Next Communication Attempt: Mar  5 15:35:57 2015 UTC
  Communication Deadline: Jun  3 03:32:51 2015 UTC

License Usage
=============

(US_License):
  Description:
  Count: 64
  Version: 1.0
  Status: AUTHORIZED

(DS_License):
  Description:
  Count: 768
  Version: 1.0
  Status: AUTHORIZED

(WAN_License):
  Description:
  Count: 8
  Version: 1.0
  Status: OUT OF COMPLIANCE

Product Information
===================
```

```
UDI: PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT

HA UDI List:
    Active:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT
    Standby:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT

Agent Version
=============
Smart Agent for Licensing: 1.2.1_throttle/5
Component Versions: SA:(1_2_1_throttle)1.1.0, SI:(rel20)1.0.1, CH:(rel4)1.0.15,
PK:(rel16)1.0.7
```

- **show license status**—Displays the license status information.

  The following is a sample output of this command:

```
Router# show license status

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Virtual Account: auto-test-1
  Initial Registration: SUCCEEDED on Mar  5 02:01:03 2015 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Sep  1 02:03:51 2015 UTC
  Registration Expires: Never

License Authorization:
  Status: OUT OF COMPLIANCE on Mar  5 03:34:54 2015 UTC
  Last Communication Attempt: SUCCEEDED on Mar  5 03:35:57 2015 UTC
  Next Communication Attempt: Mar  5 15:35:56 2015 UTC
  Communication Deadline: Jun  3 03:32:50 2015 UTC
```

- **show license summary**—Displays the license summary information.

  The following is a sample output of this command:

```
Router# show license summary

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Virtual Account: auto-test-1
  Last Renewal Attempt: None
  Next Renewal Attempt: Sep  1 02:03:51 2015 UTC

License Authorization:
  Status: OUT OF COMPLIANCE
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Mar  5 15:35:56 2015 UTC

License Usage:
            License        Entitlement tag    Count Status
  ------------------------------------------------------------
                            (US_License) 64        AUTHORIZED
                            (DS_License) 768       AUTHORIZED
                            (WAN_License) 8         OUT OF COMPLIANCE
```

- **show license tech support**—Displays the license technical support information.

The following is a sample output of this command:

```
Router# show license tech support

Smart Licensing Tech Support info

Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Virtual Account: auto-test-1
  Initial Registration: SUCCEEDED on Mar  5 02:01:03 2015 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Sep  1 02:03:51 2015 UTC
  Registration Expires: Never

License Authorization:
  Status: OUT OF COMPLIANCE on Mar  5 03:34:54 2015 UTC
  Last Communication Attempt: SUCCEEDED on Mar  5 03:35:57 2015 UTC
  Next Communication Attempt: Mar  5 15:35:57 2015 UTC
  Communication Deadline: Jun  3 03:32:51 2015 UTC

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining: 89 days, 23 hours, 25 minutes, 40 seconds

License Usage
=============
Handle: 1
    License: 'nullPtr'
    Entitlement Tag:
regid.2014-11.com.cisco.US_License,1.0_a3f32909-2c71-426c-b3e0-eeefc946f9b3
    Description: <empty>
    Count: 64
    Version: 1.0
    Status: AUTHORIZED(3)
    Status time: Mar  5 03:34:54 2015 UTC
    Request Time: Mar  5 03:34:17 2015 UTC

Handle: 2
    License: 'nullPtr'
    Entitlement Tag:
regid.2014-11.com.cisco.DS_License,1.0_71ad0ae1-5e5e-4f02-b380-d2e1b8dcfa03
    Description: <empty>
    Count: 768
    Version: 1.0
    Status: AUTHORIZED(3)
    Status time: Mar  5 03:34:54 2015 UTC
    Request Time: Mar  5 03:34:17 2015 UTC

Handle: 3
    License: 'nullPtr'
    Entitlement Tag:
regid.2014-11.com.cisco.WAN_License,1.0_3d8bb7ba-1a92-4f01-a4aa-a4479f1d7612
    Description: <empty>
    Count: 8
    Version: 1.0
    Status: OUT OF COMPLIANCE(4)
    Status time: Mar  5 03:34:54 2015 UTC
    Request Time: Mar  5 03:34:17 2015 UTC
```

```
Product Information
===================
UDI: PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT

HA UDI List:
    Active:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT
    Standby:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT

Agent Version
=============
Smart Agent for Licensing: 1.2.1_throttle/5
Component Versions: SA:(1_2_1_throttle)1.1.0, SI:(rel20)1.0.1, CH:(rel4)1.0.15,
PK:(rel16)1.0.7

Upcoming Scheduled Jobs
=======================
Current time: Mar  5 03:37:46 2015 UTC
IdCert Expiration Warning: Jan  4 02:00:41 2016 UTC (304 days, 22 hours, 22 minutes,
55 seconds remaining)
Daily: Mar  6 03:21:11 2015 UTC (23 hours, 43 minutes, 25 seconds remaining)
Certificate Renewal: Sep  1 02:03:51 2015 UTC (179 days, 22 hours, 26 minutes, 5 seconds
 remaining)
Certificate Expiration Check: Mar  4 02:00:41 2016 UTC (364 days, 22 hours, 22 minutes,
 55 seconds remaining)
Authorization Renewal: Mar  5 15:35:57 2015 UTC (11 hours, 58 minutes, 11 seconds
remaining)
Authorization Expiration Check: Jun  3 03:32:51 2015 UTC (89 days, 23 hours, 55 minutes,
 5 seconds remaining)
Init Flag Check: Not Available

License Certificates
====================
Production Cert: True
PIID: 36bf91ae-0577-4213-9e62-1b6ee0add02f
Licensing Certificated:
    Id certificate Info:
        Start Date: Mar  5 01:57:54 2015 UTC
        Expiry Date: Mar  4 01:57:54 2016 UTC
        Version Number: 3
        Serial Number: 134418
        Common Name: 05FB26B1A58A106DEA6878C346432186D08BC1C5::1,2

    Signing certificate Info:
        Start Date: Jun 14 20:18:52 2013 UTC
        Expiry Date: Apr 24 21:55:42 2033 UTC
        Version Number: 3
        Serial Number: 3
        Common Name: MMI Signer

    Sub CA Info:
        Start Date: Apr 24 22:19:15 2013 UTC
        Expiry Date: Apr 24 21:55:42 2033 UTC
        Version Number: 3
        Serial Number: 2
        Common Name: Smart Licensing CA - DEV


HA Info
==========
RP Role: Active
Chassis Role: Active
Behavior Role: Active
RMF: True
CF: True
```

```
CF State: Stateless

Other Info
==========
Software ID: regid.2014-12.com.cisco.CBR8V1,1.0_95948658-0b8b-4e8f-838d-b17020364ca9
Agent State: OOC
TS enable: True
Transport: Callhome
Locale: en_US.UTF-8
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char)  : 1
sizeof(int)   : 4
sizeof(long)  : 4
sizeof(char *): 8
sizeof(time_t): 4
sizeof(size_t): 8
Endian: Big
enableOnInit: True
routingReadyByEvent: True
systemInitByEvent: True
WaitForHaRole: False
standbyIsHot: True
chkPtType: 2
delayCommInit: False
roleByEvent: True
maxTraceLength: 150
traceAlwaysOn: False
debugFlags: 7
```

- **show license udi**—Displays the license Unique Device Identifier (UDI) information.

  The following is a sample output of this command:

  ```
  Router# show license udi

  UDI: PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT

  HA UDI List:
      Active:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT
      Standby:PID:CBR-8-CCAP-CHASS,SN:FXS1739Q0NT
  ```

- **show license usage**—Displays the license usage information.

  The following is a sample output of this command:

  ```
  Router# show license usage

  License Authorization:
    Status: OUT OF COMPLIANCE on Mar  5 03:34:54 2015 UTC

  (US_License):
    Description:
    Count: 64
    Version: 1.0
    Status: AUTHORIZED

  (DS_License):
    Description:
    Count: 768
    Version: 1.0
    Status: AUTHORIZED
  ```

```
(WAN_License):
  Description:
  Count: 8
  Version: 1.0
  Status: OUT OF COMPLIANCE
```

- **show call-home profile all**—Displays the call home profile information for all configured profiles.

    The following is a sample output of this command:

    ```
    Router# show call-home profile all

    Profile Name: CiscoTAC-1
        Profile status: ACTIVE
        Profile mode: Full Reporting
        Reporting Data: Smart Call Home, Smart Licensing
        Preferred Message Format: xml
        Message Size Limit: 3145728 Bytes
        Transport Method: http
        Email address(es): callhome@cisco.com
        HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService

        Periodic configuration info message is scheduled every 25 day of the month at 10:03

        Periodic inventory info message is scheduled every 25 day of the month at 09:48

        Alert-group              Severity
        ------------------------ ------------
        crash                    debug
        diagnostic               minor
        environment              minor
        inventory                normal

        Syslog-Pattern           Severity
        ------------------------ ------------
        .*                       major
    ```

- **show call-home smart-licensing statistics**—Displays the call home smart licensing statistics information.

    The following is a sample output of this command:

    ```
    Router# show call-home smart-licensing statistics

    Success: Successfully sent and response received.
    Failed : Failed to send or response indicated error occurred.
    Inqueue: In queue waiting to be sent.
    Dropped: Dropped due to incorrect call-home configuration.

    Msg Subtype     Success Failed  Inqueue Dropped Last-sent (GMT-06:00)
    ----------------------------------------------------------------------
    REGISTRATION    1       0       0       0       2015-03-13 13:12:13
    ACKNOWLEDGEMENT 1       0       0       0       2015-03-13 13:12:20
    ENTITLEMENT     5       0       0       0       2015-03-13 13:22:18
    ```

Use the following commands to verify the DOCSIS 3.1 Downstream License on the Cisco cBR router:

- **show cable license all | begin D3.1**—Displays all the DOCSIS 3.1 downstream license information.

    The following is a sample output of this command:

```
Router# show cable license all | begin D3.1

Load for five secs: 21%/1%; one minute: 52%; five minutes: 52%
Time source is NTP, 10:41:11.175 PST Mon May 9 2016
------------------------------------------
Entitlement:  DOCSIS 3.1 Downstream Channel License
Consumed count: 31
Consumed count reported to SmartAgent: 0
Enforced state: No Enforcement
```

Use the following commands to verify the DOCSIS 3.1 Upstream Exclusive License on the Cisco cBR router:

- • **show cable licenses us_d31_exclusive**—Displays the DOCSIS 3.1 upstream exclusive license information.

  The following is a sample output of this command:

```
Router# show cable licenses us_d31_exclusive
Load for five secs: 99%/2%; one minute: 21%; five minutes: 6%
Time source is NTP, *10:14:30.935 CST Tue Jun 6 2017

--------------------------------------------
Entitlement:  DOCSIS 3.1 Upstream Channel Exclusive License
Total Licensed Spectrum: 188000000Hz
Consumed count: 188
Consumed count reported to SmartAgent: 188
Enforced state: No Enforcement
```

Troubleshooting Cisco Smart Licensing

Before taking the steps below to troubleshoot the Cisco Smart Licensing, the customers should first make sure the configuration is correct and see if they are able to ping the HTTP address they have configured for the smart license. The output of the **show call-home smart-licensing statistics** command should have REGISTERED and ACKNOWLEDGE information. And check the output of **show logging | include SMART | CALL**.

Manually Renewing the Smart License Registration

The license agent automatically renews the registration information with Cisco every 30 days. You may need to manually renew the registration if the license is out of compliance and it needs to be registered immediately.

Procedure

	Command or Action	**Purpose**
Step 1	**enable** **Example:** Router> **enable**	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**license smart renew** **Example:** Router# **license smart renew**	Manually renews the license registration of the device instance with Cisco.

Unregistering the Router from Cisco Smart Licensing

You can unregister the router from Cisco Smart Licensing. You may need to unregister the router for the Return Material Authorization (RMA) of the router.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> **enable**	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**license smart deregister** **Example:** Router# **license smart deregister**	Removes the Cisco Smart Licensing registration for the device instance. All Cisco Smart Licensing certificates and entitlements are removed.

Additional References

Related Documents

Related Topic	Document Title
Cisco Smart Licensing	Cisco Smart Software Licensing

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

Feature Information for Cisco Smart Licensing

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the https://cfnng.cisco.com/ link. An account on the Cisco.com page is not required.

Note   The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 3: Feature Information for Cisco Smart Licensing

Feature Name	Releases	Feature Information
Cisco Smart Licensing	Cisco IOS XE Fuji 16.7.1	This feature was integrated on theCisco cBR Series Converged Broadband Routers.
DOCSIS 3.1 US Channel Licensing	Cisco IOS XE Fuji 16.7.1	This feature was integrated on theCisco cBR Series Converged Broadband Routers.