Configuring Smart Licensing

This module describes the configuration related to the Smart Licensing.

Table 1: Feature History for Smart License

Release	Modification
Release 6.3.2	Smart Licensing was introduced.
Release 6.5.2	Flexible Consumption License Model was introduced.
Release 7.4.1	YANG Data Models for Smart Licensing was introduced.

This module contains the following topics:

What is Smart Licensing?

Smart Licensing is a cloud-based, flexible software licensing model that enables you to activate and manage Cisco software licenses across their organization. Smart Licensing solution allows you to easily track the status of your license and software usage trends. Cisco Smart Licensing establishes a pool of licenses or entitlements that can be used across the entire organization in a flexible and automated manner. Smart Licensing helps simplify four core functions:

- **Purchase**—Creates a Smart Account (and optionally, your Virtual Account). Licenses are added to your Smart Account and are immediately available for use.

- **Install**—Register your product with your Smart Account using an account-based Registration Token. Thereafter, the entire process is automatic. Product Activation Keys (PAKs) and license files are no longer needed.

• **Management**—Make changes to license consumption by updating your configuration; any license change is automatically reflected in your Smart Account. You can share licenses in your Virtual Account through the license pooling option. License pools (logical grouping of licenses) can reflect your organization structure. Smart Licensing solution also offers Cisco Smart Software Manager, a centralized portal that enables you to manage all your Cisco software licenses from one centralized website.

• **Visibility and Asset Management**—Cisco Smart Software Manager (CSSM) portal offers an integrated view of the licenses you own and have deployed. You can use this data to make better purchase decisions, based on your consumption.

What is Flexible Consumption Model?

Table 2: Feature History Table

Feature Name	Release Information	Feature Description
Flexible Consumption Model on NC57-48Q2D-S and NC57-48Q2D-SE-S	Release 7.10.1	Flexible Consumption Model on NC57-48Q2D-S and NC57-48Q2D-SE-S Line cards.
Support for Flexible Consumption Model on • NC57-36H-SE and NC-55-32T16Q4H-A line cards • Cisco NCS-55A1-24Q6H-SS chassis	Release 7.2.2	Support for Flexible Consumption Model (FCM) is now extended to the Cisco NC57-36H-SE and Cisco NC-55-32T16Q4H-A line cards, and the Cisco NCS-55A1-24Q6H-SS fixed chassis.

The Flexible Consumption Model (FCM) provides the capability and flexibility to purchase software capacity as needed. FCM delivers the following:

• Pay-as-you-grow—Enables you to lower initial costs and add more capacity over time.

• Simplify operations—FCM delivers the carrier-class IOS-XR software feature set with two software suites, Essentials and Advantage, that simplifies license management.

• Utilize capital efficiently—License pooling enables an efficient way to share licenses across the network.

To enable Flexible Consumption model licensing on routers running Cisco IOS XR :

```
Router(config)# license smart flexible-consumption enable
Router(config)# commit
```

To verify the Flexible Consumption Model configuration:

```
Device# show running-config license smart flexible-consumption enable
```

The following tables provide information about FCM licenses for NCS 5500 and NCS 5700 Series routers:

*Table 3: Flexible Consumption Model Licensing Usage Pattern*

License Name	Hardware Supported	Consumption Pattern
Essential Licenses: • ESS-100G-RTU-1 • ESS-400G-RTU-1 Advantage Licenses: • ADV-100G-RTU-1 • ADV-400G-RTU-1	• Routers with fixed chassis unit: NCS-5501-SYS, NCS-5501-SE-SYS, NCS-5502-SYS, NCS-5502-SE-SYS, NCS-55A1-24H-SYS, NCS-55A1-36H-S-SYS, NCS-55A2-MOD-HD-S-SYS, NCS-55A2-MOD-SE-S-SYS, NCS-55A2-MOD-S-SYS, NCS-55A1-36H-SE-S-SYS, NCS-55A1-48Q6H-SYS, NCS-55A1-24Q6H-SS-SYS, NCS-57B1-6D24-SYS, and NCS-57B1-5DSE-SYS • Routers with modular chassis unit: NCS-5504-SYS, NCS-5508-SYS, NCS-5516-SYS • Line cards: NC-57-18DD-SE, NC-57-24DD, NC-55-32T16Q4H-A, NC-57-36H-SE, NC-55-36X100G, NC-55-36X100GA-SE, NC-55-18H18F, NC-55-24H12F-SE, NC-55-24X100G-SE, NC-55-6X200-DWDM-S, NC-55-MOD-A-S, NC-55-MOD-A-SE-S, and NC-55-36X100G-S	The number of essential or advantage licenses that are consumed depends on the number of active ports and is reported on per chassis basis.

License Name	Hardware Supported	Consumption Pattern
Hardware Tracking Licenses that support chassis: • NCS-5501-TRK • NCS-5501-SE-TRK • NCS-5502-TRK • NCS-5502-SE-TRK • NCS-5504-TRK • NCS-5508-TRK • NCS-5516-TRK • NCS-55A1-24H-TRK • NCS-55A1-36H-TRK • NCS-55A1-36HS-TRK • NCS-55A1-48Q6H-TRK • NCS-55A2-MOD-TRK • NCS-55A2-MODH-TRK • NCS-55A2-MODS-TRK • NCS-55A1-24Q6-TRK • NCS-55A1-24QX-TRK • NC55-32T16Q-LC-TRK • NCS-57B1-6D24-SYS • NCS-57B1-5DSE-SYS	These Tracking licenses are named on the basis of the hardware supported. For example, NCS-5501-TRK licenses support NCS 5501 systems.	The number of licenses that are consumed depends on the number of chassis in use.

License Name	Hardware Supported	Consumption Pattern
Hardware Tracking Licenses that support line cards: • NC55-36H-LC-TRK • NC55-36HSE-LC-TRK • NC55-18HF-LC-TRK • NC55-24H12-LC-TRK • NC55-24HSE-LC-TRK • NC55-DWDM-LC-TRK • NC55-MOD-A-SE-TRK • NC55-MOD-A-TRK • NC55-36HS-LC-TRK • NC55-18D12TH SE-LC-TRK • NC55-24D-LC-TRK	These Tracking licenses are named on the basis of the line card supported. For example, NC55-36H-LC-TRK licenses support NC-55-36X100G line cards.	The number of licenses that are consumed depends on the number of line cards in use.

How Does Smart Licensing Work?

Figure 1: Smart Licensing - Workflow
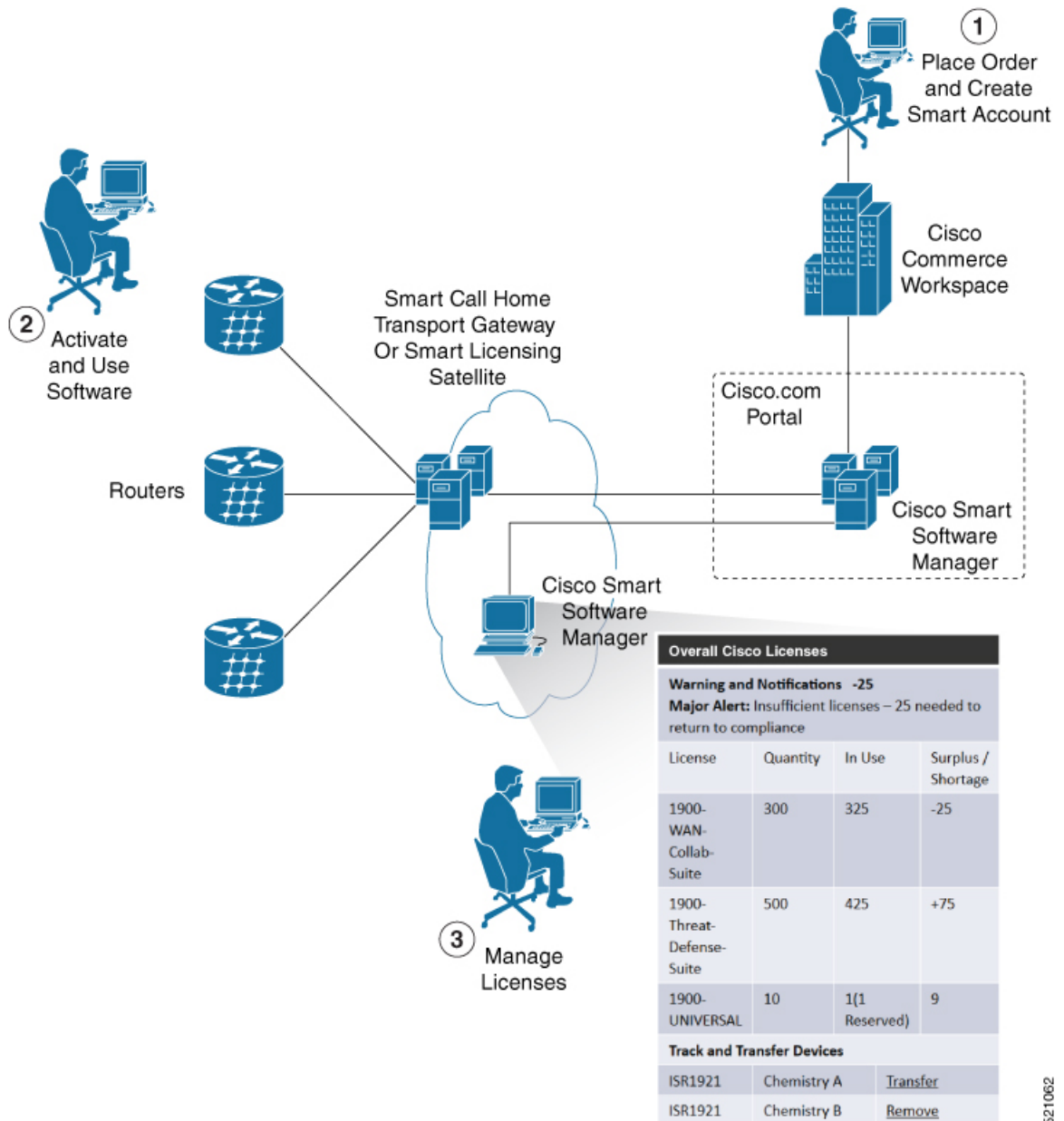
1. Place Order and Create Smart Account—You must have a Smart Account to set up Smart Licensing.

   a. Go to https://software.cisco.com/.

   b. Under the **Administration** section, click **Get a Smart Account or Request Access to an Existing Smart Account**.

   c. Verify or enter your Cisco.com profile details to complete creating a Smart Account.

2. Activate and Use Software—Register your product. For more information, see the *Registering your Router* section. You can use either of the following options to communicate with the CSSM:

- Smart Call Home—The Smart Call Home feature is automatically configured. Smart Call Home is used by Smart Licensing as a medium for communication with the CSSM. You can use this feature to page a network support engineer, email a Network Operations Center, or use Cisco Smart Call Home services to generate a case with the Technical Assistance Center. The Call Home feature can deliver alert messages containing information about diagnostics and environmental faults and events. For more information on Smart Call Home feature, see the Smart Call Home Deployment Guide.

- Smart Licensing CSSM On-Prem—The Smart licensing on-premise option provides an on-premises collector that can be used to consolidate and manage Smart license usage, as well as facilitate communications back to the CSSM at Cisco.com.

3. Manage Licenses—You can manage and view reports about your overall license usage in the Smart Software Manager portal.

What is Cisco Smart Software Manager?

Cisco Smart Software Manager enables you to manage all of your Cisco Smart software licenses from one centralized website. With Cisco Smart Software Manager, you organize and view your licenses in groups called virtual accounts (collections of licenses and product instances). The Cisco Smart Software Manager allows you to:

- Create, manage, or view virtual accounts

- Create and manage Product Instance Registration Tokens

- Transfer licenses between virtual accounts or view licenses

- Transfer, remove, or view product instances

- Run reports against your virtual accounts

- Modify your email notification settings

- View overall account information

To access the Cisco Smart Software Manager:
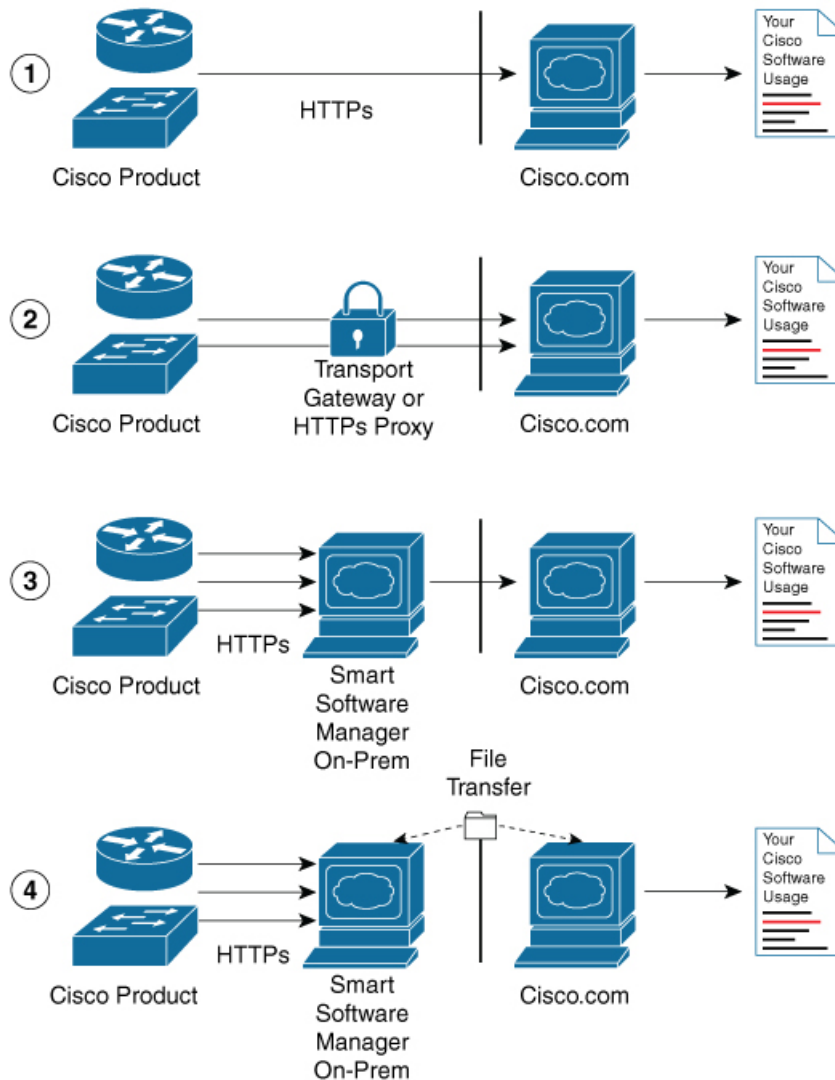
- Go to https://software.cisco.com.

- Under the **License** section, click **Smart Software Licensing**.

Smart Licensing Deployment Options

The following illustration shows the various options available for deploying Smart Licensing:

Figure 2: Smart Licensing Deployment Options

1. Direct cloud access—In this method, Cisco products send usage information directly over the internet to CSSM on http://www.cisco.com; no additional components are needed for deployment.

2. Direct cloud access through an HTTPs proxy—In direct cloud access through an HTTPs proxy deployment method, Cisco products send usage information over the internet through a proxy server—either a Smart Call Home Transport Gateway or off-the-shelf Proxy (such as Apache) to CSSM on http://www.cisco.com.

3. Mediated access through an on-premises collector-connected—In mediated access through an on-premises collector-connected deployment method, Cisco products send usage information to a locally connected collector, which acts as a local license authority. Periodically, the information is exchanged to keep the databases in synchronization.

4. Mediated access through an on-premises collector-disconnected—In the mediated access through an on-premises collector-disconnected deployment method, Cisco products send usage information to a local disconnected collector, which acts as a local license authority. Exchange of human-readable information is performed occasionally (once a month) to keep the databases in synchronization.

Options 1 and 2 provide easy deployment options, whereas options 3 and 4 provide secure environment deployment options.

Note Smart Software On-Premise provides support for options 3 and 4.

The communication between Cisco devices and CSSM is facilitated by the Smart Call Home software.

Configuring Smart Licensing

Prerequisites for Configuring Smart Licensing

Ensure that you have completed the following activities on Cisco Smart Software Manager:

- Set up a Cisco Smart Account. For more information, see the *How Smart Licensing Works* section in this document.
- Set up Virtual Account or accounts. For more information, see the *Virtual Accounts* section in the Smart Software Manager Help.
- Create user roles in the **Users** tab in the **Manage Smart Account** page. Provide the appropriate user access rights.
- Accept the Smart Software Licensing Agreement on Cisco Smart Software Manager to register your router.
- Have a layer 3 connection set up on your router.
- Configure a valid DNS and proper time on the router to connect CSSM or CSSM On-Prem.

Setting up the Router for Smart Licensing

Table 4: Three-step Roadmap to Set up the Router for Smart Licensing

Activity	Communication Connection Options		
Step 1—Configure Communications	See the *Configuring a Direct Cloud Connection* section.	See the *Configuring a Connection through a HTTP Proxy* section.	See the *Connecting to CSSM On-Premise* section.
Step 2—Register and Activate	See the *Registering and Activating your Router* section.		
Step 3—Verify the Configuration	See the *Verifying your Smart Licensing Configuration* section.		

Configuring a Communications Connection Between the Router and Cisco Smart Software Manager

Configuring a Direct Cloud Connection

In this deployment option, the **configure call-home profile** is configured by default. Use the **show call-home profile all** command to check the profile status.

Call Home service provides email-based and web-based notification of critical system events to Cisco Smart Software Manager.

To configure and enable Call Home service:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **service active**
4. **contact-email-addr** *email-address*
5. **profile CiscoTAC-1**
6. **destination transport-method http**
7. **destination address http** *url*
8. **active**
9. **no destination transport-method email**
10. **commit**
11. **exit**
12. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration mode.
Step 3	**service active** **Example:** `Router(config-call-home)# service active`	Activates Call Home service.

Step 4	**contact-email-addr** *email-address*
	
	Example:
	`Router(config-call-home)# contact-email-addr`
	`username@example.com`
		Assigns the provided email address. You can enter up to 200 characters in email address format.
		
		Note Spaces are not allowed in the email address.

	Command or Action	Purpose
Step 5	**profile CiscoTAC-1** **Example:** `Router(config-call-home)# profile CiscoTAC-1`	Enables the CiscoTAC-1 profile to be used with the Call Home service. By default, the CiscoTAC-1 profile is disabled.

Step 6	**destination transport-method http**
	
	Example:
	
	`Router(config-call-home-profile)# destination`
	`transport-method http`
		Enables the Call Home service through an HTTP connection.

Step 7	**destination address http** *url*
	
	Example:
	
	`Router(config-call-home-profile)# destination`
	`address http`
	`https://tools.cisco.com/its/service/oddce/services/DDCEService`
		Connects the router to the Cisco Smart Software Manager.

Step 8	**active** **Example:** `Router(config-call-home-profile)# active`	Enables the destination profile.

Step 9	**no destination transport-method email**
	
	Example:
	
	`Router(config-call-home-profile)# no destination`
	`transport-method email`
		Disables the email option for the Call Home service.

Step 10	**commit** **Example:** `Router(config-call-home-profile)# commit`	Commits the configuration.
Step 11	**exit** **Example:** `Router(config-call-home-profile)# exit`	Exits the Call Home destination profile configuration mode and returns to the Call Home configuration mode.

Step 12	**exit**
	
	Example:
	
	`Router(config-call-home)# exit`
	`Router(config)#`
		Exits the Call Home configuration mode and returns to the global configuration mode.

Configuring a Connection Through an HTTP Proxy

The Call Home service can be configured through an HTTPs proxy server.

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **service active**

4. **contact-email-address** *email-address*
5. **http-proxy** *proxy-address* **port** *port-number*
6. **profile CiscoTAC-1**
7. **no destination transport-method email**
8. **exit**
9. **profile** *profile-name*
10. **reporting smart-licensing-data**
11. **destination transport-method http**
12. **destination address http** *url*
13. **active**
14. **exit**
15. **exit**
16. **commit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration mode.
Step 3	**service active** **Example:** `Router(config-call-home)# service active`	Enables the Call Home feature.

Step 4	**contact-email-address** *email-address*
	
	Example:
	
	`Router(config-call-home)# contact-email-addr`
	`sch-smart-licensing@cisco.com`
		Configures the default email address.

Step 5	**http-proxy** *proxy-address* **port** *port-number*
	
	Example:
	
	`Router(config-call-home)# http-proxy 198.51.100.10`
	`port 3128`
		Provides the proxy server information to the Call Home service.

Step 6	**profile CiscoTAC-1** **Example:** `Router(config-call-home)# profile CiscoTAC-1`	Enables the CiscoTAC-1 profile to be used with the Call Home service. By default, the CiscoTAC-1 profile is disabled.
Step 7	**no destination transport-method email** **Example:**	Disables the email option for the Call Home service.

	Command or Action	Purpose
	`Router(config-call-home-profile)# no destination transport-method email`	

Step 8	**exit**
	
	Example:
	
	`Router(config-call-home-profile)# exit`
	`Router(config-call-home)#`
		Exits the Call Home destination profile configuration mode and returns to the Call Home configuration mode.

Step 9	**profile** *profile-name* **Example:** `Router(config-call-home)# profile test1`	Enters the Call Home destination profile configuration mode for the specified destination profile name. If the specified destination profile does not exist, it is created.
Step 10	**reporting smart-licensing-data** **Example:** `Router(config-call-home-profile)# reporting smart-licensing-data`	Enables data sharing with the Call Home service through the configured transport method, in this case, HTTP.
Step 11	**destination transport-method http** **Example:** `Router(config-call-home-profile)# destination transport-method http`	Enables the HTTP message transport method.
Step 12	**destination address http** *url* **Example:** `Router(config-call-home-profile)# destination address http https://tools.cisco.com/its/service/oddce/services/DDCEService`	Connects the router to the Cisco Smart Software Manager.
Step 13	**active** **Example:** `Router(config-call-home-profile)# active`	Enables the destination profile.
Step 14	**exit** **Example:** `Router(config-call-home-profile)# exit`	Exits the Call Home destination profile configuration mode and returns to the Call Home configuration mode.

Step 15	**exit**
	
	Example:
	
	`Router(config-call-home)# exit`
	`Router(config)#`
		Exits the Call Home configuration mode and returns to the global configuration mode.

Step 16	**commit** **Example:** `Router(config)# commit`	Commits the configuration.

Connecting to CSSM On-Premise

This section describes how to configure the Call Home service for on-premise smart software through connected or disconnected mode.

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile** *profile-name*
4. **reporting smart-licensing-data**
5. **destination transport-method http**
6. **destination address http** *url*
7. **no destination address http** *url*
8. **destination preferred-msg-format** {**long-text** | **short-text** | **xml**}
9. **active**
10. **exit**
11. **exit**
12. **http client source-interface** *ip-version interface-type interface-number*
13. **crypto ca trustpool policy crl optional**
14. **commit**
15. **end**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration mode.
Step 3	**profile** *profile-name* **Example:** `Router(config-call-home)# profile test1`	Enters the Call Home destination profile configuration mode for the specified destination profile name. If the specified destination profile does not exist, it is created.
Step 4	**reporting smart-licensing-data** **Example:** `Router(config-call-home-profile)# reporting smart-licensing-data`	Enables data sharing with the Call Home service through the configured transport method, in this case, HTTP.
Step 5	**destination transport-method http** **Example:** `Router(config-call-home-profile)# destination transport-method http`	Enables the HTTP message transport method.

	Command or Action	**Purpose**

Step 6	**destination address http** *url*
	
	Example:
	
	`Router(config-call-home-profile)# destination address http http://209.165.201.15/Transportgateway/services/DeviceRequestHandler`
	
	`Or`
	`Router(config-call-home-profile)# destination address http https://209.165.201.15/Transportgateway/services/DeviceRequestHandler`
		Configures the destination URL (CSSM) to which Call Home messages are sent.
		
		Note Ensure the IP address or the fully qualified domain name (FQDN) in the destination URL matches the IP address or the FQDN as configured for the **Host Name** on the CSSM On-Prem.

Step 7	**no destination address http** *url* **Example:** `Router(config-call-home-profile)# no destination address http https://tools.cisco.com/its/service/oddce/services/DDCEService`	Removes the default destination address.
Step 8	**destination preferred-msg-format** {**long-text** | **short-text** | **xml**} **Example:** `Router(config-call-home-profile)# destination preferred-msg-format xml`	(Optional) Configures a preferred message format. The default message format is XML.
Step 9	**active** **Example:** `Router(config-call-home-profile)# active`	Enables the destination profile.
Step 10	**exit** **Example:** `Router(config-call-home-profile)# exit`	Exits the Call Home destination profile configuration mode and returns to the Call Home configuration mode.

Step 11	**exit**
	
	Example:
	
	`Router(config-call-home)# exit`
	`Router(config)#`
		Exits the Call Home configuration mode and returns to the global configuration mode.

Step 12	**http client source-interface** *ip-version interface-type interface-number* **Example:** `Router(config)# http client source-interface ipv4 Vlan100`	Configures a source interface for the HTTP client. **Note** This command is mandatory for a VRF interface.
Step 13	**crypto ca trustpool policy crl optional** **Example:**	(Optional) Bypasses the Certificate Revocation Lists (CRLs) check and establishes the connection. By default, the CRLs check is mandatory while establishing a TLS

	Command or Action	Purpose
	`Router(config)# crypto ca trustpool policy crl optional`	connection. We recommend this step when the smart licensing-enabled router is within a network and can rely on the License server to check the certificate status without retrieving and caching each CRL for every peer.
Step 14	**commit** **Example:** `Router(config)# commit`	Commits the configuration.
Step 15	**end** **Example:** `Router(config)# end`	Returns to the global configuration mode.

Installing CSSM On-Premise

For information on installation instructions, see the Smart Software Manager On-Prem Installation Guide.

Registering and Activating Your Router

Product registration securely associates a device with the Smart Account and the Virtual Account of your choice. It also establishes trust between the end product and the CSSM. Tokens are used to register a product with the appropriate Virtual Account on CSSM Cloud (on Cisco.com) or CSSM On-Premise.

> **Note** When the router is in an unregistered state, the licenses are in EVAL (evaluation) mode. Evaluation period will last for 90 days.

A Registration Token:

- Can be either used once or reused multiple times. You can set a limit to the number of times a token can be reused when you create the token.

- Can be created and revoked at any time.

- Expires after a period of time (default is 30 days; minimum is one day; maximum is 365 days)

A Registration Token is not:

- Product specific: The same Registration Token can be used on different product types.

- A license, key, or PAK.

- Stored on the Cisco device and they are not persistent.

- Required after the product is registered. Token expiration has no effect on previously registered products; it simply means that that token can no longer be used to register a new product.

Generating a New Token from CSSM

Step 1 If you choose the direct cloud access deployment option, log in to CSSM from https://software.cisco.com/#.

If you chose the mediated access deployment option, log in to CSSM On-Prem from *https://<on-prem-ip-address>:8443*.

Step 2 Select the **Inventory** tab.

Step 3 From the Virtual Account drop-down list, choose the virtual account to which you want to register your product.

Step 4 Select the **General** tab.
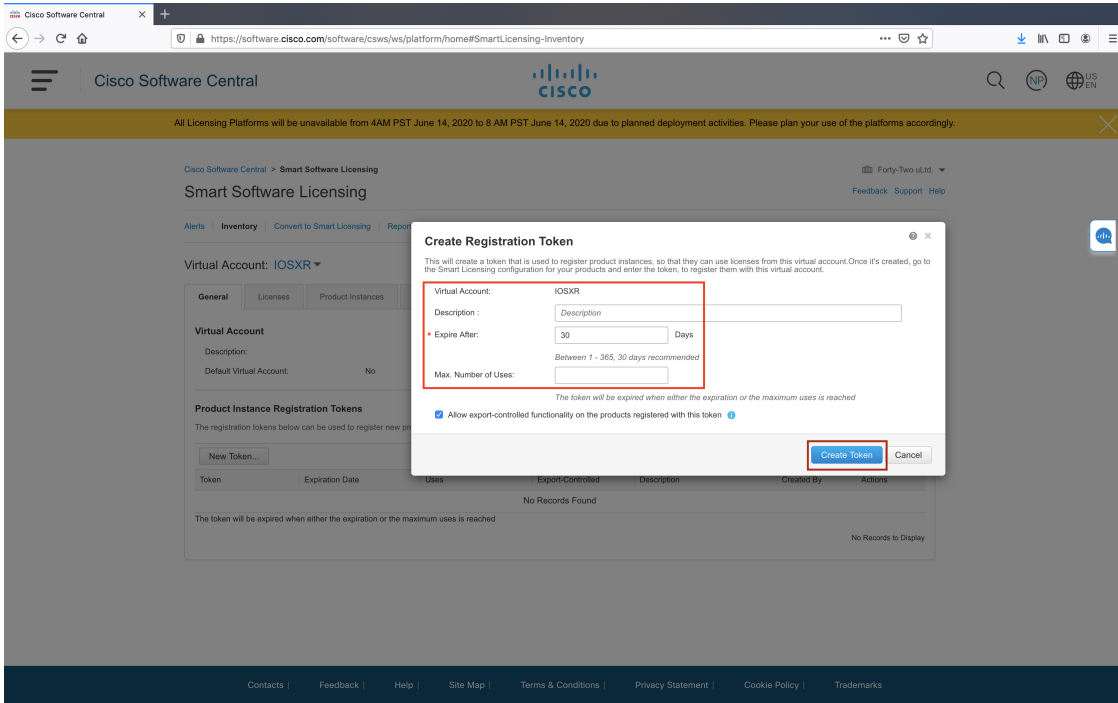
Step 5 Click **New Token**.

The **Create Registration Token** window is displayed.

Step 6 In the **Description** field, enter the token description.

In the **Expire After** field, enter the number of days the token must be active. The default value is 30 days.

In the **Max. Number of Uses** field, enter the maximum number of uses allowed after which the token expires.

Select the **Allow export-controlled functionality on the products registered with this token** checkbox to ensure Cisco compliance with US and country-specific ex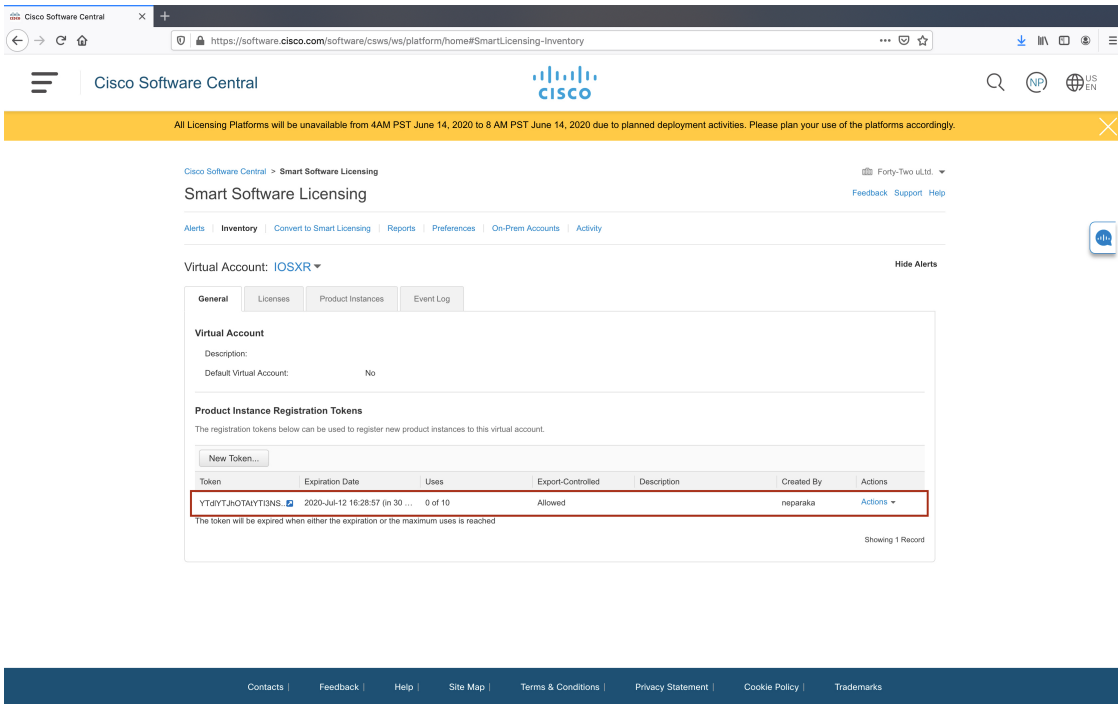port policies and guidelines. For more information, see https://www.cisco.com/c/en/us/about/legal/global-export-trade.html.
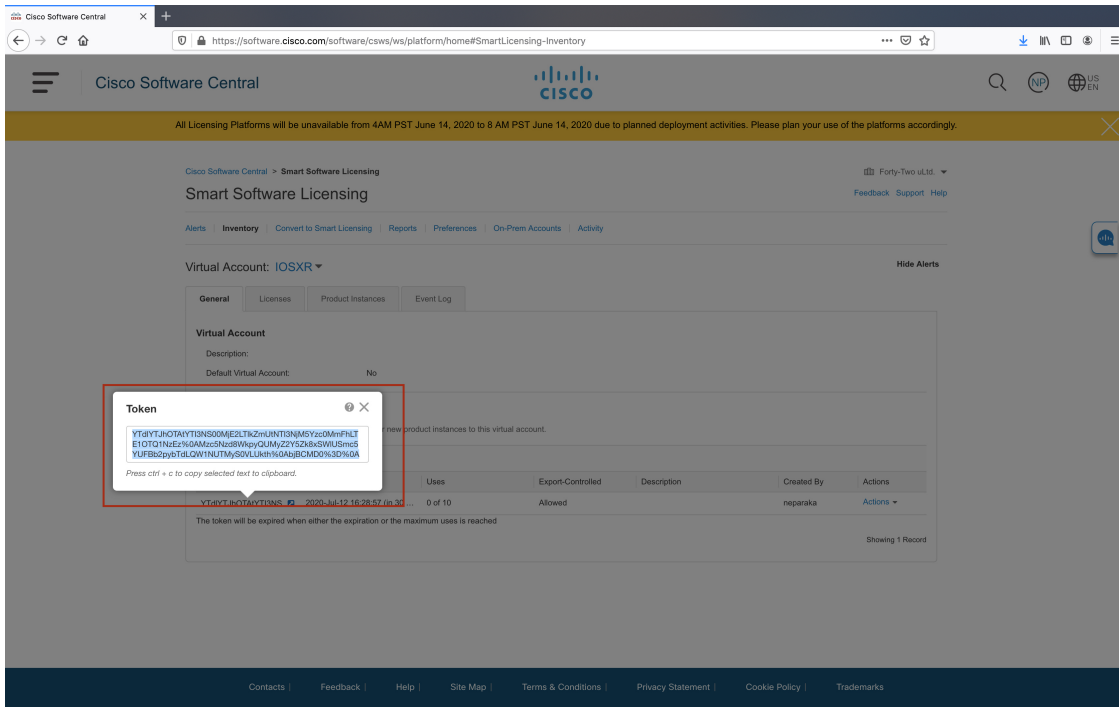
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Click **Create Token**.

Step 7 After the token is created, select and copy the token to a text file.

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You need this token to register your router.

What to do next

See the *Registering Your Device With the Token* section.

Registering Your Device With the Token

SUMMARY STEPS

1. **license smart register idtoken** *token-ID*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**license smart register idtoken** *token-ID* **Example:** ```license smart register idtoken $Tl4UytrNXBzbEs1ck8veUtWaG5abnZJOFdDa1FwbVRa%0AblRMbz0%3D%0A```	Registers Smart Licensing on the router using the registration token created in the CSSM. On successful registration, the product instance is created in the CSSM virtual account and its license usage is displayed on the CSSM.

Renewing Your Smart Licensing Registration

Your registration is automatically renewed every six months. To find the status of the license, use the **license smart renew auth** command.

As long as the license is in an 'Authorized' or 'Out-of-compliance' (OOC) state, the authorization period is renewed. Grace period starts when an authorization period expires. During the grace period or when the grace period is in the 'Expired' state, the system continues to try to renew the authorization period. If a retry is successful, a new authorization period starts.

> **Note** If the smart license renewal fails, then the product instance goes to an unidentified state and starts consuming the evaluation period.

Before you begin

Ensure that the following conditions are met to renew your smart license:

- Smart licensing is enabled.

- The router is registered.

SUMMARY STEPS

1. **license smart renew** {**auth** | **id**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**license smart renew** {**auth**	**id**} **Example:** `Router# license smart renew auth`	Renews your token ID or authorization with Cisco smart licensing.

Deregistering Your Router from CSSM

When a router is taken off the inventory, shipped elsewhere for redeployment, or returned to Cisco for replacement, you can deregister that router.

Before you begin

Ensure that a Layer 3 connection to CSSM is available to successfully deregister the device.

SUMMARY STEPS

1. **license smart deregister**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**license smart deregister** **Example:** `Router# license smart deregister`	Cancels the registration of the router and sends the router into evaluation mode. All smart licensing entitlements and certificates on the corresponding platform are removed. The product instance of the router stored on CSSM is also removed.

Verifying the Smart Licensing Configuration

Use the following **show** commands to verify the default Smart Licensing configuration. If any issue is detected, take corrective action before making further configurations.

SUMMARY STEPS

1. **show license status**
2. **show license all**
3. **show license status**
4. **show license udi**
5. **show license summary**
6. **show license platform summary**
7. **show license platform detail**
8. **show call-home smart-licensing statistics**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show license status** **Example:** `Router# show license status`	Displays the compliance status of Smart Licensing. Following are the possible status: • **Waiting**—Indicates that the initial state after your device has made a license entitlement request. The device establishes communication with Cisco and successfully registers itself with the Cisco license manager. • **Authorized**—Indicates that your device is able to communicate with the Cisco license manager, and is authorized to initiate requests for license entitlements. • **Out-Of-Compliance**—Indicates that one or more of your licenses are out-of-compliance. Buy more licenses, or renew the existing licenses. • **Eval Period**—Indicates that Smart Licensing is consuming the evaluation period. Register the device with the Cisco Licensing manager, else your license expires.

	Command or Action	**Purpose**
		Note Repetitive 'Smart Licensing evaluation expired' warning messages are displayed on the console every hour, but there is no functionality impact on the device. To stop these repetitive messages, register the device again with new a registration token. • **Disabled**—Indicates that Smart Licensing is disabled. • **Invalid**—Indicates that Cisco does not recognize the entitlement tag as the tag is not in the database.
Step 2	**show license all** **Example:** `Router# show license all`	Displays all entitlements in use. The output also displays the associated licensing certificates, compliance status, Unique Device Identifier (UDI), and other details.
Step 3	**show license status** **Example:** `Router# show license status`	Displays the status of all entitlements in use.
Step 4	**show license udi** **Example:** `Router# show license udi`	Displays the Unique Device Identifier (UDI) information.
Step 5	**show license summary** **Example:** `Router# show license summary`	Displays a summary of all entitlements in use.
Step 6	**show license platform summary** **Example:** `Router# show license platform summary`	Displays the registration status and provides detailed information about the essential, advantage without essentials, advantage with essentials, and tracking license consumption in generic or vortex license model.
Step 7	**show license platform detail** **Example:** `Router# show license platform detail`	Displays detailed information about: • Licenses that can be consumed on a platform in both, generic and vortex models • The active model, whether generic or vortex model • The current count and the next consumption count of a license
Step 8	**show call-home smart-licensing statistics** **Example:** `Router# show call-home smart-licensing statistics`	Displays statistics of the communication between the Smart Licensing manager and the Cisco back-end using Smart Call Home. **Note** If the communication fails or drops, check your call home configuration for any errors.

Smart Licensing Configuration Examples

Example: Viewing the Call Home Profile

To display the **http Call Home profile** or the **On-Prem Call Home profile**, use the **show call-home profile all** command.

```
Router# show call-home profile all
Tue Aug 18 23:52:16.590 UTC

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
    HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService
    Other address(es): default

    Periodic configuration info message is scheduled every 17 day of the month at 13:15

    Periodic inventory info message is scheduled every 17 day of the month at 13:0

    Alert-group              Severity
    ----------------------   ------------
    inventory                    normal

    Syslog-Pattern           Severity
    ----------------------   ------------
    .*                           critical

Router# show call-home profile all

Wed Aug 19 01:55:14.974 UTC

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
    HTTP  address(es): http://10.30.110.38/Transportgateway/services/DeviceRequestHandler
    Other address(es): default

    Periodic configuration info message is scheduled every 17 day of the month at 13:15

    Periodic inventory info message is scheduled every 17 day of the month at 13:0

    Alert-group              Severity
    ----------------------   ------------
    inventory                    normal

    Syslog-Pattern           Severity
    ----------------------   ------------
    .*                           critical
```

Example: Viewing License Information Before Registration

To display the license entitlements, use the **show license all** command:

```
Router# show license all
Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: NOT ALLOWED

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 83 days, 23 hours, 36 minutes, 0 seconds

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

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

(ESS-100G-RTU-1):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

(NCS-5501-TRK):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

Product Information
===================
UDI: PID:NCS-5501,SN:FOC2137R1SL

Agent Version
=============
Smart Agent for Licensing: 4.9.6_rel/41

Reservation Info
================
License reservation: DISABLED
```

To display the license usage information, use the **show license usage** command:

```
Router# show license usage

License Authorization:
  Status: EVAL MODE
```

```
  Evaluation Period Remaining: 83 days, 23 hours, 34 minutes, 34 seconds

(ESS-100G-RTU-1):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

(NCS-5501-TRK):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED
```

To display all the license summaries, use the **show license summary** command:

```
Router# show license summary
Smart Licensing is ENABLED

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: NOT ALLOWED

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 83 days, 23 hours, 33 minutes, 52 seconds

License Usage:
  License                  Entitlement tag                  Count Status
  -----------------------------------------------------------------------------
                           (ESS-100G-RTU-1)                 1 EVAL MODE
                           (NCS-5501-TRK)                    1 EVAL MODE
```

To display the license status information, use the **show license status** command:

```
Router# show license status

Smart Licensing is ENABLED

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: NOT ALLOWED

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 83 days, 23 hours, 32 minutes, 57 seconds

Export Authorization Key:
  Features Authorized
```

Example: Registering the Router

To register a device, use the **license smart register idtoken** command:

```
Router# license smart register idtoken
Tl4UytrNXBzbEs1ck8veUtWaG5abnZJOFdDa1FwbVRa%0AblRMbz0%3D%0A
```

Example: Viewing License Information After Registration

To display the license entitlements, use the **show license all** command

```
Router# show license all
Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Forty-Two uLtd.
  Virtual Account: IOSXR
  Export-Controlled Functionality: ALLOWED
  Initial Registration: SUCCEEDED on Aug 18 2020 23:51:46 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Feb 14 2021 23:51:46 UTC
  Registration Expires: Aug 18 2021 23:46:43 UTC

License Authorization:
  Status: OUT OF COMPLIANCE on Aug 18 2020 23:51:57 UTC
  Last Communication Attempt: SUCCEEDED on Aug 18 2020 23:51:57 UTC
  Next Communication Attempt: Aug 19 2020 11:51:57 UTC
  Communication Deadline: Nov 16 2020 23:46:56 UTC

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

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

Core and Aggregation Essentials SW Right-to-Use v1.0 per 100G (ESS-100G-RTU-1):
  Description: Core and Aggregation Essentials SW Right-to-Use v1.0 per 100G
  Count: 1
  Version: 1.0
  Status: OUT OF COMPLIANCE
  Export status: NOT RESTRICTED

5501 Base Hardware Tracking PID (NCS-5501-TRK):
  Description: 5501 Base Hardware Tracking PID
  Count: 1
  Version: 1.0
  Status: OUT OF COMPLIANCE
```

```
    Export status: NOT RESTRICTED

Product Information
===================
UDI: PID:NCS-5501,SN:FOC2137R1SL

Agent Version
=============
Smart Agent for Licensing: 4.9.6_rel/41

Reservation Info
================
License reservation: DISABLED
```

To display the license usage information, use the **show license usage** command:

```
Router# show license usage
License Authorization:
  Status: OUT OF COMPLIANCE on Aug 18 2020 23:51:57 UTC

Core and Aggregation Essentials SW Right-to-Use v1.0 per 100G (ESS-100G-RTU-1):
  Description: Core and Aggregation Essentials SW Right-to-Use v1.0 per 100G
  Count: 1
  Version: 1.0
  Status: OUT OF COMPLIANCE
  Export status: NOT RESTRICTED

5501 Base Hardware Tracking PID (NCS-5501-TRK):
  Description: 5501 Base Hardware Tracking PID
  Count: 1
  Version: 1.0
  Status: OUT OF COMPLIANCE
  Export status: NOT RESTRICTED
```

To display all the license summaries, use the **show license summary** command:

```
Router# show license summary
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Forty-Two uLtd.
  Virtual Account: IOSXR
  Export-Controlled Functionality: ALLOWED
  Last Renewal Attempt: None
  Next Renewal Attempt: Feb 14 2021 23:51:46 UTC

License Authorization:
  Status: OUT OF COMPLIANCE
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Aug 19 2020 11:51:56 UTC

License Usage:
  License                            Entitlement tag            Count Status

  --------------------------------------------------------------------------------------------------

  Core and Aggregation...        (ESS-100G-RTU-1)          1 OUT OF COMPLIANCE
  5501 Base Hardware T...         (NCS-5501-TRK)            1 OUT OF COMPLIANCE
```

To display the license status information, use the **show license status** command:

```
Router# show license status

Smart Licensing is ENABLED
```

```
Utility:
  Status: DISABLED

Data Privacy:
  Sending Hostname: yes
    Callhome hostname privacy: DISABLED
    Smart Licensing hostname privacy: DISABLED
  Version privacy: DISABLED

Transport:
  Type: Callhome

Registration:
  Status: REGISTERED
  Smart Account: Forty-Two uLtd.
  Virtual Account: IOSXR
  Export-Controlled Functionality: ALLOWED
  Initial Registration: SUCCEEDED on Aug 18 2020 23:51:46 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Feb 14 2021 23:51:45 UTC
  Registration Expires: Aug 18 2021 23:46:42 UTC

License Authorization:
  Status: OUT OF COMPLIANCE on Aug 18 2020 23:51:57 UTC
  Last Communication Attempt: SUCCEEDED on Aug 18 2020 23:51:57 UTC
  Next Communication Attempt: Aug 19 2020 11:51:56 UTC
  Communication Deadline: Nov 16 2020 23:46:55 UTC

Export Authorization Key:
  Features Authorized:
    <none>
```