



Cisco Smart Licensing Guide for Cisco Enterprise Routing Platforms

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Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883



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CHAPTER 1

Preface

This preface describes the audience, organization, and conventions of this document. It also provides information on how to obtain other documentation.

This preface includes the following sections:

- [Audience and Scope, on page 1](#)
- [Feature Compatibility, on page 1](#)
- [Document Conventions, on page 2](#)
- [Communications, Services, and Additional Information, on page 3](#)
- [Documentation Feedback, on page 4](#)
- [Troubleshooting, on page 4](#)

Audience and Scope

This document is designed for the person who is responsible for configuring your Cisco Enterprise router. This document is intended primarily for the following audiences:

- Customers with technical networking background and experience.
- System administrators familiar with the fundamentals of router-based internetworking but who might not be familiar with Cisco IOS software.
- System administrators who are responsible for installing and configuring internetworking equipment, and who are familiar with Cisco IOS software.

Feature Compatibility

For more information about the Cisco IOS XE software, including features available on your device as described in the configuration guides, see the respective router documentation set.

To verify support for specific features, use the [Cisco Feature Navigator](#) tool. This tool enables you to determine the Cisco IOS XE software images that support a specific software release, feature set, or a platform.

Document Conventions

This documentation uses the following conventions:

Convention	Description
^ or Ctrl	The ^ and Ctrl symbols represent the Control key. For example, the key combination ^D or Ctrl-D means hold down the Control key while you press the D key. Keys are indicated in capital letters but are not case sensitive.
<i>string</i>	A string is a nonquoted set of characters shown in italics. For example, when setting an SNMP community string to public, do not use quotation marks around the string or the string will include the quotation marks.

The command syntax descriptions use the following conventions:

Convention	Description
bold	Bold text indicates commands and keywords that you enter exactly as shown.
<i>italics</i>	Italic text indicates arguments for which you supply values.
[x]	Square brackets enclose an optional element (keyword or argument).
	A vertical line indicates a choice within an optional or required set of keywords or arguments.
[x y]	Square brackets enclosing keywords or arguments separated by a vertical line indicate an optional choice.
{x y}	Braces enclosing keywords or arguments separated by a vertical line indicate a required choice.

Nested sets of square brackets or braces indicate optional or required choices within optional or required elements. For example, see the following table.

Convention	Description
[x {y z}]	Braces and a vertical line within square brackets indicate a required choice within an optional element.

Examples use the following conventions:

Convention	Description
screen	Examples of information displayed on the screen are set in Courier font.
bold screen	Examples of text that you must enter are set in Courier bold font.
<>	Angle brackets enclose text that is not printed to the screen, such as passwords.
!	An exclamation point at the beginning of a line indicates a comment line. Exclamation points are also displayed by the Cisco IOS XE software for certain processes.
[]	Square brackets enclose default responses to system prompts.



Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Note Means *reader take note*. Notes contain helpful suggestions or references to materials that may not be contained in this manual.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you're looking for with the technologies that matter, visit [Cisco Services](#).
- To submit a service request, visit [Cisco Support](#).
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit [Cisco Marketplace](#).
- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Documentation Feedback

To provide feedback about Cisco technical documentation, use the feedback form available in the right pane of every online document.

Troubleshooting

For the most up-to-date, detailed troubleshooting information, see the Cisco TAC website at <https://www.cisco.com/en/US/support/index.html>.

Go to **Products by Category** and choose your product from the list, or enter the name of your product. Look under **Troubleshoot and Alerts** to find information for the issue that you are experiencing.



CHAPTER 2

What's New For Smart Licensing

Cisco is constantly enhancing the Smart Licensing solution with every release and we try and keep the content in line with the latest enhancements. The following table lists new and modified features we documented in the Quick Start guide. For information on known issues for Smart Licensing, see the *Known Caveats* section in this guide.

Table 1: New Features in Each Release

Release	Features
16.11.1a	<ul style="list-style-type: none">• By default, evaluation expiration syslog messages are suppressed for 365 days. For more information, see Suppression of Evaluation Expiration Messages in Cisco IOS XE Release 16.11.1a and Later Releases, on page 33• Specific License Reservation is introduced. With Specific License Reservation, you can deploy a software license on a device that is not directly connected to the Cisco Cloud. For more information, see Specific License Reservation, on page 35
16.10.1a	Smart Licensing is made mandatory on the Enterprise Networking Routing platforms.



Note If you want to learn more about licensing for the enterprise routers running on Cisco IOS XE Release 17.4.1 or later, or if you are looking for licensing information for the Cisco Catalyst 8000 Series routers, see the [Smart Licensing Using Policy for the Cisco Enterprise Routing Platforms](#).



CHAPTER 3

Information About Smart Licensing

The Smart Licensing Client feature is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how Cisco software is used across your network. Smart Licensing is the next generation licensing platform for all Cisco software products.

This document provides an overview of the Cisco Smart Licensing Client feature and describes the several tools and processes required to complete the products' registration and authorization. See the following topics to know more about Smart Licensing:



Note If you want to learn more about licensing for the enterprise routers running on Cisco IOS XE Release 17.4.1 or later, or if you are looking for licensing information for the Cisco Catalyst 8000 Series routers, see the [Smart Licensing Using Policy for the Cisco Enterprise Routing Platforms](#).

- [Overview of Smart Licensing, on page 7](#)
- [Benefits of Smart Licensing, on page 8](#)
- [Prerequisites, on page 8](#)
- [Restrictions for Smart Licensing, on page 8](#)
- [License Evaluation in Smart Licensing, on page 9](#)
- [Deployment Options for Smart Licensing, on page 10](#)

Overview of Smart Licensing

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure – you control what users can access. With Smart Licensing you get:

- **Easy Activation:** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (Product Activation Keys).
- **Unified Management:** My Cisco Entitlements (MCE) provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License Flexibility:** Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco Software Central (<http://software.cisco.com/>).

For a more detailed overview on Cisco Licensing, go to <https://cisco.com/go/licensingguide>.

You, your chosen partners, and Cisco personnel can view your hardware, software entitlements, and eventually services by using the Cisco Smart Software Manager interface. The following lists certain key operations that you can perform using the CSSM portal:

- 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.

Benefits of Smart Licensing

- Visibility into devices and software that you have purchased and deployed
- Product simplicity with standard software offers, licensing platform, and policies
- Better and educated purchase decisions that could lead to lower operational costs
- Easier deployment with automatic license activation that negates the use of product activation keys

Prerequisites

Before you enable or migrate to Smart Licensing, ensure that:

- You have a smart account, and access to the Cisco Smart Software Manager portal. To create and access a smart account, go to [Smart Accounts](#). Click **Get a Smart Account**, to get started.
- You have registered your device in CSSM. To register your device, see the [Generating a New Token from Cisco Smart Software Manager, on page 13](#) and [Registering Device using the id Token, on page 14](#) section.
- You have configured the Layer 3 connectivity to the CSSM Smart Software Manager satellite.

Restrictions for Smart Licensing

- In IOS XE Release 16.10.1a, the Smart Licensing feature is applicable only for users whose routers directly connect to the CSSM portal, or whose routers connect to a satellite server.

- To access the CSSM portal, use Chrome 32.0, Firefox 25.0, Safari 6.0, or later releases. Ensure that Javascript 1.5 or later is enabled in your browser.
- For IOS XE, DLC is not supported on ASR 1000 Series RP2 Platforms running non-universal K9 images. As a workaround, migrate to an intermediate release, such as IOS XE 16.3, 16.6, or 16.9, before you migrate to IOS XE 16.10.1a.
- If you want to [Migrate from Traditional Licensing to Smart Licensing, on page 19](#), the following releases of Smart Software Manager satellite are not supported in the following releases:
 - Releases earlier than 4.1.0
 - Releases 6.0.x
 - Releases 6.1.x
- When you configure the Call Home profile and you specify the HTTP transport URL, it is recommended that you use the host name. IP address is not supported for HTTP transport URL.
- The registration to CSSM fails if you use HTTP to communicate with the CSSM. Functionality that worked previously will no longer work. Ensure that you use only HTTPS to communicate with the CSSM.
- If you are using devices running on Cisco IOS XE release 17.2.1, when you switch from the autonomous mode to the controller mode or vice versa, your Smart Licensing registration does not work. You must reregister for your Smart Licenses to work.
- You cannot use the Web UI to configure SLP related commands for Cisco CSR1000V or Cisco ISRV 17.3.x and earlier versions.

License Evaluation in Smart Licensing

Table 2: Feature History

Release	Description
Cisco IOS XE 16.10.1a	Smart Licensing was made mandatory for all the routing platforms.
Cisco IOS XE 16.11.1a	You have 365 days to register your device with the CSSM without being restricted or receiving evaluation expiration messages.

When you boot an SL-only image, Smart Licensing is automatically enabled, and the licenses for your device go into the Evaluation or EVAL mode. You have 90 days of device usage to register your device in CSSM. During this period, the existing features work as expected for ISR and ASR routers. As long as the device is used, the evaluation timer counts down. The evaluation period applies to the whole device rather than to individual features or entitlements. When the evaluation period expires for a device, it cannot be reset. After the 90 days time period, these licenses move to the Expired or EVAL EXPIRED state.

Cisco CSR 1000V and Cisco ISRV do not have an evaluation period of 90 days. Until the license is in the EVAL mode, the throughput remains at a default of 1Mbps.

In IOS XE Release 16.11.1a, you have 365 days to register your device with the CSSM without being restricted or receiving evaluation expiration messages. For more information, see [Suppression of Evaluation Expiration Messages in Cisco IOS XE Release 16.11.1a and Later Releases, on page 33](#)

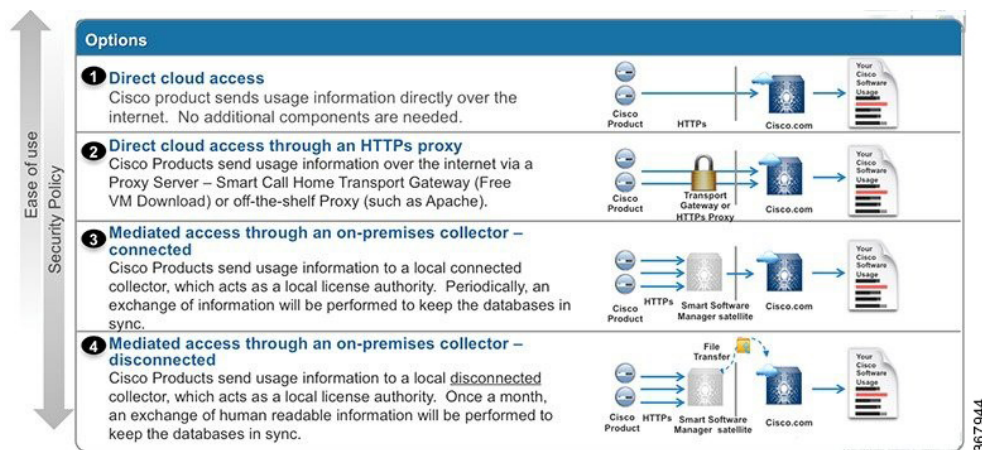


Note If you boot up a device after performing a rollback from a Cisco IOS XE 17.3 image to a Cisco IOS XE 16.9 image, the licenses that were in use, move to the Evaluation state. Note that Cisco IOS XE 17.3 is an SL-only version, and the available license states in this version are **Evaluation**, **Authorized**, and **Out Of Compliance** only.

Deployment Options for Smart Licensing

The following illustration shows the various options available for deploying Smart Licensing. Since security is one of the most important aspects for any user, the image lists the deployment options from the easiest option to the most secure one:

Figure 1: Smart Licensing Deployment Options



1. **Direct Cloud Access:** This deployment option allows you to transfer usage over the Internet to the Cloud server directly from the devices to the cloud via HTTPs.
2. **Direct cloud access through a HTTPs proxy:** The deployment option allows you to transfer files directly over the Internet to the Cloud server through an HTTPs proxy. That is, either using Smart Call Home Transport Gateway or using HTTPs proxy such as Apache.
3. **Mediated access through an on-premises collector-connected:** The third deployment option uses an internal collection device called as the “Cisco Smart Software Satellite.” The Satellite, which is available at your end, periodically transmits the information into the cloud using periodic network synchronization. In this deployment option, the only system or database transferring information to the cloud is the Satellite. You can thus control what is included in the collector database, which provides greater security.
4. **Mediated access through an on-premises collector-disconnected:** The fourth deployment option is where you use the Satellite, but only to transfer the collected files using manual synchronization (at least once a month). In this option, the system is not directly connected to the Cloud and an air gap exists between your network and the Cisco Cloud.



CHAPTER 4

Smart Licensing for New Deployments



Note If you want to learn more about licensing for the enterprise routers running on Cisco IOS XE Release 17.4.1 or later, or if you are looking for licensing information for the Cisco Catalyst 8000 Series routers, see the [Smart Licensing Using Policy for the Cisco Enterprise Routing Platforms](#).

When you purchase the SL-only 16.10.1a or later images, Smart Licensing is enabled by default. However, you must perform the following steps to use the Smart Licensing feature:

1. Ensure that the [Prerequisites, on page 8](#) are met.
2. Power on your device.
3. Configure Smart Call Home. To view the detailed steps for configuring Call Home, see [Configuring Call Home Service](#).

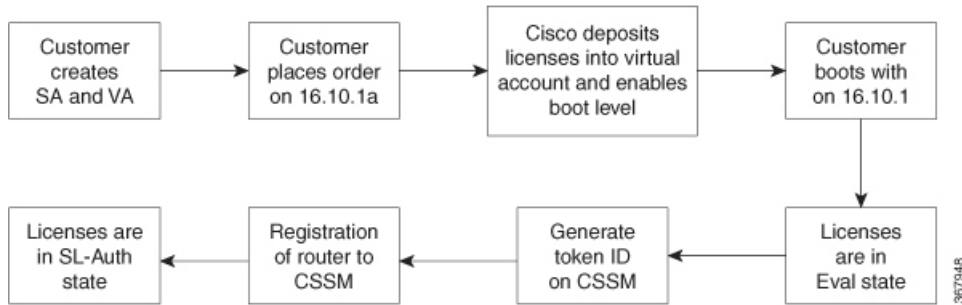


Note While specifying the Smart Licensing registration URL for the CSSM portal, prefix the URL with HTTPS; HTTP is no longer supported

4. Generate a token ID from the CSSM portal. To know how to perform this step, see the [Generating a New Token from Cisco Smart Software Manager, on page 13](#) section.
5. Register the device on the portal using the token. To know how to perform this step, see the [Registering Device using the id Token, on page 14](#) section.
6. In case of Satellite deployments under call-home profile, remove the default destination CSSM production URL and configure the satellite destination URL.

The following image describes the high level steps involved in configuring Smart Licensing for a new deployment:

Figure 2: Smart Licensing workflow for new deployments



Note You must enable some specific licenses for some enforced features such as HSEC and Boost. These licenses are called enforced licenses. To enable enforced licensing, purchase the required enforced licenses. After you purchase an enforced license, Cisco deposits these licenses in your smart account. When you register your device, the licenses undergo an automatic check after which they are enabled.

See the following topics to know how to configure Smart Licensing:

- [Configure Smart Call Home, on page 12](#)
- [Enable Smart Licensing, on page 13](#)
- [Generating a New Token from Cisco Smart Software Manager, on page 13](#)
- [Registering Device using the id Token, on page 14](#)

Configure Smart Call Home

Smart Call Home options that are required for the Smart Licensing are automatically enabled when the Smart Licensing is enabled.

If Smart Call Home is disabled, enable the following:

1. Configure terminal
2. Service call-home

In the smart licensing configuration, by default a Cisco TAC-1 profile is configured. For direct cloud access, you must additionally update the following:

- Configure terminal
- Service call-home
- Call-home > Contact-email-address

When you change from the Call Home to the Smart transport method, you do not have to disable the CiscoTAC-1 call-home profile for Smart Licensing to work as expected.

Enable Smart Licensing

Cisco IOS XE 16.10.1a and Later

When you purchase the Cisco IOS XE 16.10.1a or later images, Smart Licensing is enabled by default. Smart Licensing is the only mode that is available for licensing, and you do not have to perform any additional steps to enable this feature.

Cisco IOS XE 16.9.x or Previous Versions

If you are using Cisco IOS XE 16.9.x or a previous version, Smart Licensing is not enabled by default. To enable the same, execute the following:

1. `Conf t`
2. `license smart enable`

What to do next

As the next step, proceed to [Registering the Device](#).

Generating a New Token from Cisco Smart Software Manager

Tokens are generated to register new product instances to the virtual account.

-
- Step 1** Login to Cisco Smart Software Manager at <https://software.cisco.com/#>.
You must log into the portal using an username and password provided by Cisco.
- Step 2** Select the **Inventory** tab, and select your virtual account from the **Virtual Account** drop-down list.
- Step 3** Select the **General** tab, and click **New Token**.

Cisco Software Central > Smart Software Licensing

English [Change] Hello Smart Account Name

Smart Software Licensing

Alerts | Inventory | License Conversion | Reports | Preferences | Satellites | Activity

Questions About Licensing? Try our Virtual Assistant

Virtual Account: Virtual Account 1

28 Major 9 Minor Hide Alerts

General Licenses Product Instances Event Log

Virtual Account

Description: Account 1

Default Virtual Account: No

Product Instance Registration Tokens

The registration tokens below can be used to register new product instances to this virtual account.

New Token...

Token	Expiration Date	Description	Export-Controlled	Created By	Actions
ZjgXNzdjYjctOVRhMC00M2I0L...	Expired	Token 1	Allowed	User 1	Actions
ZTg2MjBjMzUIN2U0Ni00NDdkL...	Expired	Token 1	Allowed	User 1	Actions

The system displays the Create Registration Token page.

- Step 4** Enter the token description. Specify the number of days the token must be active.
- Step 5** Enable the **Allow export-controlled functionality on the products registered with this token** check box.
- Step 6** Click **Create Token**. After the token is created, click **Copy** to copy the newly created token.

Registering Device using the id Token

Now that you have the token from the CSSM, using the token, execute the `<device>#license smart register idtoken < token from CSSM portal >` command to complete the smart license configuration.

On successful registration, the device displays the “Registered” status and receives an identity certificate. This certificate is saved on your device and is automatically used for all future communication with Cisco. However, if the registration fails, the system generates an error log.

Example:

Note For an ASR device with redundancy enabled, you must execute `write memory` after successful registration. This ensures that the registration is valid even if you perform switchover or reload operations.

What to do next

- Enable the required technology package licenses by executing the **license boot level** `<technologypackage>` command from the global config mode.



CHAPTER 5

Configure Smart Licensing (Satellite)

Cisco Smart Software Manager satellite is a component of Cisco Smart Licensing. CSSM Satellite works in conjunction with CSSM to manage product licenses, providing near-realtime visibility and reporting of Cisco licenses in use. For security reasons, if you do not want to manage the installed base with Smart Software Manager residing on Cisco.com, you can choose to install the Smart Software Manager satellite on premises.

For information about installing a Smart Software Manager Satellite server, see the [Smart Software Manager Satellite Installation Guide](#).

The following are the high level steps to register a device in CSSM Satellite:

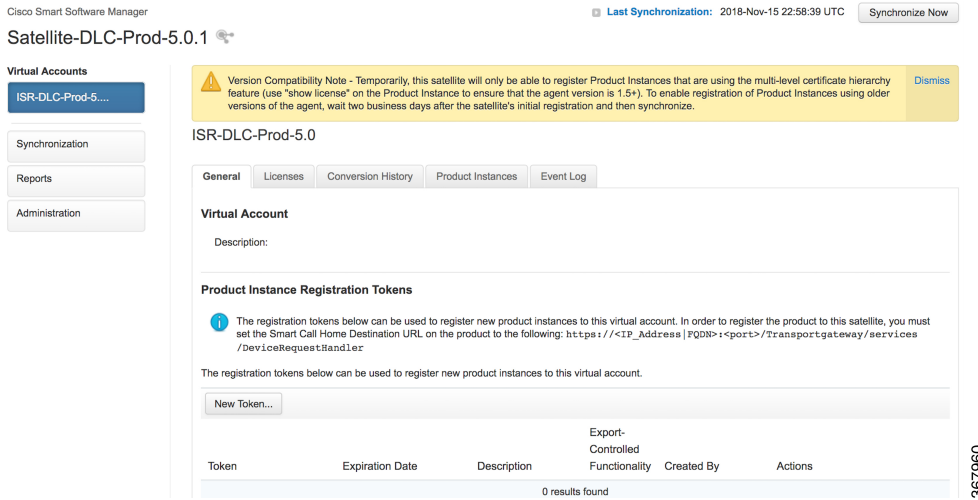
- Ensure that you meet all the prerequisites.
- Configure the Call Home settings if you want to enable email notifications.
- Register the device by executing the `license smart register id token <token>` command.
- In the Call-Home profile, remove the default destination CSSM production URL and configure the satellite destination URL.
- [Generate a New Token from the Satellite Server, on page 15](#)
- [Register a Device in Satellite , on page 17](#)

Generate a New Token from the Satellite Server

If you have chosen to deploy the Smart Software Manager Satellite On Premises, you must follow this procedure to generate a token to register your product instance to your Virtual Account.

Step 1 Log in to the Smart Software Manager Satellite server.

Generate a New Token from the Satellite Server

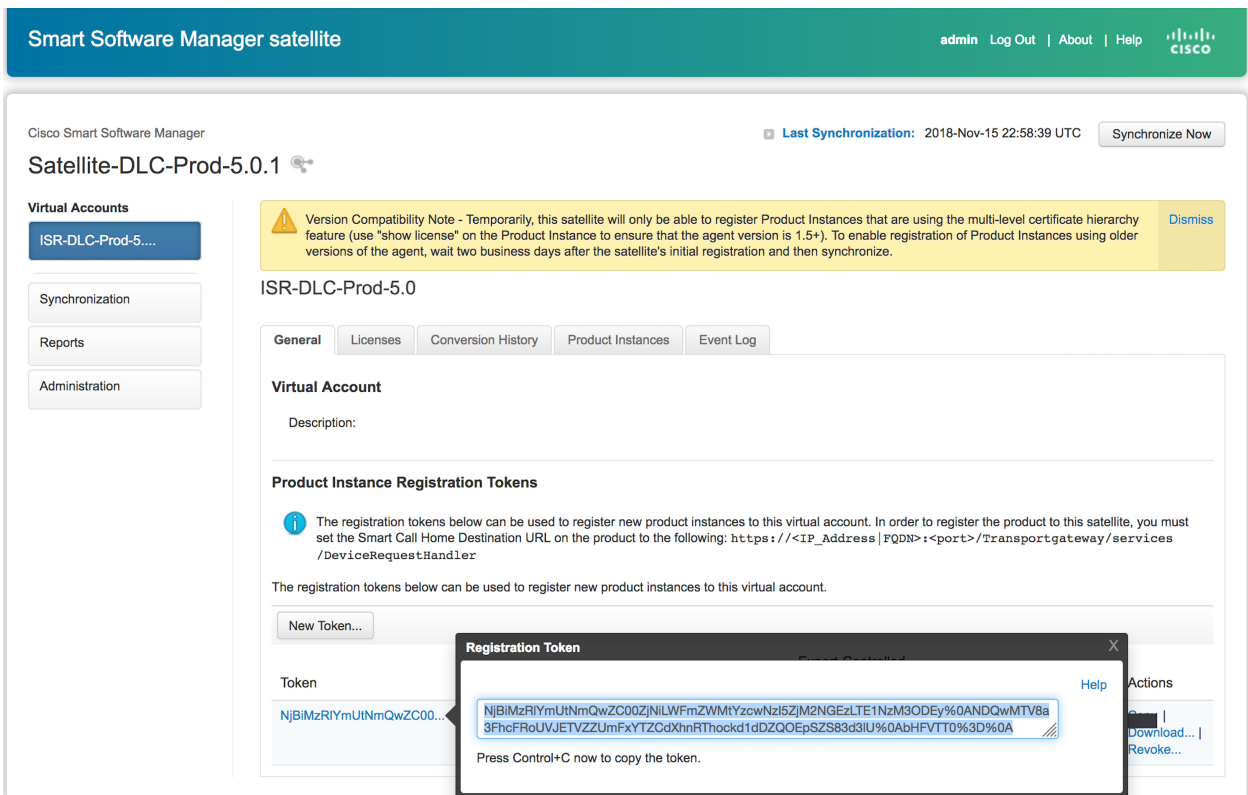


367960

Step 2

Select the **General** tab, and click **New Token**.

Once the token is generated, the system displays the token on the Virtual Account page. The event log also captures the token ID creation.



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The product instance is created in your Virtual Account.

What to do next

Register the device using the token that you generated.

Register a Device in Satellite

On the device, execute the `<device>#license smart register idtoken <token from Satellite>` command to complete the registration. Use the token ID that you generated from Satellite.

On successful registration, the device displays the “Registered” status and receives an identity certificate. This certificate is saved on the device and is automatically used for all future communications with the Satellite. However, if the registration fails, an error is logged.

Example:

```
Device#sh license summary
Smart Licensing is ENABLED
Registration:
Status: REGISTERED
Smart Account: BU Production Test
Virtual Account: ASR-SJC-DTExport-Controlled
Functionality: AllowedLast
Renewal Attempt: None
Next Renewal Attempt: Apr 28 03:39:36 2019 UTC
License Authorization:
Status: AUTHORIZED
Last Communication Attempt: SUCCEEDED
Next Communication Attempt: Nov 29 03:39:42 2018 UTC
License Usage:License                Entitlement tag                Count
-----
Upgrade from 2.5 Gbp...      (ASR_1001X_Throughput_2...)    1 AUTHORIZED
ASR_1000_AdvEnterprise      (ASR_1000_AdvEnterprise)      1 AUTHORIZED
```

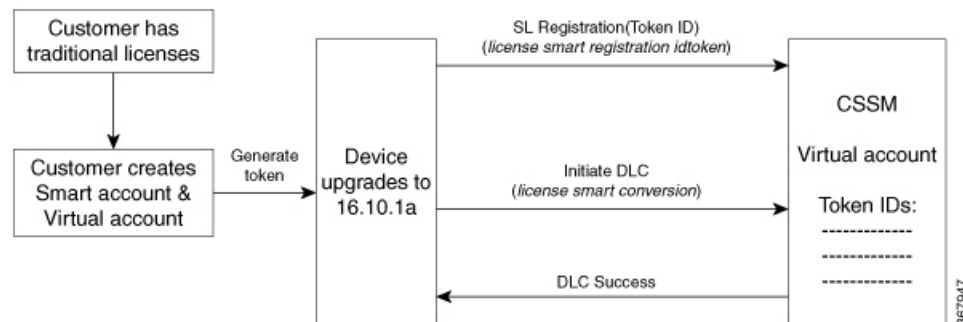



CHAPTER 6

Migrate from Traditional Licensing to Smart Licensing

Cisco employs two types of license models - Traditional or Classic Licensing and Smart Software Licensing. If you are an existing user who is using a device earlier than Cisco IOS XE Release 16.10.1a, you are most likely using Traditional Licensing such as an RTU license, paper license, or a PAK license. If you want to upgrade to the Cisco IOS XE Release 16.10.1a or later SL-only image, you must migrate to Smart Licensing. The following image specifies the high-level steps to migrate to Smart Licensing:

Figure 3: Migrate to Smart Licensing



When you upgrade to IOS XE Release 16.10.1a or later, your existing licenses change to the evaluation (EVAL) state till the device registration is complete. However, existing features continue to function without interruption. After registration, the licenses change to the AUTHORIZED state.

1. Ensure that all the prerequisites are met before you migrate to Smart Licensing. See the [Prerequisites, on page 8](#) section.
2. Load the 16.10.1a or later image. See the [Load the 16.10.1a or Later Image, on page 20](#) section.
3. Generate a token ID using the CSSM Portal. See the [Generating a New Token from Cisco Smart Software Manager, on page 13](#) section.
4. Register your device using the token that you generated. See the [Registering Device using the id Token, on page 14](#) section.
5. Initiate DLC conversion. See the [Initiate DLC, on page 21](#) section.



Note For IOS XE, DLC is not supported on ASR 1000 Series RP2 platforms running non-universal K9 images. As a workaround, you can migrate to intermediate releases such as IOS XE 16.3, 16.6, or 16.9, before migrating to IOS XE 16.10.1a or later. Or, contact the Cisco TAC team by telephone to migrate from traditional licenses to smart licenses.

The following sections describe the migration workflow in detail:

- [Load the 16.10.1a or Later Image, on page 20](#)
- [Device Led Conversion, on page 20](#)
- [Initiate DLC, on page 21](#)
- [Verify the Migration Status in CSSM Portal, on page 21](#)
- [Verify DLC Status on Satellite, on page 22](#)

Load the 16.10.1a or Later Image

As the first step of migrating to Smart Licensing, you must load the Cisco IOS XE 16.10.1a or later image. When you upgrade to this image, Smart Licensing is automatically enabled.



Note You cannot execute the `license smart enable` command on the device.

After you load the SL-only image, proceed to [Generating a New Token from Cisco Smart Software Manager, on page 13](#).

Device Led Conversion

Device Led Conversion (DLC) is the process where a new device or a product instance is upgraded from Traditional to Smart Licensing when registered in Cisco Smart Software Manager (CSSM). All licenses on the device automatically convert from Classic or Perpetual Right-to-Use (RTU) License to Smart License without the need for any manual conversion.



Note You can perform the DLC operation only once during the life of the device.



Important CSR does not support DLC in the Cisco IOS XE 16.10.1a release. You can either deposit licenses directly or you can convert licenses in CSSM and License Registration Portal (LRP).



Note ASR does not support OTV, LISP, VPLS, and FPI licenses for DLC.

Initiate DLC

To initiate the DLC operation, execute the `license smart conversion start` command. If the DLC operation is complete, the device displays a "Completed" status.

The following is an example of DLC completion. Note the Completed output in the DLC Status field.

```
Device#show platform software license dlc
Index 1 Feature:          adventerprise
Permanent License:      0
EVAL RTU License:       1
RTU License:            0
Paper License:          0
DLC Status:             Completed
Index 2 Feature:
    Permanent License:   0
    EVAL RTU License:    1
    RTU License:         0
    Paper License:       0
    DLC Status:          Completed
Index 3 Feature:         fwnat_red
Permanent License:      0
EVAL RTU License:       1
RTU License:            0
Paper License:          0
DLC Status:             Completed
```

To verify whether the operation was successful, run the `show license all` command. The system displays a "Success" status if the DLC operation is successful. The following example shows a successful DLC operation:

```
Device#show license all | sec License Conversion:
License Conversion:
Automatic Conversion Enabled: False
Status: Successful on Nov 08 18:54:40 2018 IST
```

To convert broadband licenses using DLC for an ASR1000 device, execute the `subscriber license dlc <sessions>` command. This command sets the total number of broadband sessions that can be converted using DLC including paper licenses and PAK licenses.

To consume the broadband licenses in the 16.10.1a or later image, use the **subscriber license session** command. If this command is not configured, the broadband module also supports the automatic procuring of licenses for every 2K session brought up in the device.

Any broadband licenses from traditional licensing are consumed as 2k sessions in SL-only mode in 16.10.1a or later. For example, if a customer has 10 licenses as broadband and 4k in traditional licensing, after migrating to SL-only image, these licenses are visible as 12 licenses in feature broadband during the DLC conversion. Use the **show platform software license dlc** command to view the 12 licenses.

Verify the Migration Status in CSSM Portal

After the DLC conversion is successful, the smart licenses for your virtual account are authorized. You can verify the status of the migration by checking the message in the CSSM portal.

SUMMARY STEPS

1. Log in to the CSSM portal. Click **Inventory > Product Instances**.

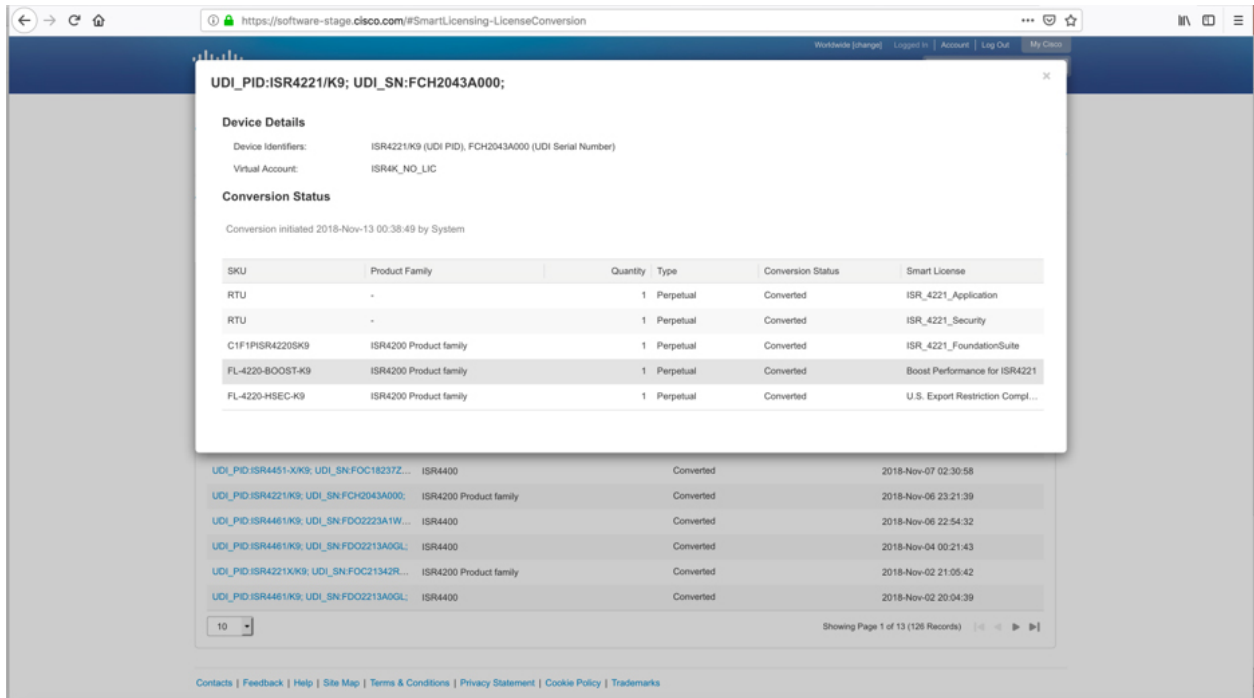
- Verify whether the DLC operation is successful by clicking the **Convert to Smart Licensing** tab, and clicking **Conversion History**. You see the following in the portal:

DETAILED STEPS

Step 1 Log in to the CSSM portal. Click **Inventory > Product Instances**.

If the migration is successful, the converted licenses are added in CSSM.

Step 2 Verify whether the DLC operation is successful by clicking the **Convert to Smart Licensing** tab, and clicking **Conversion History**. You see the following in the portal:



UDI_PID:ISR4221/K9; UDI_SN:FCH2043A000;

Device Details

Device Identifier: ISR4221K9 (UDI PID), FCH2043A000 (UDI Serial Number)

Virtual Account: ISR4K_NO_LIC

Conversion Status

Conversion initiated 2018-Nov-13 00:38:49 by System

SKU	Product Family	Quantity	Type	Conversion Status	Smart License
RTU	-	1	Perpetual	Converted	ISR_4221_Application
RTU	-	1	Perpetual	Converted	ISR_4221_Security
C1F1PISR42205K9	ISR4200 Product family	1	Perpetual	Converted	ISR_4221_FoundationSuite
FL-4220-BOOST-K9	ISR4200 Product family	1	Perpetual	Converted	Boost Performance for ISR4221
FL-4220-HSEC-K9	ISR4200 Product family	1	Perpetual	Converted	U.S. Export Restriction Compl...

UDI_PID:ISR4451-K9; UDI_SN:FOC18237Z... ISR4400
Converted 2018-Nov-07 02:30:58

UDI_PID:ISR4221/K9; UDI_SN:FCH2043A000; ISR4200 Product family
Converted 2018-Nov-06 23:21:39

UDI_PID:ISR4451/K9; UDI_SN:FDO2223A1W... ISR4400
Converted 2018-Nov-06 22:54:32

UDI_PID:ISR4451/K9; UDI_SN:FDO2213A0GL; ISR4400
Converted 2018-Nov-04 00:21:43

UDI_PID:ISR4221/K9; UDI_SN:FOC21342R... ISR4200 Product family
Converted 2018-Nov-02 21:05:42

UDI_PID:ISR4451/K9; UDI_SN:FDO2213A0GL; ISR4400
Converted 2018-Nov-02 20:04:39

Showing Page 1 of 13 (126 Records)

It takes about an hour or more for the Conversion Status of the DLC to display as "Converted" on CSSM. This status means that the DLC is complete and that successful logs have been detected on the device.

Verify DLC Status on Satellite

This verification topic is applicable only if you have configured Smart Licensing for Satellite.

Step 1 Log in to the Satellite Server, and click the **Licenses** tab. If your device is registered successfully, the Licenses are in the **In Use** State.

After you initiate DLC, the Licenses move to the **Pending** state.

UDI_PID:ISR4331/K9;UDI_SERIAL_NUMBER:FDO19360L1V;

Device Details

Device Identifiers: ISR4331/K9 (Udi pid), FDO19360L1V (Udi serial number)
 Virtual Account: ISR-DLC-Prod-5.0

Conversion Status

Conversion Pending at Fri Nov 16 02:29:43 2018

SKU	Product Family	Quantity	Type	Conversion Status	Smart License
-	ISR 4331 PRD	0	SENTINAL_LINE	Pending	-
-	ISR 4331 PRD	0	SENTINAL_LINE	Pending	-
-	ISR 4331 PRD	0	SENTINAL_LINE	Pending	-
-	ISR 4331 PRD	0	SENTINAL_LINE	Pending	-
-	ISR 4331 PRD	1	ENTITLEMENT	Pending	-

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Step 2

After the DLC conversion is successful, click the **Conversion History** tab to verify whether the conversion status is updated to "Converted".

Smart Software Manager satellite
admin Log Out | About | Help

Cisco Smart Software Manager Last Synchronization: 2018-Nov-16 20:06:32 UTC [Synchronize Now](#)

Satellite-DLC-Prod-5.0.1

Virtual Accounts

ISR-DLC-Prod-5... 1

Synchronization

Reports

Administration

Version Compatibility Note - Temporarily, this satellite will only be able to register Product Instances that are using the multi-level certificate hierarchy feature (use "show license" on the Product Instance to ensure that the agent version is 1.5+). To enable registration of Product Instances using older versions of the agent, wait two business days after the satellite's initial registration and then synchronize. [Dismiss](#)

ISR-DLC-Prod-5.0

1 Major [Hide Alerts](#)

General Licenses **Conversion History** Product Instances Event Log

Search by Device Identifier, Product Family or Conversion Status [Filter](#)

Product Instance Name	Product Family	Conversion Status	Time
UDI_PID:ISR4331/K9;UDI_SERIAL_NUMBER:FDO19360L1V;	ISR 4331 PRD	Converted	2018-Nov-16 20:09:40 UTC

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After the migration is complete, in the **Licenses** tab, the **Purchased** count is updated to 1 from 0. Also, the conversion status is displayed as "CONVERT_SUCCESS".

Cisco Smart Licensing Guide for Cisco Enterprise Routing Platforms

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Smart Software Manager satellite admin Log Out | About | Help

Cisco Smart Software Manager Last Synchronization: 2018-Nov-16 20:06:32 UTC [Synchronize Now](#)

Satellite-DLC-Prod-5.0.1

Virtual Accounts

- ISR-DLC-Prod-5.... 1
- Synchronization
- Reports
- Administration

Version Compatibility Note - Temporarily, this satellite will only be able to register Product Instances that are using the multi-level certificate hierarchy feature (use "show license" on the Product Instance to ensure that the agent version is 1.5+). To enable registration of Product Instances using older versions of the agent, wait two business days after the satellite's initial registration and then synchronize. [Dismiss](#)

ISR-DLC-Prod-5.0

1 Major [Hide Alerts](#)

General **Licenses** Conversion History Product Instances Event Log

[Filter](#)

License	Billing	Purchased	In Use	Balance	Alerts
Boost Performance for ISR4331	Prepaid	1	1	0	
ISR_4331_Application	Prepaid	1	1	0	
ISR_4331_Hsec	Prepaid	1	1	0	
ISR_4331_Security	Prepaid	1	1	0	
ISR_4331_UnifiedCommunication	Prepaid	1	1	0	
Unified Survivable Remote Site Telephony (SRST) Endpoint License	Prepaid	0	5	-5	Insufficient Licenses

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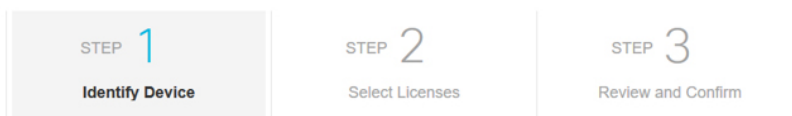


CHAPTER 7

Convert CSR1000v PAK Licenses to Smart Licenses

- Step 1** Log in to the CSSM portal using the username and password that you obtained from Cisco.
- Step 2** Click **Convert to Smart Licensing > Convert Licenses > License Conversion Wizard**.
- Step 3** From the **Product Family** drop-down list, select the product family.
- Step 4** Specify the **Device Identifier**, and click **Search**.

Convert to Smart Software Licenses



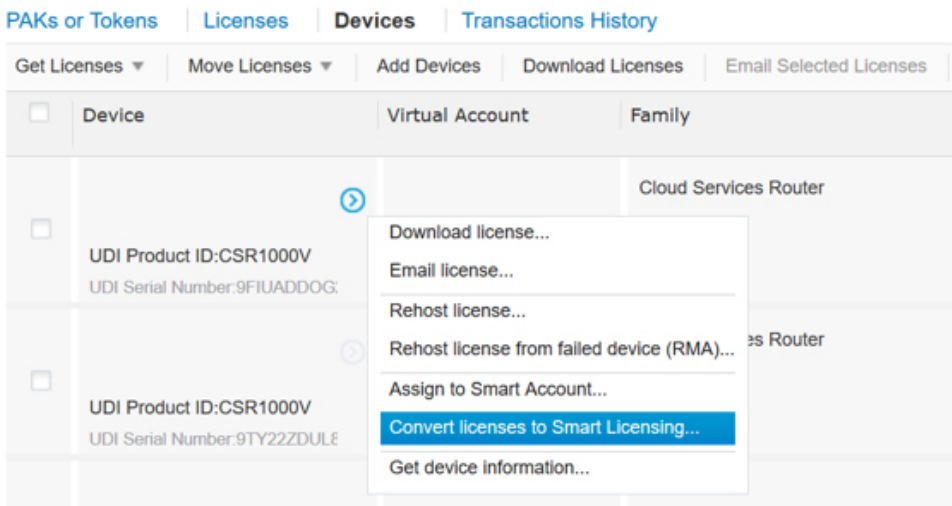
Convert traditional licenses installed on a device to Smart Software Licenses. Begin by selecting the product family and licenses in the Product License Registration Portal.

* Product Family:

* Device Identifiers:

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- Step 5** Select the device that has been added, and select **Convert Licenses to Smart Licensing**.



Step 6 Assign the licenses to a Virtual Account by choosing the corresponding option from the **Virtual Account** drop-down list.

Step 7 Specify the number of licenses that you want to convert in the **Quantity to Convert** field.

Device Details

Device Identifiers: CSR1000V (UDI Product ID), 9FIUADDOG20 (UDI Serial Number)
 Product Family: Cloud Services Router
 Device Virtual Account: CSR1000v

Licenses to Convert

Destination Virtual Account:

<input checked="" type="checkbox"/>	Transaction ID	SKU	Quantity	Type	Expiration Date	Converts to Smart License	Quantity to Convert
<input checked="" type="checkbox"/>	81274394	L-CSR-5G-SEC=	1	Perpetual	-	CSR 1KV SECURITY 5G	<input type="text" value="1"/>

Step 8 On the Convert to Smart Entitlements page, click **Submit**.

X

Convert to Smart Entitlements

Device ID: UDI Product ID:CSR1000V,UDI Serial Number:9FIUADDOG2O

Product Family: Cloud Services Router

Smart Account: InternalTestDemoAccount7.cisco.com

Virtual Account:

<input type="checkbox"/> SKU	Type	Term Date	Quantity Available	Quantity to Convert
<input checked="" type="checkbox"/> L-CSR-5G-SEC=	Perpetual	--	1	<input type="text" value="1"/>

i Once these entitlements have been converted they will no longer appear in this portal.

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- [Convert PAK Licenses in License Registration Portal, on page 27](#)

Convert PAK Licenses in License Registration Portal

- Step 1** Log in to the License Registration Portal using the credentials that you obtained from Cisco.
- Step 2** Click the **Devices** tab, and click **Add Devices**.
- Step 3** On the Add Device pop-up screen, select the appropriate **Product Family**, and **UDI**.

The screenshot shows the 'Add Device' pop-up window. On the left, there is a table with columns 'Device' and 'Virtual Account'. The table contains two rows of device information. The main form on the right has the following fields:

- Virtual Account:** (Required with Smart Account)
- Product Family:**
- Device Identifier:** (with a question mark icon)
- UDI PID:**
- UDI SN:**

At the bottom right of the pop-up are 'Cancel' and 'OK' buttons.

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- Step 4** Click **OK**.



CHAPTER 8

Roll back to Traditional Licensing Model

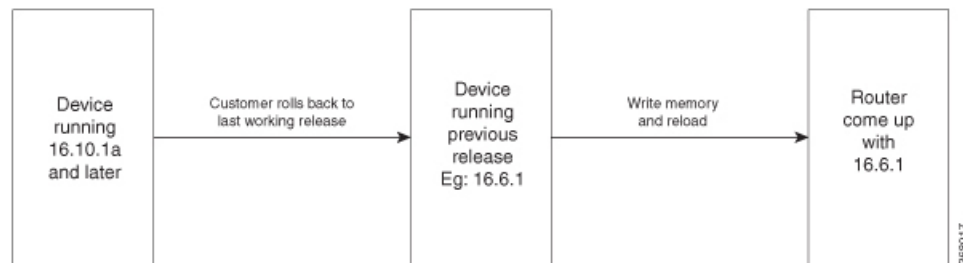
You might want to roll back to a release earlier than Cisco IOS XE 16.10.1a and therefore to the earlier/traditional licensing model in the following scenarios:

- There are multiple users, and you do not know the actual end user of your software.
- The software is deployed in a location with limited access to the license and inventory management solution.
- You have not opted to establish a Smart Call Home relationship with Cisco.
- A Smart Call Home relationship cannot be maintained with the user owing to logistics.



Note When you have upgraded from Cisco IOS XE Everest 16.6 release to Cisco IOS XE Gibraltar 16.10.1a or later, and want to rollback, you must `reload` the router twice to move the licenses to the "Active, In-Use" state.

Figure 4: Roll back to an earlier release



To roll back to the earlier release, perform these steps:

- Step 1** De-register the device from CSSM by executing the `license smart deregister` command.
- Step 2** Reload the device with an earlier release.
- Step 3** Perform a write action (write memory), if required. To do so, execute the `write memory` command.
- Step 4** Reboot the device.

Attention When you rollback from the Cisco IOS XE Release 16.10.1a to a previous release, you must reboot the router twice with a write memory in between.

Downgrading a device from Cisco IOS XE Release 16.10.1a or later to any prior release will migrate the smart license to traditional license. All smart license information on the device is removed. In case the device needs to be upgraded back to Cisco IOS XE Release 16.10.1a or later, the license status remains in the evaluation mode until the device is registered again in CSSM. Your RTU licenses will be in evaluation mode, and these licenses cannot be enforced along with the controlled features. You must contact Cisco TAC by telephone to resolve this issue.



CHAPTER 9

Renew Smart Licensing Registration

Your registration is automatically renewed every six months for a one year registration period. However, to make an on-demand manual update of your registration, perform this procedure.

Step 1 In the router command prompt, execute the `enable` command.

Enables privileged EXEC mode. Enter your password, if prompted.

Step 2 Execute the `license smart renew auth` command.

Authorization periods are renewed by the Smart Licensing system every 30 days. As long as the license is in an Authorized state, the authorization period is renewed. The evaluation period starts when an authorization period expires. When the licenses are in the 'Expired' state, the system continues to try renew the authorization period. If a retry is successful, a new authorization period starts.



CHAPTER 10

Suppression of Evaluation Expiration Messages in Cisco IOS XE Release 16.11.1a and Later Releases

Table 3: Feature History

Release	Description
Cisco IOS XE 16.10.1a	Feature introduced. In this release, users are notified about the evaluation period of a license through syslog messages. These messages are displayed when the device is not registered with the CSSM.
Cisco IOS XE 16.11.1a	In Cisco IOS XE Release 16.11.1a and later releases, the evaluation period of 90 days is the same as release 16.10.1a. However, the syslog messages are not displayed until after you use the device for 365 days.

Overview of the Evaluation Period

When you boot an SL-only image, Smart Licensing is automatically enabled, and the licenses for your device go into the Evaluation or EVAL mode. You have 90 days of device usage to register your device in CSSM. During this period, the existing features work as expected for ISR and ASR routers. As long as the device is used, the evaluation timer counts down. The evaluation period applies to the whole device rather than to individual features or entitlements. When the evaluation period expires for a device, it cannot be reset. After the 90 days time period, these licenses move to the Expired or EVAL EXPIRED state.

Cisco CSR 1000V and Cisco ISRV do not have an evaluation period of 90 days. Until the license is in the EVAL mode, the throughput remains at a default of 1Mbps.

In Cisco IOS XE rRelease 16.11.1a and later releases, the behavior of the evaluation expiration messages has been changed.

Evaluation Period in 16.10.1.a

In release 16.10.1a, to notify the user about the evaluation period, the following syslog messages are displayed when you have not registered the device in CSSM:

- %SMART_LIC-3-EVAL_EXPIRED: Displayed when the evaluation period expires.

- `%SMART_LIC-4-EVAL_WILL_EXPIRE_WARNING`: Displayed when the evaluation period is about to expire on the following schedule:
 - 60 days before expiration.
 - 30 days before expiration.
 - Every week in the last month.
 - Every day in the last week.
 - Every hour on the last day.
- `%SMART_LIC-4-EVAL_EXPIRED_WARNING`: Displayed when the evaluation period has already expired. The device displays this warning once a week after the expiration and also displays the timestamp of expiry.

Changes to the Evaluation Period in 16.11.1a and Later Releases

In Cisco IOS XE Release 16.11.1a and later releases, the evaluation period of 90 days is the same as 16.10.1a. However, the syslog messages are not displayed until after you use the device for 365 days. This period of 365 days includes the 90 days of the evaluation period. Due to the suppression of these messages, you can use your ASR and ISR devices without restrictions for 365 days from when you first start the device.

Cisco CSR 1000V and Cisco ISRV do not have an evaluation period of 90 days. Until the license is in the EVAL mode, the throughput remains at a default of 1Mbps.



CHAPTER 11

Specific License Reservation

Specific License Reservation (SLR) is a functionality that enables you to deploy a software license on a device without communicating usage information to Cisco. This functionality is especially used in highly secure networks, and it is supported on platforms that have Smart Licensing enabled.

SLR lets you reserve a license for your product instance from the CSSM. These reserved licenses need not be renewed or reauthorized unless there is a license usage change on the device.

License enforcement is a mechanism that prevents a feature from being used without first obtaining a license. The following enforcement mechanisms are available:

- **Hard enforcement:** Hard enforcement is applicable only for enforced licenses. If you do not authorize the required licenses by installing the authorization code, the license cannot be used, and the feature is disabled.
- **Soft enforcement:** When you do not authorize the required licenses by installing the authorization code, you can continue to use the license. The system displays an appropriate syslog message and the license status is “Not Authorized”.



Note SLR is not enabled by default, and you must specifically request for this functionality. See [How to Reserve Licenses](#)

- [Restrictions for Specific License Reservation, on page 35](#)
- [Register a Device Using Specific License Reservation, on page 36](#)
- [Update a Specific License Reservation, on page 38](#)
- [Deregister a Specific License Reservation, on page 39](#)

Restrictions for Specific License Reservation

- For ASR1000 Series Routers with two Route Processors (RPs), do not change the state of the licenses on switching over to a new active RP.
- The SLR authorization code file is valid only till you install the code. If there is an installation failure, you must contact GLO to generate a new authorization code.

Register a Device Using Specific License Reservation

To register a device using Specific License Reservation, you must do the following:

Enable Specific License Reservation

To enable Specific License Reservation for your device, you must execute the following commands:

-
- Step 1** **Enable**
Enables privileged EXEC mode.
Enter your password if prompted.
- Step 2** **configure terminal**
Enters global configuration mode.
- Step 3** **license smart reservation**
Enables Specific License Reservation. Use the no form of this command to disable Specific License Reservation.
- Step 4** **exit**
Exits configuration mode, and returns the device to the global configuration mode.
- Step 5** **license smart reservation request local**
Generates a request code for the device to be entered in the Cisco Smart Software Manager.
- Note** To cancel the License Reservation request, execute the `license smart reservation cancel` command.
-

Example

```
SR-I# Enable
SR-I# configure terminal
SR-I(config)# license smart reservation
SR-I(config)# exit
SR-I# license smart reservation request local
```

Reserve Licenses using Cisco Smart Software Manager

-
- Step 1** Log in to Cisco Smart Software Manager at <https://software.cisco.com/#>.
You must log in to the portal using the Cisco provided username and password.

Step 2 Click the **Inventory** tab. From the **Virtual Account** drop-down list, select your smart account.

Step 3 From the **Licenses** tab, click **License Reservation**.

Cisco Software Central > Smart Software Licensing English [Change] Hello Smart Account Name

Smart Software Licensing Feedback Support Help

Alerts | **Inventory** | Convert to Smart Licensing | Reports | Preferences | Satellites | Activity Questions About Licensing? Try our Virtual Assistant

Virtual Account: **Virtual Account 1** 104 Minor Hide Alerts

General | **Licenses** | Product Instances | Event Log

Available Actions Manage License Tags License Reservation... Show License Transactions Search by License

License	Billing	Purchased	In Use	Balance	Alerts	Actions
ASAv10 Standard - 1G	Prepaid	1	1	0	Licenses Expiring	Actions
C3850 High Port DNA Advantage	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850 High Port DNA Essentials	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850 Low Port DNA Advantage	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850 Low Port DNA Essentials	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850-DNA-A-12	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850-DNA-A-24	Prepaid	40	0	+40	Licenses Expiring	Actions
C3850-DNA-A-48	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850-DNA-E-12	Prepaid	20	0	+20	Licenses Expiring	Actions
C3850-DNA-E-24	Prepaid	20	3	+17	Licenses Expiring	Actions

Showing Page 1 of 8 (79 Records)

The system displays the Smart License Reservation wizard.

Step 4 On the **Enter Request Code** page, enter or attach the reservation request code you generated from the router, and click **Next**.

Step 5 Check the **Reserve a specific License** check box.

The system displays the list of surplus licenses available in your Virtual Account. Enter the number of licenses that you want to reserve for the required license, in the **Quantity to Reserve** field. Click **Next**.

Step 6 From the **Review and Confirm** tab, click **Generate Authorization Code**.

Note After you generate the SLR code for a specific device, the authorization code file is valid till you install the code. If the installation fails, you must contact GLO to generate a new authorization code.

The system displays the Authorization Code that is generated.

Step 7 Click the **Copy to Clipboard** option to copy the code, or download it as a file. You need to copy the code or file to your device.

If you configure SLR, you can download or install the authorization code text file. If you configure PLR, you can copy and paste the authorization code.

Register the Device Using the Authorization Code

After you get the authorization code from CSSM, execute the following commands to complete the license reservation procedure:

Step 1 enable

Enables privileged EXEC mode.

Enter your password, if prompted.

Step 2 license smart reservation install file bootflash:<authfile.txt>

This command registers the device. The authorization code you copied as a file is used to activate smart licensing reservation for your device. When you run the `show license tech support` command, the system displays the details of the reserved licenses.

Example: Enable Specific License Reservation

```
SR-I> enable
SR-I# configure terminal
SR-I(config)# license smart reservation
cancel    Cancel a Smart License reservation request before the authorization code is installed
install   Install a Smart License reservation authorization code
request   Request a license reservation
return    Return a Smart License reservation authorization code that was installed

SR-I#license smart reservation req
SR-I#license smart reservation request loc
SR-I#license smart reservation request local
ce577e57-9aa9-403e-8e7c-e9532a810075
SR-I#license smart reservation install file bootflash:slr_sl
Reservation install file successful
Last Confirmation code UDI: PID:ASR1001-HX,SN:JAE200602WHff518c84
SR-I#show license tech support | section Reservation info
Reservation Info
=====
License reservation: ENABLED

Overall status:
Active: PID:C1117-4PWA,SN:FGL214790X2
Reservation status: SPECIFIC INSTALLED on Mar 29 11:23:06 2019 PDT
Export-Controlled Functionality: ALLOWED
Request code: <none>
Last return code: <none>
Last Confirmation code: b6556195
Reservation authorization code: <authcode>
```

Update a Specific License Reservation

After you register a device successfully, if required, you can update the reservation with a new feature or license as follows:

-
- Step 1** Log in to Cisco Smart Software Manager at <https://software.cisco.com/#>.
You must log in to the portal using the Cisco provided username and password.
- Step 2** Click the **Inventory** tab. From the **Virtual Account** drop-down list, select your smart account.
- Step 3** From the **Product Instances** tab, for the device that you want to update, click **Actions**.
- Step 4** Click **Update Reserved Licenses**.
- Step 5** Select the license that you want to update.
- Step 6** Click **Next**.
- Step 7** From the **Review and Confirm** tab, click **Generate Authorization Code**. The **Authorization Code** tab is displayed.
The system displays the Authorization Code that is generated.
- Step 8** Click the **Copy to Clipboard** option to copy the code, or download it as a file. You need to copy the code or file to your device.
- Step 9** Log in to the device that you want to update.
- Step 10** Run the **license smart reservation install file** command.
license smart reservation install file bootflash:<authfile.txt>
This command registers the device with the new authorization code. The authorization code you copied as a file is used to activate smart licensing reservation for your device.
Example:

```
device# license smart reservation install file bootflash:auth.txt
Reservation install file successful
Last Confirmation code UDI: PID:ISR4351/K9,SN:FDO210305DQ
2029eee4
```
- Step 11** Note the confirmation code from the output of the previous command.
- Step 12** In CSSM, from the **Authorization Code** tab, click the **Enter Confirmation Code** button.
- Step 13** Enter the confirmation code that you noted in the previous step.
- Step 14** Click **OK**.
-

Deregister a Specific License Reservation

To deregister a Specific License Reservation for a device, you must return the license reservation in the CLI and remove the instance from CSSM.

-
- Step 1** Log in to the device that you want to deregister.
- Step 2** To remove the license reservation authorization code, run the **license smart reservation return** command
license smart reservation return local

```
Device# license smart reservation return local
This command will remove the license reservation authorization code and the device will transition
back to the unregistered state. Some features may not function properly.
Do you want to continue? [yes/no]: yes
Enter this return code in Cisco Smart Software Manager portal:
```

UDI: PID:ISR4351/K9, SN:FDO210305DQ
CBURR4-cTgMun-arvYME-gta6ir-yqnXQm-yMKxWM-2ajywD-5kADgZ-a33

- Step 3** Log in to Cisco Smart Software Manager at <https://software.cisco.com/#>.
You must log in to the portal using the Cisco provided username and password.
- Step 4** Click the **Inventory** tab. From the **Virtual Account** drop-down list, select your smart account.
- Step 5** From the **Product Instances** tab, for the device that you want to deregister, click **Actions**.
- Step 6** Click **Remove**.
- Step 7** When prompted, enter the return code.
-



CHAPTER 12

Troubleshoot Smart Licensing Issues

The following chapter describes some common Smart Licensing issues that you might encounter and possible solutions. This chapter contains the following sections:

- [Troubleshoot Smart Licensing, on page 41](#)
- [Troubleshoot Specific License Reservation, on page 45](#)

Troubleshoot Smart Licensing

This section describes some common smart licensing issues you may encounter with IOS XE Release 16.10.1a and their possible solutions.



Note The issues described in this section apply to release 16.10.1a only.

CSSM Registration Failure

Cause

HTTP Communication Failures

Sample Syslogs

```
Nov 15 14:18:48.373 PDT: %SMART_LIC-3-AGENT_REG_FAILED: Smart Agent for Licensing Registration with the Cisco Smart Software Manager or satellite failed: Fail to send out Call Home HTTP message.
```

```
Nov 15 14:18:48.373 PDT: %SMART_LIC-3-COMM_FAILED: Communications failure with the Cisco Smart Software Manager or satellite: Fail to send out Call Home HTTP message.
```

Verification Steps

Execute the `show license all` command and locate the failure reason in the output. See the following sample output:

```
Registration:
Status: REGISTERING - REGISTRATION IN PROGRESS
Export-Controlled Functionality: NOT ALLOWED
Initial Registration: FAILED on Nov 15 14:18:48 2018 PDT
```

CSSM Registration Failure reason: Invalid tokenID

Failure reason: Fail to send out Call Home HTTP message. Next Registration Attempt: Nov 15 14:38:20 2018 PDT

Recommended Solution

Ensure connectivity to the CSSM portal. See the [HTTP Communication Failures, on page 44](#) section.

CSSM Registration Failure reason: Invalid tokenID

Sample Syslogs

```
Nov 15 19:03:07.272: %SMART_LIC-3-AGENT_REG_FAILED: Smart Agent for Licensing Registration
with the Cisco Smart Software Manager or satellite failed: Error received from Smart
Software Manager: {"token": ["The token '<tokenID>' is not valid."]}
```

Verification Steps

Execute the `show license all` command and look for failure reason in the output. See the following example output:

```
Registration:
Status: REGISTERING - REGISTRATION IN PROGRESS
Export-Controlled Functionality: NOT ALLOWED
Initial Registration: FAILED on Nov 15 14:32:24 2018 PDT
Failure reason: The token '<tokenID>' is not valid.
```

Recommended Solution

The Token ID that you entered is incorrect. Try registering the device again with the correct tokenID.

DLC syslog message with "DLC Already Completed"

Sample Syslogs

```
Nov 11 00:41:22.395: %SMART_LIC-6-CONVERT_LIC_SUCCESS: PID:ISR4451-X/K9,SN:FOC17221WLK
License regid.2014-12.com.cisco.ISR_4400_Security,1.0_02ea4d4a-2469-46c1-afaf-d6cdfa1980aa has been
converted to ISR_4400_Security with a count of 1^M *Nov 11 00:41:22.395:
%SMART_LIC-6-CONVERT_ALREADY: PID:ISR4451-X/K9,SN:FOC17221WLK Smart License
Conversion successful *Nov 11 00:41:24.637: %SMART_LIC-6-AUTH_RENEW_SUCCESS: Authorization
renewal with the Cisco Smart Software Manager or satellite. State=OOC for udi
PID:ISR4451-X/K9,SN:FOC17221WLK^M
```

Recommended Solution

You can perform the DLC operation only once during the lifecycle of a device. If you want to add new licenses after DLC conversion, you have to deposit those licenses in your Virtual Account.

CSSM Registration with Out of Compliance: Existing customers upgrading to 16.10.1a and later. Virtual Account with no tags

CSSM Registration displays out of compliance error message for existing users who are upgrading to the 16.10.1a release.

Sample Syslogs

Nov 15 15:15:34.444 PDT: %SMART_LIC-6-AGENT_REG_SUCCESS: Smart Agent for Licensing Registration with the Cisco Smart Software Manager or satellite for udi PID:ISR4461/K9,SN:FDO2213A0GL

Nov 15 15:15:36.509 PDT: %SMART_LIC-4-CONFIG_NOT_SAVED: Smart Licensing configuration has not been saved

Nov 15 15:15:39.357 PDT: %SMART_LIC-3-OUT_OF_COMPLIANCE: One or more entitlements are out of compliance

Nov 15 15:15:39.358 PDT: %SMART_LIC-6-AUTH_RENEW_SUCCESS: Authorization renewal with the Cisco Smart Software Manager or satellite. State=OOC for udi PID:ISR4461/K9,SN:FDO2213A0GL

Verification Steps

Execute the `show license all` command and look for failure reason in the output. For example, see the following output:

```
Registration:
License Authorization:
Status: OUT OF COMPLIANCE
Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Nov 16 03:15:39 2018 PDT
```

Recommended Solution

Your Virtual Account has no licenses deposited. Perform the DLC operation to deposit licenses and get them authorized.

CSSM Registration with EVAL Expired: Existing customers upgrading to 16.10.1a. Licenses state after 90 days without registration

Existing customers upgrading to IOS XE Release 16.10.1a might see an "evaluation period expired" error message. This implies that the licenses are in the evaluation state after 90 days, and the device is yet to be registered.

Sample Syslogs

Nov 14 17:10:23.585 PDT: %SMART_LIC-4-EVAL_WILL_EXPIRE_WARNING: Evaluation period will expire in 1 hours. *

Nov 14 17:10:33.585 PDT: %SMART_LIC-3-EVAL_EXPIRED: Evaluation period expired

Nov 14 17:10:33.586 PDT: *** Evaluation period has expired ***

Verification Steps

Execute the `show license all` command and look for failure reason in the output. For example, see the following output:

```
Smart Licensing is ENABLED
Registration:
  Status: UNREGISTERED
    Export-Controlled Functionality: Not Allowed
  License Authorization:
    Status: EVAL EXPIRED
```

```

License Usage:
License                Entitlement tag                Count Status
-----
                        (ISR_4400_Application)                1 EVAL EXPIRED

```

Recommended Solution

Register the device and perform the DLC process if your Virtual Account has no license deposited.

DLC successful but license missing in Virtual Account

The DLC operation is successful but licenses are missing in the Virtual Account.

Possible Cause

The license could be in an "Out of Compliance" mode wherein you cannot use the corresponding features due to license unavailability.

Only those licenses seen when you execute the `show platform software license dlc` command are eligible for conversion. If a particular license is missing in the DLC path, that license cannot be converted. The license continues to be in the OOC or Out of Compliance mode.

Recommended Solution

You must manually deposit the licenses in your Virtual Account.

Invalid PAK file error during DLC

During DLC operation, you see an invalid PAK file error.

Sample Syslogs

```
Oct 23 00:06:24.234: CSL: pid = ISR4451-X/K9, sn = FOC17221WLK^M
```

```
Oct 23 00:06:24.238: CSL: pid = ISR4451-X/K9, sn = FOC17221WLK^M
```

```
Oct 23 00:06:25.827: %SMART_LIC-3-CONVERT_FAILED: PID:ISR4451-X/K9,SN:FOC17221WLK
License conversion failed: Invalid License File^M
```

Recommended Solution

You must manually deposit the licenses in your Virtual Account.

HTTP Communication Failures

If you see HTTP Communication failure errors, verify whether:

- The HTTP server configuration on the switch is correct. To verify this, execute the `show run | s http` command.
- The Call Home address or URL is correct. To verify this, execute the `show call-home profile all` command.
- The HTTP using ping tools.cisco.com or the nnslookup translated IP.

- The HTTP client source interface is correct.
- The DNS/IP in the Call Home profile is correct.
- The ip route is pointing to the right route.
- The TCP443 is not blocked anywhere in the path.

PKI Certificates are not Saved

If the required PKI certificates for your smart licenses are not saved, your license registration is not successful.

When smart license is registering, a crypto key is generated. This key is automatically saved. However, if another user is writing or configuring at the same time, an overwrite occurs. In this case, the key is not saved unless you manually save it.

Recommended Solution

Use the following sample EEM applet to save the configuration:

```
event manager applet PKI_CONFIG_SAVE auth by
event syslog severity warning pattern "%PKI-4-NOCONFIGAUTOSAVE"
action 2 syslog priority notifications msg "PKI Configuration was modified but not saved.
Issuing write memory to save new IOS PKI configuration"
action 3 cli command "enable"
action 4 cli command "write memory"
```

Troubleshoot Specific License Reservation

This section describes the steps to troubleshoot issues when configuring Specific License Reservation.

Reservation install file failed: Bad input parameter

When you register the device using the `license smart reservation install` command, a bad input parameter error is displayed.

Sample Syslogs

```
#license smart reservation install file bootflash:auth1.txt
%Error opening bootflash:auth1.txt (Permission denied)Reservation install file failed: Bad
input parameter
```

The sys log indicates that the auth file is incorrect.

Recommended Solution

Verify that the file containing the authorization code is loaded on the device flash. See [Register the Device Using the Authorization Code](#).

If you have an issue with the authorization code, generate an auth code from the CSSM. For more information, see [Generating an Auth Code from Cisco Smart Software Manager](#).

Invalid Return Code

When entering the Reservation Return Code on the CSSM portal, the following error is displayed:

The Reservation Return Code you entered is not valid. Ensure that you have entered the entire code.

Recommended Solution

Verify that you have entered the correct Reservation Return Code and that there is no extra character or space in the code. After you have verified the code, try again.



CHAPTER 13

Known Caveats

Table 4: Known Caveats in Smart Licensing (Release 16.11.1a)

Bug ID	Summary
CSCvo48002	Licenses in Eval Expired state coming up in Eval state after reload without doing a write mem.
CSCvo48377	16.11: HSEC license shown 'NOT IN USE' after upgrade from 16.9
CSCvo74870	Need to revert the soft enforcement for MACSEC licenses in SLR mode
CSCvm90638	SLR 1001-X licenses offered also provide 1002-X and non-supported throughput.
CSCvn87329	MACSEC License counts incorrect after SSO in SLR mode
CSCvo64618	Syslog appear when UUT is in registered in CSSM Portal

Table 5: Known Caveats in Smart Licensing (Release 16.10.1a)

Bug ID	Summary
CSCvn15214	Device registered to CSSM losing the registration on upgrade from 16.06.04 CCO SL-mode to 16.10.01a SL-only.
CSCvm63242	IOS_LICENSE_IMAGE_APPLICATION-3-FAILED: license request failed logs on upgrading to 16.10.1a image.
CSCvm81231	DLC status seen as Complete in show plat sw lic dlc inspite of DLC conversion failure on the device.
CSCvn22505	Device registration to Satellite 5.0.1 failing with reason “failure to send HTTP msgs”.

Bug ID	Summary
CSCvn17114	ASR1K: Unable to retrieve the information error on standby RP with ISSU downgrade.
CSCvm77949	Port Licenses are always shown as EVAL RTU though installed from PAK on ASR1001-HX
CSCvm88430	HSEck9 license which was in Authstate is available to use even after the device is deregistered
CSCvn21716	ASR : SW Redundancy and Firewall coming in DLC Path in SL Only mode
CSCvm65937	Licenses go to OOC and then later gets authorized even when tags are available in VA
CSCvn33180	Port Licenses are shown as PaperLicense undershow platform software license dlc output in 16.10.1a image
CSCvn01251	SL to SL-only path: Router hangs when downgrading from 16.10 to 16.6.4 CCO image



APPENDIX **A**

Additional References

The following are certain useful references related to Smart Licensing:

- Overview of [Smart Accounts - Introduction](#)
- Overview of [Smart Software Manager Satellite](#)
- The [Cisco Software Download](#) page from which you can download router software
- [Cisco Smart Software Manager](#) portal
- [Installing Cisco 1000v and ISRv Licenses](#)

