

Migrating to Smart Licensing Using Policy

To migrate to Smart Licensing Using Policy, you must upgrade the software version (image) on the product instance and any other components that are part of your pre-ugrade set up, to a supported version.

Before you Begin

Ensure that you have read the Upgrades section, to understand how Smart Licensing Using Policy handles all earlier licensing models.

The release in which Smart Licensing Using Policy was introduced is the *minimum* required software version for that product instance. Information about the introductory release for supported routing products is provided here: Supported Products.

Note that all the licenses that you are using prior to migration will be available after upgrade. This means that not only registered and authorized licenses (including reserved licenses), but also evaluation licenses, will all be migrated. Default licenses like ipbasek9 and internal_service, will be migrated but not displayed in **show** command outputs. (They do not have entitlement tags and are always available, by default).

The advantage with migrating registered and authorized licenses is that you will have fewer configuration steps to complete after migration, because your configuration is retained after upgrade (transport type configuration and configuration for connection to CSSM, all authorization codes). This ensures a smoother transition to the Smart Licensing Using Policy environment.

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Upgrades

This section explains the following aspects:

- Migrating from earlier licensing models to Smart Licensing Using Policy.

  After you upgrade from any earlier licensing model, to a software image that supports Smart Licensing Using Policy, Smart Licensing Using Policy is the only supported licensing model and the product instance continues to operate without any licensing changes. However, there may be other settings that you have to configure, to ensure all aspects of the licensing workflow continue to work as expected. This section provides an overview of such changes. The Migrating to Smart Licensing Using Policy, on page 1 section provides examples of migration scenarios.

- Upgrading in the Smart Licensing Using Policy environment - where the software version you are upgrading from and the software version you are upgrading to, both support Smart Licensing Using Policy.

Identifying the Current Licensing Model Before Upgrade

Before you upgrade to Smart Licensing Using Policy, if you want to know the current licensing model that is effective on the product instance, enter the **show license all** command in privileged EXEC mode. This command displays information about the current licensing model for all except the RTU licensing model. The **show license right-to-use** privileged EXEC command displays license information only if the licensing model is RTU.

How Upgrade Affects Enforcement Types for Existing Licenses

When you upgrade to a software version which supports Smart Licensing Using Policy, the way existing PLR, SLR, CSL, PAK, and RTU licenses are handled, depends on the enforcement type:

- An **unenforced** license that was being used before upgrade, continues to be available after the upgrade.

  If you are using a PAK license, ensure that you are familiar with the changes in the way the system handles a PAK license and the options available to you. For detailed information, see: Snapshots for PAK Licenses.

- An **enforced** license that was being before upgrade, continues to be available after upgrade if the required authorization exists. This is authenticated by the system on upgrade. If the requisite authorization does not exist, you must install a SLAC before use. See Manually Requesting and Auto-Installing a SLAC.

- An **export-controlled** license that was being used before upgrade, does, in general, continue to be available after upgrade if the required authorization exists.

  However, there is an exception: Prior to upgrade, if a product instance was registered to a Smart Account and had only the export-control flag in CSSM enabled to allow throughput greater than 250 Mbps - and not an export-controlled license (HSECK9) license, you may have to perform a few more steps as part of the migration to Smart Licensing Using Policy. This is because *U.S. export control regulations no longer allow the use of only the export control flag as a way of authorizing throughput greater than 250 Mbps.*

  - For a virtual product instance (A Cisco Cloud Services Router 1000v [CSR 1000v] or a Cisco Integrated Services Virtual Router [ISRv]), with throughput greater than 250 Mbps and with only the export-control flag enabled in CSSM, proceed as per the requirements for your set-up:

    - CSR 1000v or ISRv with throughput greater than 250 Mbps, in an SLR set-up: First update the SLR authorization code to include an applicable HSECK9 license and only then upgrade the product instance. This ensures uninterrupted throughput after upgrade.



Note In this scenario, if you upgrade the software image without updating the SLR authorization code to include an HSEK9 license first, the system sets the throughput to 250 Mbps after upgrade to Smart Licensing Using Policy - until SLAC is installed. Immediately after SLAC is installed, the system restores the value that you last configured.

For the product-specific HSECK9 license name information, see HSECK9 License Mapping Table for Routing Product Instances. For a sample migration scenario, see Example: Smart Licensing (SLR With Throughput >250 Mbps, Without Export-Controlled License) to Smart Licensing Using Policy, on page 40

- CSR 1000v or ISRv with throughput greater than 250 Mbps, connected to CSSM and in autonomous mode: Ensure that the throughput of greater than 250 Mbps is part of start-up configuration. Also ensure that you have a positive balance of the applicable HSECK9 license in the corresponding Smart Account and Virtual Account in CSSM. No further pre-upgrade action is required. As long as the product instance is connected to CSSM, on upgrade, the product instance will automatically trigger the HSECK9 request and install SLAC.

- For a physical product instance (a Cisco 1000 Series Integrated Services Router (ISR 1000) or Cisco 4000 Series Integrated Services Router (ISR 4000) or Cisco 1000 Series Aggregation Services Router (ASR 1000)) with throughput greater than 250 Mbps, with only the export-control flag in CSSM, connected to CSSM and in autonomous mode: Ensure that the **license feature hseck9** command is configured in the start-up configuration, and you have a positive balance of the applicable HSECK9 license in the corresponding Smart Account and Virtual Account in CSSM. No further pre-upgrade action is required. As long as the product instance is connected to CSSM on upgrade, the product instance will automatically trigger the HSECK9 request and install SLAC.

- For physical or virtual product instances, with throughput greater than 250 Mbps with only the export-control flag in CSSM, operating in the SD-WAN controller mode: you must request and install SLAC after upgrade. After upgrade complete Generating and Downloading SLAC from CSSM to a File and then Installing a File on the Product Instance.

By contrast, note the following scenarios where an export-controlled license in the earlier licensing environment does not require you install a SLAC again after upgrade:

- If a product instance (such as a Cisco 1000 Series Integrated Services Router or a Cisco 4000 Series Integrated Services Router) had an HSECK9 license registered to a Smart Account, and had the export-control flag enabled in CSSM, the authorization code is honoured after upgrade to Smart Licensing Using Policy. You only have to synchronize license usage information with CSSM after upgrade. You do not have to install a SLAC again. See Example: Smart Licensing (Registered and Authorized Licenses) to Smart Licensing Using Policy, on page 9.

- If a product instance had an HSECK9 PAK license before upgrade, you do not have to install a SLAC again after upgrade. See Example: Cisco Software Licensing (PAK Licenses) to Smart Licensing Using Policy, on page 68.

  If you are using a PAK license, ensure that you are familiar with the changes in the way the system handles a PAK license and the options available to you. For detailed information, see: Snapshots for PAK Licenses.

- If a product instance had an SLR authorization code that included an HSECK9 license, in such cases the license will be honoured after upgrade to Smart Licensing Using Policy, you do not have to install a SLAC again. See Example: Smart Licensing (SLR with Export-Controlled License) to Smart Licensing Using Policy, on page 24.

How Upgrade Affects Reporting for Existing Licenses

Existing License	Reporting Requirements After Migration to Smart Licensing Using Policy
Right-to-Use (RTU)	Depends on the license being used. After migration and deployment of a supported topology, in output of the **show license usage** command, refer to the `Next ACK deadline` field to know if and when reporting is required.
Smart Licensing (Registered and Authorized license)	Depends on the policy.
Specific License Reservation (SLR)	Required only if there is a change in license consumption. An existing SLR authorization code authorizes existing license consumption after upgrade to Smart Licensing Using Policy.
Product Authorization Keys (PAK)	Required only if there is a change in license consumption. PAK licenses have perpetual validity, but reporting is required if there is a change in license consumption. Also ensure that you are familiar with the changes in the way the system handles a PAK license and the options available to you. For detailed information, see: Snapshots for PAK Licenses.
Permanent License Reservation (PLR)	Not required. PLR licenses have perpetual validity, and reporting is not required even if there is a change in license consumption.
Cisco Software Licensing (CSL)	Not required. CSL licenses have perpetual validity, and reporting is not required even if there is a change in license consumption.
Evaluation or expired licenses	Based on the reporting requirements of the Cisco default policy.

How Upgrade Affects Transport Type for Existing Licenses

The transport type, if configured in your existing set-up, is retained after upgrade to Smart Licensing Using Policy.

When compared to the earlier version of Smart Licensing, additional transport types are available with Smart Licensing Using Policy. There is also a change in the default transport mode. The following table clarifies how this may affect upgrades:

Transport type Before Upgrade	License or License State Before Upgrade	Transport Type After Upgrade
Default (callhome)	evaluation	cslu (default in Smart Licensing Using Policy)
	SLR PLR	off
	registered	callhome
smart	evaluation	off
	SLR PLR	off
	registered	smart
Not applicable For example, if the existing licensing model is RTU or PAK.	Not applicable For example, if the existing licensing model is RTU or PAK.	cslu

How Upgrade Affects the Token Registration Process

In the earlier version of Smart Licensing, a token was used to register and connect to CSSM. ID token *registration* is not required in Smart Licensing Using Policy. The token generation feature is still available in CSSM, and is used to *establish trust*, in certain topologies in the Smart Licensing Using Policy environment.

In-Service Software Upgrade

When you upgrade from one release to another, by using the ISSU method, enforcement, reporting, and transport aspects follow the same rules as with a regular upgrade (described above).

No additional considerations relating to Smart Licensing Using Policy, apply.

Upgrades Within the Smart Licensing Using Policy Environment

This section covers any release-specific considerations or actions that apply when you upgrade the product instance from one release where Smart Licensing Using Policy is supported to another release where Smart Licensing Using Policy is supported.

Starting with Cisco IOS XE Cupertino 17.7.1a, RUM reports are stored in a format that reduces processing time. In order to ensure that there are no usage reporting inconsistencies resulting from the differences in the old and new formats, we recommend completing one round of usage reporting as a standard practice when upgrading from an earlier release that supports Smart Licensing Using Policy, to Cisco IOS XE Cupertino 17.7.1a or a later release.

Upgrading the Software Version

Information about the upgrade procedures for supported product instances is provided in the table below:

Product Series	Link to Upgrade Information
Cisco 1000 Series Integrated Services Routers	How to Install and Upgrade the Software
Cisco 4000 Series Integrated Services Routers	How to Install and Upgrade the Software
Cisco ASR 1000 Series Aggregation Services Routers	Software Upgrade Processes Supported by Cisco ASR 1000 Series Routers
Cisco Cloud Services Router 1000v	Upgrading the Cisco IOS XE Software
Cisco Integrated Services Virtual Router	Upgrading the Cisco IOS XE Software
Catalyst 8200 Series Edge Platforms	How to Install and Upgrade the Software
Catalyst 8300 Series Edge Platforms	How to Install and Upgrade the Software
Catalyst 8500 Series Edge Platforms	Cisco Catalyst 8500 Software Upgrade
Catalyst 8000V Edge Software	Upgrading the Cisco IOS XE Software
Cisco 1100 Terminal Services Gateway	How to Install and Upgrade the Software

Upgrading Other Components

If your pre-upgrade set-up includes Cisco DNA Centre, or Cisco vManage, or SSM On-Prem, ensure that you have checked the following before you migrate to Smart Licensing Using Policy:

- If the component is running a compatible version or if it requires an upgrade.

  For each component, information about the version that is compatible with Smart Licensing Using Policy (if applicable) is provided here: How Smart Licensing Using Policy Works.

- If upgrade must follow a prescribed sequence. This is to ensure that you upgrade the component and the product instance in the correct order.

Cisco DNA Centre

For Cisco DNA Centre, see Cisco DNA Center Upgrade Guide.

Cisco vManage

For Cisco vManage, see Cisco SD-WAN Getting Started Guide.

SSM On-Prem

For SSM On-Prem, see SSM On-Prem 8 Installation Guide.

After Upgrading the Software Version

- Complete topology implementation.

  If a transport mode is available in your pre-upgrade set-up, this is retained after you upgrade. Only in some cases, like with evaluation licenses or with licensing models where the notion of a transport type does not exist, the default (**cslu**) is applied - in these cases you may have a few more steps to complete before you are set to operate in the Smart Licensing Using Policy environment.

  No matter which licensing model you upgrade from, you can change the topology after upgrade. If you do, then complete implmentation for the corresponding toplogy as described here: Implementing Smart Licensing Using Policy.

- Check if any of the product instances require SLAC after upgrade.

  For export-controlled or enforced licenses, SLAC installation *after* upgrade is required *only in certain cases*. See: How Upgrade Affects Enforcement Types for Existing Licenses, on page 2.

- Check if device-led conversion (DLC) applies and is completed.

  DLC is the process of converting traditional licenses to Smart Licenses, without manual intervention. So a DLC is applicable only when migrating licenses that are *not Smart* licenses, that is, Right-To-Use (RTU) licenses and Product Authorization Keys (PAK) licenses. Once DLC is complete, the consumption of these converted licenses is reflected in CSSM.

  The DLC process is triggered automatically on the product instance only when you upgrade to a release that supports Smart Licensing Using Policy. DLC is supported for all topologies.

  DLC data is collected one hour after the product instance is upgraded to a software version that supports Smart Licensing Using Policy. This DLC data is also automatically included in the RUM report. So if DLC applies to your upgrade scenario, you can wait for the product instance to finish collecting DLC data (**show platform software license dlc** privileged EXEC command) before you send the initial usage report to CSSM. If you send the initial usage report before the DLC data collection is completed, simply follow the reporting method that applies to the topology you implement, and complete another round of reporting to send DLC data. CSSM generates an ACK after processing DLC data. The DLC process is complete after the ACK is installed on the product instance. The amount of time the DLC process takes, depends on the number of licenses.

  DLC itself requires no action from you.



Note Cisco 1000 Series Integrated Services Routers, Cisco 4000 Series Integrated Services Routers, Cisco 1000 Series Aggregation Services Routers support DLC.

Cisco Cloud Services Routers 1000v and Cisco Integrated Services Virtual Routers do not support DLC.

- Synchronize license usage with CSSM.

  No matter which licensing model you are upgrading from and no matter which topology you implement, synchronize your usage information with CSSM. For this you have to follow the reporting method that applies to the topology you implement. This initial synchronization ensures that up-to-date usage information is reflected in CSSM and a custom policy (if available), is applied. The policy that is applicable after this synchronization also indicates subsequent reporting requirements. These rules are also tabled here: How Upgrade Affects Reporting for Existing Licenses, on page 4.

Note After initial usage synchronization is completed, reporting is required only if the policy, or, system messages indicate that it is.

Downgrades

This section provides information about downgrades to an earlier licensing model. It also covers information relevant to downgrades within the Smart Licensing Using Policy environment.

New Deployment Downgrade

This section describes considerations and actions that apply if a newly purchased product instance with a software version where Smart Licensing Using Policy is enabled by default, is downgraded to a software version where Smart Licensing Using Policy is not supported.

The outcome of the downgrade depends on whether a trust code (Trust Code) was installed while still operating in the Smart Licensing Using Policy environment, and further action may be required depending on the release you downgrade to.

If the topology you implemented while in the Smart Licensing Using Policy environment was "Connected Directly to CSSM", then a trust code installation can be expected or assumed, because it is required as part of topology implementation. For any of the other topologies, trust establishment is not mandatory. Downgrading product instances with one of these other topologies will therefore mean that you have to restore licenses to a registered and authorized state by following the procedures that are applicable in the Smart Licensing environment. See the table below.

- If trust was established while in the Smart Licensing Using Policy environment, the product instance attempts to renew trust with CSSM after downgrade.

  After a successful renewal, licenses are in a registered state and the earlier version of Smart Licensing is effective on the product instance.

- If trust was *not* established while in the Smart Licensing Using Policy environment, licenses on the product instance are in evaluation mode after downgrade, and the earlier version of Smart Licensing is effective on the product instance.

Downgrades Within the Smart Licensing Using Policy Environment

This section covers any release-specific considerations or actions that apply when you downgrade the product instance from one release where Smart Licensing Using Policy is supported to another release where Smart Licensing Using Policy is supported.

Starting with Cisco IOS XE Cupertino 17.7.1a, RUM reports are stored in a format that reduces processing time. In order to ensure that there are no usage reporting inconsistencies resulting from the differences in the old and new formats, we recommend completing one round of usage reporting as a standard practice when downgrading from Cisco IOS XE Cupertino 17.7.1a or a later release to an earlier release supporting Smart Licensing Using Policy.

Sample Migration Scenarios

Sample migration scenarios have been provided considering the various existing licensing models and licenses. All scenarios provide sample outputs before and after migration, any CSSM Web UI changes to look out for (as an indicator of a successful migration or further action), and how to identify and complete any necessary post-migration steps.

Note For SSM On-Prem, the sequence in which you perform the various upgrade-related activities is crucial. So only for this scenario, the migration sequence has been provided.

Example: Smart Licensing (Registered and Authorized Licenses) to Smart Licensing Using Policy

The following is an example of a **Cisco 4461 Integrated Services Router** with authorized and registered licenses, migrating from Smart Licensing to Smart Licensing Using Policy. The software version on the product instance is upgraded from Cisco IOS XE Gibraltar 16.12.4 to Cisco IOS XE Amsterdam 17.3.2. The following is a summary of what to expect after upgrade for this example:

- Enforcement type after migration: All the licenses in this scenario are registered and authorised (implying that any license that requires authorization before use has this already). Accordingly, the export-controlled license (ISR_4400_Hsec) will be available and have enforcement type: EXPORT RESTRICTED, after migration. Further, SLAC installation after upgrade is not required. See the point about an HSECK9 license registered to a Smart Account, and with the export-control flag enabled in CSSM here: How Upgrade Affects Enforcement Types for Existing Licenses, on page 2.

  All remaining registered and authorized licenses will have enforcement type: NOT ENFORCED after migration.

- Transport type after migration: Call Home is the configured transport type before migration. Since the licenses are registered, the transport type (**callhome**) and the configuration to connect to CSSM is retained after migration.

- Device-Led Conversion (DLC): DLC does not apply to the licenses in this scenario, because they are licenses from the earlier Smart Licensing environment (they are already Smart licenses).

- Reporting after migration: For this example, refer to the sample output under ***show version*** *Before and After Migration*. The system messages that are displayed after software version upgrade show that the product instance has retained the connection to CSSM after migration and has already successfully synchronized with CSSM (reporting, authorization code, and policy). But a separate synchronization will be performed for this example, for the sake of clarity and completion.

  Subsequent reporting depends on the policy. After initial synchronization is completed, refer to the output of **show license status** command to know if and by when reporting is required. In the output check fields `Next report push` and `Next ACK deadline`. You will also receive system messages when reporting is required.

Show Commands Before and After Migration

show version Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show version Before Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version before upgrade, followed by an excerpt of licensing-related system messages that were displayed when this earlier software version was loaded:

```
Device# show version
Cisco IOS XE Software, Version 16.12.04
Cisco IOS Software [Gibraltar], ISR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.12.4, RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 09-Jul-20 21:44 by mcpre
<output truncated>



*Jul 23 13:36:25.062: %SMART_LIC-5-IN_COMPLIANCE: All entitlements and licenses in use on
this device are authorized
*Jul 23 13:36:25.064: %SMART_LIC-5-END_POINT_RESET: End Point list reset
*Jul 23 13:36:25.065: %SMART_LIC-6-AUTH_RENEW_SUCCESS: Authorization renewal successful.
State=authorized for udi PID:ISR4461/K9,SN:FDO222815Y4
```

```
------------------------------------------------------------------------------------------------------------
show version After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version after migration, followed by an excerpt of the licensing-related system messages after system restart with the new image.

```
Device# show version
Cisco IOS Software [Amsterdam], ISR Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 17.3.2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Sat 31-Oct-20 13:21 by mcpre
<output truncated>


<output truncated>
Press RETURN to get started!

*Jan 15 03:21:10.823: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.
*Jan 15 03:21:15.341: %SMART_LIC-6-REPORTING_REQUIRED: A Usage report acknowledgement will
 be required
in 365 days.
*Jan 15 03:21:29.510: %SMART_LIC-6-TRUST_INSTALL_SUCCESS: A new licensing trust code was
successfully
installed on PID:ISR4461/K9,S:FDO222815Y4.
*Jan 15 03:21:31.981: %SMART_LIC-6-AUTHORIZATION_INSTALL_SUCCESS: A new licensing
authorization code was
successfully installed on PID:ISR4461/K9,SN:FDO222815Y4
*Jan 15 03:26:07.805: %SIP-1-LICENSING: SIP service is Up. License report acknowledged.
*Jan 15 03:26:07.812: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is allowed
for feature hseck9
*Jan 15 03:26:08.282: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
successfully installed
<output truncated>
```

show license summary Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show license summary Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows that all licenses are REGISTERED and AUTHORIZED. Therefore, they will all be migrated and displayed as IN USE after migration.

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

Registration:
  Status: REGISTERED
  Smart Account: Eg-SA-01
  Virtual Account: Eg-VA-01
  Export-Controlled Functionality: ALLOWED
  Last Renewal Attempt: None
  Next Renewal Attempt: Jul 14 02:15:39 2021 UTC

License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Feb 14 02:37:24 2021 UTC

License Usage:
  License                 Entitlement tag            Count Status
  -----------------------------------------------------------------------
  ISR_4400_Application    (ISR_4400_Application)         1 AUTHORIZED
  ISR_4400_UnifiedComm... (ISR_4400_UnifiedCommun...)    1 AUTHORIZED
  ISR_4400_Security       (ISR_4400_Security)            1 AUTHORIZED
  Booster Performance ... (ISR_4460_BOOST)               1 AUTHORIZED
  ISR_4400_Hsec           (ISR_4400_Hsec)                1 AUTHORIZED
```

```
------------------------------------------------------------------------------------------------------------
show license summary After Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows that all five licenses have been migrated and are displayed with status IN USE.

```
Device# show license summary
License Usage:
  License                 Entitlement Tag            Count Status
  -----------------------------------------------------------------
  hseck9                  (ISR_4400_Hsec)                1 IN USE
  Booster Performance ... (ISR_4460_BOOST)               1 IN USE
  ISR_4400_Application    (ISR_4400_Application)         1 IN USE
  ISR_4400_UnifiedComm... (ISR_4400_UnifiedCommun...)    1 IN USE
  ISR_4400_Security       (ISR_4400_Security)            1 IN USE
```

show license status Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show license status Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows that Call Home is the configured transport type. Since all the licenses here have status REGISTERED, the transport type configuration will be retained as is after migration.

```
Device# 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: Eg-SA-01
  Virtual Account: Eg-VA-01
  Export-Controlled Functionality: ALLOWED
  Initial Registration: SUCCEEDED on Jan 15 02:15:40 2021 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Jul 14 02:15:39 2021 UTC
  Registration Expires: Jan 15 01:12:26 2022 UTC

License Authorization:
  Status: AUTHORIZED on Jan 15 02:37:24 2021 UTC
  Last Communication Attempt: SUCCEEDED on Jan 15 02:37:24 2021 UTC
  Next Communication Attempt: Feb 14 02:37:23 2021 UTC
  Communication Deadline: Apr 15 01:34:11 2021 UTC

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

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

---

show license status After Migration

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

The transport type is retained (`Type: Callhome`). Since the product instance has been able to communicate with CSSM at system restart (after software image upgrade), the following events have already occurred:

- A RUM report has been sent, and an ACK received (`Last report push: Jan 15 03:22:05 2021 UTC`, `Last ACK received: Jan 15 03:26:07 2021 UTC`).
- A policy that was returned with the ACK has been installed (`Policy in use: Installed On Jan 15 03:26:08 2021 UTC`) .
- A trust code that was returned with the ACK has also been installed (`Trust Code Installed: Jan 15 03:21:29 2021 UTC`).

```
Device# show license status

Utility:
  Status: DISABLED
```

```
Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Callhome

Policy:
  Policy in use: Installed On Jan 15 03:26:08 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: Jan 15 03:26:07 2021 UTC
  Next ACK deadline: Mar 16 03:26:07 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Feb 14 03:22:05 2021 UTC
  Last report push: Jan 15 03:22:05 2021 UTC
  Last report file write: <none>

Trust Code Installed: Jan 15 03:21:29 2021 UTC
```

show license usage Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show license usage Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows all the licenses that are being used.

All licenses that have export status NOT RESTRICTED will have enforcement type NOT ENFORCED after migration.

Licenses that have export status RESTRICTED - ALLOWED, will continue to display the same after migration, and also have enforcement type EXPORT RESTRICTED.

```
Device# show license usage

License Authorization:
  Status: AUTHORIZED on Jan 15 02:37:24 2021 UTC

ISR_4400_Application (ISR_4400_Application):
  Description: AppX License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

ISR_4400_UnifiedCommunication (ISR_4400_UnifiedCommunication):
  Description: Unified Communications License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

ISR_4400_Security (ISR_4400_Security):
  Description: Security License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

Booster Performance License for 4460 Series (ISR_4460_BOOST):
  Description: Booster Performance License for 4460 Series
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED

ISR_4400_Hsec (ISR_4400_Hsec):
  Description: U.S. Export Restriction Compliance license for 4400 series
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: Export Controlled Feature hseck9
```

---

show license usage After Migration

The output after migration shows the licenses being used (`Status: IN USE`) and their enforcement type.

Licenses that do not require authorization are displayed with `Enforcement type: NOT ENFORCED`.

The export-controlled license which requires authorization before use is also correctly displayed with `Enforcement type: EXPORT RESTRICTED` and `Export status: RESTRICTED - ALLOWED`, which means that the required authorization is in place.

```
Device# show license usage

License Authorization:
  Status: Not Applicable

hseck9 (ISR_4400_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
```

```
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual

Booster Performance License for 4460 Series (ISR_4460_BOOST):
  Description: Booster Performance License for 4460 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: booster_performance
  Feature Description: booster_performance
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_Application (ISR_4400_Application):
  Description: AppX License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_UnifiedCommunication (ISR_4400_UnifiedCommunication):
  Description: Unified Communications License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_Security (ISR_4400_Security):
  Description: Security License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
```

show platform hardware throughput level Before and After Migration

```
-------------------------------------------------------------------------------------------------------
show platform hardware throughput level Before Migration
-------------------------------------------------------------------------------------------------------
```

The output before migration shows that the throughput level is unthrottled. On a Cisco ISR 4000 Series router, the Booster Performance license enables unthrottled Cisco Express Forwarding (CEF) throughput. There will therefore be no change in this configuration after migration.

```
Device# show platform hardware throughput level
The current throughput level is unthrottled
```

```
---------------------------------------------------------------------------------------------------------
show platform hardware throughput level After Migration
---------------------------------------------------------------------------------------------------------
```

The output after migration shows that the same throughput level configuration is the retained after migration.

```
Device# show platform hardware throughput level
The current throughput level is unthrottled
```

show platform software cerm-information Before and After Migration

```
---------------------------------------------------------------------------------------------------------
show platform software cerm-information Before Migration
---------------------------------------------------------------------------------------------------------
```

The output before migration shows that CERM functionality is disabled. There will be no change in this configuration after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED
```

```
---------------------------------------------------------------------------------------------------------
show platform software cerm-information After Migration
---------------------------------------------------------------------------------------------------------
```

The output after migration shows that the same CERM configuration is retained after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED
```

show license authorization Before and After Migration

```
---------------------------------------------------------------------------------------------------------
show license authorization Before Migration
---------------------------------------------------------------------------------------------------------
```

The **show license authorization** command is not available in the Smart Licensing environment. But for the purpose of verification before migration, the **show license usage** output above shows that the required authorization is in place. You could also use the **show license reservation** command to note the authorization code before migration, and check that the same is displayed after migration.

-

```
---------------------------------------------------------------------------------------------------------
show license authorization After Migration
---------------------------------------------------------------------------------------------------------
```

The output after migration shows that the authorization code has been migrated and honored (`Status: SMART AUTHORIZATION INSTALLED on Jan 15 03:21:31 2021 UTC`). If you have noted the authorization code before migration you can check that against the `Last Confirmation code:` field here - it will be the same.

```
Device# show license authorization
Overall status:
  Active: PID:ISR4461/K9,SN:FDO222815Y4
      Status: SMART AUTHORIZATION INSTALLED on Jan 15 03:21:31 2021 UTC
      Last Confirmation code: 30bdf595

Authorizations:
  ISR_4400_Hsec (ISR_4400_Hsec):
```

```
    Description: U.S. Export Restriction Compliance license for 4400 series
    Total available count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:ISR4461/K9,SN:FDO222815Y4
        Authorization type: SMART AUTHORIZATION INSTALLED
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available

Derived Licenses:
  Entitlement Tag: regid.2017-12.com.cisco.ISR_4460_BOOST,
1.0_79633860-0c9a-472c-9306-bb2dfd1b030d
  Entitlement Tag: regid.2015-01.com.cisco.ISR_4400_Application,
1.0_da87444e-68bb-4821-8aab-63f8531a0430
  Entitlement Tag: regid.2014-12.com.cisco.ISR_4400_UnifiedCommunication,
1.0_ee2d8156-7e01-4f48-8cad-4859385e6524
  Entitlement Tag: regid.2014-12.com.cisco.ISR_4400_Security,
1.0_02ea4d4a-2469-46c1-afaf-d6cdfa1980aa
```

Required Tasks After Migration

As stated in the introduction above, the product instance has already synchronized with CSSM immediately after upgrade and no further action is actually required after migration here, until the next reporting and ACK deadline (Next ACK deadline: Mar 16 03:26:07 2021 UTC). For the sake of clarity and completion the applicable steps are displayed here:

1. Complete topology implementation.

   In this example, we're retaining the pre-migration configuration (The Connected Directly to CSSM topology with the transport type **callhome**. The corresponding workflow to refer to is: Workflow for Topology: Connected Directly to CSSM.

   Smart Account set-up, product instance connection to CSSM, a connection method and transport type, and trust establishment with CSSM are all already complete. This completes topology implementation.

2. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   For this topology you can synchronize usage by entering the **license smart sync** command in privileged EXEC mode. This manually synchronizes (sends and receives) any pending data with CSSM.

   The sample configuration below shows this, followed by system messages that show successful synchronization, and confirm that the use of export-controlled features is allowed:

   ```
   Device# license smart sync local
   Device#
   *Jan 15 03:55:42.205: %SIP-1-LICENSING: SIP service is Up. License report acknowledged.
   *Jan 15 03:55:42.211: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
    is allowed for feature hseck9
   *Jan 15 03:55:42.686: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
   successfully installed
   ```

   Verify synchronization by entering the **show license all** command in privileged EXEC mode. In the sample output below, the following fields help verify synchronization:

   - The updated timestamp here: `Policy in use: Installed On Jan 15 03:55:42 2021 UTC`

- The updated timestamp here: `Last ACK received: Jan 15 03:55:42 2021 UTC`

Check subsequent reporting requirements also, by entering the **show license all** command in privileged EXEC mode.

In the *Connected Directly to CSSM* topology, the *product instance* sends the next RUM report to CSSM, based on the policy. In the sample output, the following fields provide this information:

- `Next ACK deadline: Mar 16 03:55:42 2021 UTC`
- `Next report push: Feb 14 03:51:41 2021 UTC`

```
Device# show license all

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

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Callhome

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Installed On Jan 15 03:55:42 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
```

```
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Usage Reporting:
  Last ACK received: Jan 15 03:55:42 2021 UTC
  Next ACK deadline: Mar 16 03:55:42 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Feb 14 03:51:41 2021 UTC
  Last report push: Jan 15 03:51:41 2021 UTC
  Last report file write: <none>

Trust Code Installed: Jan 15 03:21:29 2021 UTC

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

hseck9 (ISR_4400_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual

Booster Performance License for 4460 Series (ISR_4460_BOOST):
  Description: Booster Performance License for 4460 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: booster_performance
  Feature Description: booster_performance
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_Application (ISR_4400_Application):
  Description: AppX License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_UnifiedCommunication (ISR_4400_UnifiedCommunication):
  Description: Unified Communications License for Cisco ISR 4400 Series
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

ISR_4400_Security (ISR_4400_Security):
  Description: Security License for Cisco ISR 4400 Series
  Count: 1
```

```
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

Product Information
===================
UDI: PID:ISR4461/K9,SN:FDO222815Y4

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:ISR4461/K9,SN:FDO222815Y4
       Status: SMART AUTHORIZATION INSTALLED on Jan 15 03:21:31 2021 UTC
       Last Confirmation code: 30bdf595

Authorizations:
  ISR_4400_Hsec (ISR_4400_Hsec):
    Description: U.S. Export Restriction Compliance license for 4400 series
    Total available count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:ISR4461/K9,SN:FDO222815Y4
        Authorization type: SMART AUTHORIZATION INSTALLED
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag:
regid.2017-12.com.cisco.ISR_4460_BOOST,1.0_79633860-0c9a-472c-9306-bb2dfd1b030d
  Entitlement Tag:
regid.2015-01.com.cisco.ISR_4400_Application,1.0_da87444e-68bb-4821-8aab-63f8531a0430
  Entitlement Tag:
regid.2014-12.com.cisco.ISR_4400_UnifiedCommunication,1.0_ee2d8156-7e01-4f48-8cad-4859385e6524

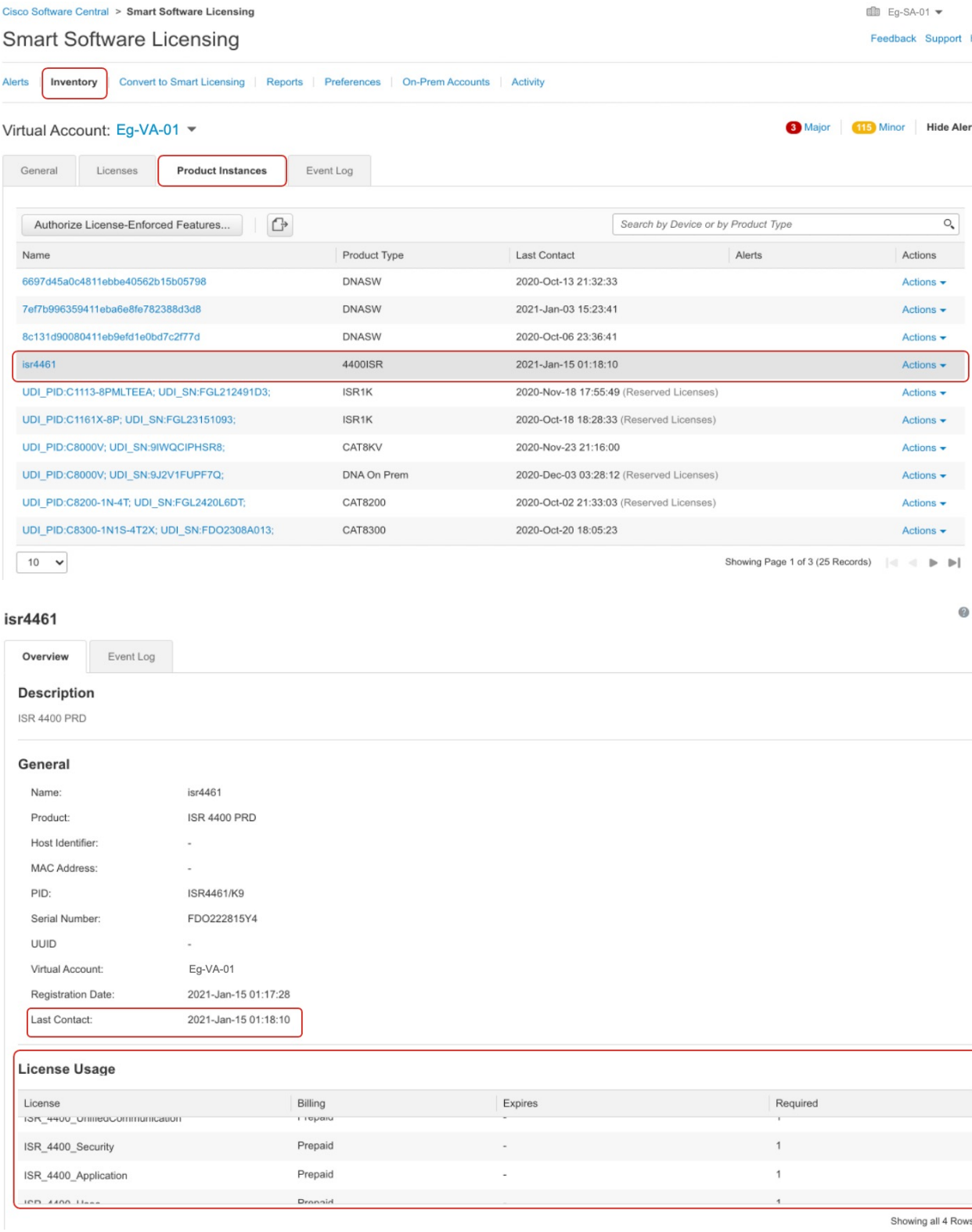
  Entitlement Tag:
regid.2014-12.com.cisco.ISR_4400_Security,1.0_02ea4d4a-2469-46c1-afaf-d6cdfa1980aa
```

CSSM Web UI Before and After Migration

Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**. In the applicable Smart Account and Virtual Account, go to **Inventory** > **Product Instances** to display all the product instances.

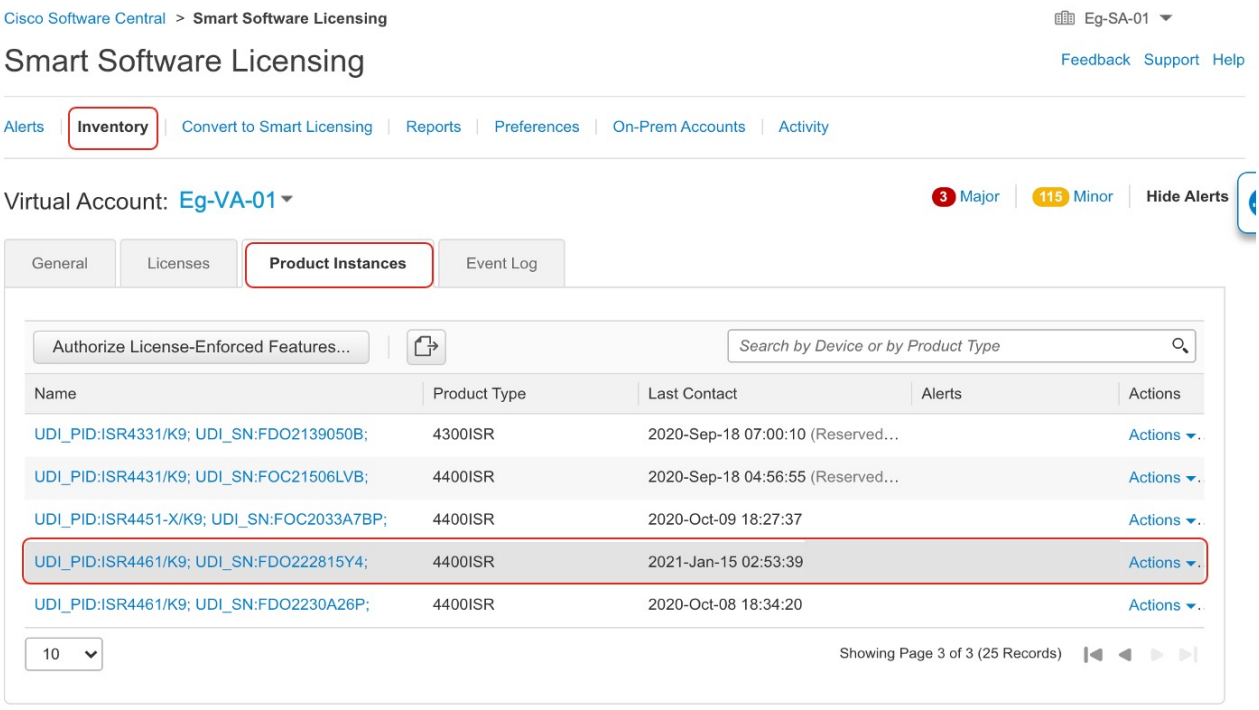
CSSM Web UI Before Migration

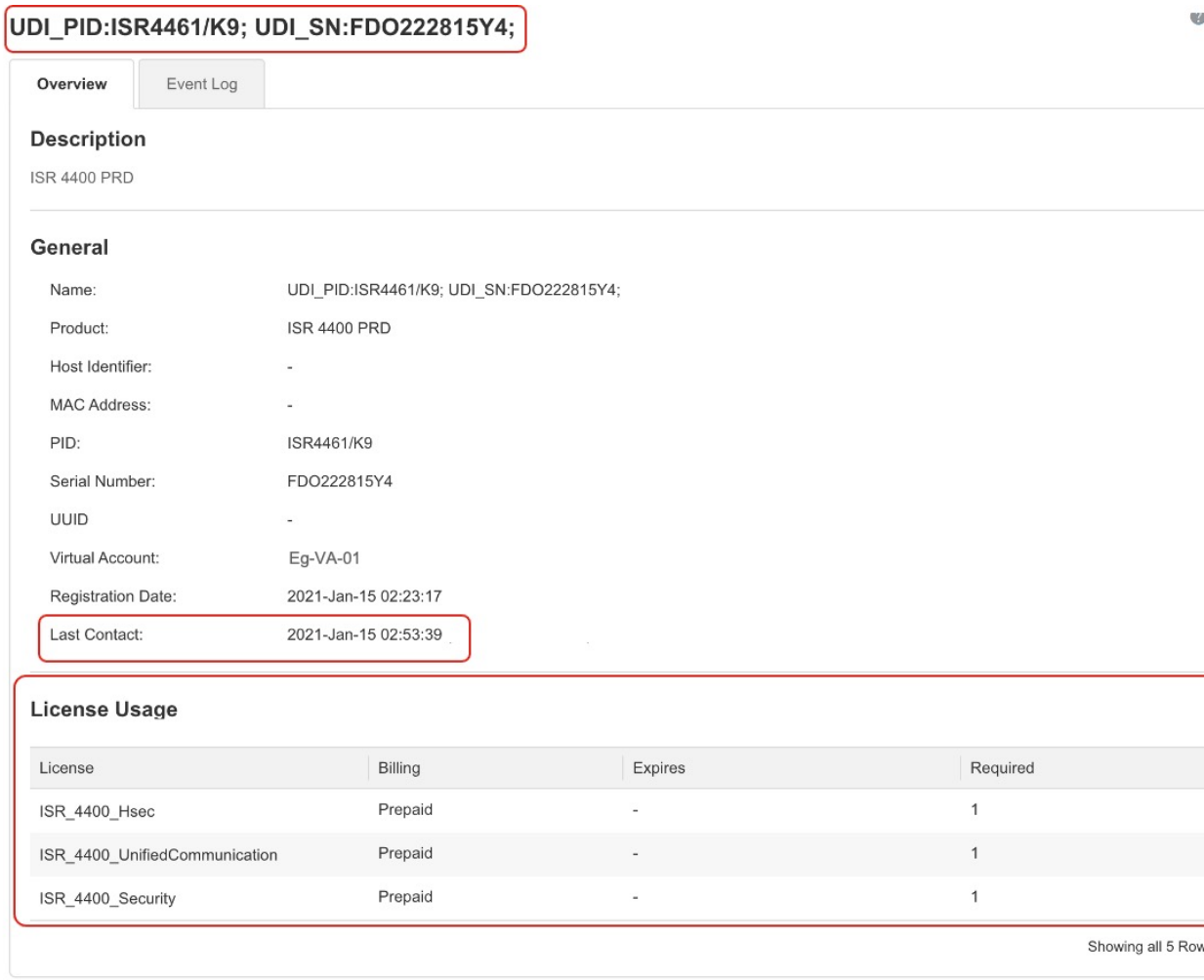
In the Smart Licensing environment, registered licenses are displayed with the hostname of the product instance in the **Name** column. Click on the product instance name to display detailed license usage information, as show in the next screenshot.



CSSM Web UI After Migration

After upgrade to Smart Licensing Using Policy, registered licenses are displayed with the UDI of the product instance in the **Name** column. In this example, the UDI is PID:ISR4461/K9,SN:FDO222815Y4. Click on the UDI to display detailed license usage information, as show in the next screenshot.





The following is a continuation of the license usage information (scrolled-down) - to display all the available licenses.



Example: Smart Licensing (SLR with Export-Controlled License) to Smart Licensing Using Policy

The following is an example of a **Cisco 1000 Series Integrated Services Router** migrating from Smart Licensing, where Specific License Reservation (SLR) is being used, to Smart Licensing Using Policy. More specifically, this is a case of an SLR with an export-controlled license, which means the SLR authorization code includes the HSECK9 authorization. The software version on the product instance is upgraded from Cisco IOS XE Gibraltar 16.12.4 to Cisco IOS XE Bengaluru 17.4.1.



Note The notion of "reservation" does not apply in the Smart Licensing Using Policy environment. The SLR equivalent here, is to implement the *No Connectivity to CSSM and No CSLU* topology. Once implemented, the product instance and CSSM are disconnected from each other, and the product instance cannot communicate online, with anything outside its network. When you upgrade from SLR, any existing SLR authorization codes are migrated - this includes authorization codes for export-controlled licenses as well. After migration, your topology itself enables you to operate in an air-gapped network and provides a way of meeting reporting requirements. No license reservation, registration, etc., applies.

- Enforcement type after migration: Two of the three licenses being used on the product instance are authorized (with an SLR authorization code). One of authorized licenses is an export-controlled license (ISR_1100_8P_Hsec). This license has the necessary authorization and will therefore be available after migration and have enforcement type: EXPORT RESTRICTED, after migration. See the point about a product instance with an SLR authorization code that includes an HSECK9 license here: How Upgrade Affects Enforcement Types for Existing Licenses, on page 2. SLAC installation after upgrade is not required.

  The third and remaining license, which does not have an SLR authorization code (**show license usage**: ISR_1100_8P_UnifiedCommunication, Reservation status: NOT INSTALLED) is not an export-controlled license (**show license usage**: Export status: NOT RESTRICTED). This will also be migrated and will have enforcement type NOT ENFORCED after migration.

- Transport type after migration: Since this an upgrade from SLR, when the software version is upgraded, the transport type will be set **off**.

- Device-Led Conversion (DLC): DLC does not apply to the licenses in this scenario, because they are authorized and reserved licenses from the earlier Smart Licensing environment (they are already Smart licenses).

- Reporting after migration: For initial synchronization, the RUM report will be manually uploaded to CSSM and the corresponding ACK will be installed on the product instance. This initial synchronization will also address usage reporting requirement for the ISR_1100_8P_UnifiedCommunication license, which did not have an authorization code in the pre-upgrade environment.

  The same reporting method applies to subsequent reporting - if reporting is required. After initial synchronization, refer to the output of **show license status** or **show license all** commands to know if and by when reporting is required. In the output check fields `Next report push` and `Next ACK deadline`. You will also receive system messages when reporting is required.

Show Commands Before and After Migration

show version Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show version Before Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version before upgrade.

```
Device# show version
Cisco IOS XE Software, Version 16.12.04 Cisco IOS Software [Gibraltar],
ISR Software (ARMV8EL_LINUX_IOSD-UNIVERSALK9-M), Version 16.12.4, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 25-Jun-20 12:56 by mcpre
<output truncated>
```

```
------------------------------------------------------------------------------------------------------------
show version After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version after migration, and an excerpt of the licensing-related system messages that are displayed when the system restarts with the new image.

```
Device# show version
Cisco IOS XE Software, Version 17.4.1a Cisco IOS Software [Bengaluru],
ISR Software (ARMV8EL_LINUX_IOSD-UNIVERSALK9-M), Version 17.4.1a, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 17-Dec-20 22:38 by mcpre
<output truncated>


<output truncated>
Press RETURN to get started!

*Jan 19 07:09:06.615: %SMART_LIC-6-RESERVED_INSTALLED:
Specific License Reservation Authorization code installed for
udi PID:C1111-8PLTEEAWB,SN:FGL214391JK
*Jan 19 07:09:06.616: %SMART_LIC-6-EXPORT_CONTROLLED:
Usage of export controlled features is not allowed
*Jan 19 07:09:07.174: %SMART_LIC-6-EXPORT_CONTROLLED:
Usage of export controlled features is allowed for feature hseck9
*Jan 19 07:09:09.163: %SMART_LIC-6-REPORTING_REQUIRED:
A Usage report acknowledgement will be required in 365 days.
<output truncated>
```

show license summary Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show license summary Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows that two licenses are AUTHORIZED, and one license is NOT AUTHORIZED. The uck9 license is *not* an export-controlled or enforced license, so all licenses will be migrated and all of the them will be displayed as IN USE.

```
Device# show license summary

Smart Licensing is ENABLED
License Reservation is ENABLED

Registration:
  Status: REGISTERED - SPECIFIC LICENSE RESERVATION
  Export-Controlled Functionality: ALLOWED
```

```
License Authorization:
  Status: NOT AUTHORIZED

License Usage:
  License                 Entitlement tag             Count Status
  -----------------------------------------------------------------------------
  Cisco 1100 Series wi... (ISR_1100_8P_Foundation...)     1 AUTHORIZED
                          (ISR_1100_8P_UnifiedCom...)     1 NOT AUTHORIZED
  hseck9                  (ISR_1100_8P_Hsec)              1 AUTHORIZED
```

show license summary After Migration

The output after migration shows that all three licenses have been migrated and are displayed with status IN USE.

```
Device# show license summary

License Reservation is ENABLED

License Usage:
  License                 Entitlement Tag             Count Status
  -----------------------------------------------------------------
  hseck9                  (ISR_1100_8P_Hsec)              1 IN USE
  uck9                    (ISR_1100_8P_UnifiedCom...)     1 IN USE
  FoundationSuiteK9       (ISR_1100_8P_Foundation...)     1 IN USE
```

show license status Before and After Migration

show license status Before Migration

The output before migration shows that default transport type is displayed - but because the licenses on this product instance are reserved licenses (SLR is effective), the transport type will be set to *off* after migration, to continue operating in an air-gapped network.

```
Device# show license status

Smart Licensing is ENABLED

Utility:
  Status: DISABLED
License Reservation is ENABLED

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

Transport:
  Type: Callhome

Registration:
  Status: REGISTERED - SPECIFIC LICENSE RESERVATION
  Export-Controlled Functionality: ALLOWED
  Initial Registration: SUCCEEDED on Jan 19 06:27:47 2021 UTC

License Authorization:
```

```
  Status: NOT AUTHORIZED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

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

---

show license status After Migration

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

The transport type is set to Off (`Type: Transport Off`). This means the product instance cannot communicate with CSSM or anything outside the network.

For now, the default policy is effective. (When no other policy is available, the product instance applies the CISCO default policy). If a custom policy is available in CSSM the same will be installed after initial synchronization. The synchronization will also address the reporting that the current policy requires (`Next ACK deadline: Jan 19 07:09:09 2022 UTC`).

```
Device# show license status

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED
License Reservation is ENABLED

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

Transport:
  Type: Transport Off

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
```

```
Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Jan 19 07:09:09 2022 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Jan 19 07:11:09 2021 UTC
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>
```

show license usage Before and After Migration

```
----------------------------------------------------------------------------------------------------
show license usage Before Migration
----------------------------------------------------------------------------------------------------
```

The output before migration shows all the licenses that are being used.

All licenses that have export status NOT RESTRICTED will have enforcement type NOT ENFORCED after migration. (This includes the one that has status NOT AUTHORIZED before migration).

The licenses that has export status RESTRICTED - ALLOWED, will continue to display the same after migration, and also have enforcement type EXPORT RESTRICTED.

All available authorization codes will be migrated. This includes the SLR authorization code for the ISR_1100_8P_FoundationSuite license (Reservation status: SPECIFIC INSTALLED), and the SLR authorization code for the export-controlled ISR_1100_8P_Hsec license (Reservation status: SPECIFIC EXPORT AUTHORIZATION KEY INSTALLED).

An SLR authorization code is not installed for the ISR_1100_8P_UnifiedCommunication license (Reservation status: NOT INSTALLED) there is therefore no code to migrate - but the license will be migrated.

```
Device# show license usage

License Authorization:
  Status: NOT AUTHORIZED

Cisco 1100 Series with 8 LAN Ports, Cisco One Foundation Suite (ISR_1100_8P_FoundationSuite):

  Description: Cisco 1100 Series with 8 LAN Ports, Cisco One Foundation Suite
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 1

(ISR_1100_8P_UnifiedCommunication):
  Description:
  Count: 1
  Version: 1.0
  Status: NOT AUTHORIZED
  Export status: NOT RESTRICTED
  Reservation:
    Reservation status: NOT INSTALLED
```

```
hseck9 (ISR_1100_8P_Hsec):
  Description: Export Controlled Feature hseck9
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: Export Controlled Feature hseck9
  Reservation:
    Reservation status: SPECIFIC EXPORT AUTHORIZATION KEY INSTALLED
    Total reserved count: UNLIMITED

------------------------------------------------------------------------------------------------------
show license usage After Migration
------------------------------------------------------------------------------------------------------
```

The output after migration shows that all licenses that were being used, have been migrated, and all available authorization codes have also been migrated.

```
Device# show license usage

License Authorization:
  Status: Not Applicable

hseck9 (ISR_1100_8P_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC EXPORT AUTHORIZATION KEY INSTALLED
    Total reserved count: UNLIMITED

uck9 (ISR_1100_8P_UnifiedCommunication):
  Description: uck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: NOT INSTALLED

FoundationSuiteK9 (ISR_1100_8P_FoundationSuite):
  Description: FoundationSuiteK9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: FoundationSuiteK9
  Feature Description: FoundationSuiteK9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 1
```

show platform hardware throughput level and **show platform hardware throughput crpto** Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show platform hardware throughput level and show platform hardware throughput crypto Before
 Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows that the Cisco Express Forwarding (CEF) throughput and crypto throughput is unthrottled. The available HSECK9 license authorizes the use of unthrottled crypto throughput. There will therefore be no change in this configuration after migration.

```
Device# show platform hardware throughput level
The current throughput level is unthrottled

Device# show platform hardware throughput crypto
The current crypto level is unthrottled
```

```
------------------------------------------------------------------------------------------------------------
show platform hardware throughput level and show platform hardware throughput crypto After
 Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows that the CEF throughput and crypto configuration is the same after migration.

```
Device# show platform hardware throughput level
The current throughput level is unthrottled

Device# show platform hardware throughput crypto
The current crypto level is unthrottled
```

show platform software cerm-information Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show platform software cerm-information Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows the throughput level is unthrottled. There will be no change in this configuration after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED
```

```
------------------------------------------------------------------------------------------------------------
show platform software cerm-information After Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows the CERM configuration is the same after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED
```

show license authorization After Migration

```
------------------------------------------------------------------------------------------------------------
show license authorization Before Migration
------------------------------------------------------------------------------------------------------------
```

The **show license authorization** command is not available in the Smart Licensing environment. But for the purpose of verification before migration, the **show license usage** output above shows that the required authorization is in place. You could also use the **show license reservation** command to note the authorization code before migration, and check that the same is displayed after migration..

```
------------------------------------------------------------------------------------------------------
show license authorization After Migration
------------------------------------------------------------------------------------------------------
```

The output after migration shows that all available authorization codes have been migrated and honored (`Status: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC`, `Last Confirmation code: 0708eeec`).

```
Device# show license authorization

Overall status:
  Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
      Status: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
      Last Confirmation code: 0708eeec

Specified license reservations:
  Cisco 1100 Series with 8 LAN Ports,
Cisco One Foundation Suite (ISR_1100_8P_FoundationSuite):
    Description: Cisco 1100 Series with 8 LAN Ports,
Cisco One Foundation Suite
    Total reserved count: 1
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
        Authorization type: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
        License type: PERPETUAL
          Term Count: 1
  ISR_1100_8P_Hsec (ISR_1100_8P_Hsec):
    Description: Cisco 1100 Series with 8 LAN Ports,
U.S. Export Restriction Compliance license
    Total reserved count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
        Authorization type: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag: regid.2017-08.com.cisco.ISR_1100_8P_Hsec,
1.0_34a5e7e7-722a-41ab-bdad-d53d5a3cac14
  Entitlement Tag: regid.2018-12.com.cisco.ISR_1100_8P_UnifiedCommunication,
1.0_55775cb5-538d-482e-b57f-fc8af02f93a3
  Entitlement Tag: regid.2017-04.com.cisco.ISR_1100_8P_FoundationSuite,
1.0_6f4a1f6f-b607-45cb-8bd0-d672ac06a314
```

Required Tasks After Migration

1. Complete topology implementation.

   In this example, we're implementing the No Connectivity to CSSM and No CSLU topology. The corresponding workflow to follow is: Workflow for Topology: No Connectivity to CSSM and No CSLU.

When migrating from SLR, the transport type is automatically set to **off**. The sample output of the **show license status** command after migration shows that this is done.

An export-controlled license is being used and the corresponding authorization code for this has been migrated. SLAC does not have to be installed again after upgrade.

This completes topology implementation to work in an air-gapped network.

2. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   For this topology, the RUM report must be saved to a file (on the product instance) and uploaded it to CSSM (from a workstation that has connectivity to the internet, and CSSM). The ACK must then be downloaded and installed on the product instance.

   a. Synchronize license usage with CSSM

      In the sample configuration shown below, the RUM report is saved to the flash memory of the product instance, in a file called *usage_report*. It is then transferred to a TFTP location for upload to CSSM:

```
Device# license smart save usage unreported file usage_report
Device# dir bootflash:
Directory of bootflash:/

73441   drwx            40960  Jan 19 2021 07:26:57 +00:00  tracelogs
23      -rw-             3950  Jan 19 2021 07:26:26 +00:00  usage_report
48961   drwx             4096  Jan 19 2021 07:09:15 +00:00  .installer
122401  drwx             4096  Jan 19 2021 07:08:36 +00:00  license_evlog
106082  drwx             4096  Jan 19 2021 07:08:23 +00:00  .geo
13      -rw-              30  Jan 19 2021 07:08:21 +00:00  throughput_monitor_params
171361  drwx             4096  Jan 19 2021 04:17:00 +00:00  .rollback_timer
11      -rw-        542523052  Jan 19 2021 04:14:17 +00:00
c1100-universalk9.16.12.04.SPA.bin

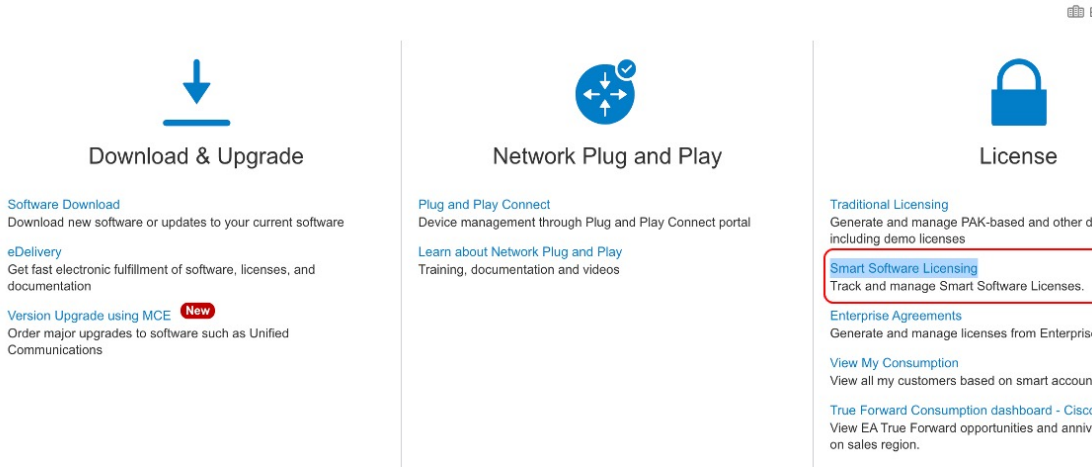
2908606464 bytes total (1558736896 bytes free)
<output truncated>


Device# copy bootflash:usage_report tftp://10.8.0.6//user01/usage_report
Address or name of remote host [10.8.0.6]?
Destination filename [/user01/usage_report]?
!!
3950 bytes copied in 0.012 secs (329167 bytes/sec)
```

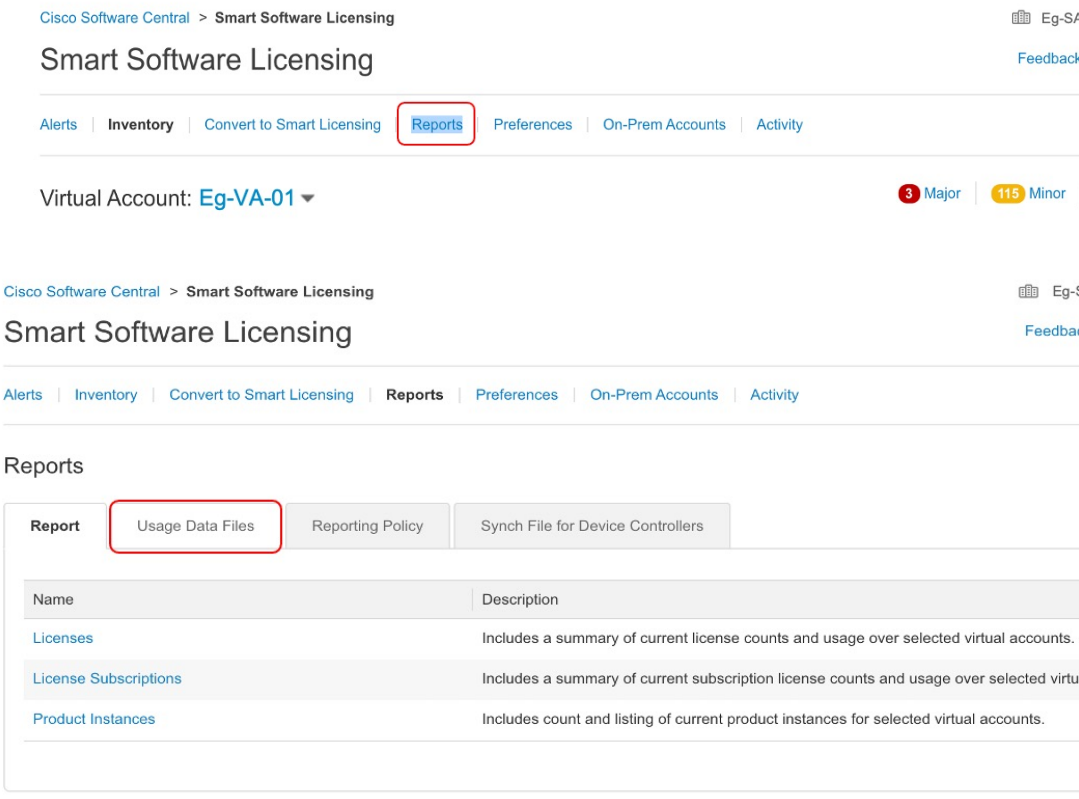
      In the screenshots and sample configuration shown below, the RUM report is uploaded to CSSM. After it is processed, the ACK is downloaded and installed on the product instance.

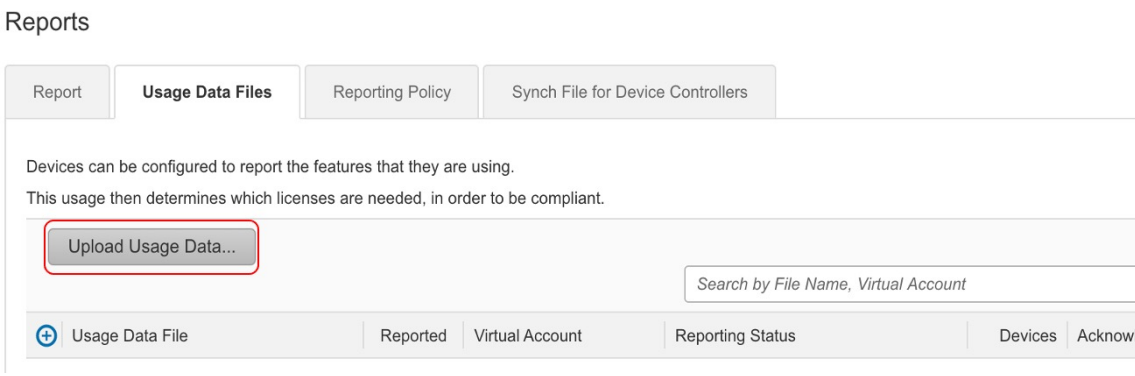
      The ACK is also furnished with a custom policy - as shown in the system messages that are displayed after the ACK is installed on the product instance.

      - Log in to the CSSM Web UI and select the **Smart Software Licensing** link.

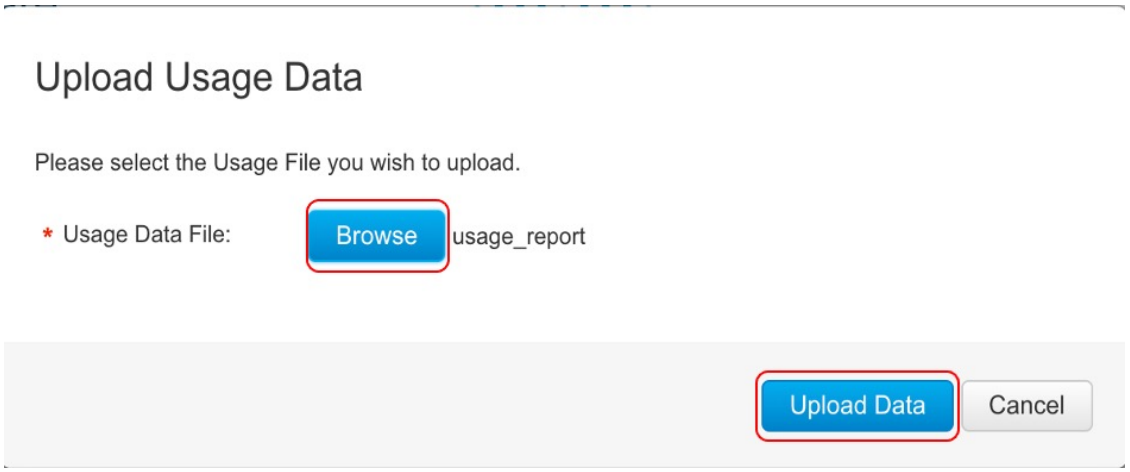


- Click**Reports** > **Usage Data Files** > **Upload Usage Data**, to upload the RUM report.

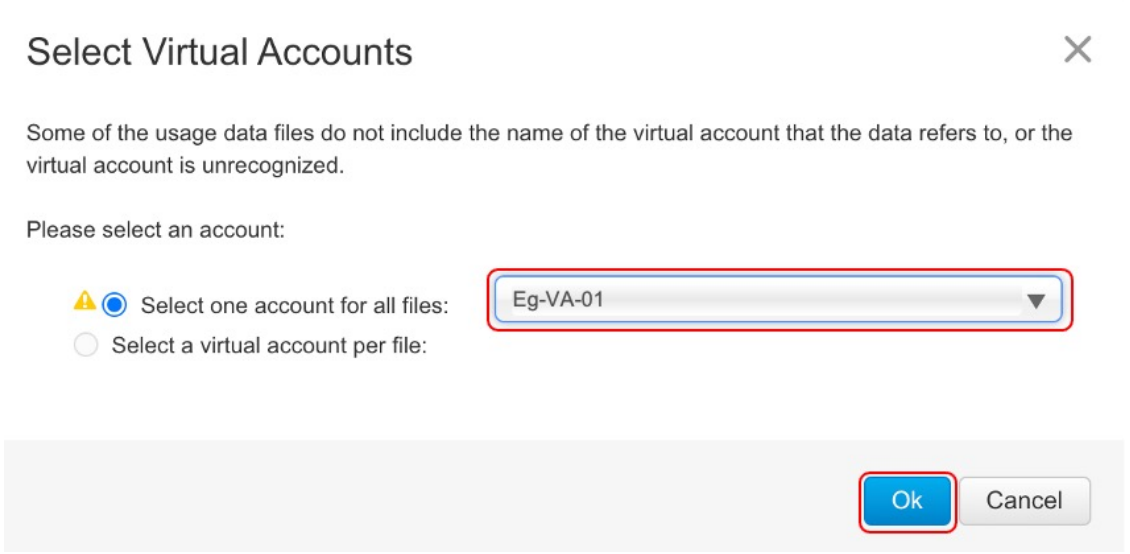


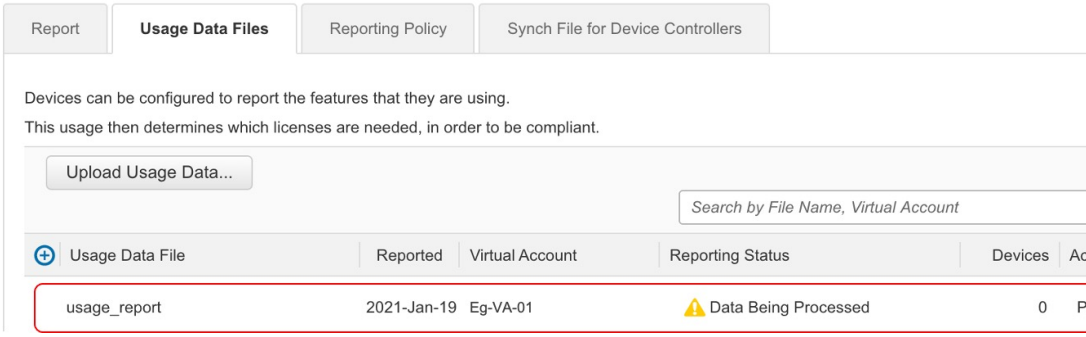


- Click **Browse** to locate the file, and the click **Upload Data**, to upload the RUM report:

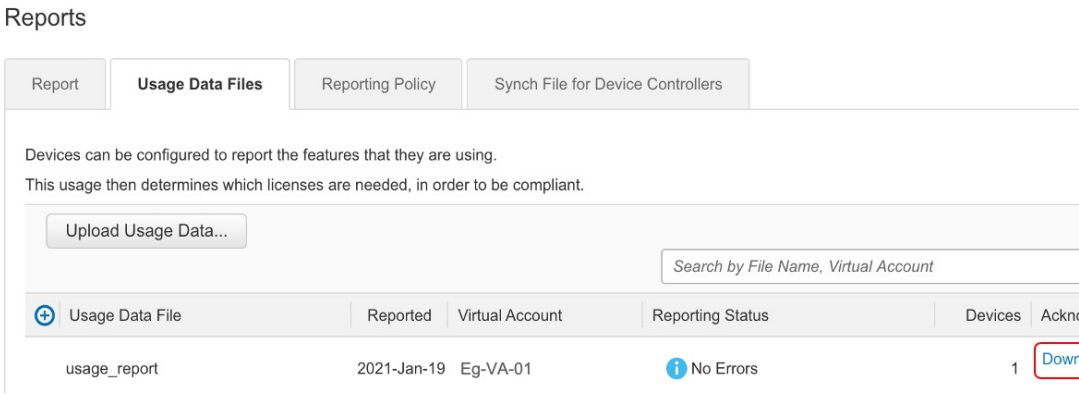


- Select the Virtual Account that will receive the RUM report and then wait for the ACK to appear in the Acknowledgement column:





- Wait for the reporting status to change to **No Errors** and then download the ACK:



- Copy the file from the downloaded location, save it in the flash memory of the product instance (**copy** *source* **bootflash:***file-name*), and install the ACK on the product instance:

```
Device# copy tftp://10.8.0.6//user01 bootflash:ACK_usage_report.txt

Device# license smart import bootflash: ACK_usage_report.txt
Import Data Successful
Device#
*Jan 19 07:50:33.311: %SIP-1-LICENSING: SIP service is Up. License report
acknowledged.
*Jan 19 07:50:33.667: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled
 features is allowed for feature hseck9
*Jan 19 07:50:34.131: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy
 was successfully installed
```

b. Verify synchronization and check updated policy to know about subsequent reporting requirements.

In the sample output below, the following fields help verify synchronization:

- The updated timestamp here: `Policy in use: Installed On Jan 19 07:50:34 2021 UTC`
- The updated timestamp here: `Last ACK received: Jan 19 07:50:33 2021 UTC`

If subsequent reporting is required, this is indicated in the policy and system messages are displayed. You then have to upload the RUM report as shown in Step 2 above (including all substeps). In the sample output, the following fields provide information about if and when reporting is required:

- `Next report push: Jan 19 07:51:04 2021 UTC`

- Next ACK deadline: Feb 18 07:50:34 2021 UTC

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

Smart Licensing is ENABLED
License Reservation is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Transport Off

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Installed On Jan 19 07:50:34 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Usage Reporting:
  Last ACK received: Jan 19 07:50:33 2021 UTC
  Next ACK deadline: Feb 18 07:50:34 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Jan 19 07:51:04 2021 UTC
  Last report push: <none>
  Last report file write: <none>
```

```
Trust Code Installed: <none>

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

hseck9 (ISR_1100_8P_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC EXPORT AUTHORIZATION KEY INSTALLED
    Total reserved count: UNLIMITED

uck9 (ISR_1100_8P_UnifiedCommunication):
  Description: uck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: NOT INSTALLED

FoundationSuiteK9 (ISR_1100_8P_FoundationSuite):
  Description: FoundationSuiteK9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: FoundationSuiteK9
  Feature Description: FoundationSuiteK9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 1

Product Information
===================
UDI: PID:C1111-8PLTEEAWB,SN:FGL214391JK

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
      Status: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
      Last Confirmation code: 0708eeec

Specified license reservations:
  Cisco 1100 Series with 8 LAN Ports, Cisco One Foundation Suite
```

```
(ISR_1100_8P_FoundationSuite):
    Description: Cisco 1100 Series with 8 LAN Ports, Cisco One Foundation Suite
    Total reserved count: 1
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
        Authorization type: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
        License type: PERPETUAL
          Term Count: 1
  ISR_1100_8P_Hsec (ISR_1100_8P_Hsec):
    Description: Cisco 1100 Series with 8 LAN Ports, U.S. Export Restriction Compliance
 license
    Total reserved count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391JK
        Authorization type: SPECIFIC INSTALLED on Jan 19 05:59:54 2021 UTC
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag:
regid.2017-08.com.cisco.ISR_1100_8P_Hsec,1.0_34a5e7e7-722a-41ab-bdad-d53d5a3cac14
  Entitlement Tag:
regid.2018-12.com.cisco.ISR_1100_8P_UnifiedCommunication,1.0_55775cb5-538d-482e-b57f-fc8af02f93a3

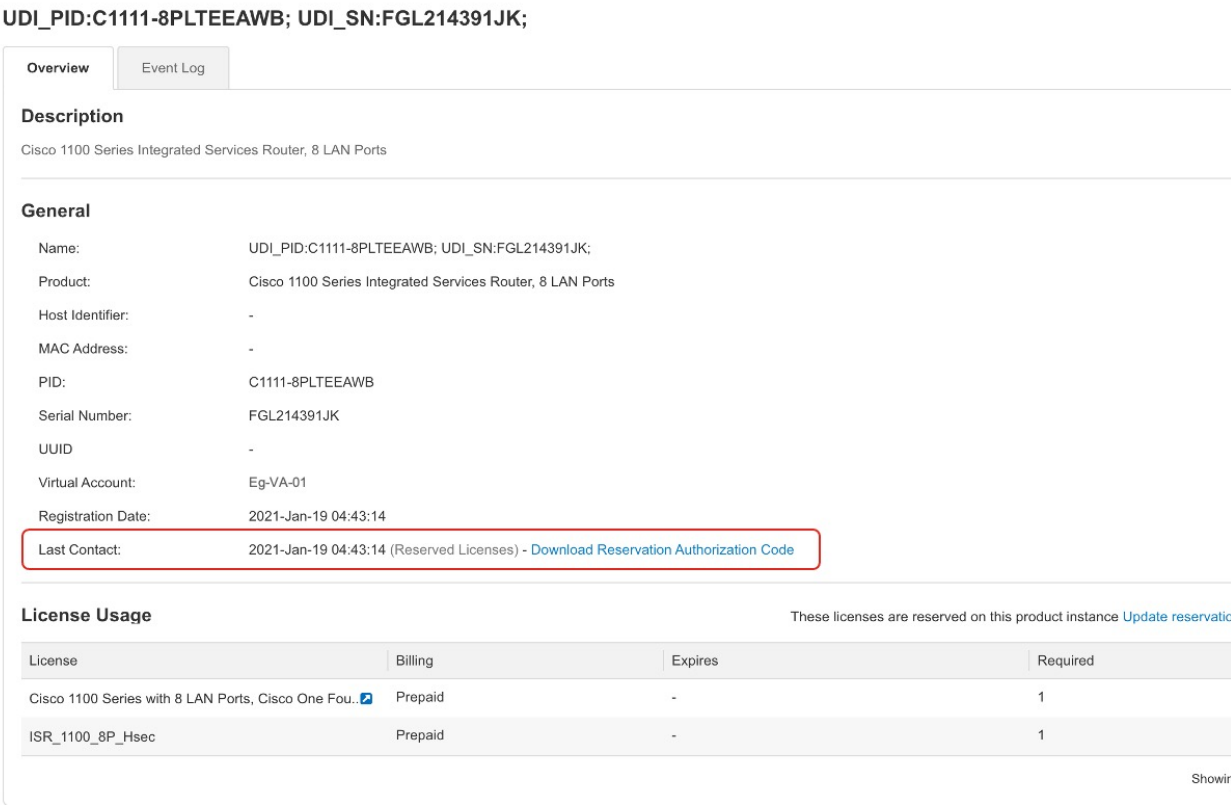
  Entitlement Tag:
regid.2017-04.com.cisco.ISR_1100_8P_FoundationSuite,1.0_6f4a1f6f-b607-45cb-8bd0-d672ac06a314
```

CSSM Web UI Before and After Migration

Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**. In the applicable Smart Account and Virtual Account, go to **Inventory** > **Product Instances** to display all the product instances.

CSSM Web UI Before Migration

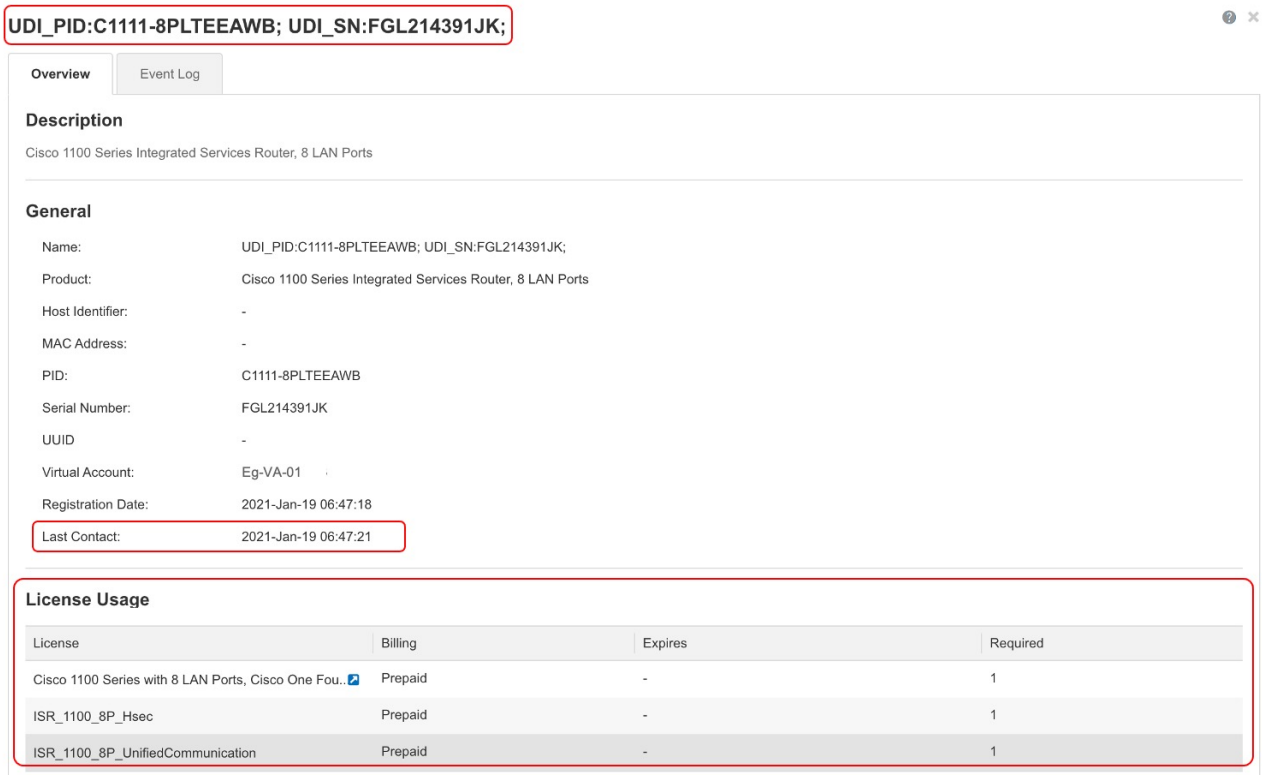
From the **Product Instances** tab, click on the UDI to display detailed license usage information as shown below.



CSSM Web UI After Migration

From the **Product Instances** tab, click on the UDI to display detailed license usage information as shown below.

After upgrade to Smart Licensing Using Policy, and after the requisite RUM report is uploaded the **Last Contact** field is updated.



Example: Smart Licensing (SLR With Throughput >250 Mbps, Without Export-Controlled License) to Smart Licensing Using Policy

The following is an example of a **Cisco Cloud Services Router 1000v** migrating from Smart Licensing, where Specific License Reservation (SLR) licenses are being used, to Smart Licensing Using Policy. The software version on the product instance is upgraded from Cisco IOS XE Gibraltar 16.12.2 (CSRv .bin image) to Cisco IOS XE Bengaluru 17.6.1 (Catalyst 8000V software image) for Smart Licensing Using Policy support.



Important All Cisco Cloud Services Routers 1000v and Cisco Integrated Services Virtual Routers where throughput greater than 250 Mbps is configured, have the export-control flag in CSSM enabled to allow throughput greater than 250 Mbps - and not an HSECK9 license. The product instance in this example also has throughput greater than 250 Mbps, further, it is using reserved licenses. So its SLR code does not include an HSECK9 license, rather, the export-control flag in CSSM is enabled.

U.S. export control regulations no longer allow the use of the export control flag as a way of authorizing throughput greater than 250 Mbps. SLAC installation is therefore required in the Smart Licensing Using Policy environment. (See Authorization Code).

If throughput is lesser than or equal to 250 Mbps, SLAC installation is not required.

When upgrading a product instance as in this example, we recommend updating the SLR authorization code to include the applicable HSECK9 license *before* upgrading the product instance, so that you have uninterrupted throughput after upgrade. This example shows you how to do it this way. If you upgrade the software image without performing this task first, the system sets the throughput *to* 250 Mbps after upgrade to Smart Licensing

Using Policy - until SLAC is installed. Immediately after SLAC is installed, the system restores the value that you last configured.

The following is a summary of what to expect after upgrade for this example:

- Enforcement type after migration: The reserved licenses on the product instance are being updated prior to upgrade, to include an HSECK9 license in the SLR authorization code. See section *Required Tasks Before Migration* below. Two licenses are therefore available on the product instance before upgrade. The HSECK9 license will be available after migration and have enforcement type: EXPORT RESTRICTED. The remaining license will be available with enforcement type: NOT ENFORCED, after migration.
- Transport type after migration: Since this an upgrade from SLR, when the software version is upgraded, the transport type will be set **off**.
- Device-Led Conversion (DLC): DLC does not apply to the licenses in this scenario, because they are authorized and reserved licenses from the earlier Smart Licensing environment (they are already Smart licenses).
- Reporting after migration: For initial synchronization, the RUM report will be manually uploaded to CSSM and the corresponding ACK will be installed on the product instance.

  The same reporting method applies to subsequent reporting - if reporting is required. After initial synchronization, refer to the output of **show license status** or **show license all** commands to know if and by when reporting is required. In the output check fields `Next report push` and `Next ACK deadline`. You will also receive system messages when reporting is required.

Required Tasks *Before* Migration

When using throughput greater than 250 Mbps with the export control flag enabled in CSSM, ensure uninterrupted throughput on upgrade to Smart Licensing Using Policy, by adding an HSECK9 license to the SLR code *before* you upgrade the software version on the product instance.

Note At this point the product instance is still in the earlier Smart Licensing environment, therefore the corresponding commands apply.

1. Display licenses that are currently available on the product instance.

```
Device# show version
Cisco IOS XE Software, Version 16.12.02
Cisco IOS Software [Gibraltar], Virtual XE Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 16.12.2, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2021 by Cisco Systems, Inc.
Compiled Thu 22-Jul-21 10:23 by mcpre

<output truncated>
```

```
Device# show license summary
Smart Licensing is ENABLED
License Reservation is ENABLED

Registration:
  Status: REGISTERED - SPECIFIC LICENSE RESERVATION
  Export-Controlled Functionality: ALLOWED

License Authorization:
```

```
  Status: AUTHORIZED - RESERVED

License Usage:
  License                  Entitlement tag               Count Status
  -----------------------------------------------------------------------------
  CSR 1KV AX 10G           (ax_10G)                          1 AUTHORIZED


Device# show license reservation
License reservation: ENABLED

Overall status:
  Active: PID:CSR1000V,SN:95QS2T1KUJX
      Reservation status: SPECIFIC INSTALLED on Jul 09 21:10:37 2021 UTC
      Export-Controlled Functionality: ALLOWED
      Last Confirmation code: 4372613e

Specified license reservations:
  CSR 1KV AX 10G (ax_10G):
    Description: CSR 1KV AX 10G
    Total reserved count: 1
    Term information:
      Active: PID:CSR1000V,SN:95QS2T1KUJX
        License type: PERPETUAL
          Term Count: 1
```

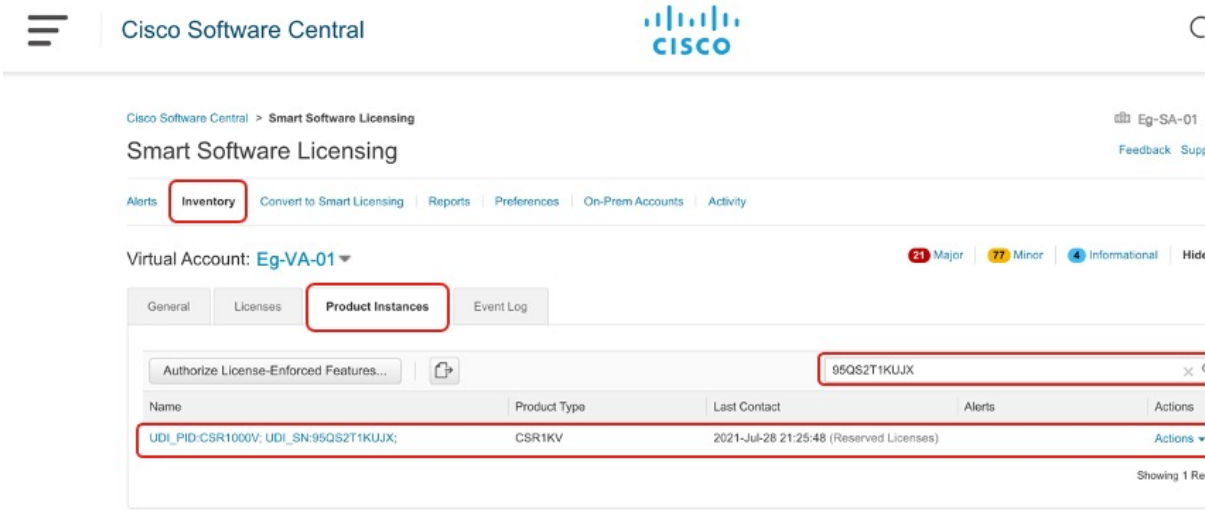
2. Update the reservation code in CSSM.
   a. Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**.

      Log in using the username and password provided by Cisco.

   b. In the corresponding Smart Account and Virtual Account, navigate to **Inventory** > **Licences**, ensure that a positive balance of the applicable DNA HSECK9 license (Router US Export Lic for DNA) is available.

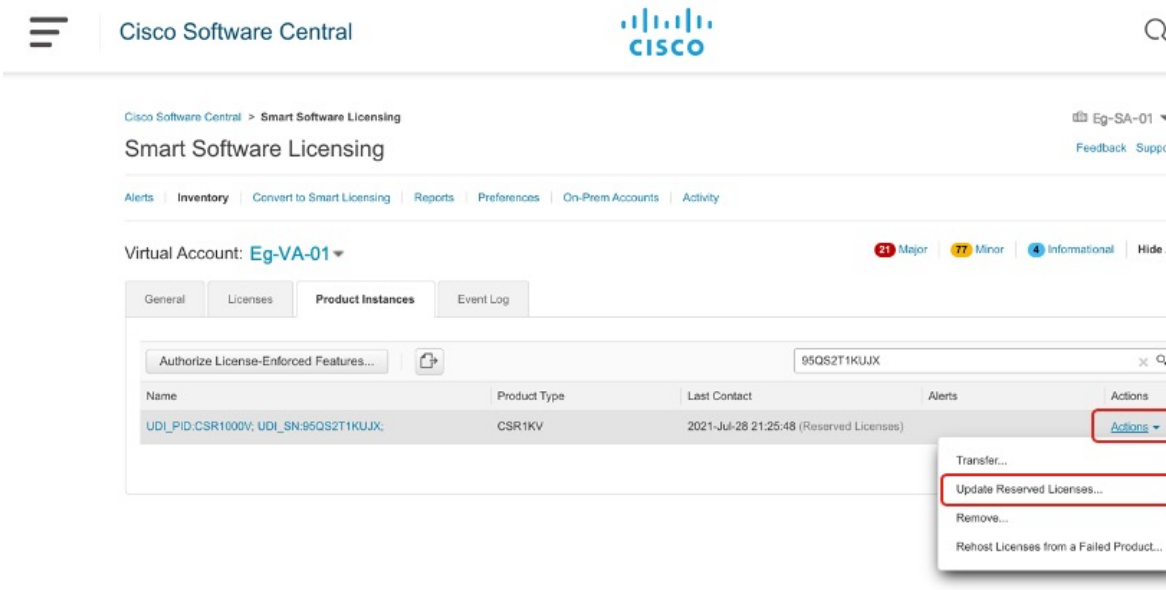
   c. Click the **Product Instances** tab use the search function to locate the product instance

      In this example, we're using the serial number (95QS2T1KUJX) to locate the product instance.



   d. From the **Actions** column of the located product instance, select **Update Reserved Licenses**.

      The **Update Reservation License** window is displayed.

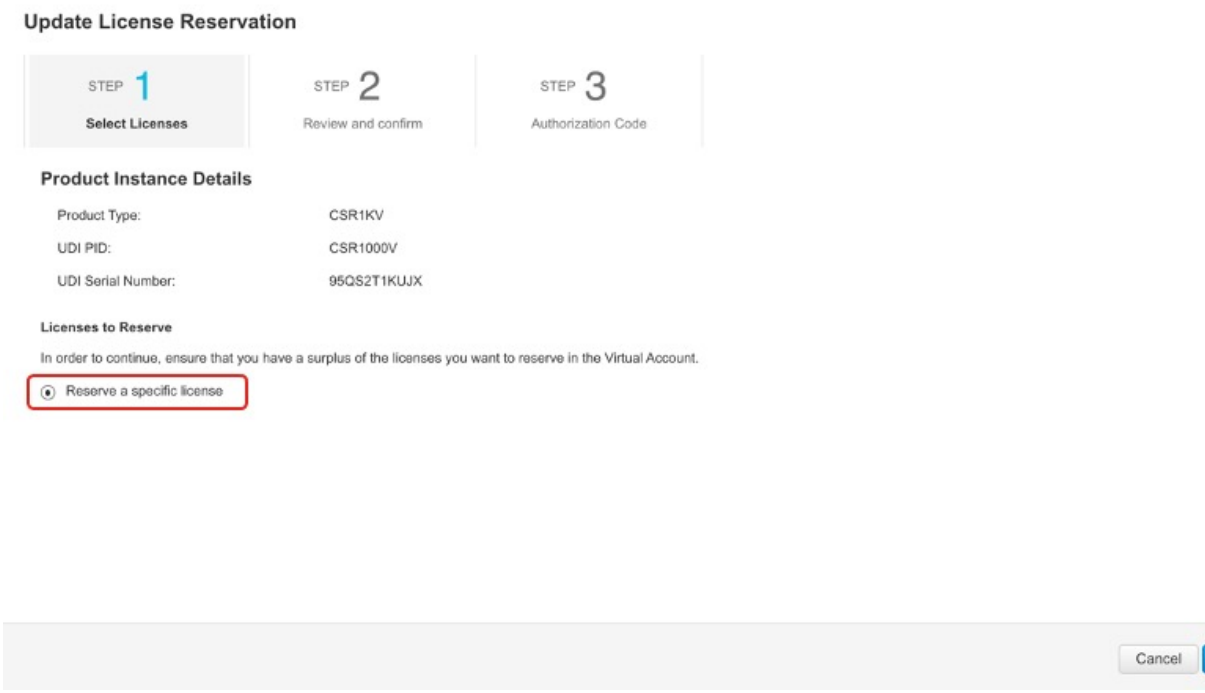


e. Select the **Reserve a specific license** radio button.

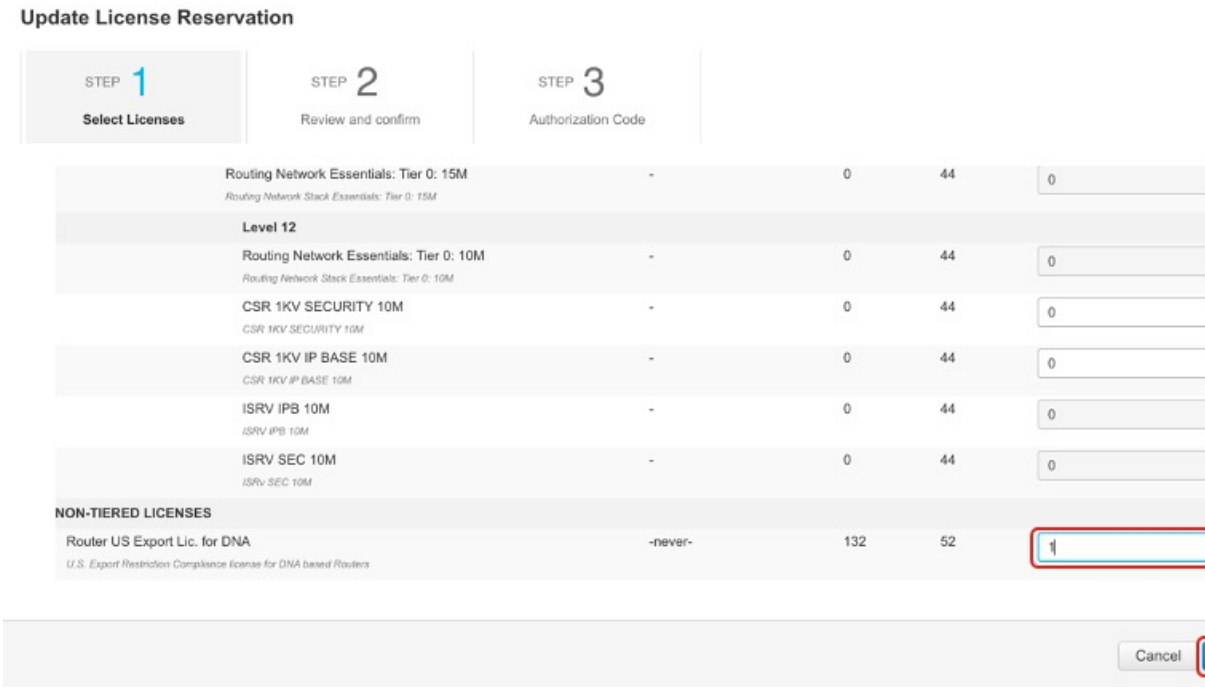
A table with all available licenses on the product instance is displayed and an HSECK9 license is automaticaly included in the list since this Smart Account and Virtual Account has a positive balance of HSECK9 licenses.

Ensure that you select the correct HSECK9 license for a product instance, see HSECK9 License Mapping Table for Routing Product Instances.

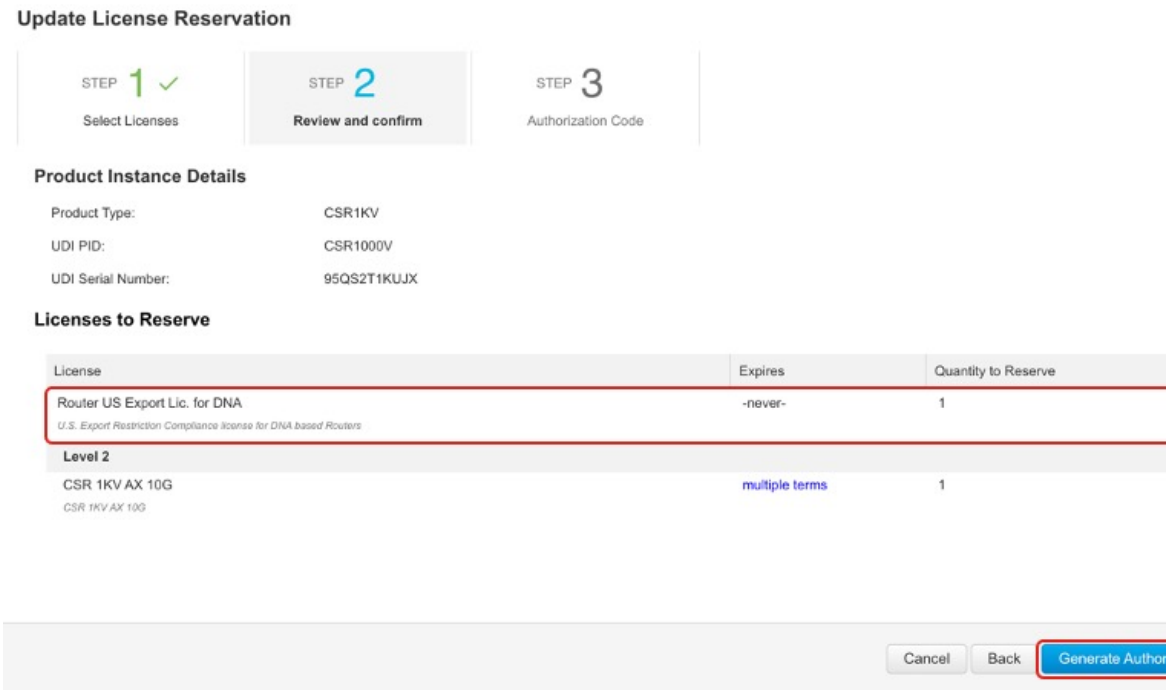
In this example, the "Router US Export Lic for DNA" is selected. (All virtual platforms use this HSECK9 license; this is also called the "DNA_HSEC"license). Other product instances, such as an ISR 1000 or ISR 4000 may require a different product-specific HSECK9 license.



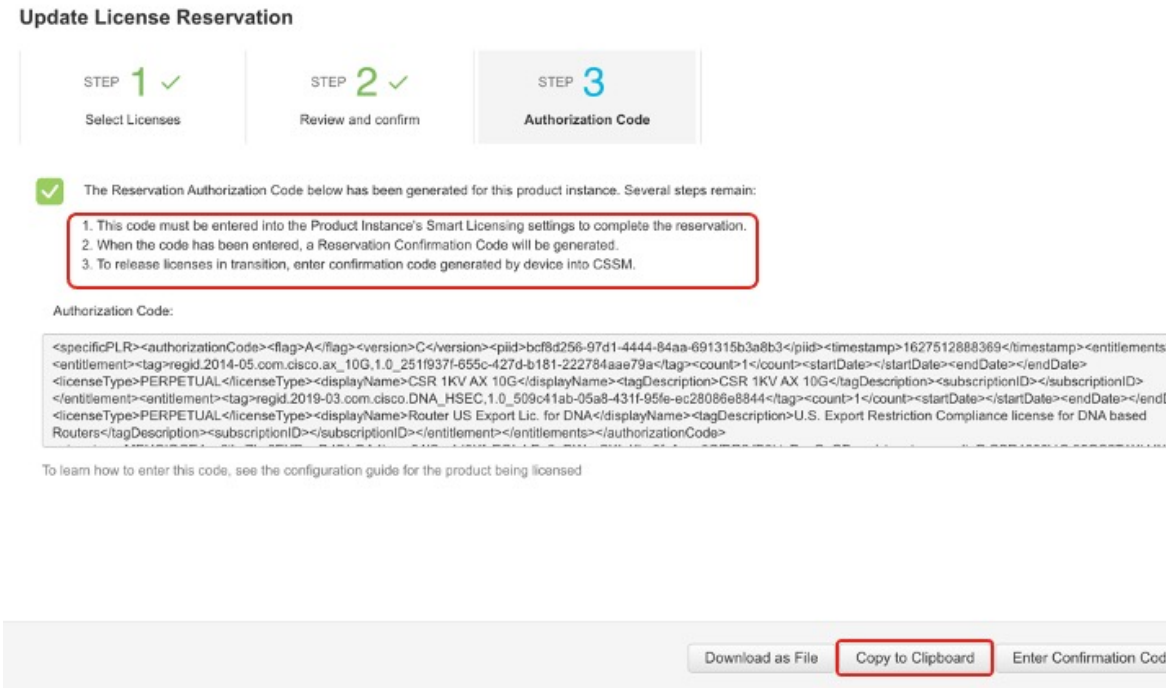
f. In the corresponding **Reserve** column, enter `1` and click **Next**.



g. Click **Generate Authorization Code**.



h. Click **Copy to Clipboard** and save the authorization code in a file.



Note Do not click **Close** yet. Keep this window open and proceed to next step.

3. Save and install the authorization code on the product instance.
   a. On the product instance, enter the **copy***source***bootflash:***file name* command in privileged EXEC mode, to save the authorization code file in the bootflash of the product instance. For example:

      ```
      Device# copy tftp://10.8.0.6/bootflash:slr_code_02
      ```

   b. On the product instance, enter the **license smart reservation install file** {**bootflash:***filename* command in privileged EXEC mode, to install the authorization code. For example:

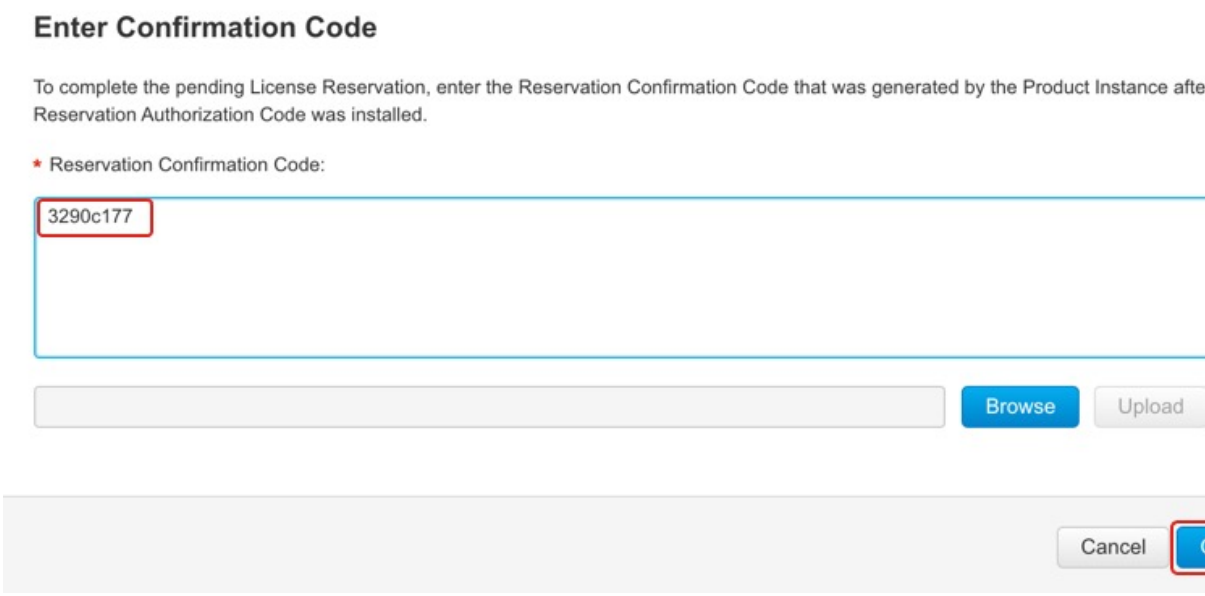
      ```
      Device# license smart reservation install file bootflash:slr_code_02
      Reservation install file successful
      Last Confirmation code UDI: PID:CSR1000V,SN:95QS2T1KUJX
          Confirmation code: 3290c177
      ```

   c. Copy the confirmation code.

4. Enter the confirmation code in CSSM, and then verify the list of licences on the product instance
   a. Go back to the **Update Reservation License** window in the CSSM Web UI and click **Enter Confirmation Code**.

      The **Enter Confirmation Code** window is displayed.

   b. Paste the confirmation code and click **OK**.



   c. On the product instance, enter the **show license reservation** command in privileged EXEC mode.

      Along with the existing ax_10G license, a DNA_HSEC license and the new confirmation code is displayed:

      ```
      Device# show license reservation
      License reservation: ENABLED

      Overall status:
        Active: PID:CSR1000V,SN:95QS2T1KUJX
            Reservation status: SPECIFIC INSTALLED on Jul 28 20:46:46 2021 UTC
            Export-Controlled Functionality: ALLOWED
            Last Confirmation code: 3290c177
      ```

```
Specified license reservations:
  CSR 1KV AX 10G (ax_10G):
    Description: CSR 1KV AX 10G
    Total reserved count: 1
    Term information:
      Active: PID:CSR1000V,SN:95QS2T1KUJX
        License type: PERPETUAL
          Term Count: 1
  Router US Export Lic. for DNA (DNA_HSEC):
    Description: U.S. Export Restriction Compliance license for DNA based Routers
    Total reserved count: 1
    Term information:
      Active: PID:CSR1000V,SN:95QS2T1KUJX
        License type: PERPETUAL
          Term Count: 1
```



Note This is now a product instance where the SLR authorization code includes authorization for an HSECK9 license and will be honored after upgrade. SLAC installation after upgrade is therefore not required.

5. Reload the device with a software version that supports Smart Licensing Using Policy.

   The product instance comes up with the previously configured (pre-upgrade) throughput. See section *Show Commands After Migration* below.

Show Commands After Migration

show version After Migration

```
------------------------------------------------------------------------------------------------------------
show version After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version after upgrade. Further, note that the software version installed is the Catalyst 8000V software image.

```
Device# show version
Cisco IOS XE Software, Version 17.6.1
Cisco IOS Software [Bengaluru], Virtual XE Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 17.6.1
Copyright (c) 1986-2021 by Cisco Systems, Inc.
Compiled Sat 24-Jul-21 11:21 by mcpre

<output truncated>

ROM: IOS-XE ROMMON

Router uptime is 1 minute
Uptime for this control processor is 2 minutes
System returned to ROM by reload
System image file is "bootflash:c8000v-universalk9.SSA.bin"
Last reload reason: Reload Command
```

show show license summary After Migration

---
show license summary After Migration

The output here shows that the export-controlled HSECK9 license and the ax_10G have been migrated.

```
Device# show licence summary
License Reservation is ENABLED

License Usage:
  License                 Entitlement Tag               Count Status
  -----------------------------------------------------------------------
  hseck9                  (DNA_HSEC)                        1 IN USE
  ax_10G                  (ax_10G)                          1 IN USE
```

show license usage After Migration

---
show license usage After Migration

The output here shows the enforcement types for the all the migrated licenses. The HSECK9 licenses has `Enforcement type: EXPORT RESTRICTED`. The ax_10G, which is not an export-controlled license has enforcement type `Enforcement type: NOT ENFORCED`.

```
Device# show license usage
License Authorization:
  Status: Not Applicable

hseck9 (DNA_HSEC):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Export
  Reservation:
    Reservation status: SPECIFIC EXPORT AUTHORIZATION KEY INSTALLED
    Total reserved count: UNLIMITED

ax_10G (ax_10G):
  Description: ax_10G
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: ax_10G
  Feature Description: ax_10G
  Enforcement type: NOT ENFORCED
  License type: Subscription
  Reservation:
    Reservation status: SPECIFIC INSTALLED
    Total reserved count: 1
```

show license authorization After Migration

```
------------------------------------------------------------------------------------------------------------
show license authorization After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows that the SLR authorization code included as part of an HSECK9 license has been honored (`Last Confirmation code: 3290c177`).

```
Device# show license authorization
Overall status:
  Active: PID:CSR1000V,SN:95QS2T1KUJX
      Status: SPECIFIC INSTALLED on Jul 28 20:46:46 2021 UTC
      Last Confirmation code: 3290c177

Specified license reservations:
  CSR 1KV AX 10G (ax_10G):
    Description: CSR 1KV AX 10G
    Total reserved count: 1
    Enforcement type: NOT ENFORCED
    Term information:
      Active: PID:CSR1000V,SN:95QS2T1KUJX
        Authorization type: SPECIFIC INSTALLED on Jul 28 20:46:46 2021 UTC
        License type: PERPETUAL
          Term Count: 1
  Router US Export Lic. for DNA (DNA_HSEC):
    Description: U.S. Export Restriction Compliance license for DNA based Routers
    Total reserved count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:CSR1000V,SN:95QS2T1KUJX
        Authorization type: SPECIFIC INSTALLED on Jul 28 20:46:46 2021 UTC
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag: regid.2019-03.com.cisco.DNA_HSEC,1.0_509c41ab-05a8-431f-95fe-ec28086e8844

  Entitlement Tag: regid.2014-05.com.cisco.ax_10G,1.0_251f937f-655c-427d-b181-222784aae79a
```

show platform hardware throughput level After Migration

```
------------------------------------------------------------------------------------------------------------
show platform hardware throughput level After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows that throughput of 1250 Mbps has been retained after migration.

```
Device# show platform hardware throughput level
The current throughput level is 10000000 kb/s
```

show license status After Migration

```
------------------------------------------------------------------------------------------------------------
show license status After Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

The transport type is set to Off (`Type: Transport Off`). This means the product instance cannot communicate with CSSM or anything outside the network.

For now, the default policy is effective. (When no other policy is available, the product instance applies the CISCO default policy). If a custom policy is available in CSSM the same will be installed after initial synchronization. The synchronization will also address the reporting that the current policy requires (`Next ACK deadline: Oct 26 21:17:32 2021 UTC`).

```
Device# show license status
Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

Account Information:
  Smart Account: <none>
  Virtual Account: <none>
License Reservation is ENABLED

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

Transport:
  Type: Transport Off

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Oct 26 21:17:32 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Jul 28 21:19:32 2021 UTC
  Last report push: <none>
  Last report file write: <none>
```

```
Trust Code Installed: <none>
```

Required Tasks After Migration

1. Complete topology implementation.

   In this example, we're implementing the No Connectivity to CSSM and No CSLU topology. The corresponding workflow to follow is: Workflow for Topology: No Connectivity to CSSM and No CSLU.

   When migrating from SLR, the transport type is automatically set to **off**. The sample output of the **show license status** command after migration shows that this is done.

   An export-controlled license is being used and the corresponding authorization code for this has been migrated. SLAC does not have to be installed again after upgrade.

   This completes topology implementation to work in an air-gapped network.

2. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   For this topology, the RUM report must be saved to a file (on the product instance) and uploaded it to CSSM (from a workstation that has connectivity to the internet, and CSSM). The ACK must then be downloaded and installed on the product instance.

   a. Synchronize usage information with CSSM.

      - In the sample configuration shown below, the RUM report is saved to the flash memory of the product instance, in a file called *usage_report*. It is then transferred to a TFTP location for upload to CSSM:

        ```
        Device# license smart save usage unreported file usage_report
        Device# dir bootflash:
        Directory of bootflash:/

        23      -rw-             3950  Jan 19 2021 07:26:26 +00:00  usage_report

        <output truncated>


        Device# copy bootflash:usage_report tftp://10.8.0.6//user01/usage_report
        Address or name of remote host [10.8.0.6]?
        Destination filename [/user01/usage_report]?
        !!
        3950 bytes copied in 0.012 secs (329167 bytes/sec)
        ```

      - Upload the RUM report to CSSM. After it is processed, download the ACK. See Uploading Data or Requests to CSSM and Downloading a File

      - Copy the file from the downloaded location, save it in the flash memory of the product instance (**copy** *source* **bootflash:***file-name*), and install the ACK on the product instance:

        ```
        Device# copy tftp://10.8.0.6//user01 bootflash:ACK_usage_report.txt

        Device# license smart import bootflash: ACK_usage_report.txt
        Import Data Successful
        ```

   b. Verify synchronization and check updated policy to know about subsequent reporting requirements.

In the output of the **show license all** privileged EXEC command, the updated time stamp in the `Last ACK received:` field of helps verify that synchronization is complete.

If subsequent reporting is required, this is indicated in the policy and system messages are displayed. You then have to upload the RUM report as shown in Step 2 above (including all substeps). The following fields of the **show license all** privileged EXEC command provide information about if and when reporting is required:

- `Next ACK deadline:`
- `Next report push:`

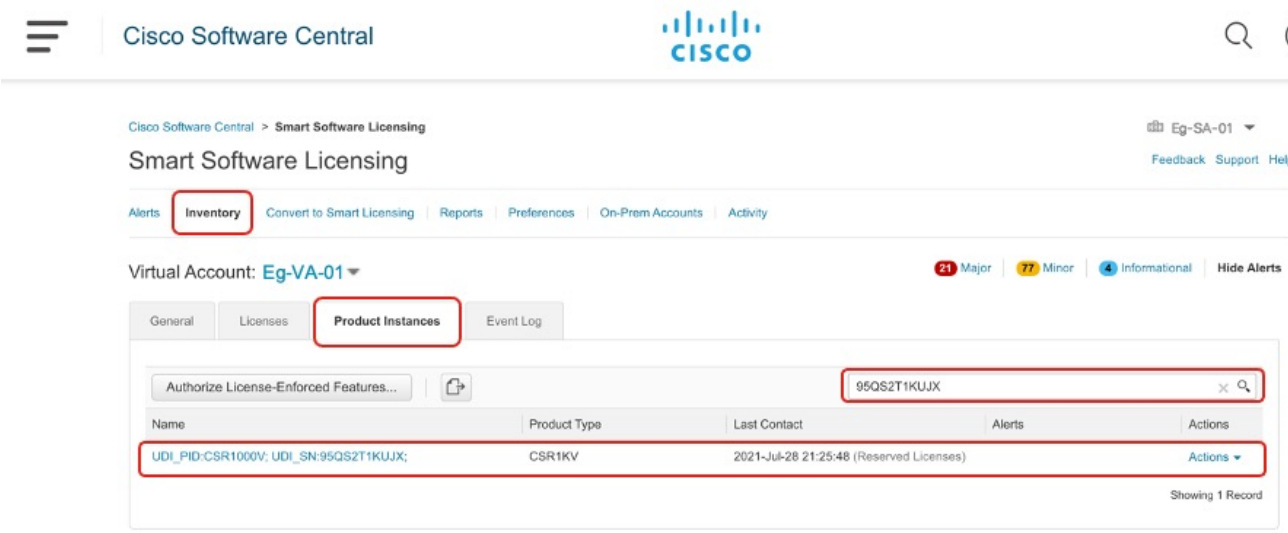
CSSM Web UI Before and After Migration

Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**. In the applicable Smart Account and Virtual Account, go to **Inventory** > **Product Instances** to display all the product instances.

CSSM Web UI Before Migration

From the **Product Instances** tab, click on the UDI to display detailed license usage information as shown below.

In the Smart Licensing environment, SLR licenses are displayed with the label "(Reserved Licenses)" in the Last Contact field:



CSSM Web UI After Migration

From the **Product Instances** tab, click on the UDI to display detailed license usage information.

Note Even though a Catalyst 8000V software image is installed on the product instance, the PID does not change. So the PID for this product instance continues to be PID:CSR1000V,SN:95QS2T1KUJX. You can also verify this with the **show license udi** command before and after upgrade.

After upgrade to Smart Licensing Using Policy, and after the requisite RUM report is uploaded the **Last Contact** field is updated.

Example: Smart Licensing (Evaluation Licenses) to Smart Licensing Using Policy

The following is an example of a **Cisco 4351 Integrated Services Router** with evaluation licenses, migrating from Smart Licensing to Smart Licensing Using Policy. The software version on the product instance is upgraded from Cisco IOS XE Gibraltar 16.12.4 to Cisco IOS XE Bengaluru 17.4.1a. The following is a summary of what to expect after upgrade for this example:

- Enforcement type after migration: Before migration, all the licenses are in evaluation mode. All licenses that are being used will be migrated and they will all have enforcement type NOT ENFORCED after migration.

  A SLAC is being installed *after* migration in this example, to use an export-controlled license in the Smart Licensing Using Policy environment. See the detailed steps under subsection *Required Tasks After Migration* below. This is only to illustration how to request and install SLAC after upgrade and is not a requirement.

- Transport type after migration: When migrating evaluation licenses the system automatically sets the default transport type (**cslu**). This can be changed depending on the topology that is finally implemented; any one of the Supported Topologies may be implemented.

  The *Connected Directly to CSSM* topology (using transport type **smart** to connect to CSSM) is being implemented in this example.

Note In this example, all the licenses being used on the product instance are in evaluation mode, and hence the automatic setting of the default transport type. If yours is a scenario where even one of the licenses being used is registered and authorized, the transport type configuration will be retained, and evaluation licenses, if any, are also migrated, as unenforced licenses (An export-controlled license, that is HSECK9, does not support evaluation mode).

- Device-Led Conversion (DLC): DLC does not apply to the licenses in this scenario, because they are evaluation licenses from the earlier Smart Licensing environment (they are already Smart licenses).
- Reporting after migration: For initial synchronization, a topology will be implemented after the software version is upgraded and the corresponding reporting method will be followed. If a custom policy is available in CSSM, it will be installed on the product instance as part of this synchronization. Subsequent reporting requirements will then depend on the updated policy. If a custom policy is not available, subsequent reporting requirements will be as per the default policy.

Show Commands Before and After Migration

show version Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show version Before Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version before upgrade.

```
Device# show version
Cisco IOS XE Software, Version 16.12.04
Cisco IOS Software [Gibraltar], ISR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 16.12.4, RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 09-Jul-20 21:44 by mcpre
```

```
-----------------------------------------------------------------------------------------------------------
show version After Migration
-----------------------------------------------------------------------------------------------------------
```

The output here shows the software version after migration, followed by an excerpt of the licensing-related system messages that are displayed when the system restarts with the new image.

```
Device# show version
Cisco IOS XE Software, Version 17.4.1a
Cisco IOS Software [Bengaluru], ISR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 17.4.1a, RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Fri 18-Dec-20 05:04 by mcpre

Press RETURN to get started!
*Jan 21 01:06:50.905: %ISR_THROUGHPUT-6-LEVEL:
Throughput level has been set to 400000 kbps
*Jan 21 01:06:53.874: %SMART_LIC-6-AGENT_ENABLED:
Smart Agent for Licensing is enabled
*Jan 21 01:06:54.485: %SMART_LIC-6-EXPORT_CONTROLLED:
Usage of export controlled features is not allowed
*Jan 21 01:07:34.924: %SYS-5-RESTART: System restarted --
*Jan 21 01:08:05.933: %CALL_HOME-6-CALL_HOME_ENABLED:
Call-home is enabled by Smart Agent for Licensing.
*Jan 21 01:08:07.186: %SMART_LIC-6-REPORTING_REQUIRED:
A Usage report acknowledgement will be required in 365 days.
*Jan 21 01:10:32.210: %SMART_LIC-3-COMM_FAILED:
Communications failure with the Cisco Smart License Utility (CSLU) :
Unable to resolve server hostname/domain name
```

show license summary Before and After Migration

```
-----------------------------------------------------------------------------------------------------------
show license summary Before Migration
-----------------------------------------------------------------------------------------------------------
```

The output before migration shows that all licenses are in Evaluation or EVAL MODE. They will all be displayed as IN USE after migration (There is no notion of an evaluation mode in the Smart Licensing Using Policy environment).

```
Device# show license summary

Smart Licensing is ENABLED

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

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 89 days, 23 hours, 58 minutes, 0 seconds

License Usage:
  License                 Entitlement tag             Count Status
  -----------------------------------------------------------------------------
```

```
                          (ISR_4351_Application)          1 EVAL MODE
                          (ISR_4351_UnifiedCommun...)     1 EVAL MODE
                          (ISR_4351_Security)             1 EVAL MODE
                          (ISR_4351_400M_Performance)     1 EVAL MODE
```

---

show license summary After Migration

The output after migration shows that all four licenses have been migrated and are displayed with status IN USE.

```
Device# show license summary

License Usage:
  License                 Entitlement Tag               Count Status
  -----------------------------------------------------------------------------
  throughput              (ISR_4351_400M_Performance)       1 IN USE
  appxk9                  (ISR_4351_Application)            1 IN USE
  uck9                    (ISR_4351_UnifiedCommun...)       1 IN USE
  securityk9              (ISR_4351_Security)               1 IN USE
```

show license status Before and After Migration

---

show license status Before Migration

The output before migration shows that the licenses are unregistered.

Evaluation licenses are unregistered and therefore the default transport type in the Smart Licensing environment is effective (**callhome**). After migration, the default in the Smart Licensing Using Policy will be effective.

```
Device# 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: 89 days, 23 hours, 57 minutes, 0 seconds

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
```

```
  Features Authorized:
    <none>
```

---

show license status After Migration

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

The transport type is set to CSLU (`Type: cslu`), which is the default in the Smart Licensing Using Policy environment.

For now, the default policy is effective. (When no other policy is available, the product instance applies the CISCO default policy). A custom policy, if available, will be applied after a topology is implemented and initial synchronization is completed.

```
Device# show license status

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: cslu
  Cslu address: <empty>
  Proxy:
    Not Configured

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Jan 21 01:08:07 2022 UTC
  Reporting push interval: 30  days
```

```
  Next ACK push check: <none>
  Next report push: Jan 21 01:10:07 2021 UTC
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>
```

show license usage Before and After Migration

---

show license usage Before Migration

The output before migration shows that all the licenses being used have `Export status: NOT RESTRICTED`. The export status will be the same after migration. Additionally they will all have enforcement type NOT ENFORCED.

```
Device# show license usage

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 89 days, 23 hours, 55 minutes, 44 seconds

(ISR_4351_Application):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

(ISR_4351_UnifiedCommunication):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

(ISR_4351_Security):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED

(ISR_4351_400M_Performance):
  Description:
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED
```

---

show license usage After Migration

The output after migration shows that all the licenses are unenforced (`Export status: NOT RESTRICTED`, `Enforcement type: NOT ENFORCED`).

```
Device# show license usage

License Authorization:
  Status: Not Applicable
```

```
throughput (ISR_4351_400M_Performance):
  Description: throughput
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: throughput
  Feature Description: throughput
  Enforcement type: NOT ENFORCED
  License type: Perpetual

appxk9 (ISR_4351_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

uck9 (ISR_4351_UnifiedCommunication):
  Description: uck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_4351_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
```

show platform hardware throughput level Before and After Migration

```
------------------------------------------------------------------------------------------------------
show platform hardware throughput level Before Migration
------------------------------------------------------------------------------------------------------
```

This command displays the currently configured throughput. The sample output shows that the throughput is set to 400000 kbps. This is authorised by the performance license (in the **show license** output, see `Feature: throughput`), which allows for increased throughput. The configured throughput will therefore be retained after migration.

```
Device# show platform hardware throughput level
The current throughput level is 400000 kb/s

------------------------------------------------------------------------------------------------------
show platform hardware throughput level After Migration
------------------------------------------------------------------------------------------------------
```

The output after migration shows the throughput configuration is the same after migration.

```
Device# show platform hardware throughput level
The current throughput level is 400000 kb/s
```

show platform software cerm-information Before and After Migration

```
------------------------------------------------------------------------------------------------------
show platform software cerm-information Before Migration
------------------------------------------------------------------------------------------------------
```

The output before migration shows that CERM functionality is enabled. Without an HSECK9 license, only 1000 secure tunnels and 250 Mbps of crypto bandwidth is supported. There will be no change in this configuration after migration.

```
Device# show platform software cerm-information

Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: ENABLED

 ---------------------------------------------------------------
 Resource   Maximum Limit  Available
 ---------------------------------------------------------------
 Number of tunnels       1000   1000
 Number of TLS sessions  1000   1000

 Resource reservation information:
 D - Dynamic
 ---------------------------------------------------------------------------
 Client  Tunnels    TLS Sessions
 ---------------------------------------------------------------------------
 VOICE     0       0
 IPSEC     0       N/A
 SSLVPN    0       N/A

 Statistics information:
 Failed tunnels:            0
 Failed sessions:           0
 Failed encrypt pkts:                        0
 Failed encrypt pkt bytes:                   0
 Failed decrypt pkts:                        0
 Failed decrypt pkt bytes:                   0
```

```
------------------------------------------------------------------------------------------------------
show platform software cerm-information After Migration
------------------------------------------------------------------------------------------------------
```

The output after migration shows the CERM configuration is the same after migration.

```
Device# show platform software cerm-information

Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: ENABLED

 ---------------------------------------------------------------
 Resource   Maximum Limit  Available
 ---------------------------------------------------------------
 Number of tunnels       1000   1000
 Number of TLS sessions  1000   1000

 Resource reservation information:
 D - Dynamic
 ---------------------------------------------------------------------------
```

```
Client  Tunnels    TLS Sessions
-------------------------------------------------------------------------
VOICE     0       0
IPSEC     0       N/A
SSLVPN    0       N/A

Statistics information:
Failed tunnels:            0
Failed sessions:           0
Failed encrypt pkts:                          0
Failed encrypt pkt bytes:                     0
Failed decrypt pkts:                          0
Failed decrypt pkt bytes:                     0
```

Required Tasks After Migration

1. Complete topology implementation.

   In this example, we're implementing the Connected Directly to CSSM topology with the transport type **smart**. The corresponding workflow to follow is: Workflow for Topology: Connected Directly to CSSM.

   a. Set-Up Smart Account.

      In this example, the evaluation licenses are already in the Smart Licensing environment. Smart Account and Virtual Account set-up is already complete.

   b. Set-Up product instance connection to CSSM

      The sample configuration shows the required configuration for a source interface for HTTP connections, and two name servers, for name and address resolution:

      ```
      Device(config)# ip http client source-interface gigabitethernet 0/0/2
      Device(config)# ip name-server 209.165.201.1 209.165.200.225
      ```

      Refer to Setting Up a Connection to CSSM for any other steps that may be required for your set-up.

   c. Configure a connection method and transport type.

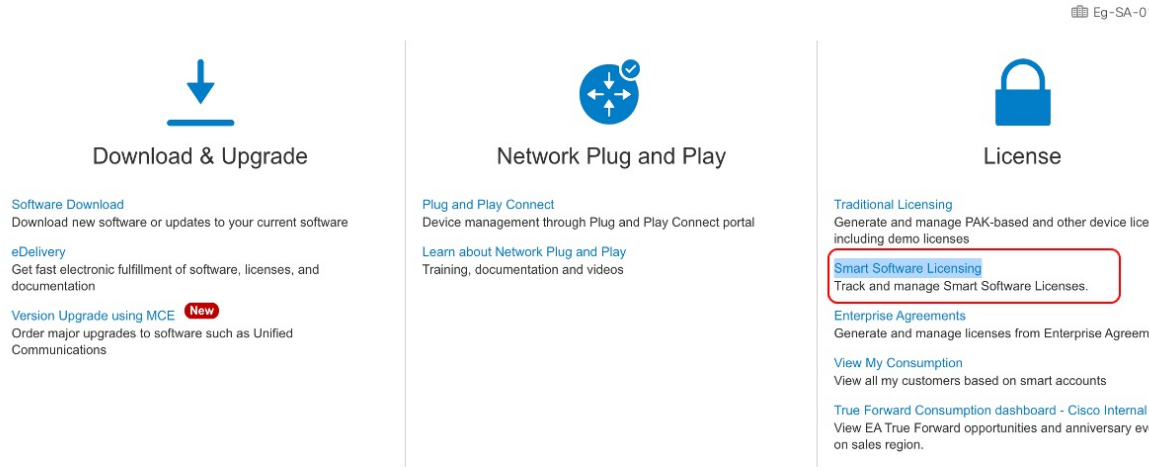
      The sample configuration below shows the required configuration to use Smart transport:

      ```
      Device(config)# license smart transport smart
      Device(config)# license smart url default
      Device(config)# exit
      Device# copy running-config startup-config
      ```

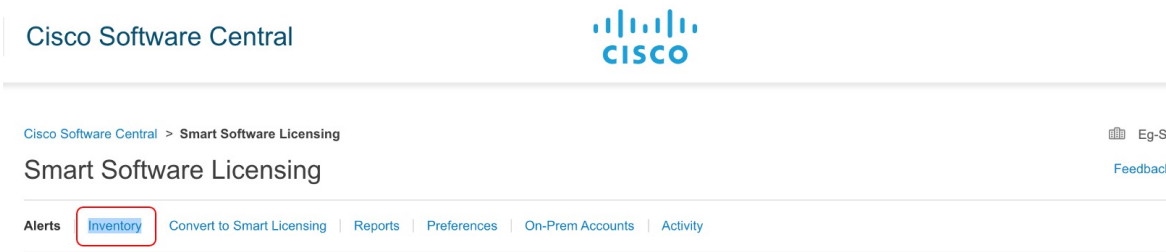
   d. Establish trust with CSSM.

      The following steps show how the token is generated and installed, and how successful trust establishment results in the provision of a policy from CSSM. (After successful trust establishment, the policy is automatically installed on all product instances of that Virtual Account):

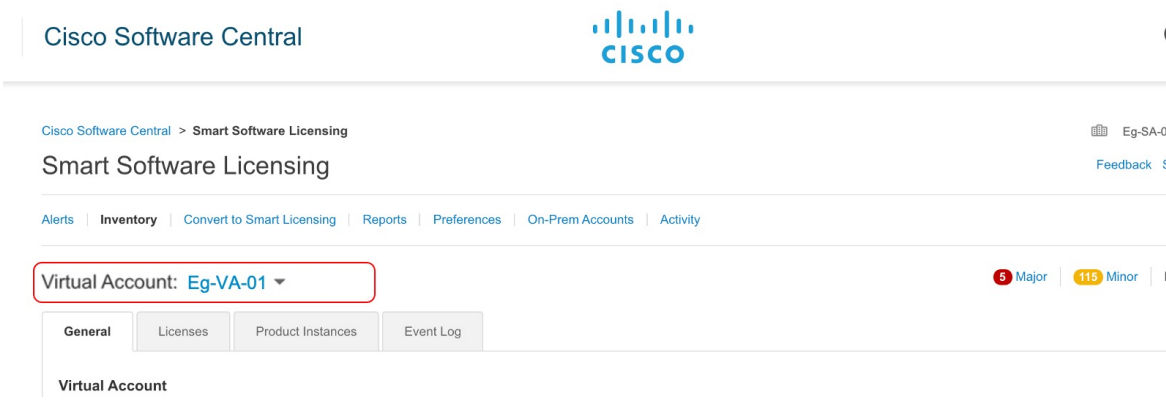
      Log in to the CSSM Web UI at https://software.cisco.com and click on **Smart Software Licensing**:



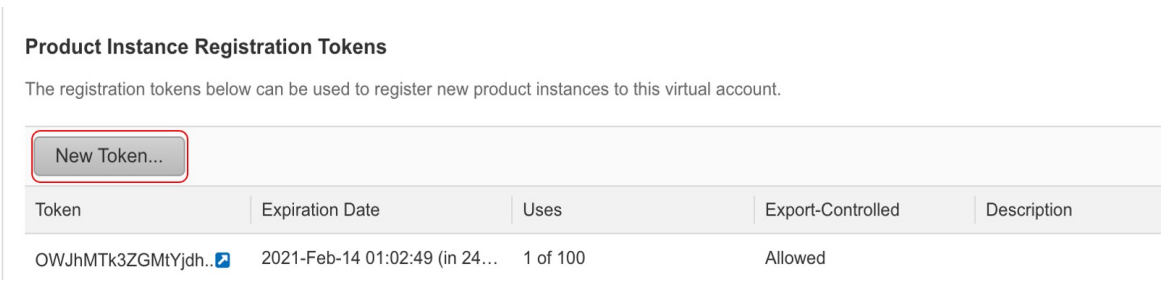
Click on the **Inventory** tab:



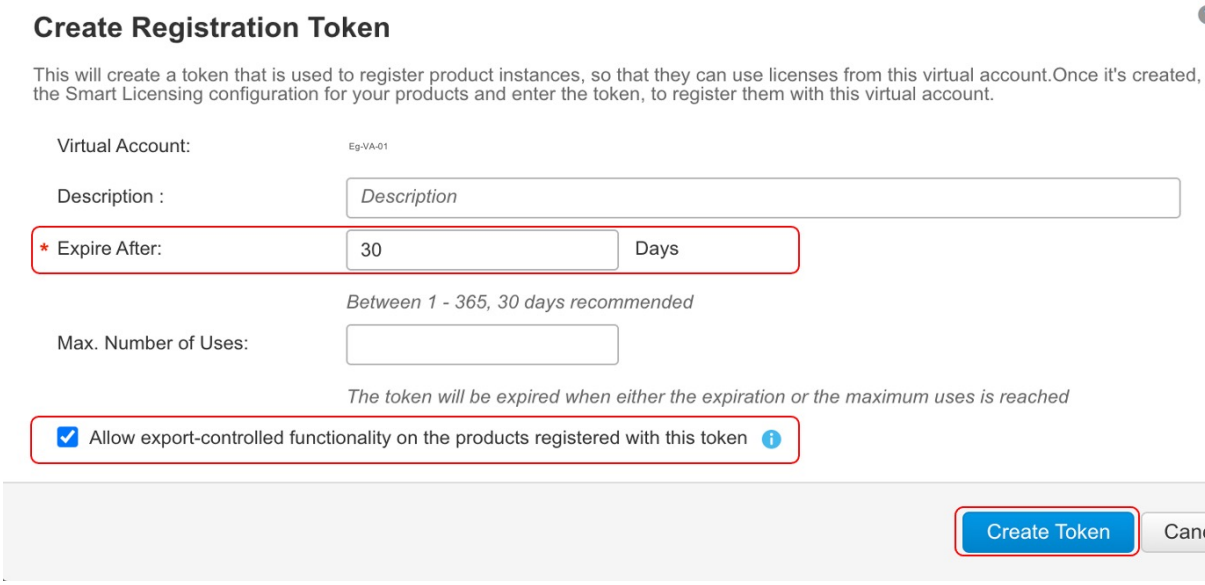
Ensure that the correct Virtual Account is selected, and click on the **General** tab:



Click on **New Token**; the **Create Registration Token** window is displayed.

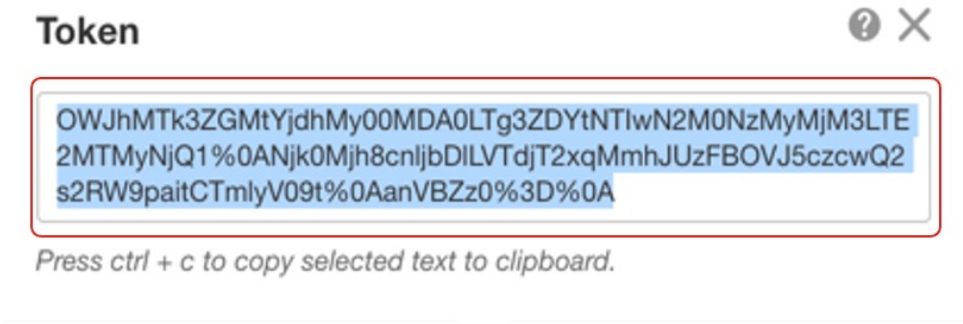


Enter the number of days for which the token must be active, and enable the export-controlled functionality check box.



Note The export-controlled functionality check box is being checked here because a SLAC is being installed after this. (SLAC installation steps are shown below). If an export-controlled license is not required, the checkbox may be left unchecked.

Copy the token to clipboard. Alternatively, you can also click **Actions** and download the token as a `.txt` file.



Install the trust code.

The sample configuration below shows the required configuration to install the trust code.

Note The system messages that are displayed after trust code installation show: a) successful trust code installation, b) new policy installation, and c) license usage synchronization with CSSM (since communication with CSSM has been restored, the product instance has automatically send the requisite RUM report):

```
Device# license smart trust idtoken
$T2xqMmhJUzFBOVJ5czcwQ2s2RW9paitCTmlyV09t%0AanVBZz0%3D%0A local

*Jan 21 03:37:14.577: %SMART_LIC-5-COMM_RESTORED: Communications with Cisco Smart
Software Manager (CSSM) restored
*Jan 21 03:37:15.404: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy
was successfully installed
*Jan 21 03:37:15.588: %SMART_LIC-6-TRUST_INSTALL_SUCCESS: A new licensing trust code
 was successfully installed on P:ISR4351/K9,S:FDO21512BJB.
*Jan 21 03:42:03.106: %SIP-1-LICENSING: SIP service is Up. License report acknowledged.
*Jan 21 03:42:03.761: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy
was successfully installed
```

2. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   System messages in the previous step show that synchronization is complete. In the sample output below, the following fields help verify synchronization:

   - The updated timestamp here: `Policy in use: Installed On Jan 21 03:42:03 2021 UTC`
   - The updated timestamp here: `Last ACK received: Jan 21 03:42:02 2021 UTC`

   In the *Connected Directly to CSSM* topology, the *product instance* sends the next RUM report to CSSM, based on the policy. In the sample output, the following fields provide this information:

   - `Next report push: Feb 20 03:38:01 2021 UTC`
   - `Next ACK deadline: Mar 22 03:42:02 2021 UTC`

```
Device# show license status
Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured

Policy:
  Policy in use: Installed On Jan 21 03:42:03 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
```

```
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: Jan 21 03:42:02 2021 UTC
  Next ACK deadline: Mar 22 03:42:02 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Feb 20 03:38:01 2021 UTC
  Last report push: Jan 21 03:38:01 2021 UTC
  Last report file write: <none>

Trust Code Installed: Jan 21 03:37:15 2021 UTC
```

3. Manually request and auto-install SLAC to use an export-controlled license. The **license smart authorization request** is supported on all enterprise routing product instances. (Additionally, alternative commands are available for certain product instances. For details, see Manually Requesting and Auto-Installing a SLAC)

```
Device# license smart authorization request replace hseck9 local
Device#
*Jan 21 03:58:37.558: %SMART_LIC-6-AUTHORIZATION_INSTALL_SUCCESS:
A new licensing authorization code was successfully installed on
PID:ISR4351/K9,SN:FDO21512BJB
*Jan 21 03:58:39.196: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
successfully installed
*Jan 21 03:59:37.087: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
 is allowed for feature hseck9
*Jan 21 04:04:10.751: %SIP-1-LICENSING: SIP service is Up. License report acknowledged.
*Jan 21 04:04:10.979: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
 is allowed for feature hseck9
*Jan 21 04:04:11.614: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
successfully installed

Device# show license summary
License Usage:
  License                 Entitlement Tag               Count Status
  -----------------------------------------------------------------------------
  throughput              (ISR_4351_400M_Performance)       1 IN USE
  hseck9                  (ISR_4351_Hsec)                   1 IN USE
  appxk9                  (ISR_4351_Application)            1 IN USE
  uck9                    (ISR_4351_UnifiedCommun...)       1 IN USE
  securityk9              (ISR_4351_Security)               1 IN USE

Device# show license all
Smart Licensing Status
======================

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
  Features Authorized:
```

```
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Installed On Jan 21 04:04:11 2021 UTC
  Policy name: SLE Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Usage Reporting:
  Last ACK received: Jan 21 04:04:10 2021 UTC
  Next ACK deadline: Mar 22 04:04:10 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Feb 20 04:00:10 2021 UTC
  Last report push: Jan 21 04:00:10 2021 UTC
  Last report file write: <none>

Trust Code Installed: Jan 21 03:37:15 2021 UTC

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

throughput (ISR_4351_400M_Performance):
  Description: throughput
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
```

```
  Feature Name: throughput
  Feature Description: throughput
  Enforcement type: NOT ENFORCED
  License type: Perpetual

hseck9 (ISR_4351_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual

appxk9 (ISR_4351_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

uck9 (ISR_4351_UnifiedCommunication):
  Description: uck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_4351_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

Product Information
===================
UDI: PID:ISR4351/K9,SN:FDO21512BJB

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:ISR4351/K9,SN:FDO21512BJB
       Status: SMART AUTHORIZATION INSTALLED on Jan 21 03:58:37 2021 UTC
       Last Confirmation code: 76c6a69b
```

```
Authorizations:
  ISR_4351_Hsec (ISR_4351_Hsec):
    Description: U.S. Export Restriction Compliance license for 4350 series
    Total available count: 1
    Enforcement type: EXPORT RESTRICTED
    Term information:
      Active: PID:ISR4351/K9,SN:FDO21512BJB
        Authorization type: SMART AUTHORIZATION INSTALLED
        License type: PERPETUAL
          Term Count: 1

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag:
regid.2015-01.com.cisco.ISR_4351_400M_Performance,1.0_79a9ccb4-d7c3-46fd-9980-7efe247c90e5

  Entitlement Tag:
regid.2015-01.com.cisco.ISR_4351_Application,1.0_601ccfff-5601-4293-98d2-2f653d864ce0
  Entitlement Tag:
regid.2014-12.com.cisco.ISR_4351_UnifiedCommunication,1.0_a04fec0e-e944-4096-bcf8-05d6e9a0a6d3

  Entitlement Tag:
regid.2014-12.com.cisco.ISR_4351_Security,1.0_df7d8d7f-b71a-4d3d-a9ab-aec7828a37a7
```

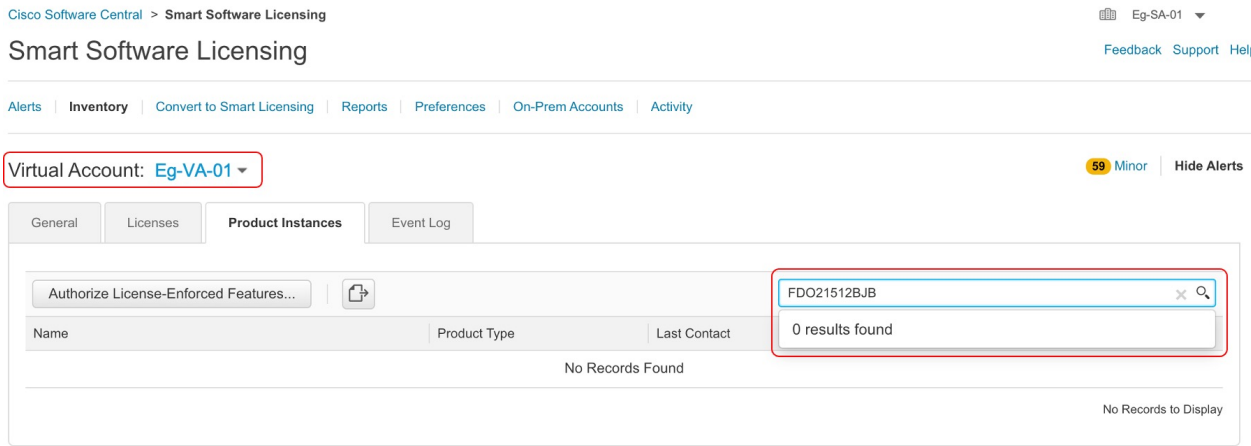
CSSM Web UI Before and After Migration

Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**. In the applicable Smart Account and Virtual Account, go to **Inventory** > **Product Instances** to display all the product instances.

CSSM Web UI Before Migration

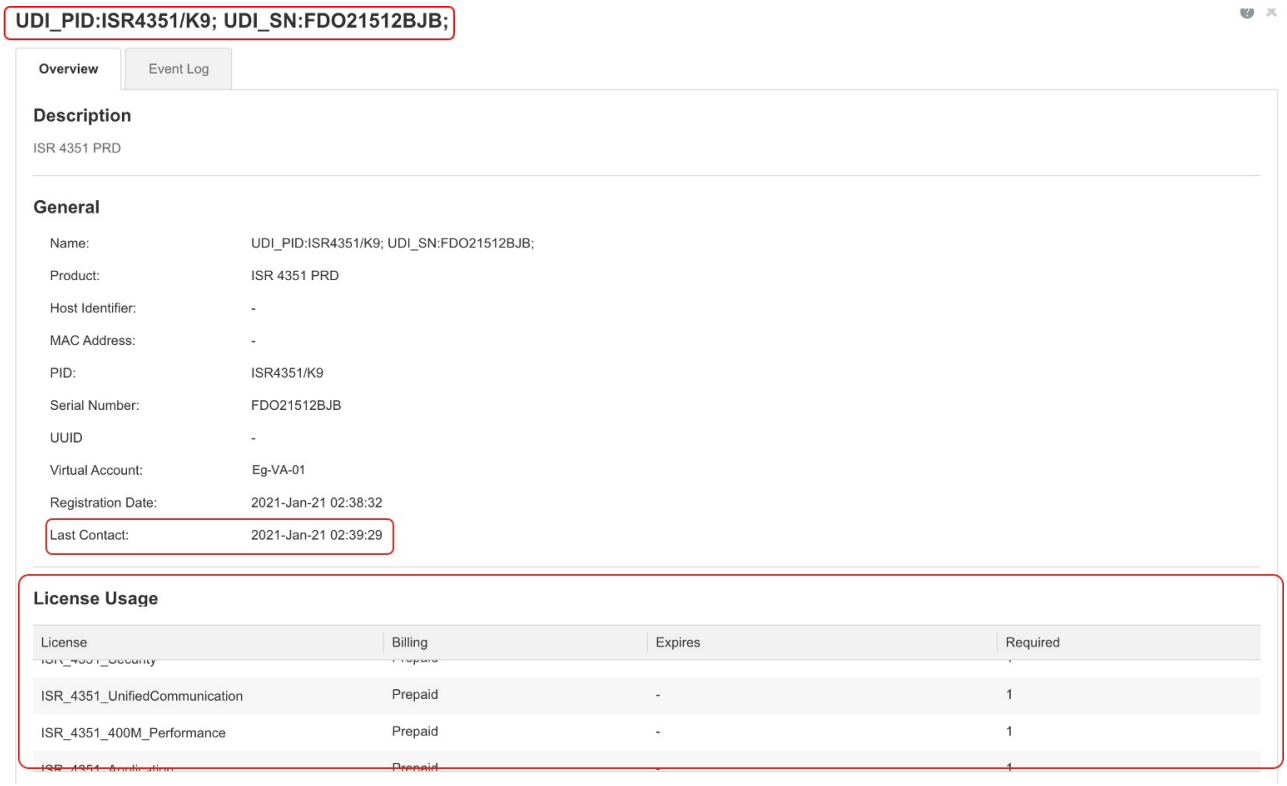
In the **Product Instances** tab area, use the search function to locate the product instance. You will see that no search results are found. This is because all the licenses on this product instance are evaluation licenses, which means the product instance had had no prior communication with CSSM.

(The notion of evaluation licenses does not exist in the Smart Licensing Using Policy environment and all the evaluation licenses will be migrated - this is displayed in the post-migration screenshot.)



CSSM Web UI After Migration

From the **Product Instances** tab, click on the UDI to display detailed license usage information as shown below.



Example: Cisco Software Licensing (PAK Licenses) to Smart Licensing Using Policy

The following is an example of a **Cisco 1000 Series Integrated Services Router** with Product Authorization Keys (PAK) licenses, which falls under the Cisco Software Licensing (CSL) licensing model, to Smart Licensing Using Policy. The software version on the product instance is upgraded from Cisco IOS XE Fuji 16.9.1 to Cisco IOS XE Amsterdam 17.3.2.

Note While this example is meant to highlight migration of PAK licenses, there are also Right-to-Use (RTU) licenses available on the product instance. The example clarifies what happens to the RTU licenses in the course of the migration process as well.

Also ensure that you are familiar with the changes in the way the system handles a PAK license and the options available to you. For detailed information, see: Snapshots for PAK Licenses.

The following is a summary of what to expect after upgrade for this example:

- Enforcement type after migration: A total of seven licenses are available on the product instance prior to migration. Only three of these are licenses are being used (**show license feature**, Enabled = yes) and and the enforcement type for these will be as follows:
  - `hseck9`: This is an HSECK9 PAK license and is an export-controlled license. It will be honored after migration and will have enforcement type EXPORT RESTRICTED. A SLAC does not have to be installed after migration. See this point about an HSECK9 PAK license here: How Upgrade Affects Enforcement Types for Existing Licenses, on page 2.
  - `appxk9` and `securityk9`: These two remaining licenses that are being used, are RTU licenses. These will also be migrated will have enforcement type NOT ENFORCED after migration.

    In this example, the `appxk9` and `securityk9` are RTU licenses - but they can also be PAK licenses. You can use the **show license feature** command to clarify. If the `RightToUse` column in the output displays `yes`, it means that they are RTU licenses. If the `RightToUse` column in the output displays `no`, they are PAK licenses.

  `ipbasek9` and `internal_services`: These are default licenses that are always available on the product instance. They will be migrated, but not displayed.

  `FoundationSuiteK9` and `throughput`: These are RTU licenses. RTU licenses that are *not* being used (**show license feature**: Enabled = no, and **show license**: License State: Active, Not in Use, EULA not accepted), will not be migrated.

- Transport type after migration: A transport type is not applicable to PAK licenses. The default transport type (**cslu**) is therefore effective after migration. After the software image is upgraded, you can implement a topology that uses CSLU, or you can implement any one of the other supported topologies and configure the transport type accordingly.

  The *Connected Directly to CSSM* topology with transport type **smart** is implemented in this example.

- Device-Led Conversion (DLC): DLC applies to this scenario, because PAK and RTU licenses are not *Smart* licenses. The *Required Tasks After Migration* section below shows how to verify the status of the DLC.

- Reporting after migration: License usage information and DLC data is being sent as part of the initial synchronization.

  After initial synchronization is completed, subsequent reporting for PAK licenses is required only if there is a change in license consumption. The output of the **show license status** command (`Next report push` and `Next ACK deadline` fields) can be used to know if and by when reporting is required. You will also receive system messages when reporting is required. The topology you implement determines the reporting *method* you can use.

Show Commands Before and After Migration

The licensing related commands available in the Cisco Software Licensing environment (with PAK licenses in this case), and in the Smart Licensing Using Policy environment are not all the same. Where the same command is not available, the closest equivalents have been used in the sample output below.

show version Before and After Migration

```
----------------------------------------------------------------------------------------------------
show version Before Migration
----------------------------------------------------------------------------------------------------
```

The output here shows the software version before upgrade.

```
Device# show version
Cisco IOS XE Software, Version 16.09.01
Cisco IOS Software [Fuji], ISR Software (ARMV8EB_LINUX_IOSD-UNIVERSALK9_IAS-M), Version
16.9.1, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Tue 17-Jul-18 17:13 by mcpre
<output truncated>
```

show version After Migration

The output here shows the software version after migration, followed by an excerpt of the licensing-related system messages that are displayed when the system restarts with the new image.

```
Device# show version
Cisco IOS XE Software, Version 17.03.02
Cisco IOS Software [Amsterdam], ISR Software (ARMV8EL_LINUX_IOSD-UNIVERSALK9-M), Version
17.3.2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Sat 31-Oct-20 11:31 by mcpre
<output truncated>

Press RETURN to get started!
*Jan 20 00:05:21.185: %ISR_THROUGHPUT-6-UNTHROTTLED: Crypto level is unthrottled
*Jan 20 00:05:23.766: %SMART_LIC-6-AGENT_ENABLED: Smart Agent for Licensing is enabled
*Jan 20 00:05:26.654: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed
*Jan 20 00:05:32.135: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is allowed for feature hseck9
*Jan 20 00:05:39.261: %SYS-5-RESTART: System restarted --
*Jan 20 00:06:10.308: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.
*Jan 20 00:06:11.574: %SMART_LIC-6-REPORTING_REQUIRED: A Usage report acknowledgement will
 be required in 365 days.
<output truncated>
```

show license feature Before Migration and **show license summary** After Migration

show license feature Before Migration

The output before migration shows all the licenses available on the product instance.

Note the licenses that are enabled (Enabled = yes). These are all the licenses that will be available after migration.

In addition, the two default licenses (ipbasek9 and internal_service) will be available after upgrade but not displayed. Default licenses will be available irrespective of whether they are enabled or not.

```
Device# show license feature

Feature name        Enforcement  Evaluation  Subscription  Enabled  RightToUse
appxk9              yes          yes         no            yes      yes
securityk9          yes          yes         no            yes      yes
ipbasek9            no           no          no            no       no
FoundationSuiteK9   yes          yes         no            no       yes
hseck9              yes          no          no            yes      no
throughput          yes          yes         no            no       yes
```

```
internal_service    yes          no          no            no       no
```

---

show license summary After Migration

The output after migration shows that the three licenses that were enabled, have been migrated and are displayed with status `IN USE`.

```
Device# show license summary

License Usage:
  License                 Entitlement Tag               Count Status
  -----------------------------------------------------------------------------
  hseck9                  (ISR_1100_8P_Hsec)                1 IN USE
  appxk9                  (ISR_1100_8P_Application)         1 IN USE
  securityk9              (ISR_1100_8P_Security)            1 IN USE
```

show license Before Migration and **show license usage** After Migration

---

show license Before Migration

The output before migration shows the state of all the licenses that are available on the product instance.

Licenses that are displayed with `License State: Active, Not in Use, EULA not accepted` will not be migrated. All other licenses, including the default ipbasek9 and internal_service will be migrated.

```
Device# show license

Index 1 Feature: appxk9
 Period left: Life time
 License Type: Permanent
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Medium
Index 2 Feature: securityk9
 Period left: Life time
 License Type: Permanent
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Medium
Index 3 Feature: ipbasek9
Index 4 Feature: FoundationSuiteK9
 Period left: Not Activated
 Period Used: 0  minute  0  second
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
 License Count: Non-Counted
 License Priority: None
Index 5 Feature: hseck9
 Period left: Life time
 License Type: Permanent
        License State: Active, In Use
 License Count: Non-Counted
 License Priority: Medium
Index 6 Feature: throughput
 Period left: Not Activated
 Period Used: 0  minute  0  second
 License Type: EvalRightToUse
```

```
 License State: Active, Not in Use, EULA not accepted
 License Count: Non-Counted
 License Priority: None
Index 7 Feature: internal_service
```

show license usage After Migration

The output after migration shows that the HSECK9 PAK license is honored (`Export status: RESTRICTED - ALLOWED`), and has enforcement type: `EXPORT RESTRICTED`.

All the other licenses are unenforced and have enforcement type: `NOT ENFORCED`.

```
Device# show license usage

License Authorization:
  Status: Not Applicable

hseck9 (ISR_1100_8P_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual

appxk9 (ISR_1100_8P_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_1100_8P_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual
```

show license all Before and After Migration

show license all Before Migration

The output before migration shows detailed information for all the available licenses on the product instance.

```
Device# show license all

License Store: Primary License Storage
```

```
StoreIndex: 0  Feature: hseck9                           Version: 1.0
 License Type: Permanent
 License State: Active, In Use
 Lock type: Node locked
 Vendor info: <UDI><PID>C1111-8PLTEEAWB</PID><SN>FGL214391J3</SN></UDI>
 License Addition: Exclusive
 License Generation version: 0x8100000
 License Count: Non-Counted
 License Priority: Medium
StoreIndex: 1  Feature: securityk9                       Version: 1.0
 License Type: Permanent
 License State: Active, In Use
 Lock type: Node locked
 Vendor info: <UDI><PID>C1111-8PLTEEAWB</PID><SN>FGL214391J3</SN></UDI>
 License Addition: Exclusive
 License Generation version: 0x8100000
 License Count: Non-Counted
 License Priority: Medium
StoreIndex: 2  Feature: appxk9                           Version: 1.0
 License Type: Permanent
 License State: Active, In Use
 Lock type: Node locked
        Vendor info: <UDI><PID>C1111-8PLTEEAWB</PID><SN>FGL214391J3</SN></UDI>
 License Addition: Exclusive
 License Generation version: 0x8100000
 License Count: Non-Counted
 License Priority: Medium
License Store: Built-In License Storage
StoreIndex: 0  Feature: appxk9                           Version: 1.0
 License Type: EvalRightToUse
 License State: Inactive
     Evaluation total period: 8  weeks 4  days
     Evaluation period left: 8  weeks 4  days
     Period used: 0  minute  0  second
 Lock type: Non Node locked
 Vendor info: <UDI><PID>NOTLOCKED</PID><SN>NOTLOCKED</SN></UDI><T>RTU</T>
 License Addition: Additive
 License Generation version: 0x8200000
 License Count: Non-Counted
 License Priority: None
StoreIndex: 1  Feature: securityk9                       Version: 1.0
 License Type: EvalRightToUse
 License State: Inactive
     Evaluation total period: 8  weeks 4  days
     Evaluation period left: 8  weeks 4  days
            Period used: 0  minute  0  second
 Lock type: Non Node locked
 Vendor info: <UDI><PID>NOTLOCKED</PID><SN>NOTLOCKED</SN></UDI><T>RTU</T>
 License Addition: Additive
 License Generation version: 0x8200000
 License Count: Non-Counted
 License Priority: None
StoreIndex: 2  Feature: FoundationSuiteK9                Version: 1.0
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
     Evaluation total period: 8  weeks 4  days
     Evaluation period left: 8  weeks 4  days
     Period used: 0  minute  0  second
 Lock type: Non Node locked
 Vendor info: <UDI><PID>NOTLOCKED</PID><SN>NOTLOCKED</SN></UDI><T>RTU</T>
 License Addition: Additive
 License Generation version: 0x8200000
 License Count: Non-Counted
 License Priority: None
```

```
StoreIndex: 3  Feature: throughput                        Version: 1.0
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
     Evaluation total period: 8  weeks 4  days
            Evaluation period left: 8  weeks 4  days
     Period used: 0  minute  0  second
 Lock type: Non Node locked
 Vendor info: <UDI><PID>NOTLOCKED</PID><SN>NOTLOCKED</SN></UDI><T>RTU</T>
 License Addition: Additive
 License Generation version: 0x8200000
 License Count: Non-Counted
 License Priority: None

--------------------------------------------------------------------------------------------------------
show license all After Migration
--------------------------------------------------------------------------------------------------------
```

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

Since PAK licenses do not have a transport type in the pre-upgrade environment, the default transport type is effective after upgrade (`Type: cslu`).

For now, the default policy is effective (Under `Policy:` see `CISCO default`). When no other policy is available, the product instance applies the CISCO default policy). A custom policy, if available, will be applied after a topology is implemented and initial synchronization is completed.

Under `License Authorizations`, you can ignore `Status: NOT INSTALLED`, since SLAC installation is not required for an HSECK9 PAK license. (Under `License Usage`, note `Export status: RESTRICTED - ALLOWED`. This shows that the license is honored after migration.

```
Device# show license all

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

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: cslu
  Cslu address: <empty>
  Proxy:
    Not Configured
```

```
Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Jan 20 00:06:11 2022 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Jan 20 00:08:11 2021 UTC
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>

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

hseck9 (ISR_1100_8P_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual

appxk9 (ISR_1100_8P_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_1100_8P_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
```

```
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

Product Information
===================
UDI: PID:C1111-8PLTEEAWB,SN:FGL214391J3

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
      Status: NOT INSTALLED
      Status:PAK

Legacy License Info:
  regid.2017-04.com.cisco.ISR_1100_8P_Application,
  1.0_c4cf42aa-2d60-4f4e-83dd-c5c9672132c9:
    DisplayName: appxk9
    Description: appxk9
    Total available count: 1
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
        License type: PERPETUAL
          Term Count: 1

  regid.2017-04.com.cisco.ISR_1100_8P_Security,
  1.0_6b61b693-0daa-42d4-8cee-930de5c1b37c:
    DisplayName: securityk9
    Description: securityk9
    Total available count: 1
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
        License type: PERPETUAL
          Term Count: 1

  regid.2017-08.com.cisco.ISR_1100_8P_Hsec,
  1.0_34a5e7e7-722a-41ab-bdad-d53d5a3cac14:
    DisplayName: hseck9
    Description: hseck9
    Total available count: 1
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
        License type: PERPETUAL
          Term Count: 1
```

show platform hardware throughput crypto Before and After Migration

```
-----------------------------------------------------------------------------------------------------
show platform hardware throughput crypto Before Migration
-----------------------------------------------------------------------------------------------------
```

The output before migration shows that the crypto throughput is unthrottled. The available HSECK9 PAK license authorizes the use of unthrottled crypto throughput. There will therefore be no change in this

configuration after migration. (On a Cisco 1000 Series Integrated Services Router, throughput is unthrottled by default. The HSECK9 license provides unthrottled *crypto* throughput).

```
Device# show platform hardware throughput crypto
The current crypto level is unthrottled

------------------------------------------------------------------------------------------------------------
show platform hardware throughput crypto After Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows that crypto throughput configuration is the same after migration.

```
Device# show platform hardware throughput crypto
The current crypto level is unthrottled
```

show platform software cerm-information Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show platform software cerm-information Before Migration
------------------------------------------------------------------------------------------------------------
```

The output before migration shows that CERM functionality is enabled. There will be no change in this configuration after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED

------------------------------------------------------------------------------------------------------------
show platform software cerm-information After Migration
------------------------------------------------------------------------------------------------------------
```

The output after migration shows the CERM configuration is the same after migration.

```
Device# show platform software cerm-information
Crypto Export Restrictions Manager(CERM) Information:
 CERM functionality: DISABLED
```

Required Tasks After Migration

1. Complete topology implementation.

   In this example, we're implementing the Connected Directly to CSSM topology with the transport type **smart**. The corresponding workflow to refer to is: Workflow for Topology: Connected Directly to CSSM.

   a. Set-Up Smart Account.

      The Smart Account and Virtual Account set-up is already completed and not shown in this example.

   b. Set-Up product instance connection to CSSM

      Refer to Setting Up a Connection to CSSM for steps that may be required for your set-up.

   c. Configure a connection method and transport type.

      The sample configuration below shows the required configuration to use Smart transport:

      ```
      Device(config)# license smart transport smart
      Device(config)# license smart url default
      Device(config)# exit
      Device# copy running-config startup-config
      ```

d. Establish trust with CSSM.

The token *generation* process is not shown here, but must be completed. See Generating a New Token for a Trust Code from CSSM. Generate one token for each *Virtual Account* you have. You can use same token for all the product instances that are part of one Virtual Account, as long as it has not expired. Token expiry corresponds to the **Expire After** field that you fill when generating a token.

Install the trust code.

The sample configuration below shows how to install the trust code, followed by system messages. The system messages show confirmation that the use of export-controlled features is allowed, new policy installation, and successful trust code installation:

```
Device# license smart trust idtoken
V0p1dCtxVXY2ZUxBQ29XYUU2Zys3dzI2aU5ZNDc1%0AQW9URT0%3D%0A all
Device#
*Jan 20 02:47:00.173: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of exportcontrolled
features is allowed for feature hseck9
*Jan 20 02:47:00.202: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy
was successfully installed
*Jan 20 02:47:00.392: %SMART_LIC-6-TRUST_INSTALL_SUCCESS: A new licensing trust code
 was successfully installed on P:C1111-8PLTEEAWB,S:FGL214391J3.
```

This completes topology implementation.

2. Check the status of the DLC.

You can monitor DLC progress by entering the **show platform software license dlc** command in command in privileged EXEC mode. DLC is complete when the output displays the following: `DLC Process Status: Completed`, `DLC Conversion Status: SUCCESS`. The DLC data will be sent to CSSM as part of usage reporting, in the next step.

The first instance of the sample output below shows the status of the DLC process soon after the software version was upgraded. The second instance of the sample output shows the status of the DLC process after around an hour.

```
Device# show platform software license dlc
Index 1  Feature:           appxk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
Index 2  Feature:           securityk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
Index 3  Feature:           hseck9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0

DLC Process Status: Not Complete

<<<<AFTER APPROXIMATELY AN HOUR>>>>>

Device# show platform software license dlc
Index 1  Feature:           appxk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
```

```
Index 2  Feature:           securityk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
Index 3  Feature:           hseck9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0

DLC Process Status: Completed
DLC Conversion Status: SUCCESS
```

3. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   For this topology you can synchronize usage by entering the **license smart sync** command in privileged EXEC mode. This manually synchronizes (sends and receives) any pending data with CSSM.

   The sample configuration below shows this, followed by system messages that show successful synchronization and confirm that the use of export-controlled features is allowed.

   The successful synchronization is indicated by successful policy installation. (A custom policy can be enclosed in a RUM ACK and a RUM ACK is sent by CSSM in response to a RUM report that has been sent).

   ```
   Device# license smart sync all
   *Jan 20 02:51:36.650: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
    is allowed for feature hseck9
   *Jan 20 02:51:36.689: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
   successfully installed
   ```

   Verify synchronization by entering the **show license all** command in privileged EXEC mode. In the sample output below, the following fields help verify synchronization:

   - The updated timestamp here: `Policy in use: Installed On Jan 20 02:51:36 2021 UTC`
   - The updated timestamp here: `Last ACK received: Jan 20 02:51:36 2021 UTC`

   In the *Connected Directly to CSSM* topology, the *product instance* sends the next RUM report to CSSM, based on the policy. In the sample output, the following fields provide this information:

   - `Next ACK deadline: Feb 19 02:51:36 2021 UTC`
   - `Next report push: Feb 19 02:47:36 2021 UTC`

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

   Smart Licensing is ENABLED

   License Conversion:
     Automatic Conversion Enabled: False
     Status: Successful on Jan 20 03:17:23 2021 UTC

   Export Authorization Key:
     Features Authorized:
       <none>

   Utility:
     Status: DISABLED
   ```

```
Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: Smart
  URL: https://smartreceiver.cisco.com/licservice/license
  Proxy:
    Not Configured

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Installed On Jan 20 02:51:36 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 30 (Customer Policy)
    Reporting frequency (days): 60 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 120 (Customer Policy)
    Reporting frequency (days): 150 (Customer Policy)
    Report on change (days): 120 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 90 (Customer Policy)
    Report on change (days): 60 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Usage Reporting:
  Last ACK received: Jan 20 02:51:36 2021 UTC
  Next ACK deadline: Feb 19 02:51:36 2021 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Feb 19 02:47:36 2021 UTC
  Last report push: Jan 20 02:47:36 2021 UTC
  Last report file write: <none>

Trust Code Installed: Jan 20 02:47:00 2021 UTC

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

hseck9 (ISR_1100_8P_Hsec):
  Description: hseck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: RESTRICTED - ALLOWED
  Feature Name: hseck9
  Feature Description: hseck9
  Enforcement type: EXPORT RESTRICTED
  License type: Perpetual
```

```
appxk9 (ISR_1100_8P_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_1100_8P_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

Product Information
===================
UDI: PID:C1111-8PLTEEAWB,SN:FGL214391J3

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
       Status: NOT INSTALLED
       Status:PAK

Legacy License Info:

regid.2017-04.com.cisco.ISR_1100_8P_Application,1.0_c4cf42aa-2d60-4f4e-83dd-c5c9672132c9:

    DisplayName: appxk9
    Description: appxk9
    Total available count: 1
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
        License type: PERPETUAL
          Term Count: 1

  regid.2017-04.com.cisco.ISR_1100_8P_Security,1.0_6b61b693-0daa-42d4-8cee-930de5c1b37c:

    DisplayName: securityk9
    Description: securityk9
    Total available count: 1
    Term information:
      Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
        License type: PERPETUAL
          Term Count: 1

  regid.2017-08.com.cisco.ISR_1100_8P_Hsec,1.0_34a5e7e7-722a-41ab-bdad-d53d5a3cac14:
    DisplayName: hseck9
    Description: hseck9
    Total available count: 1
```

```
Term information:
  Active: PID:C1111-8PLTEEAWB,SN:FGL214391J3
    License type: PERPETUAL
      Term Count: 1
```

Migration for this scenario is complete.

CSSM Web UI Before and After Migration

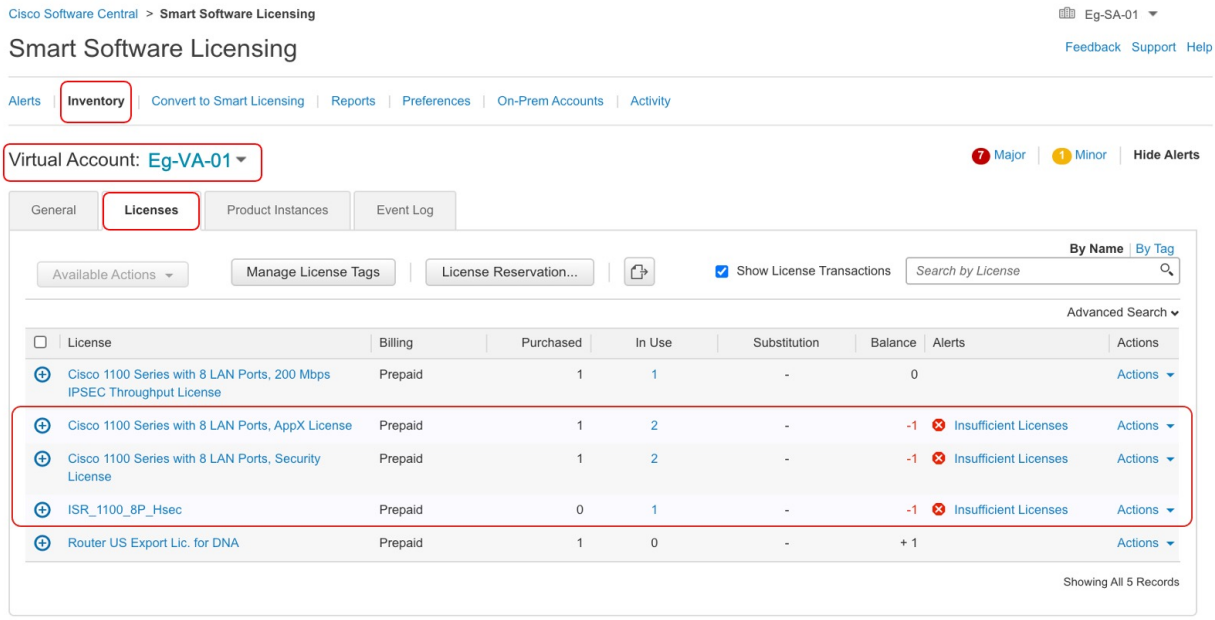
Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**.

CSSM Web UI Before Migration

In the applicable Smart Account and Virtual Account, go to **Inventory** > **Licenses** to display available licenses.

The following screenshot shows how licenses are displayed for the product instance, before upgrade.

Since they are not Smart licenses, they are displayed as Insufficient Licenses. For this same reason, their count is negative.

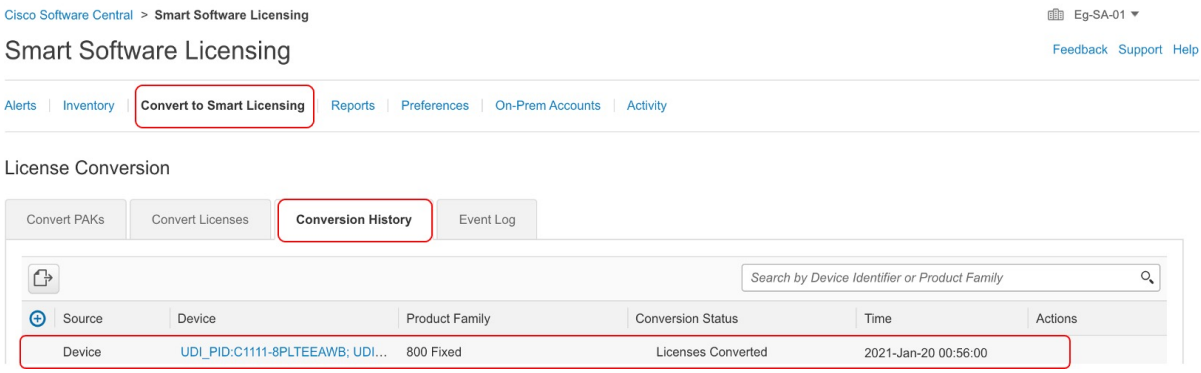


CSSM Web UI After Migration

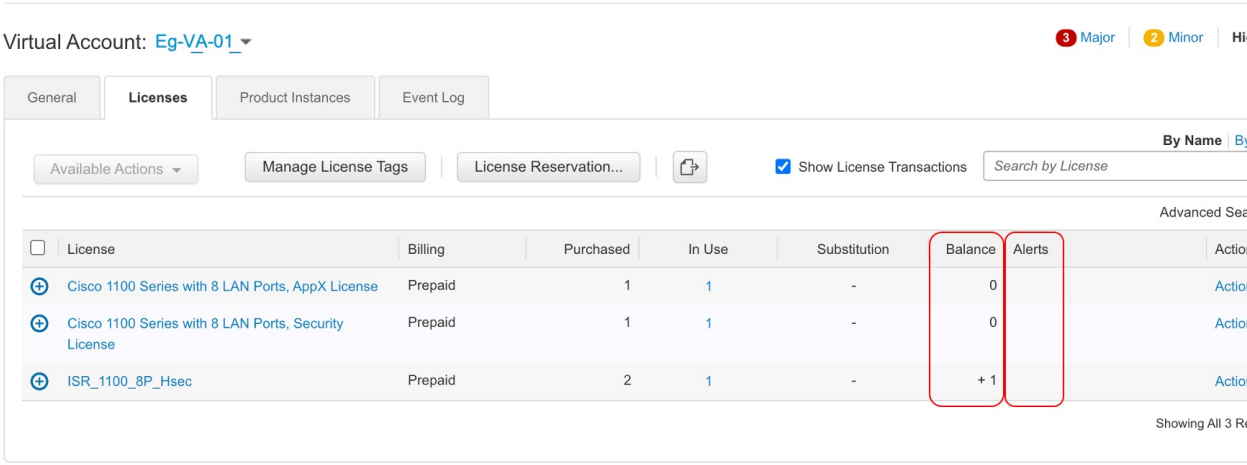
In the applicable Smart Account, go to **Convert to Smart Licensing** > **Conversion History** to verify conversion status.

The following screenshot shows how licenses are displayed for the product instance, after upgrade.

Successful DLC is reflected in the “Conversion Status” column.



Click on the product instance in the **Device** column displays license usage details for that product instance – this is displayed in the following screenshot. (The **Alerts** column no longer displays "Insufficient Licenses" and the count for all licenses is updated in the **Balance** column):



Example: Cisco Software Licensing (RTU Licenses) to Smart Licensing Using Policy

The following is an example of a **Cisco 4351 Integrated Services Router** with Right-to-Use (RTU) licenses, which falls under the Cisco Software Licensing (CSL) licensing model, to Smart Licensing Using Policy. The software version on the product instance is upgraded from Cisco IOS XE Gibraltar 16.19.6 to Cisco IOS XE Bengaluru 17.3.2. The following is a summary of what to expect after upgrade for this example:

- Enforcement type after migration: A total of 10 licenses are available on the product instance prior to migration.

  `appxk9`, `uck9`, `securityk9`, and `throughput`: Only these four licenses are being used (**show license feature**, Enabled = yes) and will be migrated. They are all RTU licenses (**show license feature** RightToUse = yes). Since none of them are export-controlled, they willl have enforcement type NOT ENFORCED after migration.

  `ipbasek9` and `internal_services`: These are default licenses that are always available on the product instance. They will be migrated, but not displayed.

`FoundationSuiteK9`, `AdvUCSuiteK9`, `cme-srst`: These are RTU licenses. RTU licenses that are *not* being used (**show license feature**: Enabled = no, and **show license**: License State: Active, Not in Use, EULA not accepted), will not be migrated.

`hseck9`: This is an export-controlled license and requires a PAK license in the RTU environment - but in this example, the requisite PAK license is not available. This license will therefore not be migrated.

- Transport type after migration: A transport type is not applicable to RTU licenses. The default transport type (**cslu**) is therefore effective after migration. After the software image is upgraded, you can implement a topology that uses CSLU, or any one of the other supported topologies and configure the transport type accordingly.

  The *Connected to CSSM Through CSLU (with product instance-initiated communication)* topology with transport type **cslu** is implemented in this example.

- Device-Led Conversion (DLC): DLC applies to this scenario, because RTU licenses are not *Smart* licenses. The *Required Tasks After Migration* section below shows how to verify the status of the DLC.

- Reporting after migration: License usage information and DLC data is being sent as part of the initial synchronization.

  After initial synchronization is completed, subsequent reporting for RTU licenses depends on the license being used. The output of the **show license status** command (`Next report push` and `Next ACK deadline` fields) can be used to know if and by when reporting is required. You will also receive system messages when reporting is required. The topology you implement determines the reporting *method* you can use.

Show Commands Before and After Migration

The licensing related commands available in the Cisco Software Licensing environment (with RTU licenses in this case) and in the Smart Licensing Using Policy environment are not all the same. Where the same command is not available, the closest equivalents have been used in the sample output below.

show version Before and After Migration

```
------------------------------------------------------------------------------------------------------------
show version Before Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version before upgrade.

```
Device# show version
Cisco IOS XE Software, Version 16.09.06
Cisco IOS Software [Fuji],
ISR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 16.9.6, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Thu 27-Aug-20 02:41 by mcpre

<output truncated>
```

```
------------------------------------------------------------------------------------------------------------
show version After Migration
------------------------------------------------------------------------------------------------------------
```

The output here shows the software version after migration, followed by an excerpt of the licensing-related system messages that are displayed when the system restarts with the new image.

```
Device# show version
Cisco IOS XE Software, Version 17.03.02
Cisco IOS Software [Amsterdam],
```

```
ISR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Version 17.3.2, RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2020 by Cisco Systems, Inc.
Compiled Sat 31-Oct-20 13:21 by mcpre

<output truncated>


Press RETURN to get started!

*Jan 29 18:18:31.506: %ISR_THROUGHPUT-6-LEVEL: Throughput level has been set to 400000 kbps
*Jan 29 18:18:34.482: %SMART_LIC-6-AGENT_ENABLED: Smart Agent for Licensing is enabled
*Jan 29 18:18:34.980: %SMART_LIC-6-EXPORT_CONTROLLED: Usage of export controlled features
is not allowed.
*Jan 29 18:19:04.089: %SYS-5-RESTART: System restarted --
*Jan 29 18:19:41.554: %CALL_HOME-6-CALL_HOME_ENABLED: Call-home is enabled by Smart Agent
for Licensing.
*Jan 29 18:19:42.803: %SMART_LIC-6-REPORTING_REQUIRED: A Usage report acknowledgement will
 be required in 365 days.
```

show license feature Before Migration and **show license summary** After Migration

---

show license feature Before Migration

The output before migration shows all the licenses available on the product instance.

Note the licenses that are enabled (Enabled = yes). These are all the licenses that will be available after migration.

In addition, the two default licenses (ipbasek9 and internal_service) will be available after upgrade but not displayed. Default licenses are available irrespective of whether they are enabled or not.

```
Device# show license feature

Feature name         Enforcement  Evaluation  Subscription   Enabled  RightToUse
appxk9               yes          yes         no             yes      yes
uck9                 yes          yes         no             yes      yes
securityk9           yes          yes         no             yes      yes
ipbasek9             no           no          no             no       no
FoundationSuiteK9    yes          yes         no             no       yes
AdvUCSuiteK9         yes          yes         no             no       yes
cme-srst             yes          yes         no             no       yes
hseck9               yes          no          no             no       no
throughput           yes          yes         no             yes      yes
internal_service     yes          no          no             no       no
```

---

show license summary After Migration

The output after migration shows that all the licenses that were enabled (Enabled = yes) before upgrade have been migrated and are displayed with status IN USE.

The default licenses (ipbasek9, internal_service) are not displayed even though they are also migrated.

```
Device# show license summary

License Usage:
  License              Entitlement Tag               Count Status
```

```
  ----------------------------------------------------------------------
  throughput           (ISR_4351_400M_Performance)       1 IN USE
  appxk9               (ISR_4351_Application)            1 IN USE
  uck9                 (ISR_4351_UnifiedCommun...)       1 IN USE
  securityk9           (ISR_4351_Security)               1 IN USE
```

show license Before Migration and **show license all** After Migration

```
-------------------------------------------------------------------------------------------------------
show license Before Migration
-------------------------------------------------------------------------------------------------------
```

The output before migration shows the state of all the licenses that are available on the product instance.

Note all licenses that have `License State: Active, In Use`. These are the licenses that are displayed with Enabled = yes in the sample output of the **show license feature** privileged EXEC command above. These and the default licenses will be migrated.

Licenses that are displayed with `License State: Active, Not in Use, EULA not accepted` will not be migrated.

```
Device# show license

Index 1 Feature: appxk9
 Period left: 8  weeks 3  days
 Period Used: 5  minutes 27 seconds
 License Type: EvalRightToUse
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Low
Index 2 Feature: uck9
 Period left: 8  weeks 3  days
 Period Used: 5  minutes 27 seconds
 License Type: EvalRightToUse
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Low
Index 3 Feature: securityk9
 Period left: 8  weeks 3  days
 Period Used: 5  minutes 27 seconds
 License Type: EvalRightToUse
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Low
Index 4 Feature: ipbasek9
Index 5 Feature: FoundationSuiteK9
        Period left: Not Activated
 Period Used: 0  minute  0  second
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
 License Count: Non-Counted
 License Priority: None
Index 6 Feature: AdvUCSuiteK9
 Period left: Not Activated
 Period Used: 0  minute  0  second
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
 License Count: Non-Counted
 License Priority: None
Index 7 Feature: cme-srst
 Period left: Not Activated
 Period Used: 0  minute  0  second
```

```
 License Type: EvalRightToUse
 License State: Active, Not in Use, EULA not accepted
 License Count: 0/0  (In-use/Violation)
 License Priority: None
Index 8 Feature: hseck9
Index 9 Feature: throughput
 Period left: 8  weeks 3  days
        Period Used: 5  minutes 26 seconds
 License Type: EvalRightToUse
 License State: Active, In Use
 License Count: Non-Counted
 License Priority: Low
Index 10 Feature: internal_service

-----------------------------------------------------------------------------------------------------
show license all After Migration
-----------------------------------------------------------------------------------------------------
```

The output after migration shows that the product instance is now in the Smart Licensing Using Policy environment (`Smart Licensing Using Policy: Status: ENABLED`).

Section `Transport`: Since RTU licenses do not have a transport type in the pre-upgrade environment, the default transport type is effective after upgrade (`Type: cslu`).

Section `Policy`: For now, the default policy is effective (Under `Policy:` see `CISCO default`). When no other policy is available, the product instance applies the CISCO default policy). A custom policy, if available, will be applied after a topology is implemented and initial synchronization is completed.

Section `License Usage`: There are no export-controlled and all licenses have `Enforcement type: NOT ENFORCED`.

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

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Not started

Export Authorization Key:
  Features Authorized:
    <none>

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: cslu
  Cslu address: <empty>
  Proxy:
    Not Configured

Miscellaneous:
```

```
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 365 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 90 (CISCO default)
    Report on change (days): 90 (CISCO default)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 0 (CISCO default)
    Report on change (days): 0 (CISCO default)

Usage Reporting:
  Last ACK received: <none>
  Next ACK deadline: Jan 29 18:19:42 2022 UTC
  Reporting push interval: 30  days
  Next ACK push check: <none>
  Next report push: Jan 29 18:21:42 2021 UTC
  Last report push: <none>
  Last report file write: <none>

Trust Code Installed: <none>

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

throughput (ISR_4351_400M_Performance):
  Description: throughput
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: throughput
  Feature Description: throughput
  Enforcement type: NOT ENFORCED
  License type: Perpetual

appxk9 (ISR_4351_Application):
  Description: appxk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: appxk9
  Feature Description: appxk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

uck9 (ISR_4351_UnifiedCommunication):
  Description: uck9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
```

```
  Feature Name: uck9
  Feature Description: uck9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

securityk9 (ISR_4351_Security):
  Description: securityk9
  Count: 1
  Version: 1.0
  Status: IN USE
  Export status: NOT RESTRICTED
  Feature Name: securityk9
  Feature Description: securityk9
  Enforcement type: NOT ENFORCED
  License type: Perpetual

Product Information
===================
UDI: PID:ISR4351/K9,SN:FDO210305DQ

Agent Version
=============
Smart Agent for Licensing: 5.0.6_rel/47

License Authorizations
======================
Overall status:
  Active: PID:ISR4351/K9,SN:FDO210305DQ
      Status: NOT INSTALLED

Purchased Licenses:
  No Purchase Information Available


Derived Licenses:
  Entitlement Tag: regid.2015-01.com.cisco.ISR_4351_400M_Performance,
1.0_79a9ccb4-d7c3-46fd-9980-7efe247c90e5
  Entitlement Tag: regid.2015-01.com.cisco.ISR_4351_Application,
1.0_601ccfff-5601-4293-98d2-2f653d864ce0
  Entitlement Tag: regid.2014-12.com.cisco.ISR_4351_UnifiedCommunication,
1.0_a04fec0e-e944-4096-bcf8-05d6e9a0a6d3
  Entitlement Tag: regid.2014-12.com.cisco.ISR_4351_Security,
1.0_df7d8d7f-b71a-4d3d-a9ab-aec7828a37a7
```

show platform hardware throughput level Before and After Migration

---

show platform hardware throughput level Before Migration

This command displays the currently configured throughput. The sample output shows that the throughput is set to 400000 kbps. This is authorised by the performance license (in the **show license** output, see `Feature: throughput`), which allows for increased throughput. The configured throughput will therefore be retained after migration.

```
Device# show platform hardware throughput level
The current throughput level is 400000 kbps
```

---

show platform hardware throughput level After Migration

The sample output shows that throughput configuration is retained after migration.

```
Device# show platform hardware throughput level
The current throughput level is 400000 kbps
```

Required Tasks After Migration

1. Complete topology implementation.

   In this example, we're implementing the Connected to CSSM Through CSLU (Product Instance-Initiated Communication) topology with the transport type **cslu**. The corresponding workflow to refer to is: Workflow for Topology: Connected to CSSM Through CSLU > Tasks for Product Instance-Initiated Communication.

   a. CSLU Installation

      CSLU installation is not shown here, but must be completed

      Download the file from Smart Software Manager > **Smart Licensing Utility**.

      Refer to Cisco Smart License Utility Quick Start Setup Guide for help with installation and set-up.

   b. CSLU Preference Settings

      CSLU settings are not shown here, but must be completed

      Logging into Cisco (CSLU Interface)

      Configuring a Smart Account and a Virtual Account (CSLU Interface)

      Adding a Product-Initiated Product Instance in CSLU (CSLU Interface)

   c. Product Instance Configuration

      Configure all required commands to ensure network reachability. Refer to Ensuring Network Reachability for Product Instance-Initiated Communication for steps that may be required for your set-up.

      ```
      Device(config)# ip route 192.168.0.1 255.255.0.0 192.168.255.1
      ```

      Ensure that transport type is set to **cslu**.

      CSLU is the default transport type, since this has not been changed, it does not have to be reconfigured. (See the sample output of the **show license all** privileged EXEC command above).

      Specify how you want CSLU to be discovered, and synchronize with CSLU to send and receive pending data.

      In this example, we're configuring the CSLU URL. Enter the **license smart url cslu** *http://<cslu_ip_or_host>:8182/cslu/v1/pi* command in global configuration mode. For `<cslu_ip_or_host>`, enter the hostname or the IP address of the windows host where you have installed CSLU. 8182 is the port number and it is the only port number that CSLU uses.

      The system message that is displayed after configuration is completed, shows that the communication with CSLU is established now.

      ```
      Device(config)# license smart url cslu http://192.168.0.1:8182/cslu/v1/pi
      *Jan 29 18:36:35.457: %SMART_LIC-5-COMM_RESTORED: Communications with Cisco Smart
      License Utility (CSLU) restored.
      ```

This completes topology implementation.

2. Check the status of the DLC.

   You can monitor DLC progress by entering the **show platform software license dlc** command in command in privileged EXEC mode. DLC is complete when the output displays the following: `DLC Process Status: Completed`, `DLC Conversion Status: SUCCESS`. The DLC data will be sent to CSSM as part of usage reporting, in the next step.

   The first instance of the sample output below shows the status of the DLC process soon after the software version was upgraded. The second instance of the sample output shows the status of the DLC process after around an hour.

```
Device# show platform software license dlc

Index 1  Feature:           appxk9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 2  Feature:           uck9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 3  Feature:           securityk9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 4  Feature:           throughput
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0

DLC Process Status: Not Complete

<<<<AFTER 1 HOUR>>>>>

Device# show platform software license dlc

Index 1  Feature:           appxk9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 2  Feature:           uck9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 3  Feature:           securityk9
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0
Index 4  Feature:           throughput
 Permanent License:  0
 EVAL RTU License:   1
 RTU License:        0
 Paper License:      0

DLC Process Status: Completed
```

```
DLC Conversion Status: SUCCESS
```

3. Synchronize license usage with CSSM, verify synchronization, and check subsequent reporting requirements.

   For this topology you can synchronize usage by entering the **license smart sync** command in privileged EXEC mode. This manually synchronizes (sends and receives) any pending data with CSLU. CSLU in turn synchronizes with CSSM.

   The sample configuration below shows this, followed by system messages that show successful synchronization.

```
Device# license smart sync all
*Jan 29 18:40:37.836: %SIP-1-LICENSING: SIP service is Up. License report acknowledged.
*Jan 29 18:40:38.484: %SMART_LIC-6-POLICY_INSTALL_SUCCESS: A new licensing policy was
successfully installed
```

   Verify synchronization by entering the **show license status** (or even **show license all**) command in privileged EXEC mode.

   In the sample output below, the following fields help verify that synchronization has been completed:

   - The updated timestamp here: `Policy in use: Installed On Jan 29 18:40:38 2021 UTC`
   - The updated timestamp here: `Last ACK received: Jan 29 18:40:37 2021 UTC`

   In the *Connected to CSSM Through CSLU* topology with Product Instance-Initiated Communication, the *product instance* sends the next RUM report to CSSM, based on the policy. In the sample output, the following fields provide this information:

Note Reporting is not required until the policy or system messages indicate that it is. Here, after initial synchronization, the updated policy shows that reporting is not required.

   - Next report push: <none>
   - Next ACK deadline: <none>

```
Device# show license status

Utility:
  Status: DISABLED

Smart Licensing Using Policy:
  Status: ENABLED

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

Transport:
  Type: cslu
  Cslu address: http://192.168.0.1:8182/cslu/v1/pi
  Proxy:
    Not Configured
```

```
Policy:
  Policy in use: Installed On Jan 29 18:40:38 2021 UTC
  Policy name: SLP Policy
  Reporting ACK required: yes (Customer Policy)
  Unenforced/Non-Export Perpetual Attributes:
    First report requirement (days): 25 (Customer Policy)
    Reporting frequency (days): 25 (Customer Policy)
    Report on change (days): 25 (Customer Policy)
  Unenforced/Non-Export Subscription Attributes:
    First report requirement (days): 15 (Customer Policy)
    Reporting frequency (days): 15 (Customer Policy)
    Report on change (days): 15 (Customer Policy)
  Enforced (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 35 (Customer Policy)
    Report on change (days): 35 (Customer Policy)
  Export (Perpetual/Subscription) License Attributes:
    First report requirement (days): 0 (CISCO default)
    Reporting frequency (days): 30 (Customer Policy)
    Report on change (days): 30 (Customer Policy)

Miscellaneous:
  Custom Id: <empty>

Usage Reporting:
  Last ACK received: Jan 29 18:40:37 2021 UTC
  Next ACK deadline: <none>
  Reporting push interval: 0 (no reporting)
  Next ACK push check: <none>
  Next report push: <none>
  Last report push: Jan 29 18:36:38 2021 UTC
  Last report file write: <none>

Trust Code Installed: <none>
```

CSSM Web UI and CSLU UI Before and After Migration

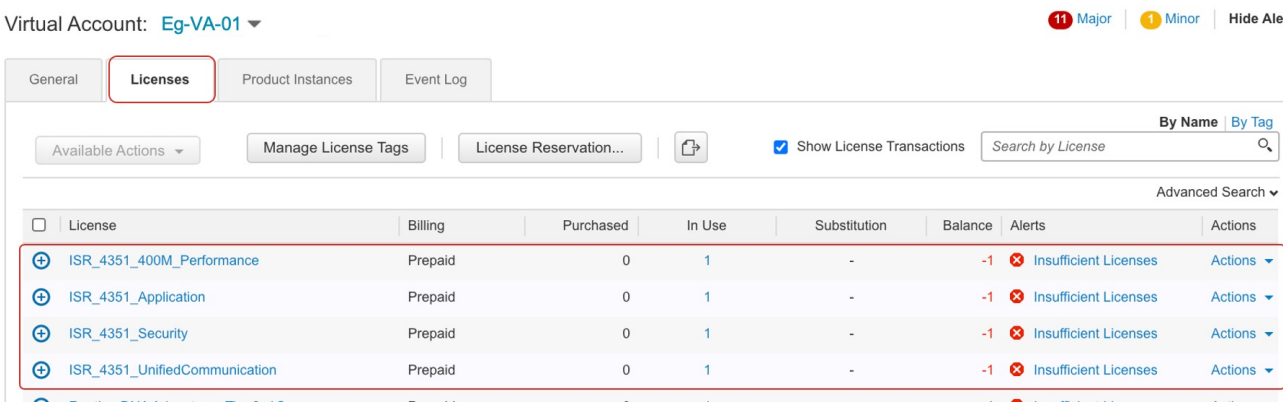
CSSM Web UI Before Migration

Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**.

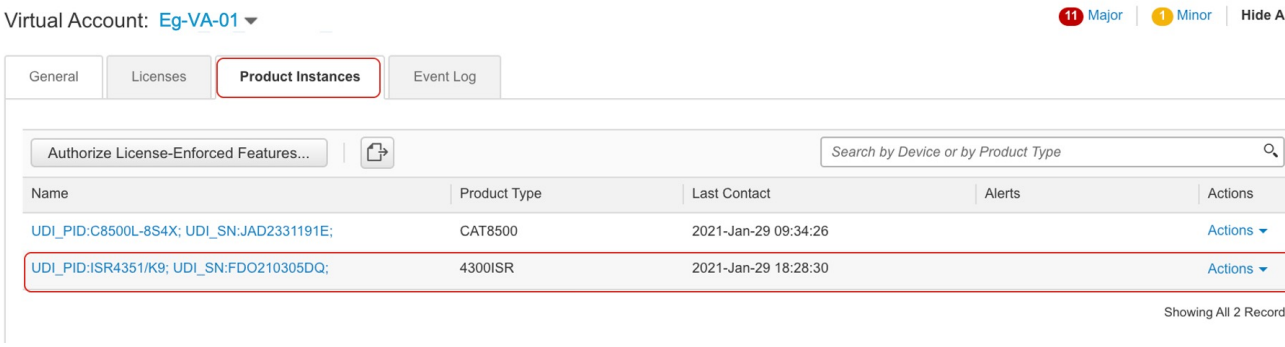
In the applicable Smart Account and Virtual Account, go to **Inventory** > **Licenses** to display available licenses.

The following screenshot shows how licenses are displayed for the product instance, before upgrade.

Since they are not Smart licenses, they are displayed as Insufficient Licenses. For this same reason, their count is negative.



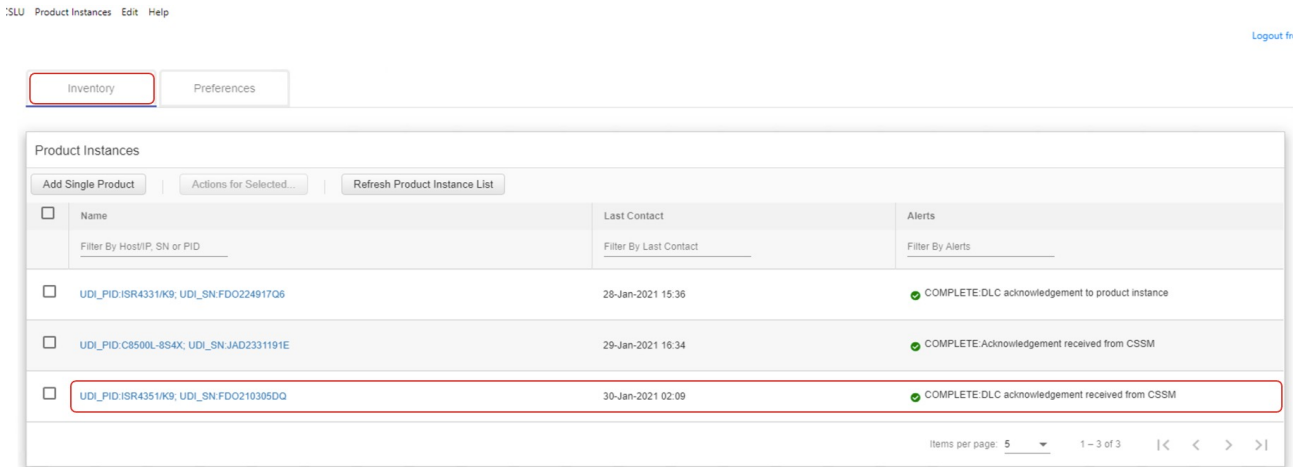
Next, click on the **Product Instances** tab to display information about the product instance that will be migrated.



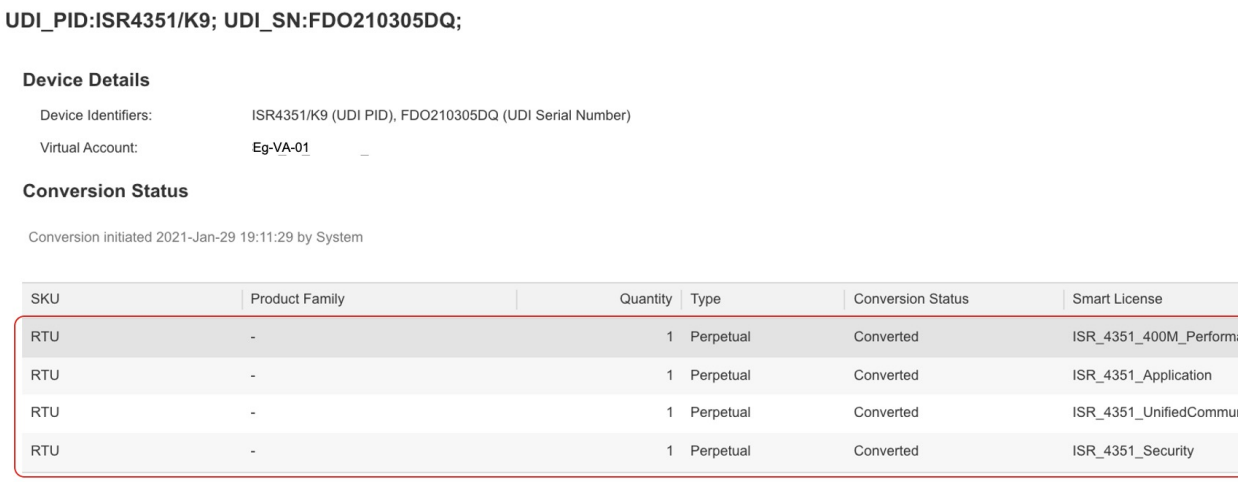
CSLU UI After Migration

In the *CSLU UI*, click the **Inventory** tab to display the Product Instances table.

See the **Alerts** column for the product instance (ISR4351/K9:FDO210305DQ in this example) that was migrated. Information about successful DLC converation is provided here - this displayed in the following screenshot:



Click on the product instance in the **Name** column to display license usage details for the product instance – this is displayed in the following screenshot:



UDI_PID:ISR4351/K9; UDI_SN:FDO210305DQ;

Device Details

Device Identifiers: ISR4351/K9 (UDI PID), FDO210305DQ (UDI Serial Number)

Virtual Account: Eg-VA-01

Conversion Status

Conversion initiated 2021-Jan-29 19:11:29 by System

SKU	Product Family	Quantity	Type	Conversion Status	Smart License
RTU	-	1	Perpetual	Converted	ISR_4351_400M_Perform
RTU	-	1	Perpetual	Converted	ISR_4351_Application
RTU	-	1	Perpetual	Converted	ISR_4351_UnifiedCommu
RTU	-	1	Perpetual	Converted	ISR_4351_Security

You can also verify the same on the CSSM Web UI: Log in to the CSSM Web UI at https://software.cisco.com and click **Smart Software Licensing**. In the applicable Smart Account, go to **Convert to Smart Licensing** > **Conversion History** to verify conversion status. Successful DLC is reflected in the "Conversion Status" column.

Migrating to a Version of SSM On-Prem That Supports Smart Licensing Using Policy

If you are using a version of SSM On-Prem that is earlier than the minimum required version (See Cisco Smart Software Manager On-Prem (SSM On-Prem)), you can use this section as an outline of the process and sequence you have to follow to update the SSM On-Prem version, the product instance, and any other tasks like SLAC installation, if applicable.

1. Upgrade SSM On-Prem.

   Upgrade to the minimum required Version 8, Release 202102 or a later version.

   Refer to the Cisco Smart Software Manager On-Prem Migration Guide.

2. Generate SLAC in CSSM and import it into SSM On-Prem (Only if Applicable).

   If you are using a CSR 1000v or ISRv *with throughput greater than 250 Mbps*, an HSECK9 license will be required in the Smart Licensing Using Policy environment. (U.S. export control regulations no longer allow the use of the export control flag to authorize throughput greater than 250 Mbps).

   Complete this procedure before you upgrade the product instanceSubmitting an Authorization Code Request (SSM On-Prem UI, Disconnected Mode).

3. Upgrade the product instance.

   For information about the minimum required software version, see Cisco Smart Software Manager On-Prem (SSM On-Prem).

   For information about the upgrade procedure, see Upgrading the Software Version, on page 6.

4. Re-Register a local account with CSSM

Online and Offline options are available. Refer to the Cisco Smart Software Manager On-Prem Migration Guide > *Re-Registering a local Account (Online Mode)* or *Manually Re-Registering a Local Account (Offline Mode)* .

Once re-registration is complete, the following events occur automatically:

- SSM On-Prem responds with new transport URL that points to the tenant in SSM On-Prem.
- The transport type configuration on the product instance changes from from **call-home** or **smart**, to **cslu**. The transport URL is also updated automatically.

5. Request and install SLAC on applicable product instances: Manually Requesting and Auto-Installing a SLAC.

   If you performed step 2 for a product instance, you must complete this step to request and install SLAC on the product instance (for an HSECK9 license).

6. Save configuration changes on the product instance, by entering the **copy running-config startup-config** command in privileged EXEC mode.

7. Clear older On-Prem Smart Licensing certificates on the product instance and reload the product instance. Do not save configuration changes after this.



Note This step is required only if the software version running on the product instance is Cisco IOS XE Amsterdam 17.3.x or Cisco IOS XE Bengaluru 17.4.x.

Enter the **licence smart factory reset** and then the **reload** commands in privileged EXEC mode.

```
Device# licence smart factory reset
Device# reload
```

8. If Device-Led Conversion (DLC) applies, wait an hour for DLC data collection to be completed.

   If the product instance was using Right-To-Use (RTU) or Product Authorization Keys (PAK) licenses prior to product instance upgrade, wait for an hour before you proceed to the next step. By waiting for an hour, you can send DLC data as part of initial usage report. If you do not wait, you have to repeat Step 9 and Step 10.

   If the product instance was NOT using PAK or RTU licenses prior to product instance upgrade, skip this step and proceed to the next step.

9. Perform usage synchronization.

   a. On the product instance, enter the **license smart sync** {**all**|**local**} command, in privileged EXEC mode. This synchronizes the product instance with SSM On-Prem, to send and receive any pending data.

      ```
      Device(config)# license smart sync local
      ```

      You can verify this in the SSM On-Prem UI. Go to **Inventory** > **SL Using Policy**. In the **Alerts** column, the following message is displayed: Usage report from product instance.

   b. Synchronize usage information with CSSM (*choose one*).

      - Option 1:

SSM On-Prem is connected to CSSM: In the SSM On-Prem UI, Smart Licensing workspace, nagivate to **Reports** > **Usage Schedules** > **Synchronize now with Cisco**.

- Option 2:

  SSM On-Prem is not connected to CSSM. See: Exporting and Importing Usage Data (SSM On-Prem UI).

After you synchronize usage with CSSM, wait for a few minutes for the device to receive the ACK from SSM On-Prem. To verify that the product instance has received the ACK, enter the **show license status** command in privileged EXEC mode, and in the output, check the date for the `Last ACK received` field.

10. If DLC was applicable in Step 8, verify DLC completion and synchronize the local account.

a. Verify DLC completion.

In SSM On-Prem UI, navigate to the **On-Prem Admin Workspace**, and click the **Support Centre** widget. Look for the following events in the **Event Log** tab: `DLC request sent to CSSM` and `DLC acknowledgement received from CSSM`.

On the product instance, enter the **show license all** privileged EXEC command and check the timestamp in the `License Conversion` section of the output.

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

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: False
  Status: Successful on Aug 11 05:42:21 2021 UTC

<output truncated>
```

On the product instance, enter the the **show platform software license dlc** privileged EXEC command, check `DLC Process Status` and `DLC Conversion Status` fields; they should display `Completed` and `SUCCESS`, respectively.

Note If DLC was applicable and *you did not wait for one hour* before usage synchronization, then DLC data is not included in the RUM report and status "Completed" is not displayed in the output below. You then have to repeat Steps 9 and 10 before you can see this status.

```
Device# show platform software license dlc
Index 1  Feature:           appxk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
Index 2  Feature:           securityk9
 Permanent License:  1
 EVAL RTU License:   0
 RTU License:        0
 Paper License:      0
Index 3  Feature:           hseck9
 Permanent License:  1
```

```
 EVAL RTU License:    0
 RTU License:         0
 Paper License:       0

DLC Process Status: Completed

DLC Conversion Status: SUCCESS
```

b. Synchronize the local account in SSM On-Prem with CSSM, by using the **Synchronization** widget in SSM On-Prem.

Result:

You have completed migration, initial usage synchronization, and DLC - if applicable. Product instance and license usage information is now displayed in SSM On-Prem.

For subsequent reporting, you have the following options:

- To synchronize data between the product instance and SSM On-Prem:
  - Schedule periodic synchronization between the product instance and SSM On-Prem, by configuring the reporting interval. Enter the **license smart usage interval** *interval_in_days* command in global configuration mode.

    To know when the product instance will be sending the next RUM report, enter the **show license all** command in privileged EXEC mode and in the output, check the `Next report push:` field.
  - Enter the **license smart sync** privileged EXEC command, for ad hoc or on-demand synchronization between the product instance and SSM On-Prem.
- To synchronize usage information with CSSM:
  - Schedule periodic synchronization with CSSM. In the SSM On-Prem UI, navigate to **Reports** > **Usage Schedules** > **Synchronization schedule with Cisco**. Enter the following frequency information and save:
    - **Days**: Refers to how *often* synchronization occurs. For example, if you enter 2, synchronization occurs once every two days.
    - **Time of Day:**: Refers to the time at which synchronization occurs, in the 24-hour notation system. For example, if you enter 14 hours and 0 minutes, synchronization occurs at 2 p.m. (1400) in your local time zone.
  - Upload and download the required files for reporting: Exporting and Importing Usage Data (SSM On-Prem UI)).