

Smart Software Licensing

This chapter provides an overview of Smart Software Licensing and describes the tools and processes required to complete the registration and authorization for Cisco MDS 9000 Series Switches.

For Cisco MDS switches running NX-OS 9.2(2) or earlier releases, you must use Smart Software Licensingto manage your licenses.

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Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature History for Smart Licensing table.

Information About Smart Software Licensing

Introduction to Smart Licensing

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

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

To use Smart Licensing, you must first set up a Smart Account on Cisco Licensing Central. For a more detailed overview on Cisco Licensing, visit the Licencing Hub.

Smart Software Licensing Overview

Smart Software Licensing is a cloud-based licensing model that consists of tools and processes to authorize you the usage and reporting of your Cisco products. This feature captures your order and communicates with the Cisco Cloud License Service through the Smart Call Home transport media to complete product registration and authorization at the corresponding performance and technology levels.

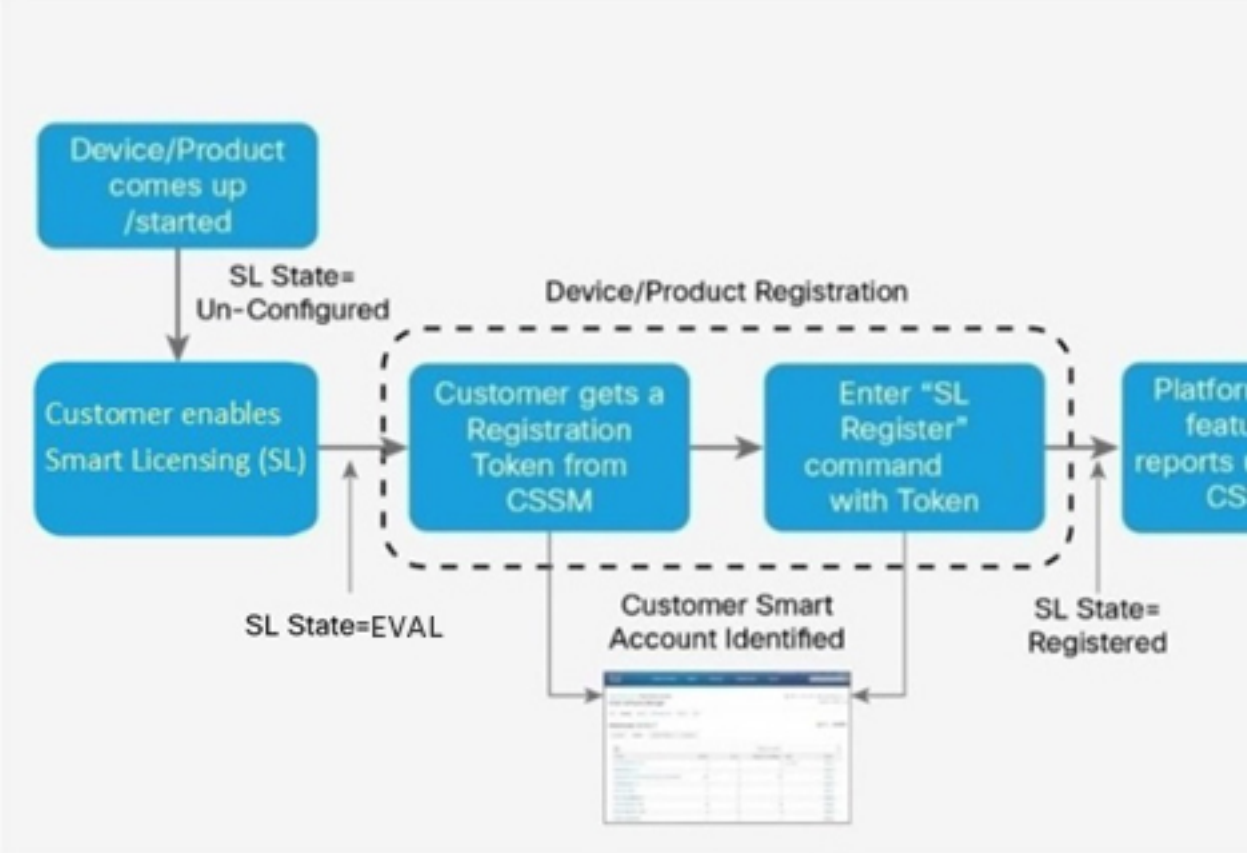
In the Smart Software Licensing model, you can activate licensed products without the use of a special software key or upgrade license file. You can activate the new functionalities using the appropriate product commands or configurations. Note that a software reboot may or may not be required depending on the product capabilities and requirements.

Similarly, downgrading or removing an advanced feature, performance, or functionality requires the removal of configurations or commands. After either of these actions is taken, the change in license state is noted by the Smart Software Manager during the next synchronization and an appropriate action is taken.

Starting from Cisco NX-OS 8.4(2), subscription-based licensing is available on Cisco MDS 9000 Series switches. This enables the customer to purchase licenses for a period of time.

Smart Software Licensing provides a single, standardized licensing solution for your Cisco products.

Figure 1: Smart Licensing Workflow



Traditional Licensing Overview

Traditional licensing at Cisco is a legacy licensing model based on Product Activation Keys (PAK) and Unique Device Identifiers (UDI). On most devices, capacity needs are assessed prior to obtaining and installing a *.tar* file on switches to retrieve the UDI. Customers place an order for a PAK, and the PAK is emailed to the user. A combination of them. UDI and PAK is used to receive a license file that is installed in the boot directory of the switch to complete the installation of the Cisco NX-OS software.

The License Registration Portal (LRP) is available to help migrate traditional licenses to smart licenses. To access the LRP, obtain training, and manage licenses, go to http://tools.cisco.com/SWIFT/LicensingUI/Home.

You can convert the traditional license to a smart license in the following ways:

- Converting a Traditional License to a Smart License Through GUI, on page 10
- Converting a Traditional License to a Smart License Through CLI, on page 11

Comparing Licensing Models

Two types of licensing models are used for the Cisco MDS 9000 Series Switches—traditional licensing and Smart Software Licensing.

Table 1: Comparison Between Traditional Licensing and Smart Software Licensing

Description	Traditional Licensing	Smart Software Licensing
License instance node locked to the product instance	Yes	No
Product registration upon configuration	No	Yes
Offers tools to report, monitor, own, and consume	No	Yes
Requires Smart Call Home	No	Yes

Smart Software Licensing Model

The Smart Software licensing model that is defined for the Cisco MDS product line has the following options:

- Subscription-based licenses
  - Advantage (A)

    License contains Cisco Nexus Dashboard Fabric Controller (formerly DCNM) and Enterprise license of Cisco MDS 9000 series.
  - Premier (P)

    License contains Cisco Nexus Dashboard Fabric Controller (formerly DCNM), SAN Analytics, and Enterprise license of Cisco MDS 9000 series.
- Enterprise Agreement (EA) licenses

The license naming convention is as follows: M91XK9-A-1Y

- M91XK9 - Cisco MDS 9000 series
- A or P - License type
- NY - License Duration in years.

This table provides PIDs for subscription-based licenses.

Table 2: PIDs for Subscription-Based Licenses

PIDs	License Type	Duration (years)
M91XK9-DCNM-1Y	Subscription	1
M92XK9-DCNM-1Y	Subscription	1
M93XK9-DCNM-1Y	Subscription	1

PIDs	License Type	Duration (years)
M97XK9-DCNM-1Y	Subscription	1
M91XK9-DCNM-3Y	Subscription	3
M92XK9-DCNM-3Y	Subscription	3
M93XK9-DCNM-3Y	Subscription	3
M97XK9-DCNM-3Y	Subscription	3
M91XK9-DCNM-5Y	Subscription	5
M92XK9-DCNM-5Y	Subscription	5
M93XK9-DCNM-5Y	Subscription	5
M97XK9-DCNM-5Y	Subscription	5
M91XK9-ENT-1Y	Subscription	1
M92XK9-ENT-1Y	Subscription	1
M93XK9-ENT-1Y	Subscription	1
M97XK9-ENT-1Y	Subscription	1
M91XK9-ENT-3Y	Subscription	3
M92XK9-ENT-3Y	Subscription	3
M93XK9-ENT-3Y	Subscription	3
M97XK9-ENT-3Y	Subscription	3
M91XK9-ENT-5Y	Subscription	5
M92XK9-ENT-5Y	Subscription	5
M93XK9-ENT-5Y	Subscription	5
M97XK9-ENT-5Y	Subscription	5
L1-D-M91S-AXK9	Time Based	1
L-D-M91S-AXK9	Time Based	3
L5-D-M91S-AXK9	Time Based	5
L1-D-M93S-AXK9	Time Based	1
L-D-M93S-AXK9	Time Based	3
L5-D-M93S-AXK9	Time Based	5
L1-D-M97S-AXK9	Time Based	1
L-D-M97S-AXK9	Time Based	3
L5-D-M97S-AXK9	Time Based	5
M91XK9-A-1Y	Subscription	1
M91XK9-A-3Y	Subscription	3

PIDs	License Type	Duration (years)
M91XK9-A-5Y	Subscription	5
M93XK9-A-1Y	Subscription	1
M93XK9-A-3Y	Subscription	3
M93XK9-A-5Y	Subscription	5
M97XK9-A-1Y	Subscription	1
M97XK9-A-3Y	Subscription	3
M97XK9-A-5Y	Subscription	5
M91XK9-P-1Y	Subscription	1
M91XK9-P-3Y	Subscription	3
M91XK9-P-5Y	Subscription	5
M93XK9-P-1Y	Subscription	1
M93XK9-P-3Y	Subscription	3
M93XK9-P-5Y	Subscription	5
M97XK9-P-1Y	Subscription	1
M97XK9-P-3Y	Subscription	3
M97XK9-P-5Y	Subscription	5
M91XK9-SD-1Y	Subscription	1
M91XK9-SD-3Y	Subscription	3
M91XK9-SD-5Y	Subscription	5
M93XK9-SD-1Y	Subscription	1
M93XK9-SD-3Y	Subscription	3
M93XK9-SD-5Y	Subscription	5
M97XK9-SD-1Y	Subscription	1
M97XK9-SD-3Y	Subscription	3
M97XK9-SD-5Y	Subscription	5

This table provides PIDs for EA licenses.

Table 3: PIDs for EA Licenses

PIDs	Term
E2N-MDS9100-G-A	3 or 5 Year
E2N-MDS9100-B-A	3 or 5 Year
E2N-MDS9100-G-P	3 or 5 Year

PIDs	Term
E2N-MDS9100-B-P	3 or 5 Year
E2N-MDS9300-G-A	3 or 5 Year
E2N-MDS9300-B-A	3 or 5 Year
E2N-MDS9300-G-P	3 or 5 Year
E2N-MDS9300-B-P	3 or 5 Year
E2N-MDS9700-G-A	3 or 5 Year
E2N-MDS9700-B-A	3 or 5 Year
E2N-MDS9700-G-P	3 or 5 Year
E2N-MDS9700-B-P	3 or 5 Year

Guidelines and Limitations for Smart Software Licensing

- You cannot use both traditional licensing and Smart Software Licensing at the same time on the Cisco MDS 9000 Series Switches.
- From Cisco MDS NX-OS Release 9.2(2), Smart Software Licensing is supported on Cisco N-Port Virtualizer (Cisco NPV) devices. Smart Software Licensing is not supported on Cisco NPV devices in Cisco MDS NX-OS Release 9.2(1) or earlier.

Smart Accounts and Virtual Accounts

- A Smart account provides you with a single location for all smart-account enabled products and licenses. It assists you in speedy procurement, deployment, and maintenance of your Cisco software.

  If you are requesting a Smart account on behalf of an organization, you must have the authority to represent the requesting organization when creating a Smart account. After submitting the request, the request goes through an approval process before you are provided with access to your Smart account.

  Go to http://software.cisco.com to learn about, set up, and manage a Smart account.
- A virtual account is a subaccount within a Smart account. You can define the virtual account's structure based on organizational layout, business function, geography, or any defined hierarchy. Virtual accounts can be created and maintained only by Smart account administrators.

Smart Software Manager Overview

Smart Software Manager enables the management of software licenses and Smart accounts from a single portal. The interface allows you to activate your product, manage entitlements, renew, and upgrade software.

An active Smart account is required to complete the registration process. To access the Smart Software Manager, go to http://www.cisco.com/web/ordering/smart-software-manager/index.html.

You must add the following information in the Smart Software Manager:

- Trusted Unique Identifier—This is the device ID (Secure Unique Device Identifier (SUDI)).
- Organizational Identifier—This is a numerical format to associate a product with a Smart account or Virtual account.
- Licenses consumed—Allows the Smart Software Manager to understand the license type and the level of consumption.

Smart Call Home Overview

Use the Smart Call Home feature to communicate with the Smart Software Manager. Smart Call Home is enabled automatically when you configure Smart Software Licensing. On Cisco MDS 9000 Series Switches, Smart Software Licensing is not enabled by default.

The Smart Call Home (SCH) server runs on the Cisco Smart Software Manager (CSSM) satellite by default. You can access this service using the following URL:

https://<CSSM satellite IP:443>/Transportgateway/services/DeviceRequestHandler

Provide this URL as part of Smart Call Home configuration so that the device registration works with the CSSM satellite. For a sample configuration, see Configuration Examples for Smart Software Licensing.

The associated Smart Call Home messages are sent to the Smart Software Manager only after enabling Smart Call Home. For switches in which Smart Software Licensing is enabled by default, Smart Call Home is also enabled by default, along with the associated messages.

To disable Smart Software Licensing, see Disabling Smart Software Licensing.

Smart Software Manager Satellite

Smart Software Manager satellite is a component of Smart Software Licensing and works in conjunction with the Smart Software Manager to manage software licenses. You can intelligently manage product licenses and get near real-time visibility and reports pertaining to the Cisco licenses you purchased and consumed.

If you do not want to manage your installed base using a direct Internet connection, the Smart Software Manager satellite will be installed on your premises to provide a subset of the Smart Software Manager functionality. You can download the satellite application, deploy it, and register it with the Smart Software Manager.

You can perform the following functions using the satellite application on your premises:

- Activate or register a license
- Get visibility to your company's licenses
- Transfer licenses between company entities

To learn more about the Smart Software Manager satellite, go to http://www.cisco.com/go/smartsatellite.

Requesting a Smart Account

Requesting a Smart account is a one-time process. Subsequent management of users is a capability provided through the tool.

Before you begin

Ensure that you have a Cisco Employee Connection (CEC) ID.

Procedure

Step 1 Go to http://software.cisco.com, and log in to your account.

Step 2 Click the **Request a Smart Account** link in the **Administration** section.

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

- To select yourself as the approver, click **Yes, I will be the Approver for the account** option.
- To select a different person as the approver, click **No, the person specified below will be the Approver for the account** option and specify the person's email ID.

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

Step 4 Depending on the approver type, perform one of the following procedures:

- If you are the approver, perform the following tasks:
  a. Enter **Account Name**, **Company/Organization Name**, **Country**, and **State/Province/Region** information.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier** and **Contact Phone Number**, and click **OK**.

  Note
  The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.

  d. Click **Continue** to select the legal address to be linked to your Smart account.

- If you are not the approver, perform the following procedure:
  a. Enter the **Account Name** and an optional **Message** to the approver.
  b. (Optional) Click **Edit**.
  c. In the **Edit Account Identifier** window, enter a valid **Proposed Domain Identifier**, and click **OK**.

  Note
  The default domain identifier is the approver's email domain. If you edit the domain identifier, the change goes through a manual approval process.

d. Click **Continue**.

e. Follow the instructions in the email that is sent to you to complete the request.

Adding a User to a Smart Account

Smart account user management is available in the **Administration** section of Cisco Software Central.

Procedure

Step 1 Go to http://software.cisco.com, and log in to your account.

Step 2 Click the **Manage Smart Account** link in the **Administration** section.

Step 3 Click the **Users** tab.

Step 4 Click **New User**.

Step 5 Provide the required information in the **New User** section.

(Define roles to manage the entire Smart account or specific virtual accounts.)

Step 6 Click **Continue**.

Converting a Traditional License to a Smart License Through GUI

Traditional licenses associated with Product Activation Keys (PAK) can be converted to Smart Licenses. Access Traditional licenses through the License Registration Portal by clicking the **PAKs/Tokens** tab, and then use the information provided in this section to convert PAKs to smart licenses.

Procedure

Step 1 Go to http://software.cisco.com, and log in to your account.

Step 2 Click the **Traditional Licensing** link in the **License** section.
You will be redirected to the **LRP** window.

Step 3 Click the **PAKs/Tokens** tab under **Manage**, if it is not already selected.

Step 4 Check the **PAK/Token ID** check box.

Step 5 Select **Convert to Smart Entitlements** from the **Actions** drop-down menu.

Step 6 Select a smart account from the **Smart Account** drop-down list.

Note

You can view only the smart accounts that are assigned to you.

Step 7 Select a virtual account from the **Virtual Account** drop-down list.

Note
You can view only the virtual accounts that are assigned to you.

Step 8 Click **Assign**.
The selected PAK will be converted to a smart license.

Converting a Traditional License to a Smart License Through CLI

Traditional licenses associated with Product Activation Keys (PAK) can be converted to smart licenses using CLI.

Before you begin

- Ensure that Smart Software Licensing is enabled.
- Ensure that you have a valid smart account.
- Ensure that you have valid user rights for the smart account.

Procedure

Step 1 switch# **license smart conversion start**

Starts a manual conversion of a traditional license to a smart license. The conversion takes place in the background. After the conversion succeeds or fails, a system log message is displayed on the switch console.

Step 2 (Optional) switch# **license smart conversion stop**

Stops the manual conversion.

Step 3 (Optional) switch# **show license status**

Displays the license conversion status. If you run this command from an active device in an high availability (HA) configuration, this will display the status of all the devices in the HA configuration.

Converting a Traditional License to a Smart License Through CLI

The following example shows how to convert a traditional license to a smart license using the CLI:

```
switch# license smart conversion start
```

```
Smart License Conversion process is in progress. Use the 'show license status' command to
check the progress and result.
```

The following example shows how to stop the process of converting a traditional license to smart license using the CLI:

The following example shows the status of the license conversion for a standalone device:

```
switch# license smart conversion stop
stop manual conversion failed:
Some Smart Licensing Conversion jobs stopped successfully.
```

The following example shows the status of line conversion for a standalone device:

```
switch# show license status

Smart Licensing is ENABLED.
Registration:
Status: REGISTERED
Smart Account: Big-U University
Virtual Account: Physics
Export-Controlled Functionality: Not Allowed
Initial Registration: SUCCEEDED on Feb 24 23:30:12 2014 PST
Last Renewal Attempt: SUCCEEDED on Feb 24 23:30:12 2014 PST
Next Renewal Attempt: Aug 24 23:30:12 2014 PST
Registration Expires: Feb 24 23:30:12 2015 PST

!The following show output is applicable from Cisco NX-OS Release 8.2(1) onwards!
Smart License Conversion:
Automatic Conversion Enabled: False
Status: SUCCEEDED on Jan 1 00:00:00 1970 UTC

License Authorization:
Status: AUTHORIZED on Aug 31 17:04:56 2017 UTC
Last Communication Attempt: SUCCEEDED on Aug 31 17:04:56 2017 UTC
Next Communication Attempt: Sep 30 17:04:56 2017 UTC
Communication Deadline: Nov 29 16:58:31 2017 UTC
```

Configuring Smart Software Licensing

Configuring a DNS Client

Note To avoid any issues during configuring a DNS client, ensure to check if the name server is reachable before you configure a DNS client.

Procedure

Step 1 switch# **configure terminal**

Enters global configuration mode.

Step 2 switch(config)# **ip domain-lookup**

Enables DNS-based address translation.

Step 3 switch(config)# **ip domain-name** *name*

Defines the default domain name that Cisco NX-OS uses to resolve unqualified host names.

Cisco NX-OS appends the default domain name to any hostname that does not contain a complete domain name before starting a domain-name lookup.

Step 4 switch(config)# **ip name-server** *address1* [*address2... address6*]

Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.

Enabling Smart Software Licensing

Note From Cisco MDS NX-OS Release 9.2(2), Smart Software Licensing is enabled by default and cannot be disabled.

Procedure

Step 1 switch# **configure terminal**.

Enters global configuration mode.

Step 2 Use one of the following commands to enable Smart Software Licensing:

- switch(config)# **license smart enable**
- switch(config)# **feature license smart**

Enables Smart Software Licensing.

Disabling Smart Software Licensing

Procedure

Step 1 switch# **configure terminal**.

Enters global configuration mode.

Step 2 Use one of the following commands to disable Smart Software Licensing:

- switch(config)# **no license smart enable**
- switch(config)# **no feature license smart**

Disables Smart Software Licensing.

Registering a Device

Before you begin

- Ensure that Smart Software Licensing is enabled.
- Ensure that you have the token to be used to register your device to the smart account.

Procedure

switch# **license smart register idtoken** *token* [**force**]

Registers your device to the smart account using the token.

Renewing Device Registration

Procedure

switch# **license smart renew ID**

Renews the device registration.

Renewing Device Authorization

Procedure

switch# **license smart renew auth**

Renews the device authorization.

Unregistering a Device

Procedure

switch# **license smart deregister**

Unregisters a device.

Configuring Smart Call Home for Smart Software Licensing

Viewing a Smart Call Home Profile

Procedure

switch# **show callhome smart-licensing**

Displays the Smart Call Home profile.

Enabling Smart Call Home Data Privacy

Procedure

Step 1 switch# **configure terminal**

Enters global configuration mode.

Step 2 switch(config)# **callhome**

Enters Call Home configuration mode.

Step 3 switch(config-callhome)# **data-privacy hostname**

Enables Call Home data privacy.

Verifying Smart Software Licensing

Verify Smart Software Licensing using the following commands:

Commands	Purpose
show license	Displays the contents of all the license files.
show license all	Displays all smart license agent information.
show license brief	Displays a list of license files.
show license status	Displays the smart license agent status.
show license summary	Displays a summary of the smart license agent status.
show license tech support	Gathers information for troubleshooting.
show license udi	Displays device UDI information.
show license usage	Displays show license usage table information.
show tech-support license	Displays licensing technical support information.

Configuration Examples for Smart Software Licensing

This example shows how to register your device with the Cisco portal and enable Smart Software Licensing:



Note To avoid any issues during registering your device, ensure to check if the name server is reachable before registering your device.

```
switch# configure terminal
switch(config)# ip domain-lookup
switch(config)# ip domain-name cisco.com
switch(config)# ip name-server 171.70.168.183
switch(config)# callhome
switch(config-callhome)# dest xml trans http
switch(config-callhome)# dest xml email sl-sch-test@cisco.com
switch(config-callhome)# dest xml http
https://tools.cisco.com/its/service/oddce/services/DDCEService
switch(config-callhome)# enable
switch(config-callhome)# commit*
switch(config-callhome)# exit
switch(config)# feature license smart
```



Note * Ensure that callhome distribute is enabled. If not the commit fails.

This example shows how to disable Smart Software Licensing:

```
switch# configure terminal
switch(config)# no feature license smart
```

This example shows how to register a device:

```
switch# configure terminal
switch(config)# license smart register idtoken sampletokenID
register status: Registration process is in progress. Use the 'show license status' command
 to check the progress and result
```

This example shows how to unregister a device:

```
switch# license smart deregister
```

This example shows how to provide the URL for CSSM satellite as part of smart call home configuration:

```
switch# configure terminal
switch(config)# callhome
switch(config-callhome)# destination-profile xml email-addr example@cisco.com
switch(config-callhome)# alert-group Configuration
switch(config-callhome)# email-addr example@cisco.com
switch(config-callhome)# http
https://tools.cisco.com/its/service/oddce/services/DDCEService/services/DeviceRequestHandler*
switch(config-callhome)# transport-method http
switch(config-callhome)# enable
switch(config-callhome)# exit
switch(config)# commit
```

Note * The IP address should have the format: https://<CSSM satellite IP:443>/Transportgateway/services/DeviceRequestHandler

Verification Examples for Smart Software Licensing

These examples show how to verify Smart Software Licensing:

```
switch# show license status

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: MDS-9148S
  Virtual Account: Default
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Apr 18 08:20:47 2017 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Oct 15 08:20:46 2017 UTC
  Registration Expires: Apr 18 08:17:43 2018 UTC

License Authorization:
  Status: AUTHORIZED on Apr 18 08:25:08 2017 UTC

  Last Communication Attempt: SUCCEEDED on Apr 18 08:25:08 2017 UTC
  Next Communication Attempt: May 18 08:25:08 2017 UTC
  Communication Deadline: Jul 17 08:22:07 2017 UTC


switch# show callhome smart-licensing

Current smart-licensing transport settings:
 Smart-license messages: enabled
```

```
 Profile: CiscoTAC-1 (status: ACTIVE)


switch# show license summary

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Cisco Systems, Inc.
  Virtual Account: NexusSmartLicensing_Test
  Export-Controlled Functionality: Allowed

License Authorization:
  Status: AUTHORIZED on Dec 14 10:43:48 2016 UTC

  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Jan 13 10:43:47 2017 UTC
  Communication Deadline: Dec 14 08:07:20 2017 UTC


switch# show license brief

Status Legend:
  u - unenforced, e - enforced
  d - platform default, f - factory installed SLP license,
  p - converted from PAK, s - migrated from Smart Licensing,
  a - installed using SLP, h - honored (pending SLP authorization)
General Legend:
  NA - not applicable
--------------------------------------------------------------------------------------------
                                                                 License  Port
License Name                                                     Count    Count  Used  Status
--------------------------------------------------------------------------------------------
MDS 9700 series Modular Enterprise package                           1     NA     1  pu
MDS 9700 series Modular Mainframe package                            1     NA     1  u
SAN Analytics                                                        1     NA     0  pu
MDS 9300V Series Enterprise                                          1     NA     1  u
MDS 9396V 64G FC 16 Port Activation License                         NA     48    48  d
MDS 9396V 64G FC 16 Port Activation License                          3     48    48  ae

switch# show license all

Smart Licensing Status
======================
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Cisco Systems, Inc.
  Virtual Account: NexusSmartLicensing_Test
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Dec 14 10:43:33 2016 UTC
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 12 10:43:32 2017 UTC
  Registration Expires: Dec 14 08:07:20 2017 UTC

License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
  Next Communication Attempt: Jan 13 10:43:48 2017 UTC
  Communication Deadline: Dec 14 08:07:21 2017 UTC

License Usage
=============
```

```
Product Information
===================
UDI: SN:JAF1428DTAH

Agent Version
=============
Smart Agent for Licensing: 1.6.6_rel/88
```

The **show license tech support** command displays the smart licensing status along with the smart agent logs.

```
switch# show license tech support

Smart Licensing Tech Support info

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

Smart Licensing is ENABLED

License Conversion:
  Automatic Conversion Enabled: True
  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:
    Address: <empty>
    Port: <empty>
    Username: <empty>
    Password: <empty>
  Server Identity Check: False

Miscellaneous:
  Custom Id: <empty>

Policy:
  Policy in use: Merged from multiple sources.
  Reporting ACK required: yes (CISCO default)
  Unenforced/Non-Export Attributes:
    First report requirement (days): 90 (CISCO default)
    Reporting frequency (days): 365 (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: May 10 2022 10:06:40 UTC
  Reporting push interval: 30  days State(2) InPolicy(90)
  Next ACK push check: <none>
  Next report push: Apr 12 2022 08:53:29 UTC
  Last report push: <none>
  Last report file write: <none>

License Usage
=============
Handle: 1
  License: LAN_ENTERPRISE_SERVICES_PKG
  Entitlement Tag:
regid.2019-06.com.cisco.LAN_Nexus9300_XF,1.0_76a87ea7-465b-40fd-b403-1bf9d845aa1b
  Description: LAN license for Nexus 9300-XF
  Count: 1
  Version: 1.0
  Status: IN USE(15)
  Status time: Apr 12 2022 08:52:59 UTC
  Request Time: Apr 12 2022 08:52:59 UTC
  Export status: NOT RESTRICTED
  Feature Name: LAN_ENTERPRISE_SERVICES_PKG
  Feature Description: LAN license for Nexus 9300-XF
  Enforcement type: NOT ENFORCED
  License type: Generic
  Measurements:
    ENTITLEMENT:
      Interval: 00:15:00
      Current Value: 1

Product Information
===================
UDI: PID:N9K-C93240YC-FX2,SN:FDO24450MBL

Agent Version
=============
Smart Agent for Licensing: 5.2.4_rel/79

Upcoming Scheduled Jobs
=======================
Current time: Apr 12 2022 10:35:37 UTC
Daily: Apr 13 2022 08:51:24 UTC (22 hours, 15 minutes, 47 seconds remaining)
Init Flag Check: Expired Not Rescheduled
Reservation configuration mismatch between nodes in HA mode: Expired Not Rescheduled
Start Utility Measurements: Apr 12 2022 10:38:09 UTC (2 minutes, 32 seconds remaining)
Send Utility RUM reports: Apr 13 2022 08:53:29 UTC (22 hours, 17 minutes, 52 seconds
remaining)
Save unreported RUM Reports: Apr 12 2022 11:23:19 UTC (47 minutes, 42 seconds remaining)
Process Utility RUM reports: Apr 13 2022 08:51:25 UTC (22 hours, 15 minutes, 48 seconds
remaining)
External Event: May 10 2022 10:06:40 UTC (27 days, 23 hours, 31 minutes, 3 seconds remaining)
Operational Model: Expired Not Rescheduled

Communication Statistics:
=========================
Communication Level Allowed: INDIRECT
Overall State: <empty>
```

```
Trust Establishment:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Trust Acknowledgement:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Usage Reporting:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Result Polling:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Request:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Confirmation:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Authorization Return:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Trust Sync:
  Attempts: Total=0, Success=0, Fail=0  Ongoing Failure: Overall=0 Communication=0
  Last Response: <none>
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: <none>
Hello Message:
  Attempts: Total=2, Success=0, Fail=2  Ongoing Failure: Overall=2 Communication=2
  Last Response: NO REPLY on Apr 12 2022 08:53:29 UTC
    Failure Reason: <none>
  Last Success Time: <none>
  Last Failure Time: Apr 12 2022 08:53:29 UTC

License Certificates
====================
Production Cert: True
Not registered. No certificates installed

HA Info
==========
RP Role: Active
Chassis Role: Active
```

```
Behavior Role: Active
RMF: True
CF: True
CF State: Stateless
Message Flow Allowed: True

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

Overall status:
  Active: PID:N9K-C93240YC-FX2,SN:FDO24450MBL
      Reservation status: NOT INSTALLED
      Request code: <none>
      Last return code: <none>
      Last Confirmation code: <none>
      Reservation authorization code: <none>
      Status:PAK

Specified license reservations:

Purchased Licenses:
  No Purchase Information Available


Other Info
==========
Software ID: regid.2017-11.com.cisco.Nexus_9300,1.0_ac6d6e6b-8ca9-4de7-8699-4ee1cb8f422d
Agent State: authorized
TS enable: True
Transport: cslu
Locale: en_US.UTF-8
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char)  : 1
sizeof(int)   : 4
sizeof(long)  : 8
sizeof(char *): 8
sizeof(time_t): 8
sizeof(size_t): 8
Endian: Little
Write Erase Occurred: False
XOS version: 0.12.0.0
Config Persist Received: True
Message Version: 1.3
connect_info.name: <empty>
connect_info.version: <empty>
connect_info.additional: <empty>
connect_info.prod: False
connect_info.capabilities: <empty>
agent.capabilities: UTILITY, DLC, AppHA, MULTITIER, EXPORT_2, OK_TRY_AGAIN
Check Point Interface: False
Config Management Interface: False
License Map Interface: True
HA Interface: True
Trusted Store Interface: True
Platform Data Interface: True
Crypto Version 2 Interface: False
SAPluginMgmtInterfaceMutex: False
SAPluginMgmtIPDomainName: False
SmartAgentClientWaitForServer: 2000
SmartAgentCmReTrySend: False
```

```
SmartAgentClientIsUnified: True
SmartAgentCmClient: True
SmartAgentClientName: UnifiedClient
builtInEncryption: True
SmartAgentXMLEntriesAreUnique: True
enableOnInit: true
chassisRole: Active
SmartTransportServerIdCheck: False
SmartTransportProxySupport: True
SmartAgentPolicyDisplayFormat: 2
SmartAgentReportOnUpgrade: true
SmartAgentIndividualRUMEncrypt: 2
SmartAgentUsageStatisticsEnable: False
SmartAgentMaxRumMemory: 4
SmartAgentConcurrentThreadMax: 10
SmartAgentPolicyControllerModel: False
SmartAgentPolicyModel: true
SmartAgentFederalLicense: False
SmartAgentMultiTenant: False
attr365DayEvalSyslog: False
checkPointWriteOnly: False
SmartAgentDelayCertValidation: False
enableByDefault: False
conversionAutomatic: True
conversionAllowed: true
storageEncryptDisable: False
storageLoadUnencryptedDisable: False
TSPluginDisable: False
bypassUDICheck: False
loggingAddTStamp: False
loggingAddTid: true
HighAvailabilityOverrideEvent: UnknownPlatformEvent
platformIndependentOverrideEvent: UnknownPlatformEvent
platformOverrideEvent: UnknownPlatformEvent
WaitForHaRole: False
standbyIsHot: True
chkPtType: 2
delayCommInit: False
roleByEvent: true
maxTraceLength: 100
traceAlwaysOn: False
debugFlags: 7
Event log max size: 512 KB
Event log current size: 68 KB
Local Device: No Trust Data
Overall Trust: No ID
Clock sync-ed with NTP: False

Platform Provided Mapping Table
================================
  regid.2017-11.com.cisco.Nexus_9300,1.0_ac6d6e6b-8ca9-4de7-8699-4ee1cb8f422d: Total licenses
 found: 17
Enforced Licenses:
  P:N9K-C93240YC-FX2,S:FDO24450MBL:
    No PD enforced licenses
```

The **show tech-support license** command displays information about the license installed on the device.

```
switch# show tech-support license
`show license host-id`
License hostid: VDH=JPG2551000X
`show license usage`

License Authorization:
```

```
  Status: Not Applicable

(ENTERPRISE_PKG):
  Description: MDS 9100V Series Enterprise
  Count: 1
  Version: 1.0
  Status: IN USE
  Enforcement Type: NOT ENFORCED
  License Type: Generic

(PORT_ACTIV_9148V_PKG):
  Description: MDS 9148V FC 8 port-activation
  Count: 24
  Version: 1.0
  Status: IN USE
  Enforcement Type: ENFORCED
  License Type: Enforced


`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: Merged from multiple sources
    Reporting ACK required: Yes
    Unenforced/Non-Export:
        First report requirement (days): 90 (CISCO default)
        Ongoing reporting frequency (days): 365 (CISCO default)
        On change reporting (days): 90 (CISCO default)
    Enforced (Pepertual/Subscription):
        First report requirement (days): 0 (CISCO default)
        Ongoing reporting frequency (days): 0 (CISCO default)
        On change reporting (days): 0 (CISCO default)
    Export (Perpetual/Subscription):
        First report requirement (days): 0 (CISCO default)
        Ongoing reporting frequency (days): 0 (CISCO default)
        On change reporting (days): 0 (CISCO default)

Miscellaneous:
    Custom Id: <empty>

Usage reporting:
    Last ACK received: <none>
    Next ACK deadline: Jun 29 13:27:54 2022  UTC
    Reporting push interval: 30 days
    Next ACK push check: <none>
    Next report push: Jul 14 12:09:43 2022  UTC
    Last report push: <none>
```

```
    Last report file write: <none>

Trust Code installed: Mar 31 11:17:43 2022  UTC
    Active: PID: DS-C9148V-K9, SN: JPG2551000X
        Mar 31 11:17:43 2022  UTC


`show license summary`


License Usage:
License                     Entitlement tag                 Count   Status
-----------------------------------------------------------------------------
MDS 9100V Series Enterp... (ENTERPRISE_PKG)                  1       IN USE
MDS 9148V FC 8 port-act... (PORT_ACTIV_9148V_PKG)            24      IN USE
`show running-config license all`

!Command: show running-config license all
!Running configuration last done at: Thu Jul 21 06:52:51 2022
!Time: Wed Jul 27 06:26:21 2022

version 9.3(1)
license grace-period
license smart transport smart
license smart url smart https://smartreceiver.cisco.com/licservice/license
license smart url cslu cslu-local
license smart usage interval 30


`test license platformInfo`
SL Status        : Enabled
Chassis ID       : 43
Trad spec file   : mds_nellis
SL spec file     : smartpd_spec_m9148V
SLP spec file    : sle_spec_m9148V
IPS bootup ports : 0
Bootup ports     : 0
Hport Status     : Disabled
SL(Prev) Status  : Disabled
`show system internal license event-history error`
```

```
switch# show license udi

UDI: SN:JAF1428DTAH



switch# show license usage
License Authorization:
  Status: AUTHORIZED on Apr 18 08:25:08 2017 UTC

(ENTERPRISE_PKG):
  Description: This entitlement tag was created via Alpha Extension application
  Count: 1
  Version: 1.0
  Status: AUTHORIZED

(PORT_ACTIV_9148S_PKG):
  Description: This entitlement tag was created via Alpha Extension application
  Count: 48
  Version: 1.0
  Status: AUTHORIZED
```

```
switch# show running-config callhome

!Time: Thu Dec 15 08:55:26 2016

version 8.0(1)
callhome
  email-contact sch-smart-licensing@cisco.com
  destination-profile xml transport-method http
  destination-profile xml http https://tools.cisco.com/its/service/oddce/
services/DDCEService
  transport http use-vrf management
  enable
```

Use Cases for Smart Software Licensing

Scenario 1

1. Configure and order a with licenses and select the release that will be preinstalled on the hardware prior to shipment.

Note To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart Account set up, and then convert the licenses by going to the License Registration Portal.

2. Click the **Devices** tab under the **Manage** section. Click the corresponding Device ID, and choose **Convert to Smart Entitlements** from the Device ID drop-down list. This will convert all the licenses that are preinstalled on the switch to smart licenses. Note that this task must be performed for each switch that you want to convert to smart license.
3. The service will validate if license Stock Keeping Units (SKUs) on the switch have been mapped to smart licenses before proceeding with the conversion.
4. Enable smart mode on the switch and start using the smart licenses.

Scenario 2

1. Configure and order a with licenses and select the release that will be preinstalled in the hardware prior to shipment.
2. Upgrade the switch to .

Note To convert the preinstalled licenses on the hardware to smart licenses, you must have a Smart account set up and then perform the conversion by going to the License Registration Portal.

3. Click the **Devices** tab under the **Manage** section. Click the corresponding Device ID, and choose **Convert to Smart Entitlements** from the Device ID drop-down list. This will convert all the licenses that are preinstalled on the switch to smart licenses. Note that this task must be performed for each switch that you want to convert to smart license.

4. The service will validate if license SKUs on the switch are mapped to smart licenses before proceeding with the conversion.
5. You enable smart mode on the switch and start using the smart licenses.

Scenario 3

1. Order a spare license SKU and do not associate a Smart account to the order in Cisco Commerce Workspace (CCW).



Note You must have a Smart account set up before using Smart Software Licensing.

2. Get a PAK delivered to yourself and load it to your Smart account.
3. License Registration Portal service will validate if a spare license SKU is mapped to a smart license.
4. The Smart Software Manager (SSM) will notify you via email that your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.
5. Specify the PAKs as smart licenses in SSM.
6. Ensure that is installed on the switch, enable smart mode, and start using the smart entitlements.

Scenario 4

1. Order a spare license SKU and assign a Smart account to the order in CCW.
2. The existing License Registration Portal service will auto deposit the PAK to the LRP Smart account.
3. License Registration Portal service will validate if the spare license SKU has been mapped to smart entitlements. If the spare license SKU are mapped to smart entitlements, the service sends out a confirmation notification to CSSM.
4. The Smart Software Manager will notify you via email that your Smart Account has licenses that can be fulfilled as traditional licenses or smart licenses.
5. Specify the PAKs as Smart Software Licenses in SSM.
6. Ensure that is installed on the switch, enable smart mode, and start using the smart licenses.

Additional References for Smart Software Licensing

Table 4: Technical Assistance

Description	Link

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

Feature History for Smart Software Licensing

Feature Name	Release	Feature Information
Smart agent log display	9.3(1)	The **show license tech support** command is enhanced to display only the smart agent logs.

Feature Name	Release	Feature Information
Smart Software Licensing	8.4(2)	Smart Software Licensing is a standardized licensing platform that simplifies the Cisco software experience and helps you understand how Cisco software is used across your network. Smart Software Licensing is the next generation licensing platform for Cisco MDS 9000 Series Switches. The following commands were introduced in this feature: • **feature license smart** • **license smart deregister** • **license smart enable** • **license smart register** • **license smart renew** • **show license all** • **show license status** • **show license summary** • **show license tech support** • **show license udi** • **show license usage**