Smart Software Licensing for Cisco Nexus 7000 Series Switches

This chapter provides an overview of Smart Software Licensing and describes the tools and processes required to complete the registration and authorization for Cisco Nexus 7000 Series Switches.

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.

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.

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.

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.

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

Procedure

	Command or Action	Purpose
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* [**use-vrf** *vrf-name*]	Defines the default domain name that Cisco NX-OS uses to resolve unqualified host names. You can also define a virtual routing and forwarding (VRF) that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF that you configured this domain name under.
		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*] [**use-vrf** *vrf-name*]	Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.
		You can optionally define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF that you configured this name server under.
Step 5	switch(config)# **vrf context** *vrf-name*	Creates a VRF and enters VRF configuration mode.
Step 6	switch(config-vrf)# **ip domain-name** *name* [**use-vrf** *vrf-name*]	Defines the default domain name that Cisco NX-OS uses to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name if it cannot be resolved in the VRF that you configured this domain name under.
		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 7	switch(config-vrf)# **ip name-server** *address1* [*address2... address6*] [**use-vrf** *vrf-name*]	Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.
		You can also define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF that you configured this name server under.

Configuring a VRF To Send a Message Using HTTP

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **callhome**	Enters Call Home configuration mode.
Step 3	switch(config-callhome)# **transport http use-vrf** *vrf-name*	Configures the VRF used to send email and other Smart Call Home messages over HTTP.

Enabling Smart Software Licensing

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

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.

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

Registers your device to the smart account using the token.

Renewing Device Registration

switch# **license smart renew ID**

Renews the device registration.

Renewing Device Authorization

switch# **license smart renew auth**

Renews the device authorization.

Unregistering a Device

switch# **license smart deregister**

Unregisters a device.

Configuring Smart Call Home for Smart Software Licensing

Viewing a Smart Call Home Profile

switch# **show callhome smart-licensing**

Displays the Smart Call Home profile.

Enabling Smart Call Home Data Privacy

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 all	Displays all smart license agent information.
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 use-vrf management
switch(config)# vrf context management
switch(config-vrf)# ip domain-name cisco.com
switch(config-vrf)# ip name-server 171.70.168.183
```

```
switch(config-vrf)# exit
switch(config)# callhome
switch(config-callhome)# transport http use-vrf management
switch(config-callhome)# exit
switch(config)# feature license smart
```

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(config-callhome)# destination-profile CiscoTAC-1 ?
alert-group Add alert group
email-addr Add email addr
http Add http or https url
transport-method Callhome message sending transport-method
destination-profile CiscoTAC-1 http https://10.83.111.51/Transportgateway/
services/DeviceRequestHandler*
```

Note * The IP address should have the format: https://<CSSM satellite IP>/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: 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 on Dec 14 10:43:48 2016 UTC

  Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
  Next Communication Attempt: Jan 13 10:43:47 2017 UTC
```

```
        Communication Deadline: Dec 14 08:07:20 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 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


switch# show license tech support

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 on Dec 14 10:43:48 2016 UTC

  Last Communication Attempt: SUCCEEDED on Dec 14 10:43:48 2016 UTC
  Next Communication Attempt: Jan 13 10:43:47 2017 UTC
  Communication Deadline: Dec 14 08:07:20 2017 UTC

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining:  89 days, 23 hours, 59 minutes, 7 seconds

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

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

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

Upcoming Scheduled Jobs
=======================
Current time: Dec 15 08:44:44 2016 UTC
IdCert Expiration Warning: Oct 15 08:07:20 2017 UTC (303 days, 23 hours, 22 minu
tes, 36 seconds remaining)
Daily: Dec 15 10:26:50 2016 UTC (1 hours, 42 minutes, 6 seconds remaining)
Certificate Renewal: Jun 12 10:43:32 2017 UTC (179 days, 1 hours, 58 minutes, 48
 seconds remaining)
Reservation configuration mismatch between nodes in HA mode: Not Available
Certificate Expiration Check: Dec 14 08:07:20 2017 UTC (363 days, 23 hours, 22 m
inutes, 36 seconds remaining)
Authorization Renewal: Jan 13 10:43:47 2017 UTC (29 days, 1 hours, 59 minutes, 3
 seconds remaining)
Authorization Expiration Check: Dec 14 08:07:20 2017 UTC (363 days, 23 hours, 22
 minutes, 36 seconds remaining)
Init Flag Check: Not Available
Register Period Expiration Check: Not Available
Ack Expiration Check: Not Available

License Certificates
====================
Production Cert: True
PIID: 27dc6a49-9745-4c7c-86de-d1dbd31e58ac

Licensing Certificated:

    Id certificate Info:
        Start Date: Dec 14 08:07:22 2016 UTC
        Expiry Date: Dec 14 08:07:22 2017 UTC
        Version Number: 3
```

```
            Serial Number: 727430
            Common Name: 9c172927d1806d05694c1f434b40ec0fbef93abb::2

        Signing certificate Info:
            Start Date: Sep 11 19:05:34 2013 UTC
            Expiry Date: Dec  7 07:00:15 2069 UTC
            Version Number: 3
            Serial Number: 3
            Common Name: MMI Signer

        Sub CA Info:
            Start Date: Sep 11 19:06:30 2013 UTC
            Expiry Date: Dec  7 07:00:15 2069 UTC
            Version Number: 3
            Serial Number: 2
            Common Name: Smart Licensing CA

        Root Cert Info:
            Start Date: May 30 19:48:47 2013 UTC
            Expiry Date: Dec  7 07:00:15 2069 UTC
            Version Number: 3
            Serial Number: 1
            Common Name: Cisco Licensing Root CA

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

Other Info
==========
Software ID: regid.2015-09.com.cisco.Nexus_7000,1.0_6e2b6ed8-fe9b-48e0-a71f-74ea
f1bcc991
Agent State: authorized
TS enable: True
Transport: Callhome
Locale: C
Debug flags: 0x7
Privacy Send Hostname: True
Privacy Send IP: True
Build type:: Production
sizeof(char)  : 1
sizeof(int)   : 4
sizeof(long)  : 4
sizeof(char *): 4
sizeof(time_t): 4
sizeof(size_t): 4
Endian: Little
Write Erase Occurred: False
XOS version: 0.11.0.0
Reservation enable: False
Reservation in progress: False
Reservation type: None
Reservation request code: <empty>
Reservation authorization code: <empty>
Reservation return code: <empty>
Config Persist Received: True
Message Version: 1.1
```

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

```
switch# show license udi

UDI: SN:JAF1428DTAH


switch# show license usage

License Authorization:
  Status: AUTHORIZED on Dec 15 08:45:50 2016 UTC

(LAN_ENTERPRISE_SERVICES_PKG):
  Description: LAN license for Nexus 7000,7700 Platforms
  Count: 1
  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 CiscoTAC-1 transport-method http
  destination-profile CiscoTAC-1 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 Cisco Nexus 7000 Series Switch with licenses and select the Cisco NX-OS 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 Cisco Nexus 7000 Series Switch with licenses and select the Cisco NX-OS release that will be preinstalled in the hardware prior to shipment.

2. Upgrade the switch to Cisco NX-OS Release 8.0(1).

> **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 Cisco NX-OS Release 8.0(1) 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 Cisco NX-OS Release 8.0(1) is installed on the switch, enable smart mode, and start using the smart licenses.

Additional References for Smart Software Licensing

Table 1: 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 Software Licensing with Satellite	8.4(2)	This feature was introduced.
Converting a Traditional License to a Smart License—CLI Version	8.2(1)	This feature was introduced.
Subscription-based Licensing	8.2(1)	This feature was introduced.

Feature Name	Release	Feature Information
Smart Software Licensing	8.0(1)	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 Nexus 7000 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**