



## Smart Licensing

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## Information About Cisco Smart Licensing

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

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

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

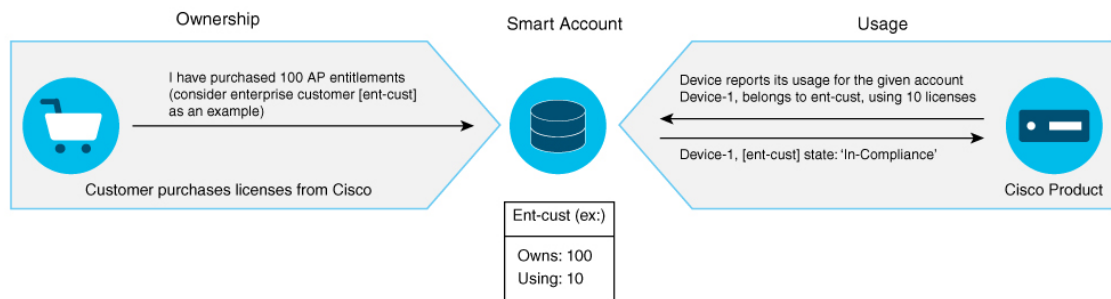
For a more detailed overview on Cisco Licensing, go to [cisco.com/go/licensingguide](https://cisco.com/go/licensingguide).



**Important** Smart Licensing is supported only until Cisco IOS XE Amsterdam 17.3.1.

Starting with Cisco IOS XE Amsterdam 17.3.2a, an enhanced version of Smart Licensing, called *Smart Licensing Using Policy* is available and automatically enabled on the device.

**Figure 1: Relationship Between Ownership, Smart Account, and Usage**



**Note** Starting with Cisco IOS XE Gibraltar 16.12.1, the Cisco Catalyst 9800 Series Wireless Controller does not support satellite server for licensing reporting. You should use the Cisco Smart Software Manager (CSSM) for any licensing reporting.

Once your product is registered in CSSM, you will be able to view the license usage using your Smart Account or Virtual Account for every eight hours.



**Note**

- Smart Licensing registration is lost when the device switches from controller to autonomous mode and back. In such instances, you should re-register the controller to CSSM to restore licenses authorization.
- After adding new license in the Cisco Smart Software Manager (CSSM) for customer virtual account, run the **license smart renew auth** command on the controller to get the license status changed from Out Of Compliance to Authorised.



**Note** You need to execute the **write memory** command once in the following cases:

- When the Standby becomes Active after the first switchover.
- When the license de-registers after the switchover.

Access points support the following AIR licensing levels:

- AIR Network Essential (AIR-NE)
- AIR Network Advantage (AIR-NA)

- AIR DNA Essential (AIR-DNA-E)
- AIR DNA Advantage (AIR-DNA-A)



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**Note** The *AIR-DNA-A* and *AIR-DNA-E* are the available license levels on the controller.

The *AIR-DNA-A* is the default mode.

You can configure as *AIR-DNA-A* or *AIR-DNA-E* license level and on term expiry, you can move to the Network Advantage or Network Essentials license level, if you do not want to renew the DNA license.

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### Smart Licensing Reservation Types

License reservation is a mechanism to reserve node locked licenses and install them on the controller.

The following are the license reservation types:

- Permanent License Reservation (PLR)—All licenses are reserved.
- Specified License Reservation (SLR)—Only specific licenses are reserved. Supports term licenses.

The controller supports four different entitlement registration or reporting on Smart Licensing or service reservation. Every connecting AP requires a Cisco DNA Center License to leverage the unique value properties of the controller.



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**Note** The controller boots up with *AIR-DNA-A* as the default. Any change in the license level requires a reboot.

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### Entitlement Reporting

Entitlement reporting is nothing but reporting the number of access points on the controller to the Cisco Smart Software Manager (CSSM).

The entitlement reporting is based on the configured AIR license level on the controller.



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**Note** Two types of entitlement reporting occurs when you are in *AIR-DNA-E* and *AIR-DNA-A* levels. For instance, if your controller reports 100 APs as count, your entitlement reporting displays *100 AIR-NE* and *100 AIR-DNA-E*. Similarly, it also displays *100 AIR-NA* and *100 AIR-DNA-A* to CSSM.

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## Creating a Smart Account

### Procedure

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**Step 1** Navigate to the Cisco Software Central web page:

<https://software.cisco.com/#>

The Cisco Software Central page is displayed.

**Step 2** From the **Important News** pop-up window, click **Get a Smart Account**.

(Or)

From the **Administration** area, click **Request a Smart Account**.

Follow the process to create a Smart Account.

**Note** You need to have a Smart Account to use Smart Licensing.

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## Using Smart Licensing

### Before you begin

Follow the procedure given below to cover the high-level steps on how to use smart licensing:

### Procedure

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**Step 1** Configure your device for smart licensing.

**Step 2** Login to CSSM customer **Smart Account** > **Virtual Account** to generate a token.

**Step 3** Execute the following command on your device:

```
Device# license smart register idtoken <token-id>
```

**Note** You can get the *token-id* from the CSSM web portal.

**Note** You can use the **license smart register idtoken *token-id* force** command to register the device again even if the same device was registered with CSSM earlier.

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## Reregister a License (GUI)

### Procedure

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**Step 1** Choose **Licensing**.

**Step 2** In the **Registration Status** field, click **Reregister** link. The **Registration** dialog box is displayed.

**Step 3** Select the **Register this product instance if it is already registered** check box to forcefully register the product.

**Step 4** Click **Finish**.

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# Using Specified License Reservation (SLR)

## Procedure

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**Step 1** configure terminal**Example:**

```
Device# configure terminal
```

Enters global configuration mode.

**Step 2** license smart reservation**Example:**

```
Device(config)# license smart reservation
```

Enables specified license reservation mode on the controller.

**Step 3** license smart reservation request local**Example:**

```
Device(config)# license smart reservation request local
```

Generates a request code.

**Note** Enter this request code in the Cisco Smart Software Manager portal:

```
CB-ZL-AIR-9500C-K9:9J4FVHMBXCO-BjSeUVwmn-D8
```

**Step 4** end**Example:**

```
Device(config)# end
```

Returns to privileged EXEC mode. Alternatively, you can also press **Ctrl-Z** to exit global configuration mode.

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# Enabling Specified License Reservation in CSSM

**Before you begin**

You should have a smart account and virtual account to generate the authorization code for the controller.

**Procedure**

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**Step 1** Login to CSSM.**Step 2** De-register the smart license, if the controller is reporting to a satellite server.

```
Device(config)# license smart deregister
```

**Step 3** Enable Specified License Reservation in the controller.

```
Device(config)# license smart reservation
```

**Step 4** Verify the license reservation status on your controller using the following command:

```
Device# show license reservation
```

```
License reservation: ENABLED
```

```
Overall status:
```

```
Active: PID:C9800-CL-K9,SN:9PQFKND9ZR8
Reservation status: NOT INSTALLED
Export-Controlled Functionality: NOT ALLOWED
Standby: PID:C9800-CL-K9,SN:9UD8BBTHL1S
Reservation status: NOT INSTALLED
Export-Controlled Functionality: NOT ALLOWED
```

**Step 5** Generate *request code* on your controller using the following command:

```
Device(config)# license smart reservation request all
```

```
Request code for active : CG-ZC9800-CL-K9:9PQFKND9ZR8-BjSeUVwmn-8E
Request code for standby : CG-ZC9800-CL-K9:9PQFKND9ZR8-BjSeUVwmn-8E
```

Option *all* will generate the request code for both active and stand-by, if the controller is in HA pair.

Option *local* will generate the request code for active or standalone controller.

**Step 6** Generate *authorization code*, using the *request code*, for each controller separately in CSSM and install both the codes in the controller. You can install the *authorization code* of standby controller through active controller.

- Go to CSSM and navigate to your Smart Account and Virtual Account:  
<https://software.cisco.com/software/cs/ws/platform/home#SmartLicensing-Inventory>
- Click **Licenses** tab.
- Click **License Reservation** button and enter the request code obtained from the previous step in to the **Reservation Request Code** field.
- Click **Next**.
- In the **Select Licenses** tab, select the **Reserve a specific license** radio button and enter the number of licenses required to reserve in the **Reserve** text box.
- Click **Next**.
- In the **Review and Confirm** tab, check the quantity and license type, and click **Generate Authorization Code** button.
- From the **Authorization Code** tab, select **Download as File** option to download the **authorization code**.

**Note** Repeat **Step b** to **Step h** to generate *authorization code* for the standby controller.

**Step 7** Upload the *authorization code* file to the controller bootflash: directory.

```
Device# copy ftp://<ip-address>authorization-code.txt bootflash:
Destination filename [authorization-code.txt]
```

**Step 8** Install the *authorization code* file in the controller using the following command.

```
Device# license smart reservation install file authorization-code.txt
```

**Note** Use the same command to install the *authorization code* for stand-by controller also using active controller in case of HA.

- Step 9** Verify the license summary after installing the *authorization code* on your controller using the following command:

```
Device# show license summary
```

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## Enabling Smart Software Licensing

### Procedure

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- Step 1** Navigate to the Cisco Software Central web page using the following link:  
<https://software.cisco.com/#>  
The Cisco Software Central page is displayed.
- Step 2** From the **License** tab, click **Smart Software Licensing**.  
The Smart Software Licensing page is displayed.
- Step 3** Click the **Inventory** tab to view **Virtual Account: Accounting** page details.
- Step 4** Click **New Token** to register the product instances to this virtual account.  
The Create Registration Token page is displayed.
- Step 5** In the **Description** field, enter a description for the ID token.
- Step 6** Check the **Allow export-controlled functionality on the products registered with this token** checkbox to enable export-controlled functionality.
- Step 7** Click **Create Token**.
- Note** Licenses cannot be purchased with the wireless controller. All licenses can be purchased with access points.
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## Enabling Smart Call Home Reporting

### Procedure

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- Step 1** **configure terminal**  
**Example:**  
Device# configure terminal  
Enters global configuration mode.
- Step 2** **call-home reporting contact-email-addr** *email-address* **http-proxy** *proxy-server* *port-number*

**Example:**

```
Device(config)# call-home reporting contact-email-addr sample@cisco.com http-proxy 120.20.2.2
5
```

Enables Call Home reporting.

- *port-number*—The valid range is from 1 to 65535.

**Step 3** end**Example:**

```
Device(config)# end
```

Returns to privileged EXEC mode. Alternatively, you can also press **Ctrl-Z** to exit global configuration mode.

For more information on Smart Call Home, see:

[https://www.cisco.com/c/en/us/td/docs/switches/lan/smart\\_call\\_home/book/SCH31\\_Ch3.html](https://www.cisco.com/c/en/us/td/docs/switches/lan/smart_call_home/book/SCH31_Ch3.html)

## Configuring AIR License Level (GUI)

### Procedure

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- Step 1** Choose **Licensing**.
  - Step 2** Click **Change Wireless License Level**. The **Change Wireless License Level** dialog box is displayed.
  - Step 3** Select the License Level using the drop-downs.
  - Step 4** After changing the **New Level** values, click **Save & Reload** (Or) **Save without Reload**. Alternatively, you can click **Reload** to reload the device. During this time, you will lose network connectivity to the device. If you wish to continue, click **Yes**.
  - Step 5** Click refresh icon to refresh the device.
- 

## Configuring AIR License Level (CLI)

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>license air level {air-network-advantage   air-network-essentials}</b>  <b>Example:</b>	Configures AIR license level. <ul style="list-style-type: none"> <li>• air-network-advantage—Is the AIR network advantage license level.</li> </ul>



	Command or Action	Purpose
	<pre>Device(config)# license air level air-network-advantage  Device(config)# license air level air-network-essentials</pre>	<ul style="list-style-type: none"> <li>air-network-essentials—Is the AIR network essential license level.</li> </ul>
<b>Step 3</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config)# end</pre>	Returns to privileged EXEC mode. Alternatively, you can also press <b>Ctrl-Z</b> to exit global configuration mode.

## Configuring AIR Network Essentials License Level

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 2</b>	<p><b>license air level network-essentials addon air-dna-essentials</b></p> <p><b>Example:</b></p> <pre>Device(config)# license air level network-essentials addon air-dna-essentials</pre>	Configures AIR network essentials license level.
<b>Step 3</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config)# end</pre>	Returns to privileged EXEC mode. Alternatively, you can also press <b>Ctrl-Z</b> to exit global configuration mode.

## Configuring AIR Network Advantage License Level

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 2</b>	<p><b>license air level air-network-advantage addon air-dna-advantage</b></p> <p><b>Example:</b></p>	Configures AIR network advantage license level.

	Command or Action	Purpose
	<pre>Device(config)# license air level air-network-advantage addon air-dna-advantage</pre>	
<b>Step 3</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config)# end</pre>	Returns to privileged EXEC mode. Alternatively, you can also press <b>Ctrl-Z</b> to exit global configuration mode.

## Enabling High-Performance License

From Cisco IOS XE Amsterdam 17.1.1s onwards, you can increase the capacity of the Cisco Catalyst C9800-L-K9 Wireless Controller using a high- performance license.

This high- performance license increases the capacity of the controller from 250 APs and 5000 clients to 500 APs and 10000 clients, and throughput from 5 Gbps to 10 Gbps.

Use the following procedure to increase the support of APs, clients, and throughput.

### Before you begin

- License activation should be completed during bootup.
- Any change in the license configuration requires reboot of the controller. Ensure that you save the configuration before reload.
- Two licenses are required for the high-availability controllers.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 2</b>	<p><b>license wireless high-performance</b></p> <p><b>Example:</b></p> <pre>Device(config)# license wireless high-performance</pre>	<p>Increases the scale from 250 APs and 5000 clients to 500 APs and 10000 clients, and throughput from 5 Gbps to 10 Gbps.</p> <p>Use the <b>no license wireless high-performance</b> command to unconfigure the high-performance license.</p> <p><b>Note</b> Reboot the controller for the performance license to take effect.</p>
<b>Step 3</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config)# end</pre>	Returns to privileged EXEC mode.

	Command or Action	Purpose
<b>Step 4</b>	<p><b>show license summary</b></p> <p><b>Example:</b></p> <pre>Device# show license summary  Smart Licensing is ENABLED Registration:   Status: REGISTERED   Smart Account: BU Production Test   Virtual Account: NplusOne   Export-Controlled Functionality: ALLOWED   Last Renewal Attempt: SUCCEEDED   Next Renewal Attempt: Apr 02 02:51:15 2020 IST License Authorization:   Status: REGISTERED   Last Communication Attempt: SUCCEEDED   Next Communication Attempt: Oct 10 22:55:34 2019 IST License Usage:   License                               Entitlement tag                                     Count Status  C9800-L performance ... (LIC_C9800L_PERF) 2 AUTHORIZED</pre>	(Optional) Displays the summary of licenses.
<b>Step 5</b>	<p><b>show wireless summary</b></p> <p><b>Example:</b></p> <pre>Device# show wireless summary  Max APs supported           : 500 Max clients supported       : 10000  Access Point Summary  ----- Total      Up      Down ----- 802.11 2.4GHz              0      0 0 802.11 5GHz                0      0 0 802.11 dual-band           0      0 0 802.11 rx-dual-band        0      0 0 Client Serving(2.4GHz)     0      0 0 Client Serving(5GHz)       0      0 0 Monitor                    0      0 0 Sensor                     0      0 0  Client Summary  Total Clients : 0</pre>	(Optional) Displays the number of access points, radios, and wireless clients known to the controller.

	Command or Action	Purpose
	Excluded : 0 Disabled : 0 Foreign : 0 Anchor : 0 Local : 0	
<b>Step 6</b>	<b>show license usage</b>  <b>Example:</b> Device# show license usage  License Authorization: Status: AUTHORIZED on Oct 04 14:47:22 2019 IST C9800-L performance license (LIC_C9800L_PERF): Description: C9800-L higher performance license Count: 2 Version: 1.0 Status: AUTHORIZED Export status: NOT RESTRICTED	(Optional) Displays license usage information.

## Verifying Smart Licensing Configurations

To verify the smart licensing status and license usage, use the following command:

```

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

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: Not Allowed

License Authorization:
  Status: EVAL MODE
  Evaluation Period Remaining: 73 days, 1 hours, 33 minutes, 8 seconds

Utility:
Status: DISABLED

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

Transport:
  Type: Callhome

License Usage
=====
(AIR_network_essential):
  Description:
  Count: 1
  Version: 1.0

```

```
Status: EVAL MODE
```

```
Product Information
```

```
=====
```

```
UDI: PID:L-AIR-9500C-K9,SN:9J4FVHMBXCO
```

```
Agent Version
```

```
=====
```

```
Smart Agent for Licensing: 4.5.3_rel/43
```

```
Component Versions: SA:(1_3_dev)1.0.15, SI:(dev22)1.2.1, CH:(rel5)1.0.3, PK:(dev18)1.0.3
```

```
Reservation Info
```

```
=====
```

```
License reservation: DISABLED
```

To verify the smart licensing status, use the following command:

```
Device# show license status
```

```
Tue Oct 02 07:34:36.023 IST
```

```
Smart Licensing is ENABLED
```

```
Initial Registration: SUCCEEDED on Mon Oct 01 2018 21:55:46 IST
```

```
Last Renewal Attempt: None
```

```
Registration Expires: Sun Dec 29 2018 11:49:40 IST
```

```
License Authorization:
```

```
Status: AUTHORIZED on Mon Oct 01 2018 21:55:46 IST
```

```
Last Communication Attempt: SUCCEEDED on Mon Oct 01 2018 21:55:46 IST
```

```
Next Communication Attempt: Thu Nov 02 2018 21:56:10 IST
```

```
Communication Deadline: Sun Dec 29 2018 11:49:16 IST
```

To verify the air license level and smart licensing status, use the following command:

```
Device# show version
```

```
AIR License Level: AIR DNA Advantage
```

```
Next reload AIR license Level: AIR DNA Advantage
```

```
Smart Licensing Status: UNREGISTERED/No Licenses in Use
```

