



## Smart Licensing

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## Feature Summary and Revision History

### Summary Data

*Table 1: Summary Data*

Applicable Product(s) or Functional Area	AMF
Applicable Platform(s)	SMI
Feature Default Setting	Disabled - Configuration required to enable
Related Documentation	Not Applicable

### Revision History

*Table 2: Revision History*

Revision Details	Release
First introduced.	2021.04.0

## Smart Software Licensing

Cisco employs two types of license models - Legacy Licensing and Smart Software Licensing. Legacy Licensing consists of software activation by installing Product Activation Keys (PAK) on to the Cisco product. A Product Activation Key is a purchasable item, ordered in the same manner as other Cisco equipment and

used to obtain license files for feature set on Cisco Products. This traditional licensing does not need any online communication with the Cisco licensing server.

Smart Software Licensing is a cloud-based licensing of the end-to-end platform through the use of a few tools that authorize and deliver license reporting. Smart Software Licensing functionality incorporated into the NFs complete the product registration and authorization. AMF supports the Smart Software Licensing model.

Smart Licensing simplifies the purchase, deployment, and management of Cisco software assets. Entitlements are purchased through your Cisco account through Cisco Commerce Workspace (CCW) and immediately available in your Virtual Account for usage. This approach eliminates the need to install license files on every device. Smart-enabled products communicate directly to Cisco to report consumption. A single location—Cisco Software Central—is available for customers to manage Cisco software licenses. License ownership and consumption are readily available to help make a better purchase decision that is based on consumption or business need.

For more information on Cisco Smart Licensing, see <https://www.cisco.com/c/en/us/buy/smart-accounts/software-licensing.html>.

## Cisco Software Central

Cisco Software Central (CSC) enables the management of software licenses and the smart account from a single portal. The CSC interface allows you to enable your product, manage entitlements, renew, and upgrade software. You need a functioning smart account to complete the registration process.

To access Cisco Software Central, see <https://software.cisco.com>.

## Smart Accounts and Virtual Accounts

A Smart Account provides a single location for all smart-enabled products and entitlements. It helps in procurement, deployment, and maintenance of Cisco Software. When creating a smart account, you must have the authority to represent the requesting organization. After submission, the request goes through approval process.

A Virtual Account exists as a sub-account within the smart account. Virtual Accounts are customer-defined based on the organizational layout, business function, geography, or any defined hierarchy. Smart account administrator creates and maintains the virtual accounts.

For information on setting up or managing the Smart Accounts, see <https://software.cisco.com>.

## Requesting a Cisco Smart Account

A Cisco Smart Account is an account where smart licensing-enabled products are available. A Cisco smart account allows you to manage and activate your licenses to devices, monitor license use, and track Cisco license purchases. Through transparent access, you have a real-time view into your smart licensing products. IT administrators can manage licenses and account users within the organization's smart account through Cisco Software Central. To create a Cisco Smart Account, perform the following steps:

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**Step 1** Visit the following URL:

<https://software.cisco.com>

**Step 2** Log in using your credentials, and click **Request a Smart Account** in the **Administration** area.

The **Smart Account Request** window appears.

**Step 3** Under **Create Account**, select one of the following options:

- **Yes, I have authority to represent my company and want to create the Smart Account.** If you select this option, you agree to authorize to create and manage product and service entitlements, users, and roles, on behalf of the organization.
- **No, the person specified below will create the account.** If you select this option, you must enter the email address of the person who creates the smart account.

**Step 4** Under **Account Information**,

- a) Click **Edit** beside **Account Domain Identifier**.
- b) In the **Edit Account Identifier** dialog box, enter the domain, and click **OK**. By default, the domain is based on the email address of the person creating the account, and must belong to the company that will own this account.
- c) Enter the **Account Name** (typically, the company name).

**Step 5** Click **Continue**.

The Smart Account request will be in pending status until it is approved by the Account Domain Identifier. After the approval, you will receive an email confirmation with instructions for completing the setup process.

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## AMF Smart Licensing

The Smart Licensing feature supports application entitlement for online and offline licensing for all 5G applications (AMF, SMF, and NRF). The application usage is unrestricted during all stages of licensing, including Out of Compliance (OOC) and expired stages.



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**Note** All licenses in use are granted a 90-day evaluation period. Currently, the functionality and operation of the 5G applications is unrestricted even after the end of the evaluation period.

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## Software Tags and Entitlement Tags

The following sections provide information on software and entitlement tags that are created to identify, report, and enforce licenses.

### Software Tags

A Software tag or a Product tag is a unique identifier that helps Smart Licensing system identify the software product family. During the addition of Smart product instance in Cisco Smart Software Manager, the Smart client uses the software/product tag for identification.

The following software tags exist for the AMF.

Product Type / Description	Software Tag
Ultra Cloud Core - Access and Mobility Management Function (AMF), Base Minimum	regid.2020-04.com.cisco.AMF,1.0_d9b74814-21c2-4667-a1b2-e27165bfc533

### Entitlement Tags

An Entitlement tag is a part of the software that identifies the features that are being used in a software image. These tags underlay the communication on usage and entitlements of the software products that are installed on the devices. The entitlement tags map to both the PID license and the Software image. Every Smart-enabled PID may contain one or more entitlement tags.

The following entitlement tags identify licenses in use.

Product Type / Description	Entitlement Tag
Ultra Cloud Core - Access and Mobility Management Function (AMF), Base Minimum	regid.2020-04.com.cisco.AMF_BASE,1.0_9aa44be9-ee64-4e65-ac3d-b4040c108180



**Note** The license information is retained during software upgrades and rollback.

## Configuring Smart Licensing

You can configure Smart Licensing after a new AMF deployment.

### Users with Access to CSC

This section describes how to configure Smart Licensing if you have access to CSC portal from your environment.

#### Setting Up the Product and Entitlement in CSC

To set up your product and entitlement in CSC:

1. Log in to your CSC account.
2. Click **Add Product** and enter the following details:
  - **Product name**—Specify the name of the deployed product. Example: AMF.
  - **Primary PM CEC ID**—Specify the primary Project Manager's CEC ID for the deployed product.
  - **Dev Manager CEC ID**—Specify the Development Manager's CEC ID for the deployed product.
  - **Description**—(Optional) Specify a brief description of the deployed product.

- **Product Type**—Specify the product type.
  - **Software ID Tag**—Specify the software ID Tag provided by the Cisco Accounts team.
3. Click **Create**.
  4. Select your product from the **Product/Entitlement Setup** grid.
  5. Click **Entitlement** drop-down list and select **Create New Entitlement**.
  6. Select **New Entitlement** in **Add Entitlement** and enter the following details:
    - **Entitlement Name**—Specify the license entitlement name. Example: AMF\_BASE.
    - **Description**—(Optional) Specify a brief description about the license entitlement.
    - **Entitlement Tag**—Specify the entitlement tag provided by the Cisco Accounts team.
    - **Entitlement Type**—Specify the type of license entitlement.
    - **Vendor String**—Specify the vendor name.
  7. Click **Entitlement Allocation**.
  8. Click **Add Entitlement Allocation**.
  9. In **New License Allocation**, provide the following details:
    - **Product**—Select your product from the drop-down list.
    - **Entitlement**—Select your entitlement from the drop-down list.
  10. Click **Continue**.
  11. In **New License Allocation**, enter the following details:
    - **Quantity**—Specify the number of licenses.
    - **License Type**—Specify the type of license.
    - **Expiring Date**—Specify the date of expiry for the license purchased.
  12. Click **Create**.

### Registering Smart Licensing

You must register the product that is entitled to the license with CSC. To register, generate an ID token from CSC.

1. Log in to your CSC account.
2. Click **General > New Token** and enter the following details:
  - **Description**—Specify a brief description for the ID token.
  - **Expires After**—Specify the number of days for the token to expire.
  - **Max. Number Users**—Specify the maximum number of users.

3. Click **Create Token**.
4. Select **new ID token** in **Product Instance Registration Token**.
5. Click **Actions > Copy**.
6. Log in to AMF Ops Center CLI and paste the **ID token** using the following command:

```
license smart register idtoken
```

**NOTES:**

- **license smart register**—Registers Smart Licensing with CSC.
- *idtoken*—Specify the ID token generated from CSC.

**Example:**

```
license smart register
Value for 'idtoken' (<string>): MTI2Y2F1NTAtOThkMi00YTAxLWE4M2QtOTNhNzNjNjY4ZmFiLlTE2MTc4N
Tky%0AMTA5MDh8ck1jUHNwc3k1ZC9nWFFCSnVecUp4QU1jTFoxOGxDTU5kQ3lpa25E%0Ab04wST0%3D%0A
```

7. Verify the Smart Licensing status using the following command:

```
show license all
```

**Example:**

```
show license all
Smart Licensing Status
=====
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: CN-5G-NF
  Virtual Account: Default
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Jun 15 12:12:38 2020 GMT
  Last Renewal Attempt: SUCCEEDED on Jun 15 12:12:38 2020 GMT
  Next Renewal Attempt: Dec 12 12:12:38 2020 GMT
  Registration Expires: Jun 15 12:02:50 2021 GMT

License Authorization:
  Status: AUTHORIZED on Jun 15 12:12:44 2020 GMT
  Last Communication Attempt: SUCCEEDED on Jun 15 12:12:44 2020 GMT
  Next Communication Attempt: Jul 15 12:12:44 2020 GMT
  Communication Deadline: Sep 13 12:09:43 2020 GMT

License Conversion:
  Automatic Conversion Enabled: true
  Status: NOT STARTED

Utility:
  Status: DISABLED

Transport:
  Type: CALLHOME

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining: 87 days, 10 hr, 3 min, 3 sec

License Usage
=====
```

License Authorization Status: AUTHORIZED as of Jun 15 12:12:44 2020 GMT

```
AMF_BASE (AMF_BASE)
  Description: 5G AMF Base Entitlement
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED
  Feature Name: <empty>
  Feature Description: <empty>
```

```
Product Information
=====
UDI: PID:AMF,SN:JEZZ35Q-ZF6DE7Y
```

```
Agent Version
=====
Smart Agent for Licensing: 3.1.4
```

## Deregistering Smart Licensing

To deregister Smart Licensing:

1. Log in to AMF Ops Center CLI and use the following command:

```
license smart deregister
```

### NOTES:

- **license smart deregister**—Deregisters Smart Licensing from CSC.

2. Verify the Smart Licensing status using the following command:

```
show license all
```

### Example:

```
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: 84 days, 22 hr, 58 min, 0 sec
  Last Communication Attempt: NONE

License Conversion:
  Automatic Conversion Enabled: true
  Status: NOT STARTED

Utility:
  Status: DISABLED

Transport:
  Type: CALLHOME

Evaluation Period:
```

```

Evaluation Mode: In Use
Evaluation Period Remaining: 84 days, 22 hr, 58 min, 0 sec

License Usage
=====
License Authorization Status: EVALUATION MODE
Evaluation Period Remaining: 84 days, 22 hr, 58 min, 0 sec

(AMF_BASE)
Description: <empty>
Count: 1
Version: 1.0
Status: EVAL MODE
Export status: NOT RESTRICTED
Feature Name: <empty>
Feature Description: <empty>

Product Information
=====
UDI: PID:AMF,SN:5DSFOZQ-DMKWHEA

Agent Version
=====
Smart Agent for Licensing: 3.1.4

```

## Users without Access to CSC

The Smart License Reservation feature—Perpetual Reservation—is reserved for customers without access to CSC from their internal environments. Cisco allows customers to reserve licenses from their virtual account and tie them to their devices' Unique Device Identifier (UDI). This enables customers to use their devices with reserved licenses in a disconnected mode.

The subsequent sections describe the procedure involved in reserving Smart License for users without access to CSC from their internal environment.

### Enabling Smart License Reservation

To enable Smart License reservation through AMF Ops Center CLI, log in to AMF Ops Center CLI and use the following configuration:

```

config terminal
license smart reservation
exit

```

#### NOTES:

- **license smart reservation**—Enables license reservation.

### Enabling and Generating Smart License Reservation Request Code

To enable and generate the Smart License reservation request code:

1. Log in to AMF Ops Center CLI.
2. To enable reservation, use the following configuration:



```
config terminal
  license smart reservation
  exit
```

**NOTES:**

- **license smart reservation**—Enables license reservation request code.

3. To request for a reservation code, use the following command:

```
license smart reservation request
```

**NOTES:**

- **license smart reservation request**—Generates the license reservation request code.




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**Important** Copy the generated license request code from the AMF Ops Center CLI to your local machine for further use.

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**Example:**

```
license smart reservation request
reservation-request-code CB-ZAMF:JEZZ35Q-ZF6DE7Y-A5QHppdj5-21
Message from confd-api-manager at 2020-06-15 12:18:47...
Global license change NotifyReservationInProgress reason code Success - Successful.
```

**Generating an Authorization Code from CSC**

To generate an authorization code from CSC using the license reservation request code:

1. Log in to your CSC account.
2. Click **License Reservation**.
3. Enter the Request Code: Paste the license reservation request code copied from the AMF Ops Center CLI in the **Reservation Request Code** text box.
4. Select the Licenses: Click **Reserve a Specific License** radio button and select *UCC 5G AMF BASE*.




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**Note** In the **Reserve** text box, enter the value *1*.

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5. Review your selection.
6. Click **Generate Authorization Code**.
7. Download the response file: The authorization code is generated and displayed on-screen. Click **Download as File** to download the authorization code.
8. Click **Close**.

**Reserving Smart Licensing**

To reserve Smart License for the deployed product using the authorization code generated in CSC:

1. Log in to AMF Ops Center CLI and use the following command:

```
license smart reservation install authorization_code
```

**NOTES:**

- **license smart reservation install** *authorization\_code*—Installs a Smart License Authorization code.

**Example:**

```
license smart reservation install
Value for 'key' (<string>): CAACfW-Wb5cMa-jEZjtU-M2KnU5-toCZBA-iaVr
```

2. Verify the smart licensing status using the following command:

```
show license all
```

**Example:**

```
show license all

Smart Licensing Status
=====
Smart Licensing is ENABLED
License Reservation is ENABLED

Registration:
  Status: REGISTERED - UNIVERSAL LICENSE RESERVATION
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Mon Jun 15 12:22:25 GMT 2020
  Last Renewal Attempt: None

License Authorization:
  Status: AUTHORIZED - RESERVED on Mon Jun 15 12:22:25 GMT 2020

Utility:
  Status: DISABLED

Transport:
  Type: CALLHOME

Evaluation Period:
  Evaluation Mode: Not In Use
  Evaluation Period Remaining: 87 days, 9 hr, 55 min, 44 sec

License Usage
=====
License Authorization Status:
  Status: AUTHORIZED - RESERVED on Mon Jun 15 12:22:25 GMT 2020
  Last Communication Attempt: SUCCEEDED on Jun 15 12:22:25 2020 GMT
  Next Communication Attempt: NONE
  Communication Deadline: NONE

AMF_BASE (AMF_BASE)
  Description: 5G AMF Base Entitlement
  Count: 1
  Version: 1.0
  Status: AUTHORIZED
  Export status: NOT RESTRICTED
  Feature Name: <empty>
  Feature Description: <empty>

Product Information
=====
UDI: PID:AMF,SN:JEZZ35Q-ZF6DE7Y
```

```
Agent Version
=====
Smart Agent for Licensing: 3.1.14
```

### Returning the Reserved License

To return the reserved license, use the following procedure:

1. When the license reservation authorization code is installed in the AMF Ops Center:

- a. Log in to the AMF Ops Center CLI and use the following command:

```
license smart reservation return
```

#### NOTES:

- **license smart reservation return**—Returns a reserved Smart License.

#### Example:

```
license smart reservation return
reservation-return-code CACfWm-rdGtXu-kPlYtP-hPNELK-63EC7s-7oK
```

- b. Copy the license reservation return code generated in AMF Ops Center CLI.
  - c. Log in to your CSC account.
  - d. Select your product instance from the list.
  - e. Click **Actions > Remove**.
  - f. Paste the license reservation return code in **Return Code** text box.
2. When the license reservation authorization code is not installed in the AMF Ops Center:
- a. Log in to the AMF Ops Center CLI and use the following command to generate the return code:

```
license smart reservation return
authorization_code
```




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**Important** Paste the license reservation authorization code generated in CSC to generate the return code.

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- b. Log in to your CSC account.
  - c. Select your product instance from the list.
  - d. Click **Actions > Remove**.
  - e. Paste the license reservation return code in **Return Code** text box.
3. Verify the smart licensing status using the following command:

```
show license all
```

#### Example:

```
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: 84 days, 22 hr, 58 min, 0 sec
  Last Communication Attempt: NONE

License Conversion:
  Automatic Conversion Enabled: true
  Status: NOT STARTED

Utility:
  Status: DISABLED

Transport:
  Type: CALLHOME

Evaluation Period:
  Evaluation Mode: In Use
  Evaluation Period Remaining: 84 days, 22 hr, 58 min, 0 sec

License Usage
=====
License Authorization Status: EVALUATION MODE
  Evaluation Period Remaining: 84 days, 22 hr, 58 min, 0 sec

(AMF_BASE)
  Description: <empty>
  Count: 1
  Version: 1.0
  Status: EVAL MODE
  Export status: NOT RESTRICTED
  Feature Name: <empty>
  Feature Description: <empty>

Product Information
=====
UDI: PID:AMF,SN:5DSFOZQ-DMKWHEA

Agent Version
=====
Smart Agent for Licensing: 3.1.4

```

## OAM Support

This section describes operations, administration, and maintenance information for this feature.

Use the following show command to view the Smart Licensing information in the AMF Ops Center:

```
show license [ all | UDI | displaylevel | reservation | smart | status |
summary | tech-support | usage ]
```

**NOTES:**

- **all**—Displays an overview of Smart Licensing information that includes license status, usage, product information, and Smart Agent version.
- **UDI**—Displays Unique Device Identifiers (UDI) details.
- **displaylevel**—Depth to display information.
- **reservation**—Displays Smart Licensing reservation information.
- **smart**—Displays Smart Licensing information.
- **status**—Displays the overall status of Smart Licensing.
- **summary**—Displays a summary of Smart Licensing.
- **tech-support**—Displays Smart Licensing debugging information.
- **usage**—Displays the license usage information for all the entitlements that are currently in use.

