

Integrate ISE with Smart Licensing Server

Contents

[Introduction](#)

[Prerequisites](#)

[Requirements](#)

[Components Used](#)

[Background Information](#)

[License Consumption Flow](#)

[TACACS+](#)

[Accounting Endpoint License](#)

[ISE Licenses](#)

[Evaluation](#)

[Tier](#)

[Device Admin](#)

[Virtual Appliance Licenses](#)

[License Registration Types](#)

[Smart Software Licensing Reservation \(Direct-Https, HTTP-Proxy, SSM On-Prem\)](#)

[Specific License Reservation \(Available in ISE 3.1 and Later\)](#)

[Configure](#)

[Connection Methods \(Direct HTTPS/HTTPS-Proxy\) for Integrating CSSM with ISE](#)

[Direct HTTPS](#)

[HTTPS Proxy](#)

[Configuring Smart Software Manager On-Prem Server](#)

[Integration Methods for ISE and CSSM](#)

[SLR](#)

[Returning Reservation for SLR](#)

[Troubleshooting](#)

[General Guidelines](#)

[ISE Logging Attributes to be Set to Debug Level](#)

[Registration and Renewal Errors](#)

[API Requests to Investigate ISE Licensing Status](#)

[Related Information](#)

Introduction

This document describes how to configure Smart Licensing on ISE.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

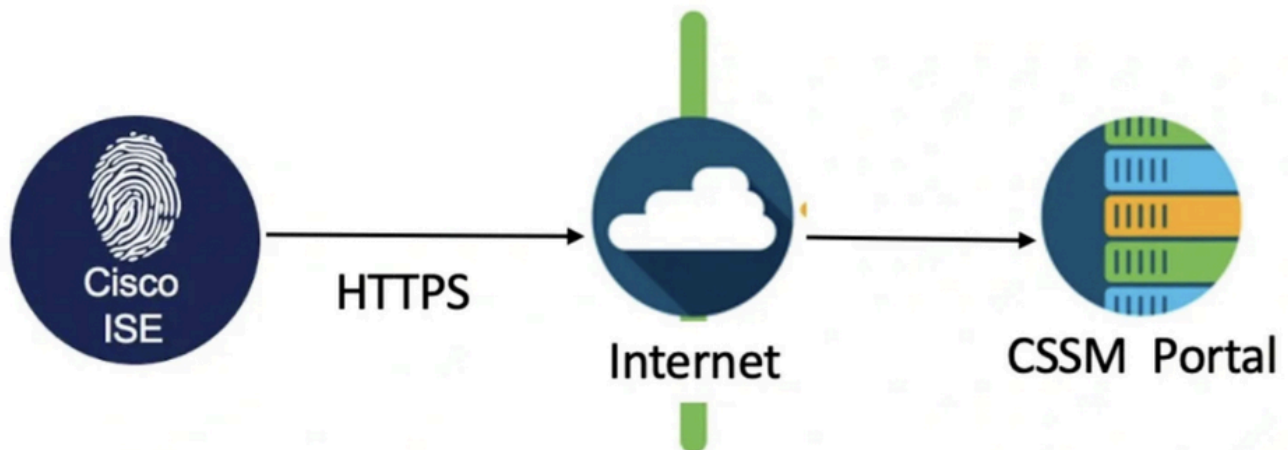
- ISE 3.x release
- Access to <https://software.cisco.com/software/smart-licensing>
- Cisco Smart Software Manager (CSSM) Version 8 Release 202010+ for On-Prem (Optional)

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information



Beginning with ISE 3.0, Smart Licensing is required. Cisco Smart Licensing simplifies license procurement, deployment, and management by enabling devices to self-register and report usage.

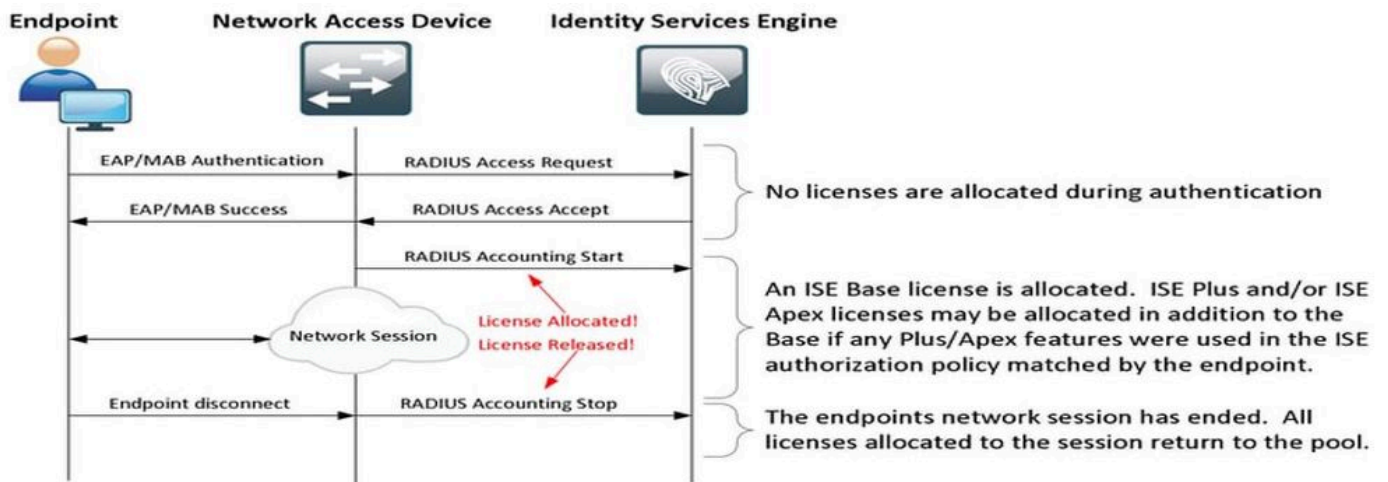
1. When a smart license token is active and registered in the Cisco ISE administration portal, the CSSM monitors the consumption of licenses by each endpoint session per product license.
2. Smart Licensing notifies the administrator about license consumption by endpoint sessions with a simple table layout in Cisco ISE.
3. Smart Licensing reports the peak usage of each enabled license to the centralized database daily.
4. Cisco ISE takes internal samples of license consumption every 30 minutes. License compliance and consumption are updated accordingly.
5. From the time you register your Cisco ISE Primary Administration node (PAN) with the CSSM, Cisco ISE reports peak counts of license consumption to the CSSM server every six hours.
6. The peak count reports help ensure that license consumption in Cisco ISE is in compliance with the licenses purchased and registered.
7. Cisco ISE communicates with the CSSM server by storing a local copy of the CSSM certificate.
8. The CSSM certificate is automatically reauthorized during the daily synchronization, and when you refresh the Licenses table. Typically, CSSM certificates are valid for six months.
9. As a result, ISE needs network connectivity in order to reach the CSSM.

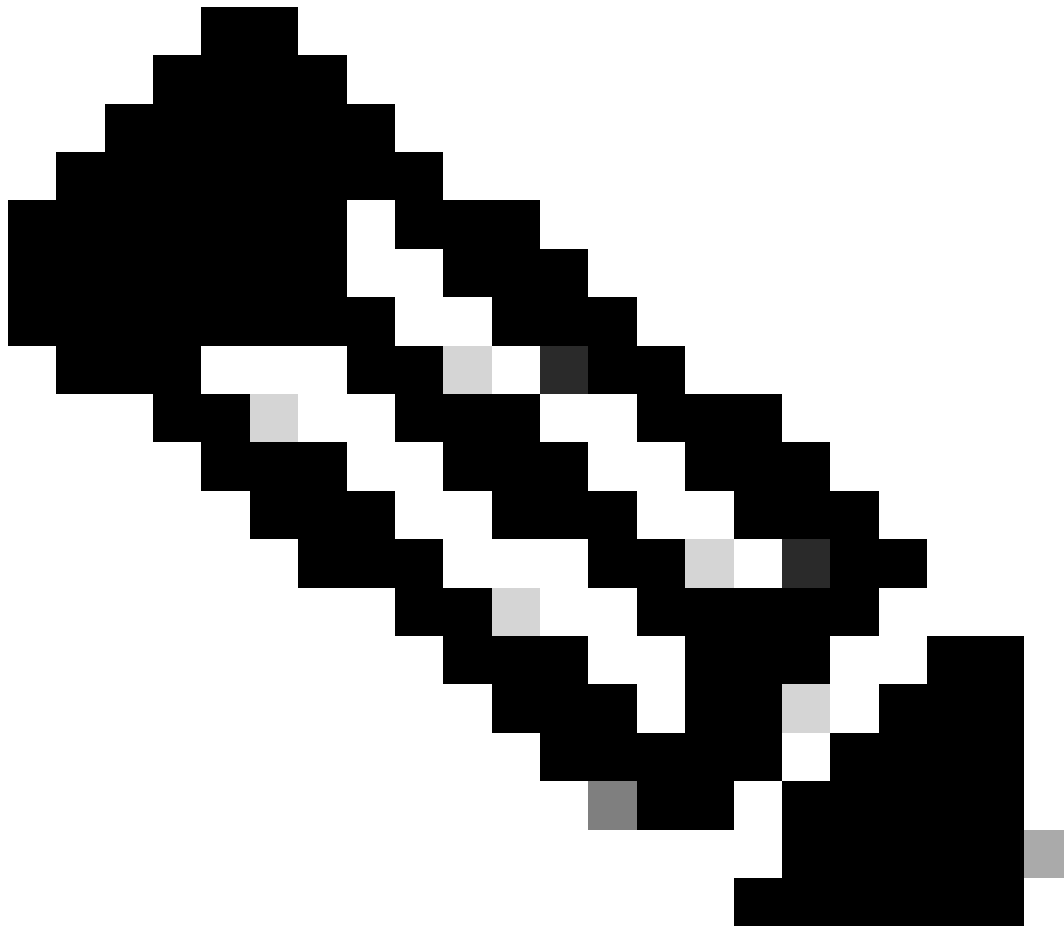
License Consumption Flow

TACACS+

The Device Admin license (PID: L-ISE-TACACS-ND=) activates TACACS+ services on a Policy Service Node (PSN). Each PSN that uses TACACS+ requires its own Device Admin license. TACACS+ device administration does not count toward endpoint usage and imposes no limit on the number of network devices you can manage. An essential license is not needed to manage Network Access Devices (NADs) such as routers and switches.

Accounting Endpoint License





Note: The diagram uses traditional license terminologies, but these also apply to the new tier licenses referenced throughout the documentation.

The number of active endpoints can differ from the licenses used because each endpoint can have multiple sessions. License consumption is based on the number of active sessions, not just the number of endpoints. For example, a system with 10 active endpoints with multiple sessions can use more licenses.

Ensure that accounting is enabled on both the wireless access points and the switch. License consumption is determined by the Start - Stop messages sent from the AAA client to the AAA server.

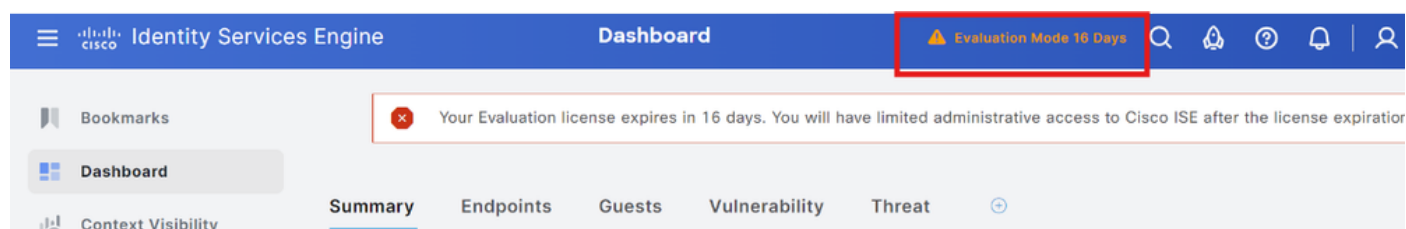
ISE uses specific rules in order to manage sessions in Monitoring and Troubleshooting (MnT), relying on accounting messages from Network Access Devices (NADs). Here is how ISE processes sessions based on these accounting messages:

- If ISE receives a RADIUS authentication request but no accounting message, it keeps the session active for 1 hour.
- Upon receiving an accounting message, ISE maintains the session for up to 5 days or until an accounting stop message is received.
- The license session is released immediately once an accounting stop message is received.
- An interim update extends the 5 days.

ISE Licenses

Evaluation

Evaluation Licenses are activated by default when you install or upgrade to Cisco ISE Release 3.x and later versions. The Evaluation License is active for 90 days, and you have access to all the Cisco ISE features during this time. Cisco ISE is considered to be in Evaluation Mode when the Evaluation License is in use. The top-right corner of the Cisco ISE administration portal displays a message with the number of days that are left in the Evaluation Mode.



Tier

Tier Licenses replace the Base, Apex, and Plus licenses used in releases earlier than release 3.x. Tier Licenses include three licenses — Essentials, Advantage, and Premier. If you currently have Base, Apex, or Plus licenses, use the CSSM in order to convert them into the new license types.

Device Admin

A Device Administration license allows you to use TACACS services on a Policy Service node. In a high-availability standalone deployment, a Device Administration license permits you to use TACACS services on a single Policy Service node in the high-availability pair. On ISE it is defined as 'Device Admin' and on the Smart license portal, it is defined as 'Maximum number of nodes entitled to TACACS+ transactions'.

Virtual Appliance Licenses

ISE 3.x onwards comes with a new form of VM license which is the 'VM Common license'. If you are using traditional VM licenses then they must be converted to VM common licenses.

For information on license types and conversion, refer to the links:

[License features](#)

[Cisco license Guide](#)

License Registration Types

For the introduction of ISE 3.1, you have three options available in order to enable Smart Licensing. These are:

Smart Software Licensing Reservation (Direct-Https, HTTP-Proxy, SSM On-Prem)

Smart Software Licensing Reservation is easily used and efficiently with a single token registration. The licenses that you purchase are maintained in a centralized database called the CSSM. Log in to the CSSM portal in order to easily track the endpoint licenses that are available to you and consumption statistics. In

this mode, ISE is required to connect with CSSM either directly (Direct HTTPS) or via Proxy in order to exchange the consumption and Compliance information. The new option SSM On-Prem allows air-gapped ISE in order to utilize the features of CSSM in the form of a local Server hosted as an On-Prem (Satellite) server.

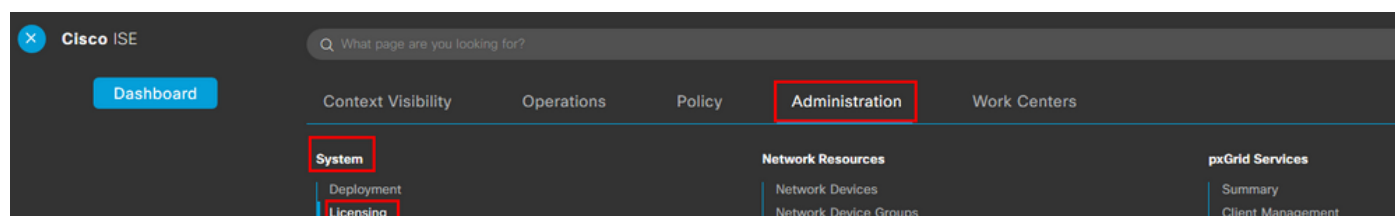
Specific License Reservation (Available in ISE 3.1 and Later)

Specific License Reservation (SLR) allows customers in highly secure networks in order to use Smart Licensing (and Smart licenses) without communicating the license information. SLR allows reservation of specific licenses, including add-on licenses. SLR does not require ISE in order to connect to CSSM and allows ISE to consume the licenses present in the Smart Account till they reach expiry.

Configure

Connection Methods (Direct HTTPS/HTTPS-Proxy) for Integrating CSSM with ISE

Step 1. Browse to **Administration > System > Licensing**:



Step 2. Choose Smart Software Licensing Reservation in License Type and paste the Registration Token in the Registration Details. Choose the Applicable Tier as required. The process differs slightly between Direct HTTPS and HTTPS Proxy.

Direct HTTPS

Step 3. For Direct HTTPS, choose the Connection Method as **Direct HTTPS** and click **Register**:

License Type

Choose Registration Details to acquire pre-purchased license entitlements. Choose Permanent License Reservation to enable all Cisco ISE licenses. Enter the required details to enable Cisco ISE licenses. When you click Register, you agree to the terms and conditions detailed in [Smart Licensing Resources](#).

- Smart Software Licensing Reservation
- Permanent License Reservation
- Specific License Reservation

Registration Details

When you register Cisco ISE in the [Cisco Smart Software Manager](#) portal, a unique ID called the Registration Token is displayed in the portal. Copy the registration token displayed in the CSSM portal and paste it here.

Registration Token
[Redacted]

You can connect to the [Cisco Smart Software Manager](#) either directly or HTTPS proxy server or Transport Gateway or Satellite option.

Connection Method
Direct Https

Tier Essential Advantage Premier Device Admin

Virtual Appliance VM Large

This enables the ISE features for the purchased licenses to be tracked by Cisco Smart Licensing.

Cancel Register

HTTPS Proxy

Step 4. In order to ensure that HTTPS Proxy is preconfigured, browse to **Administration > System > Settings**.

Add **proxy details > Host**, user ID, and Password:

Deployment Licensing Certificates Logging Maintenance Upgrade Health Checks Backup & Restore Admin Access **Settings**

Client Provisioning
FIPS Mode
Security Settings
Alarm Settings
Posture
Profiling
Protocols
Proxy
SMTP Server
SMS Gateway
System Time
API Settings
Network Success Diagnostics

Proxy Settings

Proxy host server : port
[Redacted]

Password required

User name

Password

Confirm Password

Step 5. Back on the ISE Licensing Page, choose Connection Method as **HTTPS Proxy** and ensure that the configured Proxy is seen under the HTTPS Proxy section. Click **Register**:

Registration Details

When you register Cisco ISE in the [Cisco Smart Software Manager](#) portal, a unique ID called the Registration Token is displayed in the portal. Copy the registration token displayed in the CSSM portal and paste it here.

Registration Token



You can connect to the [Cisco Smart Software Manager](#) either directly or HTTPS proxy server or Transport Gateway or Satellite option.

Connection Method



HTTPS Proxy



Tier Essential Advantage Premier Device Admin

Virtual Appliance VM Large

This enables the ISE features for the purchased licenses to be tracked by Cisco Smart Licensing.

Cancel

Register

Finally, ISE is now registered to CSSM and an entry for this ISE node can be found in the Product Instances in the Virtual Account (from where the token was generated).

Configuring Smart Software Manager On-Prem Server

This configuration requires an SSM On-Prem (Satellite) Server to be deployed in the environment. Once deployed and connected, the Satellite server acts as a local Licensing Server allowing ISE to perform the Licensing transactions without reaching out to CSSM over the Internet. Satellite servers can in turn sync with CSSM either in online or offline mode (using **.yaml** files). More details about the Satellite server are available [here](#). A quick start guide to installing the On-Prem server is present [here](#).

These steps assume that the Satellite Server is configured and a Virtual Account on CSSM containing ISE Licenses is added to the Satellite Server. Steps to perform the same can be traced [here](#).

Step 1. Login to the Satellite Server and choose the Smart Licensing Option:

Smart Software Manager On-Prem



License

[Smart Licensing](#)
Track and manage Smart Licensing



Administration

[Request an Account](#)

Get an Account for your organization. The Account must be approved by your System Administrator or System Operator before it can be used.

[Request Access to an Existing Account](#)

Submit a request for access to an existing local Account. Approval must be granted by a Smart Account Administrator for your local Account.

[Manage Account](#)

Modify the properties of your Accounts and associate existing User IDs with Accounts.

Step 2. From the inventory, generate a token and copy the token value. Back on ISE, choose Smart Software Licensing Reservation and Connection Method as 'SSM On-Prem server':

License Type

Choose Registration Details to acquire pre-purchased license entitlements. Choose Permanent License Reservation to enable all Cisco ISE licenses. Enter the required details to enable Cisco ISE licenses. When you click Register, you agree to the terms and conditions detailed in [Smart Licensing Resources](#).

- Smart Licensing Registration
- Permanent License Reservation
- Specific License Reservation

Registration Details

When you register Cisco ISE in the [Cisco Smart Software Manager portal](#), a unique ID called the Registration Token is displayed in the portal. Copy the registration token displayed in the CSSM portal and paste it here.

Registration Token

You can connect to the [Cisco Smart Software Manager](#) either directly or HTTPS proxy server or Satellite option.

Connection Method

SSM On-Prem server ▼ ⓘ

SSM On-Prem server Host

Note: Cisco Support Diagnostics will not work with SSM On-Prem server registration.

Tier Essential Advantage Premier Device Admin

Virtual Appliance ISE VM License

This enables the ISE features for the purchased licenses to be tracked by Cisco Smart Licensing.

By clicking Register you will agree to the [Terms&Conditions](#). You can download [Terms&Conditions](#) on [Smart Licensing Resources](#).

Step 3. The field SSM On-Prem Server Host is taken from the hostname configured on the On-Prem Server. The same can be confirmed from the **On-Prem Server Admin Workspace > Security > Certificates > Host Common Name**:

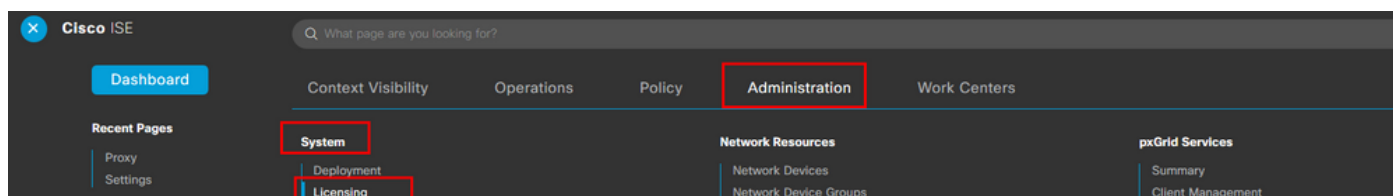
The screenshot shows the Cisco Smart Software Manager On-Prem interface. At the top, there is a green header with the Cisco logo and navigation links for "Logged In", "Account", and "Log Out". Below the header, the main content area is titled "Smart Software Manager On-Prem". On the left side, there are four icons representing "Access Management", "API Toolkit", "Accounts", and "Network". The main content area is divided into a "Security" section with tabs for "Account", "Password", "Certificates", and "Event Log". The "Certificates" tab is selected, and the "Product Certificate" section is visible. A red box highlights the "Host Common Name" field, which contains a blacked-out value. Below this field is a "Save" button. A note is displayed below the field: "NOTE: The Host Common Name is typically composed of Host + Domain Name and will look like 'www.yoursite.com' or 'yoursite.com'. The SSL Server Certificate used for product communications is specific to the Common Name that has been issued at the Host. Therefore, the Common Name must match the Web address you will use to configure the Cisco Product when connecting to SSM On-Prem. If you change the Common Name, you must resynchronize your Local Account in order for Cisco to issue a new CSR". Below the note, the "Browser Certificate" section is partially visible.

Step 4. Once the hostname is confirmed, add it to ISE under the SSM On-Prem server Host and click Register. After successful registration, ISE appears in the list of Product Instances added to the Virtual Account on the Satellite Server.

Integration Methods for ISE and CSSM

SLR

Step 1. Browse to Administration > System > Licensing as shown in the image:



Step 2. For the License Type, choose **SLR** and then click **Generate Code**. Copy the reservation code generated as this is required by the CSSM in order to generate an Authorization Code:

License Type

Choose Registration Details to acquire pre-purchased license entitlements. Choose Permanent License Reservation to enable all Cisco ISE licenses. Enter the required details to enable Cisco ISE licenses. When you click Register, you agree to the terms and conditions detailed in [Smart Licensing Resources](#).

- Smart Software Licensing Reservation
- Permanent License Reservation
- Specific License Reservation

SLR Configuration

SLR provides specific chosen License that enables use related features in ISE when no electronic communication is allowed. You can get your SLR License key in CSSM portal.

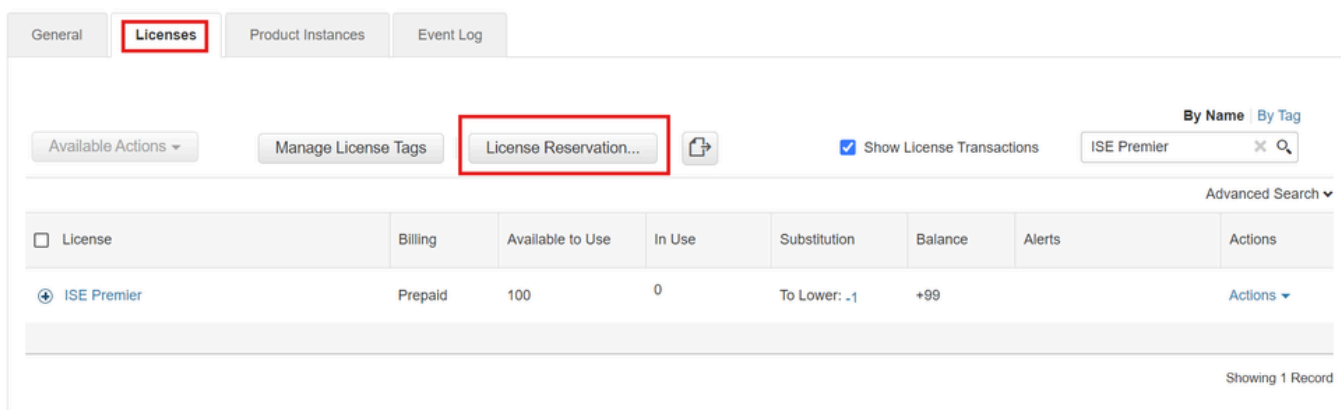
Standalone/Primary PAN ⓘ

Reservation Code

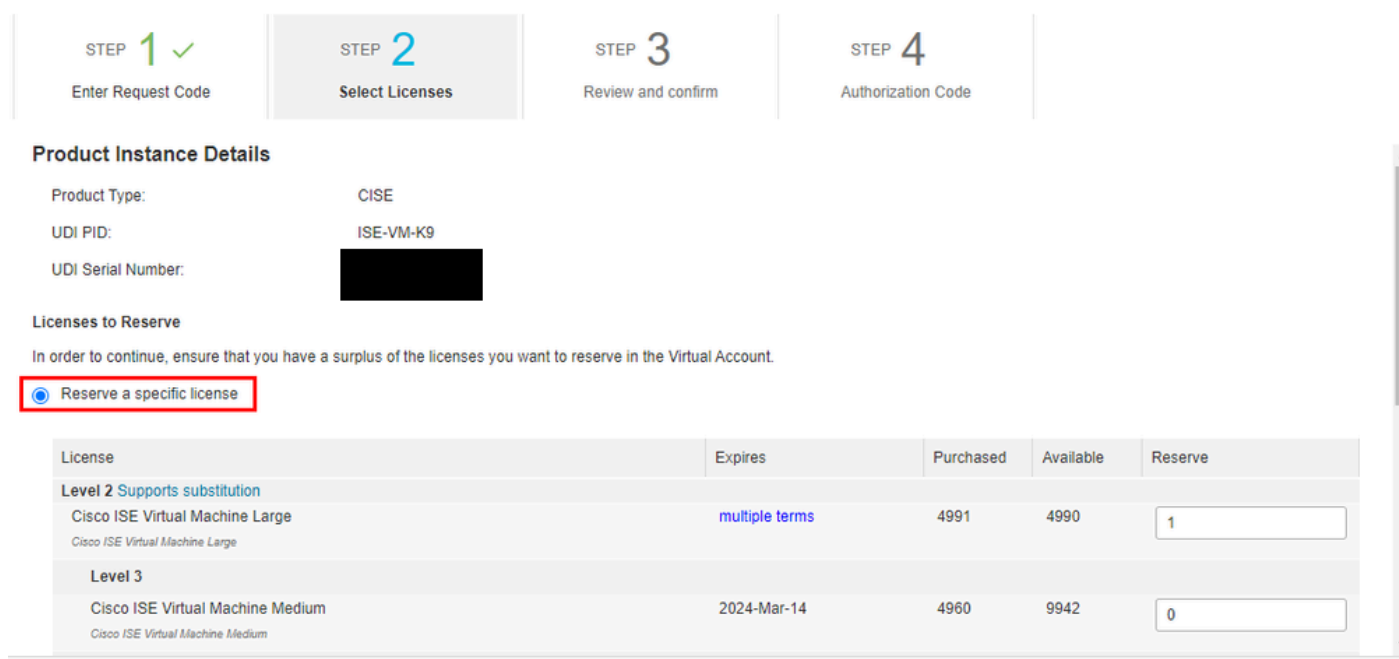
[Generate Code](#)

[Upload SLR License Key](#)

Step 3. On CSSM, choose the Virtual Account which contains ISE Licenses (Essential, Advantage, Premier, VM, TACACS+). Under the Licenses section, choose License Reservation.



Step 4. Enter the Authorized Code copied from ISE and click **Next** in order to choose **Reserve a specific license** option. Depending upon the available licenses, specify the counts to be reserved for ISE and click **Next**. Note that Tier Licenses and VM Licenses allow substitution that is Upper-Level licenses can be used in order to fulfill requests for lower level licenses. Check the Tier Model here [ISE 3.x Licensing Model](#)



Step 5. Review and download the generated Authorization code using the Download as File option. Return to ISE and click **Upload SLR License Key** in order to upload the file. The expiry date of the licenses on ISE reflects the original expiry date of licenses on the Smart Account.

Returning Reservation for SLR

Step 1. Click **Return Reservation** and copy the Reservation code provided and keep it safe.

Step 2. Browse to **Product Instances** for the Virtual Account to which ISE is added and search for ISE using its serial number. Click **Actions > Remove**, enter the code copied in Step 1. and click **Return Product Reservation**. This returns the reserved licenses to the Virtual Account.

Troubleshooting

General Guidelines

- For ISE 3.0 p7, 3.1 p5, and 3.2 or later check the reachability for this link: <https://smartreceiver.cisco.com/>.
- For lower ISE versions <= Ise 3.0, check the reachability for these links: **tools.cisco.com**, **tools1.cisco.com**, and **tools2.cisco.com**.
- These links are important because they play a vital role in communication with the CSSM to and fro, if you block these IPs then the Cisco ISE is unable to report license usage to CSSM, and this lack of reporting results in the loss of administrative access to Cisco ISE and restrictions in Cisco ISE features.

ISE Logging Attributes to be Set to Debug Level

- License (ise-psc.log)
- admin-license (ise-psc.log)

Registration and Renewal Errors

In order to troubleshoot registration errors, start by verifying that there are no communication issues with the Smart Licensing Cloud (<https://tools.cisco.com/> or <https://smartreceiver.cisco.com/>). Several factors can disrupt the connection between ISE and the Smart Licensing Cloud, including:

- Firewalls or other devices blocking traffic.
- DNS problems. If ISE cannot resolve the corresponding FQDN for <https://tools.cisco.com/> or <https://smartreceiver.cisco.com/>, it is unable to send the registration API call.
- Issues with the Smart Licensing Portal.

API Requests to Investigate ISE Licensing Status

Use HTTPS API calls directly from the browser in order to know the number of licenses being consumed on ISE:

<https://<MnTNodeIP>/admin/API/mnt/Session/ActiveCount>

<https://<MnTNodeIP>/admin/API/mnt/Session/License/LicenseCountsFromSessionDB>

<https://<MnTNodeIP>/admin/API/mnt/License/Base>

<https://<MnTNodeIP>/admin/API/mnt/License/Intermediate>

<https://<MnTNodeIP>/admin/API/mnt/License/Premium>

<https://<MnTNodeIP>/admin/API/mnt/Session/ActiveList>

In ISE 3.1 or later, you can use OpenAPI. You must navigate to **Administration > Settings > API Settings**. API calls are used to get more data about the Licensing state.

- Client Provisioning
 - FIPS Mode
 - Security Settings
 - Alarm Settings
 - General MDM / UEM Settings
- Posture
- Profiling
- Protocols
- Endpoint Scripts
- Proxy
 - SMTP Server
 - SMS Gateway
 - System Time
- API Settings**
- Data Connect
- Network Success Diagnostics
- DHCP & DNS Services
- Max Sessions

API Settings

Overview API Service Settings API Gateway Settings

API Services Overview

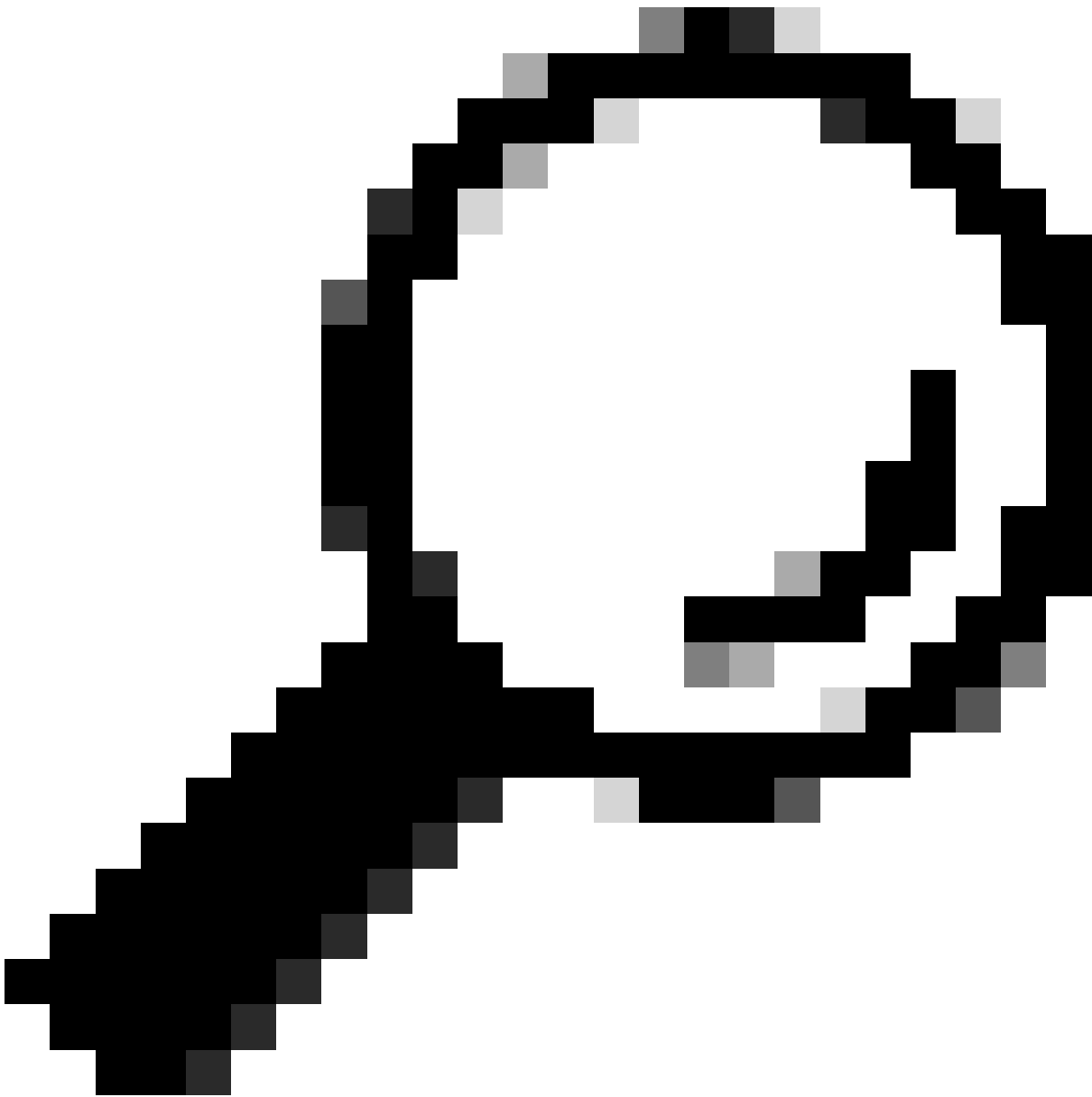
You can manage Cisco ISE nodes through two sets of API formats—External Restful Services (ERS) and OpenAPI. Starting Cisco ISE Release 3.1, new APIs are available in the OpenAPI format. The ERS and OpenAPI services are HTTPS-only REST APIs that operate over port 443. Currently, ERS APIs also operate over port 9060. However, port 9060 might not be supported for ERS APIs in later Cisco ISE releases. We recommend that you only use port 443 for ERS APIs. Both the API services are disabled by default. Enable the API services by clicking the corresponding toggle buttons in the [API Service Settings](#) tab. To use either API service, you must have the ERS-Admin or ERS-Operator user group assignment.

For more information on ISE ERS API, please visit:
[https://\[redacted\]/ers/sdk](https://[redacted]/ers/sdk)

For openapi documentation for ERS, click below:
[ERS_V1](#)

For more information on ISE Open API, please visit:
[https://\[redacted\]/api/swagger-ui/index.html](https://[redacted]/api/swagger-ui/index.html)





Tip: Ensure the ERS and Open API services are enabled in ISE. You can verify this by navigating to **Administration > Settings > API Settings > API Service Settings**. You must activate these services before accessing the API calls through the URL if these services are not enabled.

Licensing

GET	/api/v1/license/system/connection-type	License - Connection Type	🔒
GET	/api/v1/license/system/eval-license	License - registration information	🔒
GET	/api/v1/license/system/feature-to-tier-mapping	License - feature to tier mapping	🔒
GET	/api/v1/license/system/register	License - registration information	🔒
POST	/api/v1/license/system/register	License - registration information	🔒
GET	/api/v1/license/system/smart-state	License - smart license information	🔒
POST	/api/v1/license/system/smart-state	License - smart state information	🔒
GET	/api/v1/license/system/tier-state	Get tier state information	🔒
POST	/api/v1/license/system/tier-state	Post tier state information	🔒

Related Information

- [Creating an SLR using CSSM for Cisco ISE](#)
- [Basics of Cisco ISE licensing](#)
- [Troubleshoot ISE Licensing Issues](#)
- [Cisco ISE Smart Licensing](#)
- [Cisco Technical Support & Downloads](#)