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Let's go

The bridge to possible

Maximize network wide IOS XR license utilization with Flexible Consumption Model (FCM), Smart Licensing and EZ-Register

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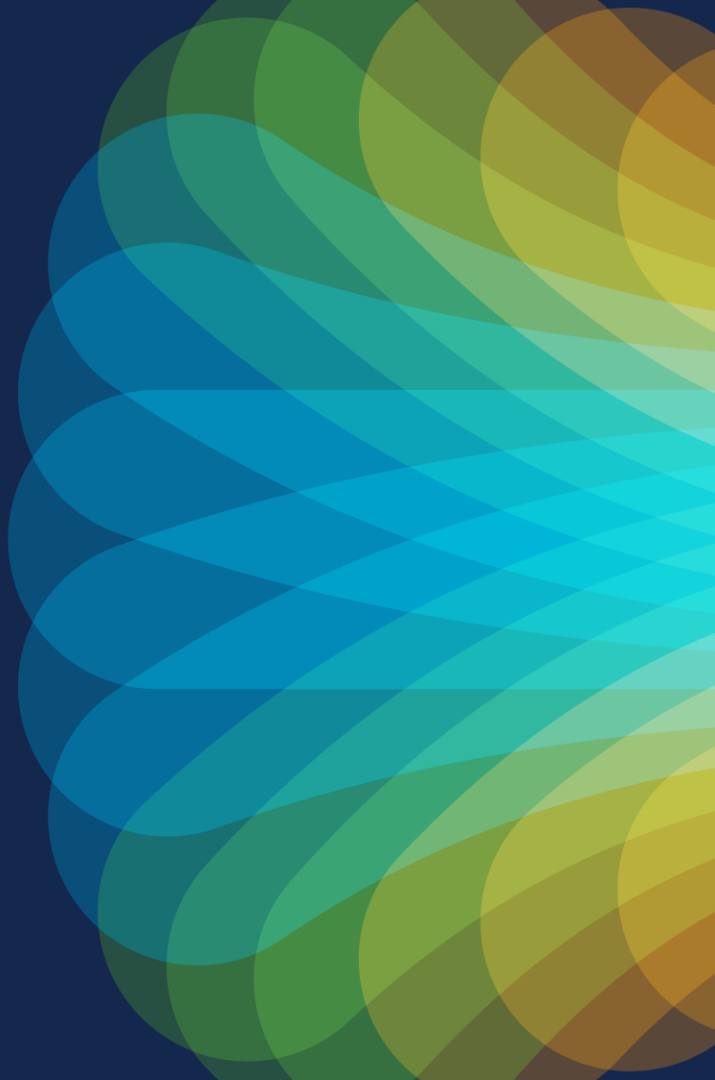
cisco Live!

DEVNET-1356

Agenda

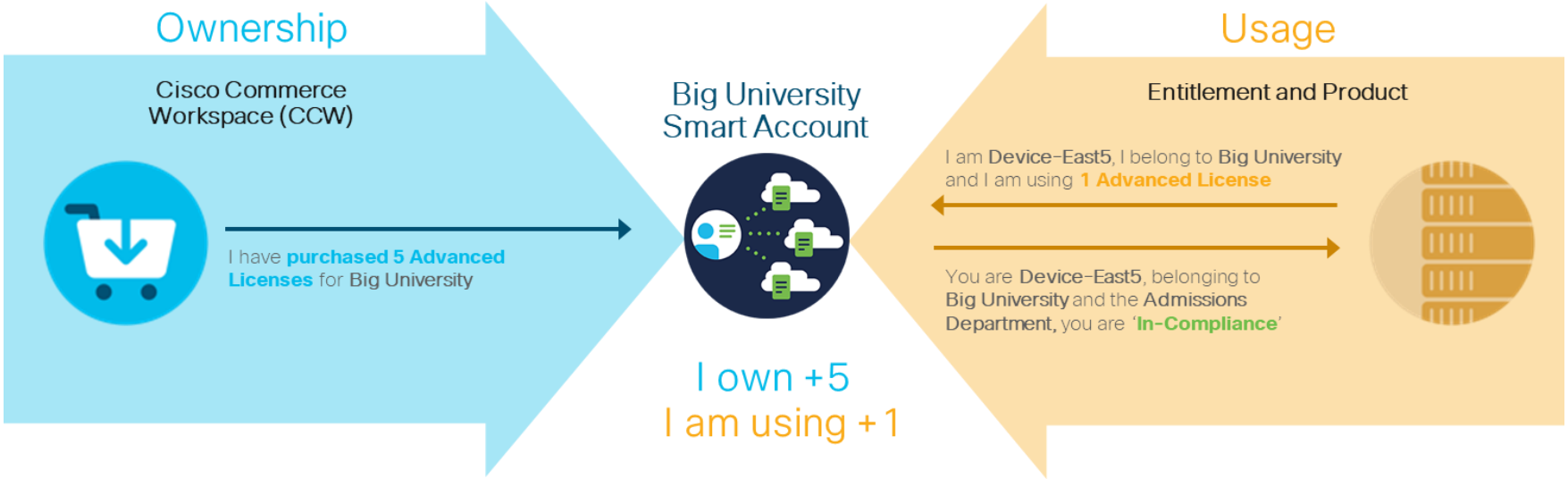
- Smart Licensing
- Flexible Consumption Model (FCM)
- Licensing Deployment Options
- EZ-Register
- Demo
- Smart Licensing using Policy (SLP)
- Resources

Smart Licensing



What Is Smart Licensing?

- Smart Licensing is a **flexible software licensing model** that simplifies the way you activate and manage licenses across your organization.
- The Smart Licensing model makes it **easier to procure, deploy, and manage** your Cisco software licenses.



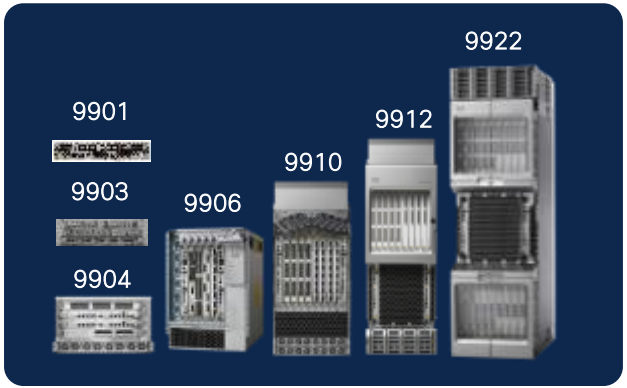
Smart Licensing Advantages

- Easy Registration
- Complete Visibility
- License Pooling
- License Portability
- Company Specific
- Unlocked
- Cost Reduction
- Compliance Reporting

Smart Licensing Supported Platforms

Access

NCS 540
NCS 560

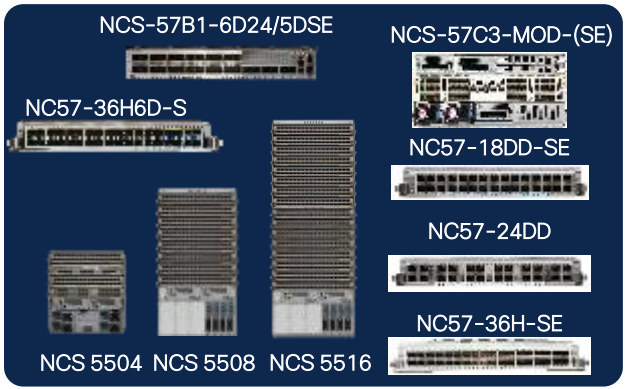


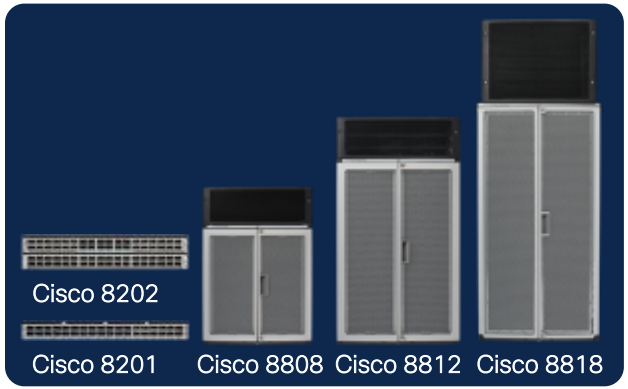
Edge

ASR 9000

Core

NCS 5500
NCS 5700





Core

8000

Flexible Consumption Model (FCM)

IOS-XR Flexible Consumption

Flexible Consumption

IOS-XR

IOS-XR Next-Gen HW

What is it?

- New IOS-XR capability
- Software licenses used to add capacity as needed
- Simplified license tracking

How does it work?

- Deploy router with minimum software fill-rate
- Easily add capacity as demand increases
- Global network visibility

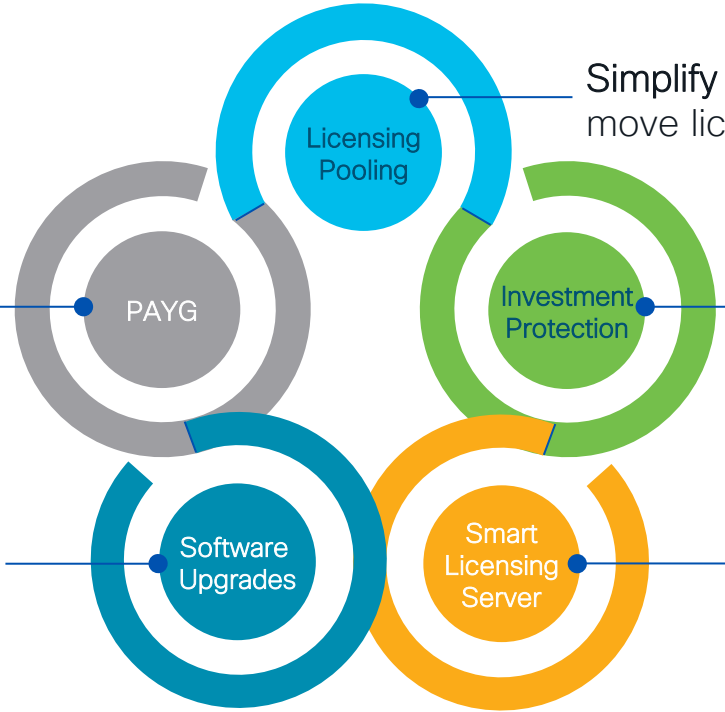
Why use it?

- Reduced upfront capital and network-wide pooling
- Software innovation
- Investment protection

Why is it better?

- On-going software innovation keeps IOS-XR software cutting edge
- Only Cisco has network-wide pooling, license portability, more visibility

Flexible Consumption Model Benefits
Most Friendly Business Model



Simplify capacity planning, move licenses around

Pay as you grow licensing

SW license entitlements may be ported to new hardware or next generation platform*

Software Upgrades via Software Innovation Access (SIA)

Easy management, set it and forget it

* In accordance with the applicable Portability Tiers

Network-wide License Pooling
“Before” Example

Legend:
● = 100G License

San Francisco

Overestimated License Usage
(10 requested, but only 5 used)

Licenses 10
In use: 5

+5 Surplus

New York

Underestimated License Usage
(10 requested, but 15 used)

Licenses 10
In use: 15

-5 Deficit

With each location separate, forecasting can be a challenge to predict
Customer is locked into initial forecasts and cannot adjust – leads to stranded capacity
Need an easier way to share capacity where demand is located

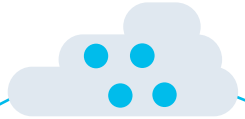
Network-wide License Pooling
“After” Example

Legend:
● = 100G License

San Francisco

Overestimated License Usage
(10 requested, but only 5 used)

Shared License Pool



Licenses 20
In use: 20

All Licenses Utilized

New York

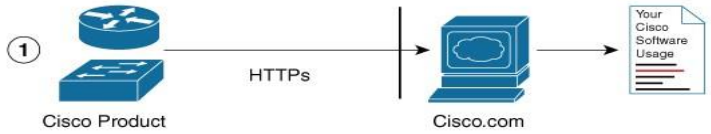
Underestimated License Usage
(10 requested, but 15 used)

Network-wide license pooling removes guesswork out of forecasting
Capacity licenses can be shared anywhere in network, redeploy them where demand is high
Simplified capacity planning via single shared license pool

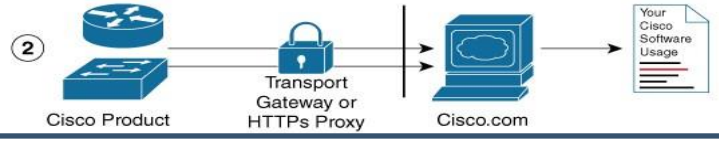
Licensing Deployment Options

Smart Licensing Deployment Options

1. Direct cloud access through HTTPs



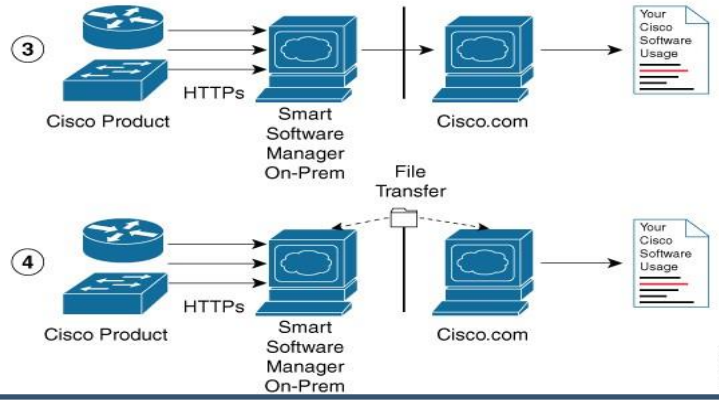
2. Direct cloud access through an HTTPs Proxy



CSSM

3. Mediated access through an on-premises collector-connected

4. Mediated access through an on-premises collector-disconnected

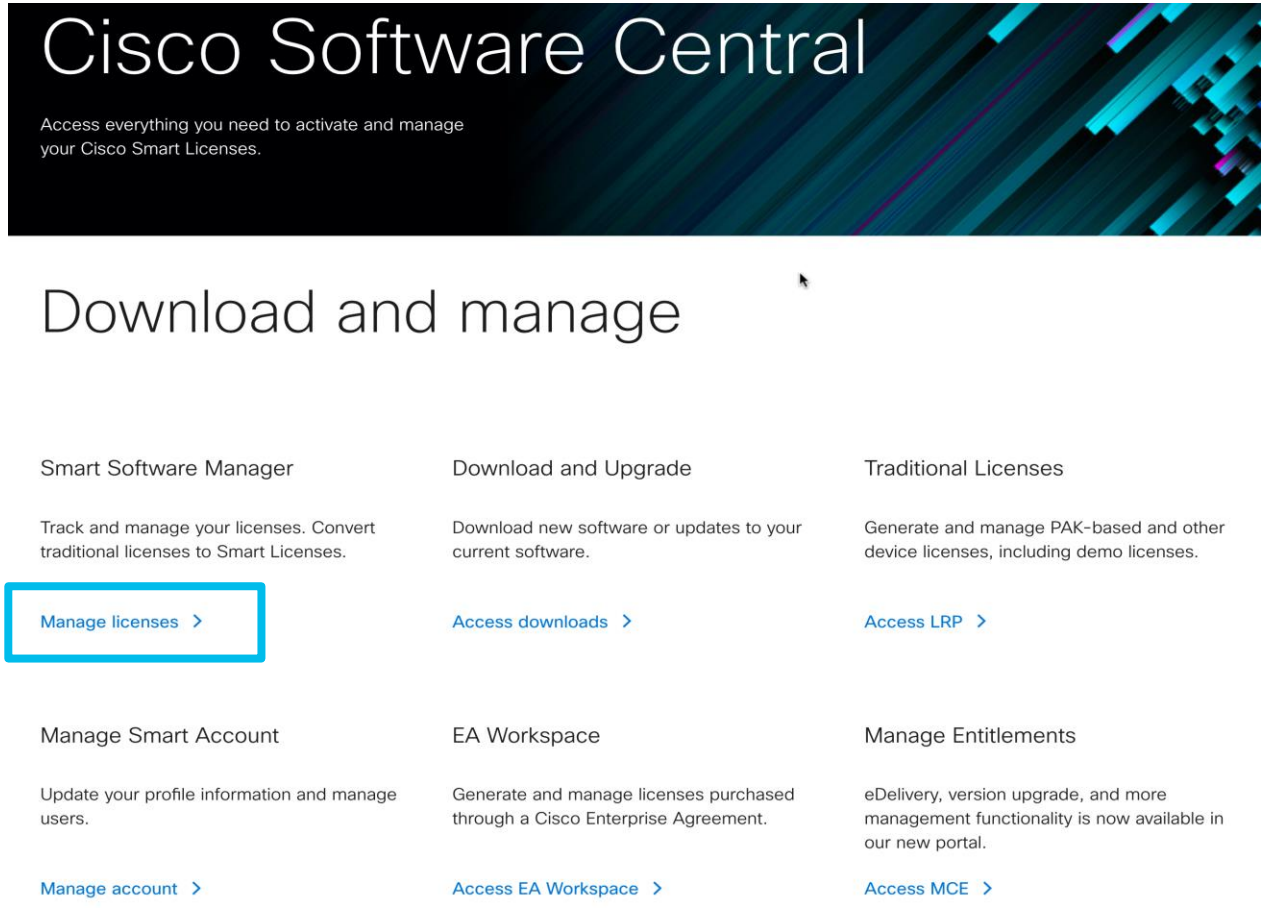


CSSM On-Prem

Cisco Software Central

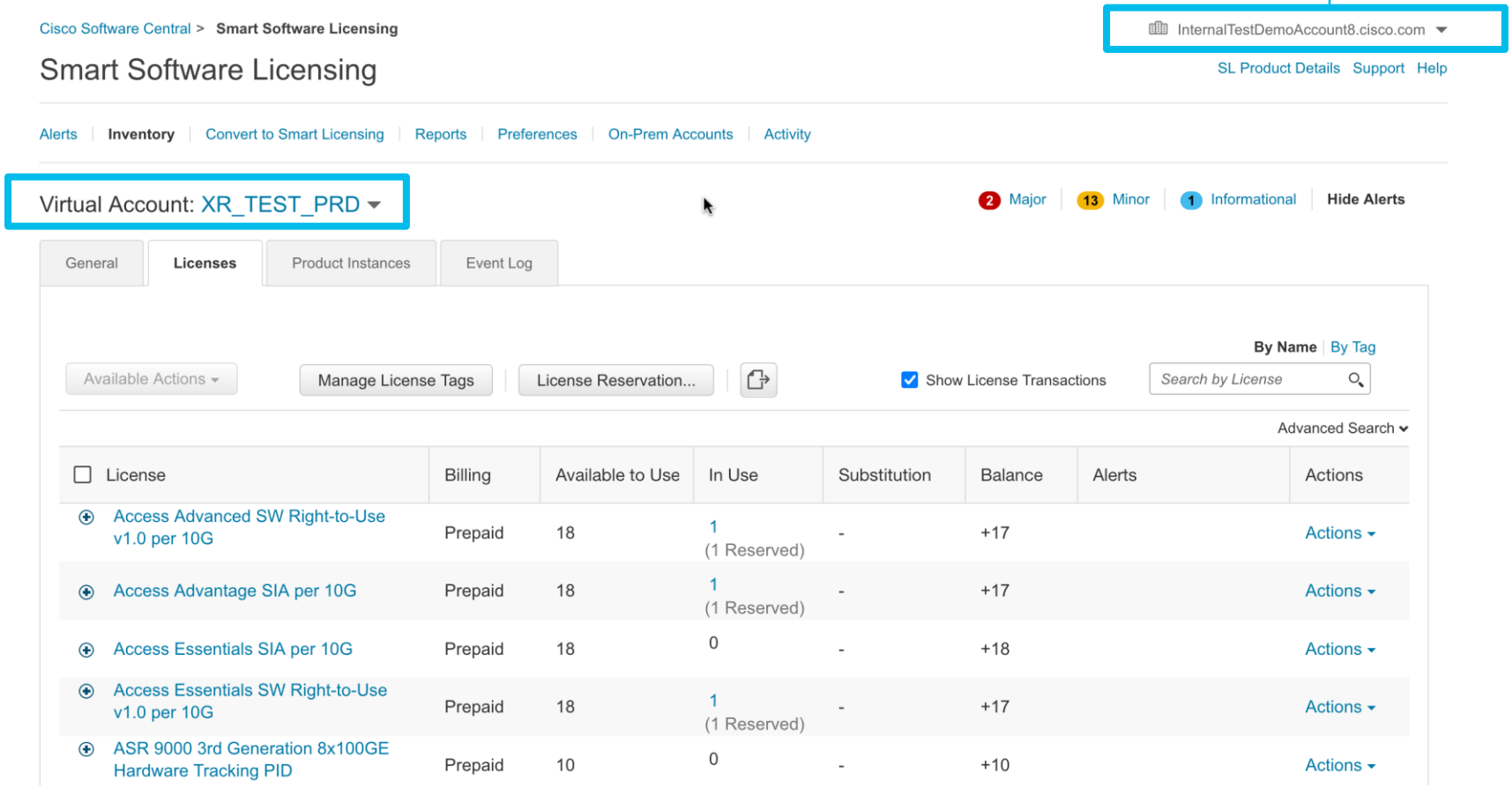
software.cisco.com

One stop for all your software and licensing needs



Cisco Smart Software Manager

Smart Account



Registration to CSSM

Activation

Start Device/ platform

Smart Licensing Enabled by Default

Registration

Device / Product Registration with your **Smart Account**

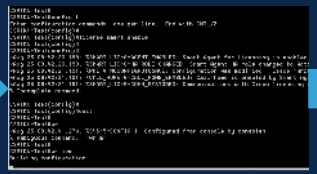
Obtain Registration **Token** from CSSM/On-Prem

(Customer Smart Account identified)

CSSM/On-Prem

Token

Register the **Software** with the **Token** from CSSM/On-Prem



Software / RSP

Usage

Feature **Usage Reported** to CSSM/On-Prem

CSSM/On-Prem

License Management

Have licenses

In-Compliance

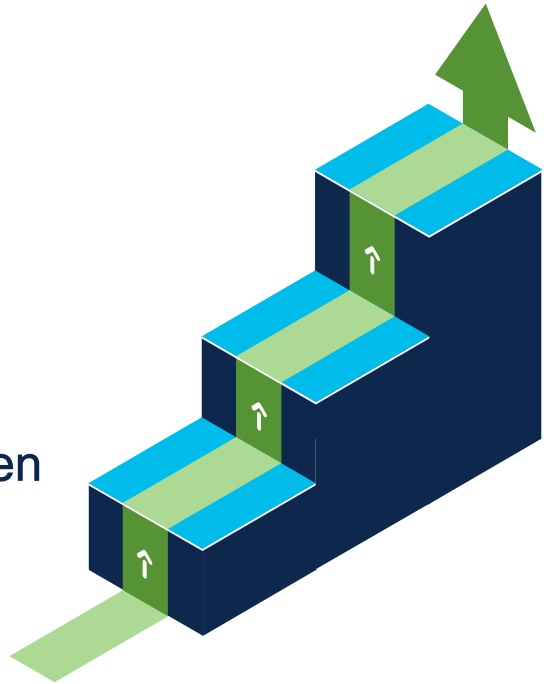
Continual reporting to CSSM or On-Prem

Out-of-Compliance

Need more licenses

Smart Licensing Configuration Workflow

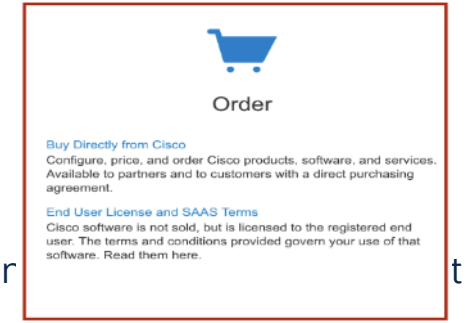
1. **Purchase** devices and licenses from https://apps.cisco.com/Commerce/home
2. **Install** CSSM On-Prem or Direct cloud access
3. **Configure** Smart Call Home on device
4. **Configure** Flexible Consumption Model (FCM)
5. Create a **token** in CSSM On-Prem
6. **Register** Smart Licensing on Device with the token
7. **Manage** Licenses in CSSM On-Prem



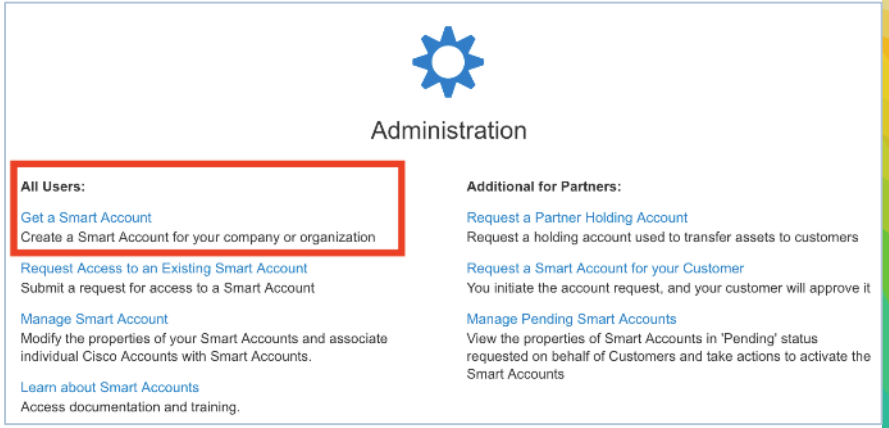
Smart Licensing Configuration Workflow

1

Step 1: Purchase devices and licenses from https://apps.cisco.com/Commerce/home



- Create your smart account while ordering the devices.
- Once the order is completed, you will get a link with creder t Account which is associated with your organization.



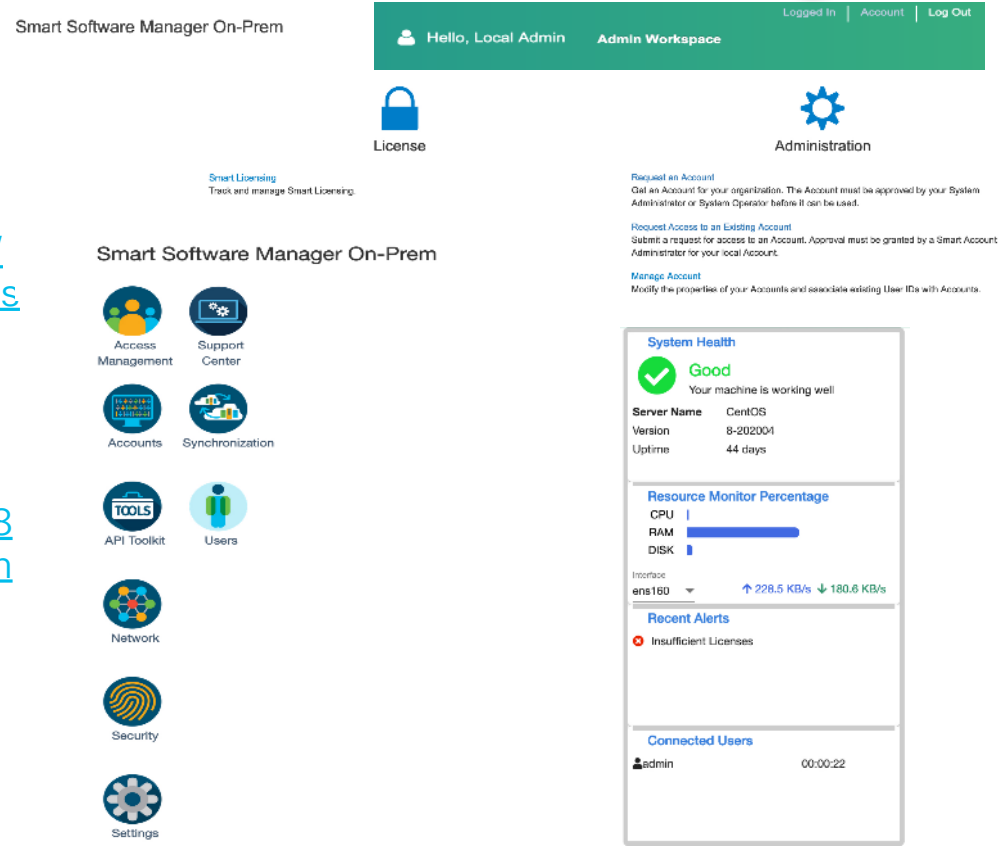
Smart Licensing Configuration Workflow

2a

Step 2a: Install CSSM On-Prem

- To download On-Prem ISO image go to: https://software.cisco.com/download/home/286285506/type/286285517/os/Linux/release/1.2

- To install CSSM On-Prem go to: https://www.cisco.com/web/software/286285517/147683/Smart_Software_Manager_On-Prem_7_Installation_Guide.pdf



Smart Licensing Configuration Workflow

2b

Step 2b: Direct cloud access

Ensure DNS is configured

```
Device(config)# domain name-server X.X.X.X
```

Note: Make sure “ping ipv4 tools.cisco.com” is success.

Ensure NTP is configured

```
Device(config)#  ntp update-calendar
```

Smart Licensing Configuration Workflow

Step 3a: Configure Smart Call Home on device (Direct cloud access through HTTPs)

Note: Below configuration is configured by default on the device.

```
Device(config)# call-home
Device(config-call-home)# vrf <vrf-name> (Optional)
Device(config-call-home)# service active
Device(config-call-home)# contact smart-licensing
Device(config-call-home)# profile CiscoTAC-1
Device(config-call-home-profile)# active
Device(config-call-home-profile)# destination transport-method http
Device(config-call-home-profile)# destination address http
https://tools.cisco.com/its/service/oddce/services/DDCEService
Device(config)# commit
```

vrf is not configured by default, configure it if required. It specifies the source interface name to send Call Home e-mail messages. If no source interface name or source ip address is specified, an interface in the routing table is used. Applies for all deployment options.

Smart Licensing Configuration Workflow

Step 3b: Configure Smart Call Home on device (Direct cloud access through HTTPs Proxy)

```
Device(config)# call-home

Device(config-call-home)# vrf <vrf-name> (Optional)

Device(config-call-home)# service active

Device(config-call-home)# contact smart-licensing

Device(config-call-home)# http-proxy proxy-address port port-num

Device(config-call-home)# profile CiscoTAC-1

Device(config-call-home-profile)# active

Device(config-call-home-profile)# destination transport-method http

Device(config-call-home-profile)# destination address http
https://tools.cisco.com/its/service/oddce/services/DDCEService

Device(config)# commit
```

Smart Licensing Configuration Workflow

Step 3c: Configure Smart Call Home on device (Mediated access through an On-Prem)

```
Device(config)# call-home

Device(config-call-home)# vrf <vrf-name> (Optional)

Device(config-call-home)# service active

Device(config-call-home)# contact smart-licensing

Device(config-call-home)# profile CiscoTAC-1

Device(config-call-home-profile)# active

Device(config-call-home-profile)# destination transport-method http

Device(config-call-home-profile)# destination address http https://<on-
prem_ip_address>/Transportgateway/services/DeviceRequestHandler

Device(config-call-home-profile)# no destination address http
https://tools.cisco.com/its/service/oddce/services/DDCEService

Device(config)# commit
```

Smart Licensing Configuration Workflow

Step 3d: Configure Smart Transport on device (Supported on IOSXR 7.4.1 and above)

```
Device(config)# license smart <destination url>
Device(config)# license smart transport smart
Device(config)# commit
```

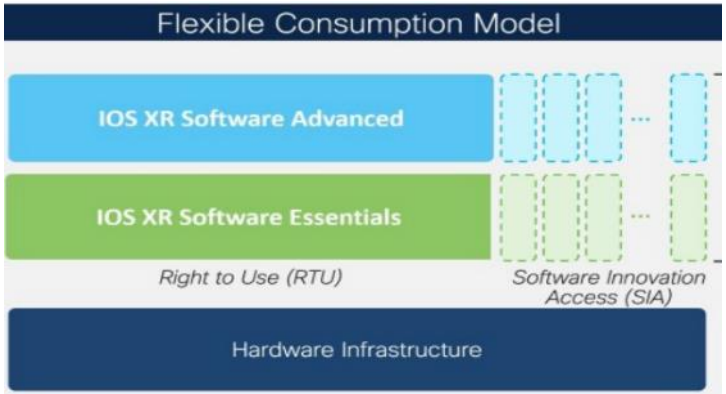
Smart Licensing Configuration Workflow

4

Step 4: Configure Flexible Consumption Model (FCM)

- Smart Licensing uses Flexible Consumption licensing model.
- It is available at **low initial investment, provides easy scalability**, and allows customers to **increase consumption of licenses as they expand**.
- If your chassis supports Flexible Consumption licensing model, you must explicitly enable this model to use the licensing features.

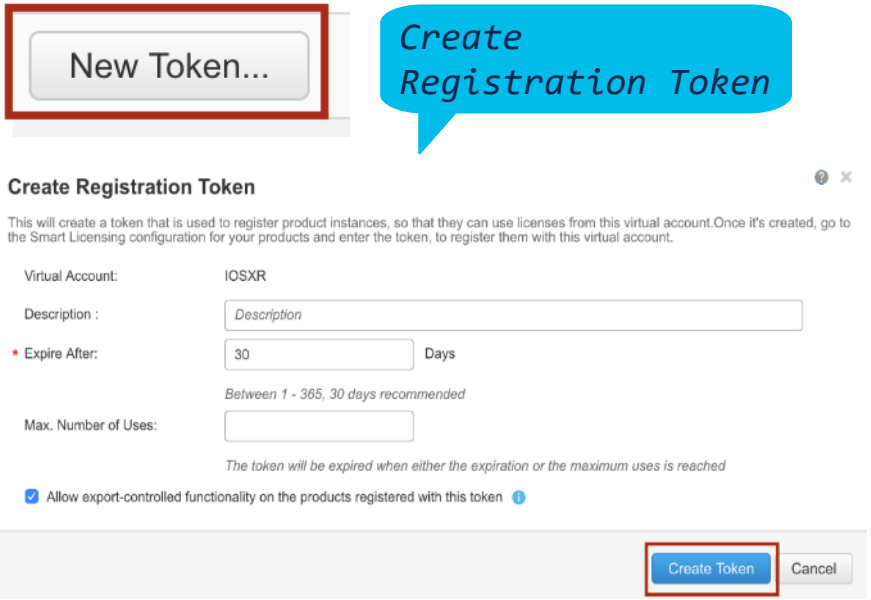
```
Device(config)# license smart flexible-consumption enable
Device(config)# commit
```



Smart Licensing Configuration Workflow

5a

Step 5a: Create a token in CSSM On-Prem or Reuse the existing token

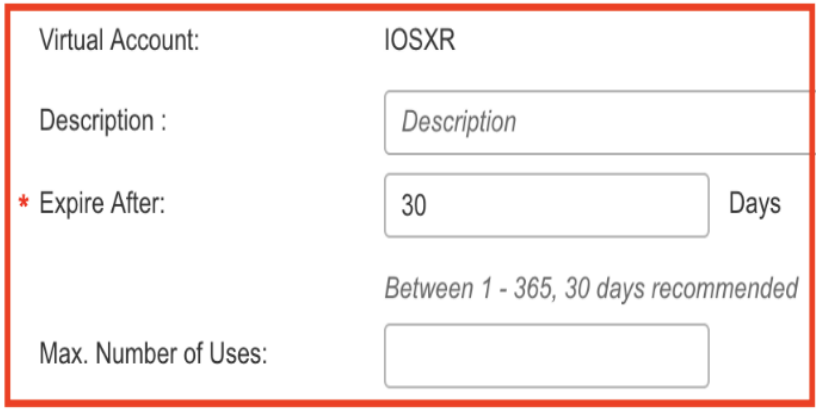


Smart Licensing Configuration Workflow

5b

Step 5b: Create a token in CSSM On-Prem or Reuse the existing token

- While creating a token we specify “**Expire After**” and “**Max. Number of Uses**”.
- “**Expire After**” is a required field and “**Max. Number of Uses**” is optional.
- “**Expire After**” is defaulted to 30 days.
- “**Max. Number of Uses**” is unlimited by default.
- The token will be expired when either the expiration or maximum uses is reached.
- Token can be reused any number of times before its expired.



Smart Licensing Configuration Workflow

6

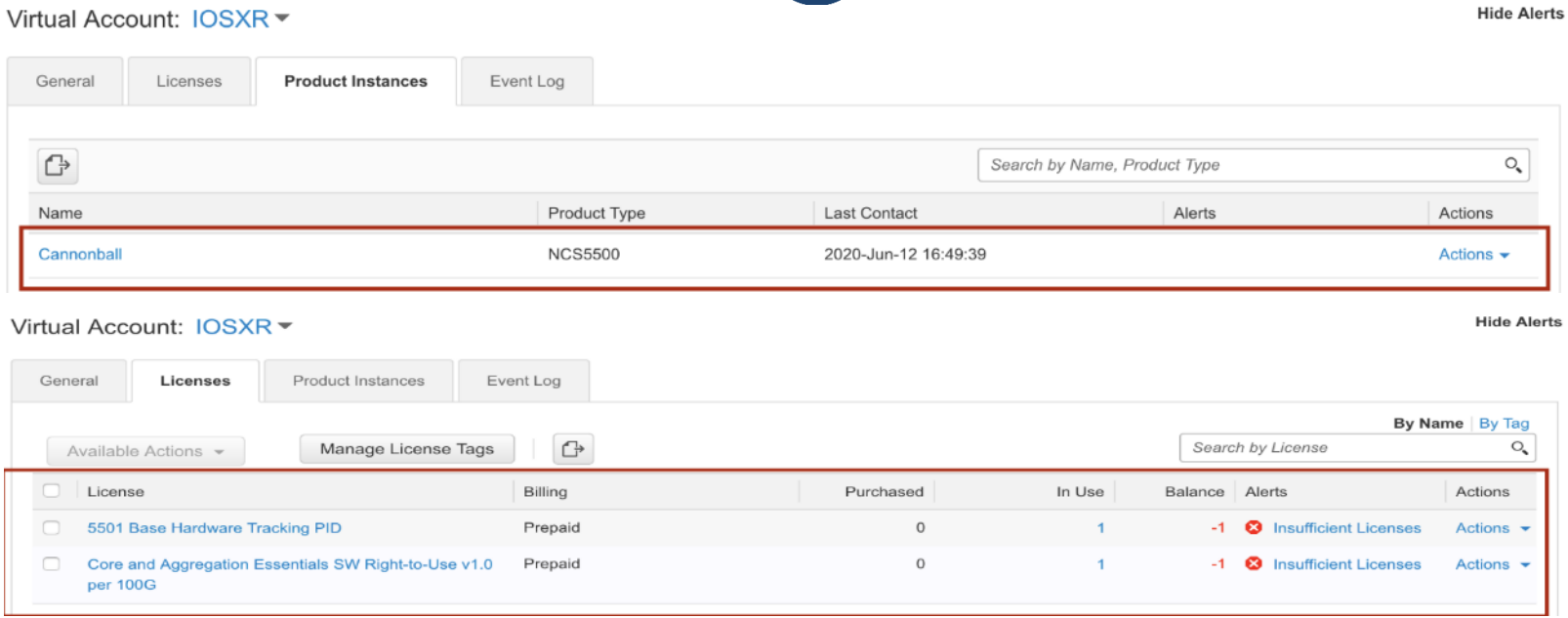
Step 6: Register Smart Licensing on Device with the token

```
Device# license smart register idtoken  YmI4YzQ4NDgtODA0OS00YmIzLWJi
MjUtN2Y5MDk3MmRiMjhiLTE1OTY2NTQ2%0ANTExODJ8UzMrcDBnMTk0SVBCMVpyWDV
FczZEbXk0YUFHZmR2Q3pmVDdBNmJK%0AMlFuVT0%3D%0A
Fri Jun 12 16:47:26.276 UTC
License command "license smart register idtoken " completed successfully.
Device# show license status
----------------
Registration:
   Status: REGISTERED
----------------
```

Smart Licensing Configuration Workflow

7

Step 7: Manage Licenses in CSSM On-Prem

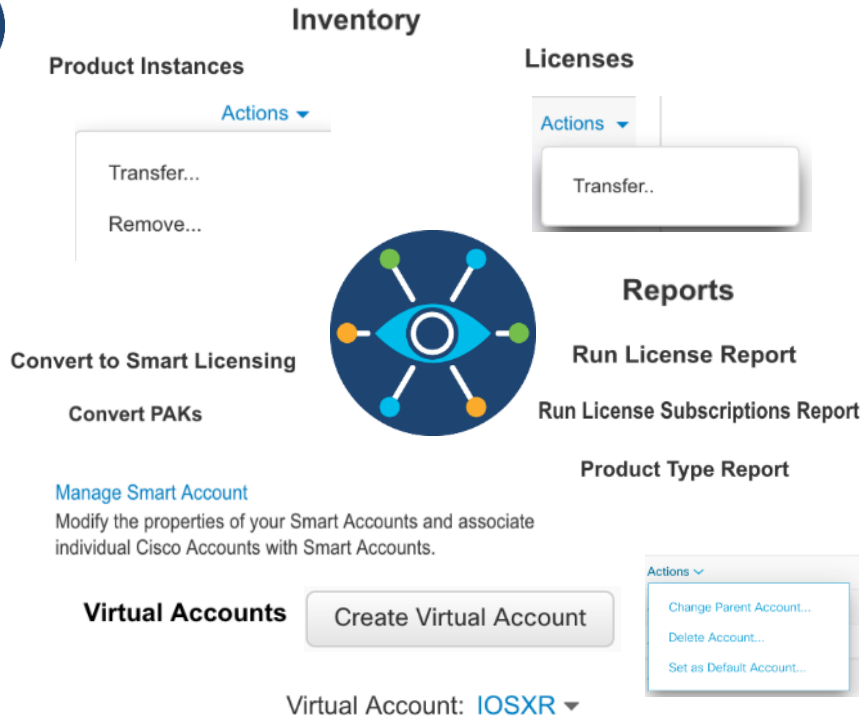


Smart Licensing Configuration Workflow

7

Step 7: View and Manage Licenses in CSSM

- As a Smart Account Admin, you can **create, edit, manage, and delete Virtual Accounts** from Cisco Software Central by navigating to Virtual Accounts.
- You can **transfer the licenses and product instances** to different virtual accounts.
- **Smart Accounts** are available for Smart Licenses, PAK-based licenses, EA licenses, and subscription-based licenses.
- **Reporting tools** in Cisco Smart Software Manager (CSSM) allow you to download reports on Licenses, License Subscriptions and Product Instances.



What Data Is Transferred ?

- Devices always **push information** to either CSSM or On-Prem, depending on configuration change.
- Information transferred is generally limited to
  - **serial number or unique identifier** of the device
  - **licenses and quantities consumed** by the device
  - **Token & license pool** being used by the device.

Information Collected	Required?
Trusted Unique Identifier (SUDI/SUVI/ID)	**Yes**
Licenses Consumed	**Yes**
Organization Identifier (Token)	**Yes**
Hostname	**No**
IP Address	**No**
MAC Address	**No**
Other Smart Call Home Info	**No**

Key Principles of Software Usage Data Transfer

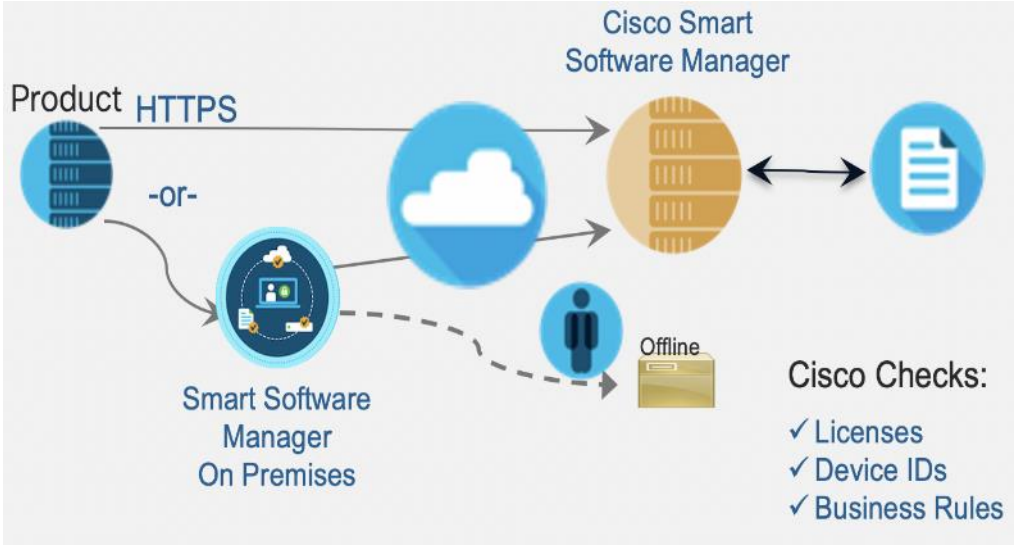
- Protect the User's Privacy!
- SSL/TLS used for Transport. No HTTP server or Email used.
- Cisco is always transparent about what information is transferred
- You have the right to inspect the data gathered
- You must receive a benefit from the data gathered

NOTE: hostname is sent by default, to disable sending the hostname, configure "data-privacy" on the device to limit what is shared.

How Often The Data Is Transferred ?

- In **direct cloud access**, devices **report consumption within 24 hrs** on configuration change or immediately on restarting smart license server process and **every 30 days to keep the data in sync**.

- In **mediated access/On-Prem**, CSSM On-Prem communicates with Cisco on a **cadence set up by the customer**. The shortest cadence for such a communication is once a day.



EZ-Register

What is Cisco EZ-Register?

- Cisco EZ-Register is a simplified automated mechanism to register multiple Mass Scale Infrastructure Group (MIG) networking devices with Cisco Smart Software Manager (CSSM)

- Cisco EZ-Register utilizes an input file that is configured by the network administrator (one time effort)

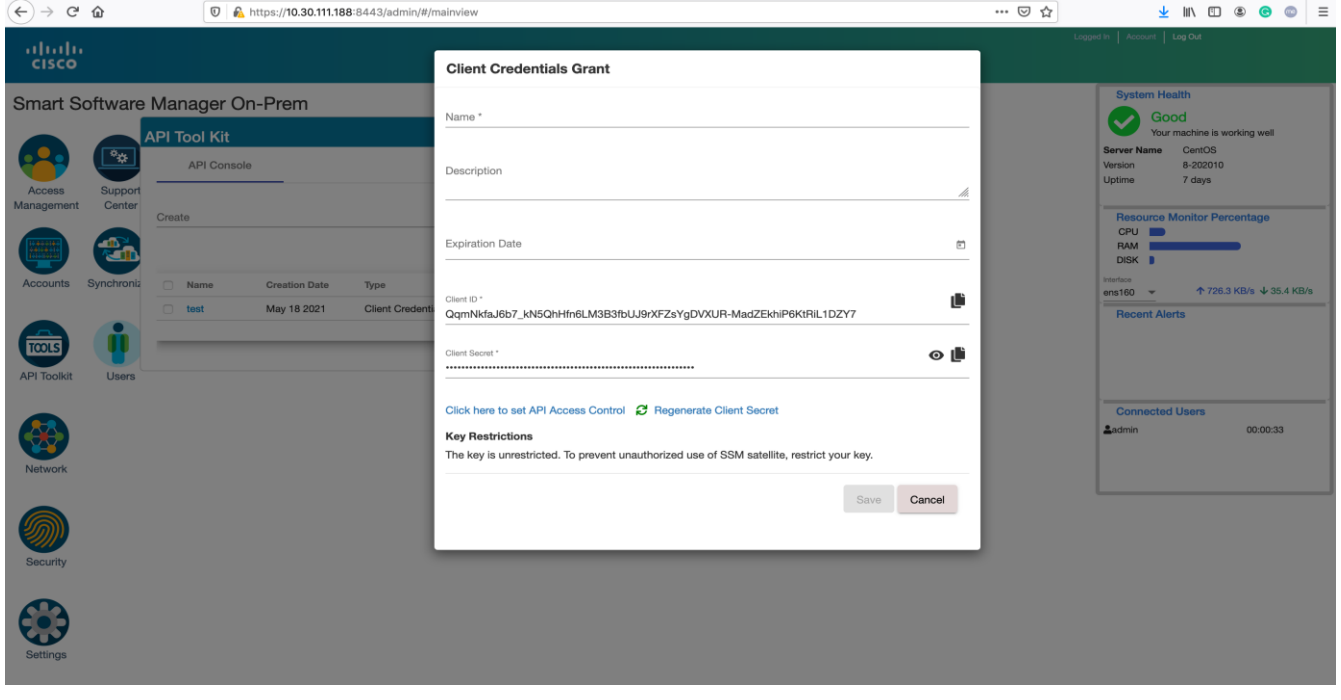
Steps Prior to Using Cisco EZ-Register (1/2)

1. Boot Router(s)
2. Download On-Prem ISO image here
3. Install CSSM On-Prem (click here for instructions)

Steps Prior to Using Cisco EZ-Register (2/2)

3. Create Client Credentials in CSSM On-Prem

CSSM On-Prem -> Admin Workspace -> API Toolkit -> Client Credentials Grant



Cisco EZ-Register Process

1. Configure Input file

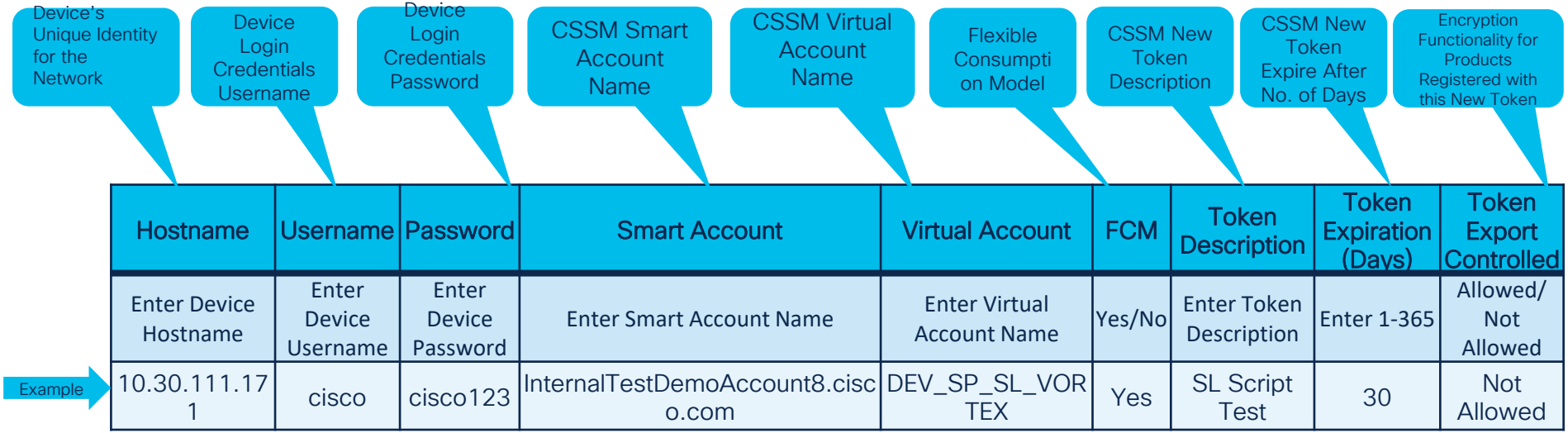
2. Execute EZ-Register Script

3. Verify Successful Completion

Note: Details for each step in following slides

1. Configure Input file (1/2)

Download input file template using this link and enter details

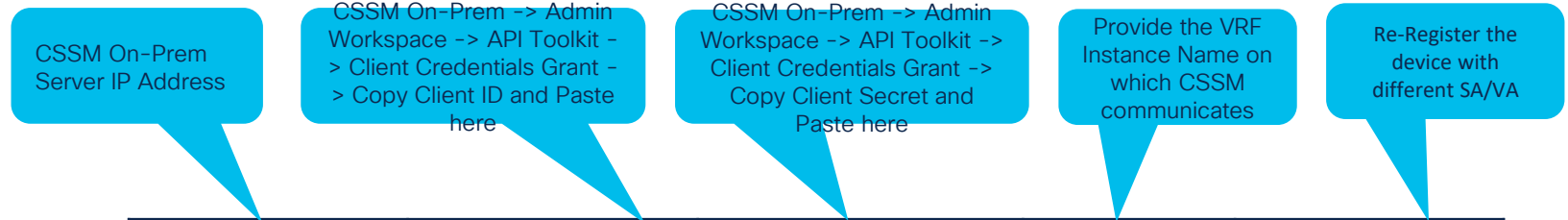


	Hostname	Username	Password	Smart Account	Virtual Account	FCM	Token Description	Token Expiration (Days)	Token Export Controlled
	Enter Device Hostname	Enter Device Username	Enter Device Password	Enter Smart Account Name	Enter Virtual Account Name	Yes/No	Enter Token Description	Enter 1-365	Allowed/ Not Allowed
Example	10.30.111.171	cisco	cisco123	InternalTestDemoAccount8.cisco.com	DEV_SP_SL_VORTEX	Yes	SL Script Test	30	Not Allowed

First 9 input file fields; Remaining 3 fields on next slide;

1. Configure Input file (2/2)

Download input file template using this link and enter details



On-Prem IP Address	On-Prem Client ID	On-Prem Client Secret	VRF	Re-Register
Enter On-Prem IP Address	Enter On-Prem Client ID	Enter On-Prem Client Secret	VRF Instance Name	Re-Register the device with different SA/VA
Example: 10.30.111.188	oC65tQ1MgNWqkBbb3oxhu-T0nGIjixQ_UUtdlaXJ-s_-a8Mk-m7smPhq7C6QBFYP	1vBEv57qfdf50T-pSA6oSuIwPUa7a65nONzs7RoILA2ey9O1bOjKdm4duM4Vb_xt	MGMT	Y/N

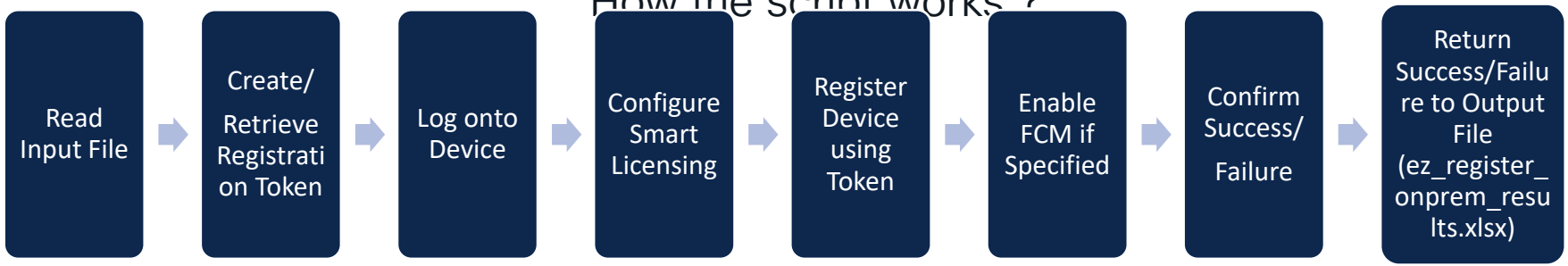
Last 3 input fields; First 9 fields in the previous slide

2. Execute EZ-Register Script

Execute this python script by providing input file location as command line argument

./ez_register_onprem.py ~/ez_register_inputfiles/ez_register_onprem.xls

How the script works ?



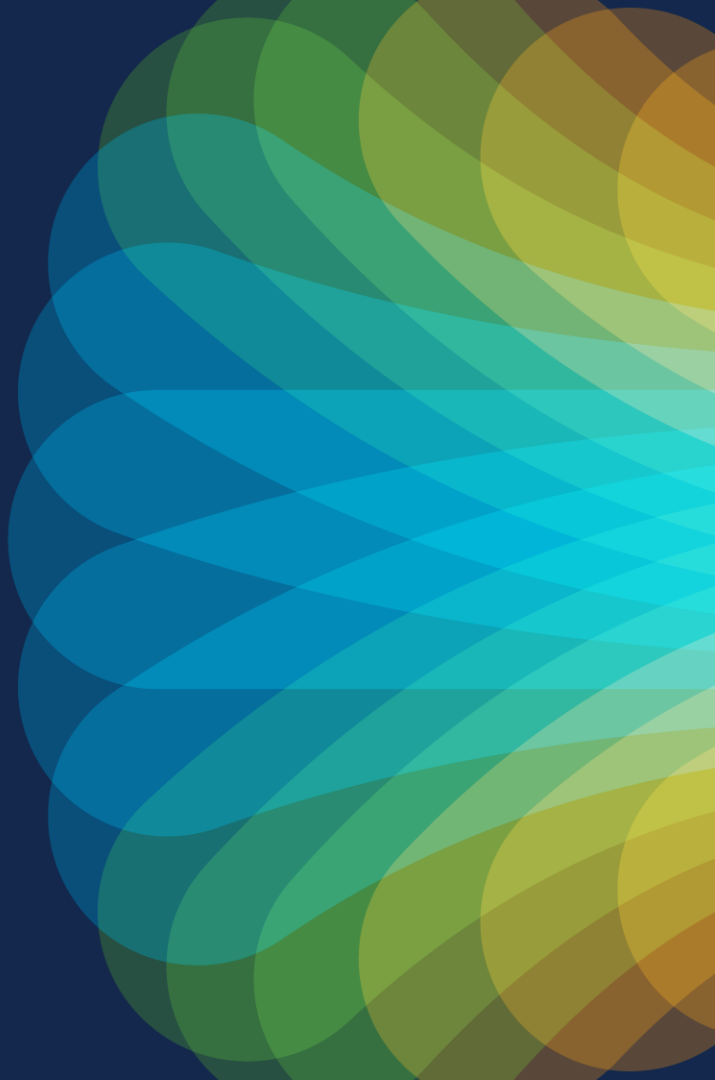
3. Verify Successful Completion

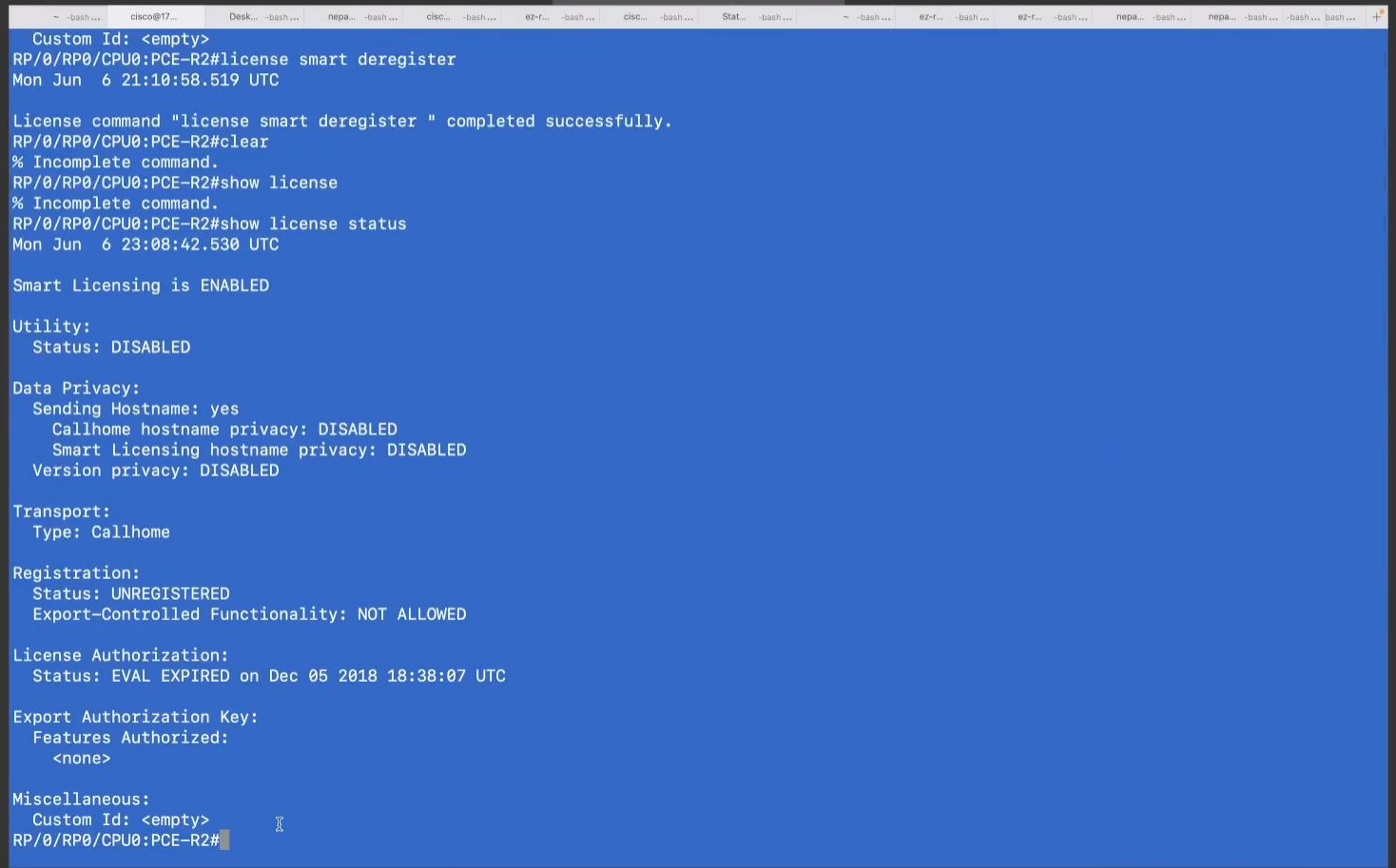
Registration status of the devices are provided in the output file

Hostname	Username	SL Registration Status	License Authorization Status
10.30.111.171	cisco	success	In-Compliance
10.30.111.170	cisco	failed	Out-of-Compliance

- If registration fails, review detailed logs by entering “show logging” on the device
- Verify the license status, configuration and connectivity of the failed devices
- Execute the script again with failed device details in the input file

Demo



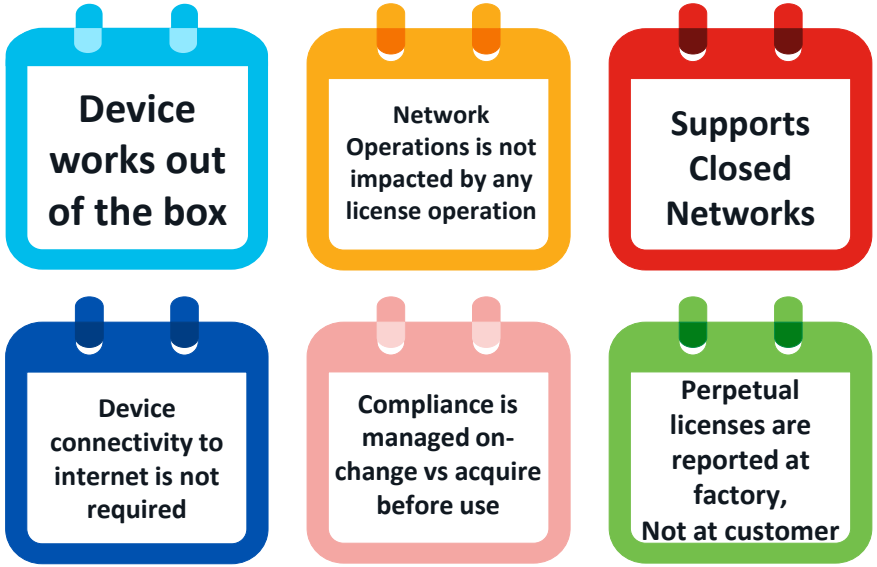

NP
Neelima Parakala (Cisc
Custom Id: <empty>
RP/0/RP0/CPU0:PCE-R2#license smart deregister
Mon Jun 6 21:10:58.519 UTC
License command "license smart deregister " completed successfully.
RP/0/RP0/CPU0:PCE-R2#clear
% Incomplete command.
RP/0/RP0/CPU0:PCE-R2#show license
% Incomplete command.
RP/0/RP0/CPU0:PCE-R2#show license status
Mon Jun 6 23:08:42.530 UTC
Smart Licensing is ENABLED
Utility:
Status: DISABLED
Data Privacy:
Sending Hostname: yes
Callhome hostname privacy: DISABLED
Smart Licensing hostname privacy: DISABLED
Version privacy: DISABLED
Transport:
Type: Callhome
Registration:
Status: UNREGISTERED
Export-Controlled Functionality: NOT ALLOWED
License Authorization:
Status: EVAL EXPIRED on Dec 05 2018 18:38:07 UTC
Export Authorization Key:
Features Authorized:
<none>
Miscellaneous:
Custom Id: <empty>
RP/0/RP0/CPU0:PCE-R2#

Smart Licensing using Policy (SLP)

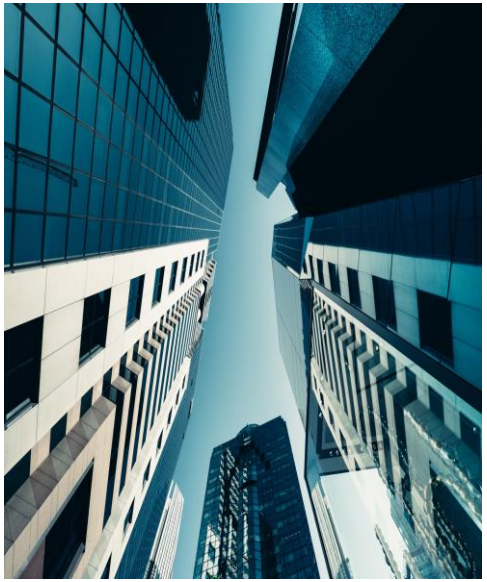
Top Principles Behind Smart Licensing using Policy

Smart Licensing Using Policy is a simplified licensing Experience without impacting security policies and OPEX costs

- Simplified Operations
- No Eval mode
- Less Connectivity to Cisco
- Eliminated Day-0 Friction
- Supports Closed Networks
- Maintains regulatory compliance



Smart Licensing Using Policy (SLP)



- Smart Licensing Using Policy (SLP) is an **evolved version** and value expansion of Smart Licensing.
- **Simplifies customer experience** & increases value
- Most of SP Routing platforms will support SLP
- **How does SLP improve** customer Licensing experience

✔ **Day-0 Registration**	100% of all devices registered by MFG as of 24.1.1
✔ **Telemetry**	Detailed info on licenses, subscription and usage
✔ **Built-in Reporting**	RUM report tracks device license usage history
✔ **Custom Reporting Policies**	90 days, High-Trust (1yr), SPNA (3yrs), Web (custom)
✔ **3rd Party Reporting**	Compatibility with other popular reporting systems
✔ **Alignment with Enterprise**	Aligns with licensing solution used by Cisco Enterprise

Continue your education

- Smart Licensing overview
- Flexible Consumption Model overview
- EZ-Register Repository
- EZ-Register for IOSXR Smart Licensing

The bridge to possible

Thank you

“Live in your own way, with the best attitude”

– Neelima Parakala

cisco Live!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Let's go