Smart Licensing

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Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	All legacy products cnUPF, cnMME
Applicable Platform(s)	ASR 5500 VPC-SI VPC-DI SMI
Feature Default	Disabled - Configuration Required
Related CDETS ID(s)	21.3: CSCvd03920 21.6: CSCvg85002
Related Changes in This Release	Not Applicable
Related Documentation	• *ASR 5500 System Administration Guide* • *Command Line Interface Reference* • *VPC-DI System Administration Guide* • *VPC-SI System Administration Guide*

Revision History

Revision Details	Release
Added Smart Licensing support for On/Off feature licenses.	21.6
First introduced.	21.3

Smart Software Licensing

Overview

StarOS 21.3 and higher releases support Smart Licensing. Smart Licensing is a cloud-based approach to licensing that simplifies the purchase, deployment, and management of Cisco software assets. Entitlements are purchased through your Cisco account via Cisco Commerce Workspace (CCW) and immediately deposited into your Virtual Account for usage. This eliminates the need to install license files on every device. Products that are smart enabled communicate directly to Cisco to report consumption. A single location is available to customers to manage Cisco software licenses—the Cisco Smart Software Manager (CSSM). License ownership and consumption are readily available to help make better purchase decision based on consumption or business need.

See https://www.cisco.com/c/en/us/buy/smart-accounts/software-licensing.html for more information about Cisco Smart Licensing.

Comparison Between Legacy Licensing and Smart 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. **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 StarOS complete the product registration, authorization resulting in reporting services available to the end customer.

Smart Licensing in StarOS

The Cisco Smart Software Manager (CSSM) is the server which keeps track of license usage and responsible for authorizing the client which exists in StarOS products. The client part of Smart Licensing has three major components which are integrated into StarOS products:

- **Smart Agent:** registers the StarOS product to obtain necessary authorization for entitlement usage.
- **Call-Home:** interacts with the Cisco cloud service and is also used to report necessary events.
- **Trust Pool:** retrieves and maintains the certificates.

Evalutation Period

A 90 day evalutation period is granted for all licenses in use. During this period feature licenses can be used without limitation, and up to one counting license each can be used. The evaluation period ends when the system registers successfully with the CSSM or Cisco.com. Licensed functionality is blocked when this 90 day period expires.

Smart Licensing in Release 21.6

In Release 21.6 and higher, Smart Licensing supports on/off feature licenses. In previous releases Smart Licensing only supported counting licenses.

StarOS performs license enforcement for on/off feature licenses. Each on/off feature license is tied to service licenses, which potentially use those on/off features. When an Out of Compliance (OOC) is detected for an on/off license, new calls for the corresponding services will be dropped, subject to the following conditions:

- Each on/off feature license is given a 90 day grace (evaluation) period. During this period, the system generates SNMP traps to inform of the unavailability of valid licenses. To resolve the OOC, corrective action is needed such as purchasing and registering licenses for this feature, or disabling the feature.
- If the feature is still OOC after the 90 day grace period, StarOS enforces the OOC state based on a predefined policy for each license. If enforcement is required, new calls for the services corresponding to the on/off licenses are dropped.

Two new commands have been introduced to display details about the enforcement of Smart Licenses in use:

```
show license enforcement policy
show license enforcement status [ allowed | blocked ] [ feature | service
 ]
```

Smart Licensing in Release 21.3

When Smart Licensing is enabled in Release 21.3, it operates in mixed mode where both Legecy and Smart Licensing is used.

- Legacy (PAK-based) licenses continue to be used for On/Off features.
- Smart licensing is used for counting each service. In Release 21.3 only the counting licenses listed below in "Entitlement Tags" are controlled by Smart Licensing. All other counting licenses use Legacy (PAK-based) licenses.

Cisco Smart Software Manager

Cisco Smart Software Manager (CSSM) enables the management of software licenses and Smart Account from a single portal. The interface allows you to activate your product, manage entitlements, and renew and upgrade software. A functioning Smart Account is required to complete the registration process. To access the Cisco Smart Software Manager, see https://software.cisco.com.

Smart Accounts/Virtual Accounts

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

A Virtual Account exists as a sub-account withing the Smart Account. Virtual Accounts are a customer-defined structure based on organizational layout, business function, geography or any defined hierarchy. They are created and maintained by the Smart Account administrator.

See https://software.cisco.com to learn about, set up, or manage Smart Accounts.

Request a Cisco Smart Account

A Cisco Smart Account is an account where all products enabled for Smart Licensing are deposited. 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 your organization's Smart Account through the Smart Software Manager.

Step 1 In a browser window, enter the following URL:

```
https://software.cisco.com
```

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

The **Smart Account Request** window is displayed.

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 authorization to create and manage product and service entitlements, users, and roles on behalf of your 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 will create 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 has been approved by the Account Domain Identifier. After approval, you will receive an email confirmation with instructions for completing the setup process.

Software Tags and Entitlement Tags

Tags for the following software and entitlements have been created to identify, report, and enforce licenses.

Software Tags

Software tags uniquely identify each licenseable software product or product suite on a device. The following software tags exist for the StarOS.

Product Type / Description	Software Tag
ASR5500 ASR-5500 Multimedia Core Platform	regid.2017-02.com.cisco.ASR5500,1.0_401f2e9e-67fd-4131-b61d-6e229d13a338

Product Type / Description	Software Tag
VPC_SI Virtualized Packet Core (Single instance)	regid.2017-02.com.cisco.VPC_SI,1.0_dcb12293-10c0 -4e90-b35e-b10a9f8bfac1
VPC_DI Virtualized Packet Core (Distributed instance)	regid.2017-02.com.cisco.VPC_DI,1.0_5cb68f91-c1d6 -48d6-9482-e9750203f5e6

Entitlement Service Tags

The following entitlement tags indentify licenses in use for each service type:

TagId	Service Type / Description	Entitlement Tag
0	ASR5K-00-PW10GTWY PDN GW Bundle, 10K Sessions	regid.2017-02.com.cisco. ASR5K-00 -PW10GTWY, 1.0_85a577a1-017d-4dc6-8bf7 -4fac7c4d465a
1	ASR5K-00-SG10 SAE GW Bundle, 10K Sessions	regid.2017-02.com.cisco. ASR5K-00-SG10, 1.0_e87d1e76-e34c-4699-94ad- 68eafa2da8b2
2	ASR5K-00-GN10SESS GGSN Software License, 10K sessions	regid.2017-02.com.cisco. ASR5K-00-GN10SESS, 1.0_bf7eb1d7-35bf- 40c6-8763-a4770f5ebf64
3	ASR5K-00-SW10LIC Serving GW Bundle, 10K Sessions	regid.2017-02.com.cisco. ASR5K-00-SW10LIC, 1.0_ca9d09ee- 5e72-4695-97ef-d5117037cfb4
4	ASR5K-00-ME10LIC MME Bundle, 10K sessions	regid.2017-02.com.cisco. ASR5K-00-ME10LIC, 1.0_ 37a452c9-ff23-41fc-b96c-c8b2eb09254b
5	ASR5K-00-EG10S-K9 EPDG, 10k Sessions	regid.2017-02.com.cisco. ASR5K-00-EG10S-K9, 1.0_5c625d0f-8b2c-4c44-970b- 9668a072890f
6	ASR5K-00-SM10S-K9 SaMOG GW 10k Sessions	regid.2017-02.com.cisco. ASR5K-00-SM10S-K9, 1.0_289f4807-fb6e-4750-b047- a9d57e7b045f

Entitlement Feature Tags

The following entitlement tags indentify licenses in use for each feature type:

TagId	Feature / Description	Entitlement Tag
0	ASR5K-00-CS01GRET GRE Interface Tunnelling	regid.2017-11.com.cisco. ASR5K-00-CS01GRET, 1.0_284ba242-a2ef-4ad0-b445-b62ed3887d3b
1	ASR5K-00-CS01MPLS MPLS on StarOS	regid.2017-11.com.cisco. ASR5K-00-CS01MPLS, 1.0_1b1221cd-39de-4113-8709-dad022c0a063

TagId	Feature / Description	Entitlement Tag
2	ASR5K-00-GN01REC Session Recovery	regid.2017-11.com.cisco. ASR5K-00-GN01REC, 1.0_88542f00-077b-4ed0-9698-a3cec699a047
3	ASR5K-00-GN01ICSR Inter-Chassis Session Recovery	regid.2017-11.com.cisco. ASR5K-00-GN01ICSR, 1.0_d0bca3e3-1218-4e91-98f6-207a20a5401a
4	ASR5K-00-EP01VLE EPC Gw VoLTE enhancements	regid.2017-11.com.cisco. ASR5K-00-EP01VLE, 1.0_a6c3d615-0b37-4f4a-8c34-3090ed5e265c
5	ASR5K-00-EP01ICSE ICSR Enhanced Recovery for Data and Control Plane	regid.2017-11.com.cisco. ASR5K-00-EP01ICSE, 1.0_bf87e837-003e-4832-b29f-ce0416699b01
6	ASR5K-00-PWXICSRP ICSR/SR Performance Improvements	regid.2017-11.com.cisco. ASR5K-00-PWXICSRP, 1.0_079a8bd2-a97d-4d12-bc5a-b0f70eec6c26
7	ASR5K-00-CS01I-K9 IPSec on StarOS	regid.2017-11.com.cisco. ASR5K-00-CS01I-K9, 1.0_a6e5539c-ab69-4303-b2a8-e71c03ac2a08
8	ASR5K-00-EG01RS ePDG Reselection	regid.2017-11.com.cisco. ASR5K-00-EG01RS, 1.0_b7f0b7d1-0d68-4223-abb1-381c3ac968ec

Configuring Smart Licensing

Before you begin, ensure you have:

- Created a Smart Licensing account on https://software.cisco.com.
- Registered your products on https://software.cisco.com using the Product Instance Registration tokens created as part of Smart Account/Virtual Account.
- Enabled a communication path between the StarOS system to the CSSM server or Cisco.com.

Enable Smart Licensing

By default, Smart Licensing is disabled in StarOS. To enable Smart Licensing, enter the following Config mode commands:

```
config
   license smart enable
   end
```

Enter the following command to verify the configuration:

```
show configuration | grep license
```

Register the Device with Cisco

Using the id Product Instance Registration token provided when you registered the products on https://software.cisco.com, register the system using the following Exec mode command:

```
license smart register idtoken token
```

The system now automatically report entitlement usage count to the CSSM server and receive a compliance status. This also removes the system from "Evaluation Mode".

To show the compliance status, enter any of the following Exec mode commands:

```
show license status
show license summary
show license statistics
```

The registration for the system is renewed automatically every 180 days. If needed, use the following Exec mode command to renew the registration information manually:

```
license smart renew id
```

The license authorization for the system is renewed automatically every 30 days. If needed, use the following Exec mode command to renew the license authorization manually:

```
license smart renew auth
```

To unregister a device, enter the following Exec mode command:

```
license smart deregister
```

Handling Out of Compliance

If there are not enough licenses in the virtual account for a given SKU, CSSM sends an Out Of Compliance (OOC) message to the device. The system stops allowing additional sessions until the OOC state is cleared. The OOC state is cleared when the device receives an authorized response.

Monitoring and Troubleshooting Smart Licensing

Enter the following Exec mode command to verify the Smart Licensing configuration:

```
show configuration | grep license
```

The following Exec mode commands display information about Smart Licensing:

```
show license { all | enforcement | eval-period | smart-tags | statistics
 | status | summary | tech-support | udi | usage } [ | { grep grep_options
 | more } ]
```

Notes:

- **all** - Shows a superset of information that includes show status, show usage, show UDI, as well as the Smart Licensing agent version.
- **enforcement { policy | status [allowed | blocked] [feature | service] }** - Shows the enforcement policy applied or current enforcement status of Smart Licenses. Status information can be filtered to show only the licenses which are currently allowed or blocked, or by type (feature license or service license).

- **eval-period** - Shows information about the evaluation period. Licenses are granted a 90 day evaluation period until they are registered.
- **smart-tags [feature | service]** - Shows the features and services that are currently supported and the corresponding Smart Entitlement Tag.
- **statistics** - Shows individual feature license status.
- **status** - Shows overall Smart Licensing status information.
- **summary** - Shows summary of Smart Licensing status.
- **tech-support** - Shows information useful for debugging issues with Smart Licensing.
- **udi** - Shows details for all Unique Device Identifiers (UDI).
- **usage** - Shows the usage information for all entitlements that are currently in use.

The following SNMP alarms (traps) are produced to track issues with Smart Licensing.

- 1349: starSmartLicenseServiceOOC / starSmartLicenseServiceOOCClear
- 1350: starSmartLicenseEvalMode / starSmartLicenseEvalModeClear
- 1351: starSmartLicenseEvalModeExpire / starSmartLicenseEvalModeExpireClear
- 1352: starSmartLicenseCSSMConntectionFail / starSmartLicenseCSSMConnectionFailClear
- 1353: starSmartLicenseServiceEvalExpiry / starSmartLicenseServiceEvalExpiryClear

Note For more information regarding these SNMP MIB alarms, see the *SNMP MIB Reference*.

Smart Licensing Bulk Statistics

The following statistics are provided in support of Smart Licensing

- current_sl_state – Current state of Smart Licensing, eitherenabled or disabled.
- current_sl_mode – Current mode of Smart Licensing, either Evaluation or Registered.
- total_sl_enabled – Total number of times Smart Licensing has been enabled.
- total_sl_disabled – Total number of times Smart Licensing has been disabled.
- mode – Counters for each service type when product in Evaluation and Registered mode.
- tagid – Tagid for each service type.
- cur_call_policy – Current call policy for new sessions of each service type, either ALLOW or BLOCK.
- cur_call_count – Current number of sessions/calls counted for the entire product for a particular service type.
- max_call_count – Maximum number of sessions/calls counted for the entire product for a particular service type.

- last_lic_count – License count last reported to Cisco licensing (CSSM) for particular service type.
- max_lic_count – Maximum license count reported to Cisco licensing (CSSM) for particular service type up to this point in time.
- policy_change_block_calls – Number of times particular service type blocked new sessions as a result of insufficient licenses available.