Cisco Nexus 1000V InterCloud License Configuration Guide, Release 5.2(1)IC1(1.1)

First Published: June 28, 2013

C O N T E N T S

Preface

This preface contains the following sections:

Audience

This publication is for network administrators who configure and maintain Cisco Nexus devices.

This guide is for network and server administrators with the following experience and knowledge:

- An understanding of virtualization
- Using VMM software to create a virtual machine and configure a VMware vSwitch
- Ability to create an account on provider cloud such as Amazon Web Services (AWS).
- Knowledge of VMware vNetwork Distributed Switch is not required.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).

Convention	Description
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
variable	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
screen font	Terminal sessions and information the switch displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Related Documentation for Cisco Nexus 1000V InterCloud

This section lists the documents used with the Cisco Nexus 1000V InterCloud and available on Cisco.com at the following URL:

http://www.cisco.com/en/US/partner/products/ps12904/tsd_products_support_series_home.html

General Information

Cisco Nexus 1000V InterCloud Release Notes

Install and Upgrade

Cisco Nexus 1000V InterCloud Installation Guide

Configuration Guides

Cisco Nexus 1000V InterCloud License Configuration Guide

Cisco Nexus 1000V InterCloud High Availability and Redundancy Configuration Guide

Cisco Nexus 1000V InterCloud Interface Configuration Guide

Cisco Nexus 1000V InterCloud Layer 2 Configuration Guide

Cisco Nexus 1000V InterCloud Port Profile Configuration Guide

Cisco Nexus 1000V InterCloud Security Configuration Guide

Cisco Nexus 1000V InterCloud System Management Configuration Guide

Reference Guides

Cisco Nexus 1000V InterCloud Command Reference

Cisco Nexus 1000V InterCloud Verified Scalability Reference

Cisco Nexus 1000V MIB Quick Reference

Troubleshooting and Alerts

Cisco Nexus 1000V Password Recovery Procedure

Cisco Nexus 1000V Documentation

Cisco Nexus 1000V for VMware vSphere Documentation

http://www.cisco.com/en/US/products/ps9902/tsd_products_support_series_home.html

Cisco Prime Network Services Controller Documentation

http://www.cisco.com/en/US/products/ps13213/tsd_products_support_series_home.html

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to nexus1k-docfeedback@cisco.com. We appreciate your feedback.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

Overview

This chapter contains the following sections:

Information About Licenses

For Cisco Nexus 1000V InterCloud, one Cisco Nexus 1000V InterCloud license is required for every active Virtual Machine in the cloud.

Cisco Nexus 1000V InterCloud licenses are delivered in a Software License Claim Certificate by e-mail and the license packages are installed and configured on the Cisco Nexus 1000V Virtual Supervisor Module (VSM). To understand more fully the terms associated with the licensing, see Licensing Terminology, on page 11.

Licenses are also required for Cisco Nexus 1000V for Cisco Nexus 1000V in the enterprise. See the *Cisco Nexus 1000V License Configuration Guide* for information about the licensing requirements for Cisco Nexus 1000V.

Types of Licenses

Cisco Nexus 1000V InterCloud includes the following types of licences:

- Permanent Licenses
- Default Licenses
- Evaluation Licenses
- Overdraft Licenses

Permanent Licenses

Permanent licenses do not expire. You can purchase permanent licenses for a fixed number of active Virtual Machines in the cloud, and you need one license for every VM instantiated on the cloud. The license file specifies the number of licenses that you have purchased.

When you purchase permanent licenses, make sure to request enough licenses to cover all of the VMs in the cloud.

Any extra licenses are placed into a pool of available licenses on the VSM to be used as needed. See Pool of Available Licenses, on page 3

After you purchase a license package, you then install the package on your VSM. The license package name is similar to the following: `Nexus1000V_INTERCLOUD_VM_PKG`. See Installing the License File on the VSM, on page 7

After installing permanent licenses, you can remove the evaluation license file from the pool if desired.

Default Licenses

There are 16 default licenses pre-installed with the Cisco Nexus 1000V InterCloud software that are valid for 90 days from the date of VSM installation. These default licenses allow you to use the Cisco Nexus 1000V InterCloud for a 90 day trial period before purchasing permanent licenses.

Default licenses are invalidated when one of the following occurs:

- You install a permanent license file.

- You install an evaluation license file.

- The license trial period expires.

If you need additional licenses to cover all the VMs in the cloud, you must obtain either permanent licenses or evaluation licenses from Cisco.com. For additional licensing information, contact your Cisco representative.

Evaluation Licenses

Evaluation licenses allows you to try Cisco Nexus 1000V InterCloud before purchasing permanent licenses. For Cisco Nexus 1000V InterCloud, evaluation licenses are in packages of 16 licenses that are valid for 60 days to enable you to evaluate the Cisco Nexus 1000V InterCloud before you purchase permanent licenses.

The evaluation period starts when you install the evaluation license file. Unlike default licenses, an evaluation license is not invalidated when you install a permanent license. Instead, evaluation licenses only expire when the license file reaches its expiration date. The validity period may vary and the expiration date is mentioned in the license file.

After installing permanent licenses, you can remove the evaluation license file from the pool if desired.

Evaluation license packs are available from Cisco.com.

Overdraft Licenses

Overdraft licenses are used when the installed licenses are used up. Overdraft licenses can prevent a service disruption in the event you exceed the number of permanent or evaluation licenses specified in your license file.

The number of overdraft licenses provided is based on the number of licenses ordered. If the number of licenses installed is less than or equal to 64, the number of overdraft licenses provided is 16. Otherwise, it is 30% of the installed licenses.

The expiration of an overdraft license is tied to the expiration date of the installed license.

Pool of Available Licenses

If you have licenses that are unused, the VSM stores these unused licenses in a pool of available licenses. Before you can uninstall a license file, you must first return all licenses from its VMs to the pool.

The following events trigger a renegotiation and synchronization of licenses between the VSM and the cloud VMs:

- Clock change in the VSM system clock

- VSM reload

- Installing a new license file

- Clearing an existing license file

During the license renegotiation process, system messages alert you if licenses could not be checked out for a VM which had a license earlier.

Licensing and High Availability

- License installation is a nondisruptive process.

- The license file is shared by both Virtual Supervisor Modules (VSMs) in an HA pair.

- If your system has dual supervisors, the licensed software runs on both supervisor modules and provides failover protection.

- Uninstalling a license file results in a service disruption.

Monitoring Licensing Usage

A system message similar to the following is generated when a VM being instantiated in the cloud is not able to get a license. This message indicates that you should add more permanent licenses:

```
VM cvm_example does not have InterCloud license, the VM will be powered down by CM. Please
 install licenses, if needed.
```

A system message similar to the following is generated when a VM which had an Cisco Nexus 1000V InterCloud license earlier, is now not able to get a license due to license expiry:

```
VM cvm_example license has expired, Please install licenses if needed
```

CHAPTER 2

Installing and Configuring Licenses

This chapter includes the following sections:

Information About Licenses

Licensing Guidelines and Limitations

Use the following guidelines and limitations when configuring the permanent licenses:

- If you modify a permanent license key file, it is invalidated.
- When you purchase permanent licenses, the license key file is sent to you in an e-mail. The license key authorizes use on only the host ID device. You must obtain a separate license key file for each of your VSMs.
- A license file contains the number of licenses ordered for your VSM. One license is required for every active VM in the cloud.
- A VSM can have more than one license file depending on the number of VMs in the cloud.
- You must have a role equivalent to that of network-admin to install, uninstall, or copy a permanent license file. For information about user accounts and roles, see the *Cisco Nexus 1000V InterCloud Security Configuration Guide*.
- If you are installing multiple permanent licenses for the same VMs, also called license stacking, each permanent license key filename must be unique.

- If a license is in use, you cannot delete its license file. You must first transfer all licenses from the VMs to the VSM license pool before uninstalling the license file by powering down the VMs.

- When you install a permanent license file, all default and evaluation licenses are invalidated.

Default License Configuration Settings

Configuration Option	Description
license filename	NEXUS1000V_INTERCLOUD_VM_PKG

Obtaining and Installing a License

This section describes how to obtain the license file that is required for each VSM and then install it. This section includes the following topics:

- Obtaining the License File, on page 6.

- Installing the License File on the VSM, on page 7.

Obtaining the License File

License files have the following characteristics:

- A license file is tied to each VSM by the host ID or the serial number associated with the VSM device.

- A license file contains the number of licenses ordered for your VSM. One license is required for each VM, but no license is required for the VSM or InterCloud Switch or InterCloud Extender itself.

- A VSM can have more than one license file depending on the VMs in the cloud.

Before You Begin

- Make sure that you have your product authorization key (PAK),which is in your software license claim certificate.

  If you cannot locate your software license claim certificate, contact contact Cisco Technical Support.

- You are logged in to the CLI in EXEC mode.

- In this procedure, you must copy a license file. This process requires that your username has a role equivalent to that of the network-admin role which allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V InterCloud Security Configuration Guide*.

Procedure

Step 1 Obtain the serial number, also called the host ID, for your VSM using the following command: **show license host-id**

```
switch# show license host-id
License hostid: VDH=1280389551234985805
```

Note   The host ID includes everything that appears after the equal sign (=). In this example, the host ID is 1280389551234985805.

Step 2 From your software license claim certificate, locate the product authorization key (PAK).

Step 3 Go to the Software Download site.

Step 4 From the Software Download site, go to the Product License Registration site.

Step 5 From the Product License Registration website, follow the instructions for registering your VSM license. The license key file is sent to you in an e-mail. The license key authorizes use on only the host ID device. You must obtain separate license key file(s) for each of your VSMs.

Caution   Modifying the license key file in any way invalidates it. Make sure you keep the file intact and unchanged.

Step 6 Save your license to a SCP/SFTP/TFTP server.

Step 7 Copy your license to bootflash on the VSM.

```
switch# copy scp://user@linux-box.cisco.com/home/user/n1kv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
n1kv_license.lic                          100%  252     0.3KB/s   00:00

switch#
```

Installing the License File on the VSM

You can install the license files on the VSM. Default licenses are invalidated when a permanent license file is installed.

Before You Begin

- Make sure that the license file you are installing contains the number of licenses needed to cover all the VMs in the cloud.

- The example below installs the license file using the name `kumo_perm.lic`. You can specify a different name if needed.

- If you are installing multiple licenses for the same VSM, also called license stacking, make sure that each license key filename is unique.

- Repeat this procedure for each additional license file you are installing, or stacking, on the VSM.

- You are logged in to the CLI in EXEC mode.

- You must have a role with privileges equivalent to that of the network-admin role to install a license. For information about user accounts and roles, see the *Cisco Nexus 1000V InterCloud Security Configuration Guide*.

Procedure

	Command or Action	Purpose
Step 1	switch# **install license bootflash:** *filename*	Installs the license from the active VSM console. **Note** If you specify a license filename, the file is installed with the specified name. Otherwise, the default filename is used. The license is installed on the VSM.
Step 2	switch# **show license file** *filename*	Verifies the license installation by displaying the license configured for the VSM.
Step 3	switch# **show license usage** *package_name*	Verifies the license installation by displaying it in the license usage table.
Step 4	switch# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to install a license file and then display its contents and usage:

```
switch# install license bootflash:kumo_perm.lic
Installing license ..done
switch# show license file kumo_perm.lic
kumo_perm.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT NEXUS1000V_INTERCLOUD_VM_PKG cisco 1.0 permanent 3 \
        HOSTID=VDH=1260092958136993530 \
        NOTICE="<LicFileID>20130605162046006</LicFileID><LicLineID>1</LicLineID>
 \
        <PAK></PAK>" SIGN=D6A9A75E8E18
switch# show license file usage NEXUS1000V_InterCloud_VM_SERVICES_PKG
-------------------------------------
Feature Usage Info
-------------------------------------
        Installed Licenses : 3
    Default Eval Licenses : 0
   Max Overdraft Licenses : 16
Installed Licenses in Use : 0
Overdraft Licenses in Use : 0
  Default Eval Lic in Use : 0
   Default Eval days left : 0
        Licenses Available : 19
          Shortest Expiry : Never
-------------------------------------
switch#
```

Changing the Serial Number in a License

You can change the serial number, or host ID, associated with a license. This process is also called rehosting and is required if you replace a VSM in your network with a new VSM.

⚠️

Caution Service Disruption—When you remove a VSM from your network, the vEthernet interfaces on the VEMs are removed from service and the traffic flowing to them from virtual machines is dropped. This traffic flow is not resumed until you add a new VSM and new license file with the new host ID.

- A license file is tied to each VSM by the host ID associated with the VSM device.

- A license file contains the number of licenses ordered for your VSM. One license is required for every VM.

- A VSM can have more than one license file depending on the number of installed VMs.

- If you have multiple license files stacked on your VSM, repeat this process for each license file.

Before You Begin

- You have a copy of your existing license files with the host ID of the existing VSM.

- You are logged in to the CLI in EXEC mode.

- You must copy a license file. Your username must have the network-admin role that allows you to copy files. For information about user accounts and roles, see the *Cisco Nexus 1000V InterCloud Security Configuration Guide*.

Procedure

Step 1 Obtain the serial number, also called the host ID, for your new VSM:
```
switch# show license host-id
License hostid: VDH=1280389551234985805
```
Note The host ID number appears after the equal sign (=). In this example, the host ID is 1280389551234985805.

Step 2 E-mail the following information to licensing@cisco.com, requesting the license file be rehosted to the new host ID:

- The old host ID

- The new host ID

A new license key file, with the host ID of the new VSM, is sent to you in e-mail within 48 hours.

Note Do not modify the license key file. The license key file is invalidated if you modify it.

Step 3 Save your license to a SCP/SFTP/TFTP server.

Step 4 Copy your license to bootflash on the VSM.
```
switch# copy scp://user@linux-box.cisco.com/home/user/n1kv_license.lic bootflash:
Enter vrf (If no input, current vrf 'default' is considered):
user@linux-box.cisco.com's password:
n1kv_license.lic                              100%  252    0.3KB/s   00:00
switch#
```

What to Do Next

Install the license file on the VSM. See Installing the License File on the VSM, on page 7.

Verifying the License Configuration

To verify the license configuration, use one of the following commands:

Command	Purpose
show license	Displays the license filename for the VSM.
show license brief	Displays the license installed on the VSM.
show license file *filename*	Displays the contents of the license file installed on the VSM, including the license filename and the expiration date for evaluation licenses.
show license usage	Displays the total number of licenses in use on the VEMs.
show license usage *package_name*	Displays statistics about the number of evaluation and permanent licenses available, installed, and in use on the VSM. When you use this command, the `Default Eval days left` field displays the number of default evaluation days that are remaining before the license expires, not including the present day.

Feature History for Licenses

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Feature Name	Releases	Feature Information
License	Release 5.2(1)IC1(1.1)	This feature was introduced.

Licensing Terminology

Licensing Terminology

Term	Definition
Default license	A license bundled with the software that is installed automatically when you install the software.
Evaluation license	A temporary license. Evaluation licenses are valid for a specified number of days and are tied to a host ID (device serial number).
Host ID	A unique chassis serial number that is specific to each device.
Incremental license	A license for additional VMs that were not included in the initial license file. License keys are incremental—if you purchase some VMs now and others later, the license file and the software detect the sum of all VMs for the specified device.
License enforcement	A mechanism that prevents a feature from being used without first obtaining a license.
License key file	A file that specifies the total licensed VMs sockets for your system. Each file is uniquely named and is specific to a VSM. The file contains digital signatures to prevent tampering and modification. License keys are required to use the product and are enforced within a specified time span.
Licensed application	A software application or component that requires a license to be used.
Licensed feature	Permission to use a particular feature through a license file, a hardware object, or a legal contract. This permission is limited to the number of users, number of instances, time span, and the implemented device.

Term	Definition
Missing license	If the bootflash has been corrupted or a supervisor module replaced after you have installed a license, that license shows as "missing." The product still works. You should reinstall the license as soon as possible.
Node locked license	A license that can only be used on a particular device using the unique host ID for the device.
Overdraft license	Overdraft licenses are used when the installed licenses are used up. Overdraft licenses can prevent a service disruption in the event you exceed the number of permanent or evaluation licenses specified in your license file. The number of overdraft licenses provided is based on the number of licenses ordered.
Permanent license	A license that is not time bound is called a permanent license.
Product Authorization Key (PAK)	A unique code, provided in the software license claim certificate, that allows you to obtain a license key. You use this key at a website to register for your license. After you register, your license key file and installation instructions are sent to you in e mail.
Rehosting	The process of changing a license to reflect a different device serial number, or host ID. A host ID is unique to each device, for example VSM.
Software license claim certificate	A document entitling its rightful owner to use licensed features on one device as described in that document. This document provides the product authorization key (PAK).
Support	If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support.
Stacking	The process of adding multiple license files on a single VSM.