



DANOS-Vyatta edition

Disaggregated Network Operating System Version 2009a

Linux KVM Installation Guide
October 2020

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Chapter 1. Copyright Statement

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Chapter 2. Preface


Document conventions


The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in this document.


Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

 **Note:** A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

 **Attention:** An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

 **CAUTION:** A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

 **DANGER:** A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font are used to highlight specific words or phrases.

Format	Description
bold text	Identifies command names. Identifies keywords and operands.
<i>italic text</i>	Identifies emphasis. Identifies variables. Identifies document titles.
<code>Courier font</code>	Identifies CLI output. Identifies command syntax examples.

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
<i>italic text</i>	Identifies a variable.
[]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ x y z }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member</i> [<i>member</i> ...].
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.


Chapter 3. About This Guide

This guide describes how to install and upgrade DANOS-Vyatta edition running in the Linux KVM environment.

Chapter 4. Installing the System

Overview of installing on Linux KVM

The router supports the Kernel-Based Virtual Machine (KVM) hypervisor on Linux operating systems. Like other virtualization platforms, the Linux KVM provides the ability to run multiple virtual systems on a single hardware platform. IPI provides a prebuilt Linux KVM image that runs on the KVM. This image has a number of Linux KVM-specific modifications and optimizations.

 **Note:** KVM uses Linux bridging functionality that includes IGMP/MLD snooping. The IGMP/MLD snooping support in Linux works correctly on a Linux KVM host, but does not work correctly when there is more than one router connected to a single network. Therefore, we recommend that you disable the IGMP/MLD snooping on the Linux host when KVM is used.

Preparing for installation


The VM install image is the simplest way to get a router up and running quickly. If the parameters of the VM install image do not meet your requirements or additional settings are required, then the vRouter can be installed from the ISO


Before installing, prepare for the installation.

- Download the router KVM files. Download the package from the site provided to you.
- Install the Linux operating system on the system where you are going to install the router software. Refer to the Linux documentation for the procedure.
- Download and install virt-manager, including the desktop application as you are going to use virt-manager to create virtual machines. For more information, refer to <http://virt-manager.org>.
- The virtual machine host must support Supplemental Streaming SIMD Extensions 3 (SSSE3). Refer to the processor specifications for more information. Alternatively, run the command `grep ssse3 /proc/cpuinfo` on the host machine to check for support for the feature.
- Ensure that you have a minimum of 10 GB of free space on the system for a root partition. A minimum of 4 GB of free space is recommended for a production installation.
- Ensure that you have a minimum of 4 GB of RAM on the system. A minimum of 4 GB is recommended.
- The data plane supports from 2 to 128 CPUs. At least 4 CPUs are recommended for optimum performance.

Installing the router Linux KVM image

After downloading the router Linux KVM disk image file, install it on the Linux operating system. The following example shows an installation on Red Hat Enterprise Linux, but installing it on other versions would be similar.

 **Note:** In the router, a data plane interface is an abstraction that represents the underlying physical or virtual Ethernet interface of the system. The terms Ethernet interface and data plane interface are synonymous in this guide.

 **Note:** If you install or upgrade the image without setting the CPU flags, the system boots and displays the following error: Starting vPlane services: huge igb_uio data plane ERROR: This system does not support "SSSE3". Please check that RTE_MACHINE is set correctly.

1. Log in to the Linux operating system and check that you have the necessary rights to perform installations for the router.
2. Start the Virtual Machine Manager by selecting **Applications > System Tools > Virtual Machine Manager**. Alternatively, enter the `virt-manager` command from the Linux command line. The **Virtual Machine Manager** screen is displayed.
 - a. In the top left corner, click **Create a new virtual machine**.
The **Create a new virtual machine** wizard is displayed at Step 1 of 5.
 - b. In the **Name:** field, enter a name for the new virtual machine and select **Import existing disk image**.
 - c. Click **Forward**.
The **Create a new virtual machine** wizard is displayed at Step 2 of 5.
 - d. Click **Browse....** The **Locate or create storage volume** dialog window is displayed.
 - e. Click **Browse Local**. The **Locate existing storage** dialog window is displayed.
 - f. Navigate to the uncompressed image that you downloaded.
3. Click **Open**. The **Create a new virtual machine** wizard is displayed at Step 2 of 5, showing the specified image.
 - a. From the **OS type:** drop-down list, select **Linux**.
 - b. From the **Version:** drop-down list, select **Debian Stretch**.
4. Click **Forward**.
The **Create a new virtual machine** wizard is displayed at Step 3 of 5.
 - a. In the **Memory (RAM):** field, specify 8 GB.
 - b. In the **CPUs:** field, specify the number of CPUs to allocate for the virtual machine.

The minimum required is 4 vCPUs.

c. Click **Forward**.

The **Create a new virtual machine wizard** is displayed at Step 5 of 5. (Note that Step 4 of 5 does not appear.)

5. Check the **Customize configuration before install** checkbox.
6. Under **Advanced options**, select the virtual network type that best meets your needs.
7. Select **Set a fixed MAC address** so that the system generates a unique MAC address for the main Ethernet interface.
8. Leave **Virt Type:** as **kvm** and set the **Architecture:** field to **i686**.
9. Click **Finish**.
The **configuration customization** screen is displayed.

Customizing the configuration

To customize your configuration, follow the steps in this procedure for the **configuration customization** screen.

1. In the left menu bar, select **Processor**.
2. Click the **Configuration** option on the right pane, then click **Copy host CPU configuration**.
3. Click **Apply**.
4. In the left menu bar, select **NIC :e9:8e:24**. The **Virtual Network Interface** configuration screen is displayed.
5. From the **Device model:** drop-down list, select **virtio** to enable the enhanced virtual network interface driver. Click **Apply**.

 **Note:** Currently virtio is the only NIC driver supported in KVM for router.

6. Select **Disk 1** in the left menu. The **Virtual Disk** screen is displayed.
7. From the **Disk Bus:** drop-down list, select **Virtio** to enable the enhanced virtual disk driver. Leave other fields at their default values. Click **Apply**.
8. Remove any devices that are not required (such as the **Sound** device) by selecting the device and clicking **Remove**.
9. At the top left of the screen, click **Begin Installation**.

The new virtual machine is created and begins to run in a separate window. When the router finishes loading, the Vyatta login prompt appears in the virtual machine console.

At this point, test your installation.

Testing your installation

After the system has successfully booted, you see the `node login:` prompt. This prompt indicates that the system is operational.

Perform the following procedures:

- Verify the Release and System Type
- Verify Connectivity

Verifying the release and system type


The next step is to confirm that the correct release is running and it is running on the device that you expect.

To verify the release and system type:

1. Log in as the **tmppuser** user. Use the default password of **tmppwd** unless you have changed it.
2. Enter the `show version` command.
 - The `version:` line shows the version number of the system that is running. Make sure the **Version:** line shows the version you expect.
 - The `system type:` line shows the type of hardware on which the system is running and whether it is in a virtual environment. Make sure the **System type:** line shows the information you expect.
 - The `boot via:` line shows the type of system that is running.

Verifying connectivity

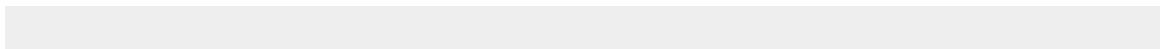
After you confirm that the correct version is running, you must confirm that the system can be accessed on the local network. Configure an Ethernet interface on the system and ping the interface from another host on the network.

 **Note:** In the system, a data plane interface is an abstraction that represents the underlying physical or virtual Ethernet interface of the system. The terms Ethernet interface and data plane interface are synonymous in this guide.

To test the system connectivity, perform the following steps:

1. At the command prompt, enter the commands that are shown in the example, substituting an IP address from your existing subnet. The example uses the following network and IP address.
 - The network is 192.168.1.0/24.
 - The IP address of the interface is 192.168.1.81.

Make the appropriate substitutions for your network, as shown in the following example.



```
tmpuser@node:~$ configure
tmpuser@node# set system login user vyatta level superuser
tmpuser@node# set system login user vyatta authentication plaintext
vyatta
tmpuser@node# set interfaces dataplane dp0sN address 192.168.1.81/24
tmpuser@node# set service ssh
tmpuser@node# set service telnet
tmpuser@node# commit
```

2. To ping the device from an outside network, add the management "routing-instance" (VRF) configuration below.

```
tmpuser@node# set routing routing-instance management description
management
tmpuser@node# set routing routing-instance management interface dp0sN
tmpuser@node# set routing routing-instance management protocols static
route 0.0.0.0/0 next-hop 192.168.1.1
tmpuser@node# set routing routing-instance management service ssh
tmpuser@node# commit
tmpuser@node# exit
tmpuser@node:~$
```

3. From another host on the same subnet, ping the interface to ensure that it is up. From a Linux or Windows command prompt, enter the following command, substituting the IP address you assigned to the interface.

```
ping 192.168.1.81
```

If the system can be reached, you see replies from it in response to the pings. If so, your system is installed and can be accessed on your network.

Chapter 5. Upgrading the System

Release-specific upgrade information

Your system may have special upgrade considerations, depending on the release.

For release-specific upgrade information, and to ensure that configuration information is correctly preserved across upgrades, consult the release notes for your release.

Before upgrading

Before upgrading your system, perform the following tasks.

- Save your existing configuration file for reference. Your configuration file is named `config.boot` and is located in the directory `/config`.
- Make sure you have enough space on your root partition to load the image. You can determine the amount of space available by using the `show system storage` command.
- If you install or upgrade the router image without setting the CPU flags, the system boots and displays the following error: `Starting vPlane services: huge igb_uio dataplane ERROR: This system does not support "SSSE3". Please check that RTE_MACHINE is set correctly.` Refer to the procedure [Installing the Vyatta Linux KVM image](#) to resolve the issue.

Upgrading the system by using the `add system image` command

The `add system image` command uses a router ISO file as the image source. It installs the new image and sets the new image as the default boot image. The new image is run the next time the system is rebooted.

To prepare for the upgrade, download the new image, determine the location of the router ISO file, and record the name of the file.

To upgrade the ISO, perform the following steps:

1. Enter the `add system image` command.
Use the location and name of the router ISO file as arguments in the command, as shown in the following example.
2. Before you reboot, confirm that the new image is loaded and ready to run the next time the system is rebooted. Enter the `show system image` command.
See the example for the command in the next sections.

3. Reboot the system by entering the `reboot` command. The system restarts with the new system image.

Sample session: “add system image”

The following example shows a session in which the `add system image` command is used to upgrade to the `xxx.iso` system image, where `xxx` is the file name of the ISO image you have downloaded.

The following example uses the 3.2R1 image:

```
tmpuser@node:~$ add system image /home/vyatta/xxx.iso
Checking MD5 checksums of files on the ISO image...OK.
Done!
What would you like to name this image? [3.2R1]:
OK. This image will be named: 3.2R1
Installing "3.2R1" image.
Copying new release files...
Would you like to save the current configuration
directory and config file? (Yes/No) [Yes]:
Copying current configuration...
Would you like to save the SSH host keys from your
current configuration? (Yes/No) [Yes]:
Copying SSH keys...
Setting up grub configuration...
Done.
tmpuser@node:~$
```

The following example shows how to display installed images:

```
tmpuser@node:~$ show system image
The system currently has the following image(s) installed:
  1: xxx (default boot)
  2: yyy (running version)
```

Chapter 6. Installation and Upgrade Commands

add system image

Adds a binary system image to the currently running system.

```
add system image { iso-filename | iso-URL [ username username password password ] }
```

iso-filename

Name of the image file to be added.

iso-URL

URL location of the image file to be added.

username *username*

Specifies the username that is required to log in to the remote system at the indicated URL location.

password *password*

Specifies the password that is required to log in to the remote system at the indicated URL location. If the username is specified, then a password must also be specified.

Operational mode

Use this command to add a binary image to the currently running system. A system image can be added to a system that was installed by using a disk-based installation or an image-based installation. After an image is added, it is set as the new default boot image and is run the next time the system is booted.

The command validates the MD5 checksums of the files that are contained in the ISO image to ensure that the image has not been corrupted. In addition, the command does not allow more than one copy of an image to exist on the same system.

The *iso-filename* and *iso-URL* arguments provide the source for the ISO image file.

The following table shows how to specify the file syntax for different file locations.

Location	Specification
An absolute path	For <i>iso-filename</i> , use standard UNIX file specification.
A relative path	For <i>iso-filename</i> , you can also specify the path name relative to the current directory.
FTP server	Use the following syntax for the <i>iso-URL</i> argument: <code>ftp://user:passwd@host/image-file</code> where <i>user</i> is the username on the host, <i>passwd</i> is the password that is associated with the username, <i>host</i> is the host name or IP address of the FTP server, and <i>image-file</i> is the ISO image file, including the path. Alternatively, the username and password can be specified as username and password arguments of the <code>add system image</code> command.

Location	Specification
	If you do not specify <i>user</i> and <i>passwd</i> , you are prompted for them.
SCP server	Use the following syntax for the <i>iso-URL</i> argument: <pre>scp://user:passwd@host/image-file</pre> where <i>user</i> is the username on the host, <i>passwd</i> is the password that is associated with the username, <i>host</i> is the host name or IP address of the SCP server, and <i>image-file</i> is the ISO image file, including the path. Alternatively, the username and password can be specified as username and password arguments to the <code>add system image</code> command. If you do not specify <i>user</i> and <i>passwd</i> , you are prompted for them.
HTTP server	Use the following syntax for the <i>iso-URL</i> argument: <pre>http://host/image-file</pre> where <i>host</i> is the host name or IP address of the HTTP server and <i>image-file</i> is the ISO image file, including the path relative to the HTTP root directory.
TFTP server	Use the following syntax for the <i>iso-URL</i> argument: <pre>tftp://host/image-file</pre> where <i>host</i> is the host name or IP address of the TFTP server, and <i>image-file</i> is the ISO image file, including the path relative to the TFTP root directory.

clone system image

Creates a copy of a system image that is installed on the local system or a remote system.

```
clone system image [ user@host:] source-image-name new-image-name [ clean ]
```

user

Username on a remote host. A username is required for remote host access through SCP and is not required for cloning a local system image.

host

Host name or IP address of a remote host. The host name or IP address is required for remote access through SCP and is not required for cloning a local system image.

source-image-name

Name of a system image to be copied. The source image can exist on the local system or a remote system.

new-image-name

Name of the new (copied) system image. An image with this name must not exist on the system.

clean

Creates an empty read/write directory tree for the new image, which is a new image that is functionally equivalent to the source image as it existed when it was originally installed.

Operational mode

Use this command to create a copy of a system image that is installed on the local system or a remote system.

If *user@host* is specified, the image is fetched from the named host by using the Secure Copy Protocol (SCP). If *user@host* is omitted, *source-image-name* is the name of an image

that exists on the system, and *new-image-name* is the image name that the system uses for the clone. No image that is named *source-image-name* can exist on the system.

Command completion is performed for local image names if *user@host* is not specified. No command completion is performed on remote image names if *user@host* is specified.

If the **clean** argument is omitted, the command copies the `squashfs` file that is being used by the image named *source-image-name* and the read/write directory tree of *source-image-name*. If the **clean** argument is given, the read/write directory tree of *source-image-name* is not copied. Instead, an empty read/write directory tree is created for the new image, which creates a new image that is functionally equivalent to the source image as it existed when it was initially installed.

Images created by this command behave the same as images that are installed by [install image](#) or [add system image](#).

Both the HTTPS and SSH services must be enabled on the remote system for [clone system image](#) to work properly. The HTTPS service is enabled by using the `set service https` command in configuration mode. The SSH service is enabled by using the `set service ssh` command in configuration mode.

delete system image

Deletes an image from the local disk drive.

```
delete system image [ image-name ]
```

When the command is entered without an image name, the system prompts for the image to delete.

image-name

Name of an image to be deleted.

Operational mode

Use this command to delete an image from the local disk drive.

The image and all its local files, including its configuration file, are destroyed. Because this command is destructive, the system prompts for confirmation.

Command completion displays all valid completions for the *image-name* argument. If the *image-name* argument is omitted, the system displays a list of available images and prompts you to select one.

If the system was originally installed in disk-based mode, an **image-name** option is available that you can use to direct that the disk-based installation must be deleted.

The system does not allow you to delete the currently running system image. However, the system does allow you to delete the image currently selected to be run at the next reboot. If you delete that image, the system uses the currently running image when the system is next rebooted.

install image

Installs a binary image of the system.

```
install image
```

Operational mode

Use this command to install a binary image of the system.

After the installation is completed, you can add multiple image versions to the same partition by using the `add system image` command, and you can then choose which version to boot by using the `set system image default-boot` command. This functionality allows you to move easily between different versions of the system.

If you have a new system and want to install from scratch, you can boot from the `*.iso` and run the `install image` command to install the image to the disk. The `install image` command operates similarly to the `install system` command—it creates and formats a new disk partition and then installs the image to the partition while preserving the system configuration.

rename system image

Renames an image.

```
rename system image old-image-name new-image-name
```

old-image-name

Name of an existing image to be renamed.

new-image-name

New name for the image.

Operational mode.

Use this command to rename an image.

The old name must match the name of an image on the system. The system does not allow you to rename the currently running system image. The new system image name cannot be in use by another image.

set system image default-boot

Selects an image to be run when the system is next rebooted.

```
set system image default-boot [ image-name ]
```

If the command is used without specifying an image name, the system displays a list of available images and prompts you to select one.

image-name

Name of an image to be run when the system is rebooted.

Operational mode

Use this command to select an image to run when the system is next rebooted.

When multiple system images have been installed by using the `add system image` command, you can use this command to direct the system to boot from a specific system image the next time the system is restarted.

Command completion displays all valid completions for the *image-name* argument. If the *image-name* argument is omitted, the system displays a list that shows all images that are installed on the system and prompts you to select one. If the system was originally installed in disk-based mode, a special **image-name** option is available so that you can select the disk-based system as the default system from which to boot.

show system image

Displays a list of all images that are installed on the system.

```
show system image [ storage | version ]
```

storage

Displays the amount of disk space that is used by each image.

version

Includes the image version number in the display of system images.

Operational mode

Use this command to display a list of all images that are installed on the system.

The command output identifies the image that is currently running and the image that has been selected to run when the system is next rebooted. If the system was originally installed in disk-based mode, one of the image names identifies that installation.

spawn

Allows you to run any native Linux command through the operational mode infrastructure.

```
spawn command-name [ text ]
```

command-name

Command to run

text

An argument to a command

Operational mode

Use this command to run any native Linux command through the operational mode infrastructure.

Commands that are spawned are run by the local shell, and with the current user's permissions. The spawned command provides a documented and supported way of running any Linux command.

The spawned command prevents any changes to the set of modeled commands from effecting the user's ability to run native commands consistently, if they are using this supported method.

Chapter 7. Licensing

About Licenses

DANOS-Vyatta edition supports the following node-locked license types, where the generated license activates just one device:

- Perpetual license - Permanent license.
- Subscription license - Limited duration license for evaluation


Enforcement Action

When a device license is expired or the device does not have the license, CPU cores will be limited to 1 core.

 **Note:** When a license is active, CPU cores are capped as per license file.

Delayed Enforcement

When a device license is released, to avoid the service interruption license enforcement is scheduled to happen 20 minutes after the license release time. This duration allows the user to install the license.

 **Note:** During this interim period any license installation failure will not lead to enforcement.

Host Identifier

A host is identified by the licensing module with the UUID prefixed with "IPI-". All the characters must be in uppercase.

The UUID is one time configurable for the VMs. Use the `show license` command after starting the machine.

Generate the License File

The *DANOS-Vyatta edition* device license file needs to be generated from the license portal provided to you.

The default name of a generated license file is `host-id.bin`. For example:

```
IPI-CC37ABBE0340.bin
```

Copy the License File to the Device

Use the `licensing get` command or `license-get` NetConf RPC to copy the license file from a remote file server to the device. Or use Linux utilities such as `curl` or `wget`.

licensing get command

```
licensing get URL dest-filepath FILEPATH routing-instance VRF
```

URL


License file URL

FILEPATH

Local filesystem's absolute path or path with file name to store the downloaded file

VRF

Routing instance name

 **Note:** Use the routing-instance name when the interface to be used in the download is part of a non-default routing-instance.

Download success:

```
tmpuser@node:~$ ls
tmpuser@node:~$ licensing get
ftp://10.12.65.89:2121/IPI-A2E11F714C0B47E8B5237F34C0225387.bin
dest-filepath /home/tmpuser/
#####
100.0%
tmpuser@node:~$
tmpuser@node:~$ ls
IPI-A2E11F714C0B47E8B5237F34C0225387.bin
tmpuser@node:~$
```

Download failure:

```
tmpuser@node:~$ licensing get
ftp://10.12.65.89:2121/IPI-A2E11F714C0B47E8B5237F34C0225387.bin
dest-filepath /home/tmpuser/
curl: (7) Couldn't connect to server
tmpuser@node:~$
```

NetConf license-get RPC

```
rpc license-get {
  configd:call-rpc "vyatta-license-rpc --license-get";
  description "Install license on device";
  input {
    leaf url {
      type string;
      mandatory true;
      description "License file URL";
    }
  }
}
```

```

leaf dest-filepath {
    type string;
    mandatory true;
    description "Local filesystem's absolute path or
    path with file name to store the downloaded file";
}

leaf routing-instance {
    type string;
    description "Download license through this routing-instance";
}
}

output {
    leaf license-response {
        description "License file download status";
        type string;
    }
}
}

```

Download success:

```

license_get.xml:
<license-get xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<url>ftp://10.12.65.89:2121/IPI-A2E11F714C0B47E8B5237F34C0225387.bin</url>
<dest-filepath>/home/tmpuser/</dest-filepath>
</license-get>

netconf> rpc license_get.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:5e3a0a66-f666-43c1-875b-af7eddf7c4d9">
<ok/>
</rpc-reply>
netconf>

```

Download failure:

```

license_get.xml:
<license-get xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<url>ftp://10.12.65.89:2121/IPI-A2E11F714C0B47E8B5237F34C0225387.bin</url>
<dest-filepath>/home/tmpuser/</dest-filepath>
<routing-instance>wrong-routing-instance</routing-instance>
</license-get>

netconf> rpc license_get.xml
<?xml version='1.0' encoding='UTF-8'?>

```

```
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:2c959683-cf00-4e3f-b756-d605ec6201ed">
<license-response
  xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">curl: (7) Couldn't
  connect to server
</license-response>
</rpc-reply>
netconf>
```

Install the License

Use the `licensing install` command or `license-install` NetConf RPC to install the license file present on the device local file system. The device clock needs to be up to date, otherwise an incorrect clock on the device may lead to license installation failure. See [License Troubleshooting](#) to resolve installation failures.

licensing install command

```
licensing install PATH
```

PATH

License file absolute path

NetConf license-install RPC

```
rpc license-install {
  configd:call-rpc "vyatta-license-rpc --license-install";
  description "Install license on device";
  input {
    leaf file-path {
      type string;
      mandatory true;
      description "Local filesystem path of the
        license file to be installed";
    }
  }
  output {
    leaf license-response {
      description "License installation status";
      type string;
    }
  }
}
```

Installing on a Device with an Inactive License

Command:

```

tmpuser@node:~$
tmpuser@node:~$ licensing
  install /home/tmpuser/IPI-A2E11F714C0B47E8B5237F34C0225387.bin
tmpuser@node:~$
tmpuser@node:~$ show licensing
status      : active
feature     : DVE-vSDE-BASE
environment : Virtual
host-id     : IPI-A2E11F714C0B47E8B5237F34C0225387
type        : subscription
enforcement : CPU_COUNT=2
validity-in-days : 357
tmpuser@node:~$

```

NetConf RPC:

```

netconf> rpc license_install.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:0da2341c-33e8-4059-b561-60633fc1abd0">
<ok/>
</rpc-reply>
netconf>

netconf> rpc license_show.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:34621de9-5320-4da4-91c2-5bb2a2f6ff34">
<license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<enforcement>CPU_COUNT=2</enforcement>
<validity-in-days>357</validity-in-days>
<status>active</status>
<feature>DVE-vSDE-BASE</feature>
<host-id>IPI-A2E11F714C0B47E8B5237F34C0225387</host-id>
<model>node-locked</model>
<type>subscription</type>
</license-status>
</rpc-reply>
netconf>

```

Installing on a Device with an Active License

Any active license on the device must be released before installing a new license.

Command:


```

tmpuser@node:~$ show licensing
status      : active
feature     : DVE-vSDE-BASE
environment : Virtual
host-id     : IPI-A2E11F714C0B47E8B5237F34C0225387
type        : subscription
enforcement : CPU_COUNT=2
validity-in-days : 357
tmpuser@node:~$
tmpuser@node:~$ licensing
  install /home/tmpuser/IPI-A2E11F714C0B47E8B5237F34C0225387.bin
Device already have a valid license
tmpuser@node:~$

```

NetConf RPC:

```

license_show.xml:
<show-license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
</show-license-status>

license_install.xml:
<license-install xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<file-path>/home/tmpuser/IPI-A2E11F714C0B47E8B5237F34C0225387.bin</file-path>
</license-install>

netconf> rpc license_show.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:f338e420-7131-4fa8-993a-171bec666be8">
<license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<model>node-locked</model>
<type>subscription</type>
<enforcement>CPU_COUNT=2</enforcement>
<validity-in-days>357</validity-in-days>
<status>active</status>
<feature>DVE-vSDE-BASE</feature>
<host-id>IPI-A2E11F714C0B47E8B5237F34C0225387</host-id>
</license-status>
</rpc-reply>
netconf>
netconf> rpc license_install.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:feb28a3e-2f57-475e-bc21-4ecfe28273b1">
<license-response
  xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">Device already have a
  valid license</license-response>

```

```
</rpc-reply>
netconf>
```

View License Status

Command:

```
show licensing
```

NetConf RPC:

```
rpc show-license-status {
  configd:call-rpc "vyatta-license-rpc --show-license";
  description "This RPC will display the license status informations";
  output {
    leaf license-response {
      description "show-license-status rpc failure response";
      type string;
    }
    container license-status {
      leaf status {
        description "License installation status";
        type enumeration {
          enum "inactive";
          enum "active";
        }
      }
      leaf feature {
        description "This attribute refers to the device feature/SKU name, which
          is used in license validation. The feature/SKU name present in the license
          file must match with device feature/SKU name";
        type string;
      }
      leaf type {
        description "Indicates the installed license type";
        type enumeration {
          enum "subscription";
          enum "perpetual";
        }
      }
      leaf enforcement {
        description "This attribute refers to the enforcement attribute value";
        type string;
      }
      leaf validity-in-days {
```

```

        description "License validity in days, and this field exists when the
license type is trial";
        type uint64;
    }

    leaf model {
description "License model, indicates the method used by the device to
acquire the license";
        type enumeration {
            enum "node-locked";
            enum "license-server";
        }
    }

    leaf host-id {
description "License identifier, this is the device base MAC or UUID for VM
prefixed with IPI- , and this attribute is used in license validation";
        type string;
    }

    leaf error {
        description "Error observed while installing the license";
        type uint64;
    }

    leaf error-string {
description "Error messages in user readable text form corresponding to the
error observed during license installation";
        type string;
    }
}
}
}
}

```

Installation Success

Command:

```

tmpuser@node:~$ show licensing
status      : active
feature     : DVE-vSDE-BASE
environment : Virtual
host-id     : IPI-E8C57A186F1B
type        : subscription
validity-in-days : 59

```

NetConf RPC:

```

license_show.xml:
<show-license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
</show-license-status>

netconf> rpc license_show.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:f338e420-7131-4fa8-993a-171bec666be8">
<license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
<model>node-locked</model>
<type>subscription</type>
<enforcement>CPU_COUNT=2</enforcement>
<validity-in-days>357</validity-in-days>
<status>active</status>
<feature>DVE-vSDE-BASE</feature>
<host-id>IPI-A2E11F714C0B47E8B5237F34C0225387</host-id>
</license-status>
</rpc-reply>

```

Installation Failure

Command:

```

tmpuser@node:~$ show licensing
status      : inactive
feature     : DVE-vSDE-BASE
environment : Virtual
host-id     : IPI-E8C57A2E4F1B
error       : 14
error-string: License not available

```

NetConf RPC:

```

license_show.xml:
<show-license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
</show-license-status>

netconf> rpc license_show.xml
<?xml version='1.0' encoding='UTF-8'?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
  xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0"
  message-id="urn:uuid:471f9d0e-c1e9-4a98-9042-d35c73864b8e">
  <license-status xmlns="urn:vyatta.com:mgmt:vyatta-op-licensing-v1:1">
    <status>inactive</status>
    <feature>DVE-vSDE-BASE</feature>
    <host-id>IPI-A2E11F714C0B47E8B5237F34C0225387</host-id>
  </license-status>
</rpc-reply>

```

```

<error>l4</error>
  <error-string>License not available</error-string>
</license-status>
</rpc-reply>
netconf>

```

License Troubleshooting

Table 1. License Troubleshooting

Error code	Description	Resolution
1	Failed to create license error object	Report the error to support team .
2	Failed to create license environment	Report the error to support team .
3	Failed to add trusted storage as license source	Trusted storage path does not exist or does not have required permission. Report the error to the support team.
4	Failed to create trusted storage folder	Creation of trusted storage inside /config/license-manager parent directory is not successful. This should not fail, but if you see this error report to the support team.
5	Failed to create license object	Report the error to support team.
6	Failed to process license	Downloaded license files could have been corrupted, download the license file from the portal again and try installing. Also compare the checksum of the license file between the file present in the device and the one downloaded from the portal.
7	Failed to get mapped SKU in license	The generated license could have been mapped to a different software feature than what is required for the device. Use the <code>show licensing</code> command to understand the SKU to be mapped while generating the license. This happens mostly when customers have purchased multiple software features / SKUs.
8	Device SKU is not found in license	Generate the license file by mapping the correct device feature in the portal.
9	Failed to acquire license	Report the error to support team.
10	Failed to return acquired license	Report the error to support team.
11	License file is not the latest one, please install the recently downloaded license or download again from the portal	When license is generated successively say first and second, installation of second on top of the first is accepted, but not vice versa.
12	Failed to update private storage	Report the error to support team.
13	Failed to fetch data from private storage	Report the error to support team.
14	License not available	Device does not have any license activated.
15	Subscription license is expired	Validity of the device license has ended, download new license from portal and install if you have purchased.
16	Device already have a valid license	To install new license on the already license activated device. 1. Use <code>licensing release</code> command or <code>license-release</code> RPC to remove current license

Table 1. License Troubleshooting (continued)

Error code	Description	Resolution
		2. Use <code>licensing install</code> command or <code>license-install</code> RPC to install new license
17	Device does not have a valid license	Device does have any license activated.
18	File not found	Check whether the specified absolute path, and the file exists on the device.
19	Empty file	Could be a copy or the download issue, please download the license into the device using the alternate method or compare the checksum of the license file between the file present in the device and the one downloaded from the portal.
20	License start date is in future	Device clock must be up to date to install the license successfully.
21	Invalid host-id	The license is generated with a different HOST ID, please cross check and download the license with the correct HOST-ID.
22	License activation time (lifetime) elapsed, please download the license again from the portal	License file downloaded from the portal should be installed within 42 days of generation, otherwise you need to download the license file from portal again