



FortiManager - KVM Cookbook

Version 6.4

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FortiManager 6.4 KVM Cookbook

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Change log

Date	Change description
2020-04-09	Initial release.
2021-03-09	Updated Minimum system requirements on page 7 .
2021-05-13	Updated About FortiManager on KVM on page 5 .
2021-05-28	Updated information about trial licenses and add-on licenses.
2022-11-18	Updated "Minimum system requirements" on page 7.

About FortiManager on KVM

This document provides information about deploying a FortiManager virtual appliance in Linux KVM server environments.

This includes how to configure the virtual appliance's virtual hardware settings. This guide presumes that the reader has a thorough understanding of virtualization servers.

This document does not cover configuring and operating the virtual appliance after successfully installing and starting it. For that information, see the [FortiManager Administration Guide](#).

Licensing

Fortinet offers the FortiManager-VM with a limited, free trial license. Stackable licenses can be purchased, letting you expand your VM solution as your environment expands. You can purchase perpetual or subscription-based licenses. Perpetual licenses never expire.

For information on purchasing a FortiManager-VM license, contact your Fortinet-authorized reseller, or visit [How To Buy](#).

When configuring your FortiManager-VM, ensure that you configure hardware settings as the following table outlines and consider future expansion. Contact your Fortinet-authorized reseller for more information.

License	Devices/VDOMs	GB/day of logs with FortiAnalyzer enabled (not stackable)
Trial License	3	0 FortiAnalyzer features not supported
VM-10-UG	+10	2
VM-100-UG	+100	5
VM-1000-UG	+1000	10
VM-5000-UG	+5000	25
VM-10K-UG	+10000	50

See [Minimum system requirements on page 7](#).

See also the [FortiManager product datasheet](#).

Trial license

With a FortiCare account and FortiManager 6.4.1 or later, FortiManager-VM includes a free limited non-expiring trial license.

The free trial license includes support for to add 3 devices/VDOMs and use 3 ADOMs.

The free trial license does not include services or support.

You can activate the trial license when you connect to the GUI for the FortiManager-VM. Full-feature products and services are available for purchase with an add-on license. See [Connecting to the GUI and enabling a trial license on page 15](#).

Add-on license

You must activate a trial license before you can upgrade FortiManager-VM to a purchased add-on license.

See also [FortiManager 6.4 Trial License Guide](#).

Preparing for deployment

You can prepare for deployment by reviewing the following information:

- [Minimum system requirements](#)
- [Deployment package for Linux KVM](#)
- [Downloading a deployment package](#)

Minimum system requirements



FortiManager-VM has a minimum requirement of 4 CPU, 8 GB of RAM, and 500 GB of disk storage.

The following table lists the minimum system requirements for your VM hardware, based on the number of devices, VDOMs, or ADOMs that your VM manages.

Maximum devices/ VDOMs	VM hardware requirements	
	RAM (GB)	CPU cores
100	8	4
300	16	6
1200	32	6
4000	64	16
10000	128	24



This table does not take into account other hardware specifications, such as bus speed, CPU model, or storage type.



Enabling FortiAnalyzer features requires more resources.

Deployment package for Linux KVM

FortiManager deployment packages are included with firmware images on the [Customer Service & Support site](#). The following table lists the available VM deployment package.

VM Platform	Deployment File
Linux KVM RedHat 7.1	FMG_VM64_KVM-vX-buildxxxx-FORTINET.out.kvm.zip

The `.out.kvm.zip` file contains:

- FMG.qcow2: The FortiManager system hard disk in QCOW2 format.
The log disk and virtual hardware settings have to be configured manually.

For more information FortiManager, see the FortiManager [datasheet](#).

Downloading a deployment package

Firmware image FTP directories are organized by firmware version, major release, and patch release. The firmware images in the directories follow a specific naming convention. Each firmware image is specific to the device model. For example, the `FMG_VM64_HV-vX-buildxxxx-FORTINET.out.hyperv.zip` image, found in the 5.6.0 directory, is specific to the 64-bit Microsoft Hyper-V Server virtualization environment.



You can download the *FortiManager Release Notes* and MIB file from this directory. The Fortinet Core MIB file is located in the *FortiManager > Download* tab.



Download the `.out` file to upgrade your existing FortiManager installation.

To download deployment packages:

1. Log in to the Fortinet Customer Service & Support portal then, from the toolbar select *Download > Firmware Images*. The *Firmware Images* page opens.
2. Select *FortiManager* from the *Select Product* dropdown list, then select *Download*.
3. Browse to the appropriate directory for the version that you would like to download.
4. Download the appropriate firmware image and release notes to your management computer.
5. Extract the contents of the package to a new folder on your management computer.

Compatibility for VM hardware versions

FortiManager-VM supports ESXi 6.5 and later versions. Using corresponding hardware versions 13 and later is highly recommended, as mentioned in [Virtual machine hardware versions](#).

It is recommended to upgrade hardware versions incrementally with only one delta at a time. For example, upgrading from 10 to 11, 11 to 12, 12 to 13, then 13 to 14 is recommended, although directly upgrading from 10 to 14 generally has no issues.

To upgrade hardware versions:

1. Log in to vSphere Client web console.
2. In the left pane tree-menu, right-click the FortiManager-VM.
3. From the shortcut menu, select *Compatibility > Schedule VM Compatibility Upgrade*.
4. Click *YES*.
5. From the *Compatible with* dropdown, select the desired compatibility.
6. Click *OK*.
7. Reboot the FortiManager-VM.

Deployment

Prior to deploying the FortiManager, the VM platform must be installed and configured so that it is ready to create virtual machines. The installation instructions for FortiManager presume that you are familiar with the management software and terminology of your VM platform.

You might also need to refer to the documentation provided with your VM server. The deployment information in this guide is provided as an example because, for any particular VM server, there are multiple ways of creating a virtual machine - command line tools, APIs, alternative graphical user interface tools.

Before you start your FortiManager appliance for the first time, you might need to adjust virtual disk sizes and networking settings. The first time you start FortiManager, you will have access only through the console window of your VM server environment. After you configure one network interface with an IP address and administrative access, you can access the FortiManager GUI (see [Enabling GUI access on page 14](#)).

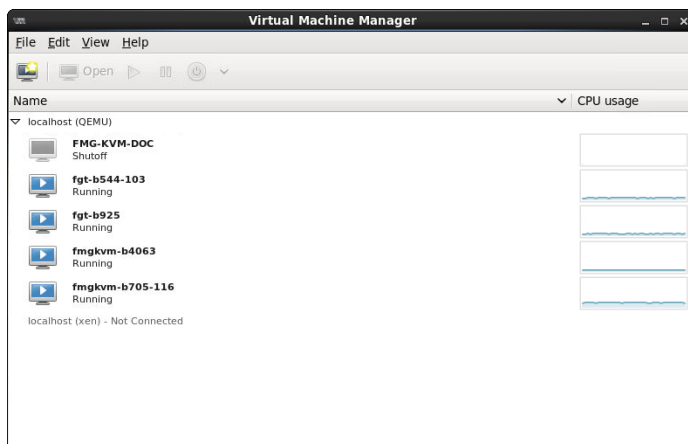
Deploying FortiManager on KVM

After you download the `FMG_VM64_KVM-vX-buildxxxx-FORTINET.out.kvm.zip` file and extract the virtual hard drive image file, you can create the VM in your KVM environment.

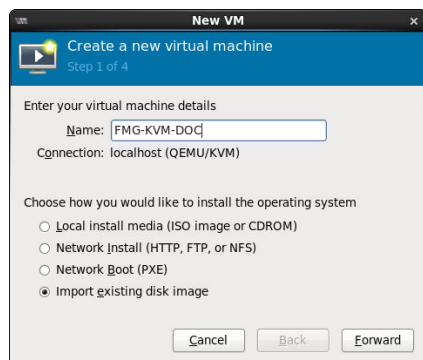
Creating the virtual machine

To create the virtual machine:

1. Launch Virtual Machine Manager (virt-manager) on your KVM host server. The *Virtual Machine Manager* homepage opens.

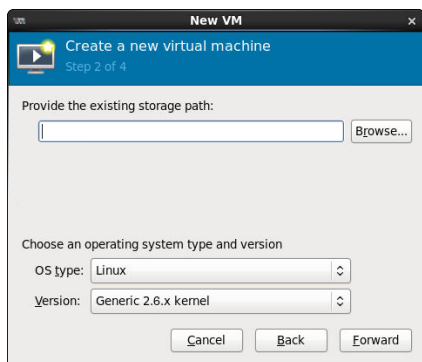


2. On the toolbar, click *Create a new virtual machine*.

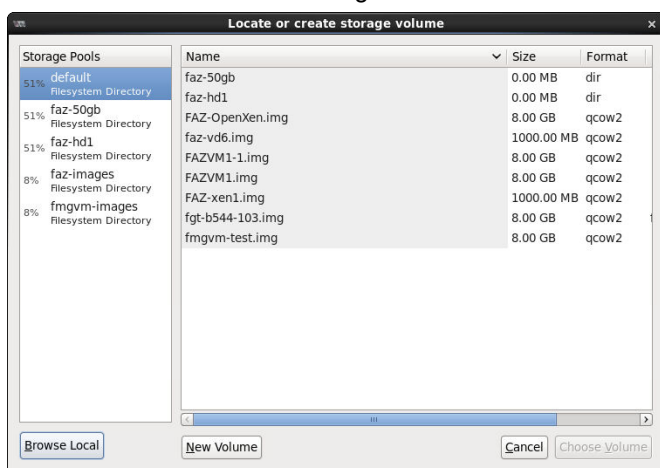


3. Configure the VM:

- a. Enter the VM name, such as *FMG-KVM-DOC*.
- b. Ensure that *Connection* is *localhost*, select *Import existing disk image*, then click *Forward* to continue.

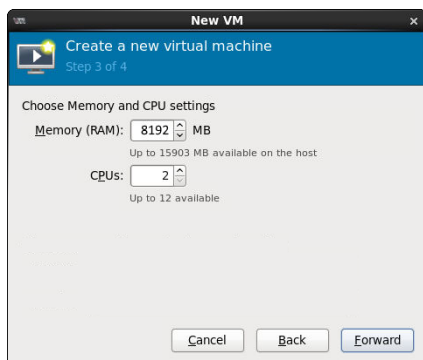


- c. From the *OS type* dropdown list, select *Linux*.
- d. From the *Version* dropdown list, select *Generic 2.6.x kernel*. You may have to first select *Show all OS options*.
- e. Click *Browse* to locate the storage volume.



- f. If you copied the *fmg.qcow2* file to */var/lib/libvirt/images* it shows on the right. If you saved it elsewhere on the server, click *Browse Local* to find it.

- g. Once the file has been located, click *Choose Volume*, then click *Forward*.



- h. Specify the amount of memory and the number of CPUs to allocate to this VM, then select *Forward*. To determine your required memory, see [Minimum system requirements on page 7](#).
- i. Expand the *Advanced options* section. By default, a new VM includes one network adapter. Select a network adapter on the host computer.
Optionally, set a specific MAC address for the virtual network interface.
- j. Set *Virt Type* to *virtio* and set *Architecture* to *qcow2*.

4. Click *Finish* to create the VM.

Configuring hardware settings

Before powering on your FortiManager-VM, you must configure virtual disks and at least four network interfaces.

To configure settings on the server:

1. In the Virtual Machine Manager, locate the VM name, then click *Open* on the toolbar.
2. In the Virtual Machine window, select *Show virtual hardware details*.
3. Click *Add Hardware* to open the *Add Hardware* window
4. Select *Storage*.



5. Select *Create a disk image on the computer's hddrive*, and set the size.



If you know your environment will expand in the future, or if you will be using ADOMs, adding hard disks larger than 500 GB. This allows your environment to expand as required while not taking up more space than is needed.



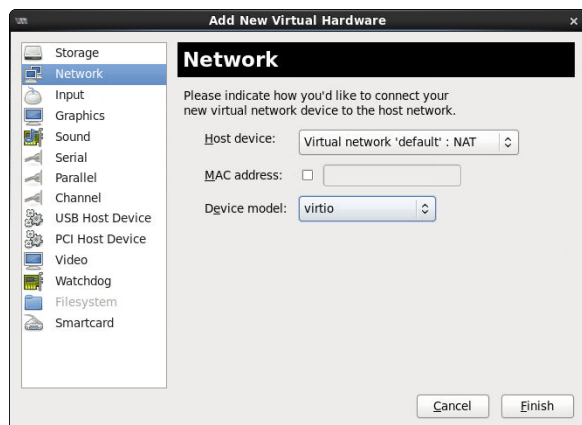
The FortiManager-VM allows you to add twelve virtual log disks to a deployed instance. When adding additional hard disks, use the following CLI command to extend the LVM logical volume:

```
execute lvm start
execute lvm extend <arg ..>
```

6. Enter the following information:

Device Type	Virtio disk
Cache mode	writethrough
Storage format	raw

7. Select *Network* to add more network interfaces. The *Device Model* must be *Virtio*.



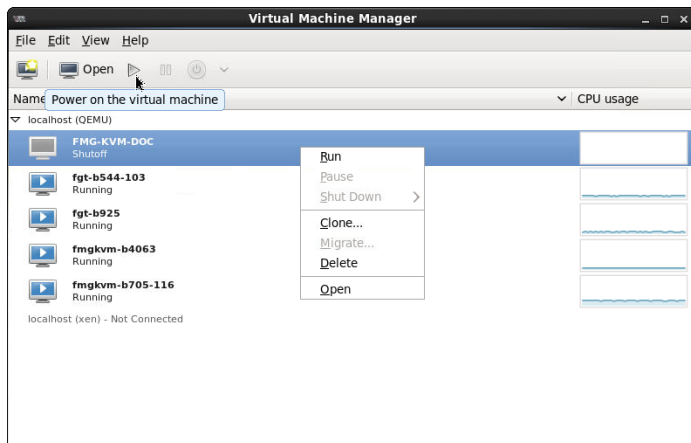
A new VM includes one network adapter by default. You can add more through the *Add Hardware* window. FortiManager-VM supports up to four network adapters. You can configure network adapters to connect to a virtual switch or to network adapters on the host computer.

8. Click *Finish*.

Starting the VM

You can now proceed to power on your FortiManager-VM.

1. Do one of the following:
 - a. Right-click the FortiManager-VM and select *Run*.
 - b. Select the FortiManager-VM from the list of VMs, then click *Power on the virtual machine* from the toolbar.



After the VM starts, proceed with the initial configuration. See [Configuring initial settings on page 14](#).

Configuring initial settings

Before you can connect to the FortiManager-VM, you must configure basic network settings via the CLI console. Once configured, you can connect to the FortiManager GUI.

Enabling GUI access

To enable GUI access to the FortiManager, you must configure the IP address and network mask of the appropriate port on the FortiManager. The following instructions use port 1.



You can determine the appropriate by matching the network adapter's MAC address and the HWaddr that the CLI command `diagnose fmnetwork interface list` provides.

To configure the port1 IP address and netmask:

1. In your hypervisor manager, start the FortiManager and access the console window. You might need to press *Enter* to see the login prompt.
2. At the FortiManager login prompt, enter the username *admin*, then press *Enter*. By default, there is no password.
3. Using CLI commands, configure the port1 IP address and netmask.


```
config system interface
  edit port1
    set ip <IP address> <netmask>
  end
```



The port management interface should match the first network adapter and virtual switch that you have configured in the hypervisor VM settings.

4. To configure the default gateway, enter the following commands:

```
config system route
  edit 1
    set device port1
    set gateway <gateway_ipv4_address>
end
```



The Customer Service & Support portal does not currently support IPv6 for FortiManager license validation. You must specify an IPv4 address in the support portal and the port management interface.

Connecting to the GUI and enabling a trial license

Once you have configured a port's IP address and network mask, you can connect to the GUI by using a web browser.

To connect to the GUI and enable a trial license:

1. Launch a web browser, and enter the IP address you configured for the port management interface.
2. At the login page, click the *Login with FortiCloud* button to start the process of activating your free trial license.

See also [FortiManager 6.4 Trial License Guide](#).

Upgrading to an add-on license

You must activate a trial license before you can upgrade FortiManager-VM to a purchased add-on license.

See also [FortiManager 6.4 Trial License Guide](#).

Configuring your FortiManager

Once the FortiManager license has been validated, you can configure your device.

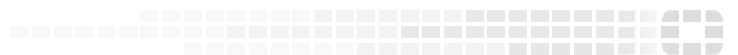


If the amount of memory or number of CPUs is too small for the VM, or if the allocated hard drive space is less than the licensed VM storage volume, warning messages show in the GUI in the *System Resources* widget on the dashboard and in the *Notification* list.

For more information on configuring your FortiManager, see the [FortiManager Administration Guide](#).



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