FortiManager VM - Install Guide

VERSION 5.2

FORTINET DOCUMENT LIBRARY

http://docs.fortinet.com

FORTINET VIDEO GUIDE

http://video.fortinet.com

FORTINET BLOG

https://blog.fortinet.com

CUSTOMER SERVICE & SUPPORT

https://support.fortinet.com

FORTIGATE COOKBOOK

http://cookbook.fortinet.com

FORTINET TRAINING SERVICES

http://www.fortinet.com/training

FORTIGUARD CENTER

http://www.fortiguard.com

END USER LICENSE AGREEMENT

http://www.fortinet.com/doc/legal/EULA.pdf

FEEDBACK

Email: techdocs@fortinet.com

2015-07-07

FortiManager VM 5.2 Install Guide

02-520-227429-20150707

TABLE OF CONTENTS

Change Log

Date	Change Description
2015-07-07	Initial release.
2016-04-08	As of FortiManager 5.2.7, 32bit VMs are not supported.

Introduction

The FortiManager Security Management appliances allow you to centrally manage any number of Fortinet Network Security devices, from several to thousands, including FortiGate, FortiWiFi, and FortiCarrier. Network administrators can better control their network by logically grouping devices into administrative domains (ADOMs), efficiently applying policies and distributing content security/firmware updates. FortiManager is one of several versatile Network Security Management Products that provide a diversity of deployment types, growth flexibility, advanced customization through APIs and simple licensing.

This document describes how to deploy a FortiManager virtual appliance in several virtualization server environments. This includes how to configure the virtual hardware settings of the virtual appliance. This guide presumes that the reader has a thorough understanding of vitualization servers.

This document does not cover configuration and operation of the virtual appliance after it has been successfully installed and started. For that information, see the *FortiManager Administration Guide* in the Fortinet Document Library.

FortiManager documentation

The following FortiManager product documentation is available:

- *FortiManager Administration Guide*

  This document describes how to set up the FortiManager system and use it to manage supported Fortinet units. It includes information on how to configure multiple Fortinet units, configuring and managing VPN policies, monitoring managed devices, viewing and analyzing logs, updating virus and attack signatures, providing web filtering and email filter service to licensed devices as a local FortiGuard Distribution Server (FDS), and firmware revision control and updating the firmware images of the managed units.

- *FortiManager device QuickStart Guides*

  These documents are included with your FortiManager system package. Use these document to install and begin working with the FortiManager system and GUI.

- *FortiManager Online Help*

  You can get online help from the FortiManager GUI. FortiManager online help contains detailed procedures for using the GUI to configure and manage devices.

- *FortiManager CLI Reference*

  This document describes how to use the FortiManager Command Line Interface (CLI) and contains references for all CLI commands.

- *FortiManager Release Notes*

  This document describes new features and enhancements in the FortiManager system for the release, and lists resolved and known issues. This document also defines supported platforms and firmware versions.

- *FortiManager VM Install Guide*

  This document describes installing FortiManager VM in your Citrix XenServer, Microsoft Hyper-V Server 2008 R2 or 2012, KVM, Open Xen, VMware vSphere, or Amazon Web Services (AWS) virtual environments.

Overview

This section provides an overview of FortiManager VM. The following topics are included:

Licensing

Fortinet offers the FortiManager VM in a stackable license model. This model allows you to expand your VM solution as your environment expands.For information on purchasing a FortiManager VM license, contact your Fortinet Authorized Reseller, or visit http://www.fortinet.com/how_to_buy/.

When configuring your FortiManager VM, ensure to configure hardware settings as outlined in the following table and consider future expansion. Contact your Fortinet Authorized Reseller for more information.

Technical Specification	VM-BASE	VM-10-UG	VM-100-UG	VM-1000-UG	VM-5000-UG	VM-U-UG
HA Support	Yes					
Virtual CPUs (min / max)	1 / Unlimited					
Virtual Network Interfaces (min / max)	1 / 4					
Virtual Memory (min / max)	2GB / Unlimited (default: 2GB)					
Virtual Storage (min / max)	80GB / 16TB					
GB / Day of logs	1	2	5	10	25	50
Device Quota	100GB	200GB	1TB	4TB	8TB	16TB
Licensed Network Devices	10	+10	+100	+1000	+5000	Unlimited
Administrative Domains	10	+10	+100	+1000	+5000	Unlimited
Admin Web Portals / Maximum Portal Users	10	+10	+100	+1000	+5000	Unlimited

For more information, see the FortiManager product data sheet available on the Fortinet web site, http://www.fortinet.com/sites/default/files/productdatasheets/FortiManager-VM.pdf.

After placing an order for FortiManager VM, a license registration code is sent to the email address used in the order form. Use the license registration code provided to register the FortiManager VM with Customer Service & Support at https://support.fortinet.com.

Upon registration, you can download the license file. You will need this file to activate your FortiManager VM. You can configure basic network settings from the CLI to complete the deployment. Once the license file is uploaded and validated, the CLI and GUI will be fully functional.

Evaluation license

FortiManager VM includes a free, full featured 15 day trial license. No activation is required for the built-in evaluation license.

The trial period begins the first time you start the FortiManager VM. When the trial expires, all functionality is disabled until you upload a license file.

Technical support is not included with the 15-day evaluation.

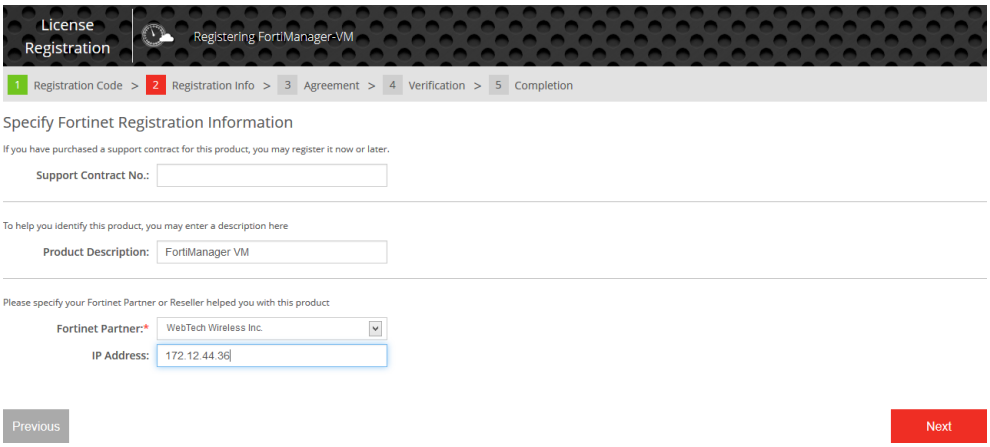
Contact your Fortinet Reseller to request a full evaluation (60-days) license.

Register with Customer Service & Support

To obtain the FortiManager VM license file you must first register your FortiManager VM with Fortinet Customer Service & Support.

To register your FortiManager VM:

1. Log in to the Fortinet Customer Service & Support portal using an existing support account or select *Create an Account* to create a new account.
2. In the toolbar select *Asset* > *Register/Renew*. The *Registration Wizard* opens.
3. Enter the registration code from the FortiManager VM License Certificate that was emailed to you, then select *Next*. The *Registration Info* page is displayed.

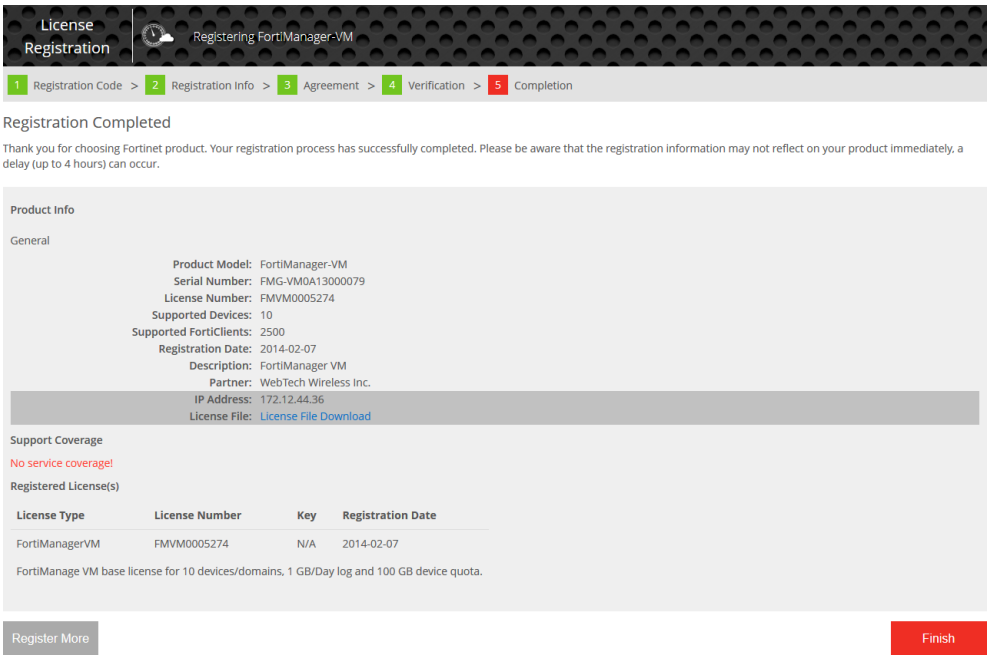


4. Enter your support contract number, product description, Fortinet Partner, and IP address in the requisite fields, then select *Next*.

As a part of the license validation process FortiManager VM compares its IP address with the IP information in the license file. If a new license has been imported or the FortiManager VM's IP address has been changed, the FortiManager VM must be rebooted in order for the system to validate the change and operate with a valid license.

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

5. On the *Fortinet Product Registration Agreement* page, select the checkbox to indicate that you have read, understood, and accepted the service contract, then select *Next* to continue to the *Verification* page.
6. The verification page displays the product entitlement. Select the checkbox to indicate that you accept the terms then select *Confirm* to submit the request.

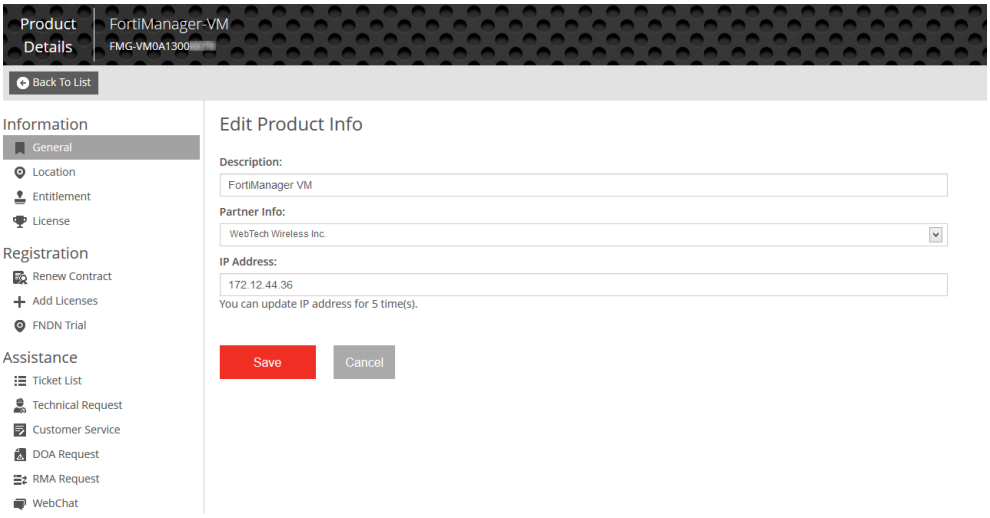


7. From the *Registration Completed* page you can download the FortiManager VM license file, select *Register More* to register another FortiManager VM, or select *Finish* to complete the registration process.

   Select *License File Download* to save the license file (`.lic`) to your management computer. See Upload the license file on page 44 for instructions on uploading the license file to your FortiManager VM via the GUI.

To edit the FortiManager VM IP address:

1. In the toolbar select *Asset* > *Manage/View Products* to open the *View Products* page.
2. Select the FortiManager VM serial number to open the *Product Details* page.
3. Select *Edit* to change the description, partner information, and IP address of your FortiManager VM from the *Edit Product Info* page.



4. Enter the new IP address then select *Save*.

You can change the IP address five (5) times on a regular FortiManager VM license. There is no restriction on a full evaluation license.

5. Select *License File Download* to save the license file (`.lic`) to your management computer. See Upload the license file on page 44 for instructions on uploading the license file to your FortiManager VM via the GUI.

Download the deployment package

FortiManager VM deployment packages are included with firmware images on the Customer Service & Support site. The following table list the available VM deployment packages.

VM Platform	Deployment File
Amazon Web Service AMI, EC2, and EBS	The 64bit Amazon Machine Image (AMI) is available in the AWS marketplace.
Citrix XenServer 6.2	`FMG_VM64_XEN-v5-build07xx-FORTINET.out.CitrixXen.zip`
Linux KVM RedHat 6.5	`FMG_VM64_KVM-v5-build07xx-FORTINET.out.kvm.zip`
Microsoft Hyper-V Server 2008 R2 and 2012	`FMG_VM64_HV-v5-build07xx-FORTINET.out.hyperv.zip`
Open Source XenServer 4.2.5	`FMG_VM64_XEN-v5-build07xx-FORTINET.out.OpenXen.zip`
VMware ESX 4.0 and 4.1 VMware ESXi 4.0, 4.1, 5.0, 5.1, 5.5, and 6.0	ESX/ESXi server: `FMG_VM64-v5-build07xx-FORTINET.out.ovf.zip`

For more information see the FortiManager VM datasheet available on the Fortinet web site, http://www.fortinet.com/products/fortimanager/virtualappliances.html.

Firmware images FTP directories are organized by firmware version, major release, and patch release. The firmware images in the directories follow a specific naming convention and each firmware image is specific to the device model. For example, the `FMG_VM64_HV-v500-build0766-FORTINET.out.hyperv.zip` image, found in the 5.2.X directory, is specific to the 64bit 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 main FortiManager v5.00 directory.

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

To download the firmware package:

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* drop-down 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 you management computer.

Deployment package contents

Citrix XenServer

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

- `fmg.xva`: The Citrix XenServer Virtual Appliance (XVA) binary file containing virtual hardware configuration settings.
- `ovf` folder:
  - `FortiManager.ovf`: Open Virtualization Format (OVF) template file, containing virtual hardware settings for Xen.
  - `fmg.vhd`: The FortiManager VM system hard disk in VHD format.
  - `datadrive.vhd`: The FortiManager VM log disk in VHD format.

Linux KVM

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

- `fmg.qcow2`: TheFortiManager VM system hard disk in QCOW2 format.
  The log disk and virtual hardware settings have to be configured manually.

Microsoft Hyper-V

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

- `fmg.vhd`: The FortiManager VM system hard disk in VHD format.
  The log disk and virtual hardware settings have to be configured manually.

Open Source XenServer

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

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

VMware

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

- `fmg.vmdk`: The FortiManager VM system hard disk in Virtual Machine Disk (VMDK) format.
- `FortiManager-VM64.ovf` : The VMware virtual hardware configuration file.

- `DATADRIVE.vmdk`: The FortiManager VM log disk in VMDK format

Deploying the appliance

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

For assistance in deploying FortiManager VM, refer to the deployment chapter in this guide that corresponds to your hypervisor environment. You may also need to refer to the documentation provided with your VM server. The deployment chapters are presented as examples 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 VM appliance for the first time, you might need to adjust virtual disk sizes and networking settings. With the exception of AWS environments, the first time you start FortiManager VM, 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 VM GUI (see GUI access on page 43).

Citrix XenServer deployment example

Once you have downloaded the `FMG_VM64_XEN-v5xx-build0xxx-FORTINET.out.CitrixXen.zip` file and extracted the files, you can create the virtual machine in your Citrix Xen environment.

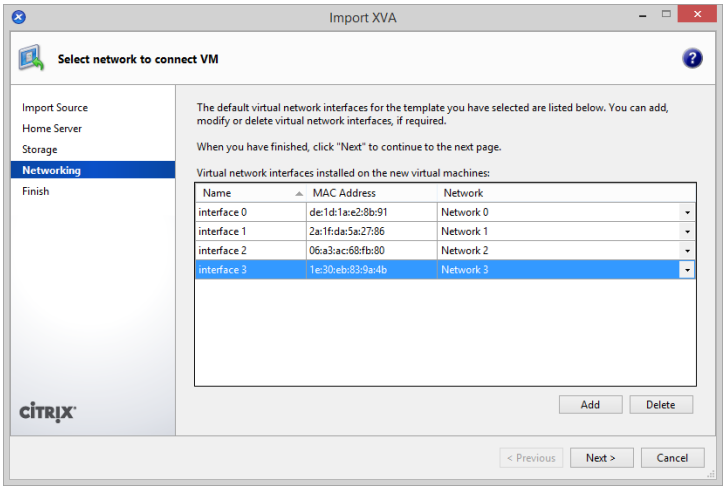
The following topics are included in this section:

- Create the virtual machine
- Configure hardware settings
- Start the virtual machine

Create the virtual machine

To create the virtual machine:

1. Launch XenCenter on your management computer.
   The management computer can be any computer that can run Citrix XenServer, a Microsoft Windows application.
2. Select *ADD a server*, then enter the Citrix XenServer IP address and the root logon credentials required to manage that server.
   Your Citrix XenServer is added to the list in the left pane, and the *Virtual Machine Manager* home page opens.
3. Select *File* > *Import*.
4. Select *Browse*, locate the `fmg.xva` file, select *Open*, then select *Next*.
5. Choose the pool or standalone server that will host the VM, then select *Next*.
6. Select the storage location for the FortiManager VM disk drives, then select *Next*.
7. Configure the virtual network interfaces, then select *Next*. By default, there are four virtual network interfaces.



8. Review the import settings, deselect *Start VM(s) after import*, and then select *Finish* to import the VM.

The Citrix XenServer imports the FortiManager VM files and configures the VM as specified in the template. Depending on your computer's hardware speed and resource load, as well as on the file size and speed of the network connection, this may take several minutes to complete

When the VM import is complete, the XenServer left pane will include the FortiManager VM in the list of deployed VMs for your Citrix XenServer.

Configure hardware settings

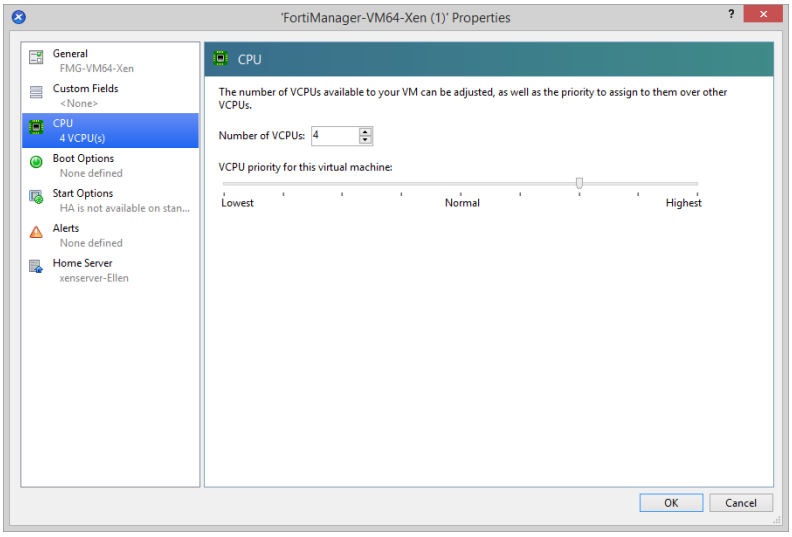
Before starting your FortiManager VM for the first time, you must adjust the VM's virtual hardware settings to meet your network requirements.

To access VM settings, open XenCenter and select the FortiManager VM in the left pane. The tabs in the right pane provide access to the virtual hardware configuration, and the console tab provides access to the FortiManager console.

Disk resizing must be done before you start the VM for the first time.
If you know your environment will expand in the future, it is recommended to add hard disks larger than the 200GB base license requirement. This will allow your environment to be expanded as required while not taking up more space than is needed.

To set the number of CPUs:

1. In the XenCenter left pane, right-click the FortiManager VM and select *Properties*.
2. In the left pane of the *Properties* window, select *CPU*.

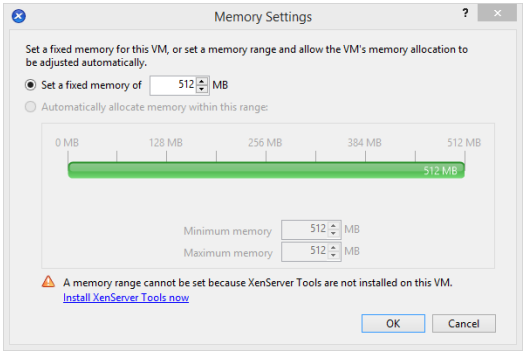


3. Adjust the in the *Number of VCPUs*, then select *OK*.

   XenCenter will display a warning if you select more CPUs than the Xen host computer contains. Such a configuration might reduce performance.

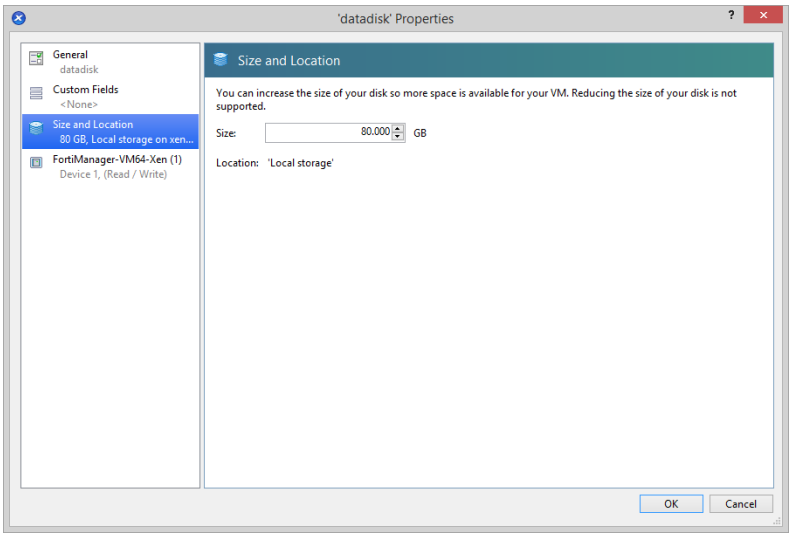
To set the memory size:

1. In the XenCenter left pane, select the FortiManager VM.
2. In the right pane, select the *Memory* tab.
3. Select *Edit*, modify the value in the *Set a fixed memory of* field, then select *OK*.



To resize the data disk:

1. In the XenCenter left pane, select the FortiManager VM.
2. In the right pane, select the *Storage* tab.
3. Select the data disk, then select *Properties* to open the *Properties* window.
4. Select *Size and Location*.



5. Adjust the *Size* to the required value, then select *OK*.

The FortiManager VM allows for 12 virtual log disks to be added 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 ..>
```

Start the virtual machine

You can now proceed to start on your FortiManager VM.

- In the XenCenter left pane, right-click on the name of the FortiManager VM and select *Start*.
- Select the name of the FortiManager VM from the left pane, then select *Start* in the toolbar.

Hyper-V deployment example

Once you have downloaded the `FMG_VM64_HV-v5xx-build0xxx-FORTINET.out.hyperv.zip` file and extracted the package contents to a folder on your Microsoft server, you can deploy the VHD package to your Mircosoft Hyper-V environment.

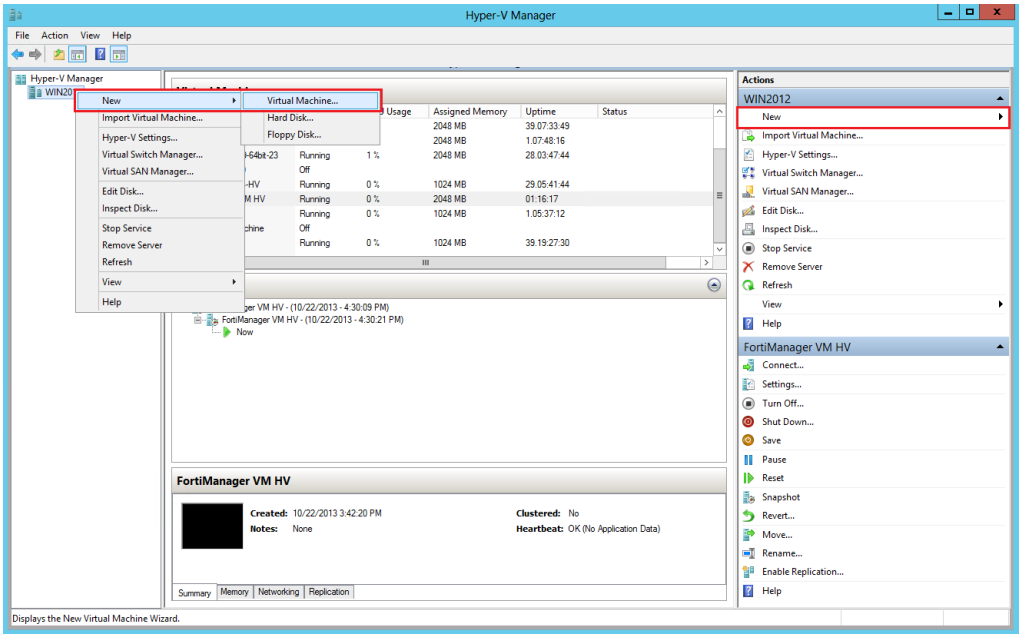
The following topics are included in this section:

- Create the virtual machine
- Configure hardware settings
- Start the virtual machine

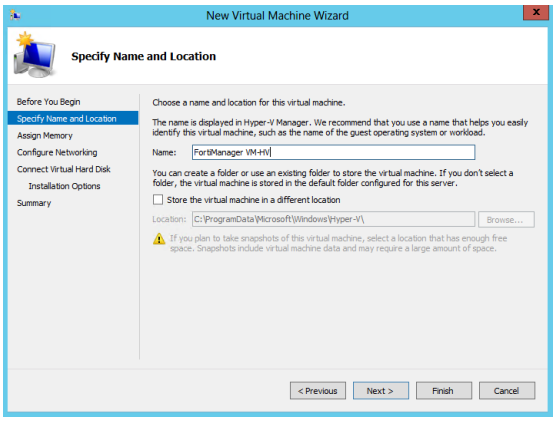
Create the virtual machine

To create the virtual machine:

1. Launch the Hyper-V Manager in your Microsoft server. The *Hyper-V Manager* home page opens.
2. Select the server in the right-tree menu. The server details page opens.

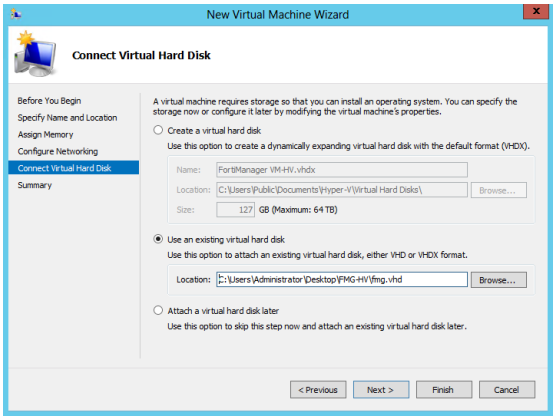


3. Right-click the server and select *New* > *Virtual Machine*, or in the *Actions* menu, select *New* > *Virtual Machine*. The *New Virtual Machine Wizard* opens..
4. Select *Next* to create a virtual machine with a custom configuration. The *Specify Name and Location* page opens.



5. Enter a name for this VM. The name is displayed in the Hyper-V Manager.
6. Select *Next* to continue to the *Assign Memory* page .
7. Specify the amount of memory to allocate to this virtual machine. The default memory for FortiManager VM is 2GB (2048MB).
8. Select *Next* to continue to the *Configure Networking* page.
9. You must configure network adapters in the *Settings* page.

   Each new VM includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected. FortiManager VM requires four network adapters.
10. Select *Next* to continue to the *Connect Virtual Hard Disk* page.

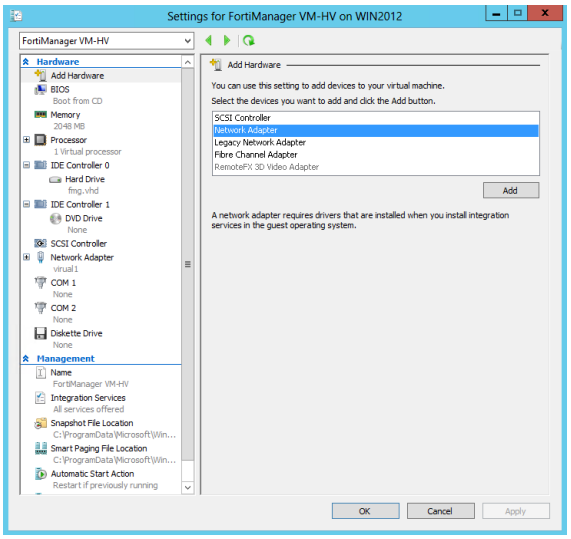


11. Select to use an existing virtual hard disk and browse for the `fmg.vhd` file that you downloaded from the Fortinet Customer Service & Support portal.
12. Select *Next* to continue to the *Summary* page.
13. To create the virtual machine and close the wizard, select *Finish*.

Configure hardware settings

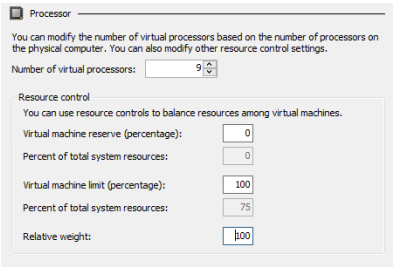
Before powering on your FortiManager VM you must configure the virtual processors, network adapters, and hard disk to match your FortiManager VM license. See Licensing on page 7 for FortiManager VM license information.

To open the *Settings* page, in the Hyper-V Manager, right-click on the name of the virtual machine and select *Settings*, or select the virtual machine then select *Settings* from the *Actions* menu.



To configure virtual processors:

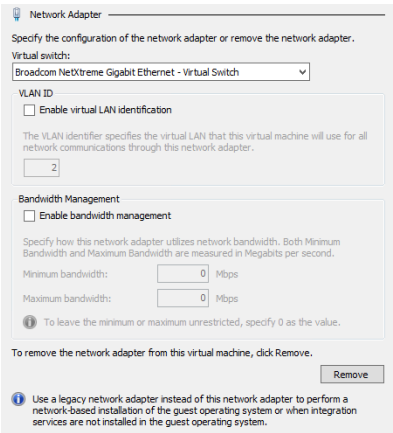
1. In the *Settings* page, select *Processor* from the *Hardware* menu. The *Processor* page is displayed.



2. Configure the number of virtual processors for the VM. Optionally, you can use resource controls to balance resources among VMs.
3. Select *Apply* to save your settings.

To configure network adapters:

1. In the *Settings* page, select *Add Hardware* from the *Hardware* menu.
2. From the device list, select *Network Adapter*, then select *Add*. The *Network Adapter* page opens.



3. Manually configure four network adapters in the settings page. For each network adapter, select a virtual switch from the drop-down list.
4. Select *Apply* to save your settings.

To configure the virtual hard disk:

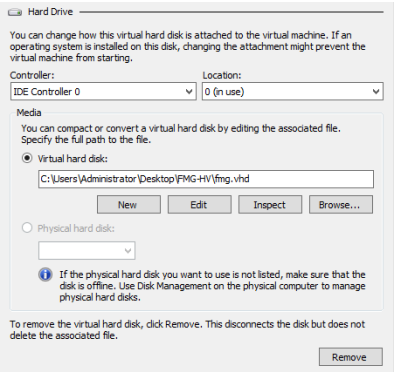
The FortiManager VM requires at least two virtual hard disks. Before powering on the FortiManager VM, you must add at least one more virtual hard disk. The default hard drive, `fmg.vhd`, contains the operating system. The second hard drive is used for logs.

If you know your environment will expand in the future, it is recommended to add hard disks larger than the 200GB base license requirement. This will allow your environment to be expanded as required while not taking up more space in the Storage Area Network (SAN) than is needed.

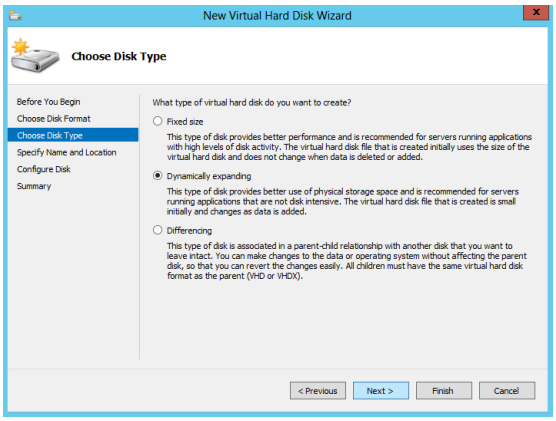
The FortiManager VM allows for 12 virtual log disks to be added to a deployed instance. When adding additional hard disks use the following CLI command to extend the LVM logical volume:

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

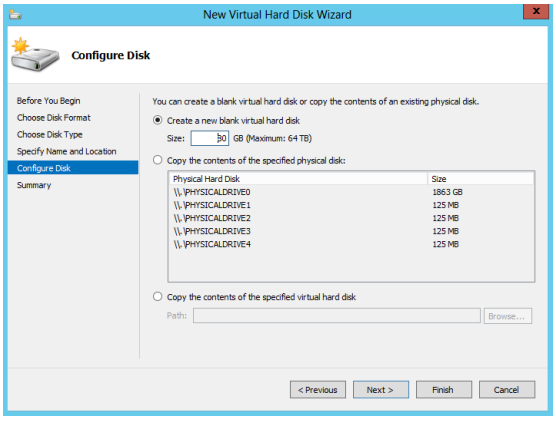
1. In the *Settings* page, select *IDE Controller 0* from the *Hardware* menu.
2. Select the type of drive that you want to attach to the controller, then select *Add*. The *Hard Drive* page opens.



3. Select *New* to create a new virtual hard disk. The *New Virtual Hard Disk Wizard* opens to help you create a new virtual hard disk.
4. Select *Next* to continue to the *Choose Disk Format* page.
5. Select to use VHDX format virtual hard disks. This format supports virtual disks up to 64TB and is resilient to consistency issues that might occur from power failures. This format is not supported in operating systems earlier that Windows Server 2012.
6. Select *Next* to continue to the *Choose Disk Type* page.



7. Select the type of virtual disk you want to use, one of the following:
   - *Fixed Size*: This type of disk provides better performance and is recommended for servers running applications with high levels of disk activity. The virtual hard disk file that is created initially uses the size of the virtual hard disk and does not change when data is deleted or added.
   - *Dynamically Expanding*: This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The virtual disk file that is created is small initially and changes as data is added.
   - *Differencing*: This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to the data or operating system without affecting the parent disk, so that you can revert the changes easily. All children must have the same virtual hard disk format as the parent (VHD or VHDX).
8. Select *Next* to continue to the *Specify Name and Location* page.
9. Specify the name and location of the virtual hard disk file. Use the *Browse* button to select a specific file folder on your server.
10. Select *Next* to continue to the *Configure Disk* page.



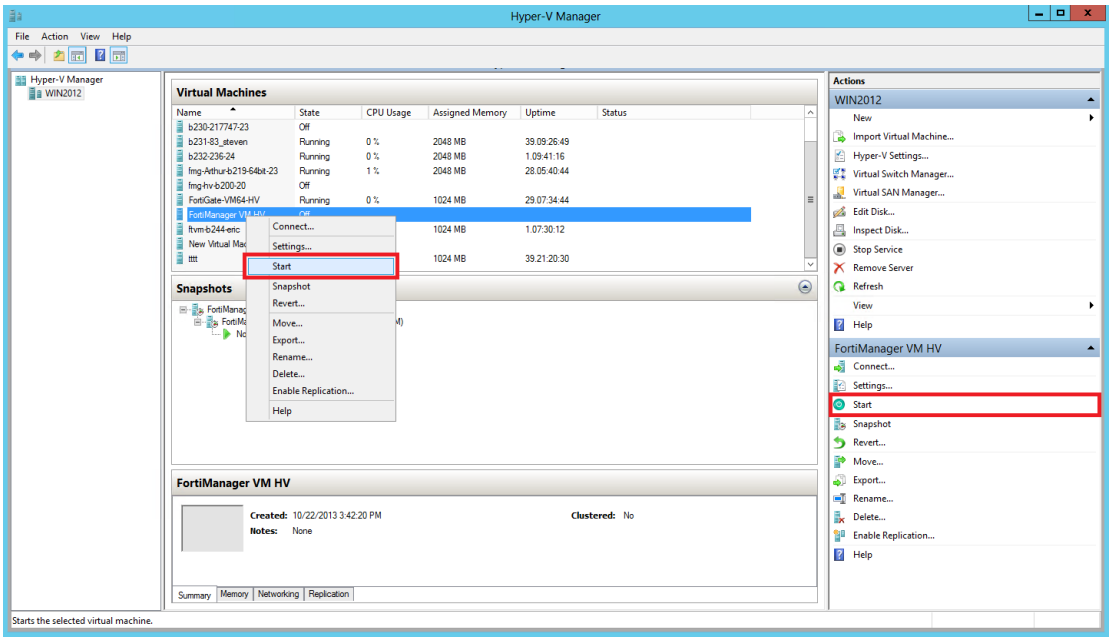
11. Select *Create a new blank virtual hard disk*, then enter the size of the disk in GB. The maximum size is dependent on your server environment.
12. Select *Next* to continue to the *Summary* page.

    The summary page provides details about the virtual hard disk.
13. Select *Finish* to create the virtual hard disk, then select *Apply* to save the settings, and then select *OK* to exit the settings page.

Start the virtual machine

You can now proceed to power on your FortiManager VM.

- In the list of virtual machines, right-click on the name of the FortiManager VM and select *Start*.
- Select the name of the FortiManager VM from the list of virtual machines, then select *Start* from the *Actions* menu.



KVM deployment example

Once you have downloaded the `FMG_VM64_KVM-v5xx-build0xxx-FORTINET.out.kvm.zip` file and extracted the virtual hard drive image file, you can create the virtual machine in your KVM environment.

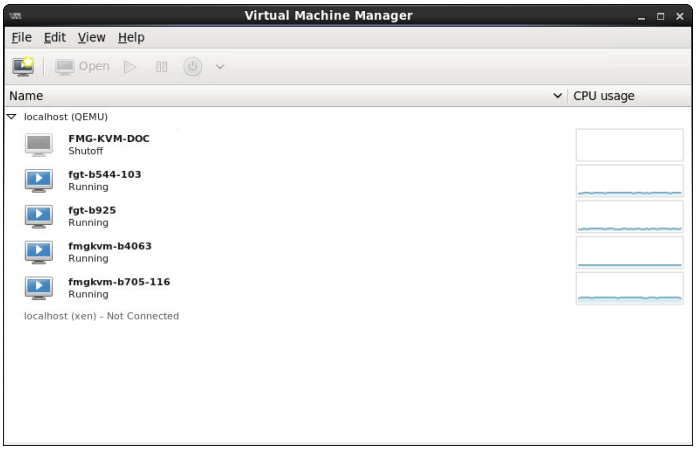
The following topics are included in this section:

- Create the virtual machine
- Configure hardware settings
- Start the virtual machine

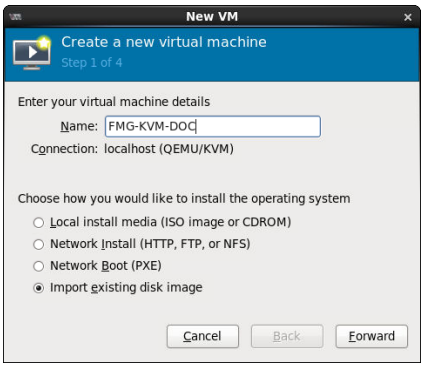
Create the virtual machine

To create the virtual machine:

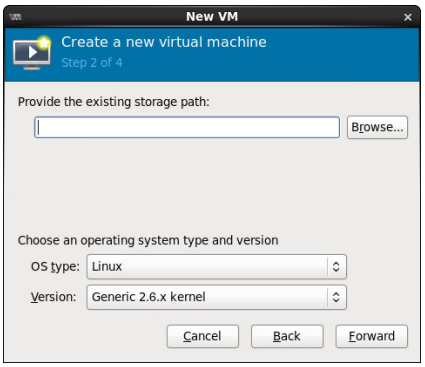
1. Launch Virtual Machine Manager (virt-manager) on you KVM host server. The *Virtual Machine Manager* home page opens.



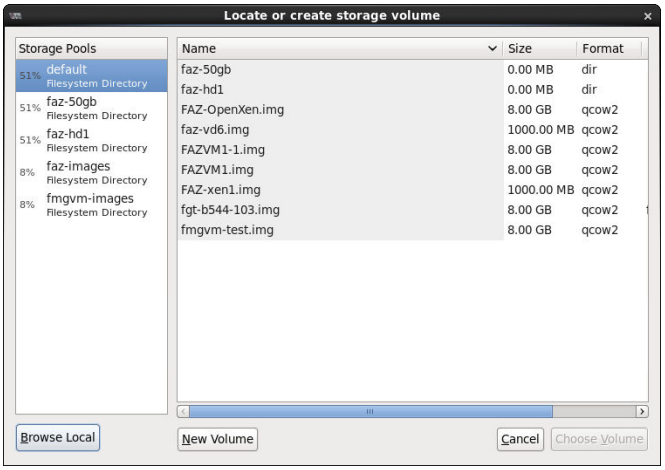
2. Select *Create a new virtual machine* from the toolbar..



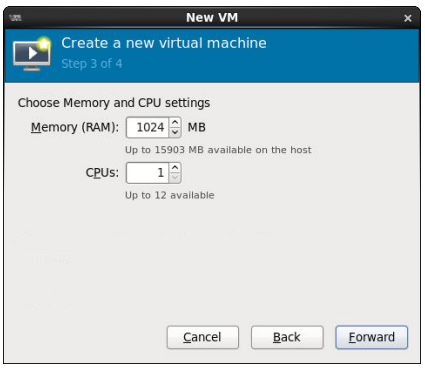
3. Enter a name for the virtual machine, such as *FMG-KVM-DOC*.
4. Ensure that *Connection* is *localhost*, select *Import existing disk image*, then select *Forward* to continue.



5. In the *OS Type* field select *Linux*.
6. In the *Version* field select *Generic 2.6.x kernel*. You may have to first select *Show all OS options*.
7. Select *Browse* to locate the storage volume.



8. If you copied the *fmg.qcow2* file to `/var/lib/libvirt/images` it will be shown on the right. If you saved it elsewhere on the server, select *Browse Local* to find it.
9. Once the file has been located, select *Choose Volume*, then select *Forward*.



10. Specify the amount of memory and the number of CPUs to allocated to this VM, then select *Forward*.
11. Expand the *Advanced options* section. By default, a new virtual machine includes one network adapter. Select a network adapter on the host computer.

    Optionally, set a specific MAC address for the virtual network interface.
12. Set *Virt Type* to *virtio* and set *Architecture* to *qcow2*.

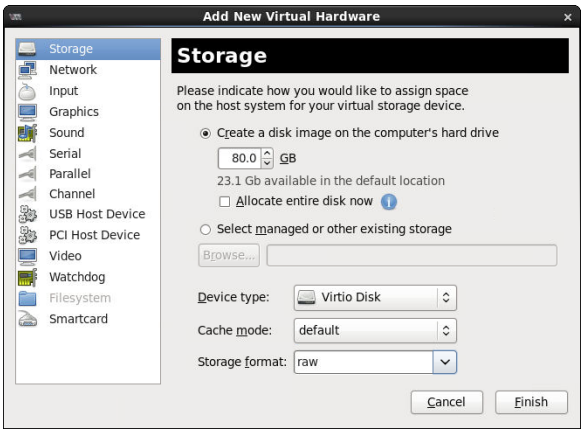
13. Select *Finish* to create the VM.

Configure 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 name of the VM, then select *Open* from toolbar.
2. In the Virtual Machine window, select *Show virtual hardware details*.
3. Select *Add Hardware* to open the *Add Hardware* window
4. Select *Storage*.



5. Select *Create a disk image on the computer's harddrive*, and set the size to 80GB.

If you know your environment will expand in the future, it is recommended to add hard disks larger than 80GB. This will allow your environment to be expanded as required while not taking up more space than is needed.

The FortiManager VM allows for 12 virtual log disks to be added 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	Default
Storage format	raw

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

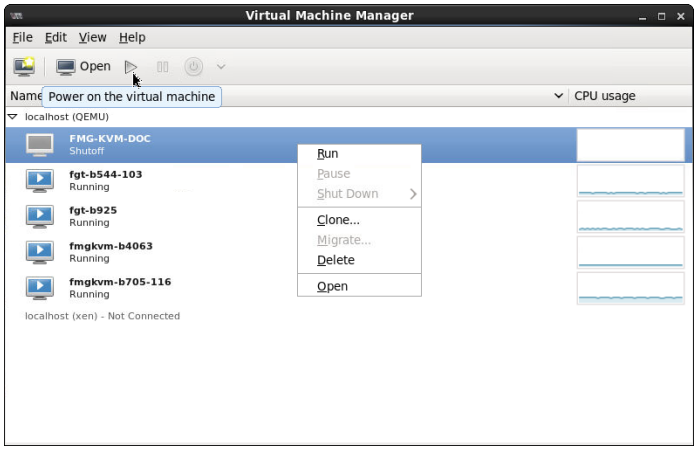
A new VM includes one network adapter by default. More can be added through the Add Hardware window. FortiManager VM supports up to four network adapters. You can configure network adapters to connect to a virtual switch or to network adapters on the host computer.

8. Select *Finish*.

Start the virtual machine

You can now proceed to power on your FortiManager VM.

- Right-click on the FortiManager VM and select Run, or
- Select the FortiManager VM from the list of VMs, then select *Power on the virtual machine* from the toolbar.



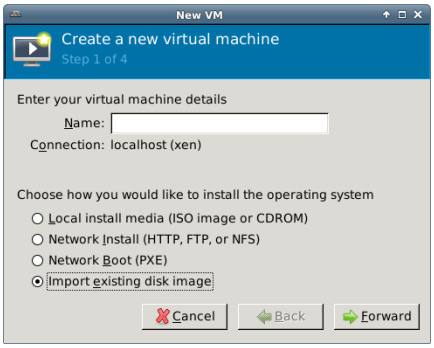
Open Xen deployment example

Once you have downloaded the `FMG_VM64_XEN-v5xx-build0xxx-FORTINET.out.OpenXen.zip` file and extracted the *fmg.qcow2*, you can create the virtual machine in your Open Xen environment.

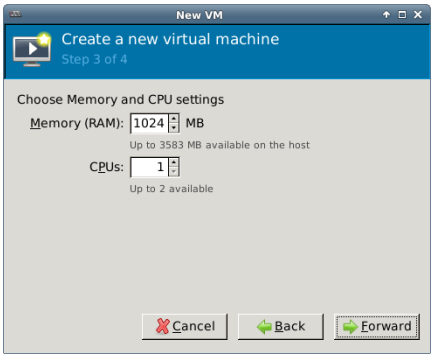
Create and configure the virtual machine

To deploy and configure the virtual machine:

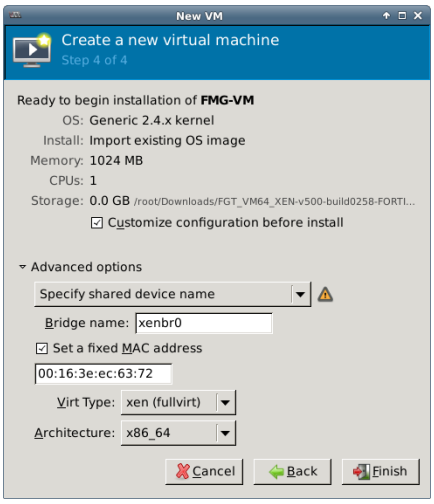
1. Launch Virtual Machine Manager (virt-manager) on you Open Xen host server. The *Virtual Machine Manager* home page opens.
2. Select *Create a new virtual machine* from the toolbar..



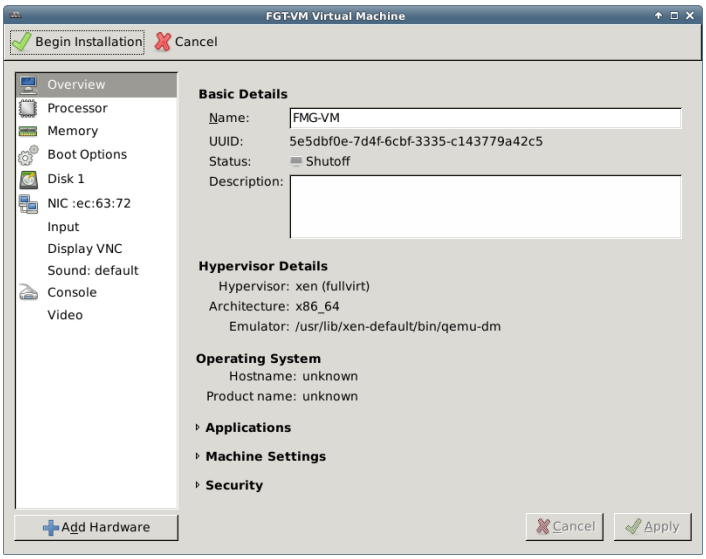
3. Enter a name for the VM, such as *FMG-VM*.
4. Ensure that *Connection* is *localhost*, select *Import existing disk image*, then select *Forward* to continue.
5. In the *OS Type* field select *Linux*. In the *Version* field select *Generic 2.6.x kernel*.
6. Select *Browse* to open the *Locate or create storage volume* window.
7. Select *Browse Local*, find the fmg.qcow2 disk image file, then select *Choose Volume* and then *Forward*.



8. Specify the amount of memory and the number of CPUs to allocated to this VM.
9. Select *Forward*.



10. Select *Customize configuration before install*. This enables you to make hardware configuration changes before the VM creation is started.
11. Expand the *Advanced options* section.
    - By default, a new virtual machine includes one network adapter.
    - Select *Specify shared device name*, and enter the name of the bridge interface on the Open Xen host.
    - Optionally, set a fixed MAC address for the virtual network interface.
    - *Virt Type* and *Architecture* are set by default and should not need to be changed.
12. Select *Finish*. The virtual machine hardware configuration window opens. It can be used to add hardware such as network interfaces and disk drives.



13. Select *Add Hardware* to open the *Add Hardware* window, then select *Storage*.
14. Select *Create a disk image on the computer's harddrive*, and set the size to 80GB.

If you know your environment will expand in the future, it is recommended to add hard disks larger than 80GB. This will allow your environment to be expanded as required while not taking up more space than is needed.

The FortiManager VM allows for 12 virtual log disks to be added 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 ..>
```

15. Select *Network* to add more network interfaces.

    A new VM includes one network adapter by default. More can be added through the *Add Hardware* window. FortiManager VM required four network adapters. You can configure network adapters to connect to a virtual switch or to network adapters on the host computer.

16. Select *Finish*.
17. Select *Begin Installation*.

    After the installation completes successfully, the VM will start and the console window will open.

VMware deployment example

The FortiManager VM can be deployed and configured using VMware vSphere Hypervisor™ (ESX/ESXi) and VMware vSphere Client™.

VMware vSphere

Once you have downloaded the `FMG_VM64-v5xx-build0xxx-FORTINET.out.ovf.zip` file and extracted the package contents to a folder on your management computer, you can deploy the OVF package to your VMware environment.

Prior to deploying the FortiManager VM, ensure that the following are configured and functioning properly:

- VMware vSphere Hypervisor™ (ESX/ESXi) software must be installed on a server prior to installing FortiManager VM. Go to http://www.vmware.com/products/vsphere-hypervisor/index.html for installation details.
- VMware vSphere Client™ must be installed on the computer that you will be using for managing the FortiManager VM.

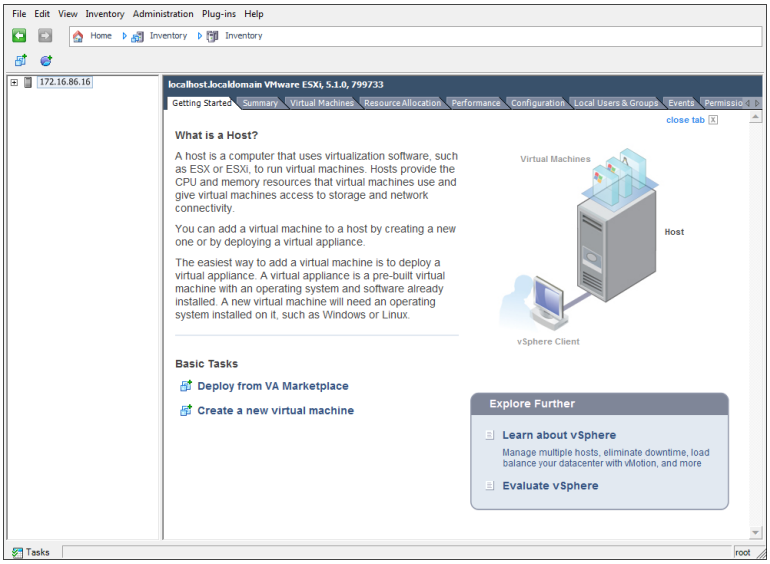
The following topics are included in this section:

- Deploy the OVF file
- Configure hardware settings
- Power on the virtual machine

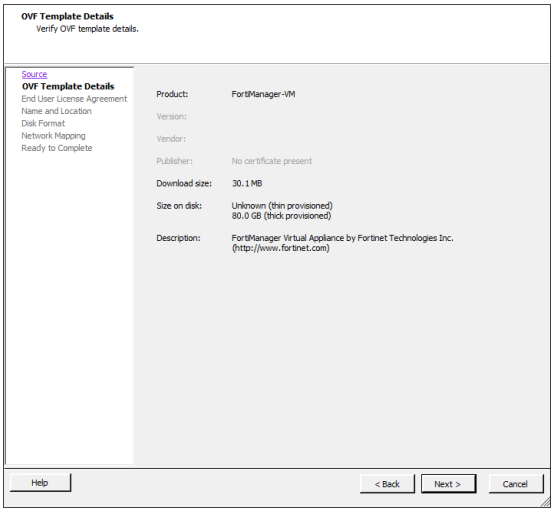
Deploy the OVF file

To deploy the OVF file template:

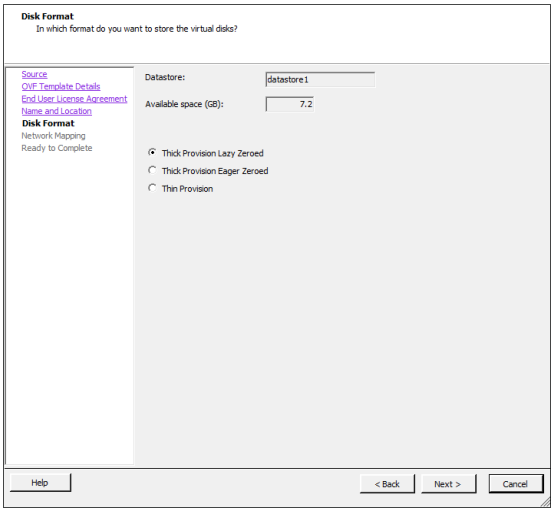
1. Launch the VMware vSphere client, enter the IP address or host name of your server, enter your user name and password, then select *Login*. The vSphere client home page opens.



2. Select *File* > *Deploy OVF Template* to launch the OVF Template wizard. The OVF Template *Source* page opens.
3. Select *Browse*, locate the OVF file on your computer, then select *Next* to continue. The OVF Template *Details* page opens.



4. Verify the OVF template details. This page details the product name, download size, size on disk, and description. Select *Next* to continue. The OVF Template *End User License Agreement* page opens.
5. Read the end user license agreement, then select *Accept* then *Next* to continue. The OVF Template *Name and Location* page opens.
6. Enter a name for this OVF template. The name can contain up to 80 characters and it must be unique within the inventory folder. Select *Next* to continue. The OVF Template *Disk Format* page opens.

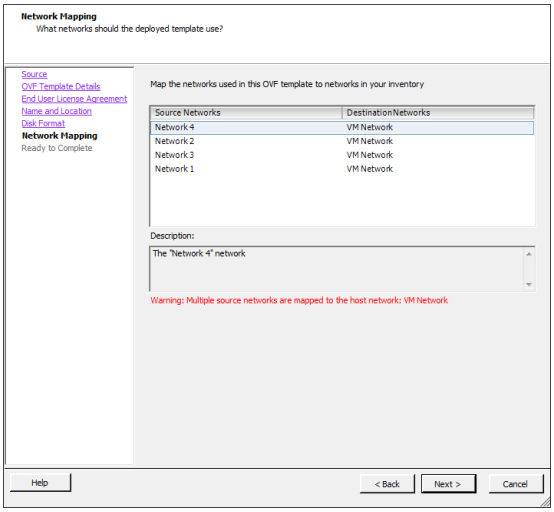


7. Select one of the following:
   - *Thick Provision Lazy Zeroed*: Allocates the disk space statically (no other volumes can take the space), but does not write zeros to the blocks until the first write takes place to that block during runtime (which includes a full disk format).
   - *Thick Provision Eager Zeroed*: Allocates the disk space statically (no other volumes can take the space), and writes zeros to all the blocks.
   - *Thin Provision*: Allocates the disk space only when a write occurs to a block, but the total volume size is reported by the Virtual Machine File System (VMFS) to the OS. Other volumes can take the remaining space.

This allows you to float space between your servers, and expand your storage when your size monitoring indicates there is a problem. Note that once a Thin Provisioned block is allocated, it remains in the volume regardless of if you have deleted data, etc.

If you know your environment will expand in the future, it is recommended to add hard disks larger than the 200GB FortiManager VM base license requirement and utilize Thin Provision when setting the OVF Template disk format. This will allow your environment to be expanded as required while not taking up more space in the SAN than is needed.

8. Select *Next* to continue. The OVF Template *Network Mapping* page opens.



9. Map the networks used in this OVF template to networks in your inventory. Network 1 maps to port1 of the FortiManager VM. You must set the destination network for this entry to access the device console. Select *Next* to continue. The OVF Template *Ready to Complete* page opens.
10. Review the template configuration.

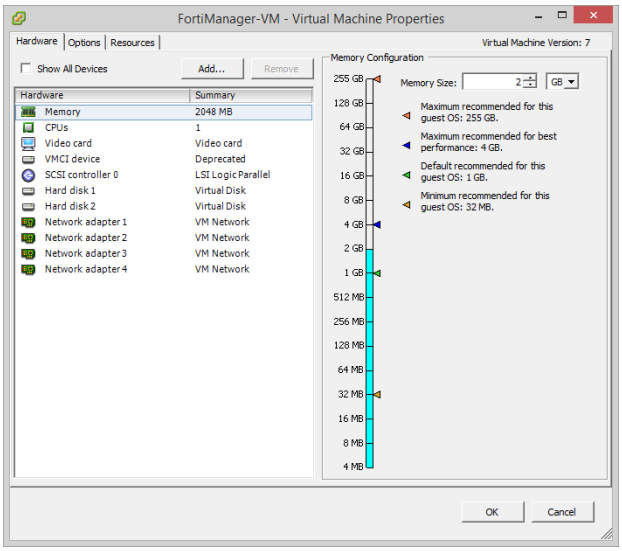
    Ensure that *Power on after deployment* is not enabled. You might need to configure the FortiManager VM hardware settings prior to powering on the VM.
11. Select *Finish* to deploy the OVF template. You will receive a *Deployment Completed Successfully* dialog box once the FortiManager VM OVF template wizard has finished.

Configure hardware settings

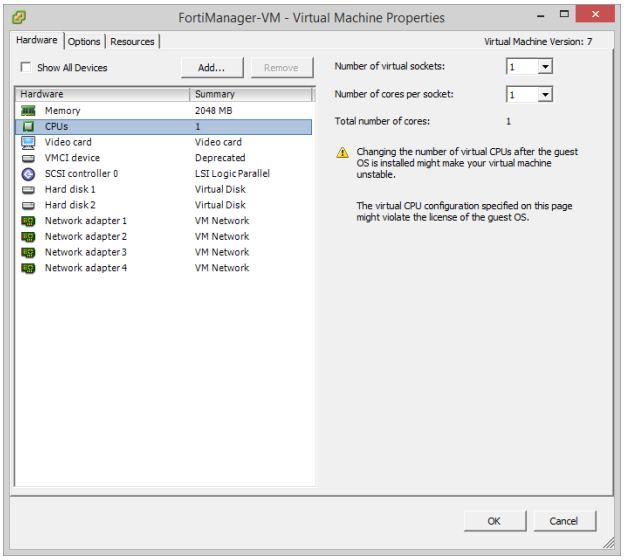
Before powering on your FortiManager VM you must configure the virtual memory, virtual CPU, and virtual disk.

To configure the VM:

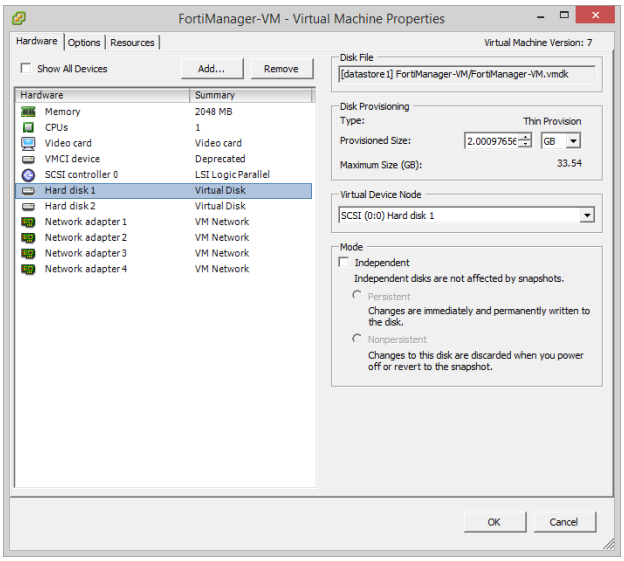
1. In the vSphere Client, right-click on the FortiManager VM in the left pane and select Edit Settings to open the *Virtual Machine Properties* window.
2. Select *Memory* from the *Hardware* list, then adjust the *Memory Size* as required.



3. Select *CPUs* from the *Hardware* list, then adjust the *Number of virtual sockets* and *Number of cores per socket* as required.



4. Select *Hard disk 2*, the log disk, from the *Hardware* list, and configure it as required. *Hard disk 1* should not be edited.



The FortiManager VM allows for 12 virtual log disks to be added 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 ..>
```

5. Select *OK* to apply your changes.

Power on the virtual machine

You can now proceed to power on your FortiManager VM.

- Select the FortiManager VM in the left pane and select *Power on the virtual machine* in the *Getting Started* tab.
- Select the VM in the left pane, then select *Power On* in the toolbar.
- Right-click the VM in the left pane, then select *Power* > *Power On* from the right-click menu.

AWS deployment example

FortiManager VM can be deployed on the AWS Elastic Compute Cloud (EC2). Prior to deploying the VM, the following are required:

- Amazon EC2 account

The FortiManager VM can be deployed using either the AWS Marketplace *1-Click Launch* option, or directly from the EC2 console.

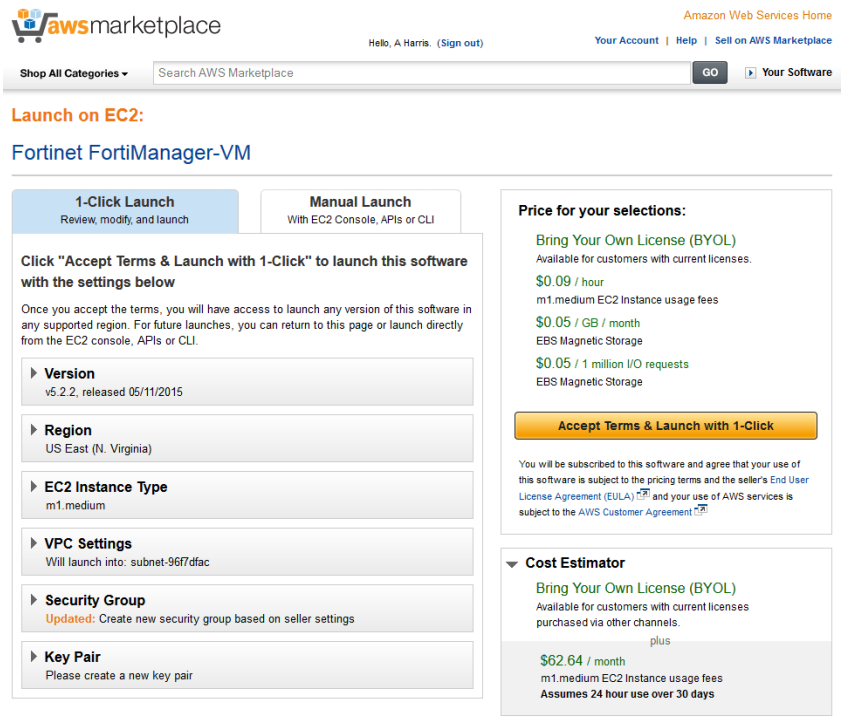
This chapter includes the following sections:

AWS Marketplace 1-Click Launch

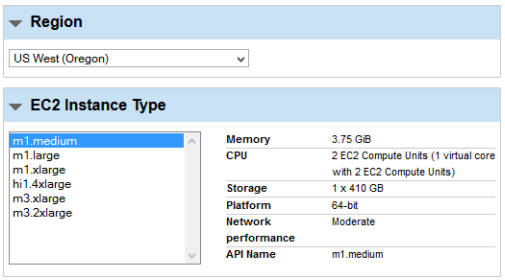
This section shows the steps for deploying the FortiManager VM from the AWS Marketplace using the *1-Click Launch* option.

To deploy the VM from the AWS Marketplace:

1. Log in to AWS.
2. From the AWS Marketplace, find the Fortinet FortiManager-VM page by searching with the key word *Fortinet*, or by selecting *Security* in the left pane.
3. On the FortiManager VM page, select *Continue*.

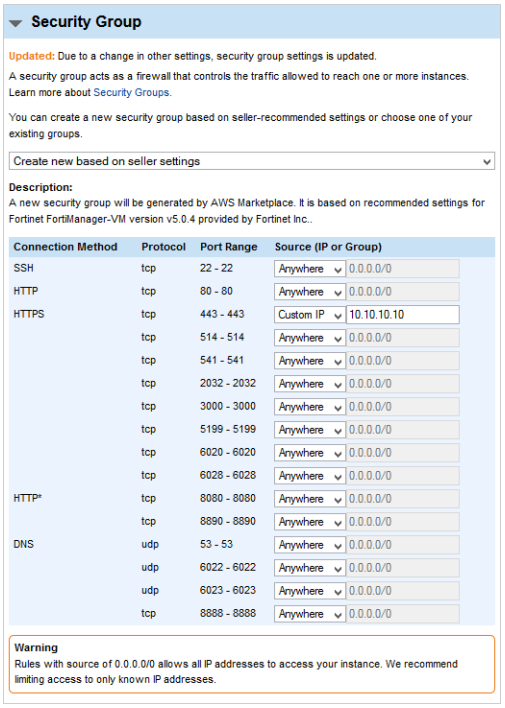


4. Select a region and the instance type. Ensure that the instance type fits the size of your deployment and potential future growth.

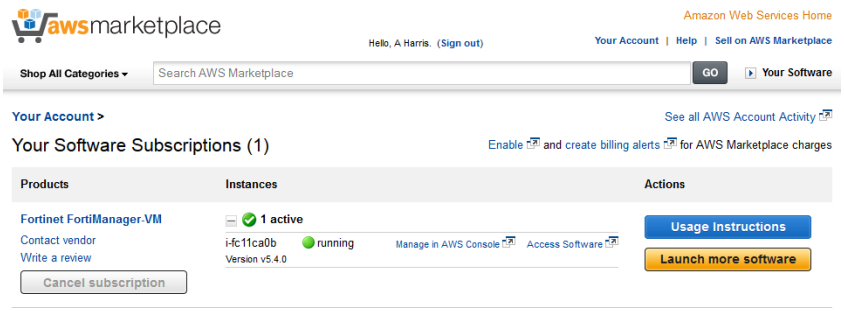


5. Under *Security Group*, ensure that *Create new based on seller settings* is selected from the drop-down list

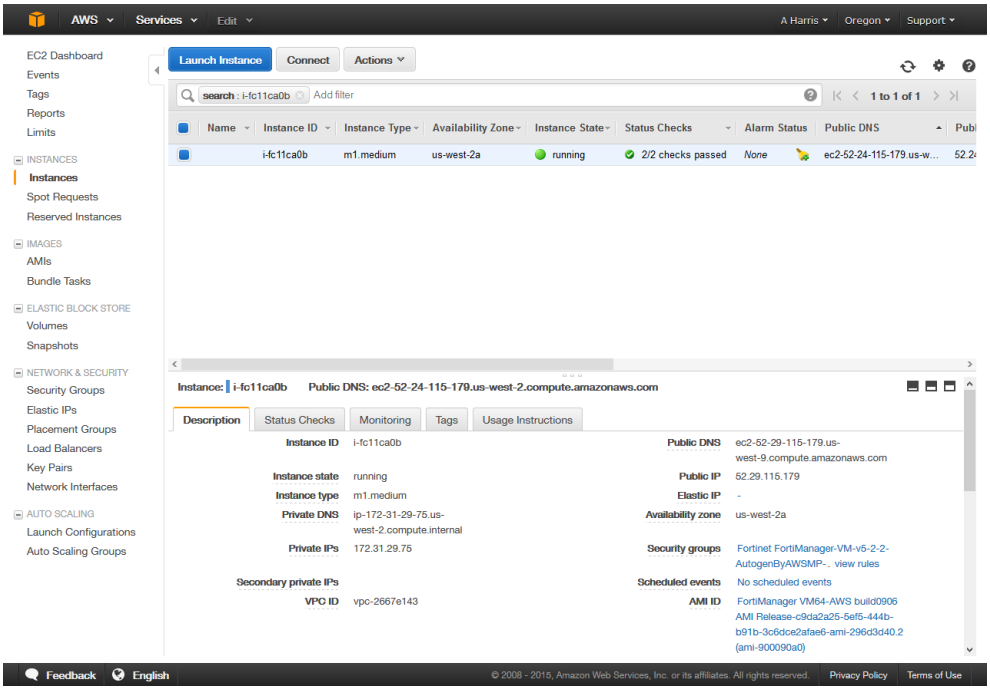
   The only open port that is required for the initial configuration of the VM is port 443, which will allow for an HTTPS connections to the GUI. The remaining ports can also be opened to allow for all potential FortiManager communication.



6. Use the instructions provided under *Key Pair* to create a new key pair, or use an existing key pair if it is secure.
7. Select *Accept Terms & Launch with 1-Click* to deploy the instance and view the summary page.
8. Close the summary page, then, from the software subscriptions page, select *Manage in AWS Console* to view the VM instance and the public DNS address.



The public DNS address is used to connect to and configure the FortiManager VM via the GUI.



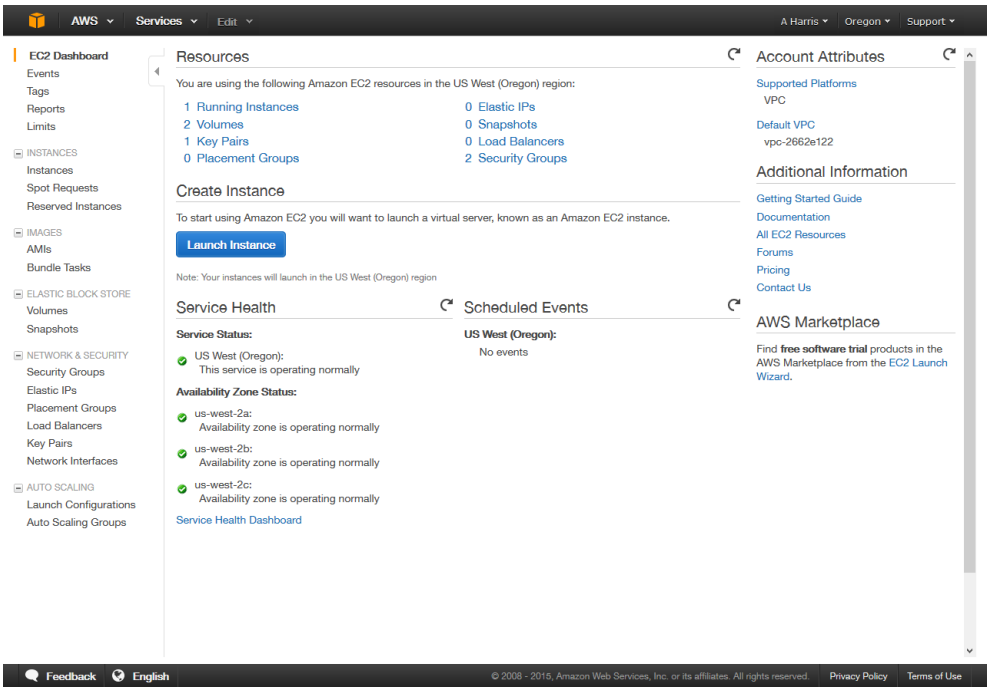
9. To connect to the FortiManager VM GUI, open a web browser and use the public DNS address as the URL:
   `https://<public DNS address>`
10. Log in with default username `admin` and the instance ID as the password to configure your FortiManager VM.

AWS EC2 console

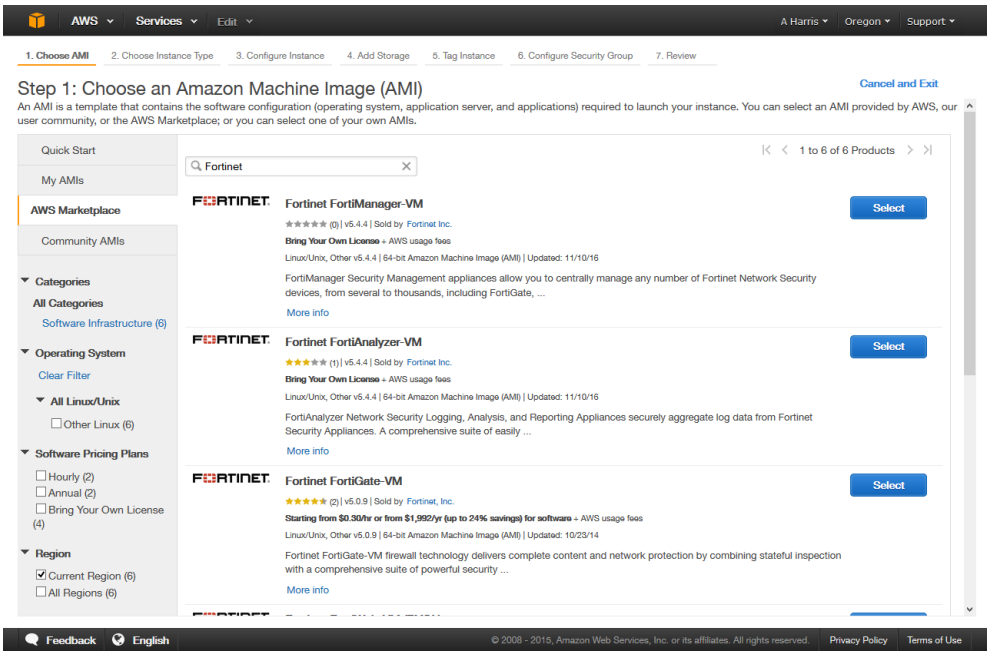
This section shows the steps for deploying the FortiManager VM directly from the EC2 console.

To deploy the VM from the EC2 console:

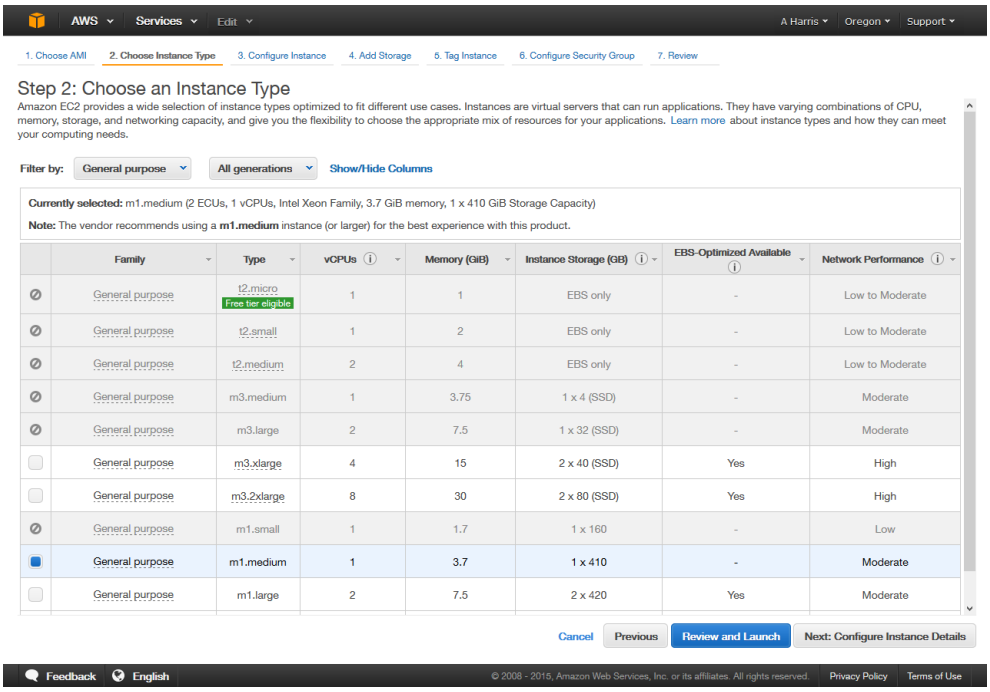
1. Log in to AWS and go to your EC2 dashboard.



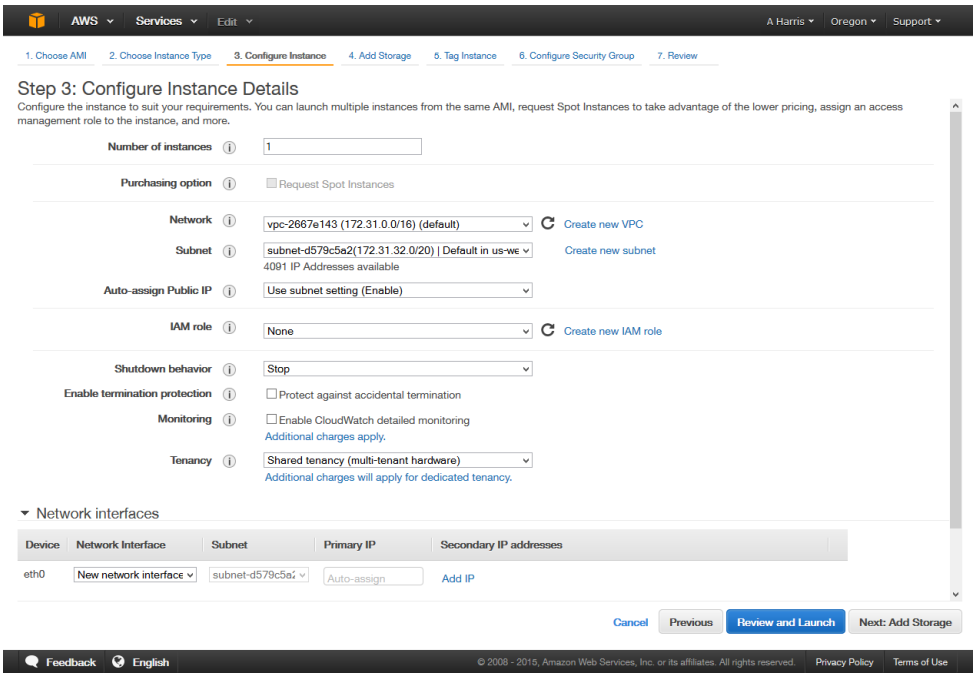
2. Select *Launch Instance* to choose an Amazon Machine Image (AMI).
Select the *AWS Marketplace* category, then search for *Fortinet*.



3. *Select* the FortiManager VM, and then choose the instance type that matches your license.

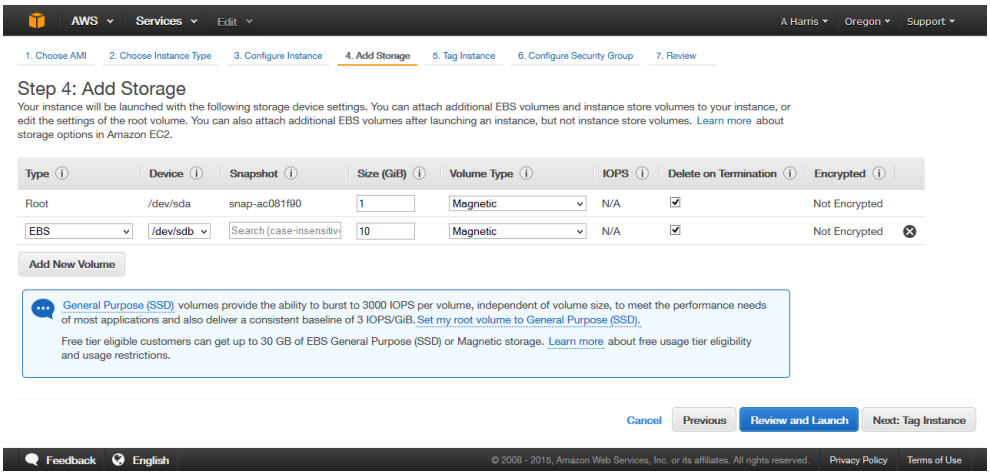


4. Select *Next: Configure Instance Details* to configure the instance details, including the public subnet and network interfaces.

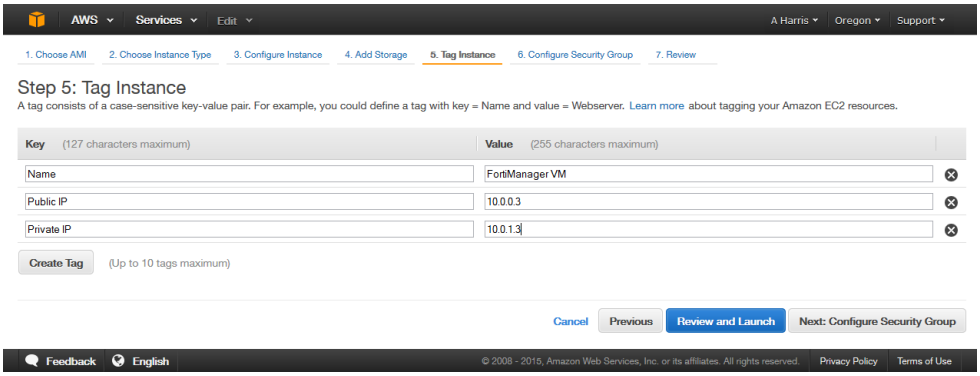


A network interface must be manually created so that you can upload your license file. Up to two interfaces can be attached to the instance.

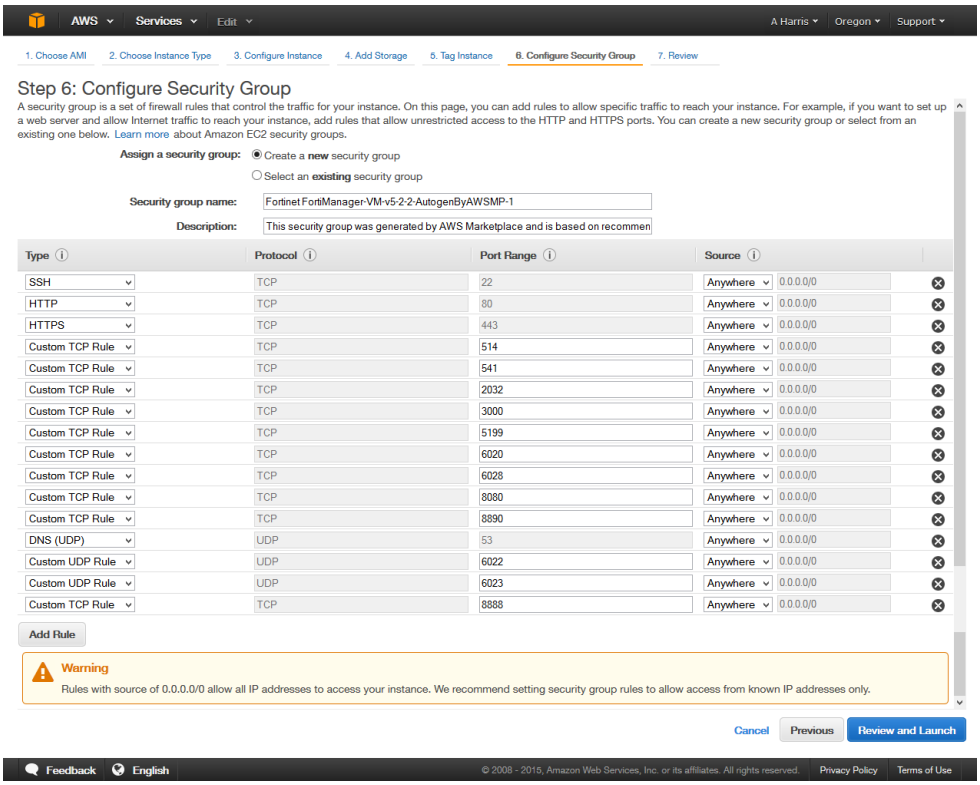
5. Select *Next: Add Storage* to configure the instance's storage based on your requirements.



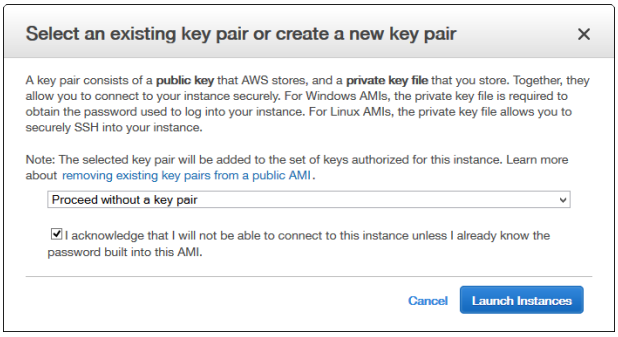
6. Select *Next: Tag Instance* to create a tag. A tag consists of a key-value pair. It is useful to create tags to quickly reference instance items in your deployment. Up to 10 tags can be added.



7. Select *Next: Configure Security Group*, then either create a new security group, or select an existing security group. The default provided security group is based on recommended settings the FortiManager VM.



8. Select *Review and Launch*. If necessary, decide which boot volume to boot the instance from.
9. Review the instance, including the AMI details, instance type, security groups, instance details, storage, and tags. Edit the configuration as needed.
10. Select *Launch*, select *Proceed without a key pair* from the drop-down list, then select the checkbox acknowledging that you already have the username and password for the AMI.



11. Select *Launch Instances* to launch the new FortiManager VM instance.
12. To connect to the FortiManager VM GUI, open a web browser and use the public DNS address as the URL:

    `https://<public DNS address>`
13. Log in with default username `admin` and the instance ID as the password to configure your FortiManager VM.

Initial Configuration

Before you can connect to the FortiManager VM you must configure basic configuration via the CLI console. Once configured, you can connect to the FortiManager VM GUI and upload the FortiManager VM license file that you downloaded from the Customer Service & Support portal.

The following topics are included in this section:

- GUI access
- Upload the license file
- Configure your FortiManager VM

GUI access

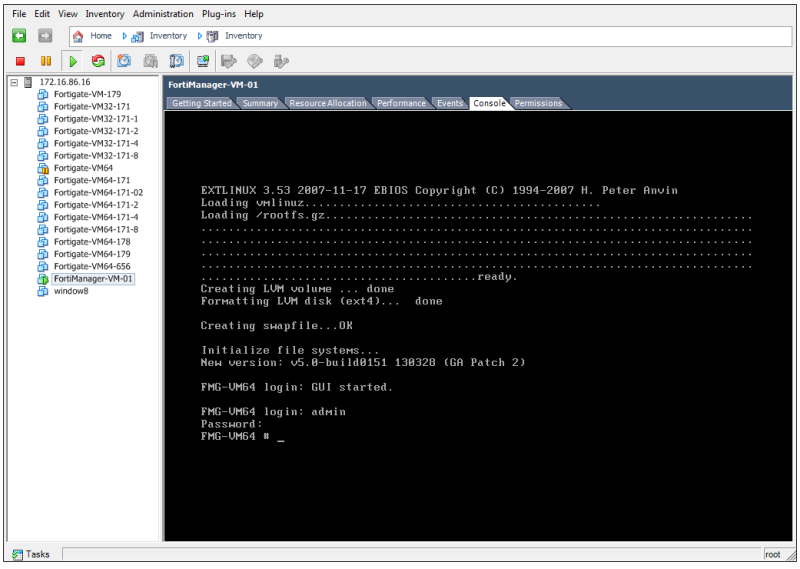
FortiManager VM AWS instances do not require any special configuration to enable GUI access. The GUI can be accessed with the public DNS

Enable GUI access

To enable GUI access to the FortiManager VM you must configure the port1 IP address and network mask of the FortiManager VM.

To configure the port1 IP address and netmask:

1. In your hypervisor manager, start the FortiManager VM and access the console window. You might need to press *Enter* to see the login prompt.



2. At the FortiManager VM 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.

   For example:

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

You can also use the *append allowaccess* command to enable other access protocols, such as *auto-ipsec* and *snmp*. The *ping*, *https*, *ssh*, and *fgfm* protocols are enabled by default.
For more information, see the *FortiManager CLI Reference* in the Fortinet Document Library.

The port management interface should match the first network adapter and virtual switch that you have configured in the hypervisor virtual machine 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 VM license validation. You must specify an IPv4 address in both the support portal and the port management interface.

Connect to the GUI

Once you have configured the port1 IP address and network mask, launch a web browser and enter the IP address you configured for the port management interface. At the login page, enter the user name `admin` and no password, then select *Login*.

The GUI will open with an *Evaluation License* dialog box.

Upload the license file

FortiManager VM includes a free, full featured 15 day trial.

Before using the FortiManager VM you must enter the license file that you downloaded from the Customer Service & Support portal upon registration.

To upload the license via the CLI:

1. Open the license file in a text editor and copy the VM license string.
2. In a FortiManager VM console window, enter the following:

```
execute add-vm-license <vm license string>
```

To upload the license file via the GUI:

1. In the *Evaluation License* dialog box, select *Enter License*.
   Optionally, you can also select *Upload License* in the *License Information* dashboard widget.
2. In the license upload page, select *Browse*, locate the VM license file (`.lic`) on your computer, then select *OK* to upload the license file.
   A reboot message will be shown, then the FortiManager VM system will reboot and load the license file.
3. Refresh your browser and log back into the FortiManager VM with username *admin* and no password.
   The VM registration status appears as valid in the *License Information* widget once the license has been validated.

As a part of the license validation process FortiManager VM compares its IP address with the IP information in the license file. If a new license has been imported or the FortiManager's IP address has been changed, the FortiManager VM must be rebooted in order for the system to validate the change and operate with a valid license.

If the IP address in the license file and the IP address configured in the FortiManager VM do not match, you will receive an error message when you log back into the VM.

If this occurs, you will need to change the IP address in the Customer Service & Support portal to match the management IP and re-download the license file. To change the management IP address, see To edit the FortiManager VM IP address: on page 10

After an invalid license file has been loaded onto the FortiManager VM, the GUI will be locked until a valid license file is uploaded. A new license file can be uploaded via the CLI.

Configure your FortiManager VM

Once the FortiManager VM license has been validated, you can configure your device. For more information on configuring your FortiManager VM, see the *FortiManager Administration Guide* available in the Fortinet Document Library.

Index