

MiVoice MX-ONE

# Service Node Virtual Appliance - Installation Instructions

Release 7.2

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# General

This document describes the usage of the MX-ONE Service Node (SN) packed as a Virtual Appliance for VMware vSphere/ESXi.

If an existing MiVoice MX-ONE system has used Turnkey Solution installation (with hardware), and shall be changed into a Virtual Appliance installation, that has to be done as a new installation with Virtual Appliance.

## Glossary and Acronyms

For a complete list of abbreviations and glossary, see the description for ACRONYMS, ABBREVIATIONS AND GLOSSARY.

# Prerequisites

- The vSphere Client installed on a workstation.
- VMware ESXi 5.5 host (minimum version 5.5) or a vCenter solution, recommended version is VMware ESXi 6.5.
- The MX-ONE Service Node Virtual Appliance file.
- Good knowledge of VMware vSphere.
- Good knowledge of SLES12 and MX-ONE installation.
- Read the *MiVoice MX-ONE SYSTEM PLANNING description*, and the description *VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later*.

**NOTE:** For database (Cassandra) server VMs, co-located or stand-alone, SSD disks are required.

# Execution

The procedure involves the following 3 major tasks:

1. Importing the Virtual Appliance to:
  - a single ESXi host, or
  - a vCenter cluster
2. Post-configuring a newly imported MX-ONE virtual machine
3. Installing and Configuring MX-ONE

# Importing the Virtual Appliance

This section describes how to install the MX-ONE Service Node Virtual Appliance on a virtual machine.

## Importing on a Single ESXi Host (From ESXi 6.5)

This section describes how to install the MX-ONE Service Node Virtual Appliance on a single VMware ESXi host through the VMware host client. This scenario applies to the free version of ESXi.

1. Log in directly to the ESXi host through the VMware Host Client (via Web browser enter the IP address/FQDN of the ESXi host).
2. Click Host and from the main menu, select Create/Register VM. A wizard opens that will assist in the deployment process. In the first step, select the Creation Type and select Deploy a virtual machine from an OVF or OVA file.
3. On the next page, specify a name for the virtual machine and select the OVF and VMDK files or the OVA for the VM you want to deploy.
4. Select a data store for the virtual machine. It could be either local or centralized (SAN).
5. Map the networks used in this OVF to networks in your inventory, select disk format for the virtual disks. Thick provisioning allocates all space at once, thin allocates on demand. Thick gives a slight performance gain and eliminates the risk of over-shooting actual storage space.
6. You will get a summary page to review your settings selection before you exit the wizard and proceed to start the deployment.
7. Click Finish to start the deployment task.

## Importing on a Single ESXi host (From ESXi 6.0 Or Earlier)

This section describes how to install the MX-ONE Service Node Virtual Appliance on a single VMware ESXi host through the vSphere client. This scenario applies to the free version of ESXi.

1. Log in directly to the ESXi host through the vSphere client.
2. From the File menu, select Deploy OVF Template....
3. A wizard opens that will assist you with deployment process. In the first, select the Virtual Appliance file. Next page shows some information about the Virtual Appliance.
4. Specify a name and location for the deployed template.
5. Select a data store for the virtual machine. It could be either local or centralized (SAN).
6. Select thick lazy zero provisioning as the disk format for the virtual disks.
7. Map the networks used in this OVF to networks in your inventory.
8. All done - click Finish to start the deployment task.

## Importing into a vCenter cluster

This section describes the import process of a MX-ONE Service Node Virtual Appliance in a VMware vCenter cluster environment.

Such an environment contains multiple hosts, centralized storage, and distributed network and supports the vCenter features such as vMotion, High Availability (HA), and Fault Tolerance (FT).

1. From the vSphere client or vSphere Web client, log on to the vCenter server.
2. If you are importing on a vSphere client, select from the File menu and select Deploy OVF Template.... A wizard opens that guides you through the deployment process. Select the Virtual Appliance file to import.
3. A page opens showing information about the Virtual Appliance.
  - a. Select the Virtual Appliance file to import. A page opens showing information about the Virtual Appliance.
  - b. Enter a name for the virtual machine, and also, select the datacenter where it should be used.
  - c. Select the host or cluster that should handle the new virtual machine. A review page with data about the Virtual Appliance is displayed.
4. If you are importing on a vSphere Web client, right-click on the vCenter server and select Deploy OVF Template.... A wizard opens that guides you through the deployment process.
  - a. Select the Virtual Appliance file to import.
  - b. Enter a name for the virtual machine, and also, select the datacenter where it must be used.
  - c. Select the host or cluster or resource pool or vapp where to run the new virtual machine. A review page with data about the Virtual Appliance is displayed.
5. Select datastore for the virtual machine. Choose a centralized storage (SAN) if HA/FT will be used.
6. Select the virtual network the virtual machine must connect to. In a clustered environment, this is normally a Distributed Switch. Be sure that switch is connected to the production/telephony network
7. Select the disk format for the virtual disks. If FT will be used, or thick provisioning must be selected. For other cases, select any format (you can keep the default selected).
8. Select the virtual network the virtual machine must connect to. In a clustered environment, this is normally a Distributed Switch. Be sure that switch is connected to the production/telephony network
9. With this all, necessary information is now collected. Click Finish to start the deployment task.

After you finish importing a Virtual Appliance by using a single ESXi host or a vCenter cluster, you will have a MX-ONE Service Node in turnkey state. At this moment, the server is not yet configured and is generic (it has not yet been assigned any specific function). Starting up the virtual machine triggers the turnkey installation process, which is identical to the one used for physical MX-ONE servers. If more than one MX-ONE Service Node is needed, just run the process above multiple times using the same Virtual Appliance file. Give each virtual machine an unique name and distribute them over the hosts in the cluster (how depends on the cluster setup, the amount of servers inside the cluster and the load on the hosts)

# Post-Configuration of a Newly Imported MX-ONE VM

Before using a newly imported MX-ONE virtual server, some settings must be considered and maybe changed. These are mainly related to processor and memory allocation

- Hardware - Memory

The amount of memory the virtual machine is equipped with. The value must be changed according to the system size and the MX-ONE application that the server will run, e.g. Service Node, Service Node Manager, Database (Cassandra), Provisioning Manager and Media Server. For configuration and planning of virtualization, see the description *VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later*.

- Hardware - CPU

By default, two CPUs are allocated to the virtual machine. If you plan to use Fault Tolerance together with the MX-ONE Service Node, this must be changed up to 8 vCPUs. Also, numbers of CPUs needed in a server depends on desired performance and system size. For configuration and planning of virtualization, see the description *VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later*.

- Options - Paravirtualization

This must be disabled on Fault Tolerance-enabled virtual machines as it is not supported. On all other configurations, keep this enabled.

- Resources - CPU

This setting affects the resource allocation in the cluster/host. This must be configured to match required performance of the MX-ONE and the capacity of the cluster/host and how many virtual machines are running in parallel.

- Resources - Memory

As for the CPU-resources, this setting depends on the capacity needed, the cluster/host configuration and how many other virtual machines are running in parallel.

- Disks

For database (Cassandra) server VMs co-located or stand-alone, SSD disks are required.

**NOTE:** Be sure that the network configuration of the virtual machines is properly set up in the cluster. By default, the standard "VM Network" is used. In a cluster environment where distributed switches are used (a requirement if HA/FT is used), this must certainly be changed.

# Installing MX-ONE on Hyper-V

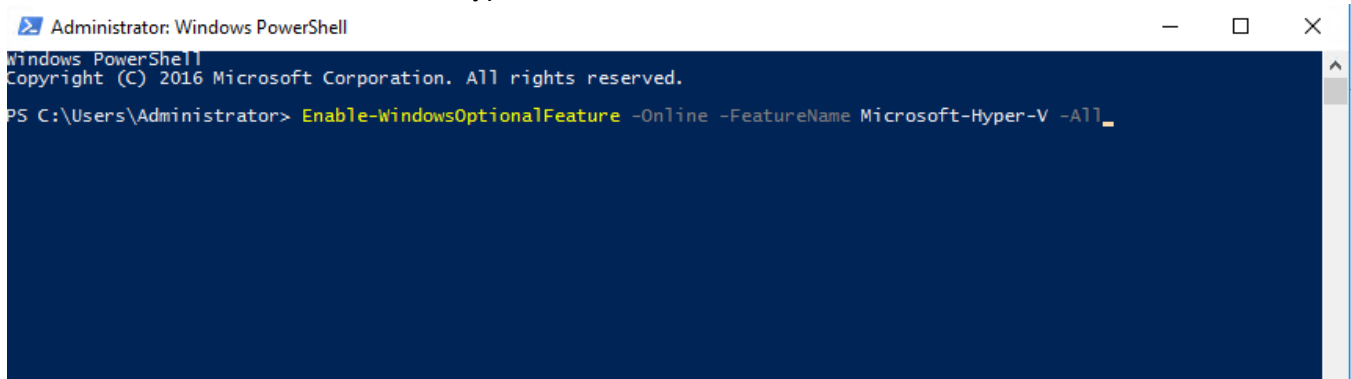
The Microsoft hardware virtualization product, Hyper-V lets you create and run a software version of a computer, called a virtual machine. Each virtual machine acts like a complete computer, running an operating system and programs. The following are the requirements of the virtual machine.

- It can be installed on Windows Server (2008, 2012, 2016)
- It requires only a Windows license and no specific license is required.
- Windows Server can be installed on a Dell or an HP server. It is similar to VMware in its functioning.
- It uses .vhd and .vhdx format image for installation.

To install MX-ONE on a Hyper-V setup:

Once the Windows Server get successfully installed,

1. Enable Hyper-V using PowerShell.
  - a. Open a PowerShell console as Administrator.
  - b. Run `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All` command to install Hyper-V.

A screenshot of a Windows PowerShell console window titled "Administrator: Windows PowerShell". The window has a dark blue background. The text inside shows the PowerShell prompt "PS C:\Users\Administrator>" followed by the command "Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All" which is partially entered. The command is highlighted in yellow. The window also shows the standard Windows title bar with minimize, maximize, and close buttons.

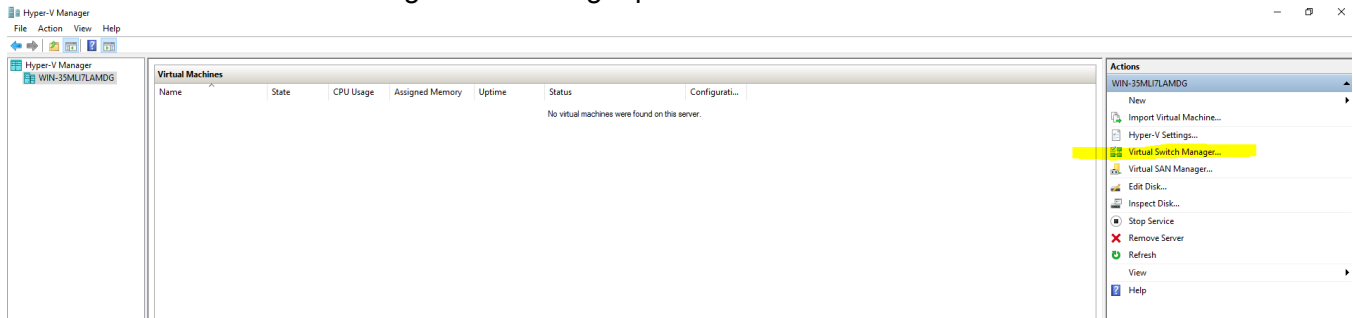
```
Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\Administrator> Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All
```

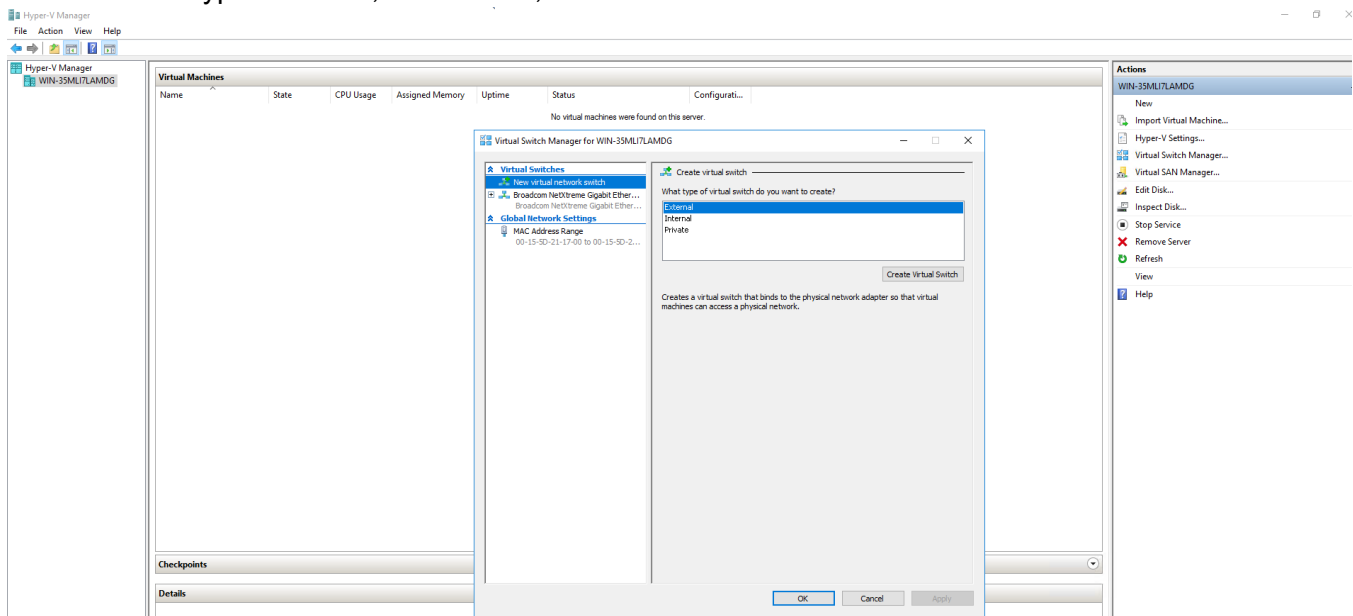
c. Or you can open the service manager - Add role and features and install Hyper-V.

The image shows two screenshots of Windows Server Manager. The top screenshot displays the 'Add Roles and Features Wizard' with the 'Server Roles' tab selected. The 'Roles' list includes 'Active Directory Certificate Services' (highlighted), 'Active Directory Domain Services', 'Active Directory Federation Services', 'Active Directory Lightweight Directory Services', 'Active Directory Rights Management Services', 'Device Health Attestation', 'DHCP Server', 'DNS Server', 'Fax Server', 'File and Storage Services (1 of 12 installed)', 'Host Guardian Service', 'Hyper-V (Installed)', 'MultiPoint Services', 'Network Policy and Access Services', 'Print and Document Services', 'Remote Access', 'Remote Desktop Services', 'Volume Activation Services', 'Web Server (IIS)', and 'Windows Deployment Services'. The 'Description' for 'Active Directory Certificate Services' is provided. The bottom screenshot shows the 'Server Manager' dashboard with the 'Hyper-V' link highlighted in the left navigation pane. Below the dashboard, the 'ROLES AND SERVER GROUPS' section shows 'File and Storage Services' and 'Hyper-V' both with a count of 1. The 'Hyper-V Manager' console is open, showing a table of virtual machines with columns: Name, State, CPU Usage, Assigned Memory, Uptime, Status, and Configuration. The table is empty, indicating no virtual machines are found on this server. The 'Actions' pane on the right lists various tasks such as 'New', 'Import Virtual Machine...', 'Hyper-V Settings...', 'Virtual Switch Manager...', 'Virtual SAN Manager...', 'Edit Disk...', 'Inspect Disk...', 'Stop Service', 'Remove Server', 'Refresh', 'View', and 'Help'.

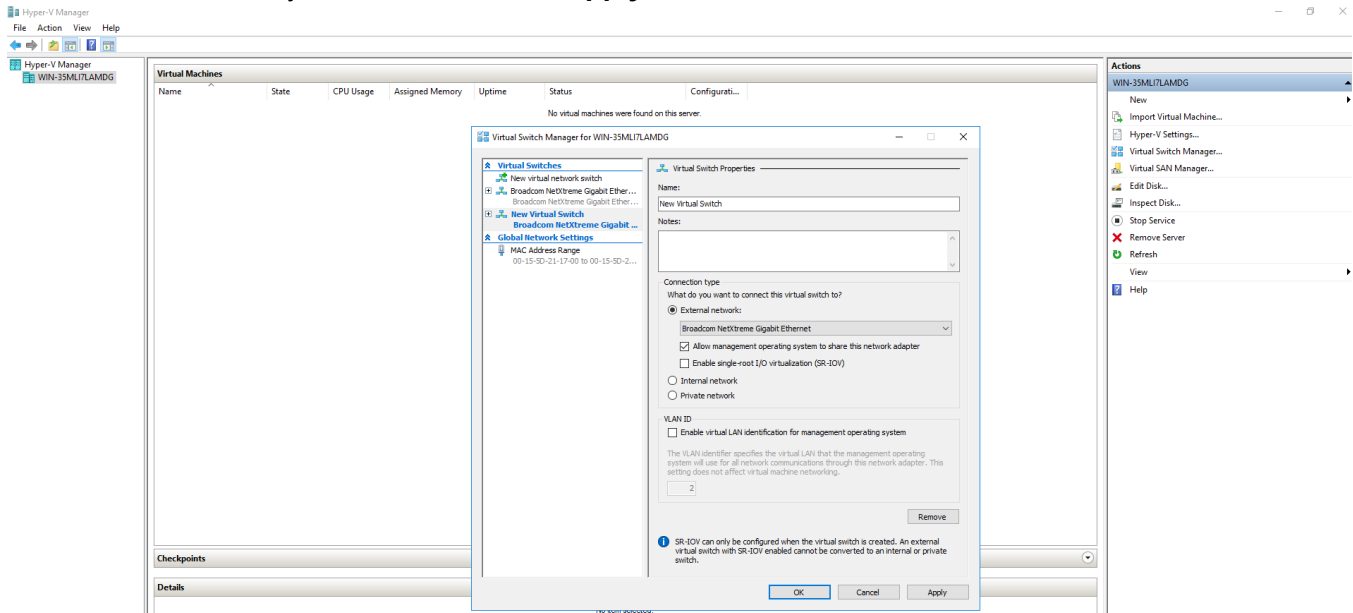
- Before you install, create a Virtual Switch Manager for Hyper-V to give network access to the virtual machines.
- Select Virtual Switch Manager from the right pane.



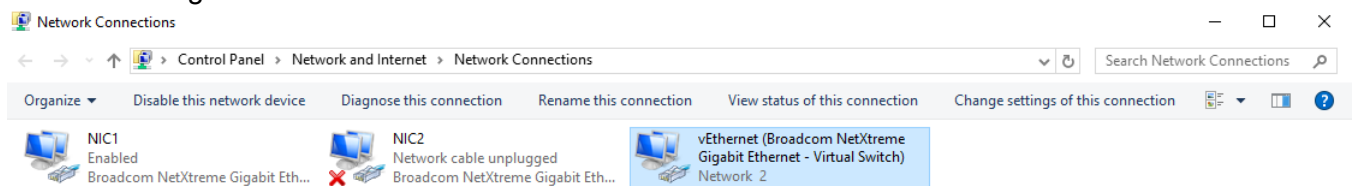
- Select the type of switch, in this case, an External Switch.



## 5. Enter a Name for your switch and click **Apply**.

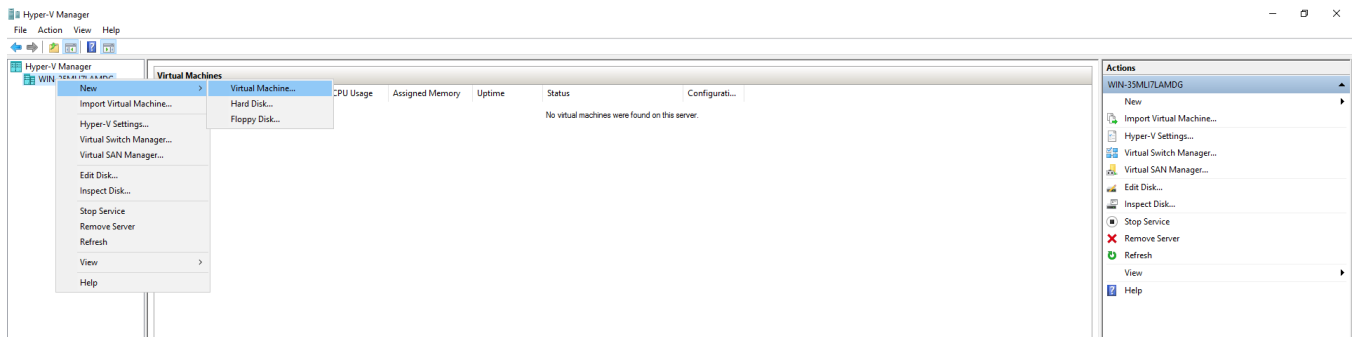


## 6. Your configured Network Switch is listed in the Network Connections.

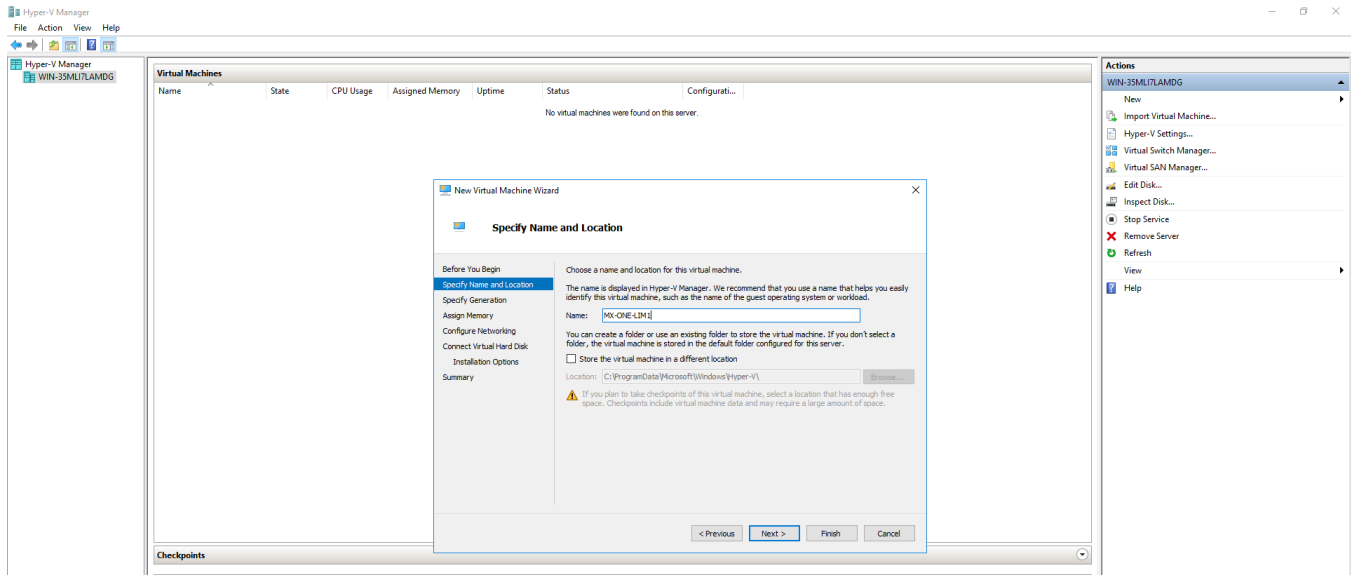


## 7. Create a virtual instance.

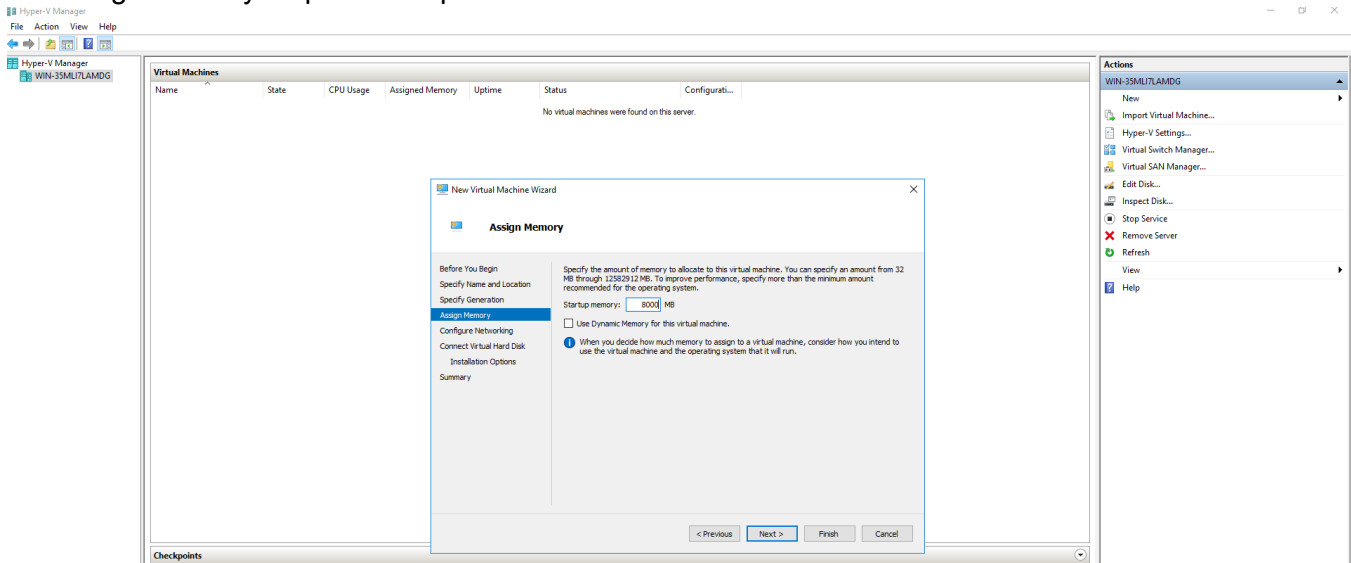
## 8. Select **New > Virtual Machine**.

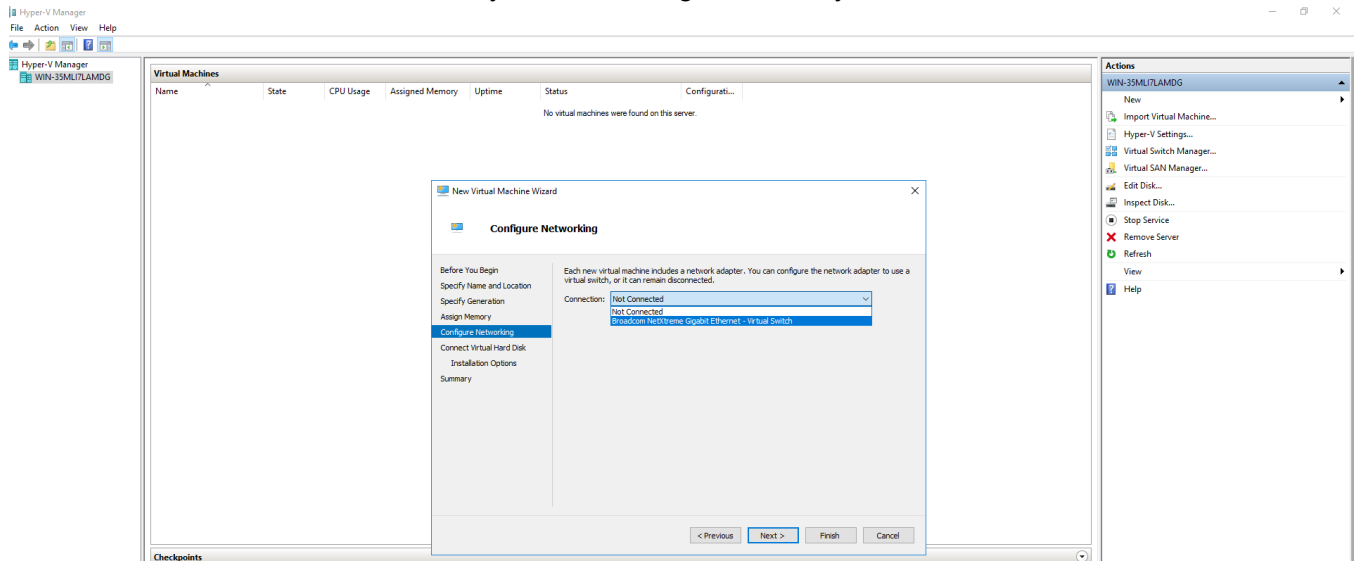


## 9. Enter the virtual instance name and click **Next**.



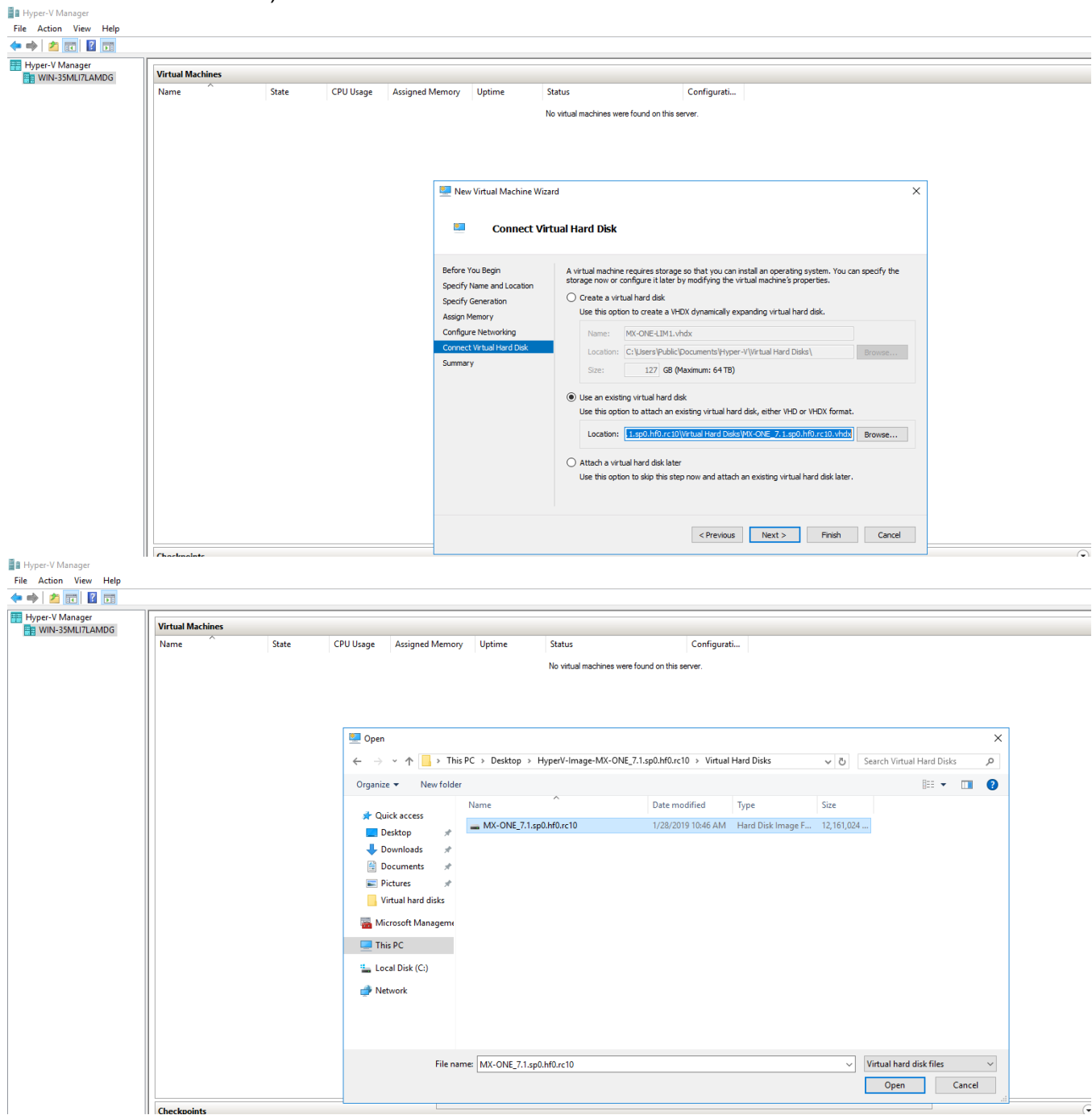
## 10. Assign memory as per the requirement and click **Next**.

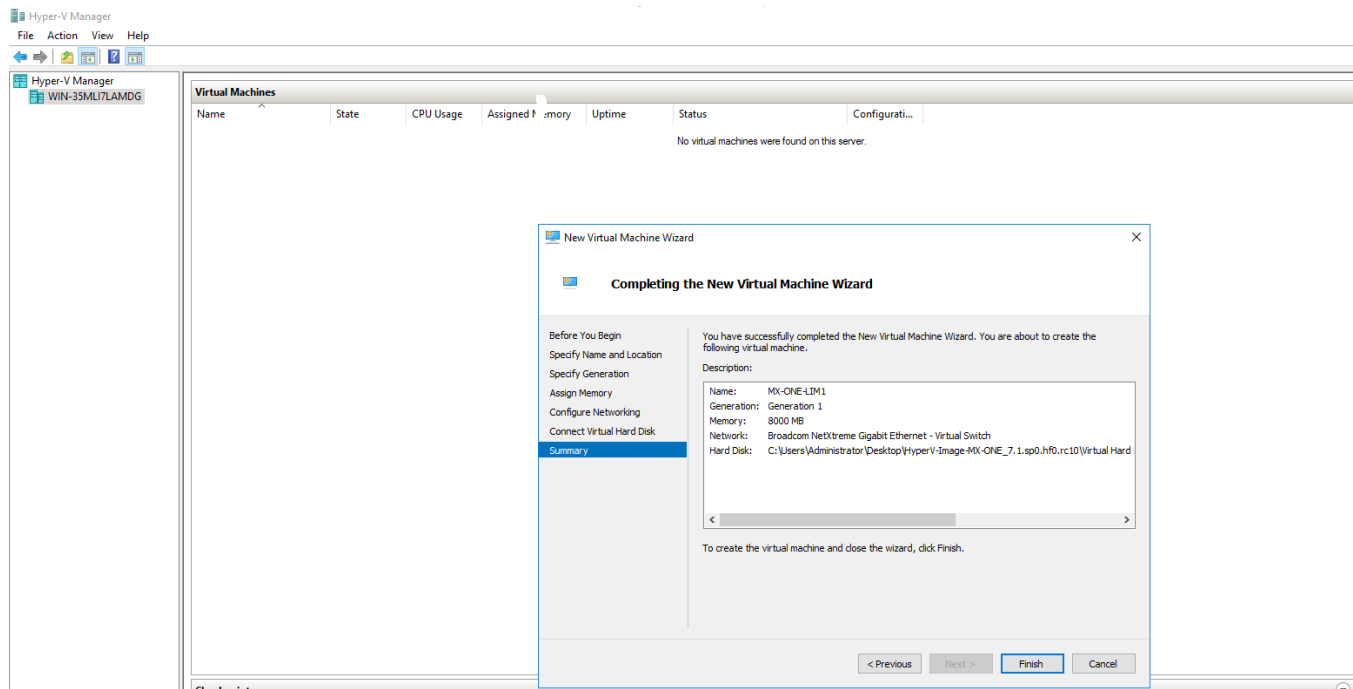


**11. Select the Network Switch which you have configured initially and click **Next**.**

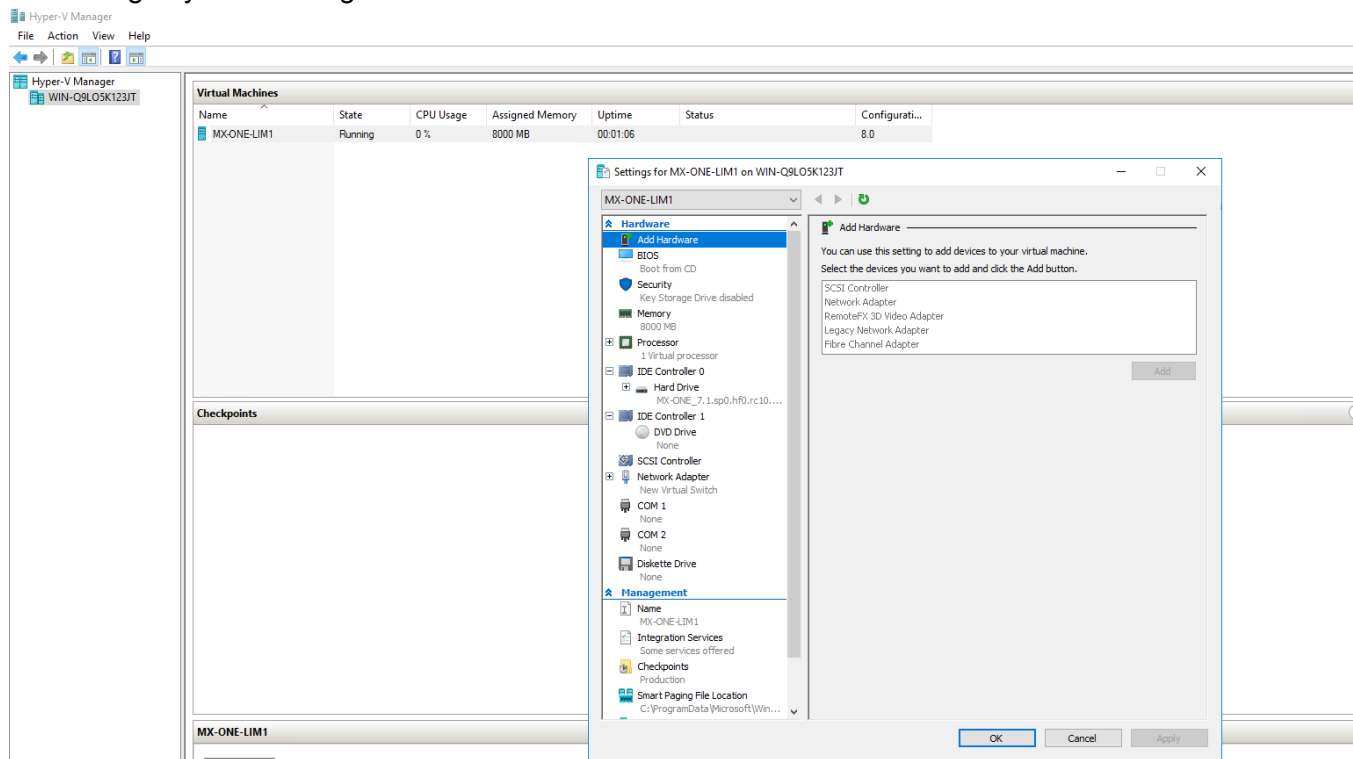
12. Select the image (VHD) by selecting the option, **Use an existing virtual Hard disk** and select the location where your VHD image is stored (In case of MX-ONE Unzip the Hyper-V Image and select

the Virtual Hard Disk ).

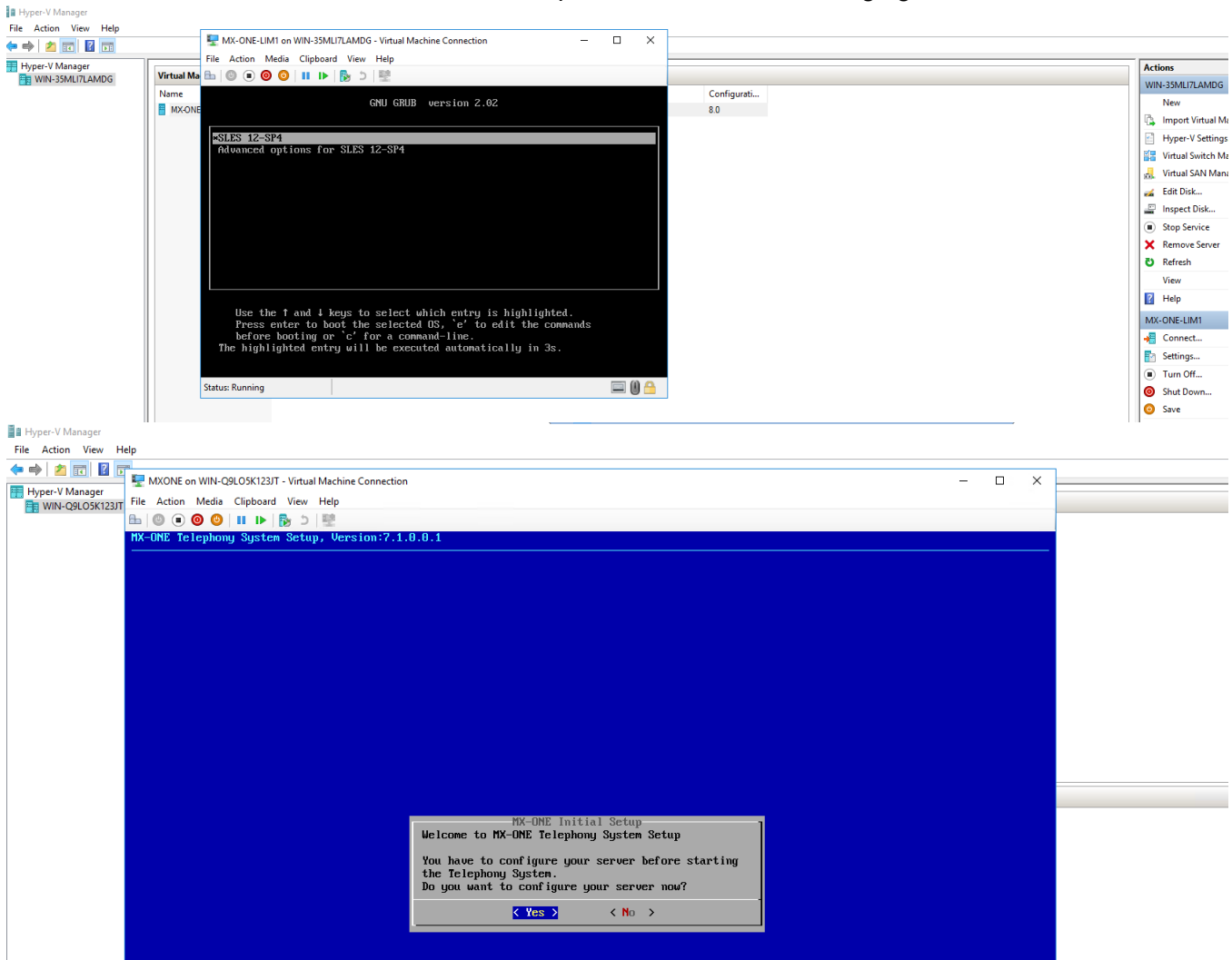


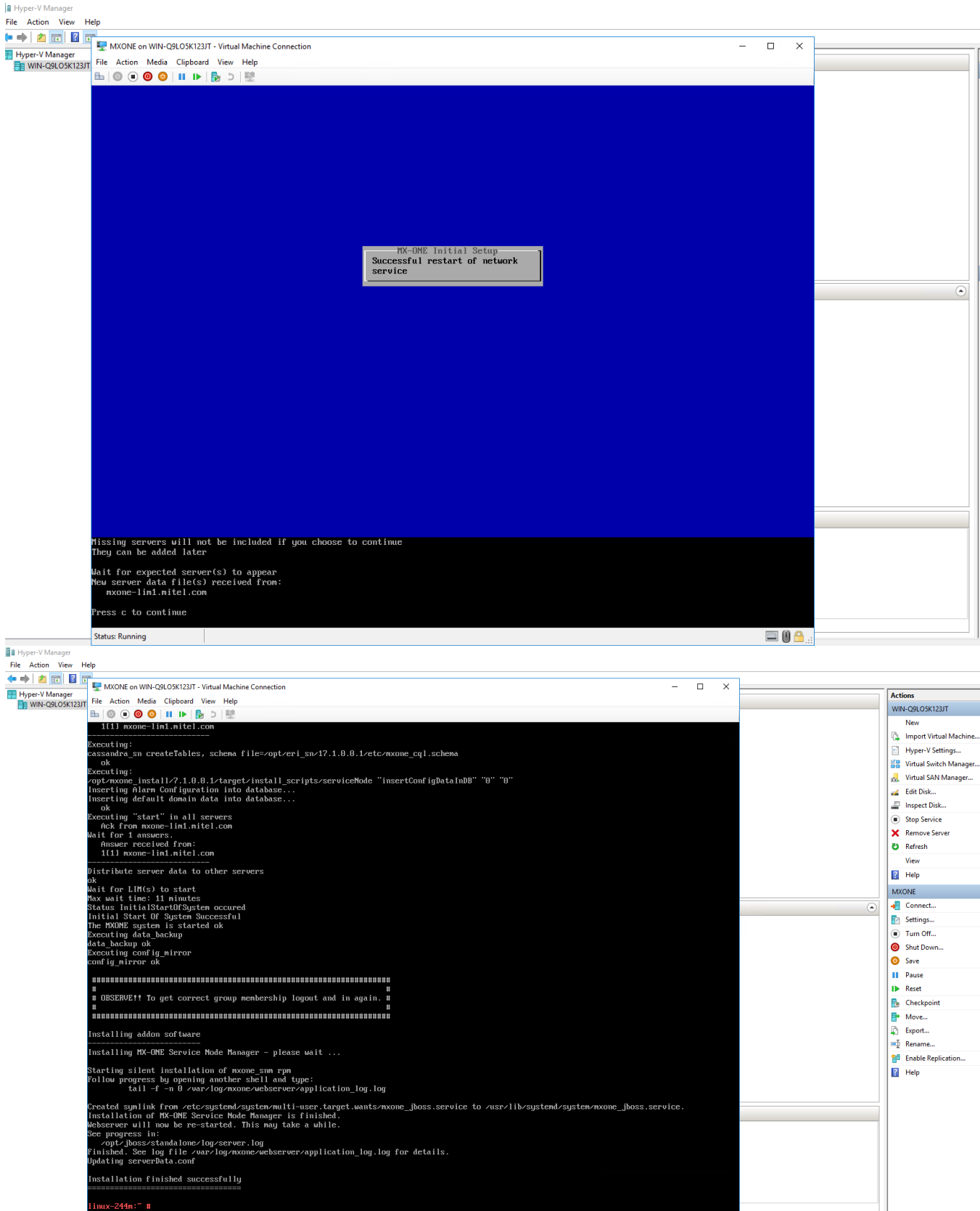


### 13. Change system settings.



14. Start the machine and install MX-ONE setup as shown in the following figures.





# Installing MX-ONE KVM, SuSE Linux

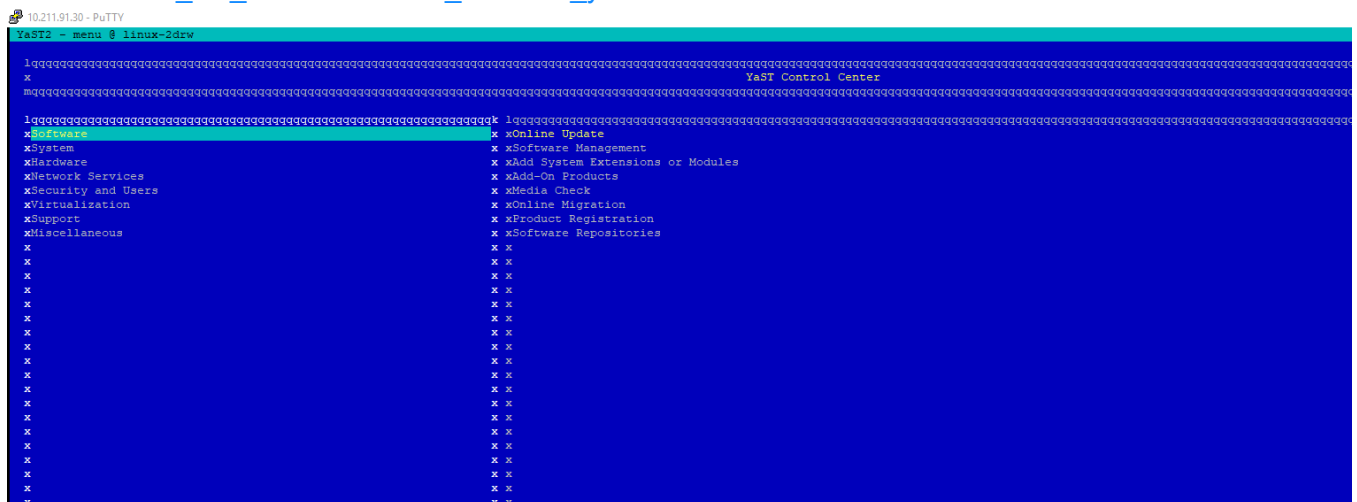
To install MX-ONE on the Kernel-based Virtual Machine (KVM) on the SuSE Linux platform, follow these steps:

1. Download the MX-ONE ISO image (Recovery image) from the [MX-ONE repository](#).
2. Make a bootable USB and load it with the Recovery image to install OS with KVM capability.
3. Run the USB and select option 3 (KVM install).
4. Install the KVM image and system is restored with SuSE Linux installed.
5. Enter the root login credentials.

```
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Tue Apr  9 08:31:21 2019 from 10.210.30.207
linux-2drw:~ #
linux-2drw:~ #
```

6. Using the Yast utility, enter IP address, Gateway, DNS and subnet Mask to the system. For more information see,

[https://www.suse.com/documentation/sled11/book\\_sle\\_admin/index.html?page=/documentation/sled11/book\\_sle\\_admin/data/sec\\_basinet\\_yast.html](https://www.suse.com/documentation/sled11/book_sle_admin/index.html?page=/documentation/sled11/book_sle_admin/data/sec_basinet_yast.html).



7. Using the configured IP address login to the terminal using putty.
8. For the installation of KVM over SuSE download the. qcow2 and .xml files from the package repository.
9. Check if `libvirtd` is running or not, else start it: `sudo systemctl status libvirtd`

```
libvirtd.service - Virtualization daemon    Loaded: loaded
(/usr/lib/systemd/system/libvirtd.service; enabled; vendor preset:
enabled)   Active: active (running) since Mon 2019-04-08 14:38:40 CEST;
22h ago    Docs: man:libvirtd(8)           https://libvirt.org Main PID:
```

```
21036 (libvirtd) Tasks: 18 (limit: 32768) CGroup:
/system.slice/libvirtd.service ??21036 /usr/sbin/libvirtd -listen
```

10. Create a virtual machine, enter `virt-clone --original-xml Virtual_Image-MX-ONE_7.0.sp0.hf2.rc5.xml --name <your system name> --file /local/images/<your system name>.qcow2`

For example, `virt-clone --original-xml Virtual_Image-MX-ONE_7.1.sp0.hf0.rc26.xml --name MX-ONE --file /local/MX-ONE.qcow2`

**NOTE:** Keep the qcow2 and xml under the local folder. Edit (vi) the xml file and change the default path from `/kvm/images` to `/local` where you have saved the image file.

11. When the kvm image installation is complete, create a network bridge and map it to the `eth0` that you are using so that KVM can access it.
12. To add a new network bridge device on VM Host Server with `brctl`, follow these steps:

- Log in as root on the VM Host Server where you want to create a new network bridge.
- Choose a name for the new bridge-VIRBR\_TEST in our example- and run `root # brctl addbr VIRBR_TEST`.
- Check if the bridge was created on VM Host Server `root # brctl show`

```
bridge name      bridge id      STP enabled    interfacesbr0
8000.e06995ec09e8 no              eth0virbr0     8000.525400b37ec9
yes              virbr0-nicvirbr_test 8000.000000000000 no
```

**NOTE:** `virbr_test` is listed, but not associated with any physical network interface

- Add a network interface to the bridge using `root # brctl addif eth1` command.

**NOTE:** Network interface must not be already in use. This is because you can only enslave a network interface that is not yet used by other network bridge.

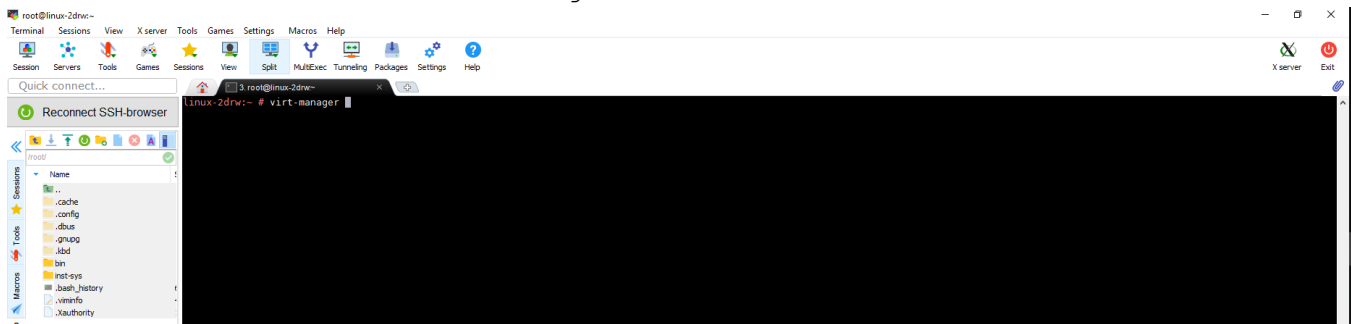
- Optionally, enable STP using `root # brctl stp VIRBR_TEST` on command.

For more information, see [https://www.suse.com/documentation/sles-12/book\\_virt/data/libvirt\\_networks\\_bridged.html](https://www.suse.com/documentation/sles-12/book_virt/data/libvirt_networks_bridged.html).

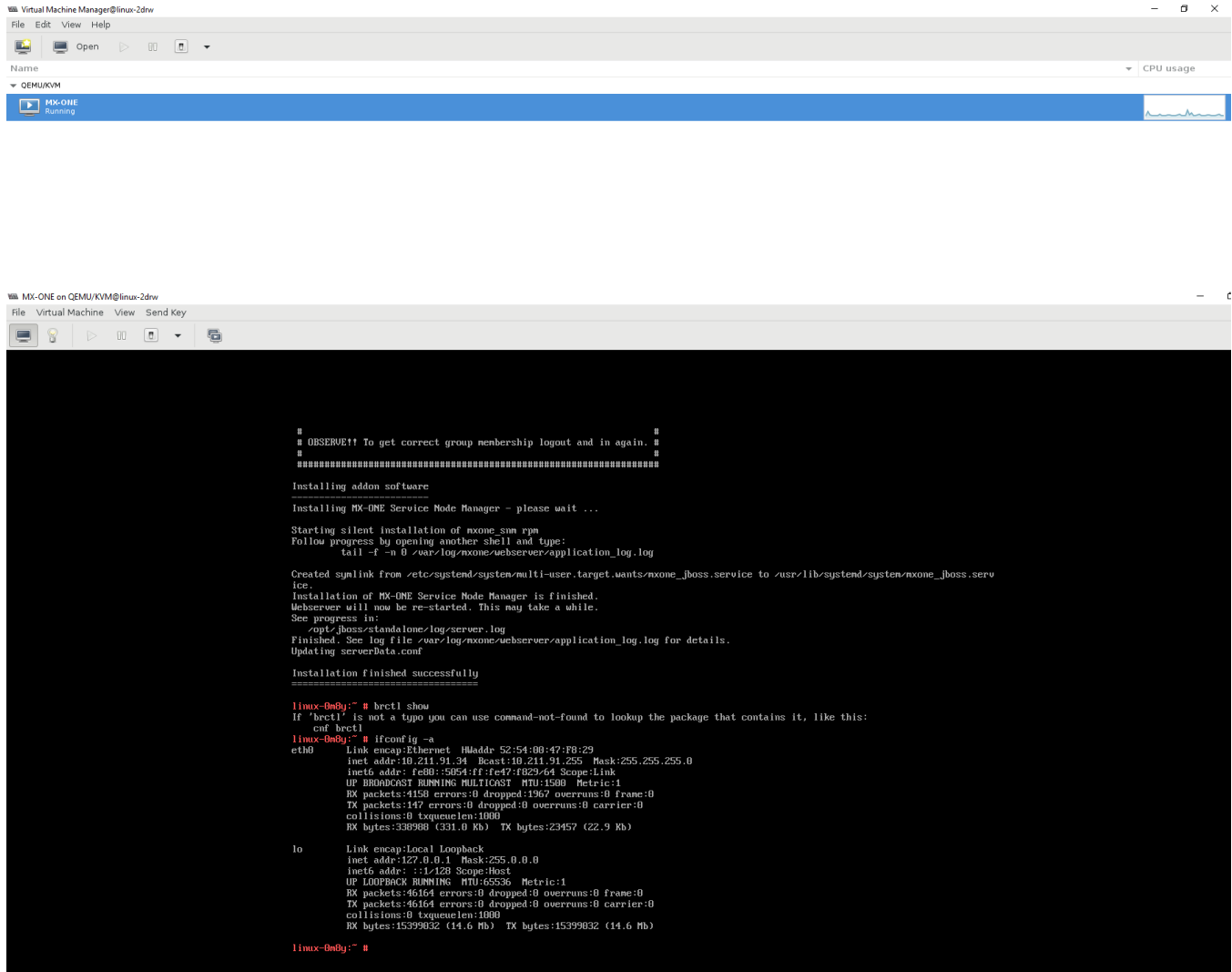
```
brctl showbridge name      bridge id      STP enabled
interfacesbr0      8000.28b9d9e09f41 no              eth0
vnet0
```

13. To start your virtual machine, install Mobaxterm (GUI or X server support). See <https://mobaxterm.mobatek.net/download-home-edition.html>

14. Run KVM machine and run `virt-manager` on the command line.



15. This gives you the virtual manager access through which you, start, stop, or change the MX-ONE deployed KVM and install it.



```

Virtual Machine Manager@linux-2dru
File Edit View Help
Name CPU usage
QEMU/KVM
MX-ONE Running

MX-ONE on QEMU/KVM@linux-2dru
File Virtual Machine View Send Key
MX-ONE on QEMU/KVM@linux-2dru

# OBSERVE!! To get correct group membership logout and in again. #
# =====
Installing add-on software
Installing MX-ONE Service Node Manager - please wait ...
Starting silent installation of mxone-smn rpm
Follow progress by opening another shell and type:
tail -f -n 0 /var/log/mxone/webserver/application_log.log

Created symlink from /etc/systemd/system/multi-user.target.wants/mxone_1boss.service to /usr/lib/systemd/system/mxone_1boss.serv
ice.
Installation of MX-ONE Service Node Manager is finished.
Webserver will now be re-started. This may take a while.
See progress in:
/opt_1boss/standalone/log/server_log
Finished. See log file /var/log/mxone/webserver/application_log.log for details.
Updating serverData.conf

Installation finished successfully
=====
linux-060y:~# brctl show
If 'brctl' is not a typo you can use command-not-found to lookup the package that contains it, like this:
cnf brctl
linux-060y:~# ifconfig -a
eth0      Link encap:Ethernet  HWaddr 52:54:00:47:F8:29
          inet addr:10.211.91.24  Bcast:10.211.91.255  Mask:255.255.255.0
          inet6 addr: fe80::5054:ff:fe47:f829:64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4150 errors:0 dropped:1967 overruns:0 frame:0
          TX packets:147 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:338988 (331.0 Kb)  TX bytes:23457 (22.9 Kb)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1:1 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:46164 errors:0 dropped:0 overruns:0 frame:0
          TX packets:46164 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15399832 (14.6 Mb)  TX bytes:15399832 (14.6 Mb)

linux-060y:~#

```

16. Executables are stored in /usr/libexe.

# Installing MX-ONE KVM on Redhat-Linux

To install Kernel-based Virtual Machine (KVM) on Redhat-Linux, follow these steps:

1. Install the Redhat-7.6 OS through a bootable pen-drive or any other external media.
2. Create a bridge interface; for example, `ifcfg-br0`.

**NOTE:** For configuration details, see [Network Bridge](#).

3. Copy the MX-ONE .qcow2 image to the host machine to continue installation. See [Creating a VM by Importing an MX-ONE qcow2 Image](#) for installation instructions.

## Creating a VM by Importing an MX-ONE qcow2 Image

To create a virtual machine (VM) by importing an MX-ONE qcow2 image, follow these steps:

1. Log in to your machine as root user.
2. Navigate to the directory of the installation files previously downloaded.

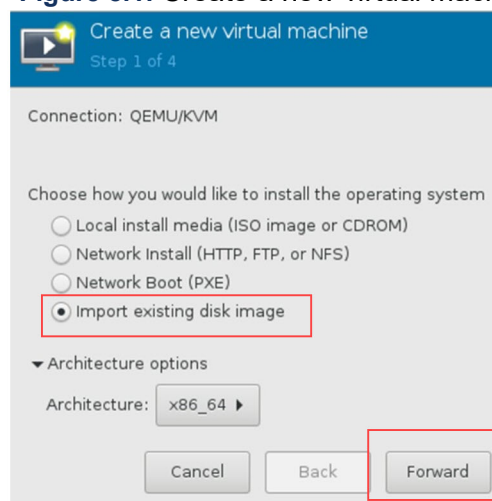
**NOTE:** Create a backup copy of the image file.

3. Move the image file to the directory where you want to place the virtual machine.
4. Start the Virtual Manager and click **Create a new virtual machine**



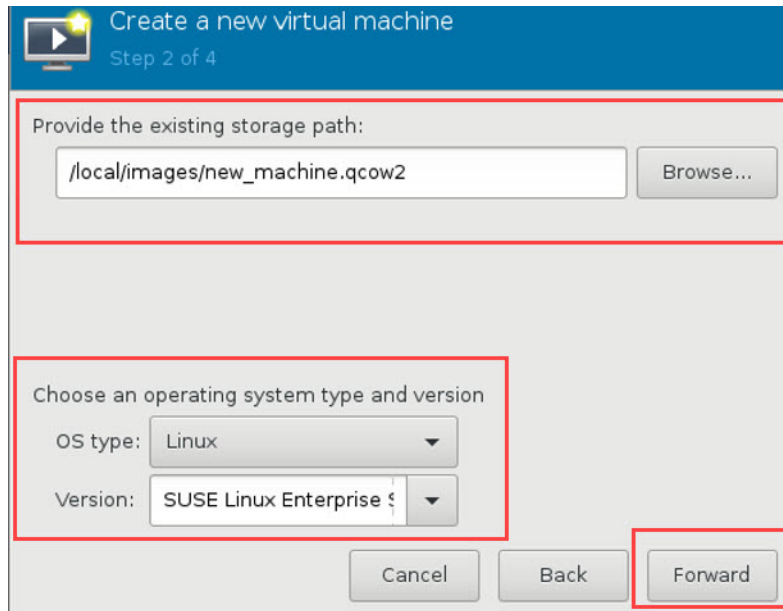
5. Select **Import existing disk image** and click **Forward**. See [Create a new virtual machine screen](#) for details.

**Figure 8.1:** Create a new virtual machine screen



6. Click **Browse** and navigate to the path of the image file.
7. Select the image file and select the operating system type and version from the following fields and click **Forward**. See [Selecting the OS and version](#) for details.

- **OS type**
- **Version**



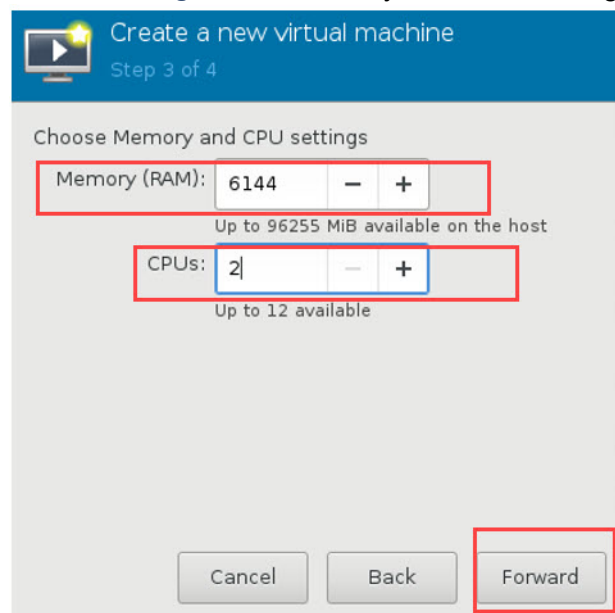
Selecting the OS and version

8. Complete the following fields and click **Forward** (see [Memory and CPU settings](#) for details):

- **Memory (RAM)**
- **CPUs**

**NOTE:** For the memory and CPU settings, specify values that match your system. For the purposes of this procedure, the values 6 GB RAM (6144 MB) and 2 CPUs are specified.

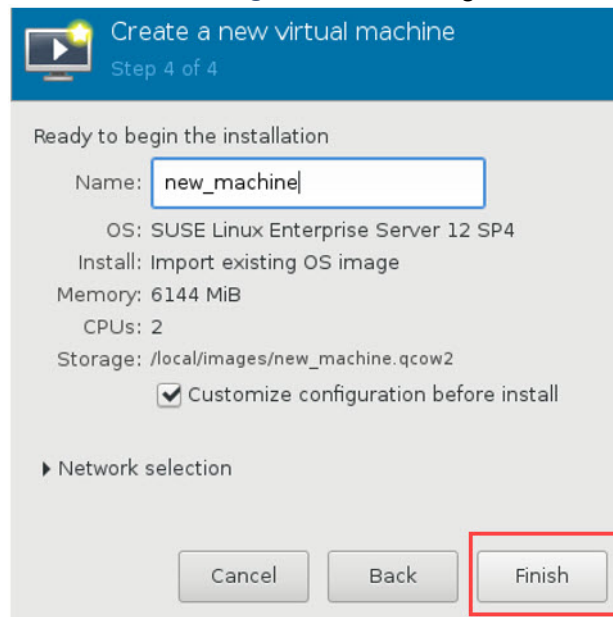
**Figure 8.2:** Memory and CPU settings



9. Click **Finish**. See [Creating a VM](#) for details.

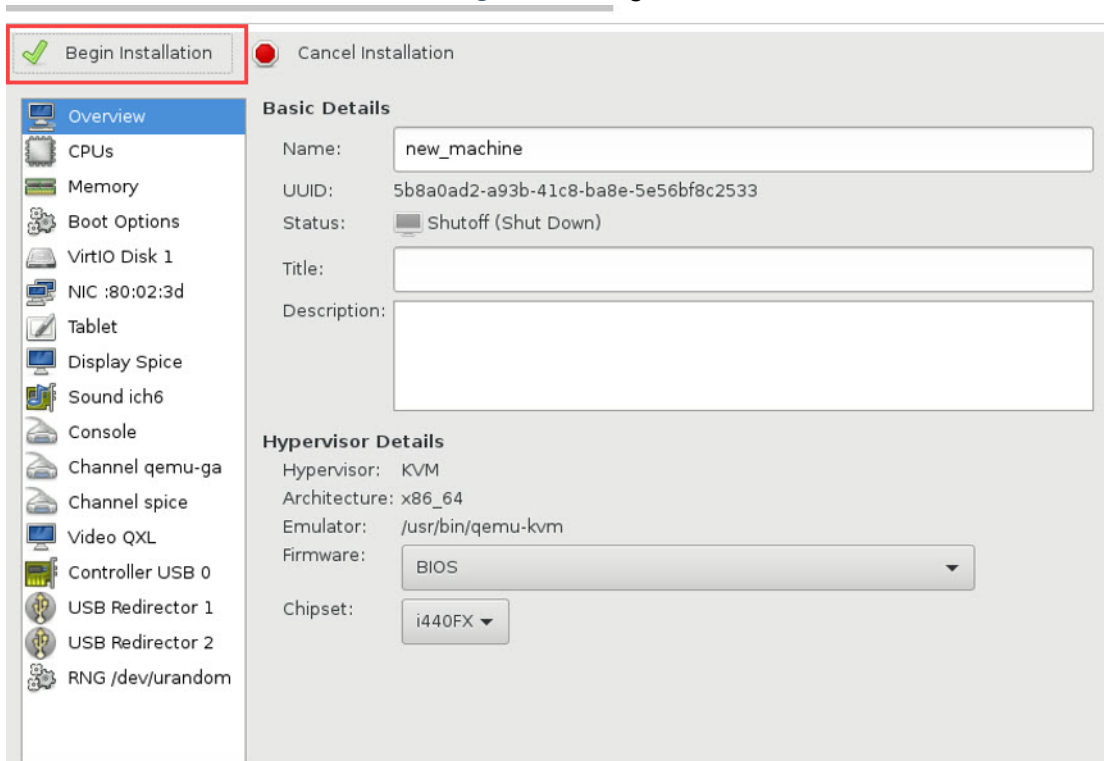
The details of the VM to be created are displayed.

Figure 8.3: Creating a VM



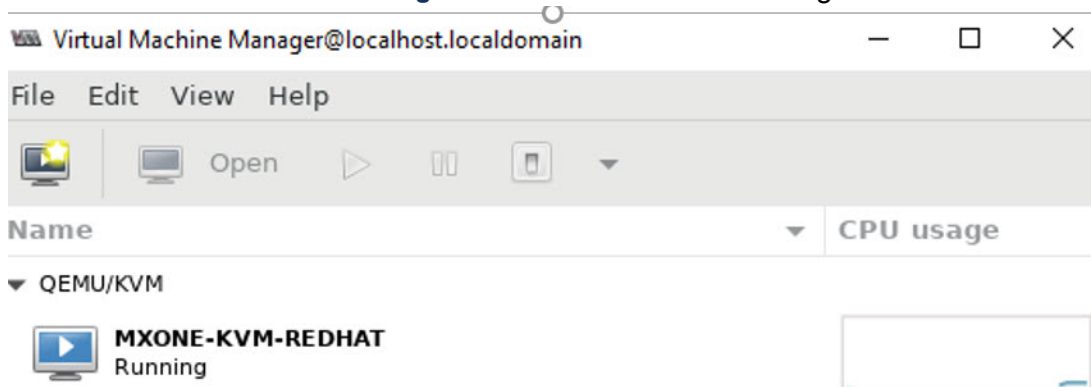
10. Click **Begin Installation**. The virtual machine is created. See [Begin Installation](#) for details.

Figure 8.4: Begin Installation



11. Use the MobaXterm (GUI or X server support). to open a virtual manager session. See [Virtual Machine Manager](#) for details.

Figure 8.5: Virtual Machine Manager



# Installing and Configuring MX-ONE

With all the virtual MX-ONE servers in place and configured, it is time to build a PBX out of them. The procedure of setting up the system is the same as for physical MX-ONE servers loaded with turnkey installations. The difference lays in the access of the MX-ONE servers that is done through the vSphere client.

For more details see *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

