Wanos on QEMU/KVM and virt-manager

Comprehensive guide for a complete lab

This document guides the user in setting up a Wanos appliance using KVM/QEMU and Virtual Machine Manager (virt-manager) on a CentOS 6.x (64-bit) GNU/Linux operating system. Four Virtual Machines will be created in this guide. It is assumed that the current version of CentOS 6 64-bit (with GUI) has all the necessary updates installed. Two Microsoft Windows OS based virtual machines such as Windows 7 are also needed. Wanos version 2.6.2. is used in this guide.

The system requirements for Wanos as well as the download image can be obtained at http://wanos.co/wan-optimization/download/. The Raw Disk Image is used in this tutoral.

Table of Contents

Setting up QEMU/KVM and Virtual Machine Manager

This section will focus on the installation of QEMU/KVM Hypervisor and Virtual Machine Manager using the CLI (Commad Line Interface). Internet connectivity is required.

Open the Terminal and switch to root user by typing ***su*** followed by the ***root password.***

After logging in as root, run the following command:

```
yum install libvirt qemu-kvm.x86_64 virt-manager
```

Review and confirm all prompts during the installation phase. After installation, start ***libvirt*** service by running this command as root.

```
service libvirtd start
```

Launch Virtual Machine Manager under **Applications** > **System Tools** > **Virtual Machine Manager**

Disabling Network Manager

NetworkManager is a GUI based tool available to assist users manage basic aspects of computer networking. However, setting up bridge or advanced networking on a Virtual Machine Manager does not work well with NetworkManager and Wanos so this feature needs to be disabled.

Open the Terminal, log in as root by typing ***su*** followed by the ***root password***.

Type the following commands:

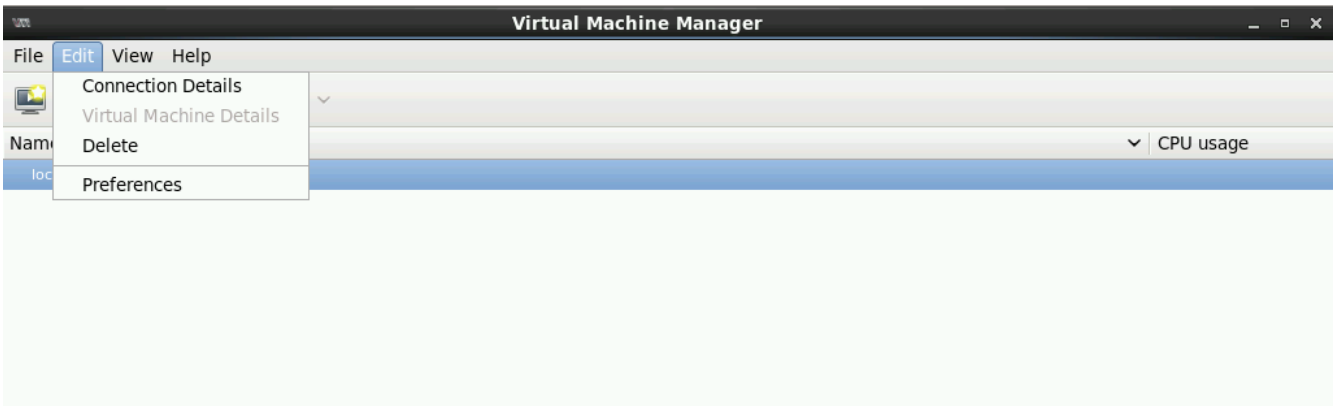
```
chkconfig NetworkManager off
```

```
chkconfig network on
```

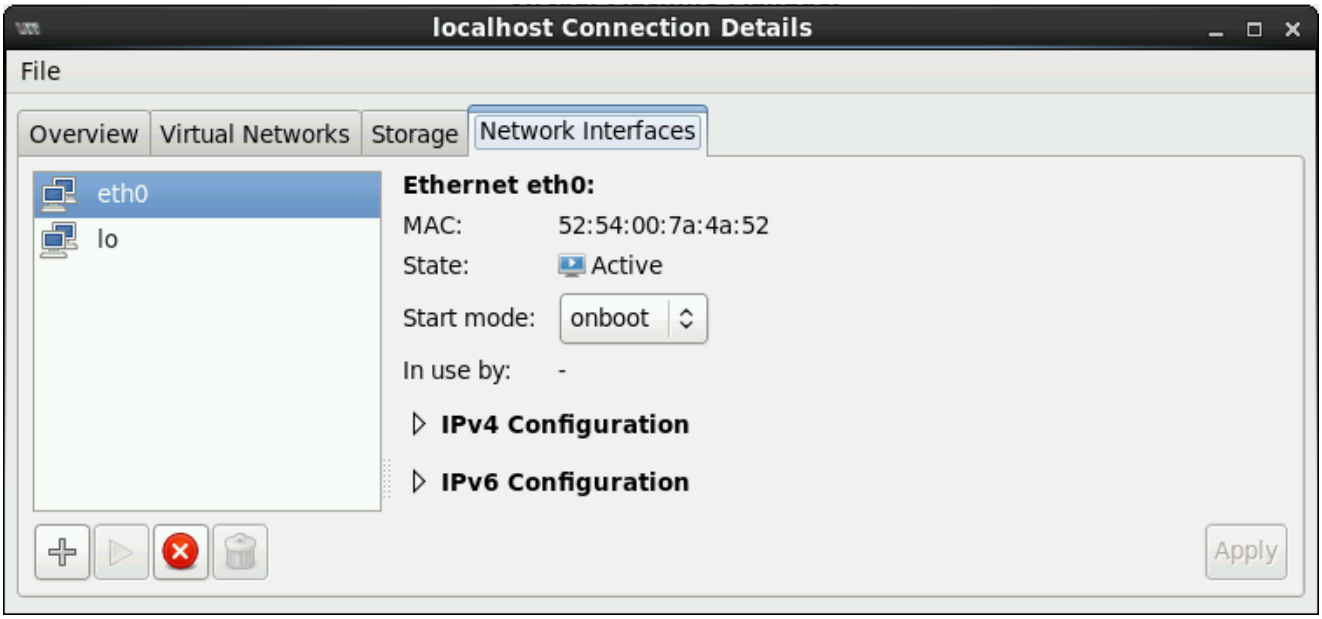
Reboot the machine and launch Virtual Machine Manager from ***Applications*** > ***System Tools*** > ***Virtual Machine Manager***

Configure Network Interface

On the Virtual Machine Manager menu, click ***Edit*** > ***Connection Details***.

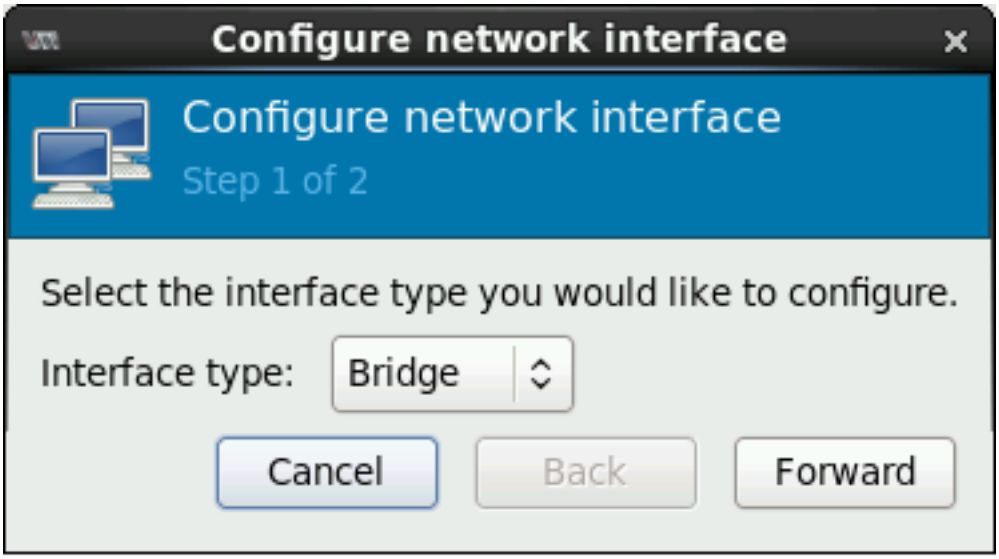


Go to ***Network Interfaces*** tab.



Select LAN interface (***eth0***), click the ***Stop Interface*** button  (select ***Yes*** to confirm) then click the ***Delete Interface*** button  to remove ***eth0***.

Click the ***Add Interface*** button  , select ***Bridge*** and click the ***Forward*** button.



Set the following parameters:

Name: ***br0***

Start Mode: ***OnBoot***

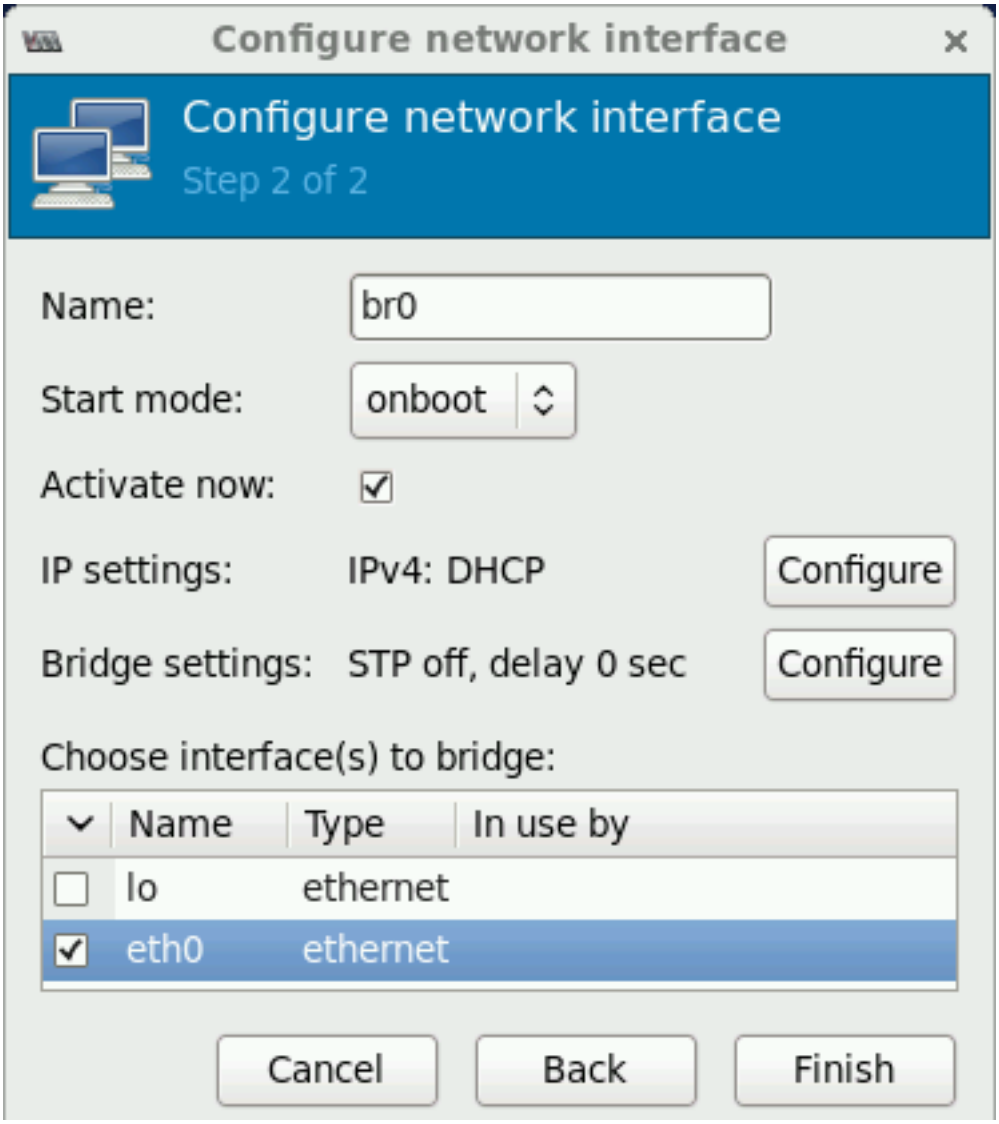
Activate Now: ***Ticked*** / ***Mark Checked***

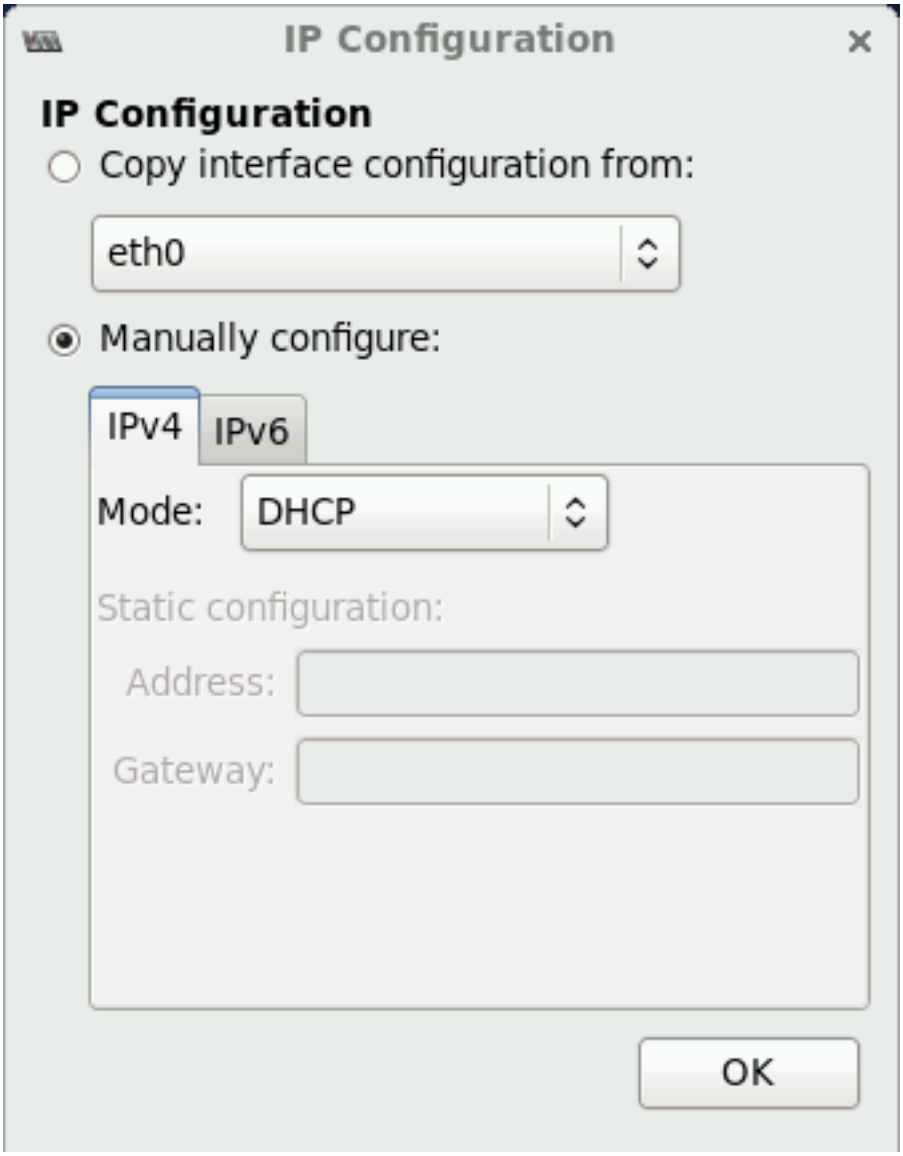
IP Settings: ***IPv4***, ***DHCP***

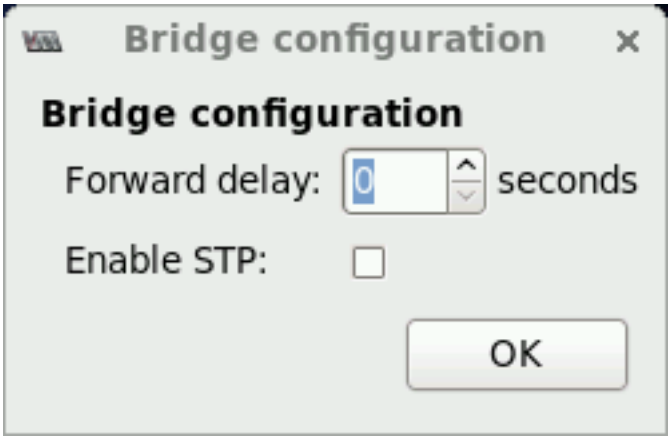
Bridge Settings: ***STP off***, ***delay 0 sec***

Click the ***Finish*** button to complete the process. Select ***Yes*** when a dialogb box pops up stating that using the new settings will overwrite your existing configuration on the selected interface.

(Screen shots on the succeeding pages)


Configure network interface
Configure network interface
Step 2 of 2
Name:
br0
Start mode:
onboot
Activate now:
IP settings:
IPv4: DHCP
Configure
Bridge settings:
STP off, delay 0 sec
Configure
Choose interface(s) to bridge:
Name
Type
In use by
lo
ethernet
eth0
ethernet
Cancel
Back
Finish


IP Configuration
IP Configuration
Copy interface configuration from:
eth0
Manually configure:
IPv4
IPv6
Mode:
DHCP
Static configuration:
Address:
Gateway:
OK

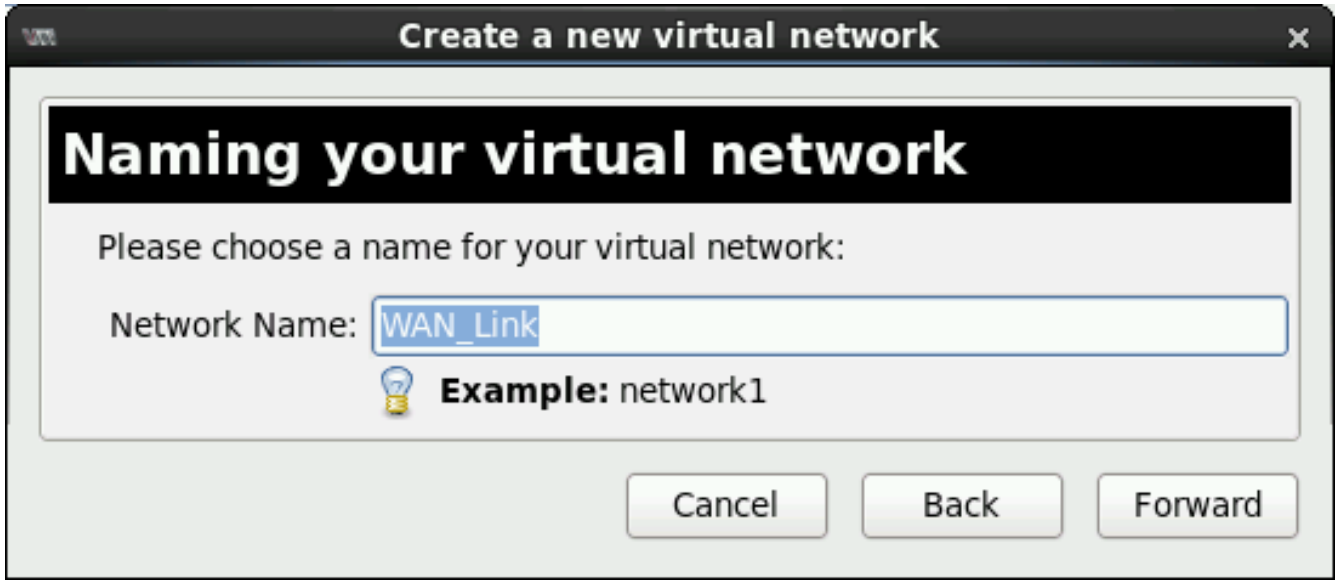

Bridge configuration
Bridge configuration
Forward delay:
0
seconds
Enable STP:
OK

Configure Virtual Networks

From ***Network Interfaces*** tab, switch to ***Virtual Networks*** tab. Click the Stop Interface button  to stop the ***default*** virtual network. Untick / Uncheck the ***Autostart*** option to set the option to ***Never***.

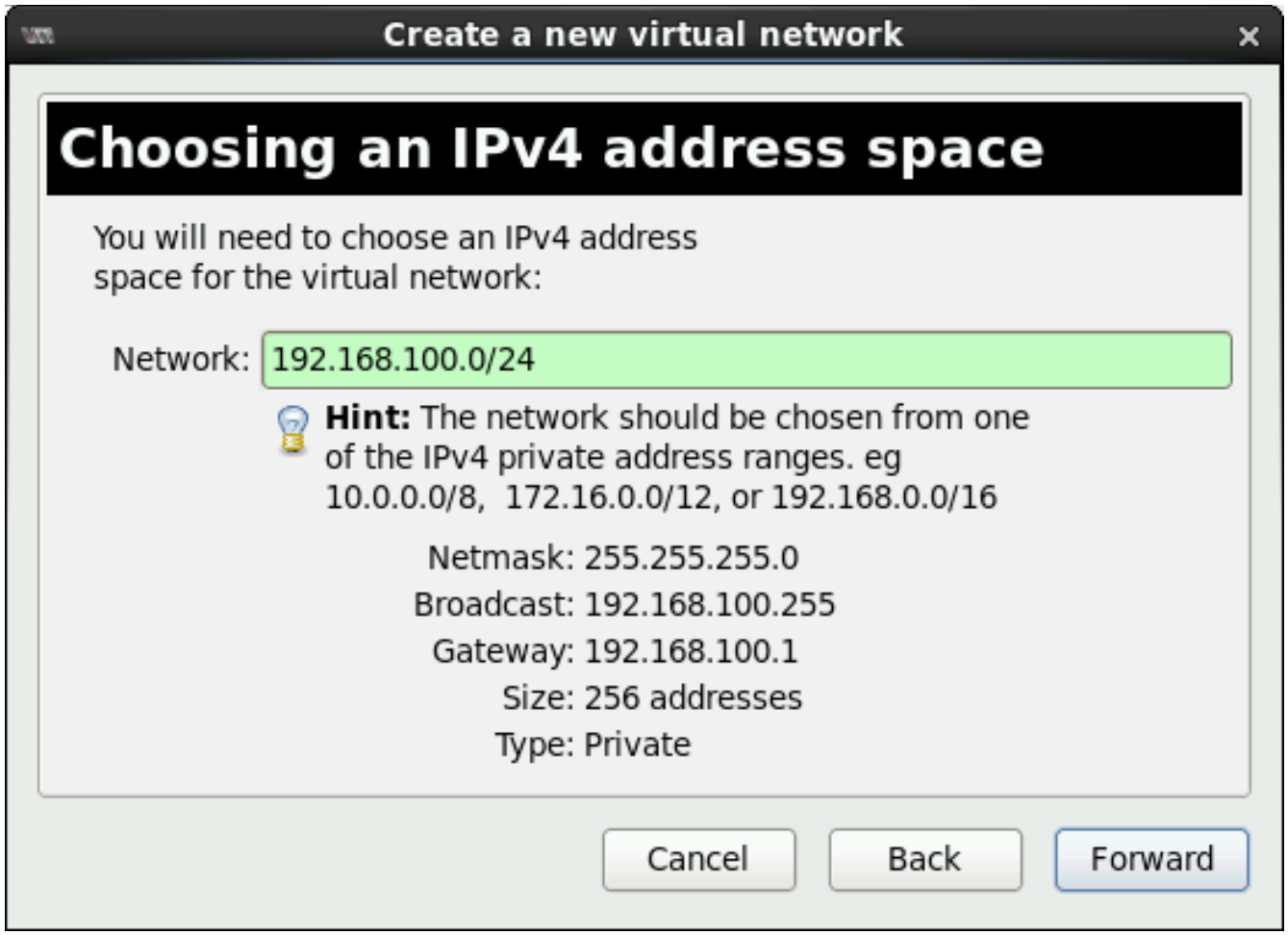
Adding Virtual Networks

Click the ***Add Network*** button  to add a new entry. Click the ***Forward*** button and set the ***Network Name*** to ***WAN_Link***.

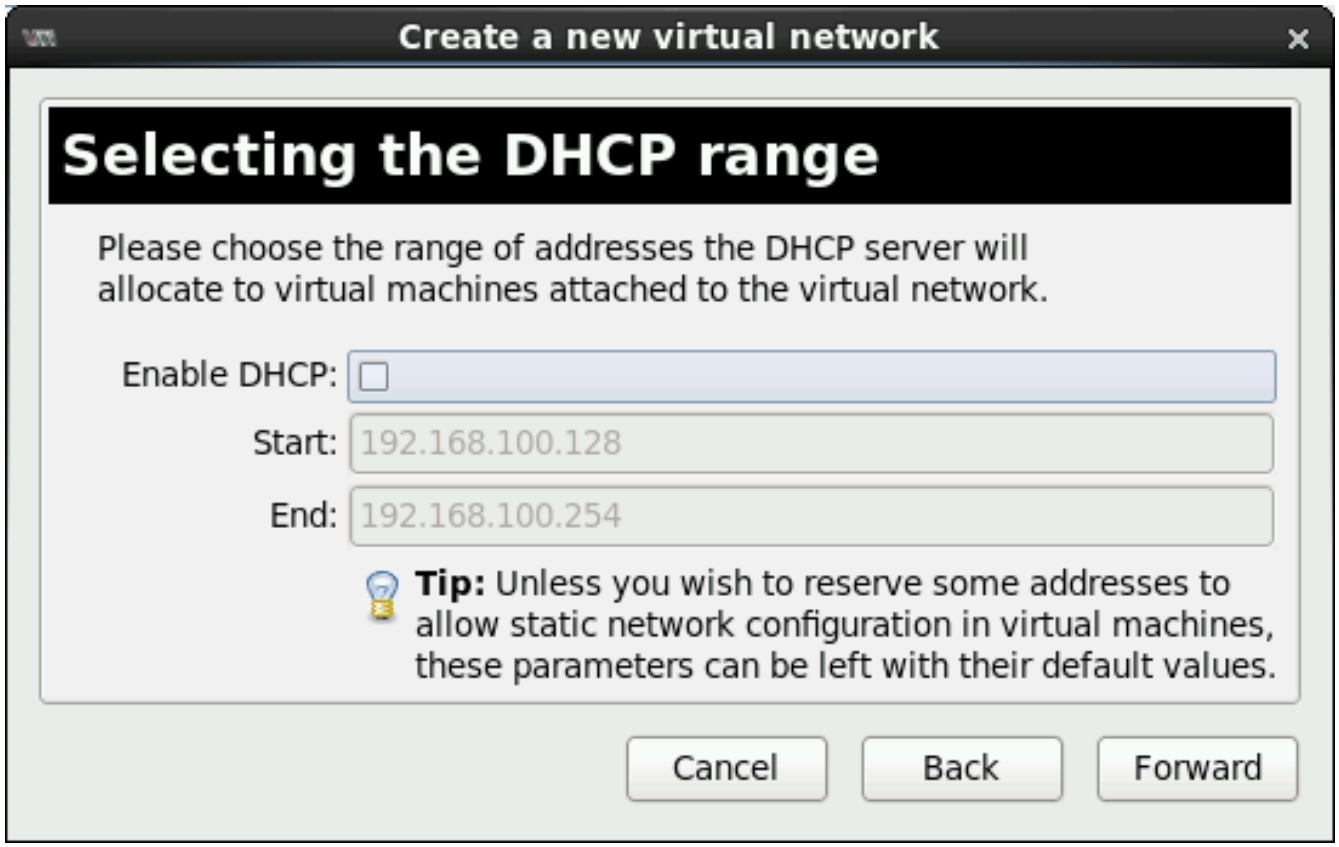


Click the ***Forward*** button to continue.

Set or Leave the ***Network*** value to/as **192.168.100.0/24** and click the ***Forward*** button.



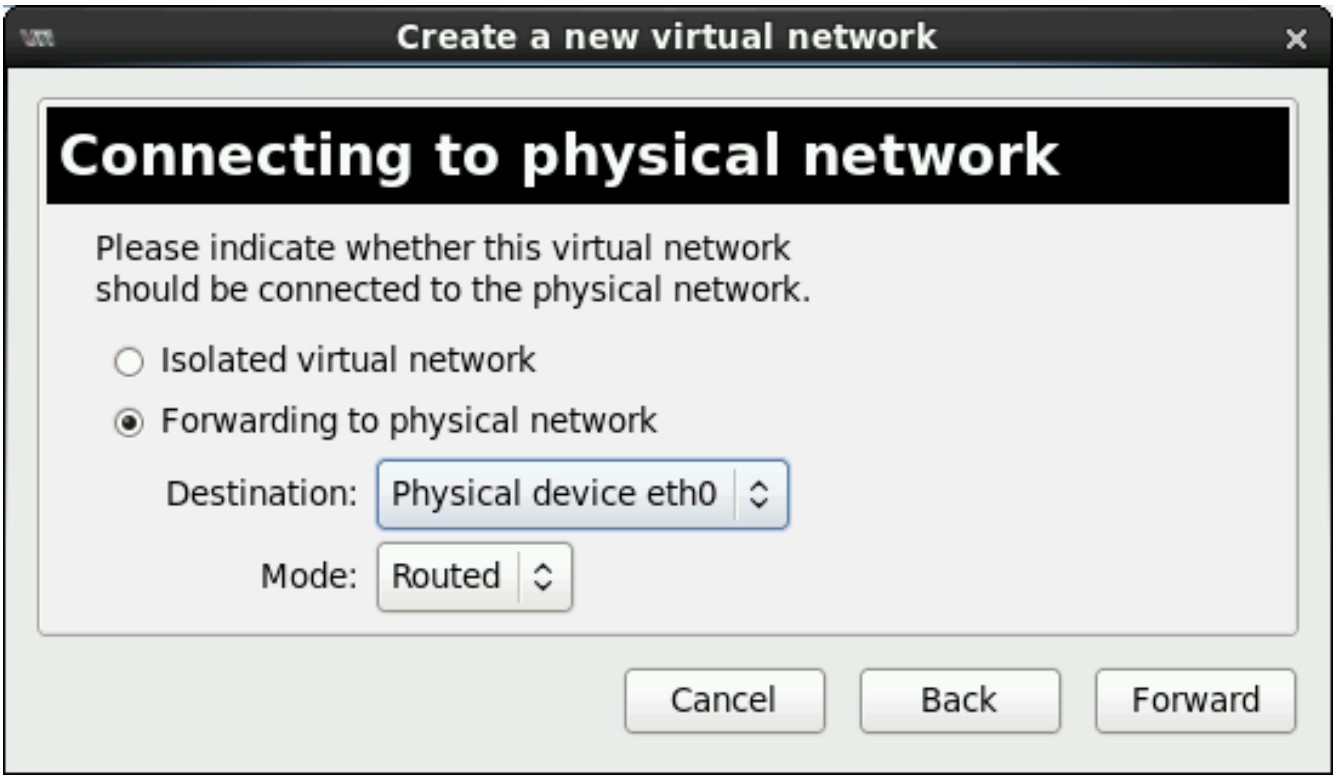
Untick / Uncheck ***Enable DHCP*** and click the ***Forward*** button.



Select ***Forwarding to physical network***

Destination: Physical device eth0

Mode: Routed



Click the ***Forward*** button to continue. Review the settings and click the ***Finish*** button to complete the process.

Add a new network by repeating the same process outlined in Adding Virtual Networks with the following information:

Network Name: ***Branch_LAN***

Network: ***192.168.200.0/24***

Enable DHCP: ***Untick*** / ***Uncheck***

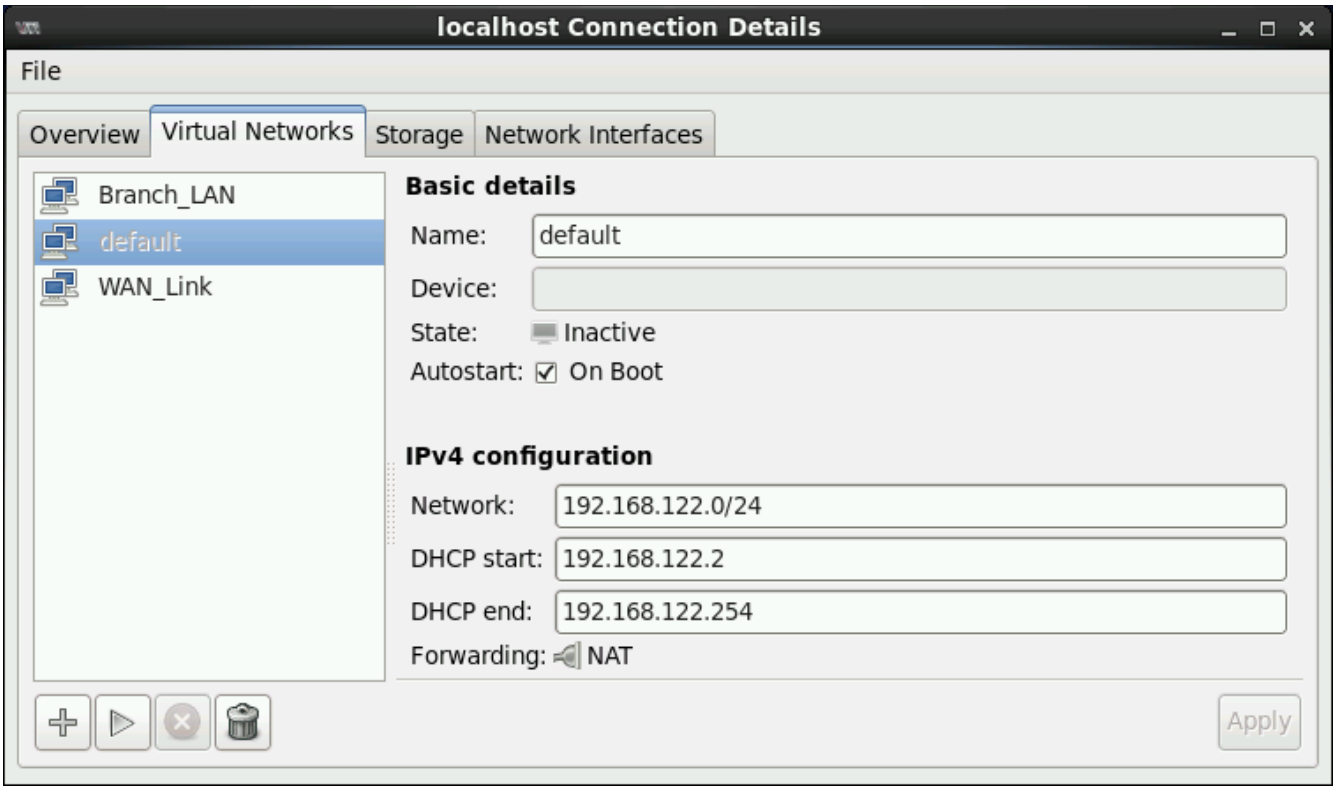
Connecting to physical network:

Forwarding to physical network

Destination: ***Physical device eth0***

Mode: ***Routed***

Once done, two new entries should appear under ***Virtual Networks***.



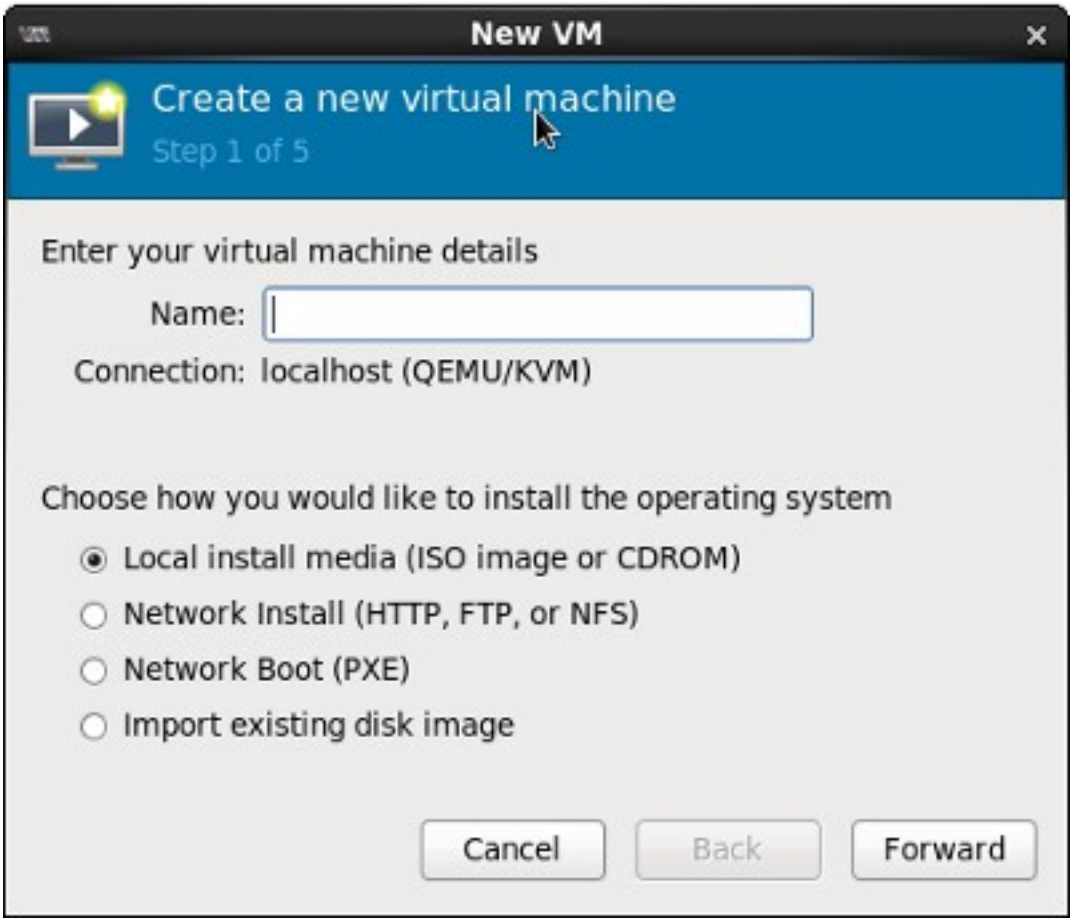
Set up and Configure Wanos Appliance

After downloading Wanos ***Raw Disk Image*** from the website, the file is stored in zip format. Use the built in extraction tool provided in CentOS or use the p7zip tool to extract the .img file to your preferred directory.

Launch Virtual Machine Manager from ***Applications*** > ***System Tools*** > ***Virtual Machine Manager***

Creating a Wanos Virtual Machine

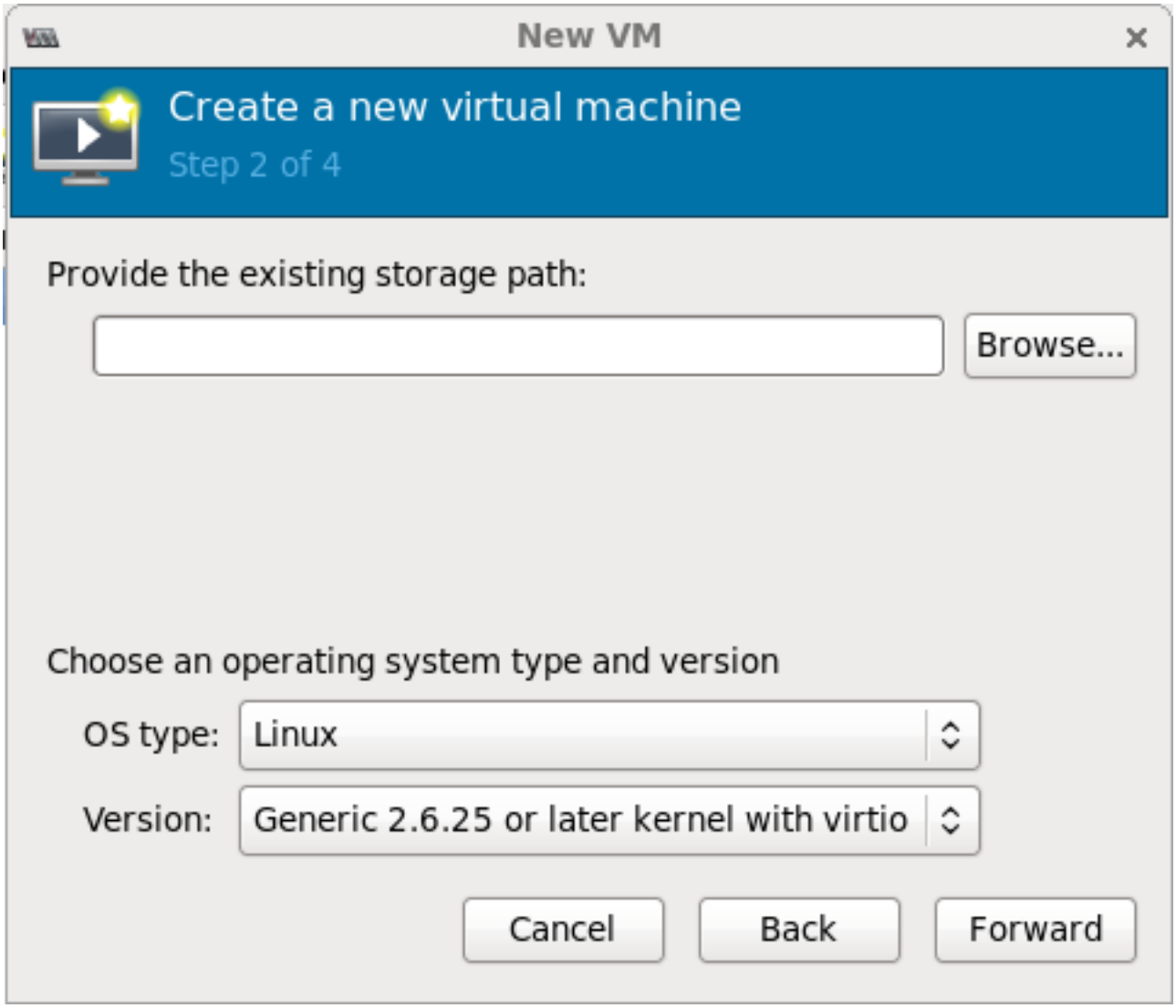
Click the ***Create a new virtual machine*** button  . Set the ***Name*** to ***Wanos-HQ***, select ***Import existing disk image*** and click the ***Forward*** button.



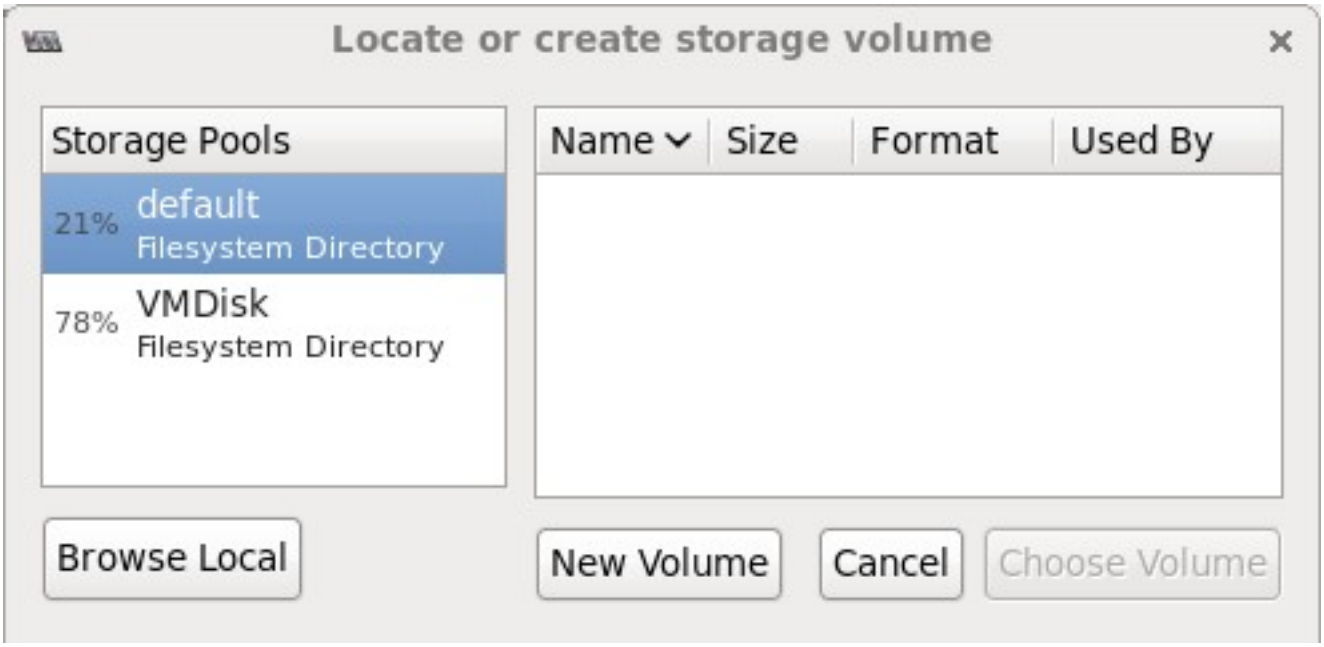
Select ***Linux*** as the ***OS type*** and ***Generic 2.6.25 or later kernel with virtio*** as the ***Version***. Click the ***Forward*** button.

Click the ***Browse*** button under ***Provide the existing storage path.***

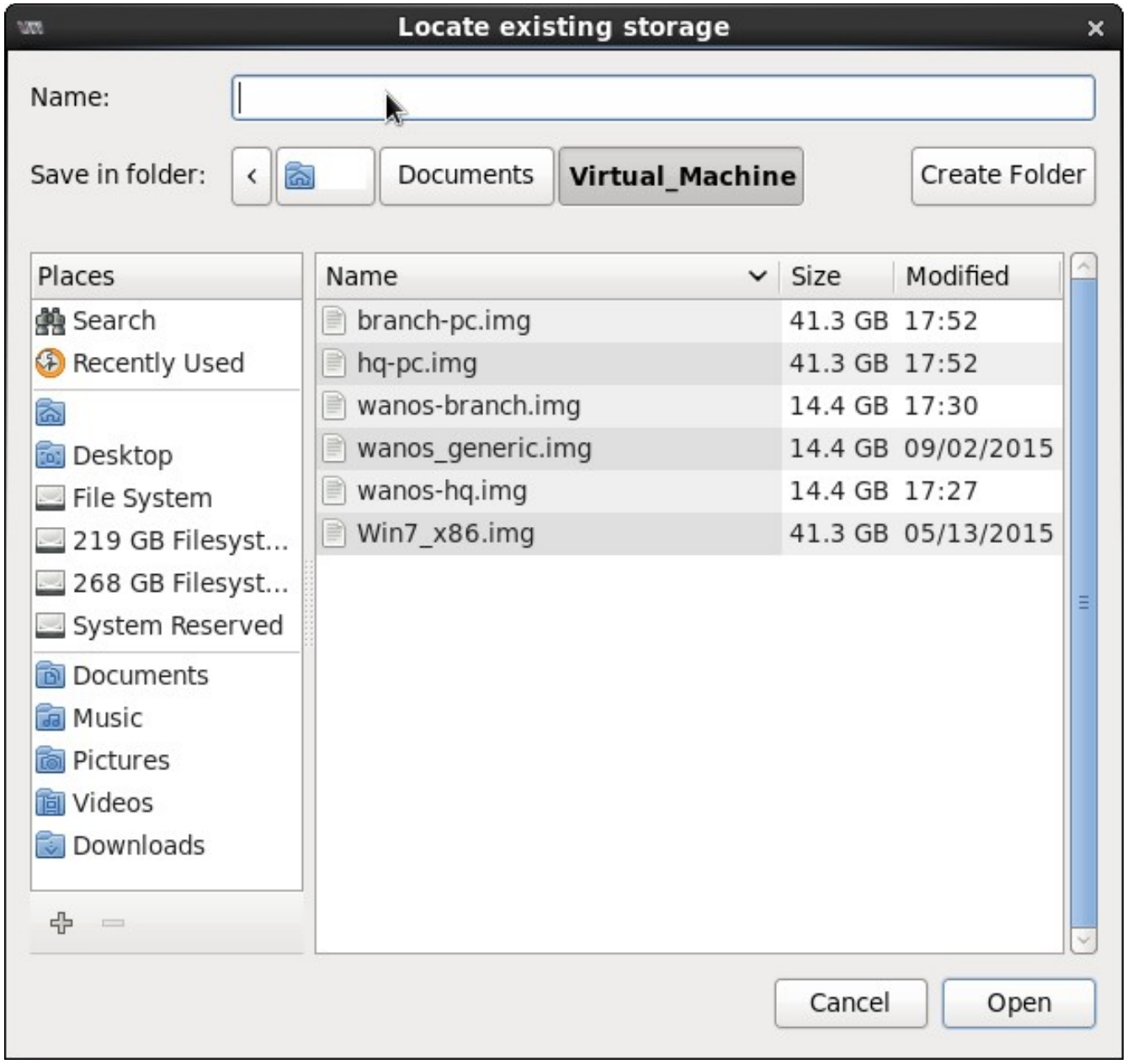
Note that the zip file was extracted and duplicated prior to this step. The files were renamed to ***wanos-hq.img*** *and* ***wanos-branch.img****.*



Click the ***Browse Local*** button.

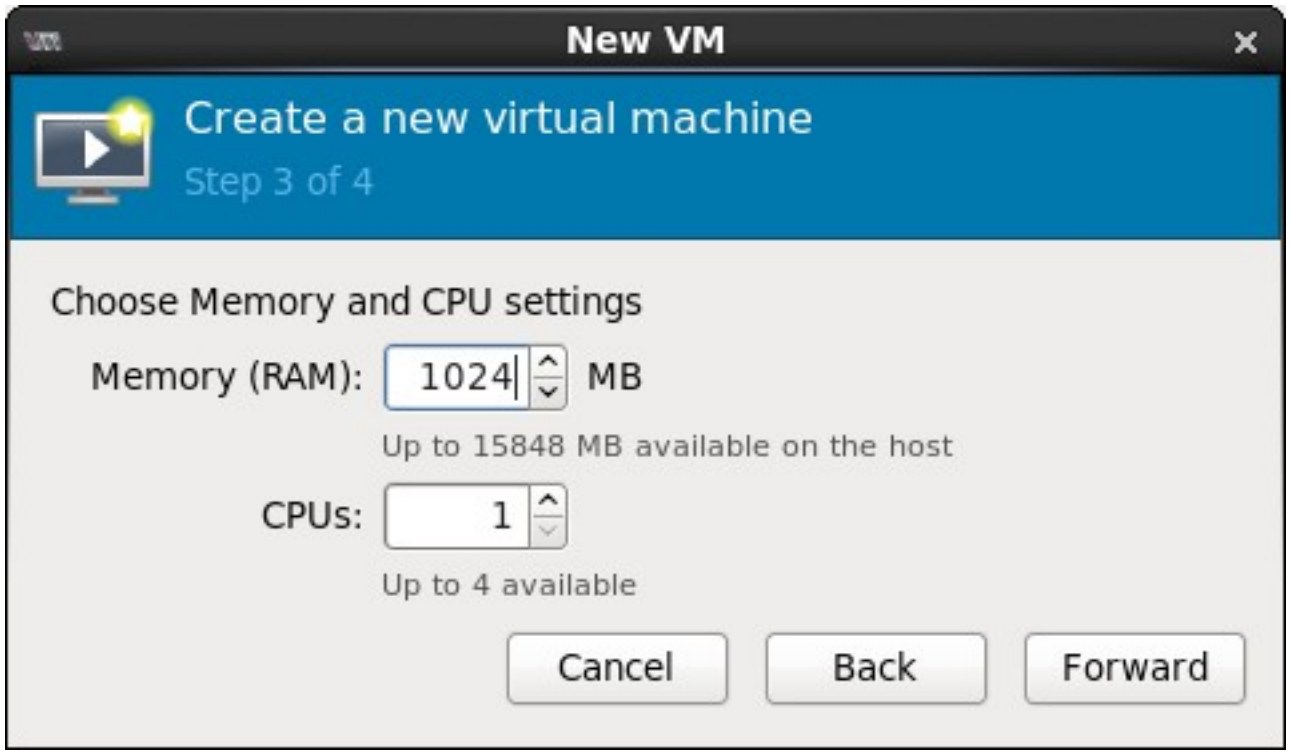


Navigate to the directory where ***wanos-hq.img*** is stored.



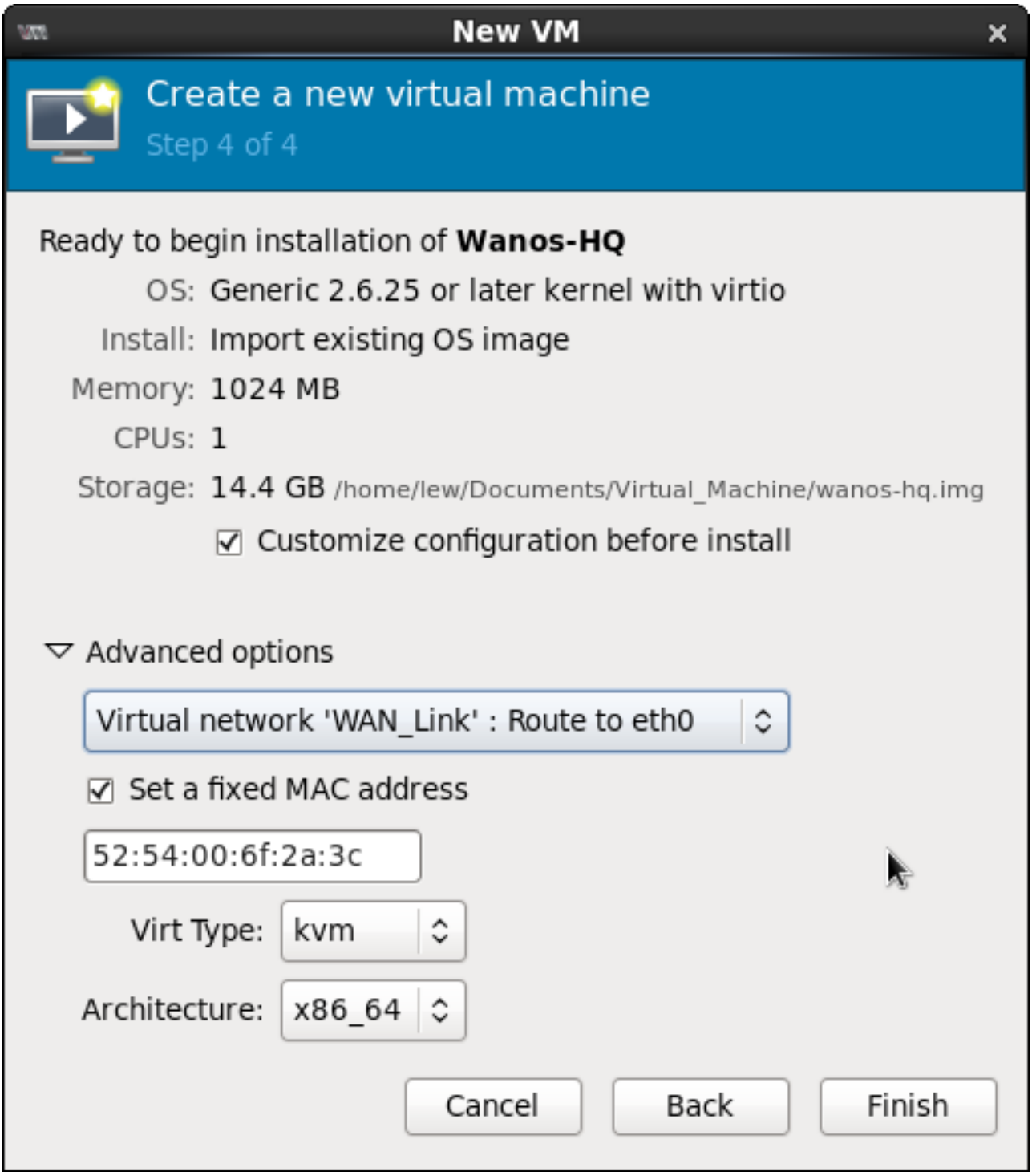
Click the ***Open*** button, select ***Choose Volume*** and click the ***Forward*** button to continue.

Leave or set the value of ***Memory (RAM)*** as ***1024*** MB and ***CPUs*** to ***1***.

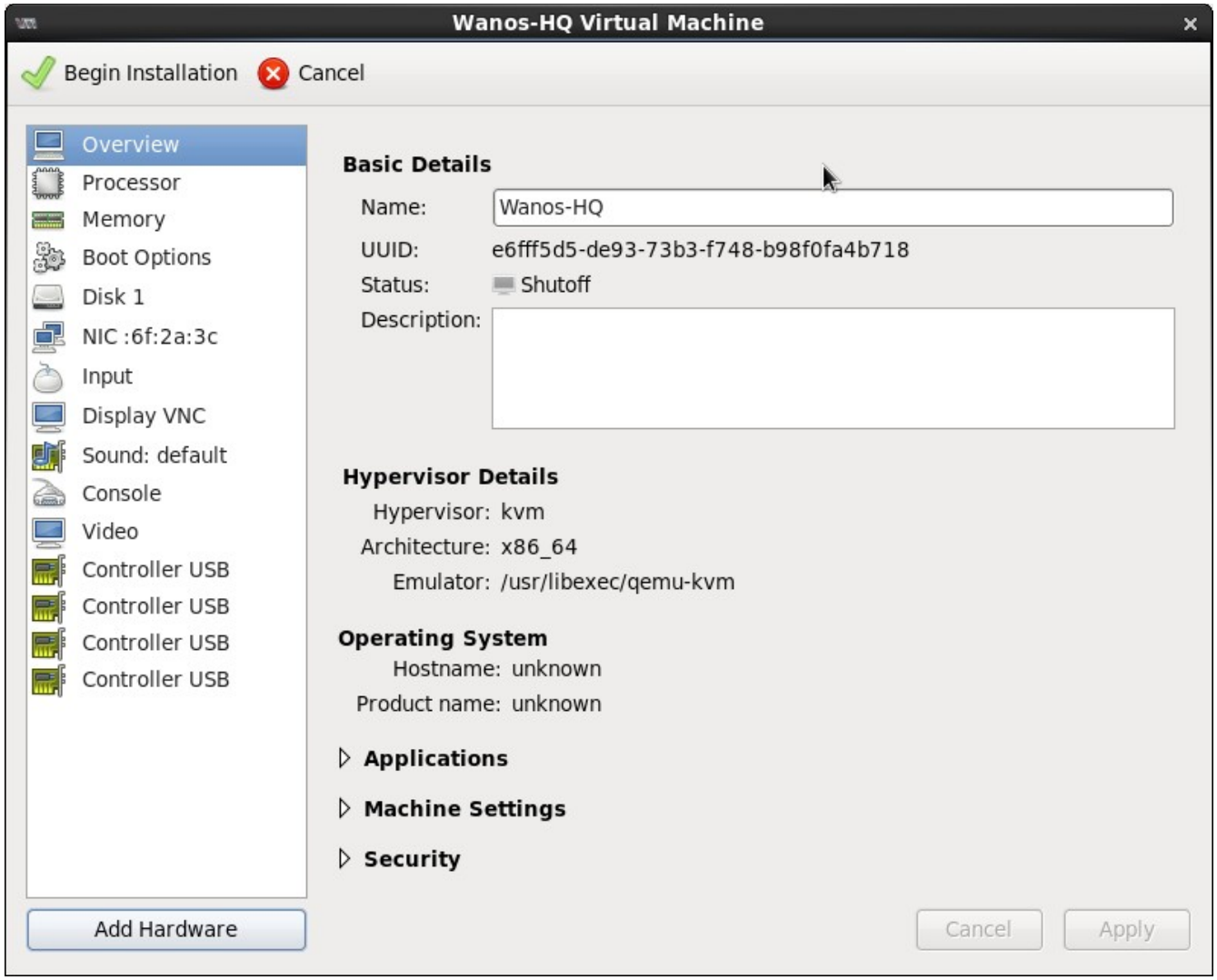


Click the ***Forward*** button to continue.

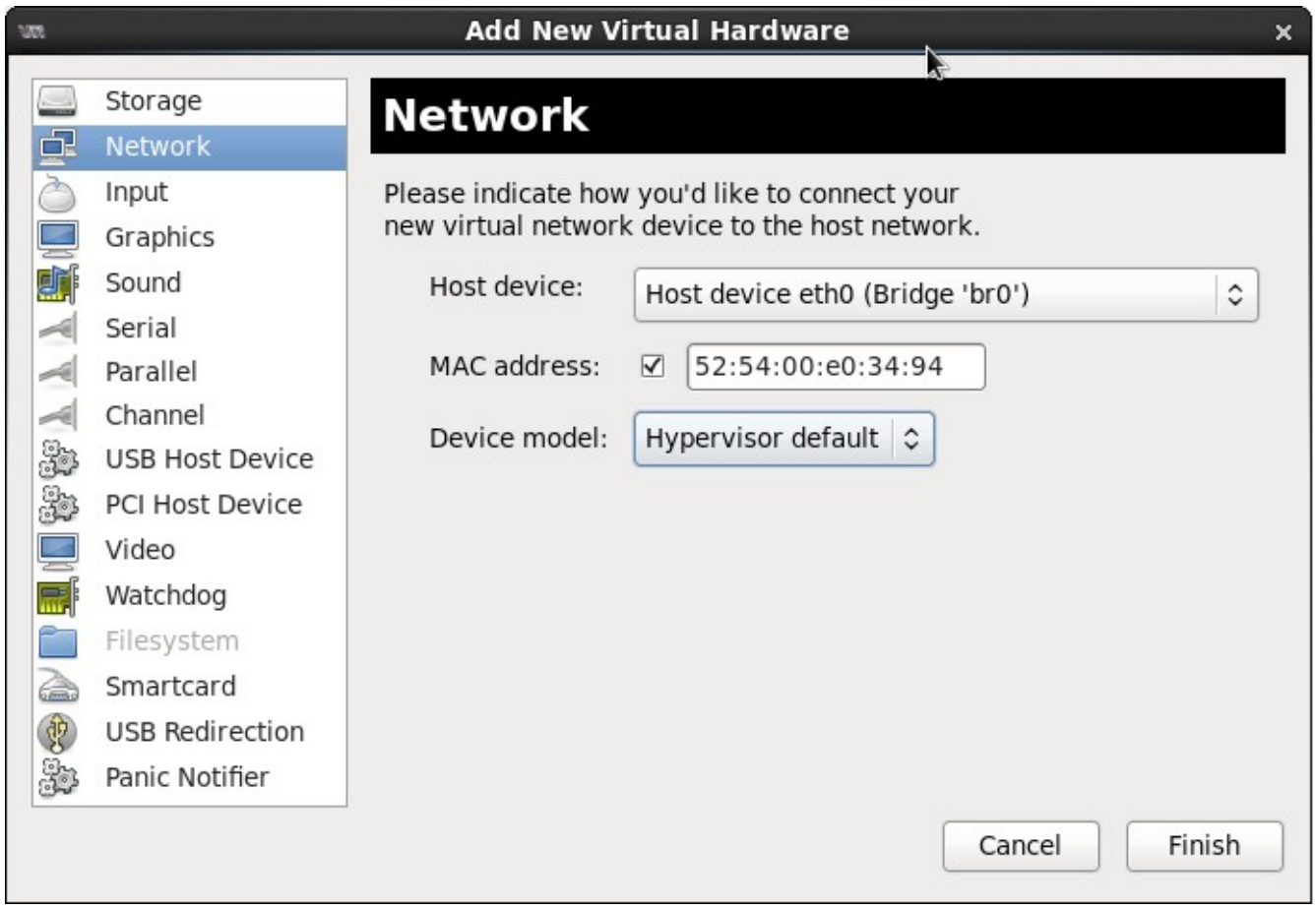
Tick / Check on ***Customize configuration before install***. Expand ***Advanced options*** select WAN_Link from the drop down list. Make sure ***Virt Type*** is ***KVM*** and ***Architecture*** is ***x86_64***. Click the ***Finish*** button to create the VM.



Click the ***Add Hardware*** button to add the second NIC.



Set the ***Host device*** to ***Bridge br0*** from the drop down menu and click the ***Finish*** button.



Click the ***Begin Installation*** button to start the virtual machine.

The same step can be used as outlined in Creating a Wanos Virtual Machine to create Wanos-Branch Virtual Machine with the following information:

Name: ***Wanos-Branch***

Import existing image > Browse and locate ***wanos-branch.img***

OS Type: ***Linux***

Version: ***Generic 2.6.25 or later kernel with virtio***

Memory (RAM): ***1024***

CPUs: ***1***

Tick / Check ***Customize configuration before install***

Advanced Options > ***WAN_Link*** (drop down menu)

Virt Type: ***kvm***

Architecture: ***x86_64***

Add Hardware > ***Network*** > ***Host device***: ***Branch_LAN***

Configuring Wanos Appliance to work on your network

By default, the Wanos Virtual Machine is configured as follows:

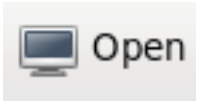
IP: ***192.168.1.200***

Address Mask: ***24***

Gateway Address: ***192.168.1.1***

Wanos-HQ does not need to be configured if the physical network is configured as 192.168.1.0/24 network with the gateway being 192.168.1.1. If the network is different then follow the same steps outlined below and use ***192.168.1.200*** for the ***IP*** field.

This section guides the user in configuring ***Wanos-Branch*** Virtual Machine.

Ensure that both ***Wanos-HQ*** and ***Wanos-Branch*** are running. If not, select the target Appliance on your Virtual Machine Manager and click the ***Power on virtual machine*** button  then click the ***Show the virtual machine console and details*** button 

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The Virtual machine will go through the boot up process. Once the user is prompted with the information:

```
############################
    Press Enter to Login
############################
```

Press the Enter key and use the following information to log-in.

Username: ***tc***

Password: ***ChangeM3*** (the password is C@$e $enSiT!ve)

Once logged in, type `wanos-cfg` to run the configuration utility and set the following information:

IP: ***192.168.1.201***

Address Mask: ***24***

Gateway Address: ***192.168.1.1***

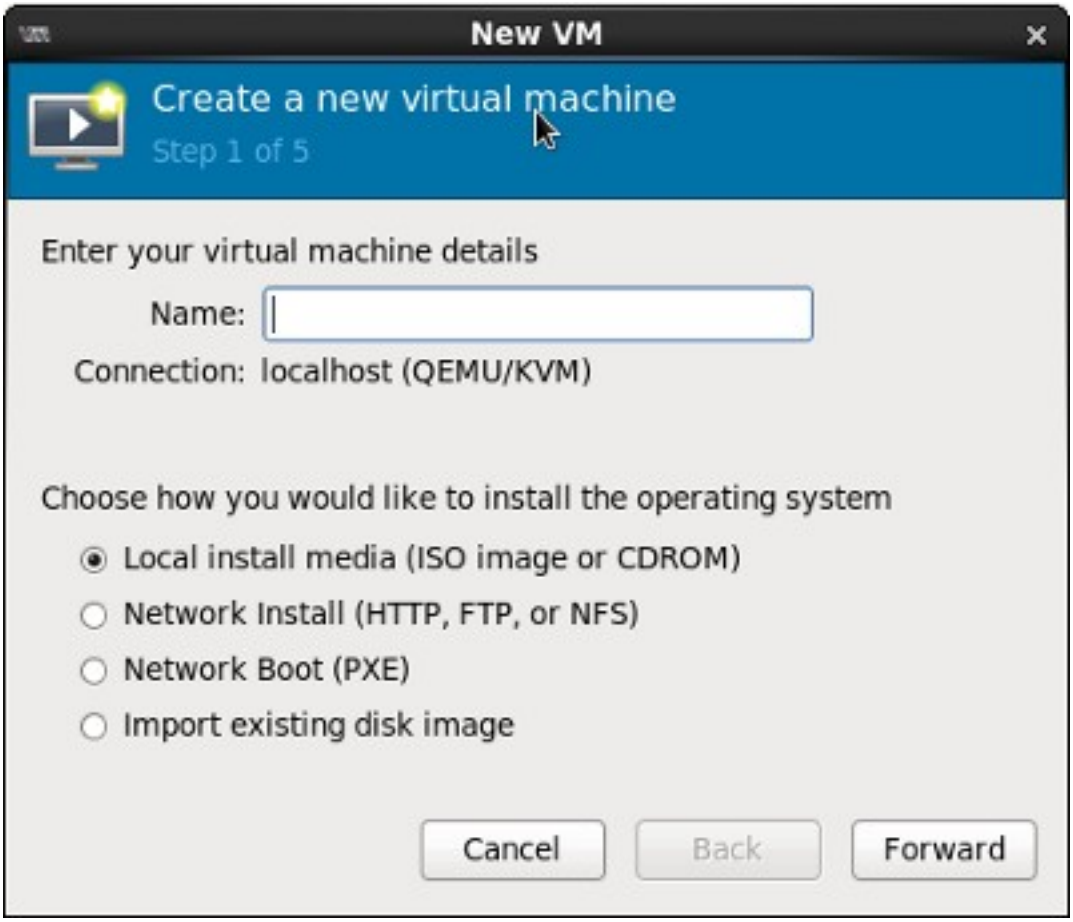
A prompt will ask you if you want to save the new settings. Type ***y*** to confirm.

Set up and Configure Client-PC Virtual Machine

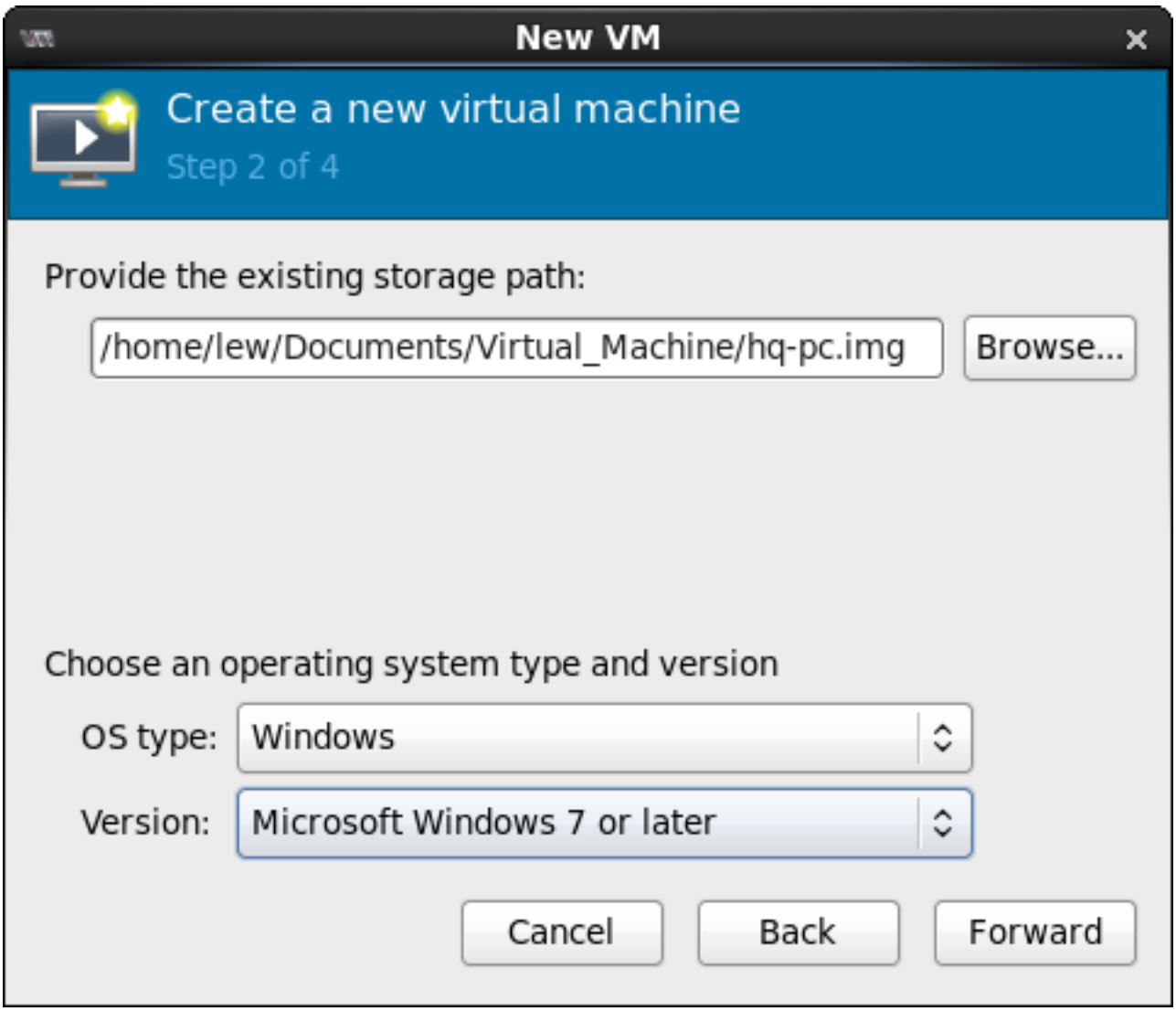
In this section, the user will set up a Windows-based virtual machine. Two virtual machines are needed to act as a workstation PC; one is for the WAN_Link while the second virtual machine will work for the Branch_LAN network. A 32-bit Windows 7 .img file has been created for this lab but feel free to use whatever version of Windows is available to you.

Creating a Windows Virtual Machine

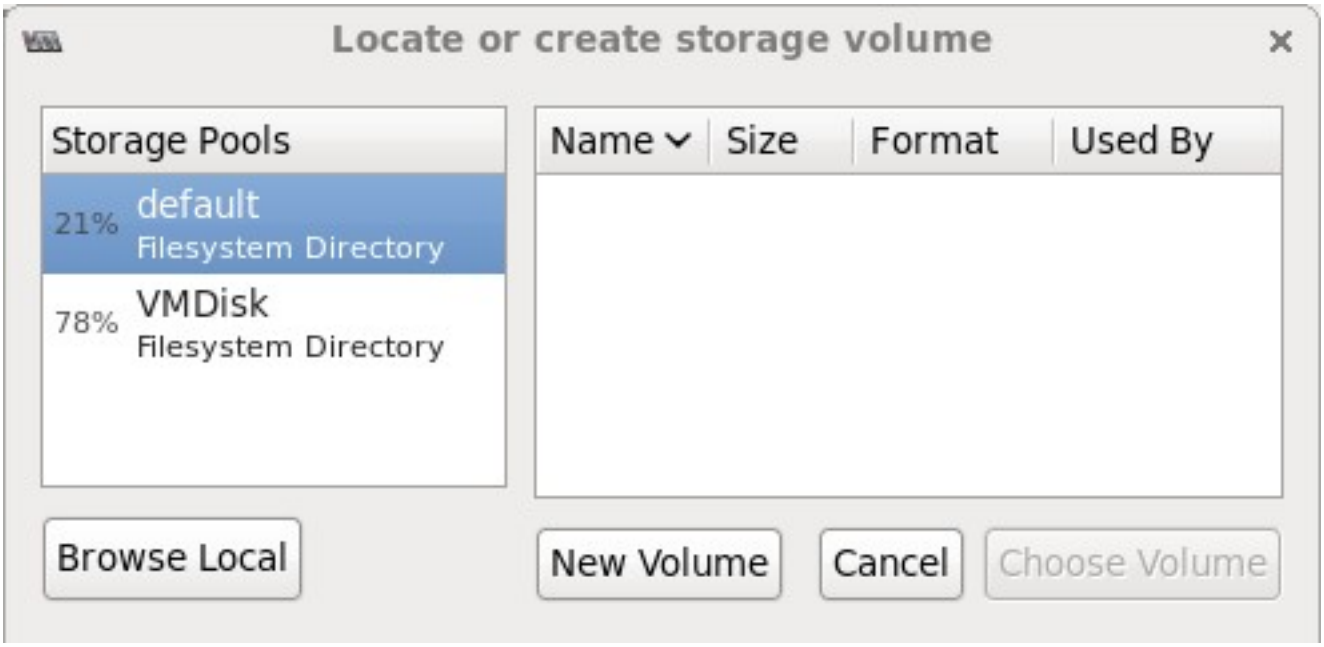
Click the ***Create a new virtual machine*** button  . Use ***HQ-PC*** as the ***Name*** of the virtual machine, select ***Import existing disk image*** and click the ***Forward*** button.



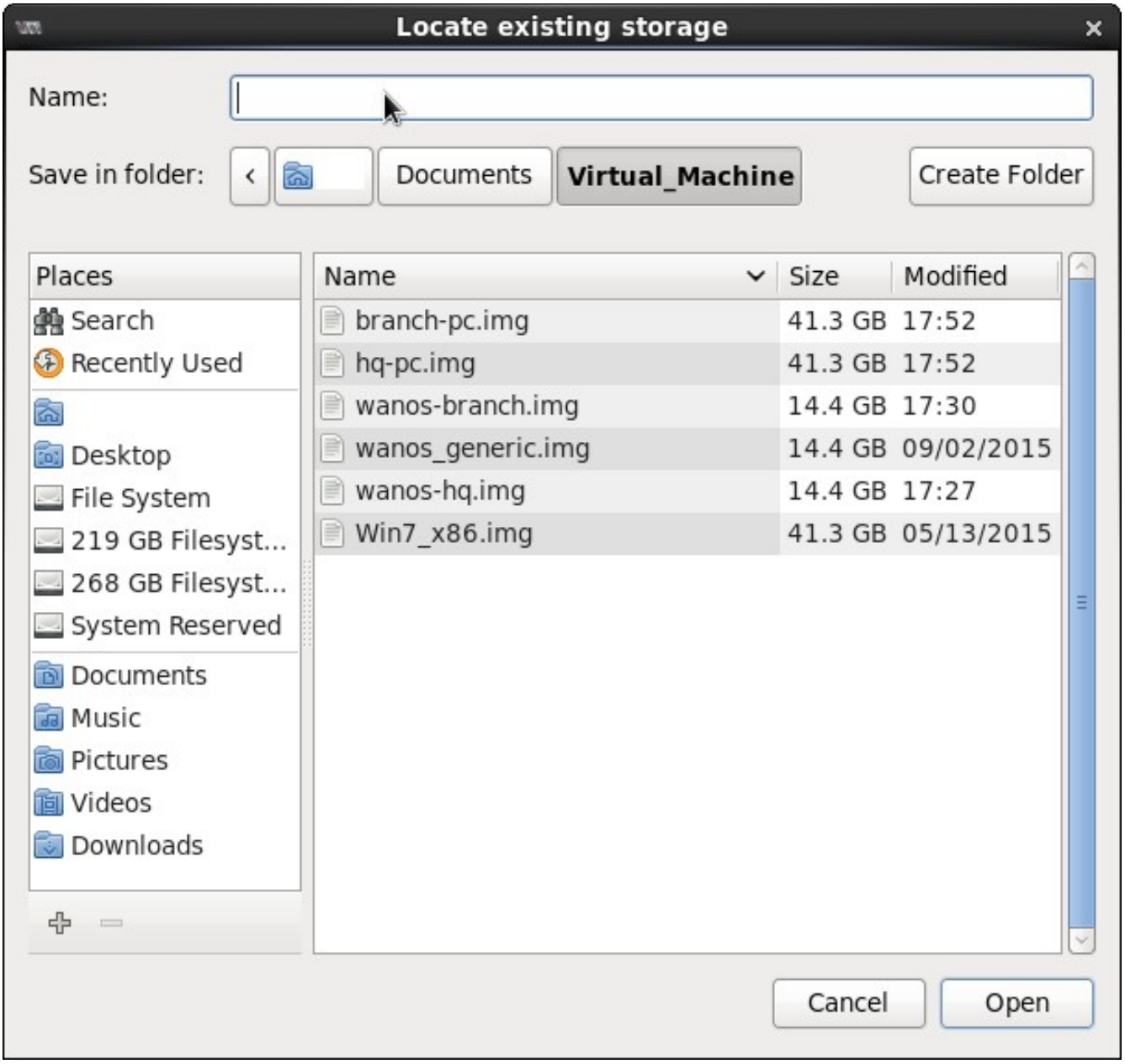
Select ***Windows*** as the ***OS type*** and ***Microsoft Windows 7 or later*** as the ***Version***. Click the ***Browse*** button under ***Provide the existing storage path***.



Click the ***Browse Local*** button.

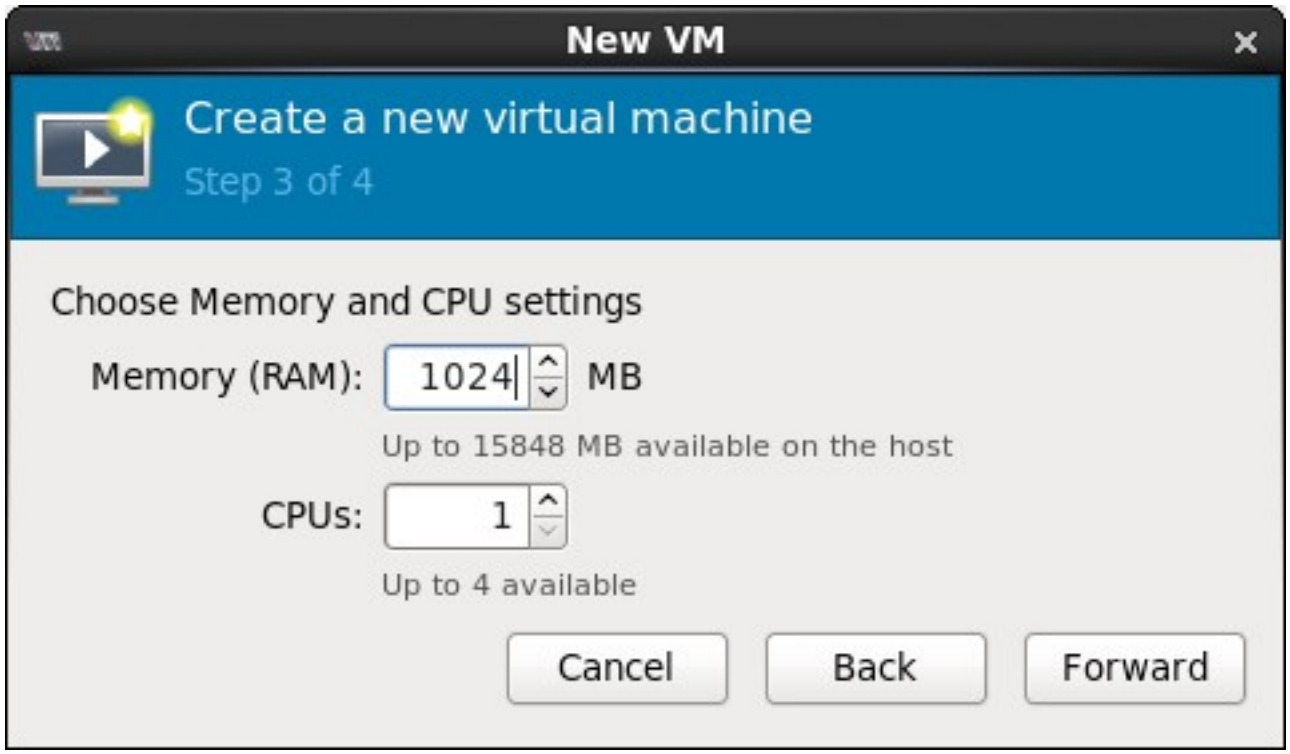


Navigate to the directory where ***hq-pc.img*** is stored.



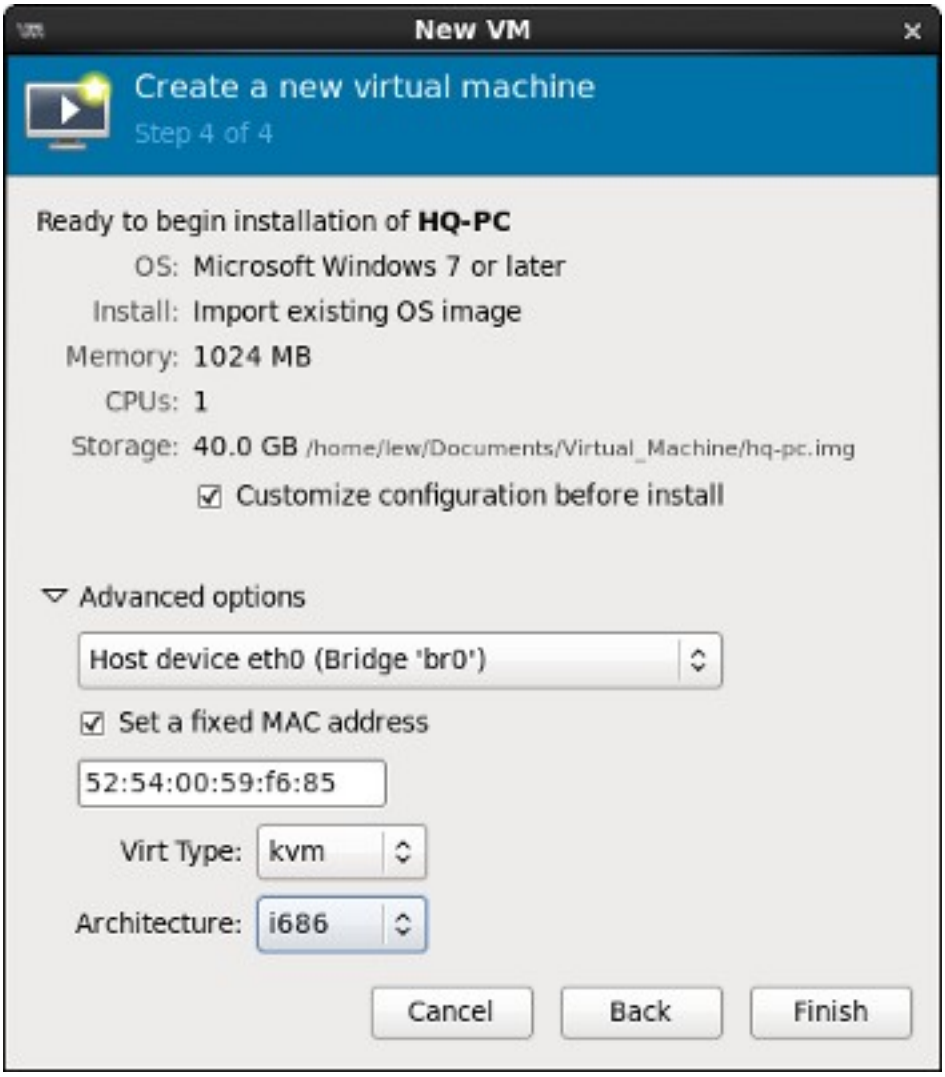
Click the ***Open*** button, select ***Choose Volume*** and click the ***Forward*** button to continue.

Leave the value of ***Memory (RAM)*** as ***1024*** MB and ***CPUs*** as ***1***.

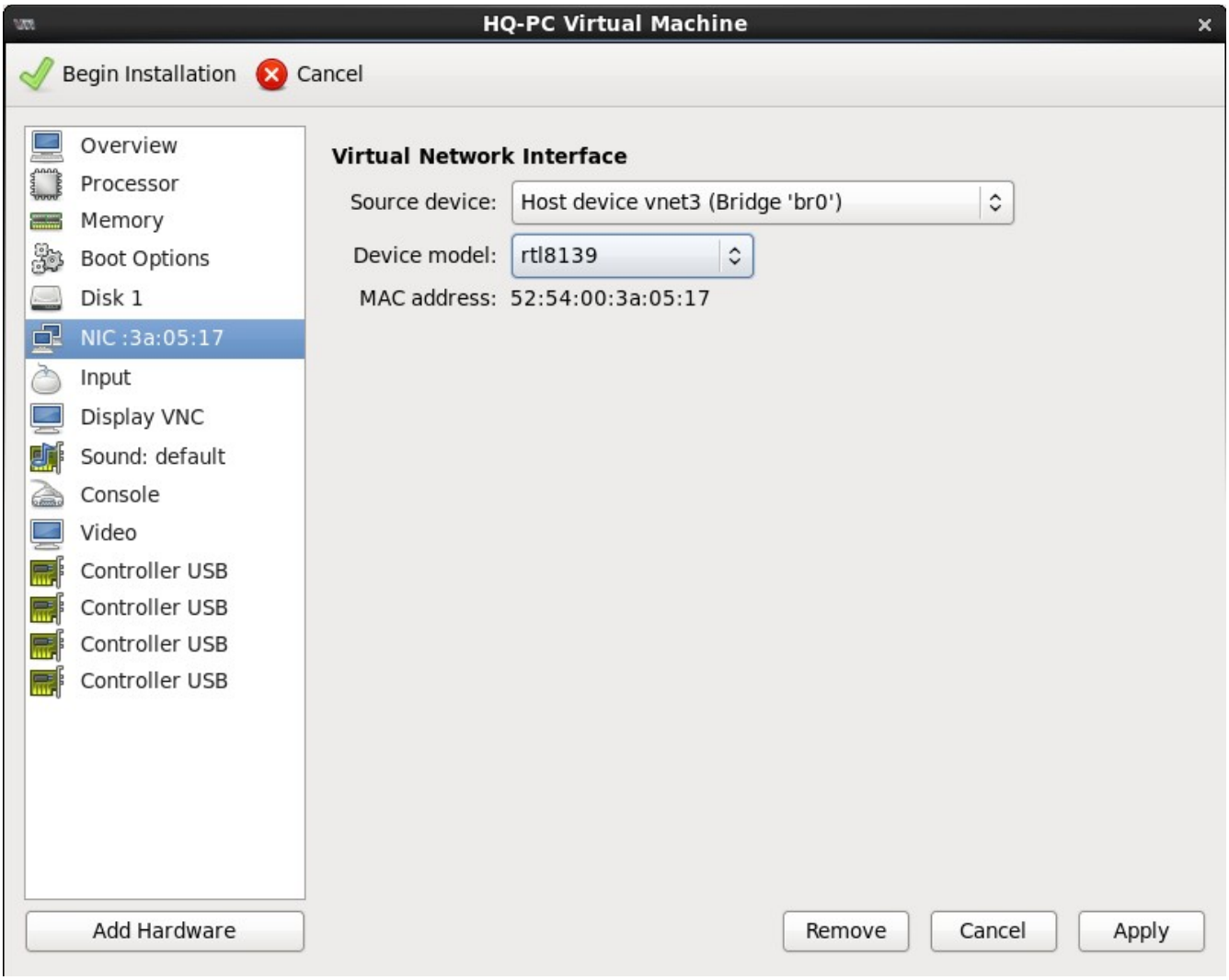


Click the ***Forward*** button to continue.

Tick / Check on ***Customize configuration before install***. Expand ***Advanced options*** and select ***Bridge br0*** from the drop down list. Make sure ***Virt Type*** is ***kvm*** and ***Architecture*** is ***i686***.



Select ***NIC*** and set the ***Device model*** to ***rtl8139***. Click the ***Apply*** button to save the changes and click ***Begin Installation*** to start the virtual machine.



Click the ***Begin Installation*** button to start the virtual machine.

The same step can be used, as outlined in Creating a Windows Virtual Machine, to create Wanos-Branch Virtual Machine with the following information:

Name: ***Branch-PC***

Import existing image > Browse and locate ***branch-pc.img***

OS Type: ***Windows***

Version: ***Microsoft Windows 7 or later***

Memory (RAM): ***1024***

CPUs: ***1***

Tick / Check ***Customize configuration before install***

Advanced Options > ***Branch_LAN*** (drop down menu)

Virt Type: ***kvm***

Architecture: ***i686***

NIC > ***Device model***: ***rtl8139***

Configure Wanos web-based GUI for testing simulation

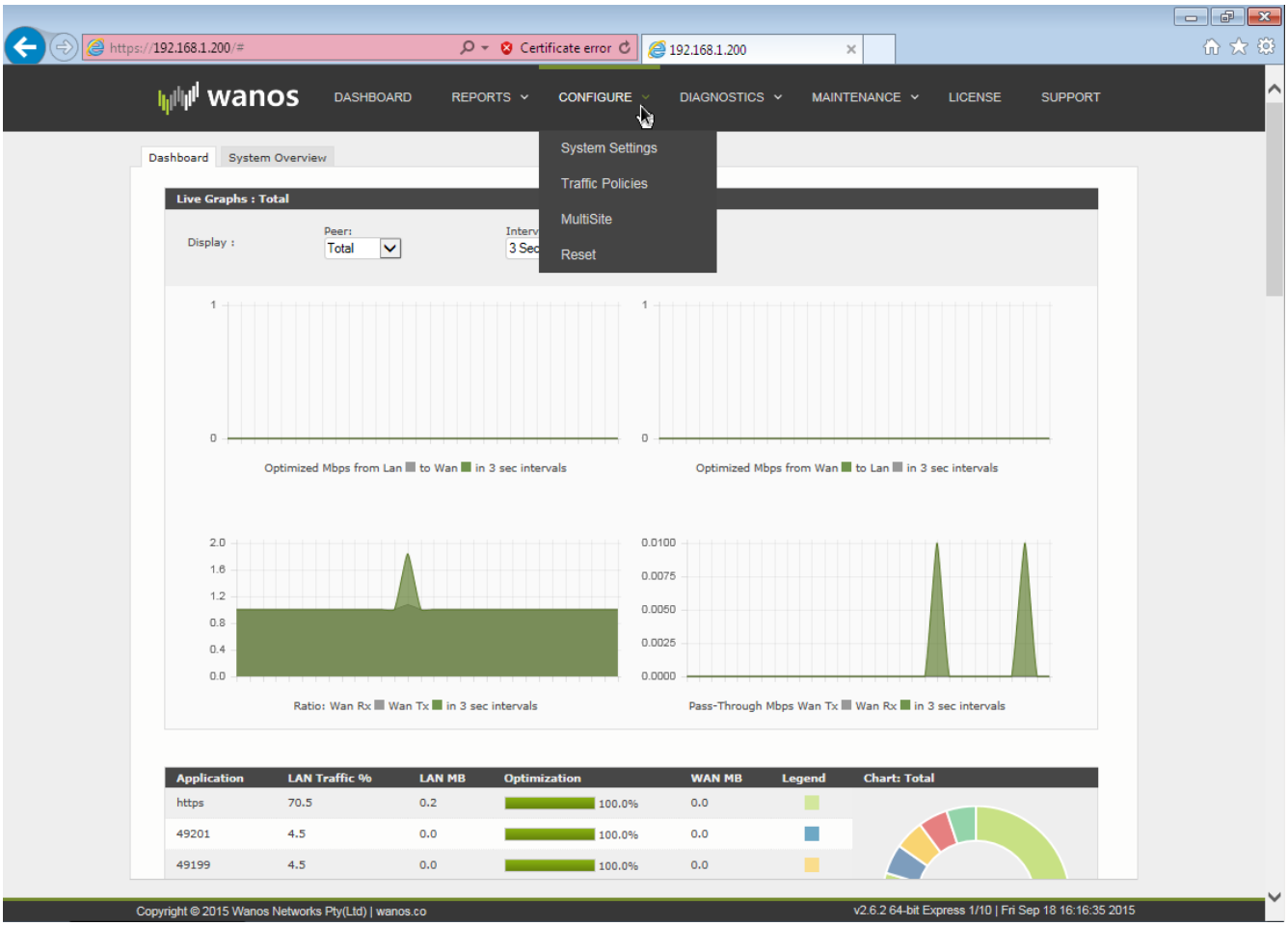
Open ***Internet Explorer*** on your ***HQ-PC*** virtual machine. Type ***192.168.1.200*** on the address bar and enter the following log in credential:

User name: ***wanos***

Password: ***wanos***

Internet Explorer will prompt a problem with the website's security certificate. Click ***Continue to this website (not recommended)*** and enter the same user name and password listed above.

The user will be redirected to the Wanos ***Dashboard***. Go to ***Configure*** > ***System Settings***.

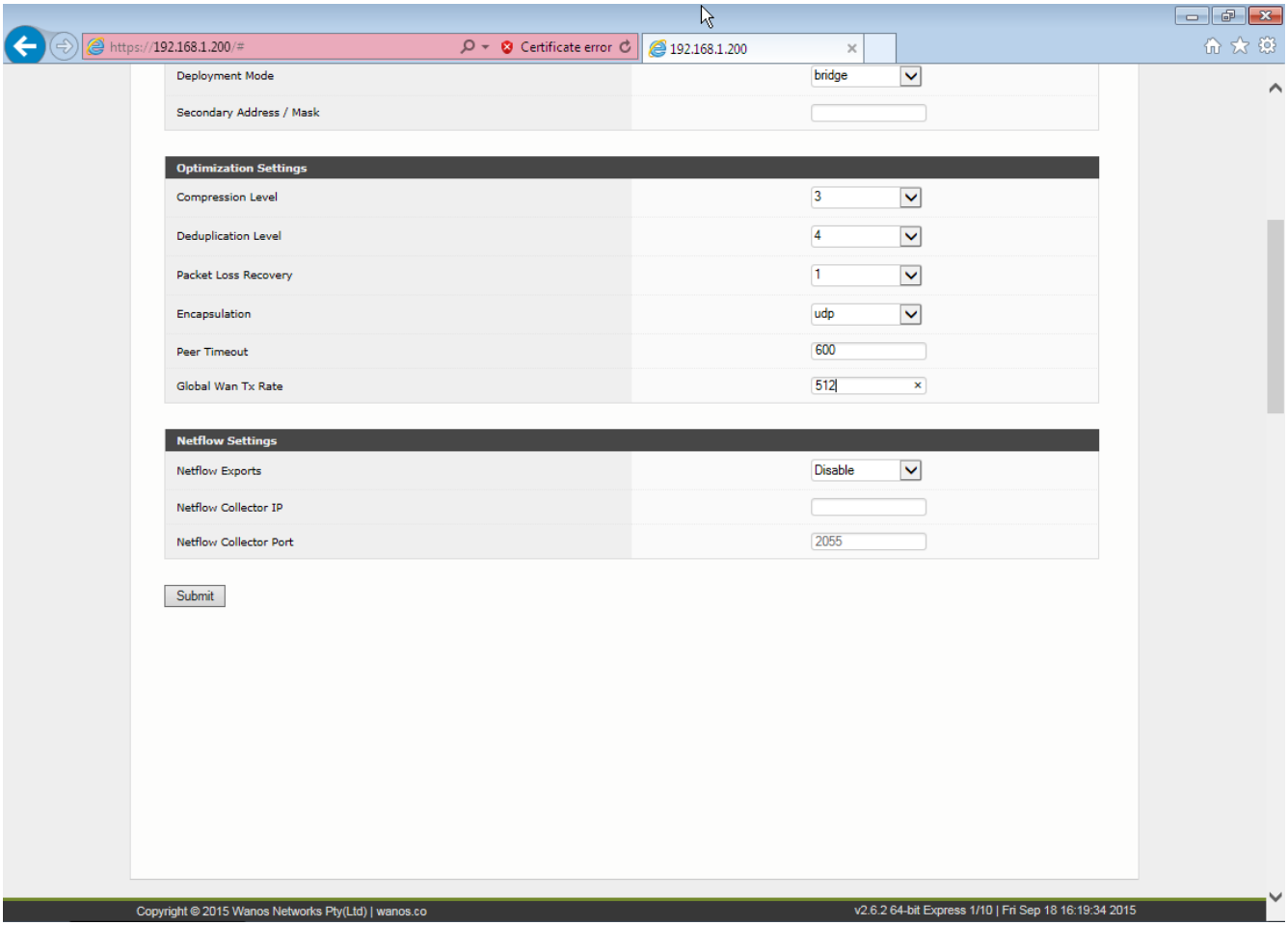


Under ***Optimization Settings***, set the following parameters:

Encapsulation: ***UDP***

Peer Timeout: ***600***

Global WAN Tx Rate: ***1024***



Click the ***Submit*** button to commit the changes. Wanos will apply the new configuration and restart.

Apply the same settings to Wanos-Branch Virtual Machine. Use the following IP address after launching ***Internet Explorer*** on ***Branch-PC***:

192.168.1.201

and follow the instructions outlined in Configure Wanos web-based GUI for testing simulation.