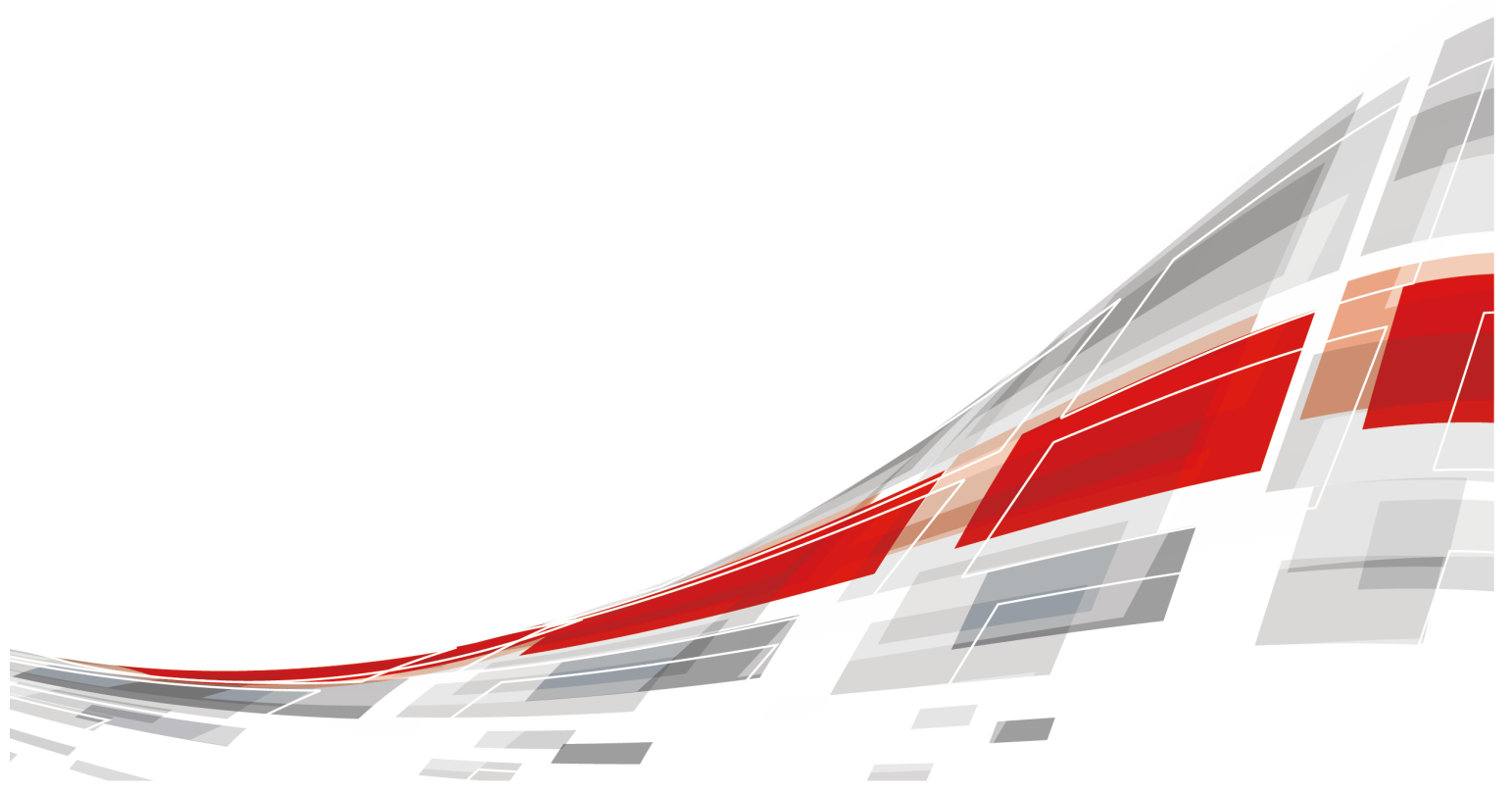


**XP210 NIC**

# **User Guide**

**Issue**            02  
**Date**             2024-06-27



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# About This Document

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## Purpose

This document describes the appearance, features, installation, and upgrade of the XP210 NIC card.






## Intended Audience

This document is intended for:

- Enterprise administrators
- Enterprise device users

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 <b>DANGER</b>	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 <b>NOTICE</b>	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. This symbol does not indicate human body injuries.
 <b>NOTE</b>	Supplements the important information in the main text. <b>NOTE</b> is used to address information not related to personal injury, equipment damage, and environment deterioration.

## Change History

Issue	Date	Description
02	2024-06-27	Added <a href="#">5 Config</a> .
01	2022-12-09	This issue is the first official release.

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# 1 Getting to Know the XP210

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[1.1 Overview](#)

[1.2 Appearance](#)

[1.3 Technical Specifications](#)

## 1.1 Overview

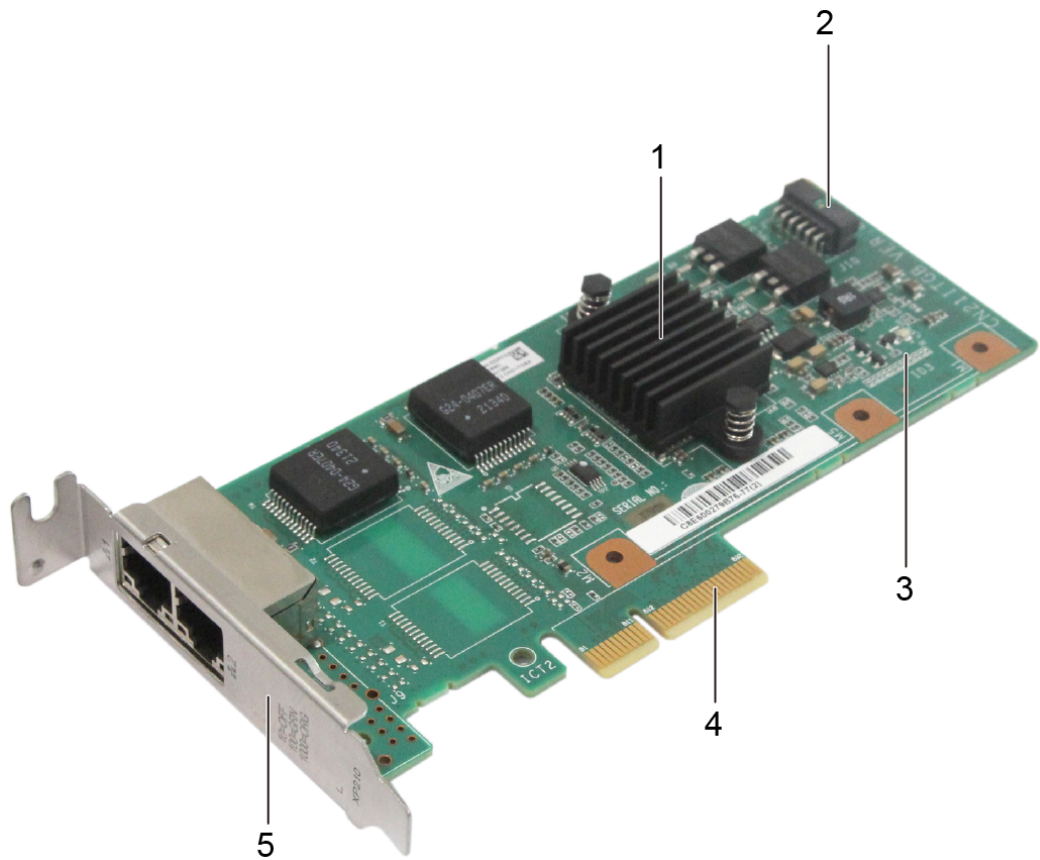
The XP210 is a GE NIC that provides two 1000BASE-T ports using RJ45 connectors. It is compatible with standard rack servers and high-density servers. The XP210 uses the Intel I350 chip, which integrates the media access control (MAC) and physical layer (PHY).

## 1.2 Appearance

### Components

[Figure 1-1](#) shows the components of the XP210.

**Figure 1-1** XP210 components



1	I350 (with a heat sink) <b>NOTE</b> The I350 is located below the heat sink.	2	NC-SI connector
3	Mainboard	4	PCIe edge connector
5	Bracket	-	-

**Table 1-1** describes the functions of the XP210 components.

**Table 1-1** XP210 component description

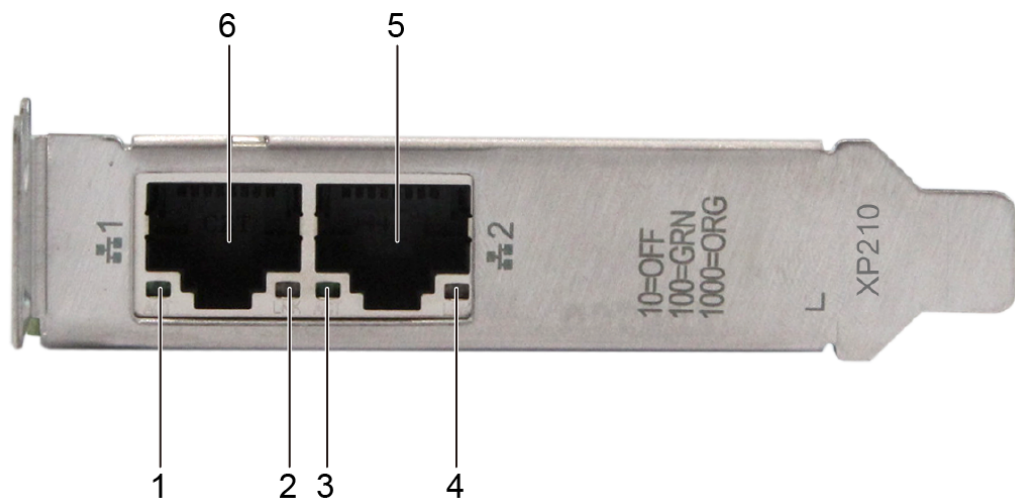
Name	Description
Mainboard	Includes a NIC module, network port module, and power module.
I350	NIC chip that implements NIC functions
Bracket	A half-height or full-height NIC bracket

Name	Description
PCIe edge connector	Connects the NIC to a PCIe slot.
NC-SI connector	Network controller sideband interface, which is used for NIC sideband communication.

## Panel

**Figure 1-2** shows the panel of the XP380.

**Figure 1-2** XP210 panel



1	ACT (Link/Active) indicator 1	2	LNK (Link Speed) indicator 1
3	ACT (Link/Active) indicator 2	4	LNK (Link Speed) indicator 2
5	RJ45 electrical port 2	6	RJ45 electrical port 1

## Indicators

The indicators on the XP210 display its working status. **Table 1-2** describes the indicators on the XP210 panel.

**Table 1-2** XP210 indicators

Indicator	Meaning	Color	Description
Link/Active indicator	Network connection status/ Data transmission indicator	Green	<ul style="list-style-type: none"> <li>Steady on: The link is connected but no data is being transmitted.</li> <li>Blinking: The link is connected and data is being transmitted.</li> <li>Off: The link is not connected.</li> </ul>
Speed indicator	Speed indicator	Orange/ Green	<ul style="list-style-type: none"> <li>Orange steady on: A 1 Gb/s link is connected.</li> <li>Green steady on: A 100 Mb/s link is connected.</li> <li>Off: The link is not connected.</li> </ul>

## 1.3 Technical Specifications

**Table 1-3** describes technical specifications for the XP210.

**Table 1-3** Specifications

Item	Description
Dimensions (H x W x D)	130 mm x 77 mm x 18 mm (including the front panel)
Form factor	HHHL PCIe card
Weight	0.3 kg (including the packaging)
Maximum power consumption	4.4 W
PCIe bandwidth	20 Gbit/s (PCIe 2.0 x4)
Port rate	1000 Mb/s, 100 Mb/s
Number of ports	2
Port protocol	Ethernet
Port type	Electrical port (RJ45)
Chip model/ Manufacturer	I350/Intel

# 2 Product Features

---

## [2.1 Feature List](#)

## [2.2 Features Description](#)

## [2.3 Standards and Protocols](#)

## 2.1 Feature List

The XP210 has the following features:

- PCIe 2.0 x 4 host port.
- Two RJ45 connectors at the rate of 100M and 1000M.
- Auto-negotiation, full-duplex (100M/1000M).
- Preboot execution environment (PXE), wake on LAN (WOL).
- Single-Root I/O Virtualization (SR-IOV).
- Virtual Machine Device Queues (VMDq).
- 802.1Q VLAN.
- Supports IP, TCP, and UDP checksum offloading.
- Supports Transmit Segmentation Offload (TSO).
- Supports Receive Side Scaling (RSS).
- Supports Jumbo Frames.
- MSI and MSI-X.
- Network Adapter Teaming.
- Supports network controller sideband interface (NC-SI) communication.

## 2.2 Features Description

### PXE

PXE is used for remote boot over the Ethernet or IP network. It enables users to connect to the remote PXE server for loading an OS.

## 802.1Q VLAN

The XP210 supports up to 4094 VLANs. The VLAN IDs are integers ranging from 1 to 4094.

The XP210 port does not add or delete tags to packets in the sending direction. The **VLAN\_ID** is specified by the OS or Hypervisor. The XP210 port only transparently transmits packets. The XP210 port does not add or delete tags to packets in the reception direction. Instead, the packets are transparently transmitted to the upper layer (OS or Hypervisor).

## SR-IOV

The XP210 ports support the SR-IOV function. The NIC supports a maximum of 16 (2 x 8) VFs, and the maximum number of supported VFs per port is limited to 7 by the driver. The VFs generated from each physical port can be added and mapped to virtual machines (VMs).

## Auto negotiation

In 1000BASE-T mode, IEEE 802.3 defines that the auto-negotiation mode must be used.

## NC-SI

The XP210 supports NC-SI sideband communication. The baseboard management controller (BMC) connects to the XP210 by using the NC-SI interface and communicates with the external network by using the 1GE port of the XP210. The XP210 forwards the BMC sideband communication packets without processing them.

When the power status of the mainboard is normal or standby, the XP210 can perform NC-SI sideband communication.

## 2.3 Standards and Protocols

**Table 2-1** lists the standards and protocols that the XP212 complies with.

**Table 2-1** Standards and protocols

Standard	Protocol
IEEE 802.1Q, 802.1p	VLAN tags and priorities
IEEE 802.3ab	1000BASE-T
IEEE 802.3az	Energy Efficient Ethernet (EEE)
DMTF DSP0222	Network Controller Sideband Interface (NC-SI)

# 3 Compatibility

---

For details about the compatible servers, visit the compatibility list on the technical support website or contact the local sales representatives.

# 4 Installation and Upgrade

---

## [4.1 Installing the Hardware](#)

## [4.2 Installing Drivers and Upgrading Firmware](#)

### 4.1 Installing the Hardware

The XP210 is a PCIe card. For details about how to install it, see sections related to PCIe cards in maintenance and service guides of servers.

After the NIC is installed, log in to the iBMC WebUI and choose **System > System Info > Network Adapters**. For details, see the iBMC user guide of the corresponding server model.

### 4.2 Installing Drivers and Upgrading Firmware

Different OSs have strict requirements on the XP210 driver and firmware versions. You can compare and check the version mapping table. If the driver or firmware version of the XP210 card does not meet the requirements, install or upgrade the driver or firmware to ensure proper running of the server.

Obtain the driver package from the technical support website. For details, see [Downloading a Driver Package](#).

#### Downloading a Driver Package

**Step 1** Visit the technical support website, and choose **Software Download > FusionServer iDriver**.

The FusionServer iDriver version list is displayed.

**Step 2** Click the target version on the **Software** tab. The **Version and Patch Software** screen is displayed.

**Step 3** In the **Documentation** area, view and download the required driver version mapping table.

You can view the driver names corresponding to different OSs in the driver version mapping table. For different OSs, filter the desired card by **Card Name**, and view **System Version**, **Driver File**, and **Onboard ISO Driver contain Files**.

External Driver Version	System Vers	Driver File	Onboard ISO Driver contain Files	Card Name	Driver Version	FW Version
FusionServer Driver-SLES12SP5-Driver-V116	SLES 12 SP5	inbox driver(use the driver provided by the OS).		XP210	inbox	1.63.0x6000117b

 **NOTE**

- **System Version:** OS version.
- **Driver File:** the ISO file that contains the target driver file. (If the **Driver File** is **inbox driver (use the driver provided by the OS)**, the driver provided by the OS is used.)
- **Onboard ISO Driver contain Files:** the driver file list contained in the ISO file.

 **NOTE**

The *FusionServer iDriver XXX Driver Version Mapping* records all components for which drivers can be installed in an OS and corresponding driver information. If you cannot find driver information about a component in the sheet, no driver can be installed for the component in the OS.

----End

## 4.2.1 Installing the Driver

The XP210 uses the inbox driver. Therefore, you do not need to install a driver for XP210.

## 4.2.2 Upgrading Firmware

The XP210 uses the I350 chip. For details about how to upgrade the firmware of the XP210, see section "Upgrading the NIC Firmware" or "Upgrading the RAID Controller Card or NIC Firmware" in the server upgrade guides.

# 5 Config

- [5.1 Identify the port](#)
- [5.2 Configuring a VLAN](#)
- [5.3 Configuring port bonding](#)
- [5.4 Configuring SR-IOV](#)
- [5.5 Configuring VXLAN Offload](#)

## 5.1 Identify the port

Before performing all configuration operations, identify the ports.

### 5.1.1 Identifying Ports in Linux

NIC ports are identified in the OS. The following uses RHEL 8.6 as an example.

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Run the **lspci |grep -i eth** command on the Linux CLI to check the PCIe functions of the NIC.

```
[root@localhost ~]# lspci |grep -i eth
16:00.0 Ethernet controller: Broadcom Inc. and subsidiaries BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller (rev 01)
16:00.1 Ethernet controller: Broadcom Inc. and subsidiaries BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller (rev 01)
38:00.0 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
38:00.1 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
38:00.2 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
38:00.3 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
b8:00.0 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5]
b8:00.1 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5]
```

**Step 3** Run the **ifconfig -a** command to check that the NIC port is displayed in **eth[num]/eno[num]** format, for example, eth70 and eth71 in the command output.

#### NOTE

If the network port information cannot be queried by **ifconfig -a** commands, the driver is not installed. Install the driver first.

```
linux-12go:~# ifconfig -a
eth70  Link encap:Ethernet HWaddr 00:00:00:00:01:01
       BROADCAST MULTICAST  MTU:1500  Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth71  Link encap:Ethernet HWaddr 00:00:00:00:01:00
       BROADCAST MULTICAST  MTU:1500  Metric:1
       RX packets:0 errors:0 dropped:0 overruns:0 frame:0
       TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1000
       RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

lo     Link encap:Local Loopback
       inet addr:127.0.0.1  Mask:255.0.0.0
       inet6 addr: ::1/128 Scope:Host
       UP LOOPBACK RUNNING  MTU:65536  Metric:1
       RX packets:121 errors:0 dropped:0 overruns:0 frame:0
       TX packets:121 errors:0 dropped:0 overruns:0 carrier:0
       collisions:0 txqueuelen:1
       RX bytes:9066 (8.8 Kb) TX bytes:9066 (8.8 Kb)
```

**Step 4** Run the **ethtool -i** command to view port information.

```
linux-12go:~# ethtool -i eth70
driver: i40e
version: 2.7.26
firmware-version: 6.01 0x80003f13 1.1927.0
expansion-rom-version:
bus-info: 0000:af:00.1
supports-statistics: yes
supports-test: yes
supports-eeprom-access: yes
supports-register-dump: yes
supports-priv-flags: yes
```

 **NOTE**

If the command is not displayed, install the net-tools toolkit.

----End

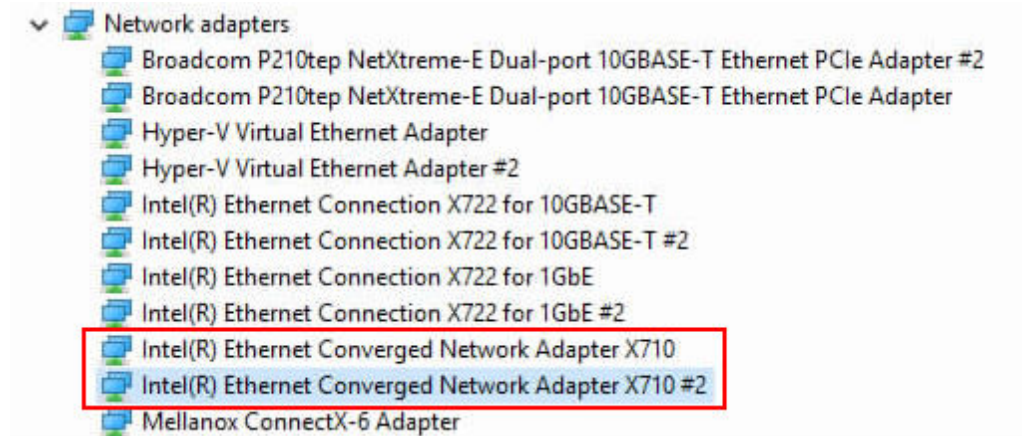
## 5.1.2 Port identification in Windows

NIC ports are recognized by the operating system. Let's take a 2\*10GE NIC as an example for illustration in the Windows Server 2019 system.

**Step 1** On a Windows Server 2019 system, open the Start menu and select Control Panel.

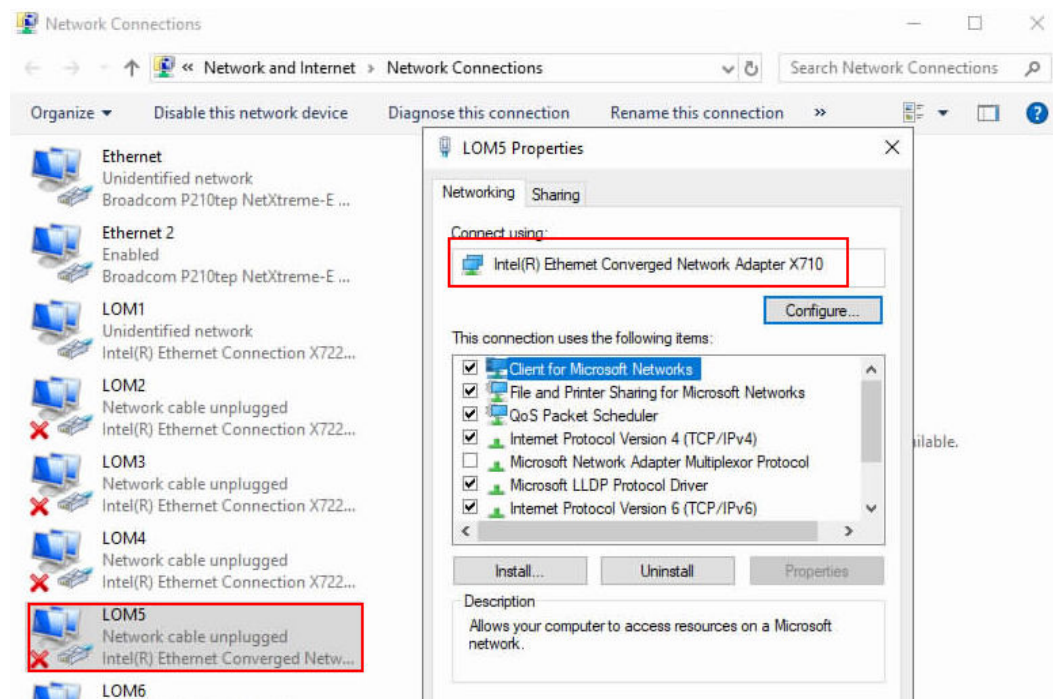
**Step 2** Navigate to "Hardware > Server Manager > Device Manager" sequentially to access the Device Manager and check the NIC device, as shown [Figure 5-1](#)

**Figure 5-1** Enter Device Manager



**Step 3** Click on the "Start" menu again, then navigate to "Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings." This will open the "Network Connections" window. Double-touch the name of each network connection to view its details. The network port with the keyword "X710" in the details is the P3 port of the XP330, as shown **Figure 5-2**.

**Figure 5-2** Querying Network Port Names



----End

### 5.1.3 VMware Port Identification

The NIC port is identified in the OS. The following describes the two 25 GE Mellanox NIC XC382 in VMware ESXi 7.0 U3 as an example.

**NOTICE**

VMware ESXi 7.0 U3 does not have the XC382 driver by default. You need to install the NIC driver first.

**Step 1** to remotely log in to Shell over SSH through the xx port as the **root** user.

**Step 2** Run the following command to check the PCIe functions of the TM210:

**lspci | grep -i eth**

Information similar to the following is displayed:

```
[root@localhost:~] lspci | grep -i eth
0000:16:00.0 Ethernet controller: Broadcom BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller [vmnic5]
0000:16:00.1 Ethernet controller: Broadcom BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller [vmnic6]
0000:a8:00.0 Ethernet controller: Intel Corporation I350 Gigabit Network Connection [vmnic1]
0000:a8:00.1 Ethernet controller: Intel Corporation I350 Gigabit Network Connection [vmnic2]
0000:a8:00.2 Ethernet controller: Intel Corporation I350 Gigabit Network Connection [vmnic3]
0000:a8:00.3 Ethernet controller: Intel Corporation I350 Gigabit Network Connection [vmnic4]
0000:b8:00.0 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5] [vmnic7]
0000:b8:00.1 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5] [vmnic8]
[root@localhost:~]
```

**Step 3** Run the following command to query the network port names:

**esxcfg-nics -l**

Information similar to the following is displayed:

```
[root@localhost:~] esxcfg-nics -l
Name PCI Driver Link Speed Duplex MAC Address MTU Description
vmnic1 0000:a8:00.0 igbn Up 1000Mbps Full 34:73:79:2e:d8:79 1500 Intel Corporation I350 Gigabit Network Connection
vmnic2 0000:a8:00.1 igbn Up 1000Mbps Full 34:73:79:2e:d8:7a 1500 Intel Corporation I350 Gigabit Network Connection
vmnic3 0000:a8:00.2 igbn Up 1000Mbps Full 34:73:79:2e:d8:7b 1500 Intel Corporation I350 Gigabit Network Connection
vmnic4 0000:a8:00.3 igbn Up 1000Mbps Full 34:73:79:2e:d8:7c 1500 Intel Corporation I350 Gigabit Network Connection
vmnic5 0000:16:00.0 bnxtnet Up 10000Mbps Full 34:73:79:bd:05:d6 1500 Broadcom BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller
vmnic6 0000:16:00.1 bnxtnet Up 10000Mbps Full 34:73:79:bd:05:d7 1500 Broadcom BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller
vmnic7 0000:b8:00.0 nmlx5_core Up 25000Mbps Full 34:73:79:91:85:18 1500 Mellanox Technologies MT27800 Family [ConnectX-5]
vmnic8 0000:b8:00.1 nmlx5_core Up 25000Mbps Full 34:73:79:91:85:19 1500 Mellanox Technologies MT27800 Family [ConnectX-5]
[root@localhost:~]
```

**esxcli network nic list**

Information similar to the following is displayed:

```
[root@localhost:~] esxcli network nic list
Name PCI Device Driver Admin Status Link Status Speed Duplex MAC Address MTU Description
-----
vmnic1 0000:a8:00.0 igbn Up Up 1000 Full 34:73:79:2e:d8:79 1500 Intel Corporation I350 Gigabit Network Connection
vmnic2 0000:a8:00.1 igbn Up Up 1000 Full 34:73:79:2e:d8:7a 1500 Intel Corporation I350 Gigabit Network Connection
vmnic3 0000:a8:00.2 igbn Up Up 1000 Full 34:73:79:2e:d8:7b 1500 Intel Corporation I350 Gigabit Network Connection
vmnic4 0000:a8:00.3 igbn Up Up 1000 Full 34:73:79:2e:d8:7c 1500 Intel Corporation I350 Gigabit Network Connection
vmnic5 0000:16:00.0 bnxtnet Up Up 10000 Full 34:73:79:bd:05:d6 1500 Broadcom BCM57412
```

```
NetXtreme-E 10Gb RDMA Ethernet Controller
vmnic6 0000:16:00.1 bnxtnet Up Up 10000 Full 34:73:79:bd:05:d7 1500 Broadcom BCM57412
NetXtreme-E 10Gb RDMA Ethernet Controller
vmnic7 0000:b8:00.0 nmlx5_core Up Up 25000 Full 34:73:79:91:85:18 1500 Mellanox Technologies
MT27800 Family [ConnectX-5]
vmnic8 0000:b8:00.1 nmlx5_core Up Up 25000 Full 34:73:79:91:85:19 1500 Mellanox Technologies
MT27800 Family [ConnectX-5]
[root@localhost:~]
```

----End

## 5.2 Configuring a VLAN

### 5.2.1 Configuring a VLAN on Linux

On Linux, you can temporarily or permanently enable VLAN configuration.

- If restarting the network service affects traffic processing, you can enable VLAN configuration temporarily.
- If restarting the network service does not affect traffic processing, you can enable VLAN configuration permanently.

The following uses RHEL 8.6 as an example to describe how to configure VLANs on Linux.

#### 5.2.1.1 Temporary effect

##### Procedure

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Run the following command to find the network port of the NIC. The eno2 port is used as an example:

```
ifconfig -a
```

**Step 3** Run the following command to add a VLAN to the port, for example, to add VLAN 100 to enp125s0f0:

```
ip link add link eno2 name eno2.100 type vlan id 100
```

**Step 4** Run the following command to configure the IP address of the VLAN, which is equivalent to the IP address of the network port sub-port. For example, set the IP address 192.168.13.200/24 for enp125s0f3 port 100.

```
ip addr add 192.168.13.200/24 dev eno2.100
```

**Step 5** Run the following command to enable network port eno2:

```
ip link set dev eno2.100 up
```

**Step 6** Run the following commands to check the configuration result:

```
ifconfig eno2.100
```

Information similar to the following is displayed:

```
eno2.100: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.13.200 netmask 255.255.255.0 broadcast 0.0.0.0
inet6 fe80::c6b8:b4ff:fe63:8a3e prefixlen 64 scopeid 0x20<link>
ether c4:b8:b4:63:8a:3e txqueuelen 1000 (Ethernet)
```

```
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 26 bytes 3958 (3.8 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

**NOTE**

- IP addresses of different VLANs must be in different network segments (subnets).
- Use the **ip link delete eno[device].[num]** command to delete a VLAN.

----End

### 5.2.1.2 Enabling the Configuration Permanently

#### Procedure

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Run the following command to find the network port of the NIC. The eno2 port is used as an example:

```
ip a
```

**Step 3** Use the nmcli tool to create and configure a VLAN.

```
nmcli d
nmcli con add type vlan con-name VLAN100-on-ens4f3 dev ens4f3 id 100
nmcli con mod VLAN100-on-ens4f3 ipv4.addresses 192.16
nmcli con mod VLAN100-on-ens4f3 ipv4.gateway 192.168.1.1
nmcli con mod VLAN100-on-ens4f3 ipv4.dns 8.8.8.8
nmcli con mod VLAN100-on-ens4f3 ipv4.method manual
nmcli con up VLAN100-on-ens4f3
ip a
nmcli con show VLAN100-on-ens4f3
```

**NOTE**

- IP addresses of different VLANs must be in different network segments (subnets).
- \*.When deleting a VLAN, first run the **nmcli con show** command to obtain the **VLAN\_CONNECTION\_NAME**; then execute the **nmcli con del VLAN\_CONNECTION\_NAME** command to delete the corresponding **VLAN\_CONNECTION\_NAME**. Finally, restart the network service using **systemctl restart NetworkManager**.

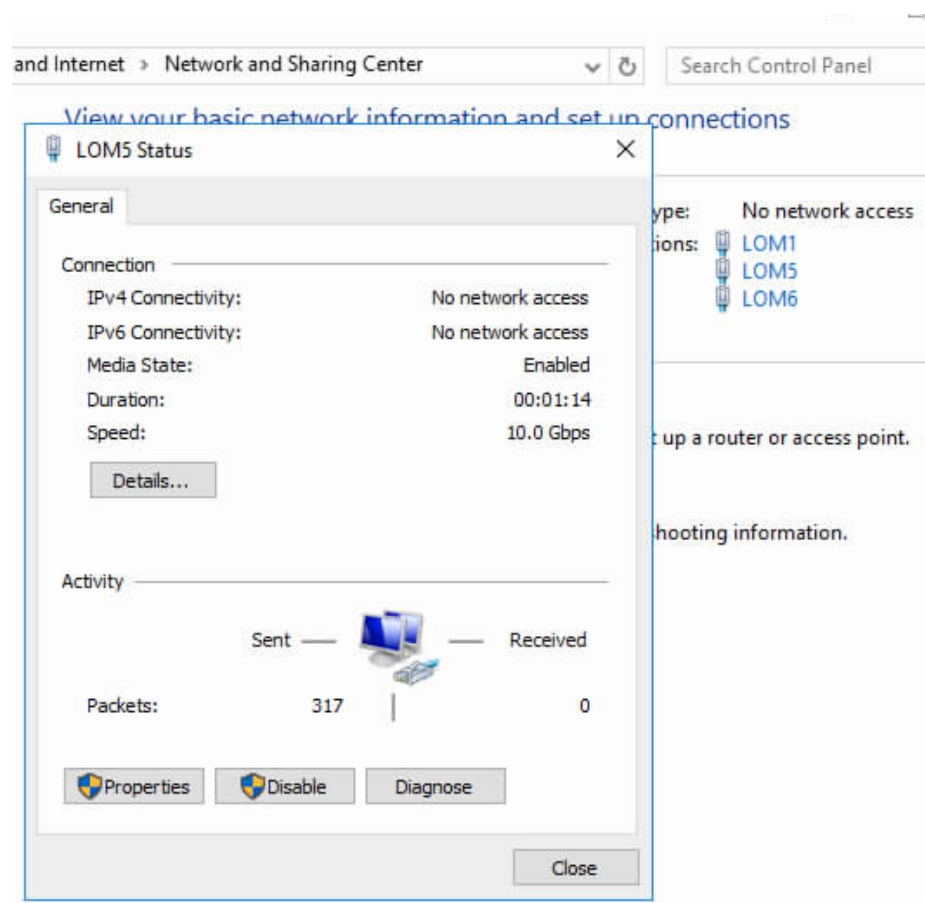
----End

### 5.2.2 Configuring VLANs in Windows

The following uses LOM5 as an example to describe how to configure VLANs in Windows Server 2019. This operation takes effect permanently, including the restart and AC power-on and power-off.

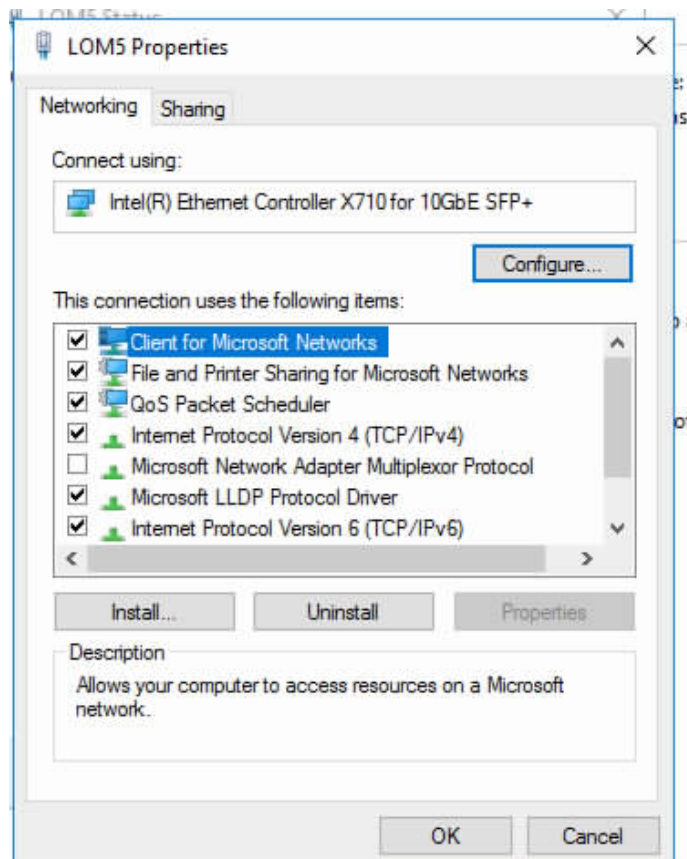
**Step 1** In Windows Server 2019, open Network Manager, select a physical port for which a VLAN needs to be configured. Take LOM5 as an example, and click the network port, as shown in [Figure 5-3](#) .

**Figure 5-3** Select NIC port



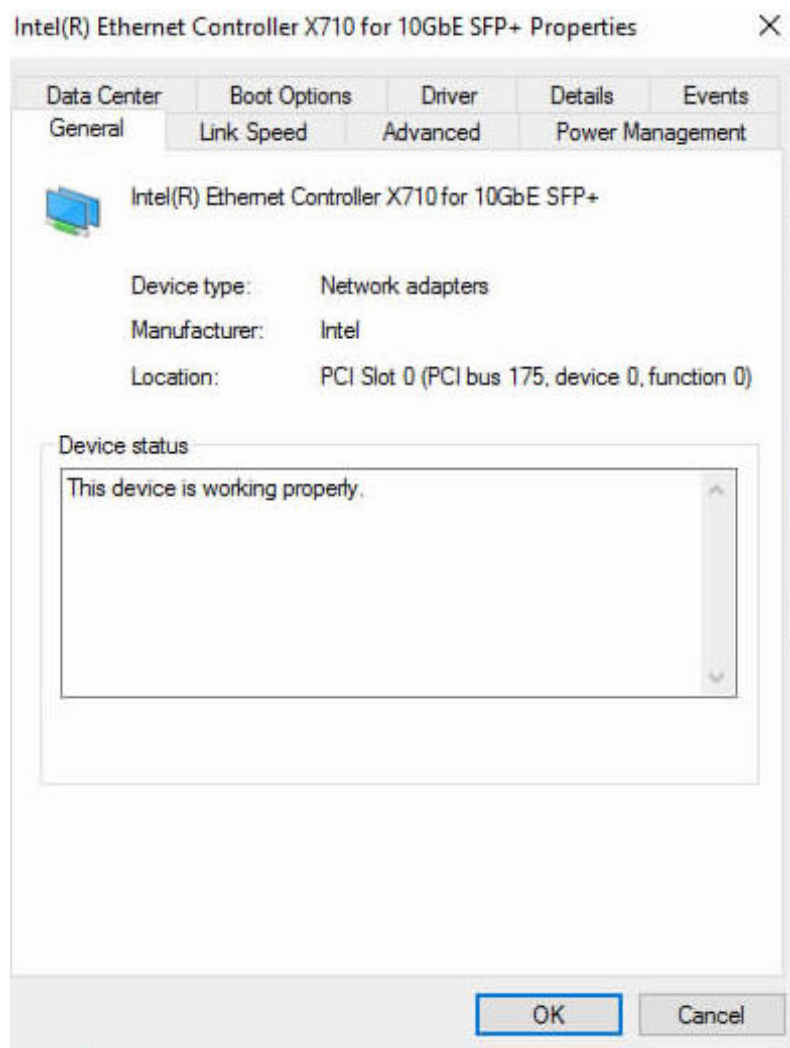
**Step 2** Click Properties. The Properties screen is displayed, as shown in [Figure 5-4](#) .

**Figure 5-4** The Properties page is displayed



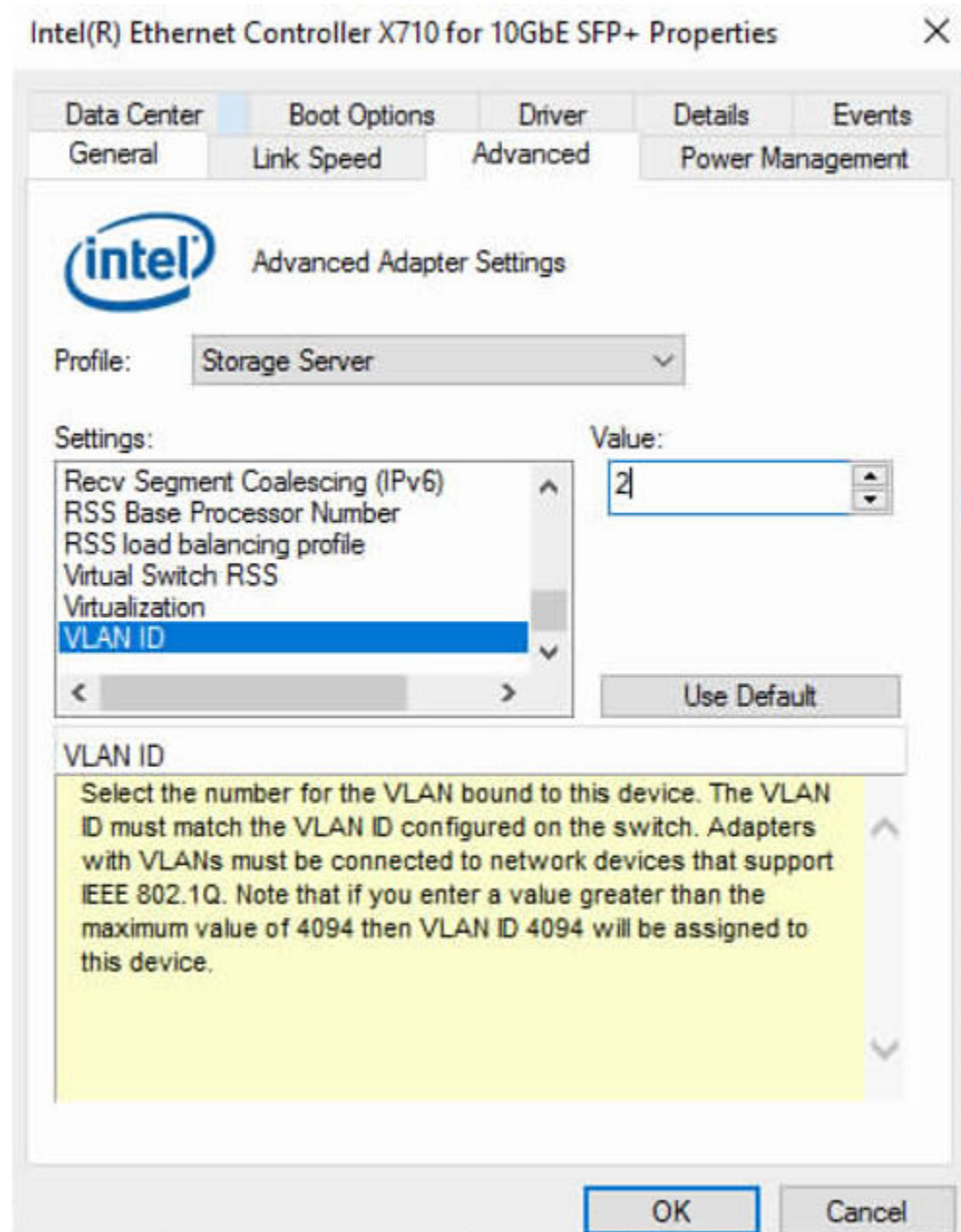
**Step 3** Click Configure. The LOM5 configuration page is displayed, as shown in [Figure 5-5](#).

**Figure 5-5** Configuring NIC Port Properties



**Step 4** Click Advanced. In the Settings drop-down list, select VLAN ID, set Value to 2, and set the VLAN ID to be used. See .

**Figure 5-6** Configure VLAN ID



----End

### 5.2.3 Configuring VLANs on VMware

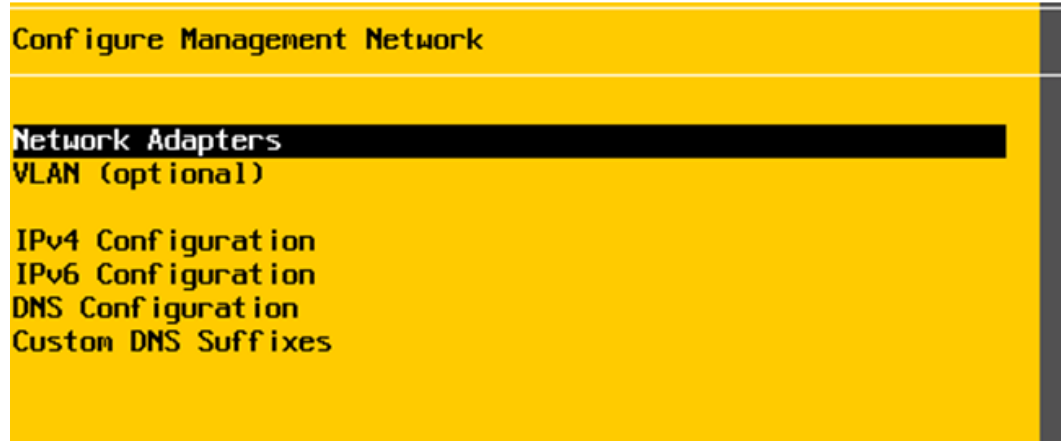
VLAN configuration in VMware ESXi includes the configuration scenarios of servers that are not managed by clusters and servers that are managed by clusters. The configuration of a non-clustered server varies across systems. This section describes the configuration for a non-clustered server in VMware ESXi 7.0 U3.

#### VMware ESXi 7.0 U3

**Step 1** Install VMware ESXi 7.0 U3 on compute nodes and install the NIC driver.

**Step 2** On the System Customization page, choose Configure Management Network & gt. Network Adapter, as shown in **Figure 5-7** .

**Figure 5-7** Physical port of the NIC

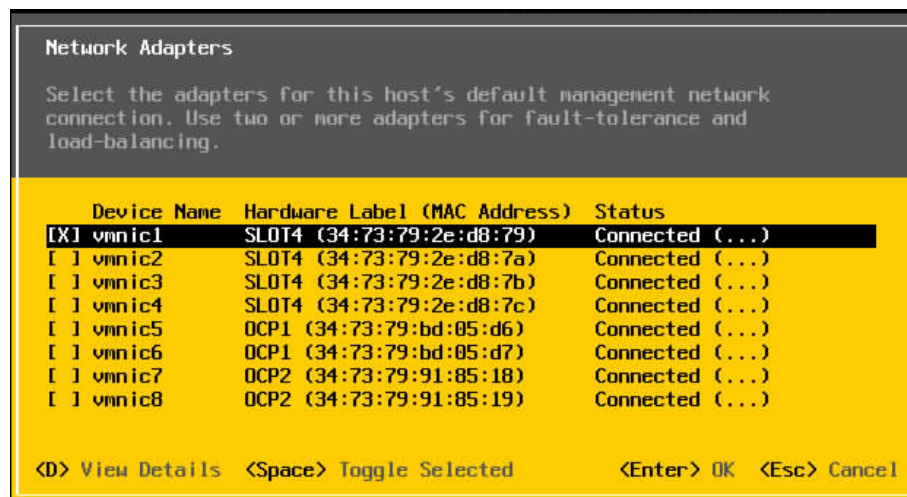


**Step 3** Navigate to the "Network Adapters" screen and specify the vmnic to be used for the management network, as shown **Figure 5-8**. Confirm and exit to the Configure Management Network menu.

**NOTE**

- The management network refers to the PC where the vSphere Client is installed. In fact, the vmnic is also used to connect to the service network.
- In the figure, [X] indicates that the VMNIC can be used to connect to the management network. If multiple VMNICs are selected, the hypervisor (ESXi) selects the VMNIC as the default management network port to connect to the management network. The port can be switched.

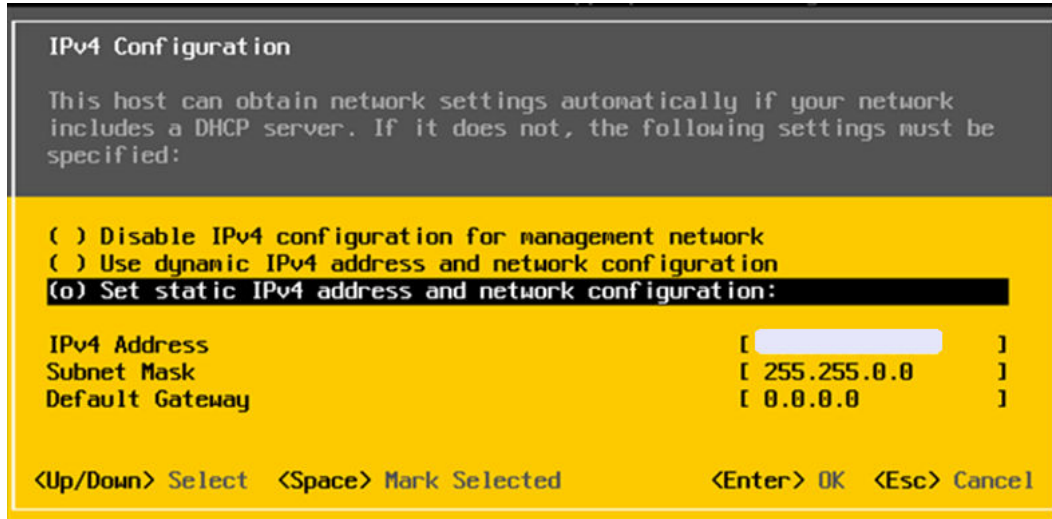
**Figure 5-8** Specify the physical port for the management network



**Step 4** On the Configure Management Network menu, choose IPv4 Configuration. Enter the IP address of the NIC port, as shown in **Figure 5-9**. The IP address is assigned to the vmnic connected to the management network. The IP address is first assigned to the default port vmnic, for example, vmnic0. Set the IP address to the same network segment as the NIC of the PC. Then, the ESXi can communicate with the PC. Press

Enter to confirm the setting and press **Esc** to return to the **Configure Management Network** menu.

**Figure 5-9** vmnic IP address to connect to the management network

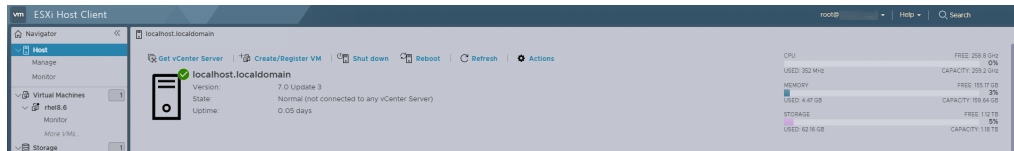


**NOTE**

VLAN (Optional) in the Configure Management Network menu is optional. You do not need to configure VLANs for management network connections.

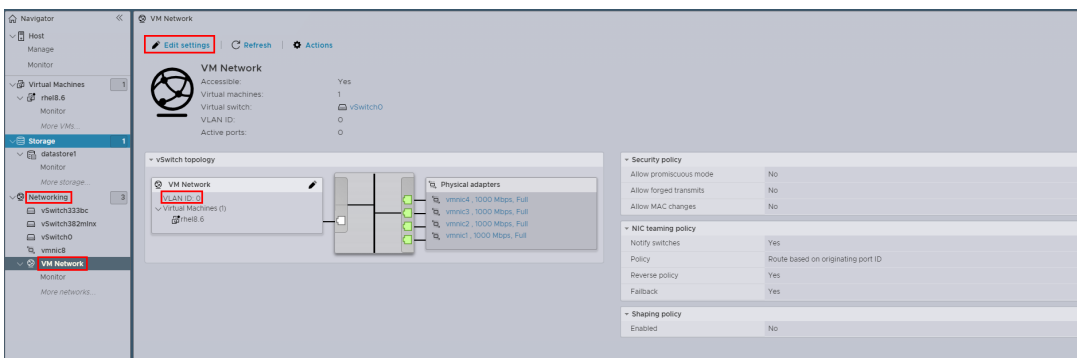
**Step 5** Log in to the management network using the browser of a PC, and enter the account and password to access the management page, as shown in **Figure 5-10**.

**Figure 5-10** VMware management main window



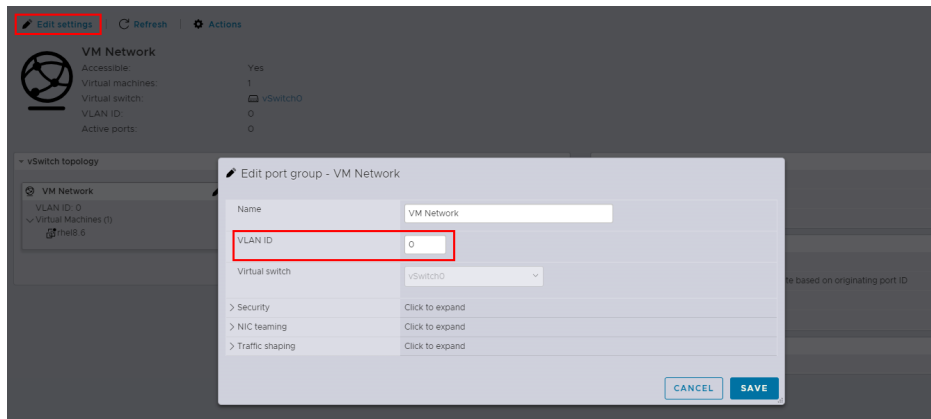
**Step 6** In the navigation tree, choose Networking & gt. In the VM Network window, click Edit settings, as shown in the **Figure 5-11**.

**Figure 5-11** VM Network page



**Step 7** Enter the VIAN ID in the dialog box that is displayed, and click Save, as shown in **Figure 5-12**.

**Figure 5-12** VM Network Edit Window



**NOTE**

Virtual port groups are used for service networks. You can specify a VLAN ID for a virtual port group. On the virtual port group configuration page, select None (0) or (All) 4095, or enter a value ranging from 1 to 4094. The description of different VLAN ID values is shown in the [Table 5-1](#).

**Table 5-1** Description of the different VLAN ID values

VLAN Tagging Mode	VLAN ID	Description
External Switch Tag (EST)	0	Virtual switches do not pass traffic associated with VLANs.
Virtual Switch Tagging (VST)	From 1 to 4094	The virtual switch marks the traffic with the tags entered.
Virtual Client Tag (VGT)	4095	Virtual machines handle VLANs. Virtual switches pass traffic from any VLAN.

----End

## 5.3 Configuring port bonding

### 5.3.1 Configuring Port Bonding in Linux

The following uses RHEL 8.6 as an example to describe how to configure port bonding.

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Run the following command to locate the NIC port:

```
ip a
```

**Step 3** Use the nmcli tool to create and configure the bond mode.

```
nmcli connection add con-name bond1 ifname bond1 type bond mode 1
```

**Step 4** The following uses ens66f0np0 as an example. Set ens66f0np0 to slave1.

```
nmcli connection add con-name slave1 ifname ens66f0np0 type ethernet master bond1
```

**Step 5** The following uses ens66f1np1 as an example. Set ens66f1np1 to slave2.

```
nmcli connection add con-name slave2 ifname ens66f1np1 type ethernet master bond1
```

**Step 6** Run the following command to configure the IP address of bond1:.

```
nmcli connection modify bond1 ipv4.method manual connection.autoconnect yes ipv4.addresses 70.176.56.79  
ipv4.gateway 70.176.0.1
```

**Step 7** Run the following command to enable the bond1 network:.

```
nmcli connection up bond1
```

**NOTE**

When deleting bond1, first run **nmcli con show** to get the con-name; then execute **nmcli c delete bond1 slave1 slave2** to remove bond1 along with slaves slave1 and slave2. Finally, restart the network service using **systemctl restart NetworkManager**.

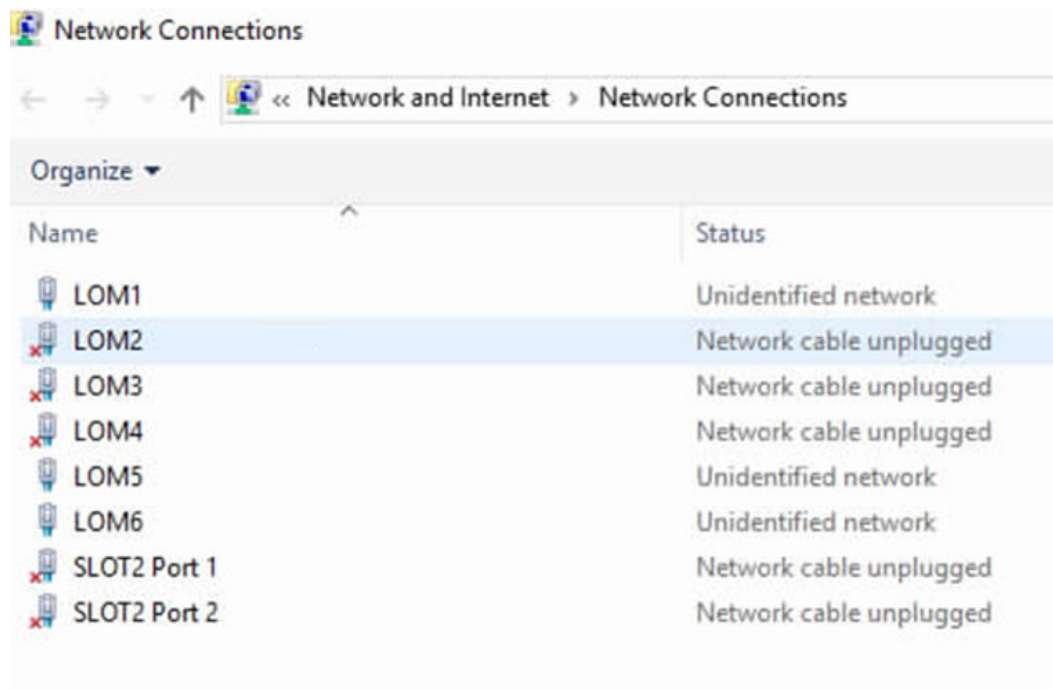
----End

### 5.3.2 Configuring Port Bonding on Windows

In Windows Server 2019, the following uses the XP330 as an example. Port bonding (NIC Teaming for Windows) is configured through Server Manager.

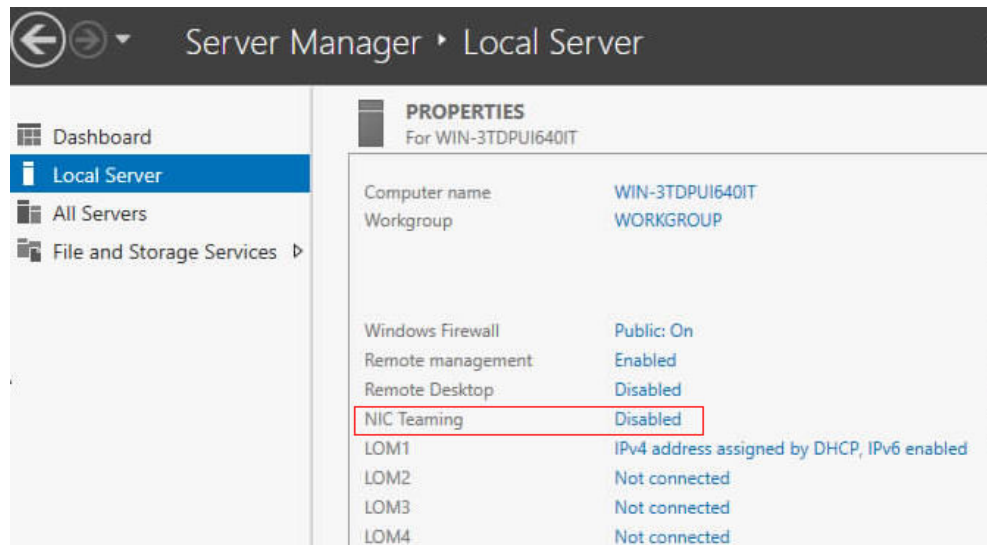
**Step 1** Before configuring NIC teaming, check the existing NIC ports in the system, as shown in [Figure 5-13](#) .

**Figure 5-13** NIC port information



**Step 2** Start Server Manager and click Local Server, as shown in the [Figure 5-14](#) .

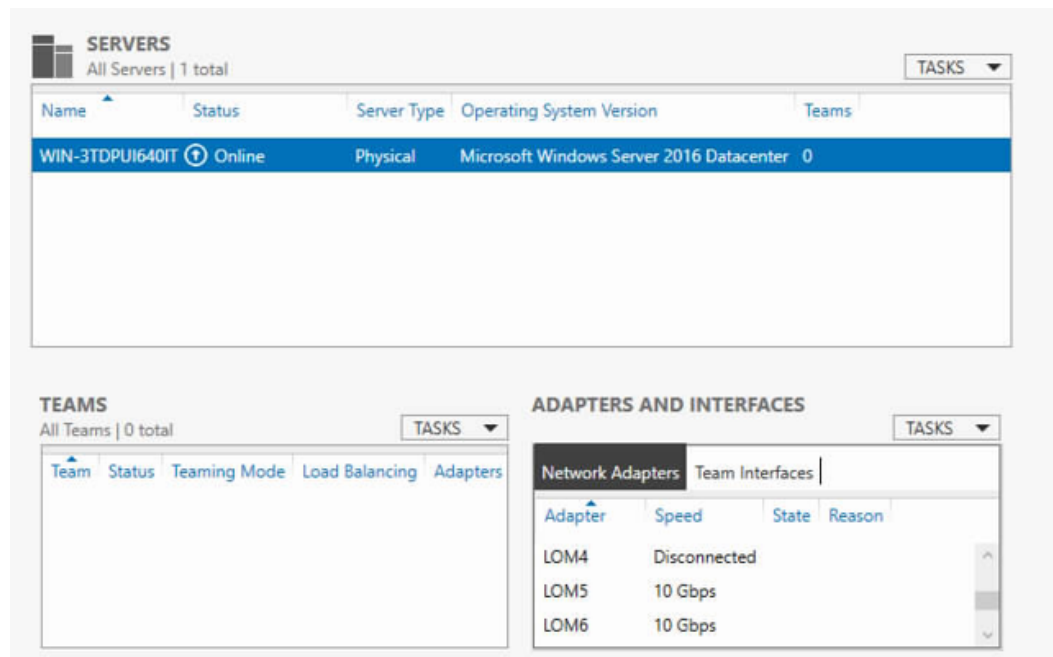
**Figure 5-14** Server Manager configuration page



**Step 3** Run NIC Teaming.

On the Properties page of the Local Server, click Disabled for NIC Teaming. The NIC Teaming configuration page is displayed, as shown in [Figure 5-15](#).

**Figure 5-15** NIC Teaming configuration page



**Step 4** Create a NIC team.

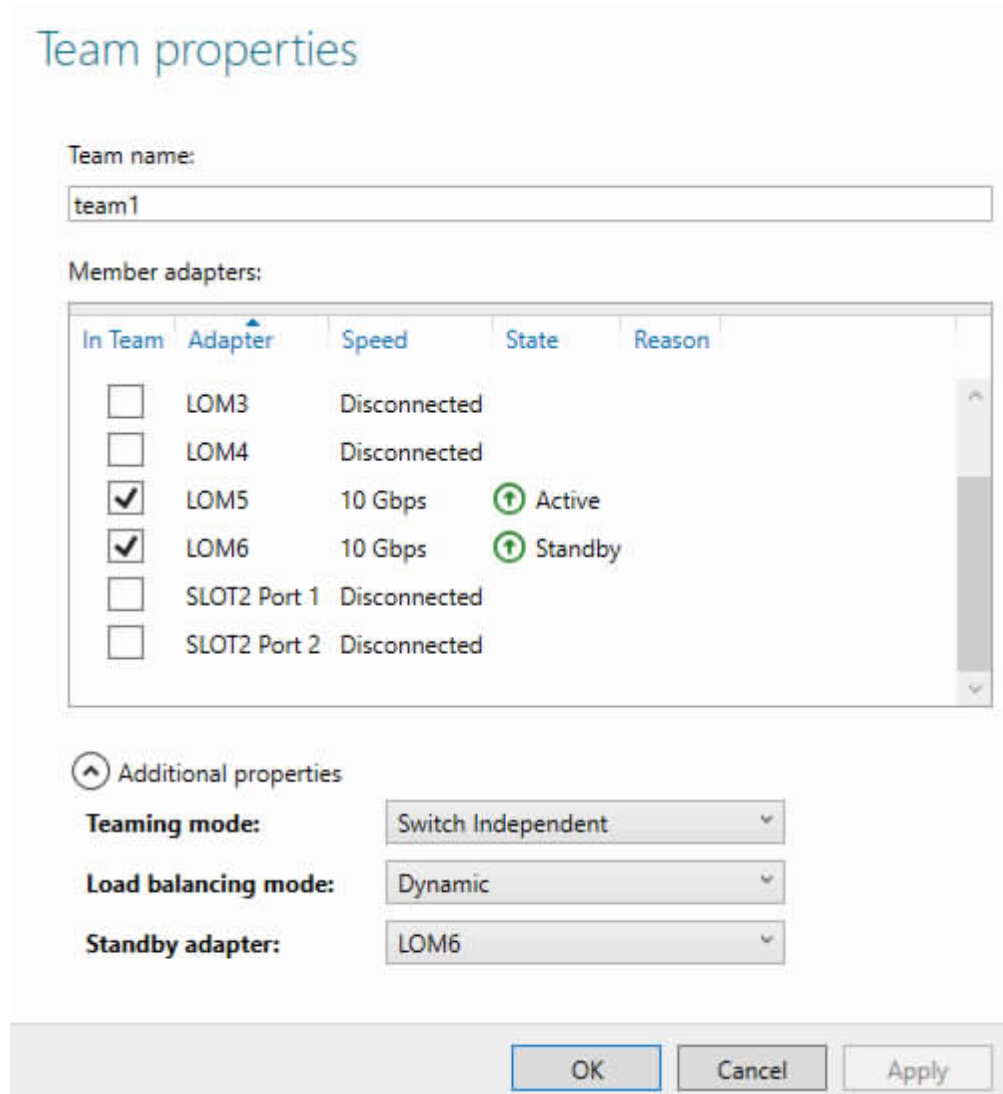
In the Teams area, select New Team from the Tasks drop-down list. The Team Properties page is displayed.

**Step 5** Enter Team name and select the NIC port to be bound.

In the Additional Properties area, select Configure Teaming mode.

Click **OK**, as shown in [Figure 5-16](#).

**Figure 5-16** Configuring NIC Teaming



**NOTE**

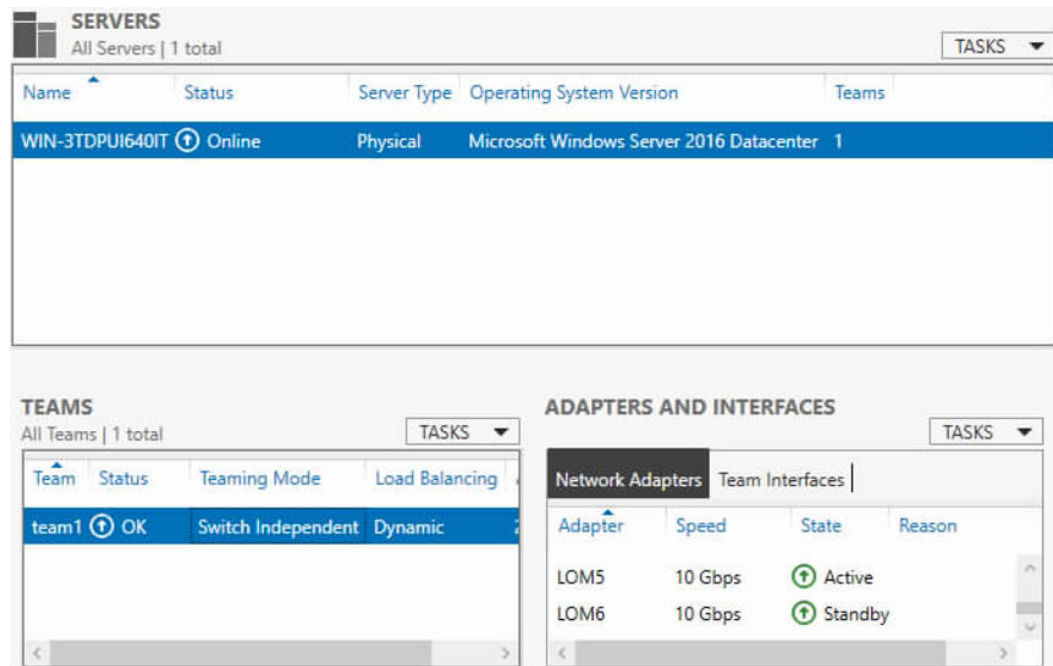
There are three Teaming modes: Switch Independent, Static Teaming, and LACP.

- Switch Independent can be active-backup and balancing, which are determined by the Standby adapter.
- If the value of Standby adapter is None (all adapters Active), the value is equal to balancing.
- If the standby adapter is a specified NIC port, the standby adapter is active-backup.
- Both Static teaming and LACP are link aggregation modes defined in IEEE 802.3ad. The same link aggregation configuration must be performed on the peer device. Static teaming uses the manual configuration of link aggregation parameters (static). LACP is the auto-negotiation of link aggregation parameters based on protocols.

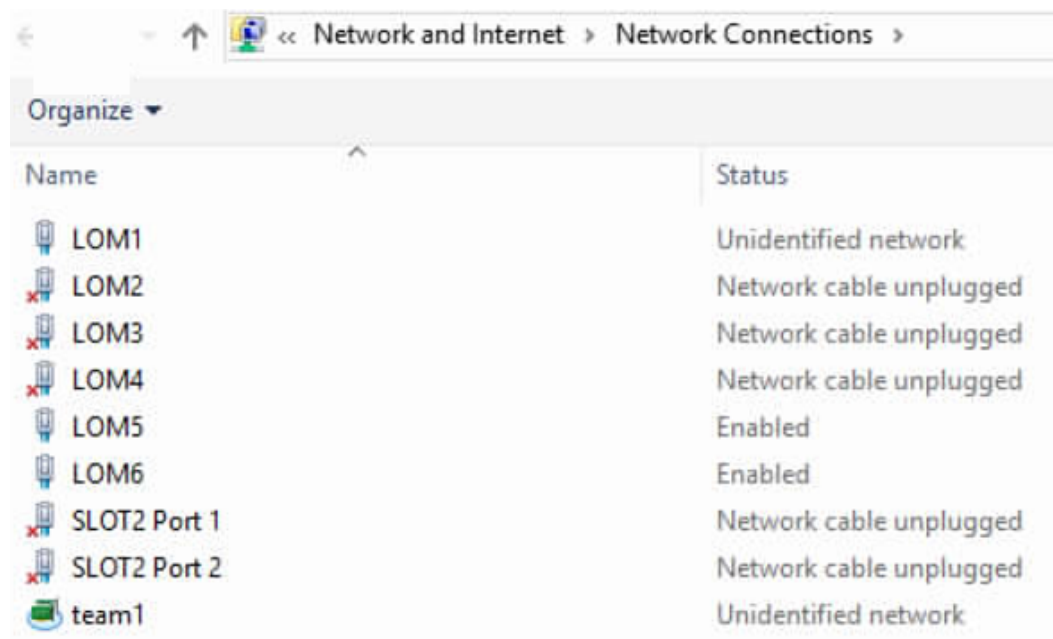
**Step 6** View the created NIC team.

On the NIC Teaming and Network Connections pages, you can view the created team1. As shown in [Figure 5-17](#) and [Figure 5-18](#).

**Figure 5-17** View NIC Teaming



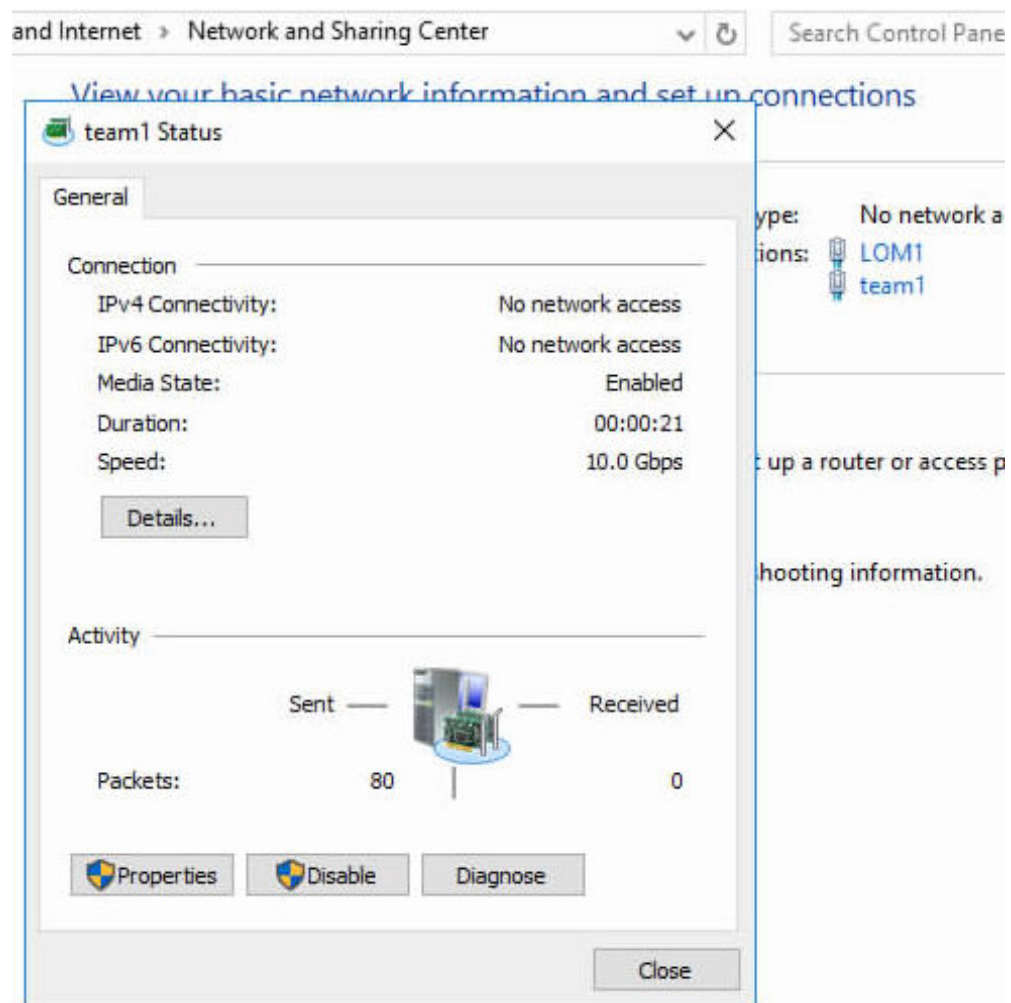
**Figure 5-18** Viewing the Teaming Network Port



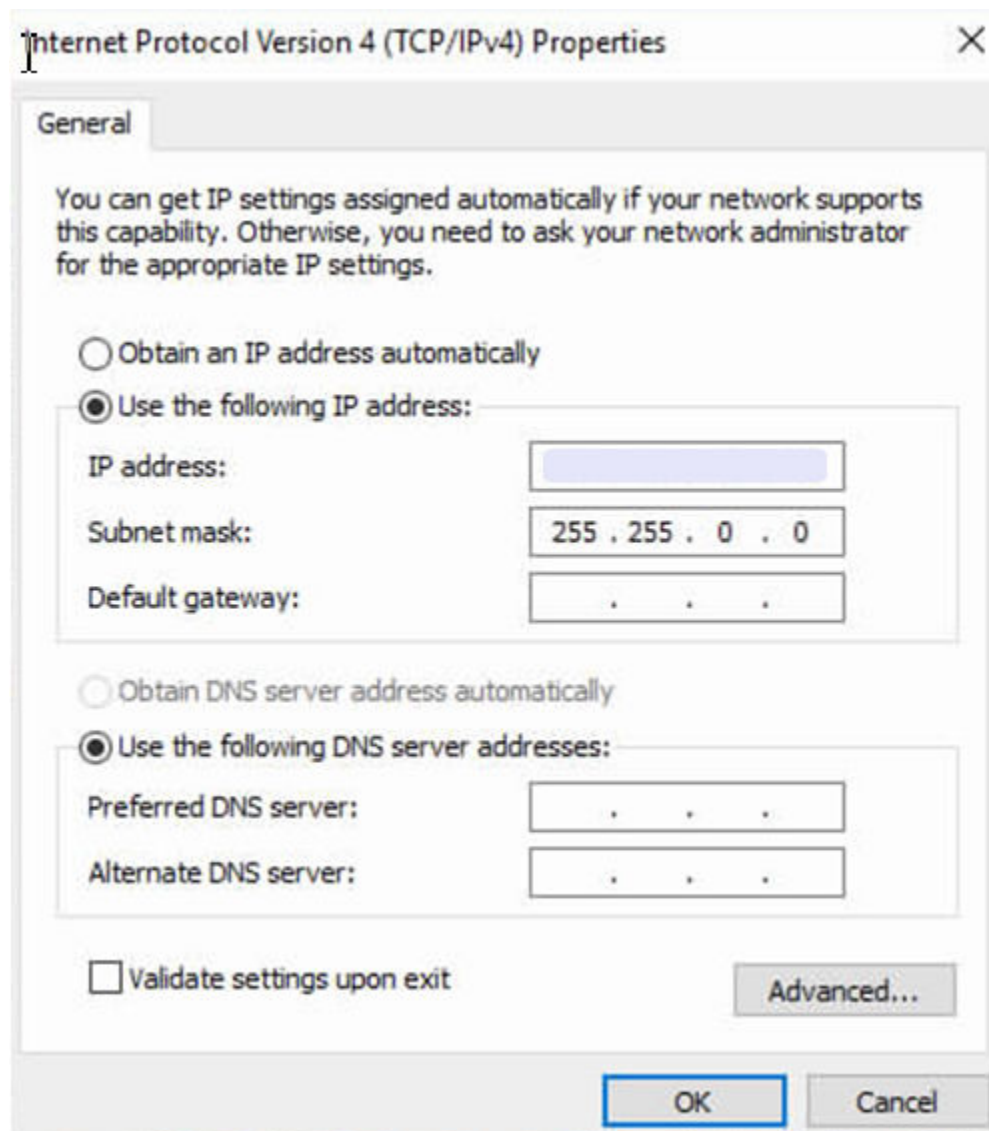
**Step 7** Set the IP address of the NIC team.

Open the Network Manager of Windows, locate team1, click Properties, and double-click Internet Protocol Version 4 (TCP/IPv4) to configure an IP address. As shown in [Figure 5-19](#) and [Figure 5-20](#).

**Figure 5-19** Open the team1 Status page



**Figure 5-20** Set the IP address of the NIC team.



----End

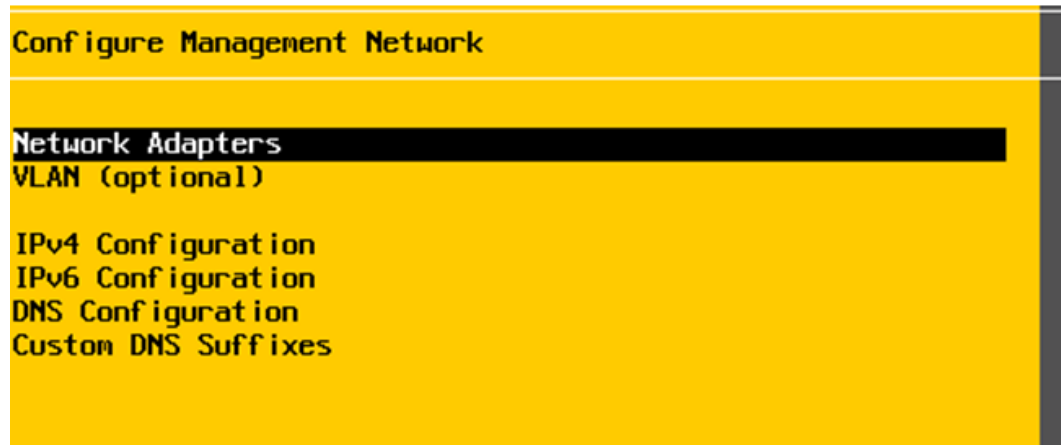
### 5.3.3 Configuring port bonding on VMware

VLAN configuration in VMware ESXi includes the configuration scenarios of servers that are not managed by clusters and servers that are managed by clusters. The configuration of a non-clustered server varies across systems. This section describes the configuration for a non-clustered server in VMware ESXi 7.0 U3.

#### VMware ESXi 7.0 U3

- Step 1** Install VMware ESXi 7.0 U3 on compute nodes and install the NIC driver.
- Step 2** On the System Customization page, choose Configure Management Network & gt. Network Adapter, as shown in [Figure 5-21](#).

**Figure 5-21** Physical port of the NIC

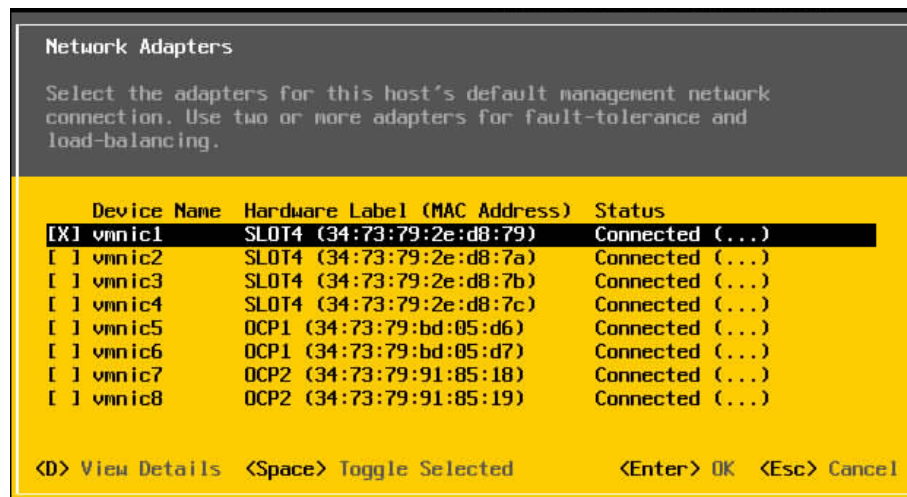


**Step 3** Navigate to the "Network Adapters" screen and specify the vmnic to be used for the management network, as shown [Figure 5-22](#). Confirm and exit to the Configure Management Network menu.

**NOTE**

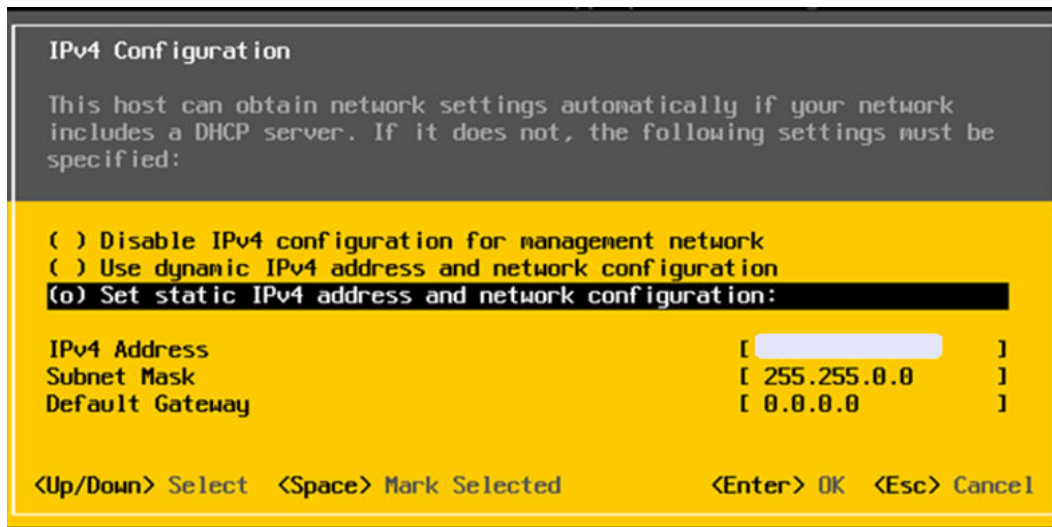
- The management network refers to the PC where the vSphere Client is installed. In fact, the vmnic is also used to connect to the service network.\
- In the figure, [X] indicates that the VMNIC can be used to connect to the management network. If multiple VMNICs are selected, the hypervisor (ESXi) selects the VMNIC as the default management network port to connect to the management network. The port can be switched.

**Figure 5-22** Specify the physical port for the management network



**Step 4** On the Configure Management Network menu, choose IPv4 Configuration. Enter the IP address of the NIC port, as shown in [Figure 5-23](#) . The IP address is assigned to the vmnic connected to the management network. The IP address is first assigned to the default port vmnic, for example, vmnic0. Set the IP address to the same network segment as the NIC of the PC. Then, the ESXi can communicate with the PC. Press **Enter** to confirm the setting and press **Esc** to return to the **Configure Management Network** menu.

**Figure 5-23** vmnic IP address to connect to the management network

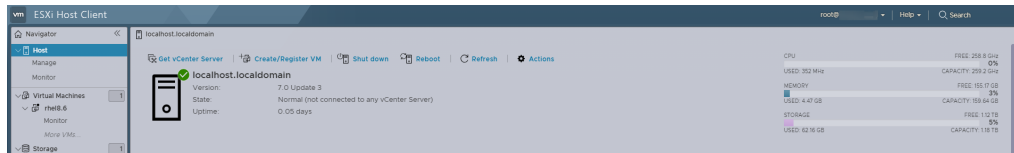


**NOTE**

VLAN (Optional) in the Configure Management Network menu is optional. You do not need to configure VLANs for management network connections.

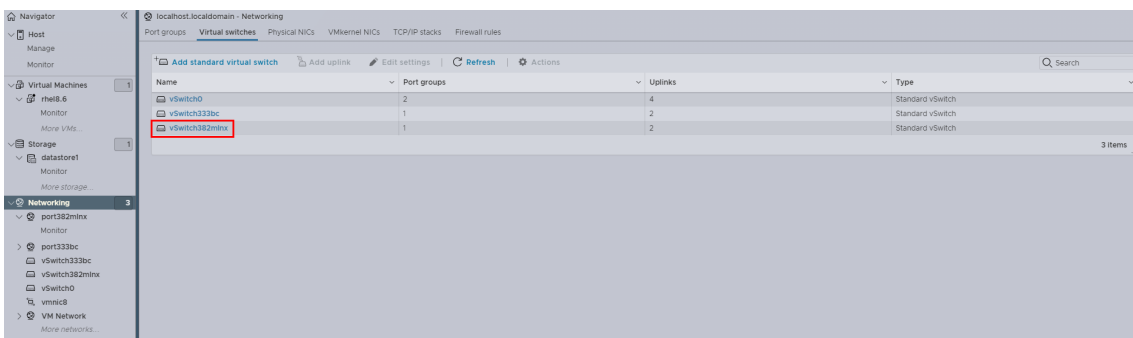
**Step 5** Log in to the management network using the browser of a PC, and enter the account and password to access the management page, as shown in [Figure 5-24](#).

**Figure 5-24** VMware management main window



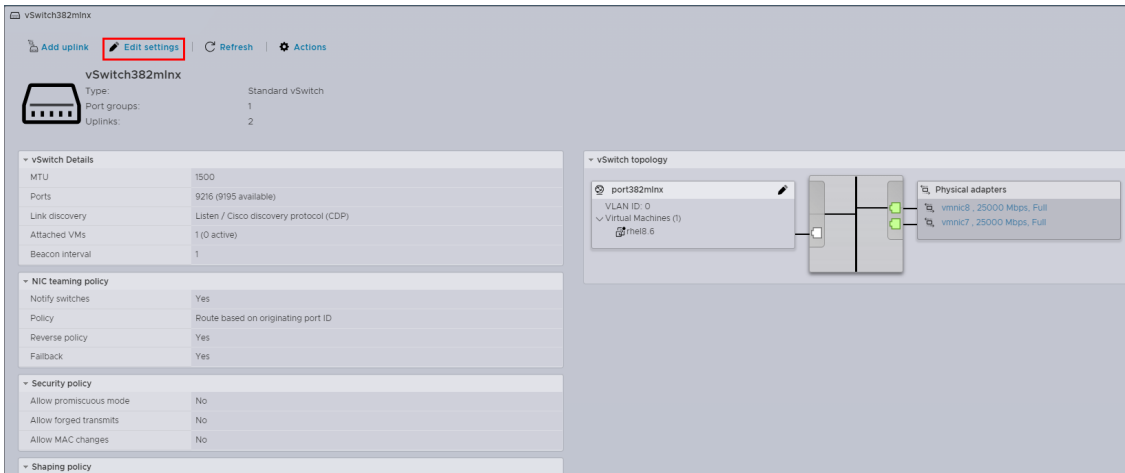
**Step 6** In the navigation tree, choose Networking > Virtual switches. In the right main window, click vSwitch382mlnx to be configured, as shown in [Figure 5-25](#).

**Figure 5-25** Networking interface



**Step 7** Click Edit settings in the main window, as shown in the [Figure 5-26](#).

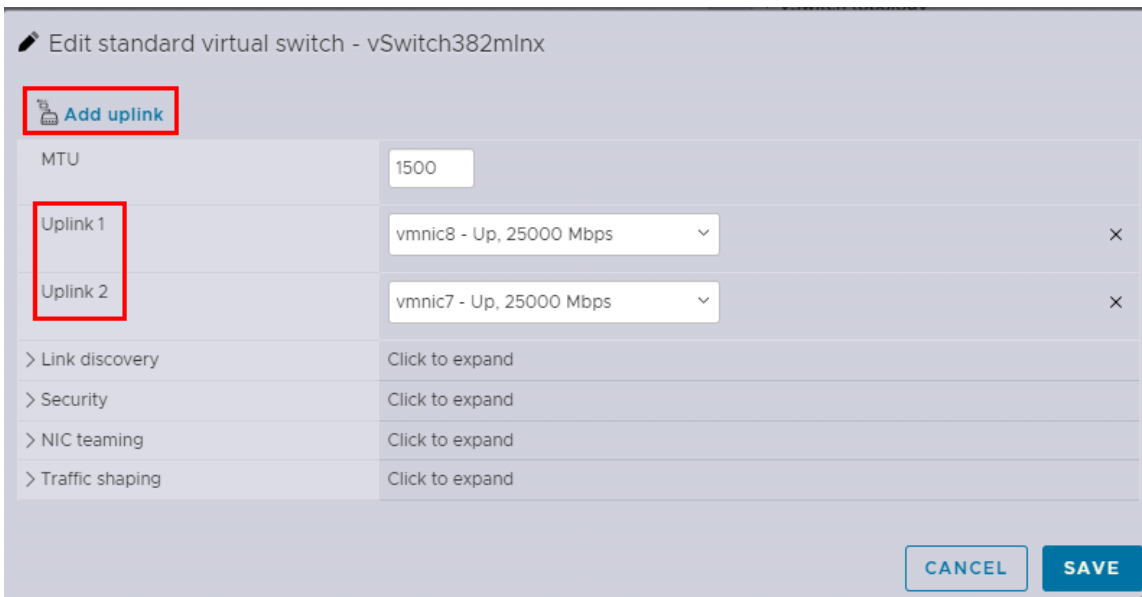
**Figure 5-26** vSwitch interface



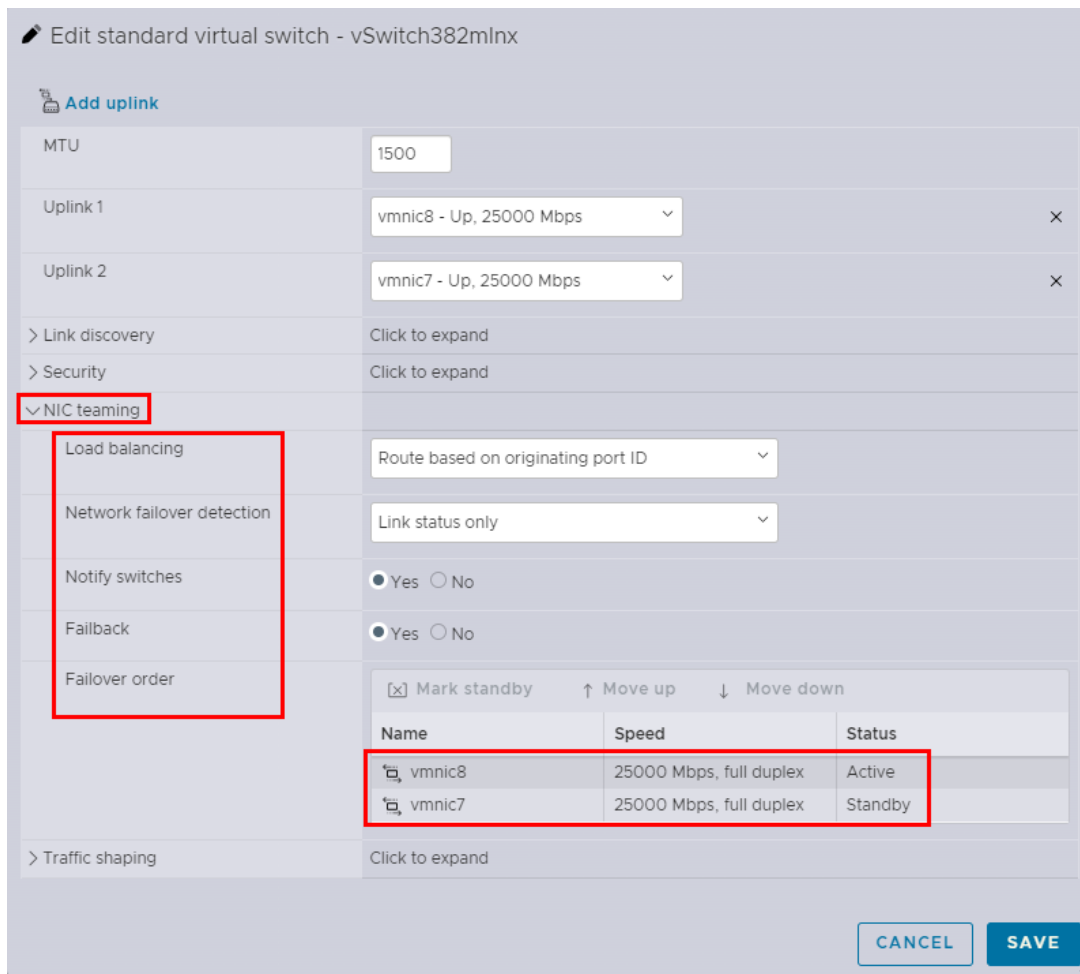
**Step 8** The Add uplink option allows you to add network ports to be bound.

Click the NIC Teaming tab and configure Load Balancing, Network Failover Detection, Notify Switches, Failback, and Failover Order. By default, vmnic7 and vmnic8 belong to Active Adapters. Select vmnic7, set vmnic7 to Standby Adapters in Mark standby, configure active and standby bonding, and click Save. As shown in [Figure 5-27](#) and [Figure 5-28](#).

**Figure 5-27** vSwitch setting screen 1



**Figure 5-28** vSwitch setting screen 2



**NOTE**

There are four types of Load Balancing: Route based on originating port ID, Route based on source MAC hash, Route based on IP hash, and Use explicit failover order.

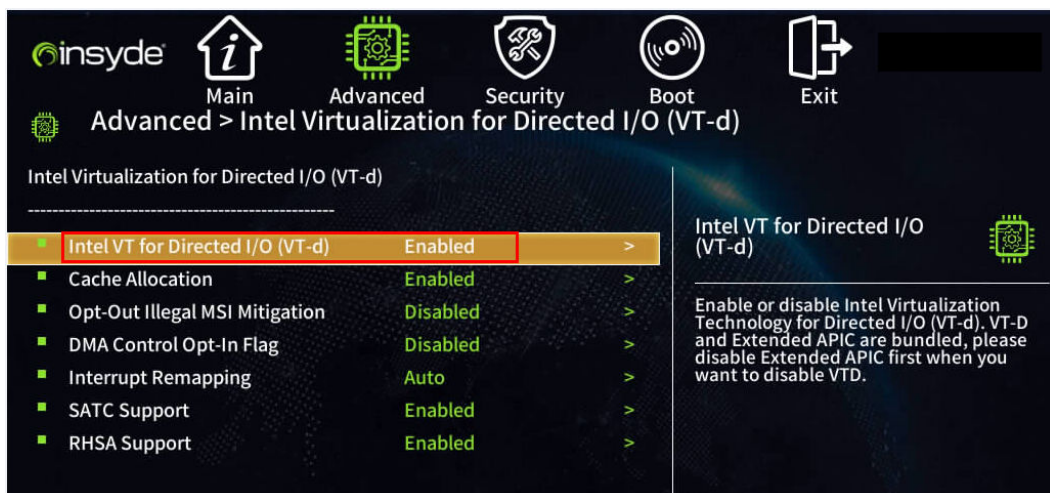
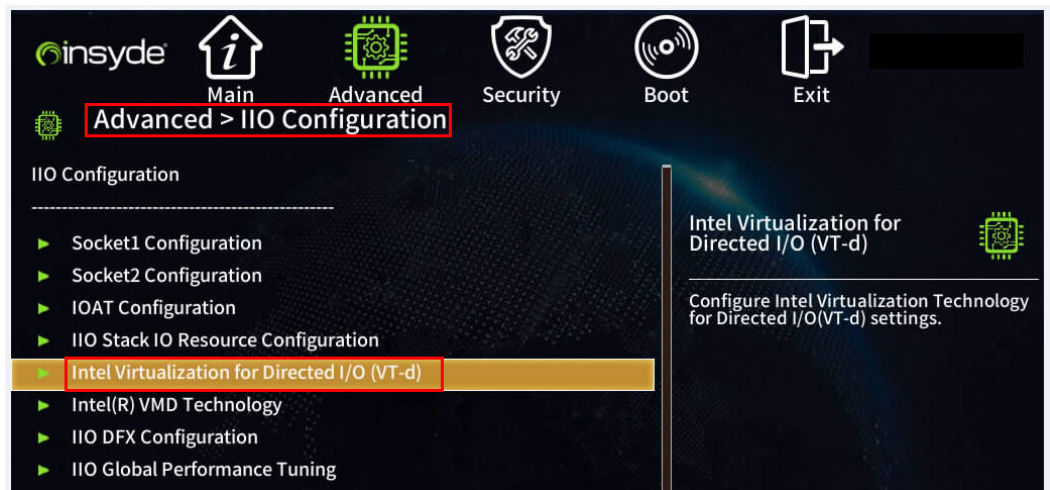
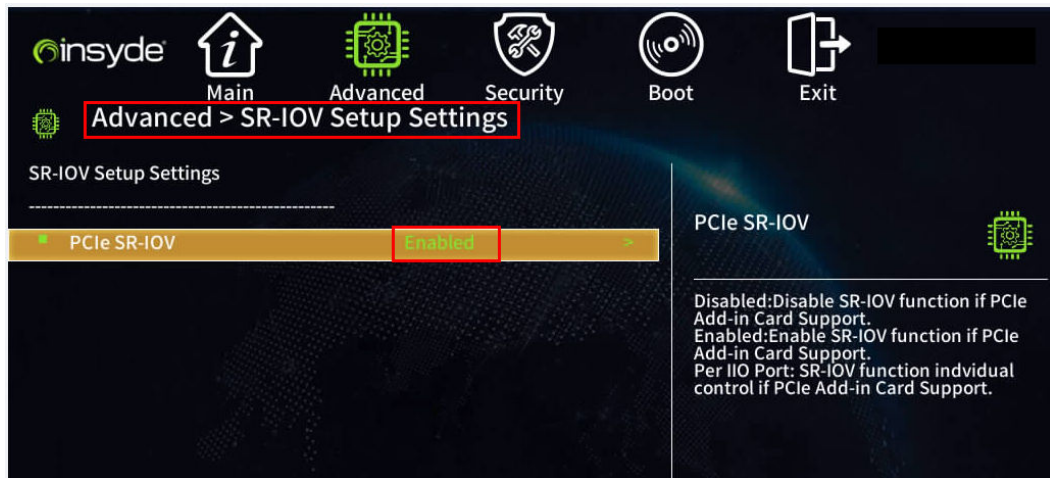
- Route based on originating port ID: Virtual switches can select uplinks based on VM port IDs on standard vSphere switches.
- Route based on source MAC hash: Virtual switches can select uplinks for virtual machines based on their MAC addresses. To calculate the VM uplinks, the virtual switch uses the VM MAC address and the number of uplinks in the NIC group.
- Route based on IP hash: The virtual switch selects the virtual machine's uplink based on the source and destination IP addresses of each packet.
- Use explicit failover order: There is no actual load balancing available for this policy. The virtual switch always uses the uplink that ranks first in the Active Adapter list and meets the failover detection criteria. If there is no uplink available in the active list, the virtual switch uses the uplink in the standby list.

----End

## 5.4 Configuring SR-IOV

Ensure that the SR-IOV and VT-d functions are enabled in the BIOS. Generally, the functions are enabled by default on servers.

If this function is disabled, perform the following steps to enable VT-d and SRIOV in the BIOS.



### 5.4.1 Configuring Port SR-IOV in Linux

The following uses RHEL 8.6 XP330 as an example to describe how to configure the SR-IOV for the XP330 port in Linux.

### 5.4.1.1 Enable SR-IOV

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Add system startup parameters to the grub configuration file.

Run the **vi /etc/default/grub** command, press **i** to enter the editing mode, and add **intel\_iommu = on iommu = pt** to the **GRUB\_CMDLINE\_LINUX** line.

```
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="intel_iommu=on iommu=pt crashkernel=auto resume=UUID=39a648f8-b595-44e4-b272-6c039df9b2bc rhgb quiet"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

After the modification is complete, press **Esc** to exit the editing mode and enter **:wq!** to save the settings and exit.

**Step 3** Execute the command **grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg** effect configuration.

**Step 4** Reboot the OS.

**Step 5** Run the **lspci |grep -i eth** command to find the BDF of the NIC (bus: device:). function), for example, "b8: 0.00" and "b8: 00.1" for BDF.

```
[root@localhost ~]# lspci |grep -i eth
16:00.0 Ethernet controller: Broadcom Inc. and subsidiaries BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller (rev 01)
16:00.1 Ethernet controller: Broadcom Inc. and subsidiaries BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller (rev 01)
a8:00.0 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
a8:00.1 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
a8:00.2 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
a8:00.3 Ethernet controller: Intel Corporation I350 Gigabit Network Connection (rev 01)
b8:00.0 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5]
b8:00.1 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5]
```

**Step 6** Run the **find / -name "sriov\_numvfs"|grep -i "b8:00"** command to query the paths of all the sriov\_numvfs configuration files and locate the sriov\_numvfs configuration files for the BDF NIC based on the BDF number.

```
[root@localhost ~]# find / -name "sriov_numvfs"|grep -i "b8:00"
/sys/devices/pci0000:b7/0000:b7:01.0/0000:b8:00.1/sriov_numvfs
/sys/devices/pci0000:b7/0000:b7:01.0/0000:b8:00.0/sriov_numvfs
```

**Step 7** Run the command **echo [num] > [file path]/sriov\_numvfs** to enable [num] Virtual Functions (VF)s.

[num] Indicates the number of enabled VFs. For example, to enable eight VFs, run the following command:

```
echo 1 >/sys/devices/pci0000:b7/0000:b7:01.0/0000:b8:00.0/sriov_numvfs
```

**Step 8** Run the **lspci|grep -i "virtual function"** command to check the PCIe devices corresponding to the new VF.

```
[root@localhost ~]# lspci|grep -i "virtual function"
b8:00.2 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5 Virtual Function]
```

**NOTE**

- In this mode, the configuration fails after the driver is reloaded or the system restarts. You need to perform **Step 6~ Step 8** again. The maximum number of VFs supported by the NIC can be checked by querying the `sriov_totalvfs` in the same directory as `sriov_numvfs`. Run the `cat sriov_totalvfs` command to check the maximum number of VFs supported by the PF.
- For Mellanox NICs, it is recommended to install NVIDIA MLNX\_OFED or NVIDIA DOCA. After installation, the `mlxconfig` tool can be used to modify the maximum number of VFs supported by default for the NIC in the system.

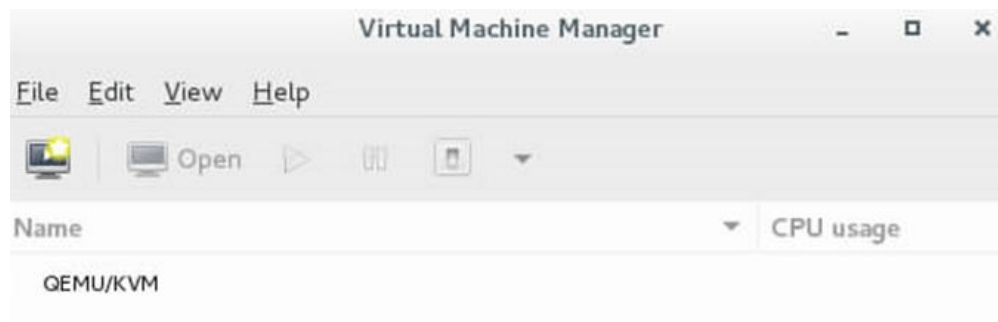
----End


### 5.4.1.2 Create VM

The data in the figure are examples. The configuration depends on actual requirements.

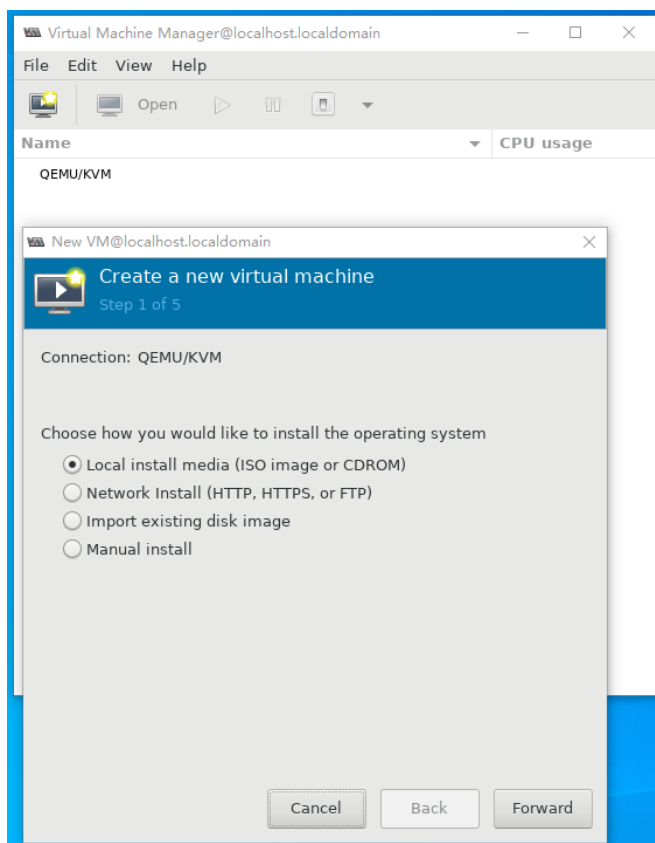
- Step 1** Open the remote virtual console on the iBMC WebUI.
- Step 2** Transfer the OS image file to the test host.
- Step 3** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.
- Step 4** Enter **virt-manager** in Terminal to access the VM management page, as shown in **Figure 5-29**.

**Figure 5-29** Entering the VM Management Page



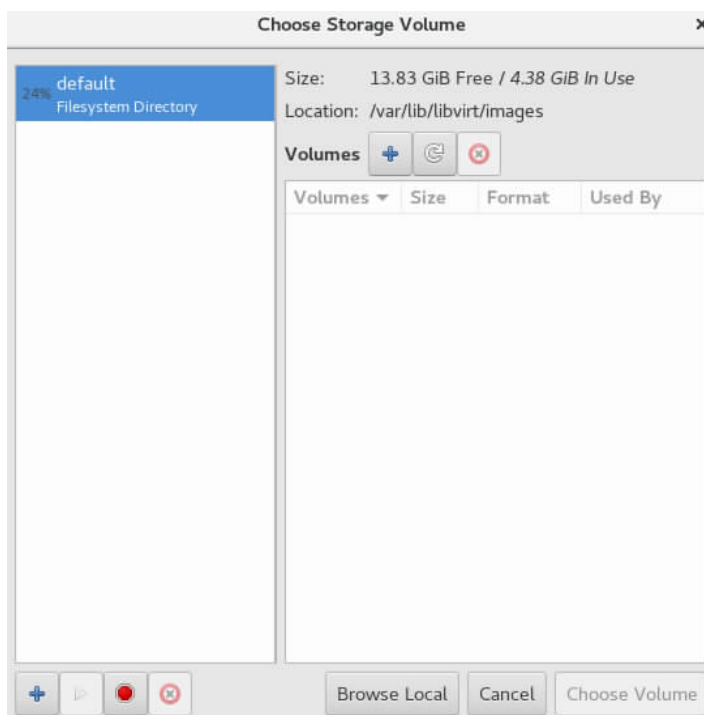
- Step 5** Click on  Create Virtual Machine, select the installation method as "Local install media (ISO image or CDROM)", and click "Forward", as shown in **Figure 5-30**.

**Figure 5-30** Create VM



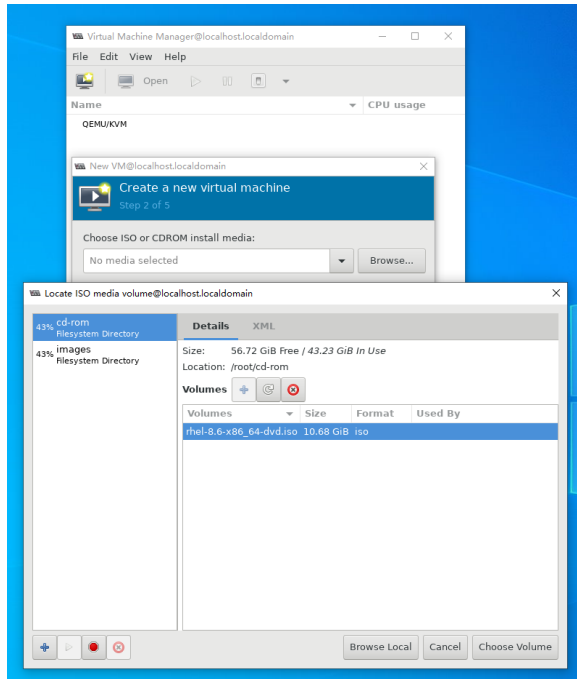
**Step 6** Click Browse Local to locate the installation image, as shown in [Figure 5-31](#).

**Figure 5-31** Locate the installation image



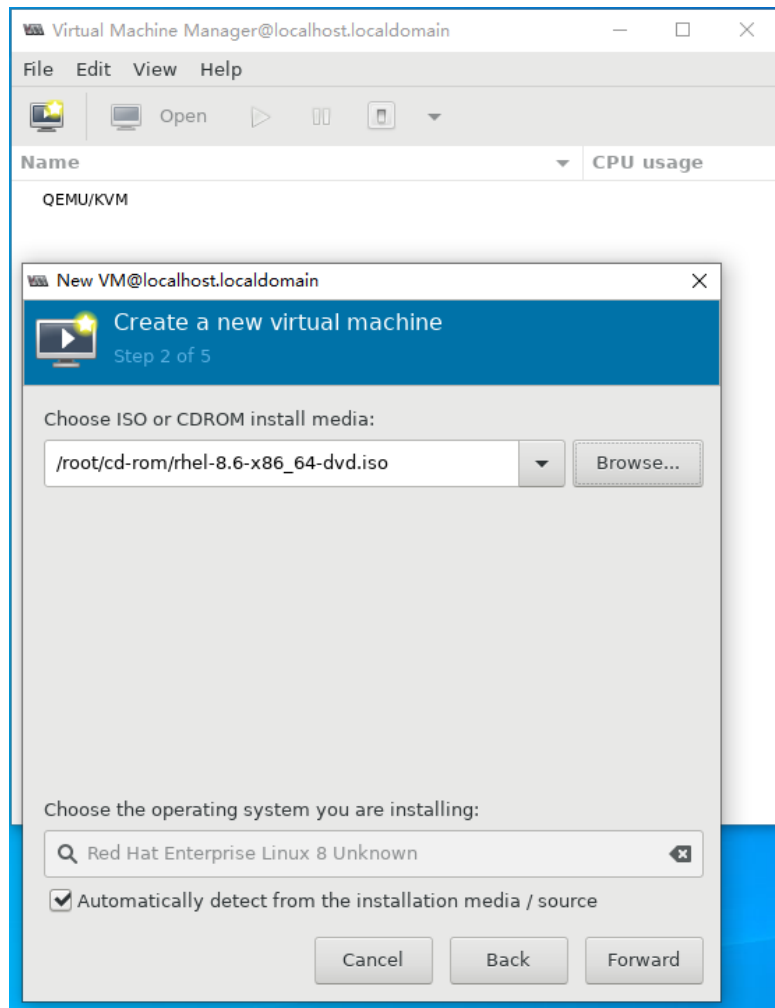
**Step 7** Select the image file, for example, `rhel-8.6-x86_64-dvd.iso`, and click Choose Volume, as shown in **Figure 5-32**.

**Figure 5-32** Selecting an image file to be installed



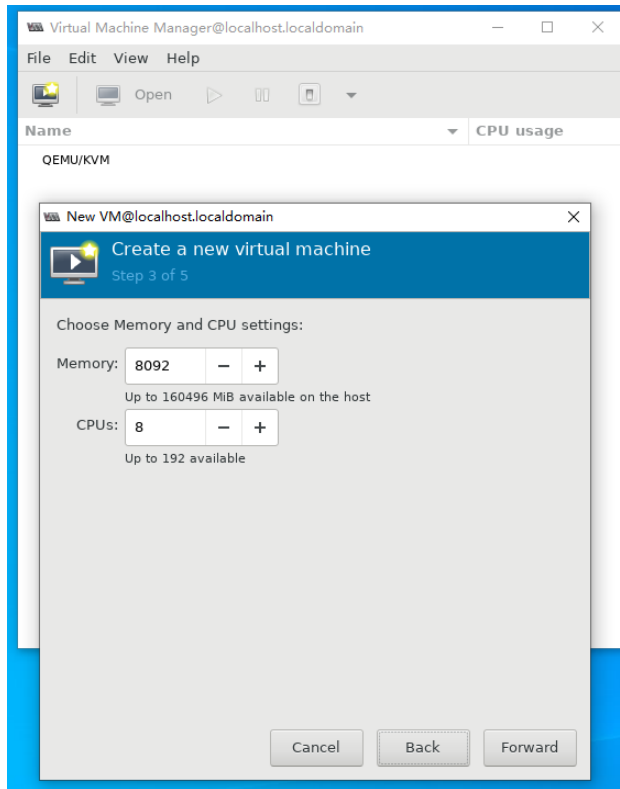
**Step 8** Click Forward to select the image file, as shown in **Figure 5-33**.

**Figure 5-33** Selecting an image file



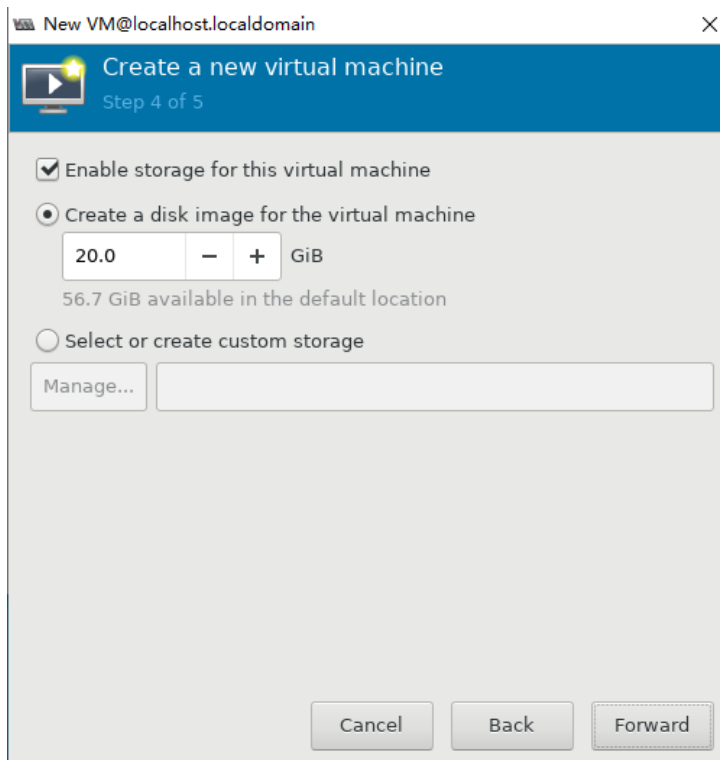
**Step 9** Set the VM memory size and number of CPUs and click Forward, as shown in [Figure 5-34](#).

**Figure 5-34** Configuring the VM Memory Size and Number of CPUs



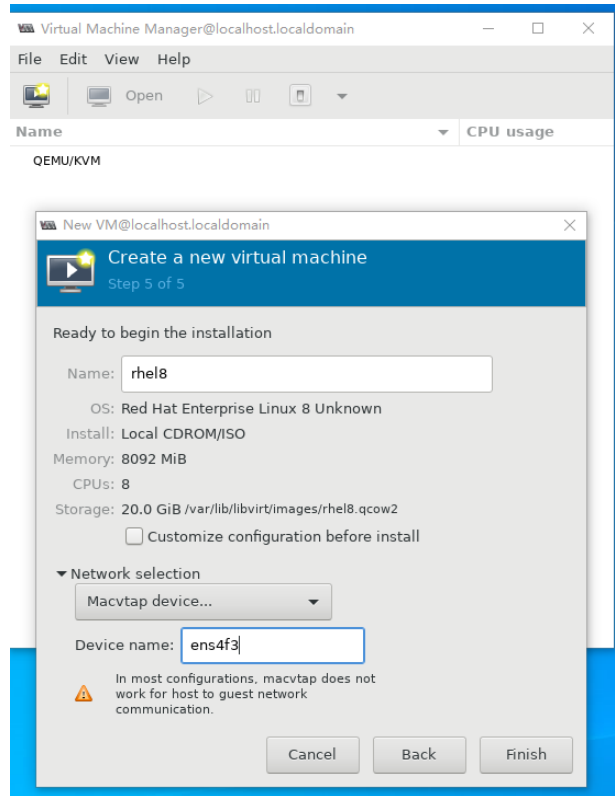
**Step 10** Configure VM storage and click Forward, as shown in [Figure 5-35](#).


**Figure 5-35** Configuring VM Storage

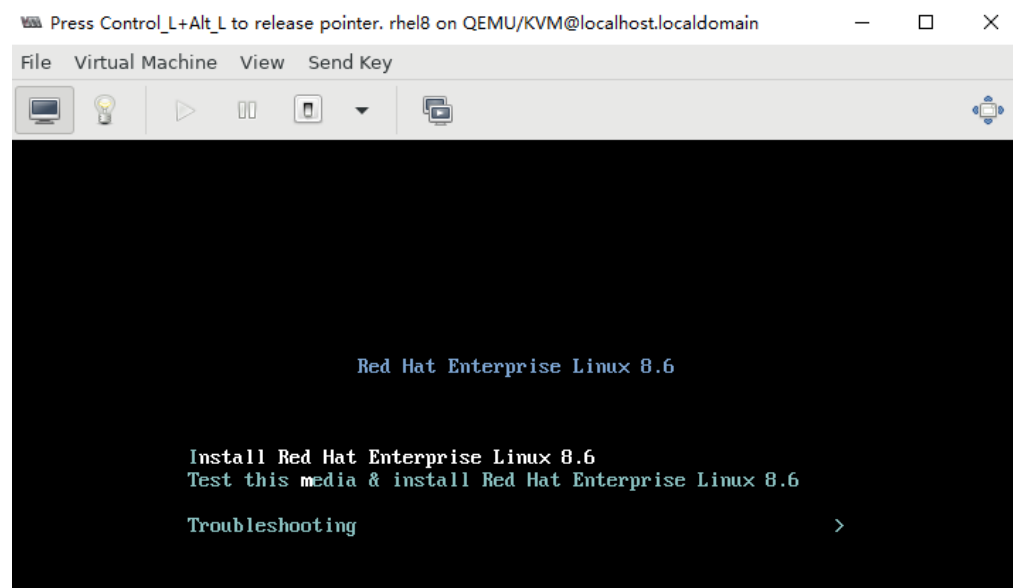


**Step 11** Configure a network device. For example, select Macvtap device... Device name. and click Finish to complete the VM configuration, as shown in [Figure 5-36](#) .

**Figure 5-36** Complete VM configuration



**Step 12** Double-click the configured virtual machine  to enter the system installation interface, as shown in [Figure 5-37](#). Follow the instructions in the [Server OS Installation Guide](#) for operation.

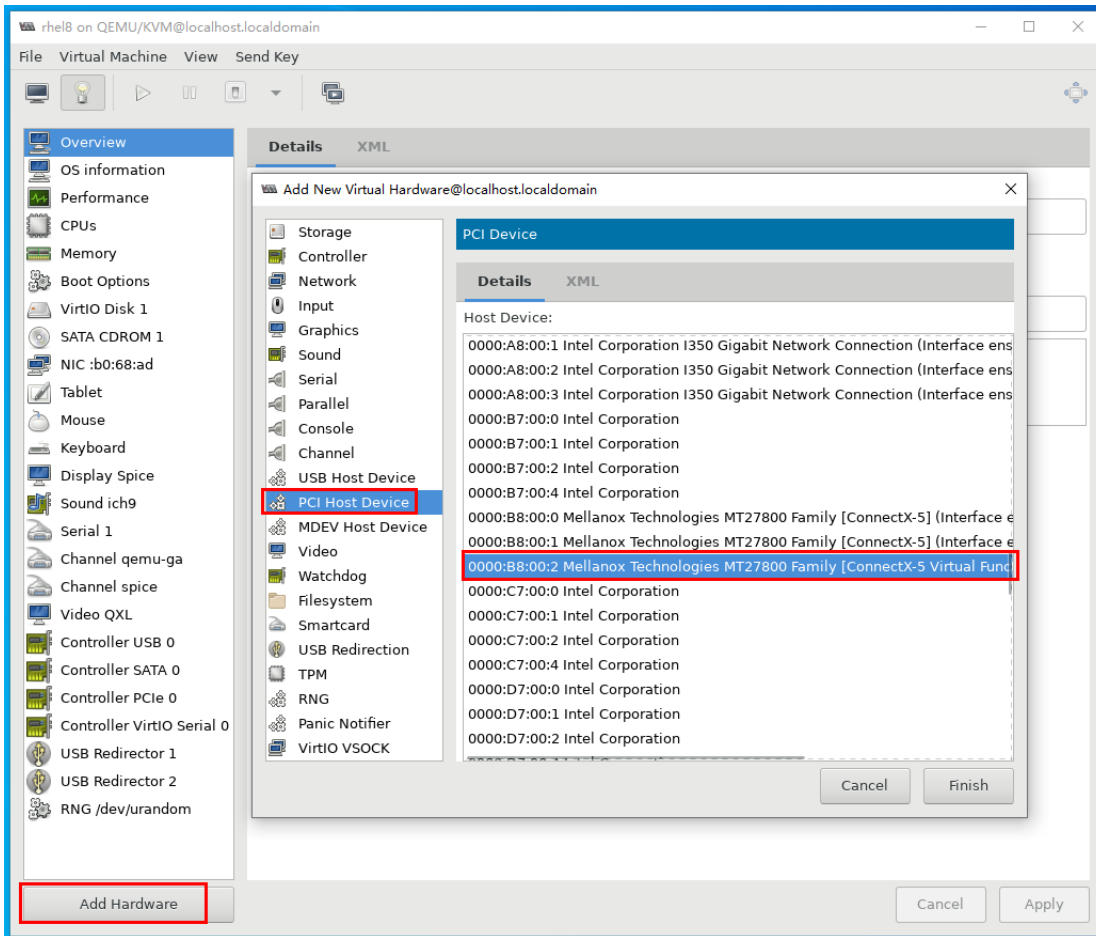
**Figure 5-37** Entering the System Installation Page

----End

### 5.4.1.3 Adding SR-IOV Network Ports

- Step 1** After the VM is created, right-click the server OS as an **root** user, and choose Open Terminal from the shortcut menu.
- Step 2** Run the following command to power off the VM:  
**poweroff**
- Step 3** Under the new virtual machine configuration, select "Add Hardware > PCI Host Device" to add the created VF to the VM. Upon starting the virtual machine, the VM will have a PCIe device corresponding to the VF, as shown in [Figure 5-38](#).

**Figure 5-38** Adding the created VF to the VM



**Step 4** Run the following command on the VM to view the network port of the VF.

**ip a**

Information similar to the following is displayed:

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 52:54:00:b0:68:ad brd ff:ff:ff:ff:ff:ff
    inet 70.176.56.71/16 scope global enp1s0
        valid_lft forever preferred_lft forever
3: enp7s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether b6:22:83:88:52:ea brd ff:ff:ff:ff:ff:ff permaddr 32:d1:45:66:93:99
4: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN group default qlen 1000
    link/ether 52:54:00:f8:29:6c brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.1/24 brd 192.168.122.255 scope global virbr0
        valid_lft forever preferred_lft forever
```

**----End**

## 5.4.2 Configuring Port SR-IOV in Windows

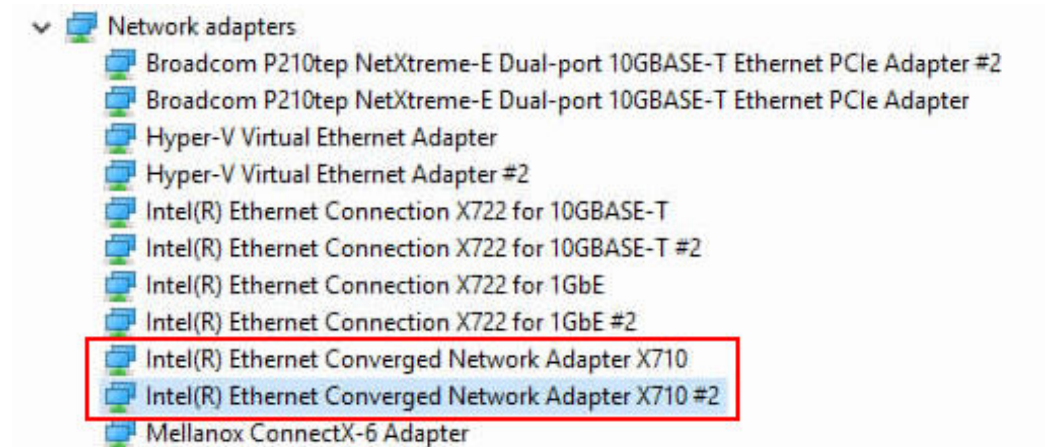
The following uses Windows Server 2019 XP330 as an example to describe how to configure port SR-IOV in Windows.

### Prerequisites

The NIC SR-IOV must be enabled. The value is **Enabled** by default.

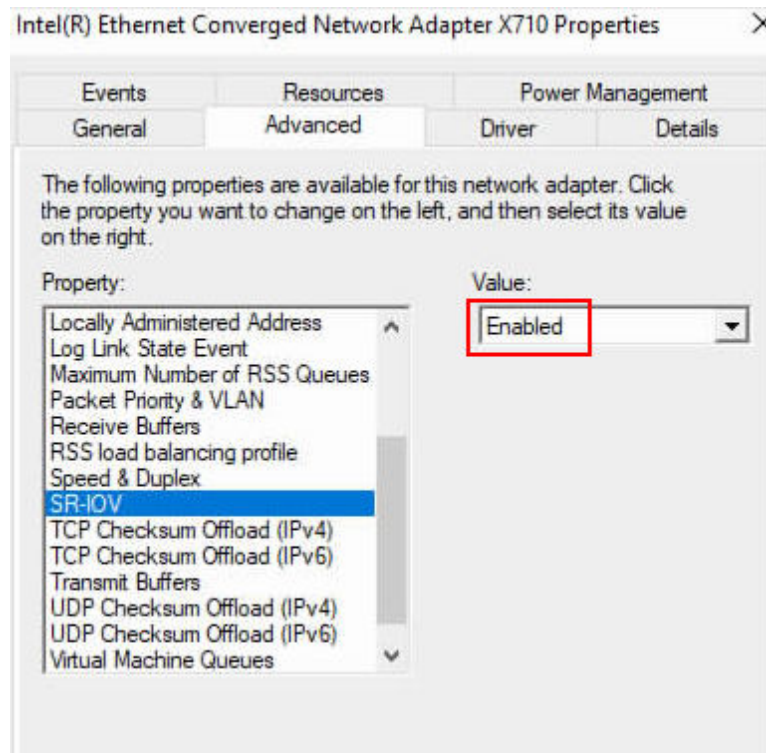
**Step 1** In Device Manager, select XP330, as shown in [Figure 5-39](#) .

**Figure 5-39** Enter Device Manager



**Step 2** Select the network port to be checked, double-click the network port to display the property configuration page, click the Advanced tab, and check that the SR-IOV value is Enabled, as shown in [Figure 5-40](#) .

**Figure 5-40** Configure properties.

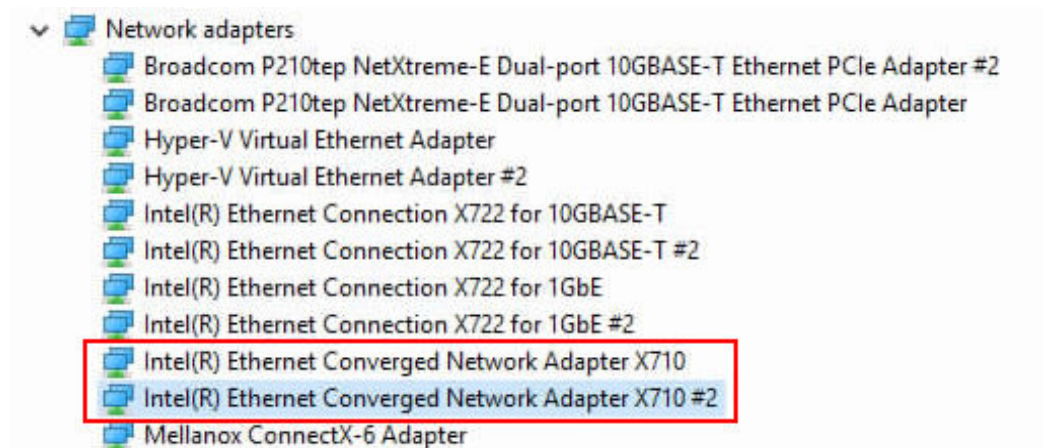


----End

### 5.4.2.1 Installing Hyper-V

**Step 1** Open the Device Manager, as shown in [Figure 5-41](#) . Check whether the chipset driver and NIC driver are installed properly.

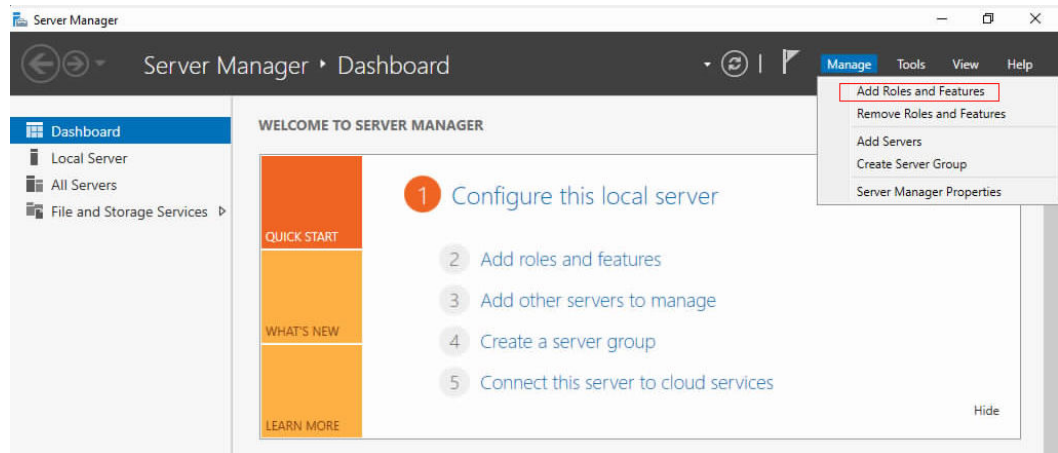
**Figure 5-41** Viewing NIC Ports



- If yes, perform [Step 2](#).
- If no, install the driver for the NIC.

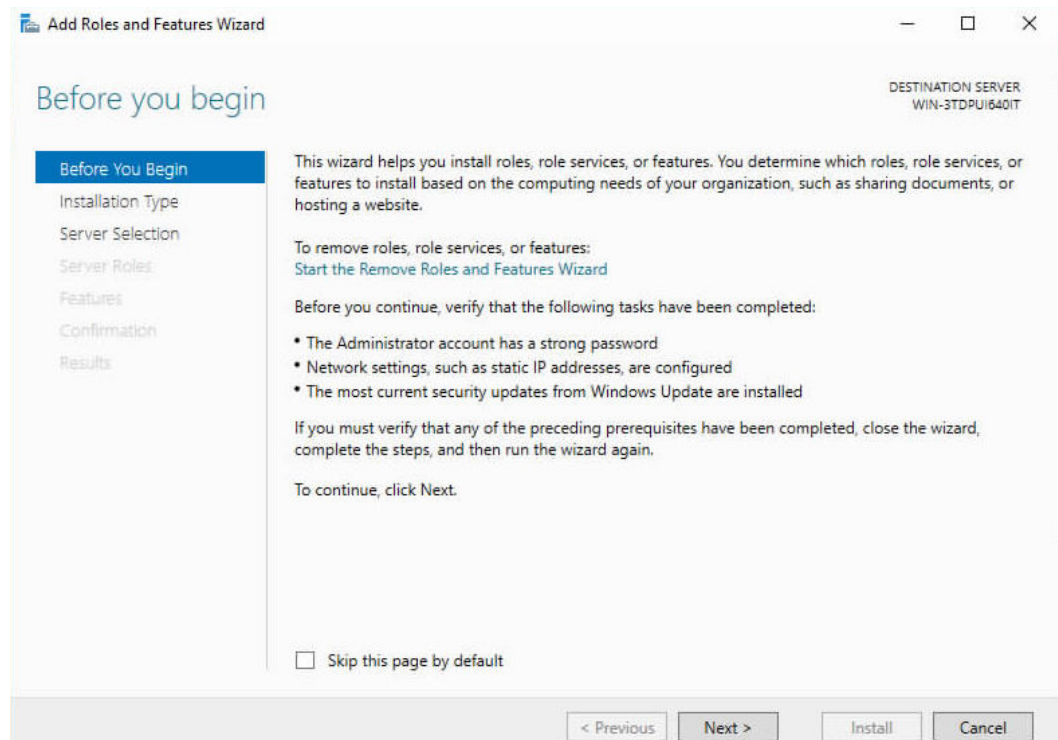
**Step 2** Choose Server Manager, and choose Manage > gt from the upper right corner. Add Roles and Features, as shown in [Figure 5-42](#) .

**Figure 5-42** Server Manager Configuration



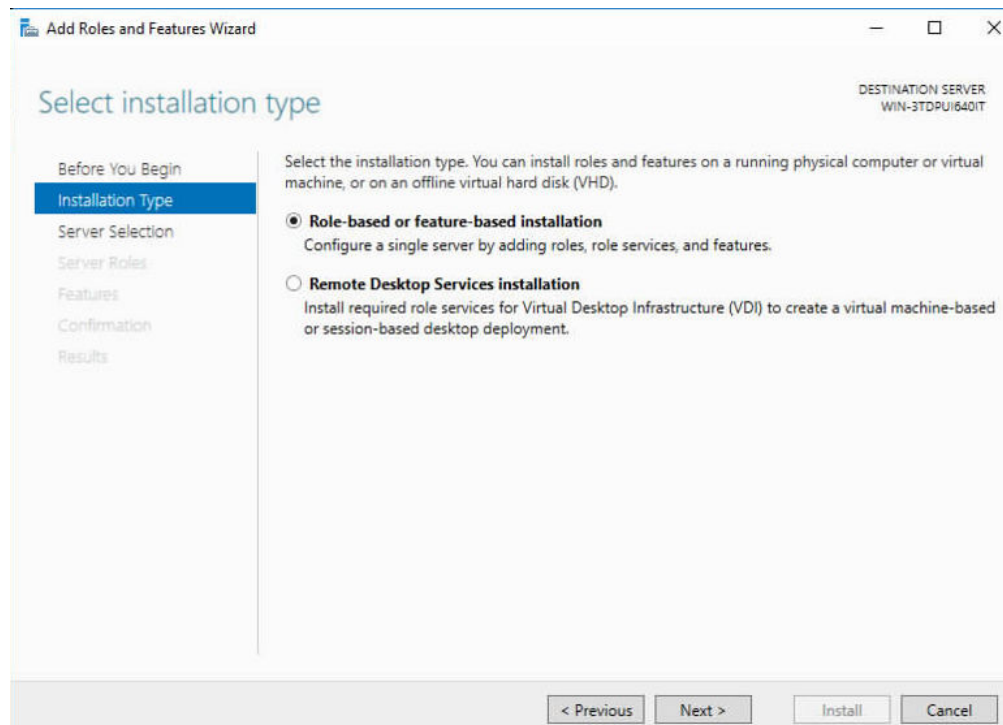
**Step 3** On the Before you begin page, retain the default value and click Next. as shown in [Figure 5-43](#) .

**Figure 5-43** Add Roles and Features Configuration



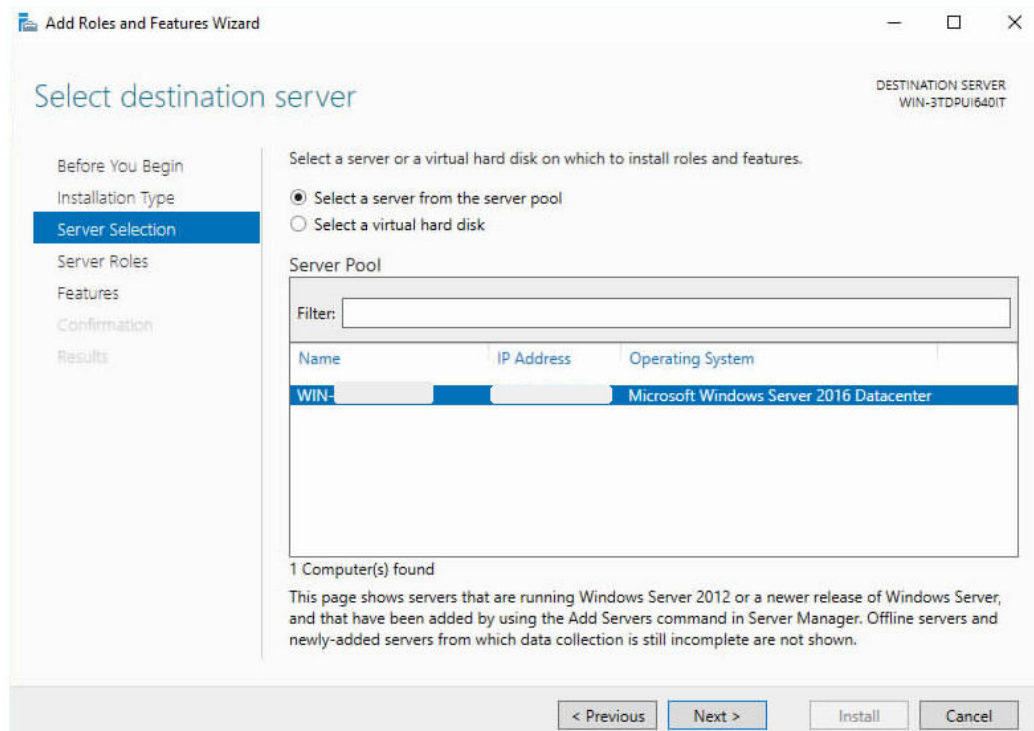
**Step 4** In the Installation Type dialog box, retain the default value and click Next. as shown in [Figure 5-44](#).

**Figure 5-44** Select the installation mode.



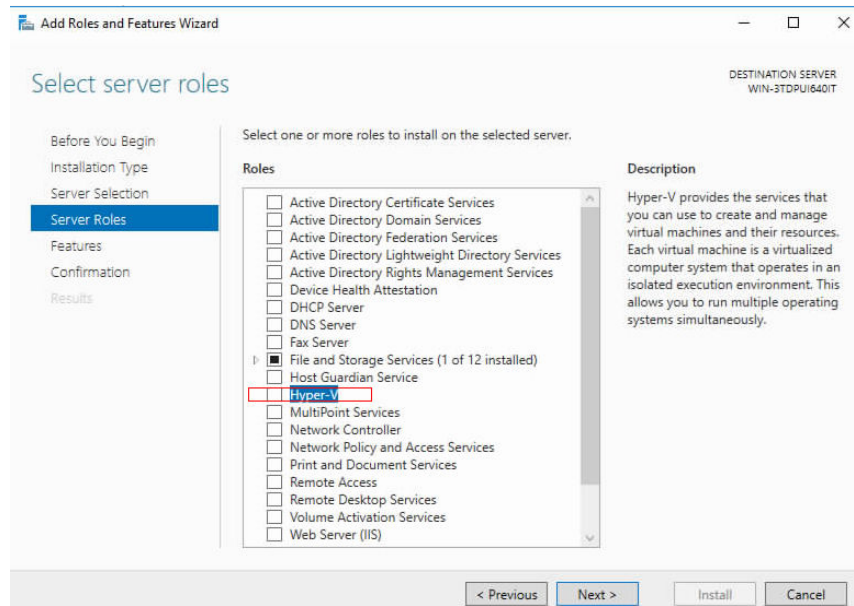
**Step 5** In Server Selection, select Server in the Server Pool list, and click Next. as shown in [Figure 5-45](#) .

**Figure 5-45** Choose Server



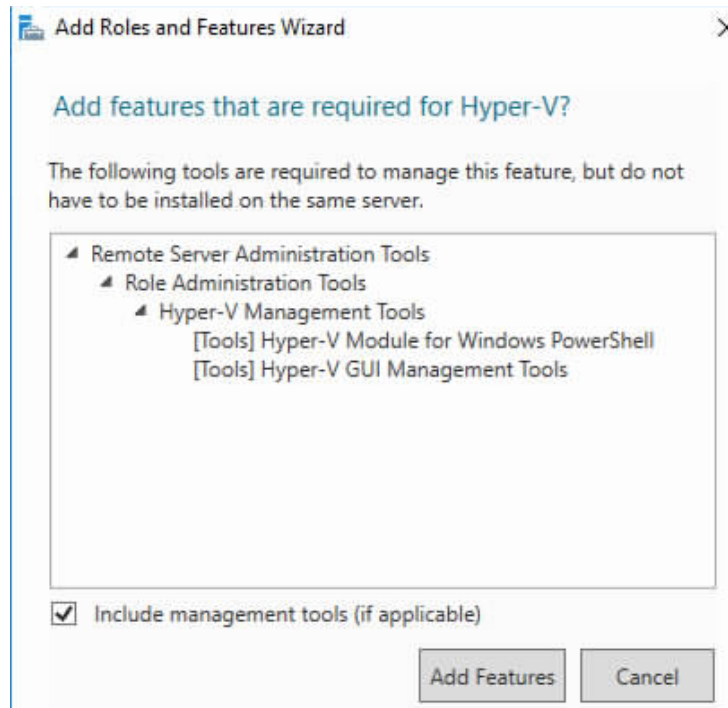
**Step 6** Click Hyper-V on the Server Roles page, as shown in the [Figure 5-46](#) .

**Figure 5-46** Select Server Role



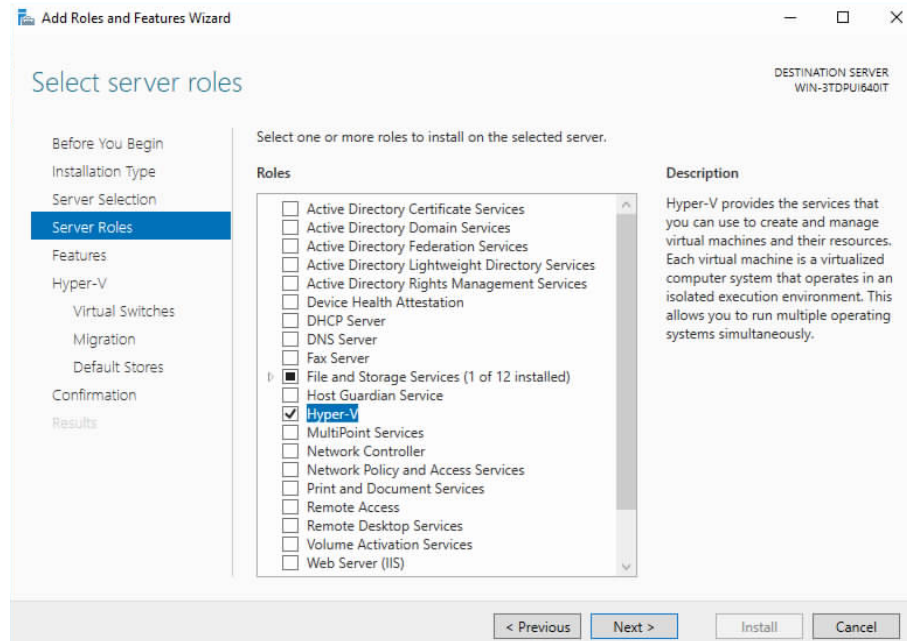
**Step 7** In the displayed dialog box, click Add Features, as shown in [Figure 5-47](#).

**Figure 5-47** Add Features (1)



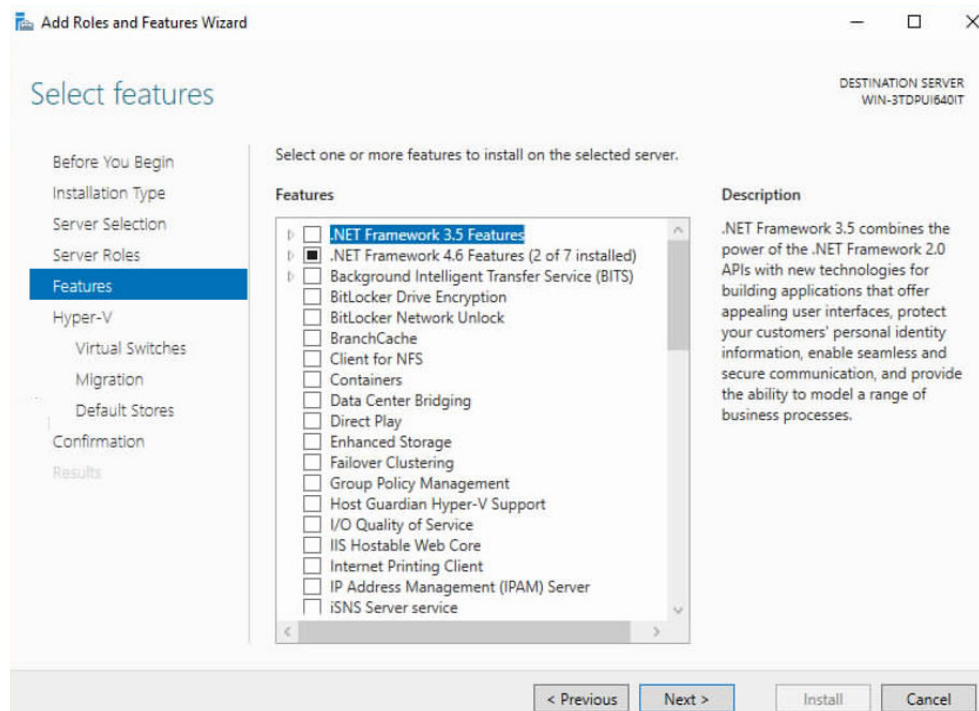
**Step 8** The Server Roles page is displayed and click Next. as shown in [Figure 5-48](#).

**Figure 5-48** Add Features (2)



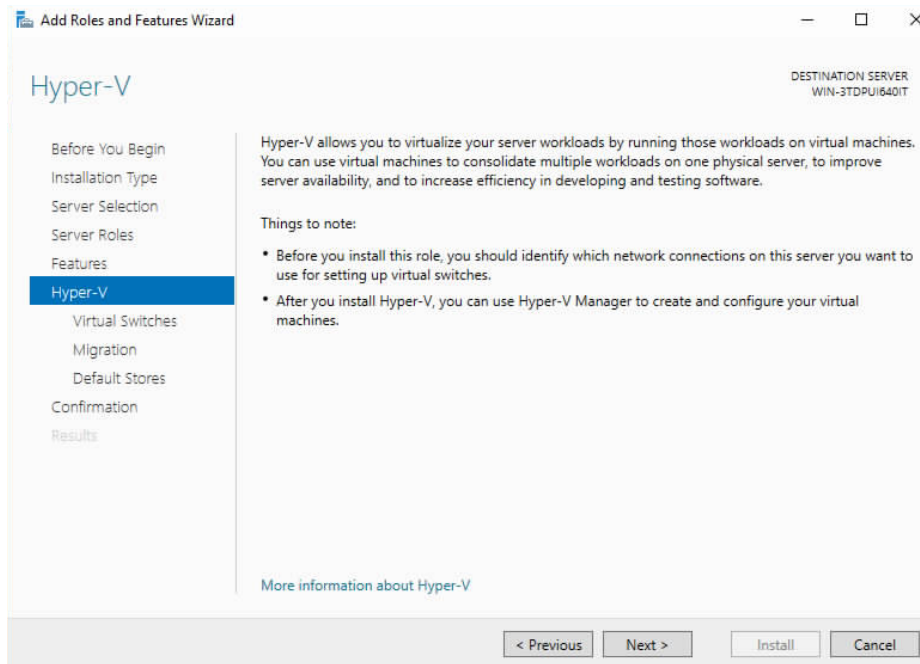
**Step 9** On the Features configuration page, keep the default settings and click Next, as shown in [Figure 5-49](#) .

**Figure 5-49** Features configuration



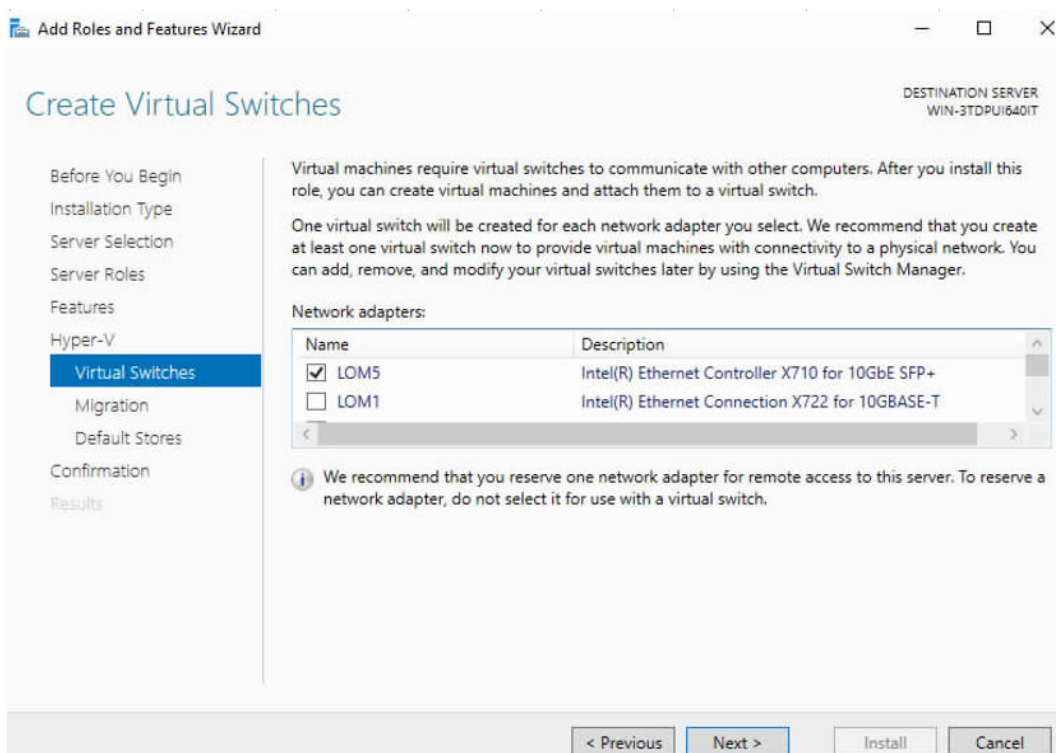
**Step 10** On the Hyper-V configuration page, click Next, as shown in [Figure 5-50](#) .

**Figure 5-50** Hyper-V Configuration



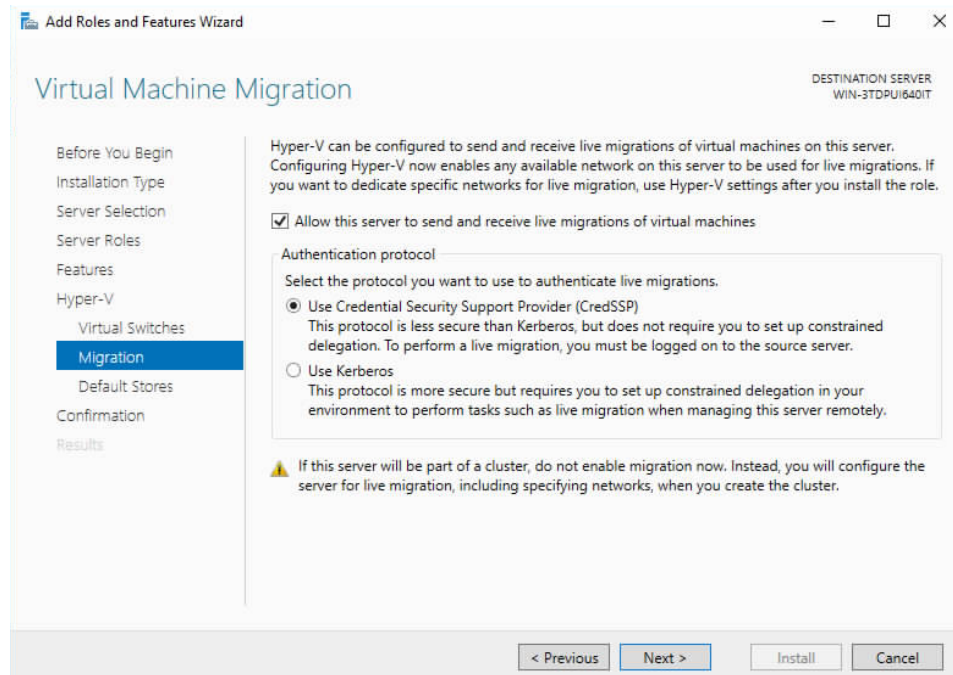
**Step 11** On the Virtual Switches page, select a network port, such as LOM5, and click Next, as shown in [Figure 5-51](#) .

**Figure 5-51** Select Network Ports



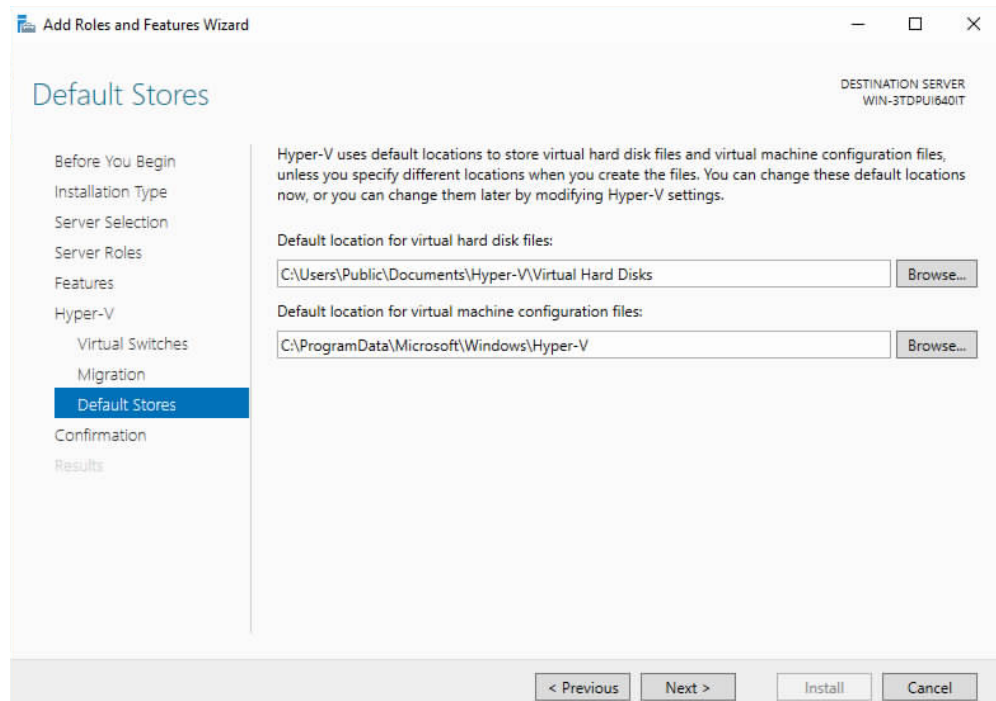
**Step 12** Select Allow this server to send and receive live migrations of virtual machines on the Migration page and click Next, as shown in the [Figure 5-52](#) .

**Figure 5-52** Migration configuration page



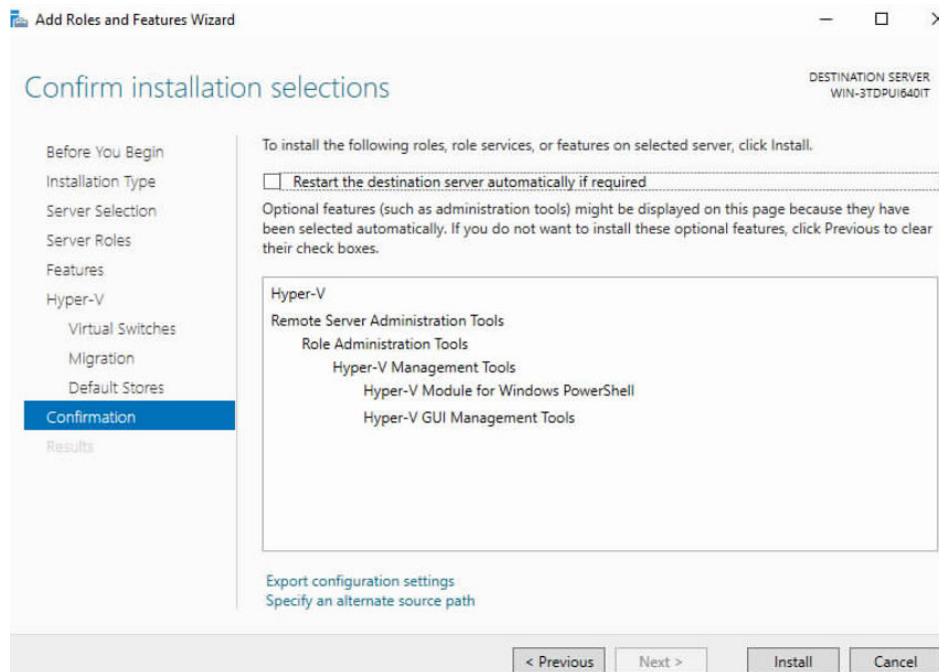
**Step 13** On the Default Stores page, keep the default path and click Next. as shown in **Figure 5-53**.

**Figure 5-53** Default Stores Configuration



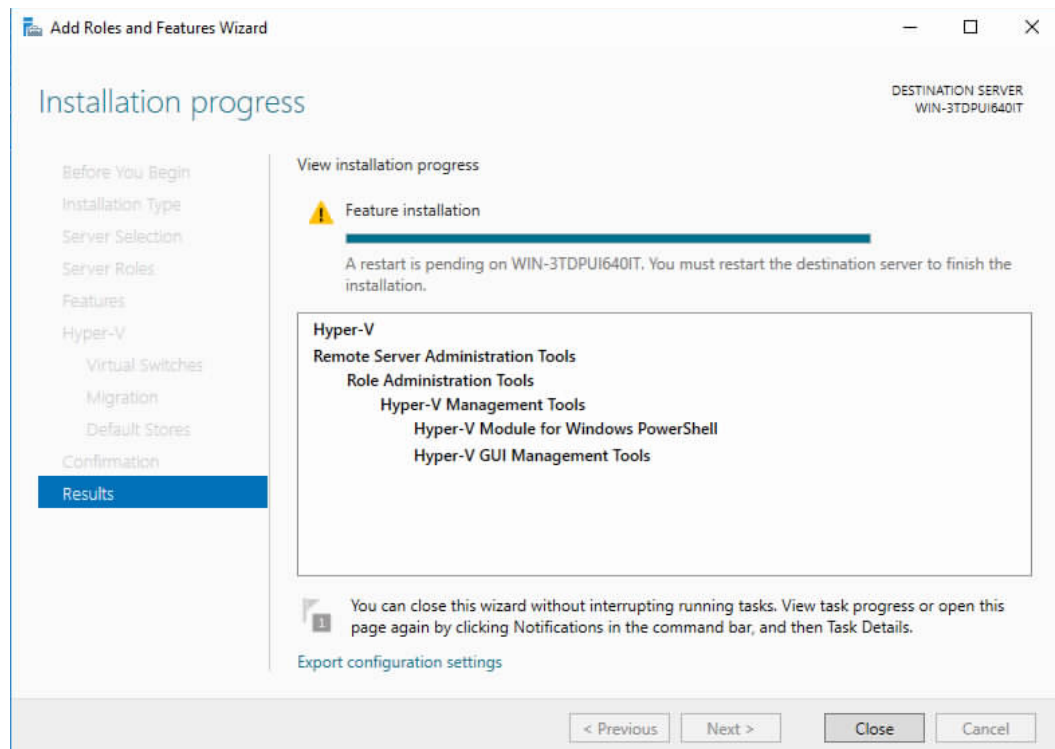
**Step 14** On the Confirmation page, click Install, as shown in **Figure 5-54**.

**Figure 5-54** Confirmation



**Step 15** After Hyper-V is installed, click Close, as shown in the [Figure 5-55](#) .

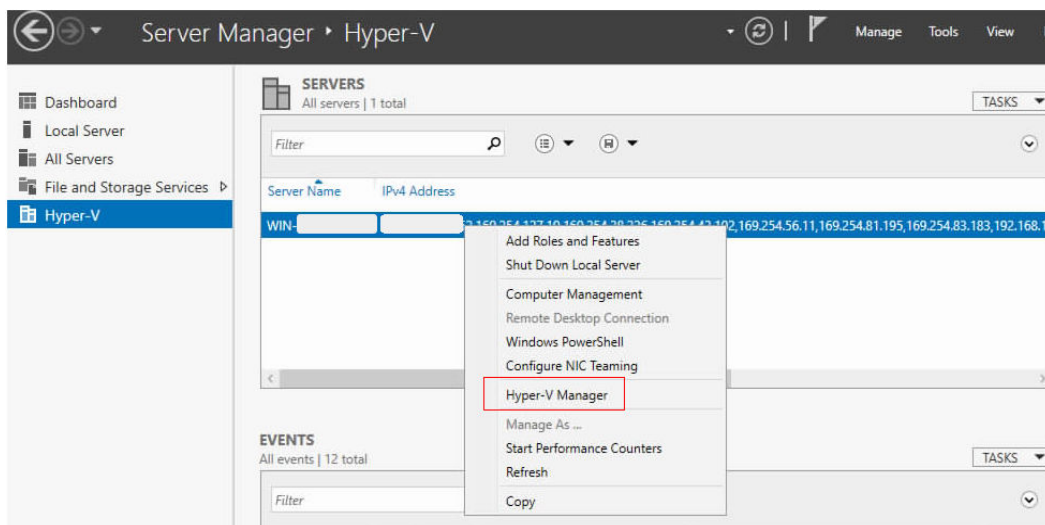
**Figure 5-55** Hyper-V installation complete



**Step 16** Restarting the Windows system takes effect.

**Step 17** After the system restarts, you can see the Hpyer-V in the left navigation bar of the Server Manager page, as shown in the [Figure 5-56](#) .

**Figure 5-56** View Hyper-V



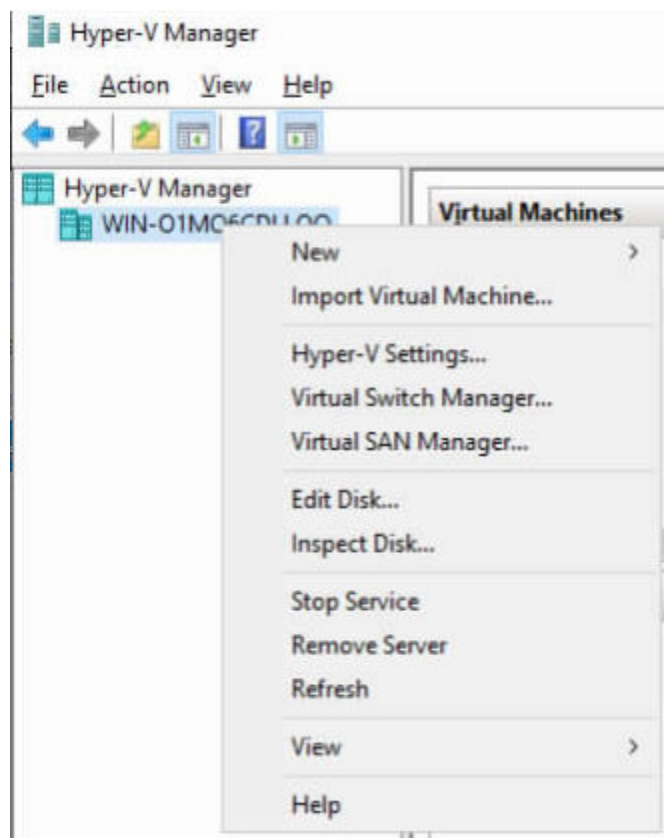
**Step 18** Click Hyper-V in the navigation tree on the left. In the right, select Server in the SERVERS list. Right-click Hyper-V Manager and choose Hyper-V Manager from the shortcut menu. as shown in [Figure 5-56](#) .

----End

### 5.4.2.2 Creating a Virtual Switch

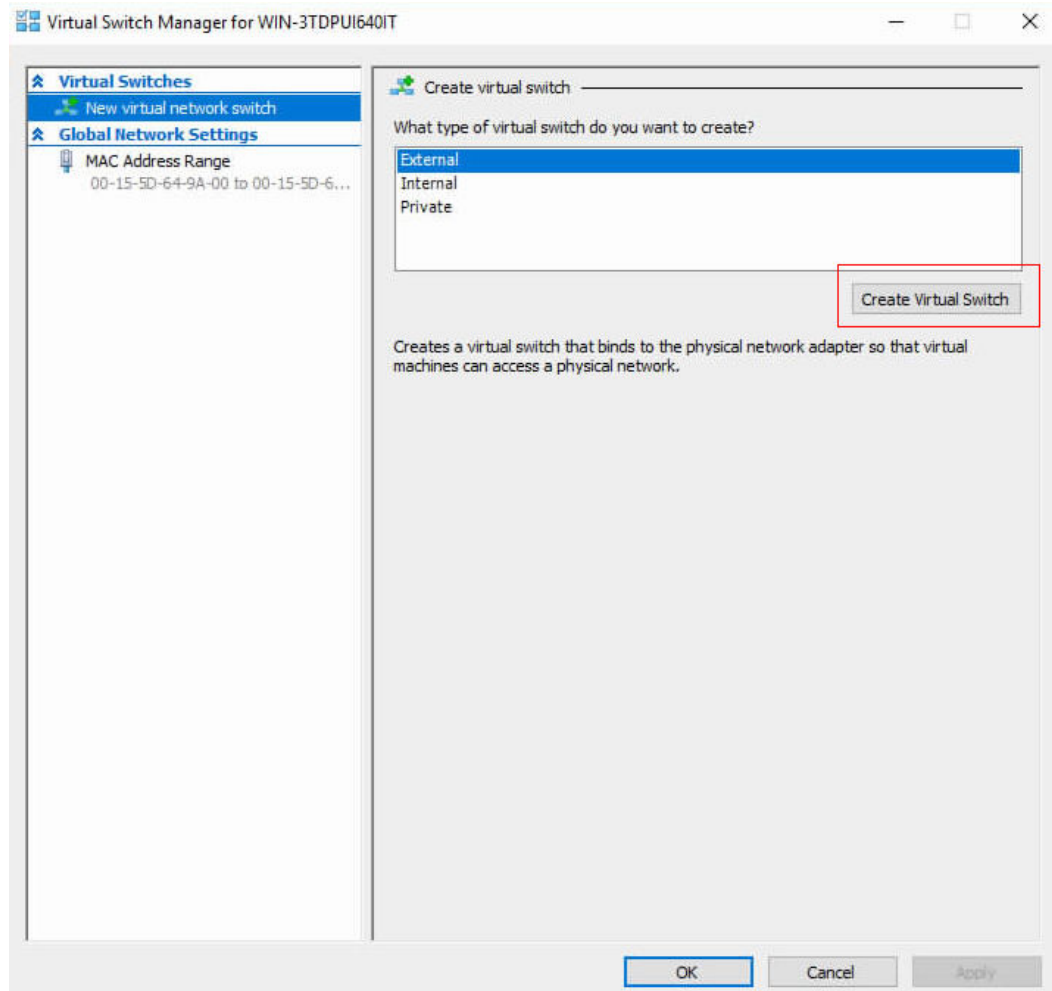
**Step 1** Right-click Hyper-V, and choose Virtual Switch Manager from the shortcut menu. Configure a virtual switch. Then, the VM can add the SR-IOV network port, as shown in [Figure 5-57](#) .

**Figure 5-57** Enter Hyper-V Manager



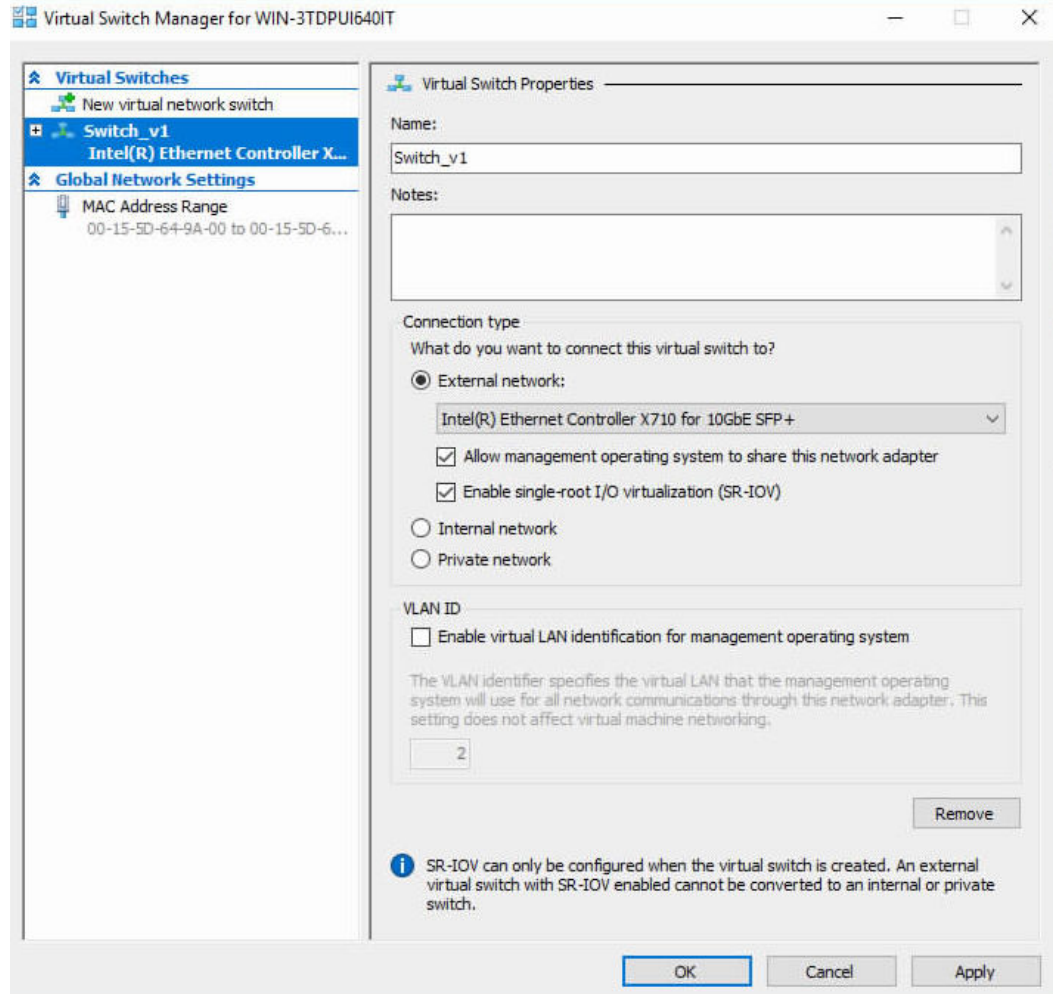
**Step 2** Click Create Virtual Switch, as shown in [Figure 5-58](#) .

**Figure 5-58** Creating a Virtual Switch



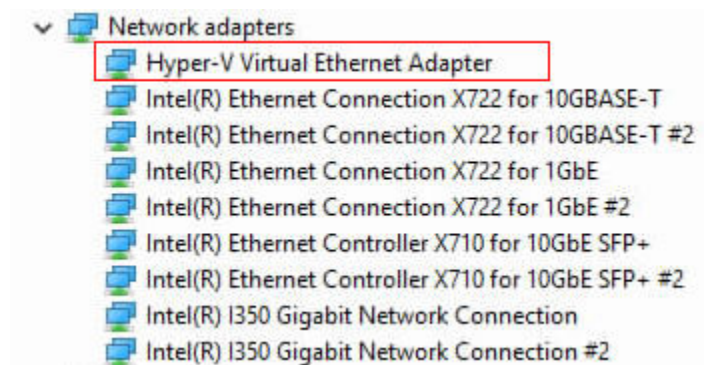
**Step 3** Select an X710 network port and name it Switch\_v1 (user-defined name). Select Enable single-root I/O virtualization (SR-IOV) and click Apply. In the displayed dialog box, click yes. Then click OK. as shown in [Figure 5-59](#).

**Figure 5-59** Associating NIC Ports



**Step 4** After the configuration is complete, you can view the corresponding network port (Hyper-V Virtual Ethernet Adapter) in Device Manager, as shown in [Figure 5-60](#).

**Figure 5-60** View Virtual Switch

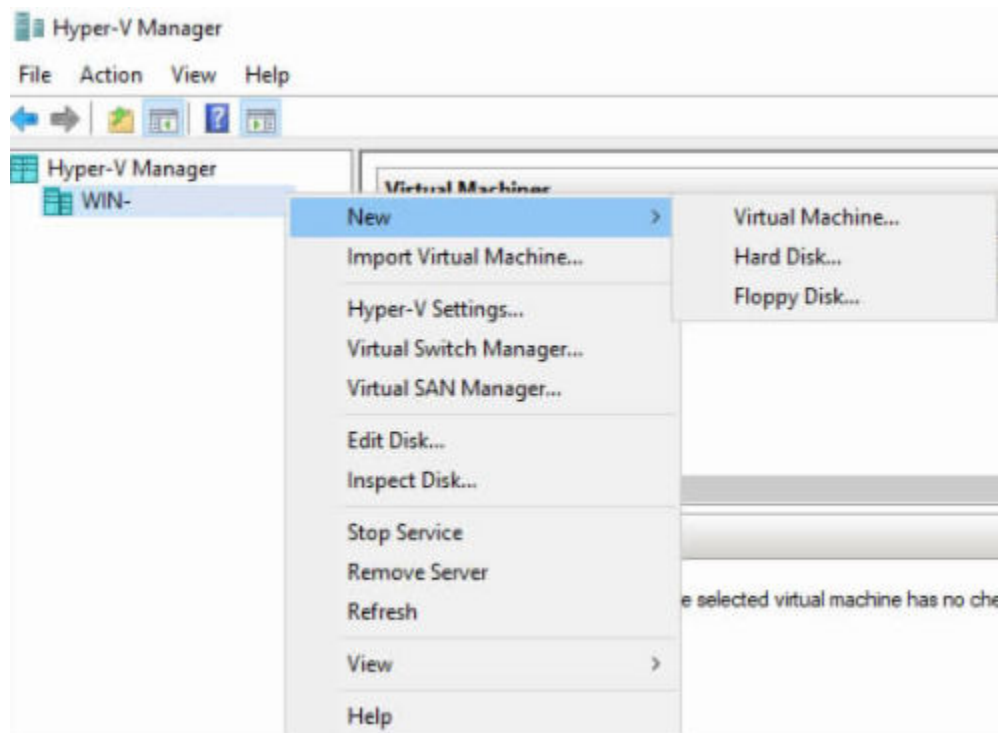


----End

### 5.4.2.3 Create VM

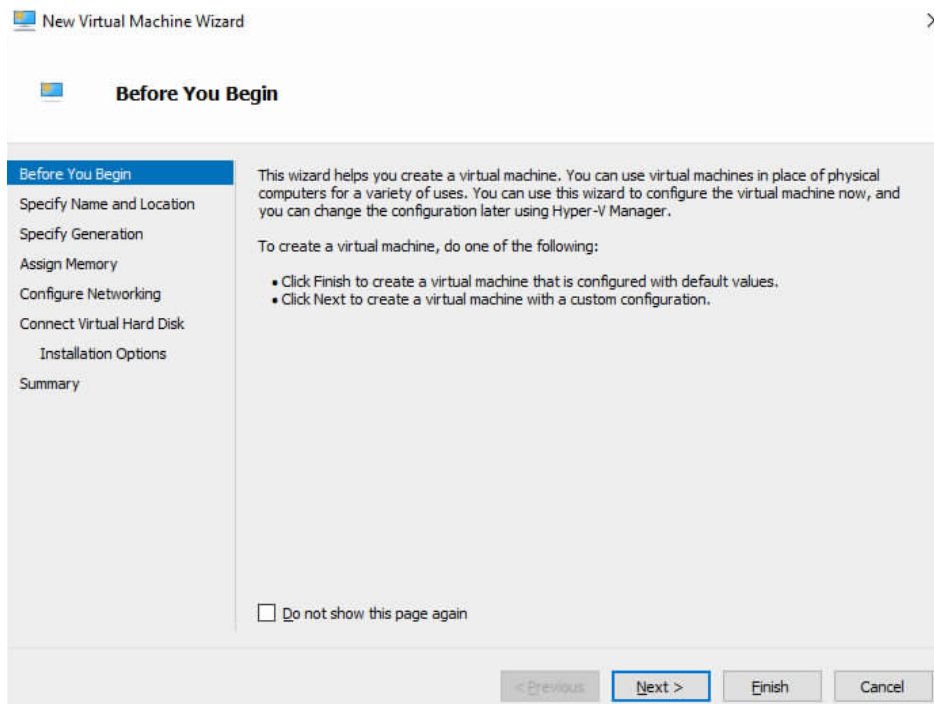
**Step 1** Right-click the installed Hyper-V, and choose New > Virtual Machine "Create a virtual machine, as shown in the [Figure 5-61](#).

**Figure 5-61** New VM



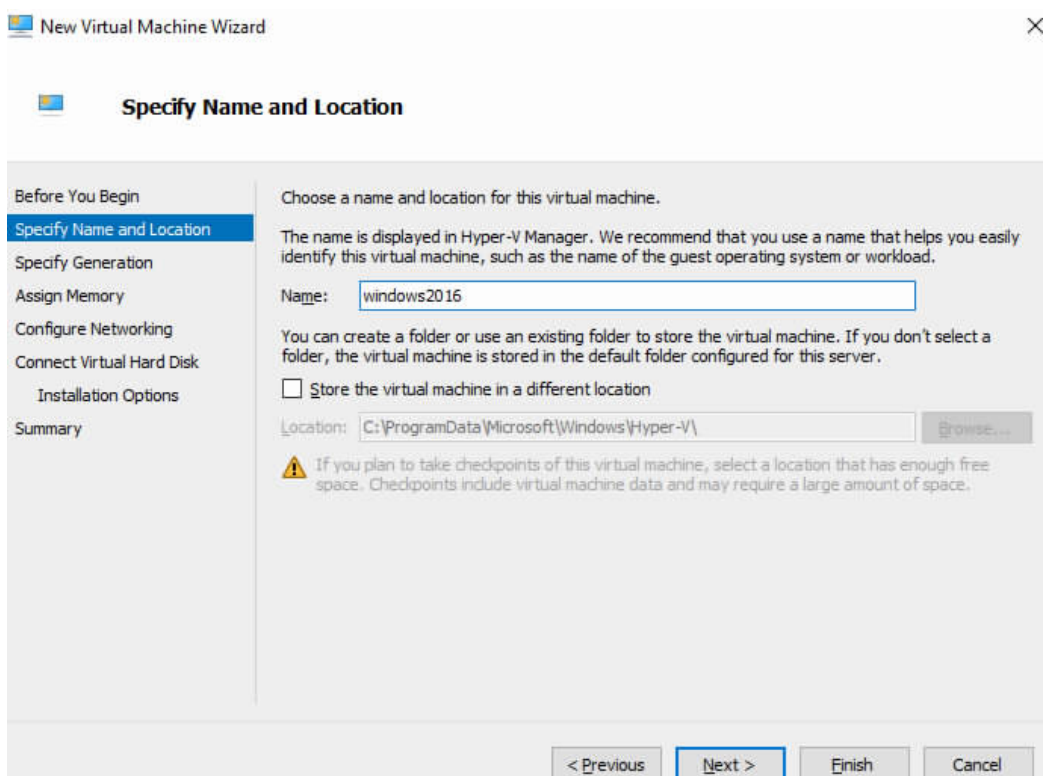
**Step 2** On the Before You Begin page, retain the default settings and click Next, as shown in the [Figure 5-61](#).

**Figure 5-62** Precautions to Begin



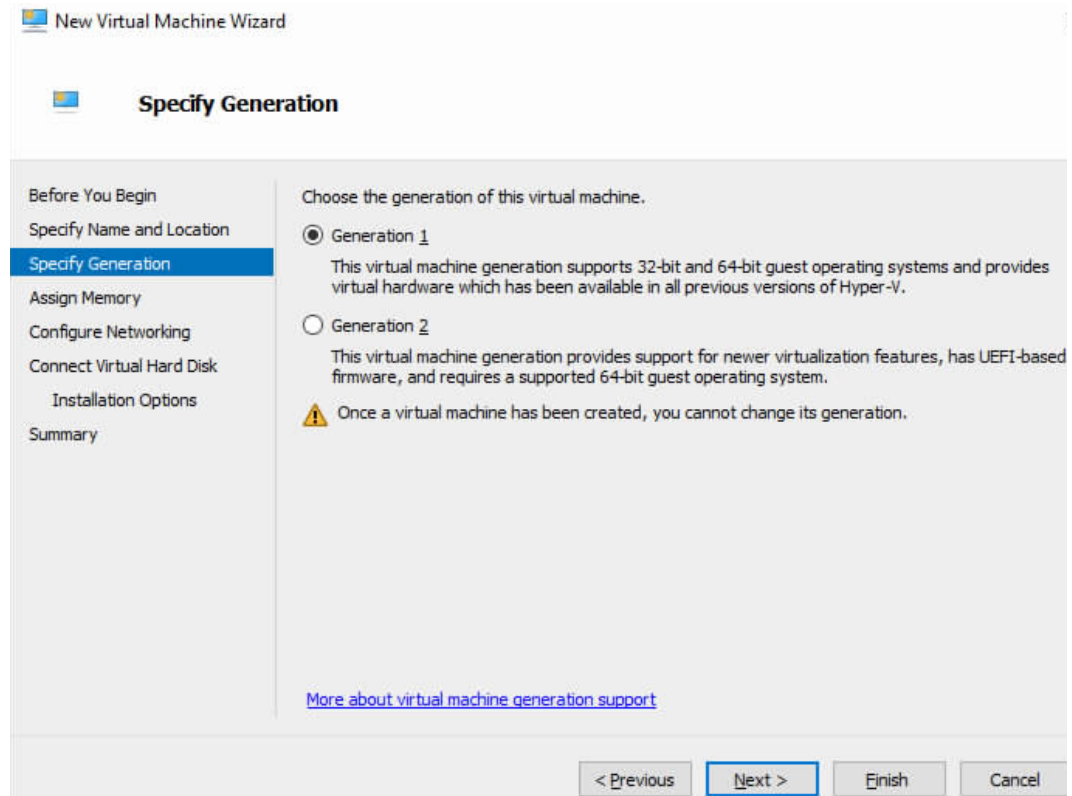
**Step 3** On the Specify Name and Location page, enter the VM name, for example, Windows2016, and click Next, as shown in [Figure 5-63](#) .

**Figure 5-63** Enter a VM name.



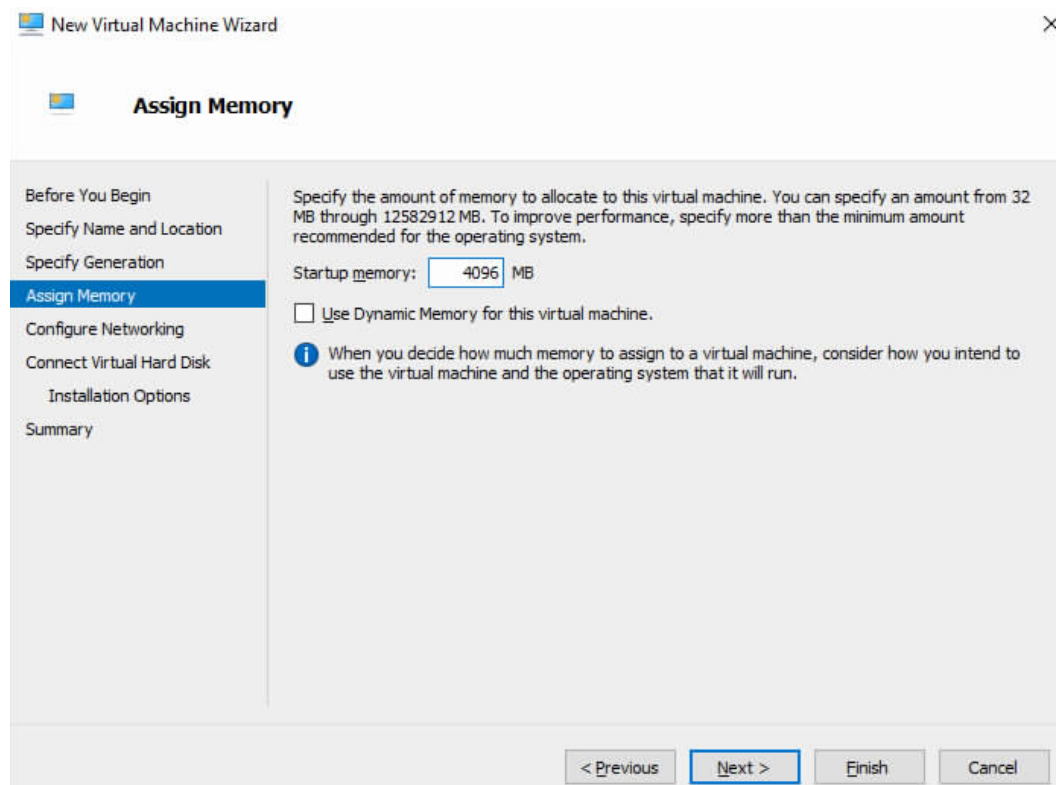
**Step 4** On the Specify Generation page, specify the VM type and click Next, as shown in [Figure 5-64](#)

**Figure 5-64** Specifying the VM Type



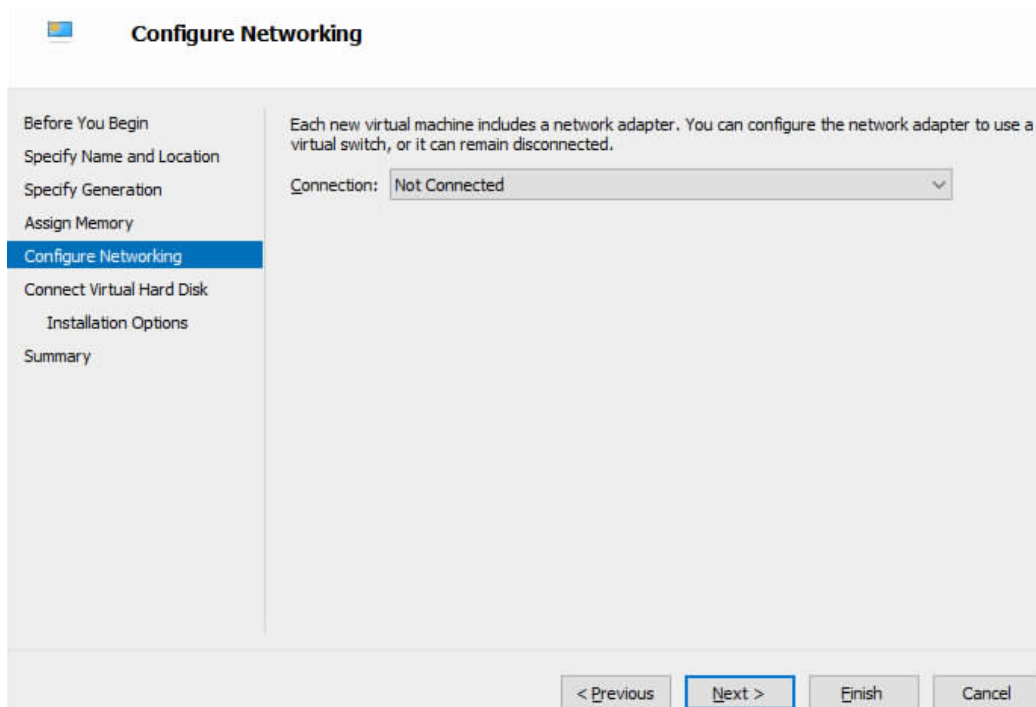
**Step 5** On the Assign Memory page, click Next, as shown in [Figure 5-65](#) .

**Figure 5-65** Allocate memory



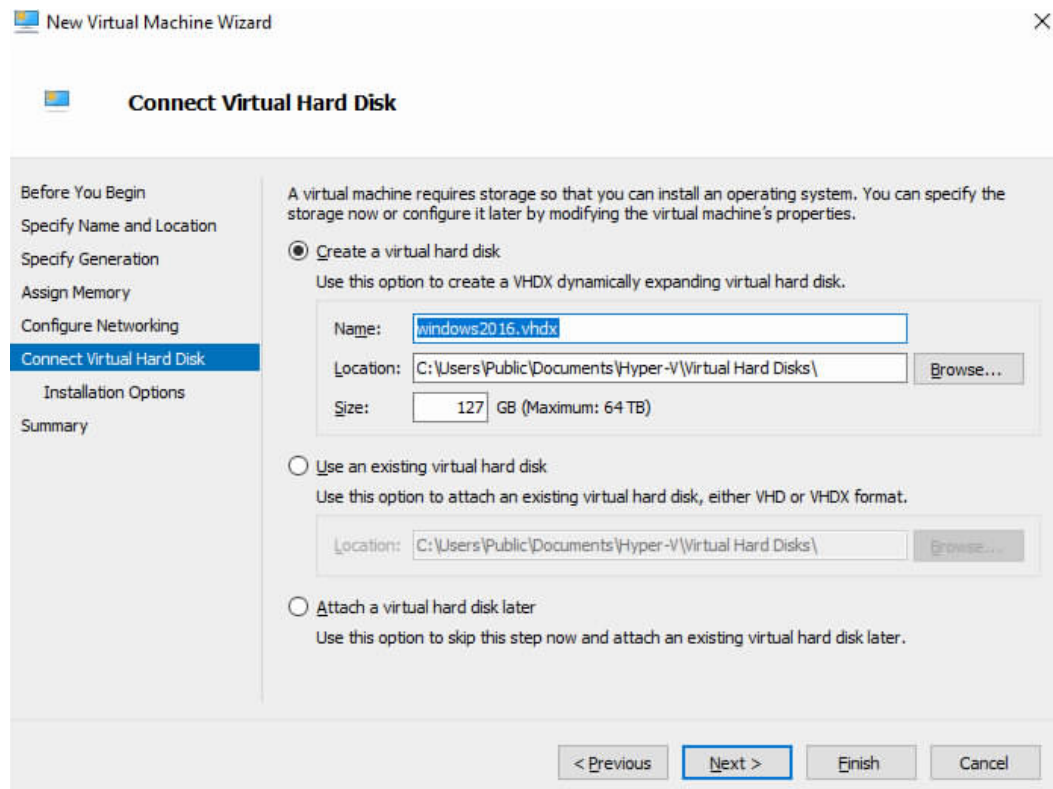
**Step 6** On the Configure Networking page, select Not Connected and click Next. as shown in **Figure 5-66** .

**Figure 5-66** Configuring the Network



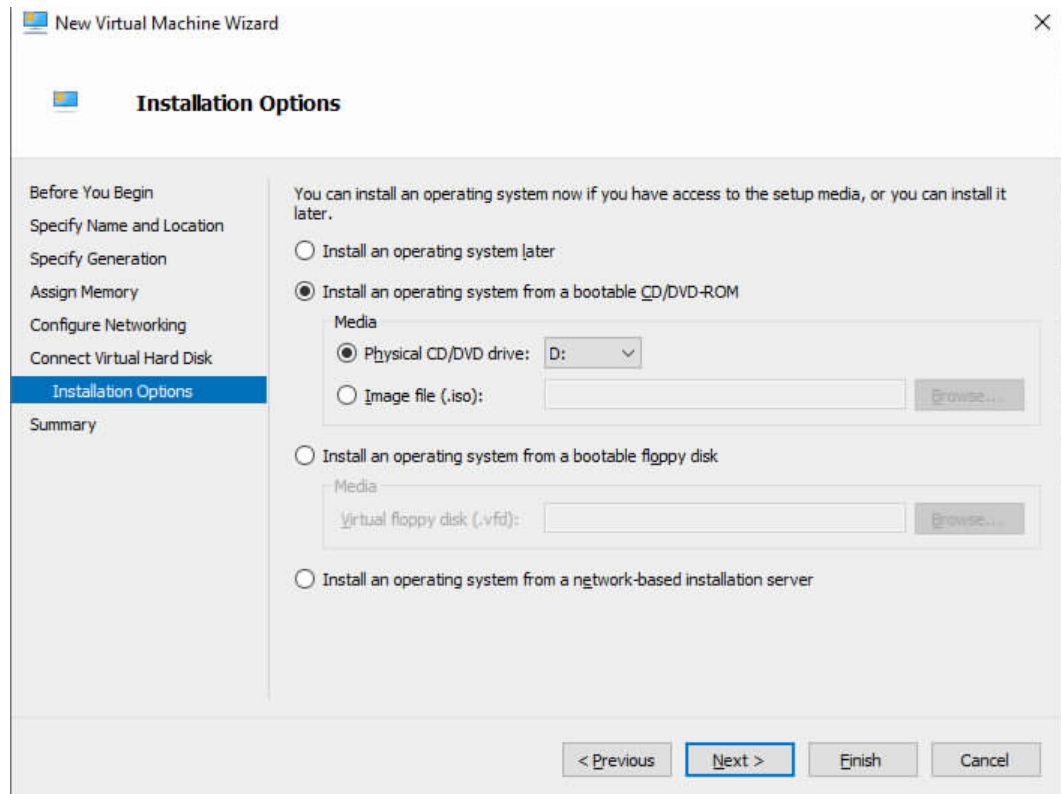
**Step 7** On the Connect Virtual Hard Disk page, set hard disk parameters and click Next, as shown in **Figure 5-67**

**Figure 5-67** Setting Hard Disk Parameters



**Step 8** On the Installation Options page, select an installation image source and click Next, as shown in [Figure 5-68](#).

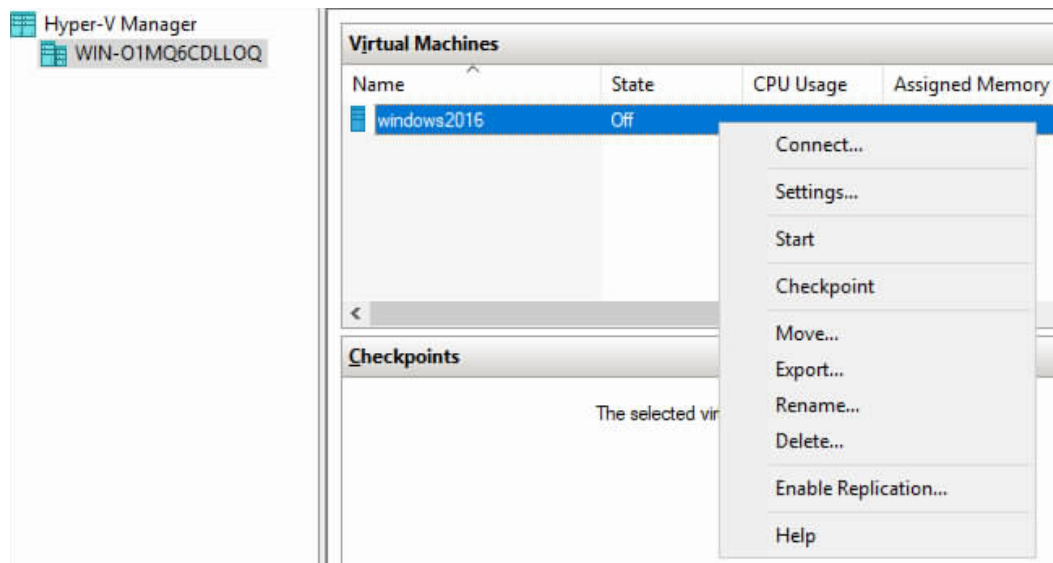
**Figure 5-68** Installing a Mirror Source



**Step 9** On the Summary page, click Finish to complete the VM creation.

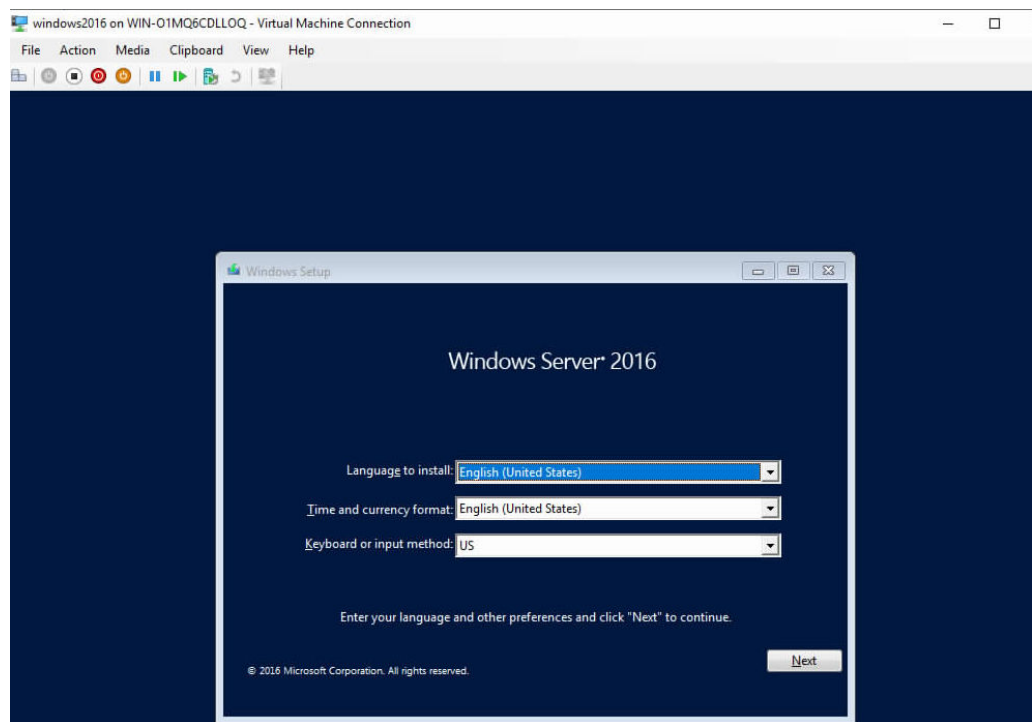
**Step 10** Right-click the created VM and choose Start from the shortcut menu to start the VM, as shown in [Figure 5-69](#).

**Figure 5-69** Start the VM



**Step 11** Double-touch the virtual machine to open the virtual machine window, and boot to the interface shown in [Figure 1-78](#). Follow the instructions in the [Server OS Installation Guide](#) for the operation.

**Figure 5-70** Entering the System Installation Page

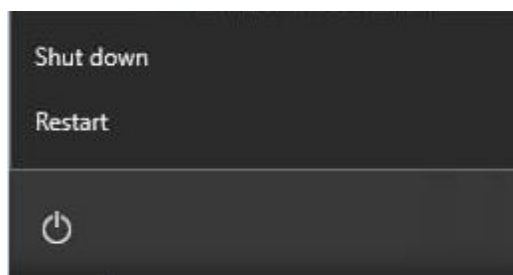


----End

#### 5.4.2.4 Adding SR-IOV Network Ports

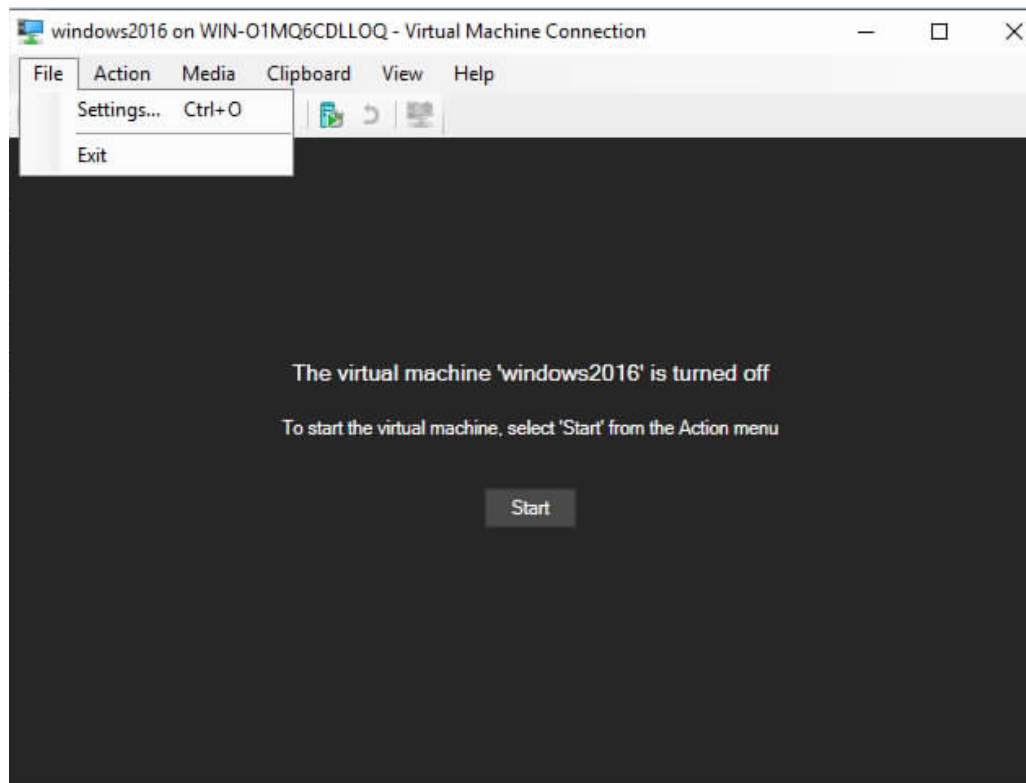
**Step 1** On the VM, click Shut down to power off the VM, as shown in [Figure 5-71](#) .

**Figure 5-71** Power off the VM



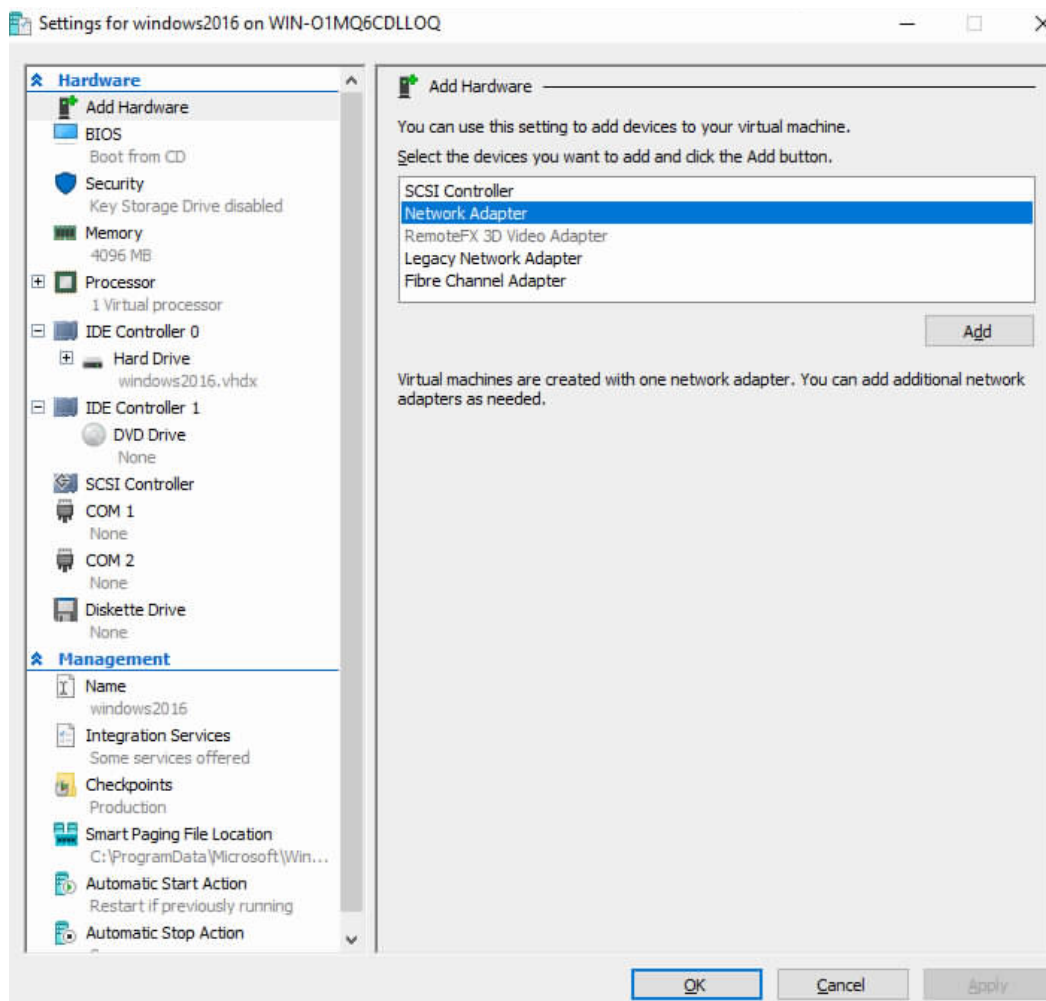
**Step 2** Select File & gt; from the menu bar Settings, as shown in the [Figure 5-72](#).

**Figure 5-72** Start to set



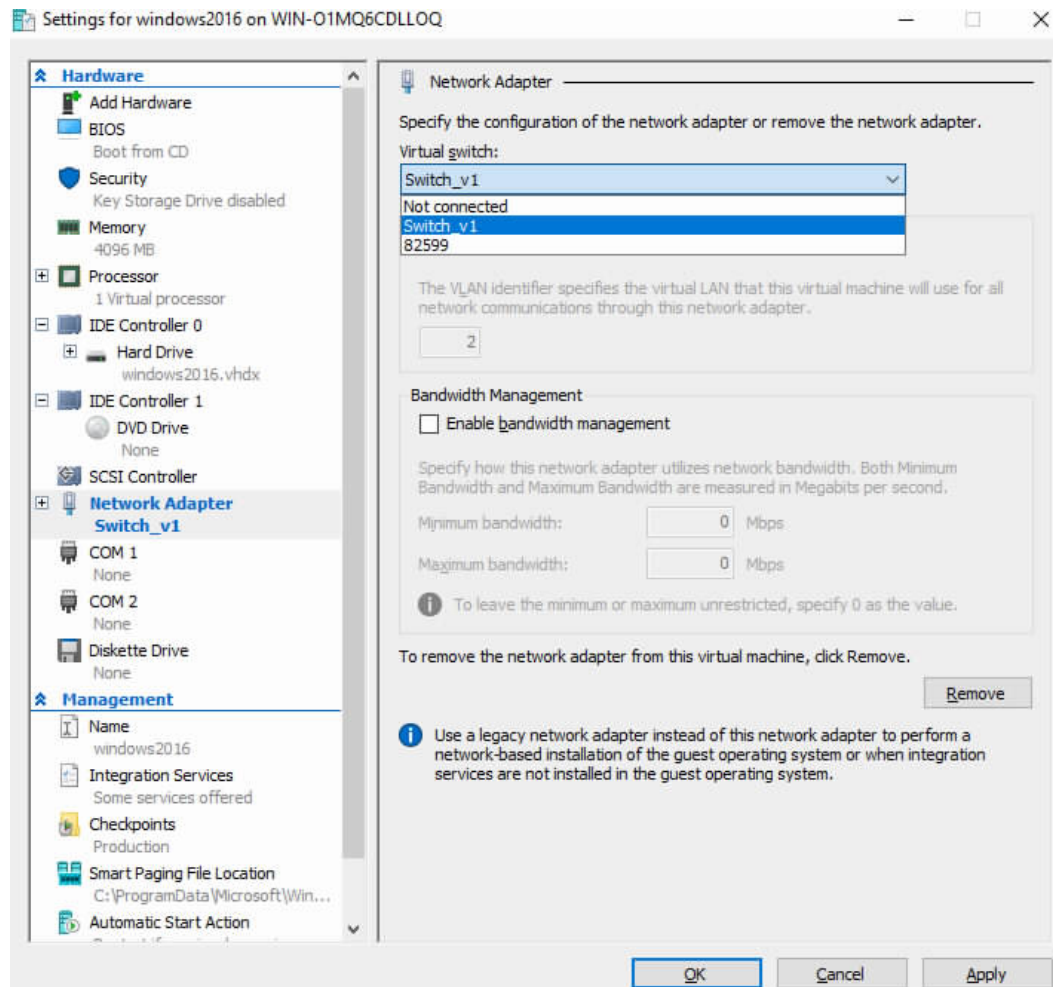
**Step 3** In the navigation tree, choose Add Hardware. In the right pane, choose Network Adapter. Click Add. as shown in [Figure 5-73](#).


**Figure 5-73** Add Network Port



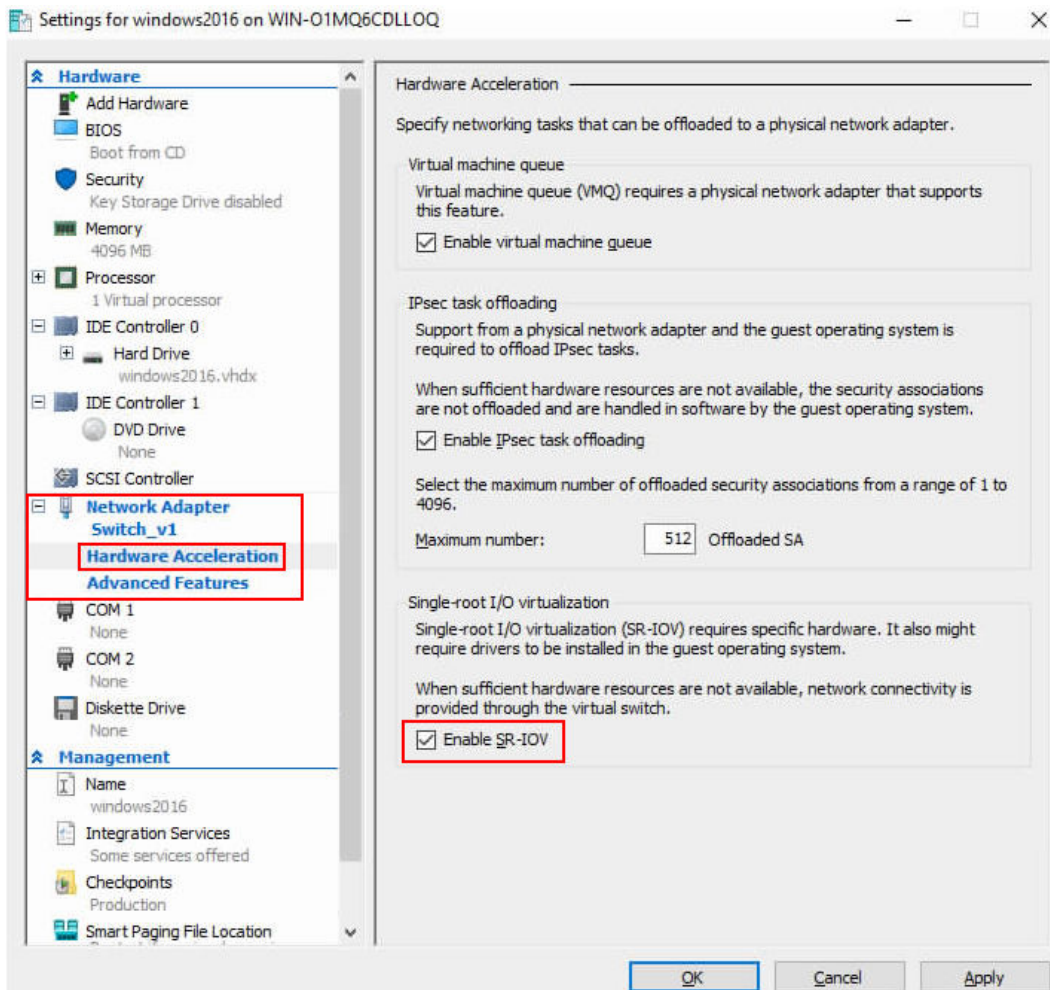
**Step 4** Select Switch\_v1 under Virtual Switch, as shown in [Figure 5-74](#) .

**Figure 5-74** Select VM



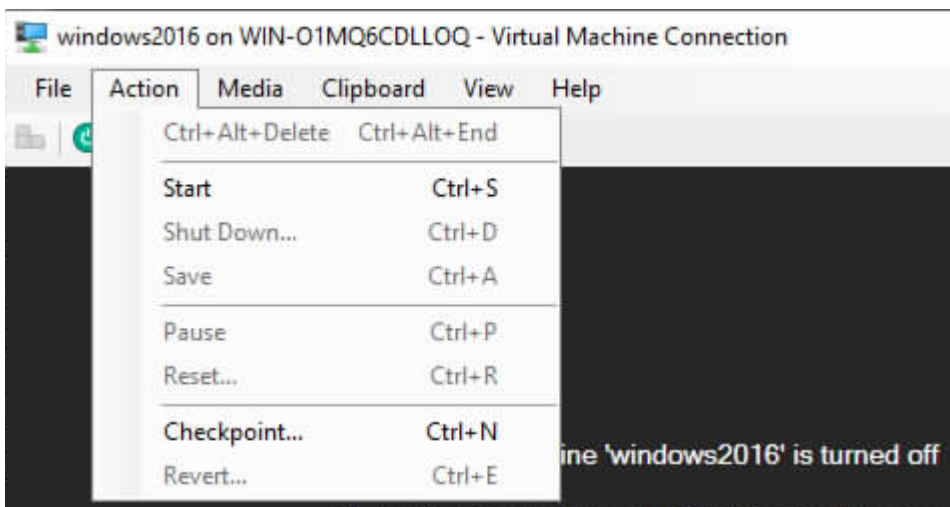
**Step 5** In the navigation tree on the left, click the new  in front of Switch\_v1, expand the options, choose Hardware Acceleration, select Enable SR-IOV in the right pane, and click OK. as shown in [Figure 5-75](#) .

**Figure 5-75** Enable SR-IOV



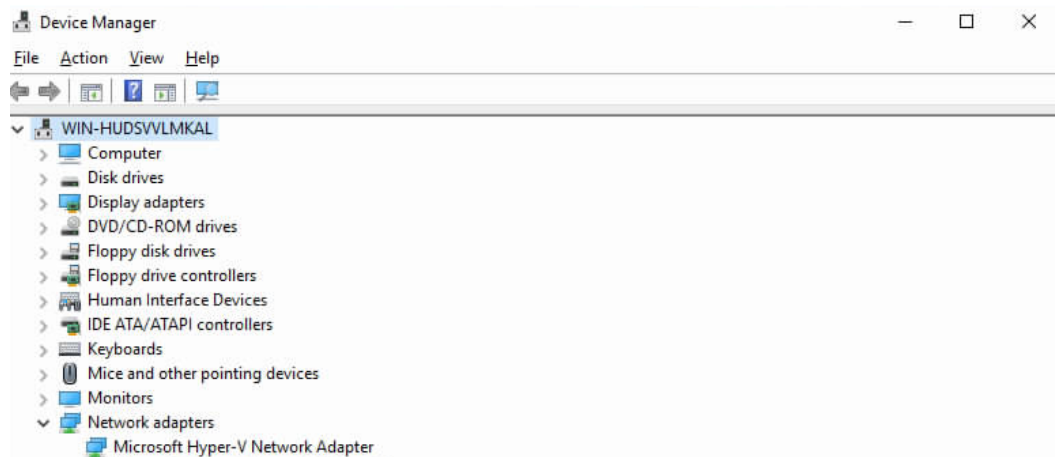
**Step 6** Choose Action > from the menu bar. Start to start the VM, as shown in [Figure 5-76](#).

**Figure 5-76** Start the VM



- Step 7** Log in to the VM and access the task manager. You can find the Microsoft Hyper-V Network Adapter, as shown in [Figure 5-77](#) .

**Figure 5-77** Viewing Virtual Network Ports



----End

### 5.4.3 Configuring Port SR-IOV in VMware

The following uses VMware ESXi 7.0 U3 as an example to describe how to configure port SR-IOV in VMware.

#### 5.4.3.1 Enable SR-IOV

In VMware ESXi, SR-IOV can be enabled for cluster-managed servers and non-cluster-managed servers.

#### Prerequisites

The latest version of the network card driver is installed; the NIC supports SR-IOV functionality, and VMware ESXi has compatible support for the NIC's SR-IOV, which can be verified through the "[VMware Compatibility Guide](#)."

- Step 1** to remotely log in to Shell over SSH through the xx port as the **root** user.
- Step 2** Run the **esxcli network nic list** command to view the list of network devices that use the NIC driver, and determine the NIC location from the list.

Information similar to the following is displayed:

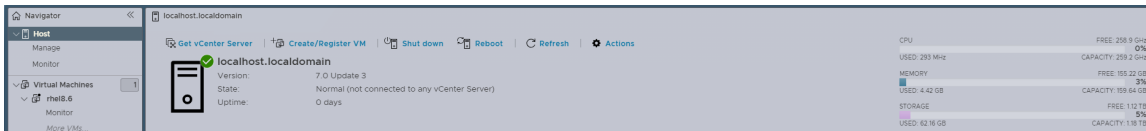
```
[root@localhost:~] esxcli network nic list
```

Name	PCI Device	Driver	Admin	Status	Link Status	Speed	Duplex	MAC Address	MTU	Description
vmnic1	0000:a8:00.0	igbn	Up	Up	1000	Full	34:73:79:2e:d8:79	1500	Intel Corporation I350 Gigabit Network Connection	
vmnic2	0000:a8:00.1	igbn	Up	Up	1000	Full	34:73:79:2e:d8:7a	1500	Intel Corporation I350 Gigabit Network Connection	
vmnic3	0000:a8:00.2	igbn	Up	Up	1000	Full	34:73:79:2e:d8:7b	1500	Intel Corporation I350 Gigabit Network Connection	
vmnic4	0000:a8:00.3	igbn	Up	Up	1000	Full	34:73:79:2e:d8:7c	1500	Intel Corporation I350 Gigabit Network Connection	
vmnic5	0000:16:00.0	bnxtnet	Up	Up	10000	Full	34:73:79:bd:05:d6	1500	Broadcom BCM57412 NetXtreme-E 10Gb RDMA Ethernet Controller	
vmnic6	0000:16:00.1	bnxtnet	Up	Up	10000	Full	34:73:79:bd:05:d7	1500	Broadcom BCM57412	

```
NetXtreme-E 10Gb RDMA Ethernet Controller
vmmic7 0000:b8:00.0 nmlx5_core Up Up 25000 Full 34:73:79:91:85:18 1500 Mellanox Technologies
MT27800 Family [ConnectX-5]
vmmic8 0000:b8:00.1 nmlx5_core Up Up 25000 Full 34:73:79:91:85:19 1500 Mellanox Technologies
MT27800 Family [ConnectX-5]
[root@localhost:~]
```

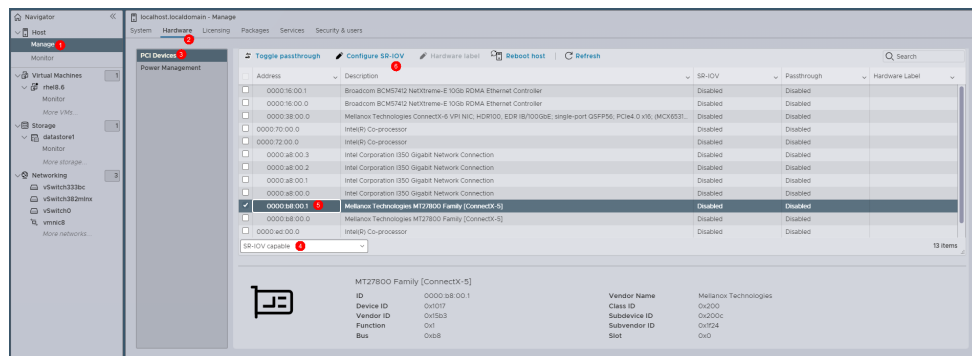
**Step 3** Log in to the IP address of VMware ESXi 7.0 U3 using a browser on a PC. The main page is displayed, as shown in [Figure 5-78](#) .

**Figure 5-78** The session dialog box is displayed.



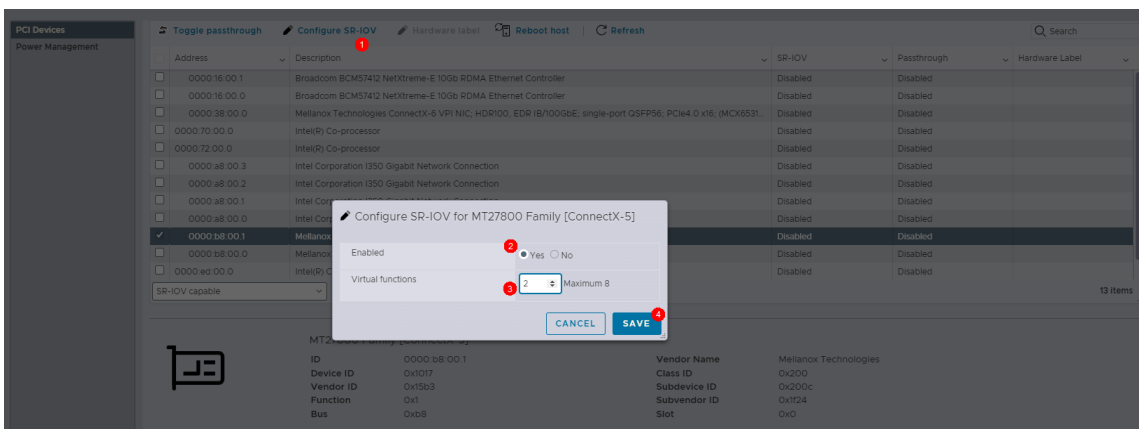
**Step 4** In the navigation tree, select the host to be configured, click the Manage tab, select Hardware > PCI Devices > SR-IOV capable, and select BDF 0000 for which SR-IOV is to be configured. b8: 00.1, click Configure SR-IOV, as shown in [Figure 5-79](#) .

**Figure 5-79** Select the port to be configured



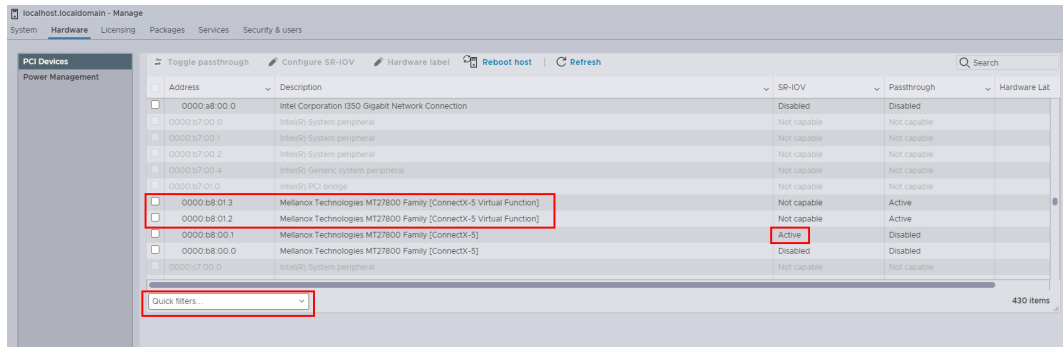
**Step 5** Set Enabled to Yes and Virtual functions to the required value, as shown in the [Figure 5-80](#) . Click Save.

**Figure 5-80** Configure parameters.



**Step 6** After restarting the computer, switch to Quick filters. Check the device list. The VF device appears, as shown in the [Figure 5-81](#)

**Figure 5-81 VF Device**



**Step 7** View the number of VFs successfully enabled. Assume that two VFs are enabled for each PF of the XC382. Run the `lspci | grep -i "virtual function"` command to check whether the number of PCI devices corresponding to the VFs enabled for SR-IOV is consistent with the configured parameters.

Information similar to the following is displayed:

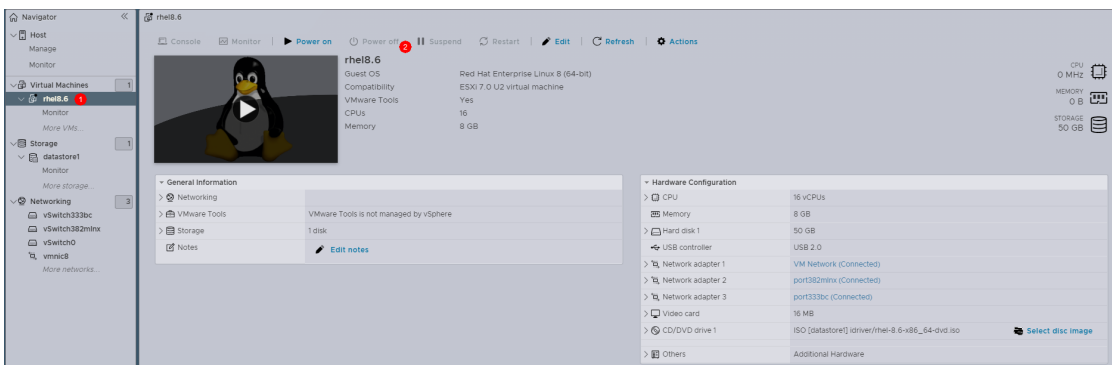
```
[root@localhost:~] lspci | grep -i "virtual function"
0000:b8:00.2 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5 Virtual Function]
[PF_0.184.0_VF_0]
0000:b8:00.3 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5 Virtual Function]
[PF_0.184.0_VF_1]
```

----End

### 5.4.3.2 Adding SR-IOV Network Ports

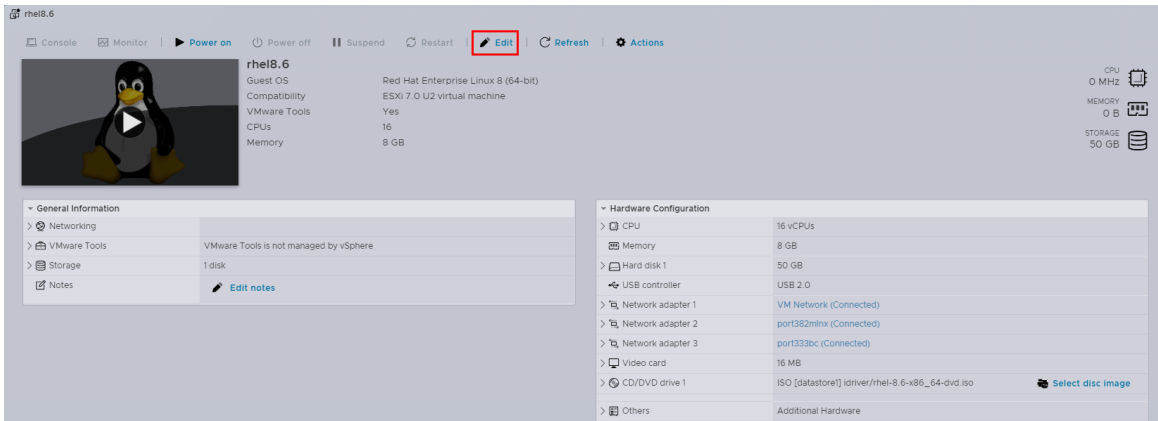
**Step 1** Select the VM and click Power Off, as shown in xref .

**Figure 5-82 Power off the VM**

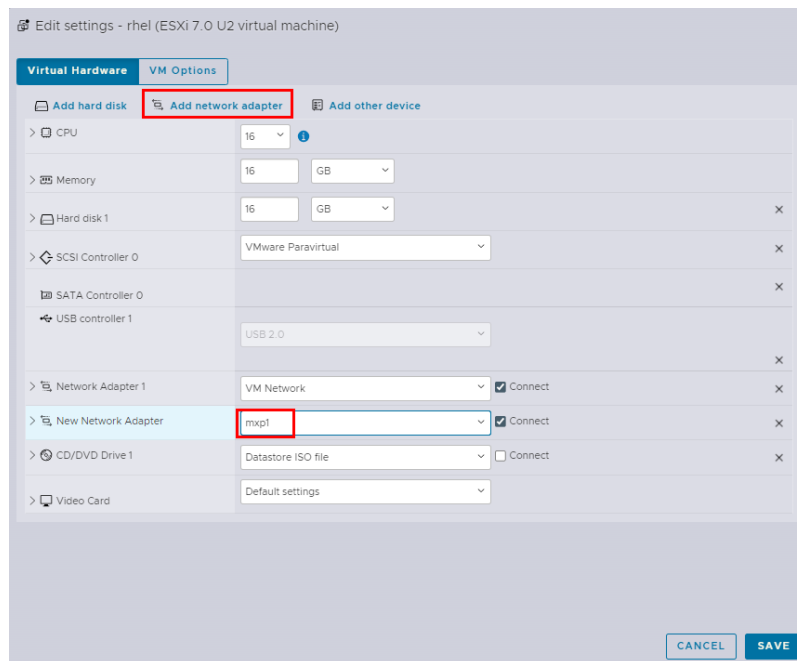


**Step 2** Right-click the VM and choose Edit from the shortcut menu, as shown in the [Figure 5-83](#) .

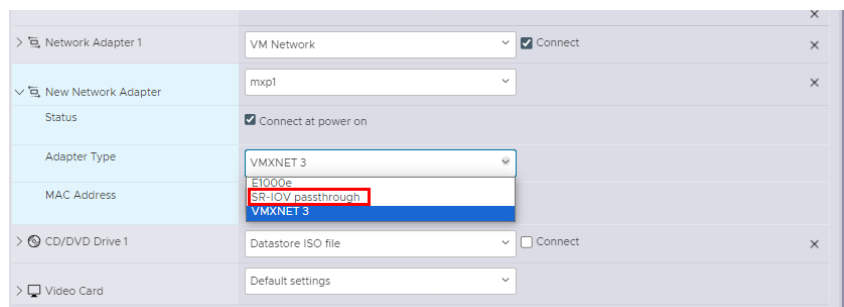
**Figure 5-83** Entering the Settings screen

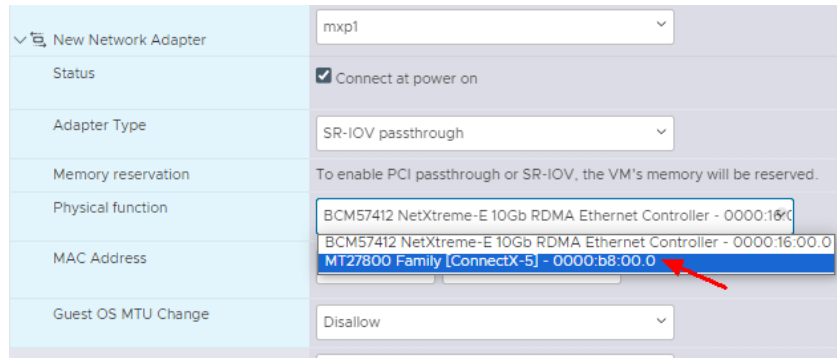


**Step 3** Click Add network adapter and select mxp1.



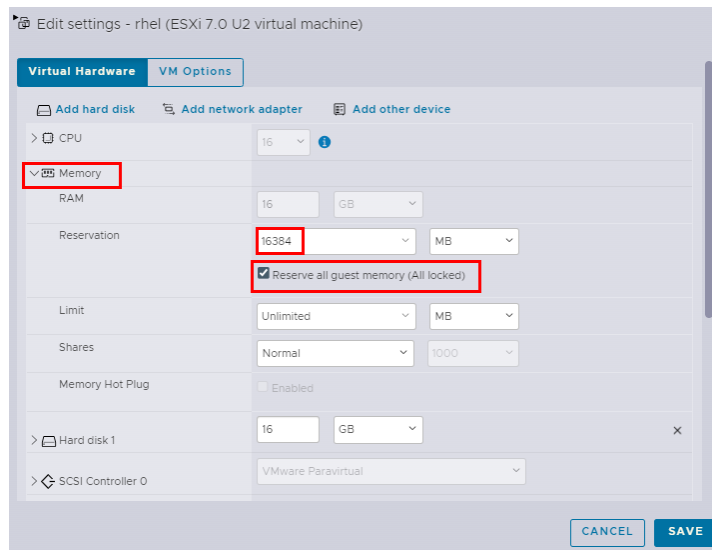
**Step 4** Select SR-IOV passthrough for Adapter Type and BDF for Physical function.





**Step 5** Configure Memory. In Memory, select Reserve all guest memory (All locked) and click Save. as shown in **Figure 5-84**.

**Figure 5-84** Configure parameters.



**Step 6** Start the VM

**Step 7** Run the following command to locate the device with the SR-IOV network port:.

```
lspci | grep -i Ethernet | grep -i virtual
```

Information similar to the following is displayed:

```
1b:00.0 Ethernet controller: Mellanox Technologies MT27800 Family [ConnectX-5 Virtual Function]
```

**Step 8** Install the VF driver on the VM by using the NIC of each vendor or use the iDriver.

----End

## 5.5 Configuring VXLAN Offload

**Step 1** Log in to the server OS as the **root** user, right-click on the screen, and choose **Open Terminal** from the shortcut menu to open the CLI.

**Step 2** Find the network port name for which VXLAN offload is to be configured. For example, ens65f0np0 is used.

**Step 3** Run the **ethtool -K ens65f0np0 tx-udp\_tnl-segmentation on tx-udp\_tnl-csum-segmentation on** command to enable VXLAN offload.

**Step 4** Run the **ethtool -k ens65f0np0 |grep -i udp** command to view the enable result.

```
[root@localhost ~]# ethtool -K ens65f0np0 tx-udp_tnl-segmentation on tx-udp_tnl-csum-segmentation on
[root@localhost ~]# ethtool -k ens65f0np0 |grep -i udp
tx-udp_tnl-segmentation: on
tx-udp_tnl-csum-segmentation: on
tx-udp-segmentation: off [fixed]
rx-udp-gro-forwarding: off
rx-udp_tunnel-port-offload: on
```

**----End**

# A Appendixes

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## A.1 Logging In to the iBMC WebUI

## A.2 Getting Help

If a fault persists during routine maintenance or troubleshooting, contact technical support.

### A.2.1 Collecting Fault Information

Collect fault information before troubleshooting.

The information includes:

- Customer company and address
- Contact person and telephone number
- Time when the fault occurred
- Detailed fault symptom
- Device types and software versions
- Measures taken and effects
- Fault severity and expected rectification deadline

### A.2.2 Preparing for Debugging

Technical support engineers can assist you in further collecting fault information and rectifying the fault.

Before contacting technical support, get ready the spare parts and tools such as screwdrivers, screws, serial cables, and network cables.

### A.2.3 Using Product Documentation

xFusion provides a complete documentation shipped with the device. The documentation provides guidance on how to solve common problems that occur during routine maintenance and troubleshooting.

Refer to the documentation before you contact xFusion for technical support.

## A.2.4 Technical Support

xFusion provides timely and efficient technical support through:

- Local branch offices
- Secondary technical support system
- Telephone technical support
- Remote technical support
- Onsite technical support

### Technical Support Website

Technical documents are available at [xFusion website](#).

### Knowledge Base

To obtain case study about servers, visit [Knowledge Base](#).

### Contact xFusion

xFusion provides comprehensive technical support and services. To obtain assistance, contact xFusion technical support as follows:

- Contact xFusion customer service center.
  - Email: [support@xfusion.com](mailto:support@xfusion.com)
- Contact technical support personnel at your local xFusion branch office.

## A.3 Acronyms and Abbreviations

<b>E</b>	
<b>EEE</b>	Energy Efficient Ethernet
<b>I</b>	
<b>IP</b>	Internet Protocol
<b>M</b>	
<b>MSI</b>	Message Signaled Interrupts
<b>MSI-X</b>	Message Signaled Interrupts-eXtension
<b>N</b>	
<b>NC-SI</b>	Network Controller Sideband Interface
<b>O</b>	
<b>OS</b>	Operating System

<b>P</b>	
<b>PCIe</b>	PCI Express
<b>PXE</b>	Preboot Execution Environment
<b>R</b>	
<b>RSS</b>	Receive Side Scaling
<b>S</b>	
<b>SR-IOV</b>	Single Root I/O Virtualization
<b>T</b>	
<b>TCP</b>	Transfer Control Protocol
<b>TSO</b>	Transmit Segmentation Offload
<b>U</b>	
<b>UDP</b>	User Data Protocol
<b>V</b>	
<b>VF</b>	Virtual Function
<b>VLAN</b>	Virtual Local Area Network
<b>VM</b>	Virtual Machine
<b>VMDq</b>	Virtual Machine Device Queue
<b>W</b>	
<b>WOL</b>	wake on LAN