SANGFOR HCI v5.2 User Manual

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Declaration

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Revisions

Version	Drafted by	Date	Remarks
V5.0	Cheney Hu	2016-10	
V5.2	Cheney Hu	2017-03	

Preface

About This Manual

Chapter 1 Installing & Initializing SANGFOR HCI Software

Chapter 2 Initial Login to Sangfor HCI Console

Chapter 3 Case Study

This manual is for SANGFOR HCI 5.2 official version. There are some differences in configurations for different versions. For details, refer to the corresponding chapter.

Document Conventions

This manual uses the following typographical conventions for special terms and instructions:

Convention	Meaning	Example
boldface	Page title, parameter, button, key press, other highlighted keyword or item	Page/tab name example: Navigate to **Nodes** > **Storage** to enter the **Storage** configuration page. Parameter example: **IP Address:** Specifies the IP address that you want to reserve for certain computer. Button example: Click the **OK** button to save the settings.

		Key press example: Press **Log In** to enter the administrator console of the Sangfor HCI platform. Highlighted keyword/item example: The username and password are **Admin** by default.
italics	Directory, URL	Enter the following address in the IE address bar: *http://10.254.254.254:1000*
>	Multilevel menu and submenu	Navigate to **Storage > iSCSI Virtual Disks** to create iSCSI virtual disk.
“ ”	Prompt	The browser may pop up prompt to ask you to confirm the current operation.

Symbol Conventions

This manual also adopts the following symbols to indicate the parts which need special attention to be paid during the operation:

Convention	Meaning	Description
	Caution	Indicates actions that could cause setting error, loss of data or damage to the device
	Warning	Indicates actions that could cause injury to human body
	Note	Indicates helpful suggestion or supplementary information

Technical Support

For technical support, please contact us through the following:

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- Tel: +60 12711 7129 (7511)
- Website: www.sangfor.com

Acknowledgments

Thanks for using our product and user manual. If you have any suggestions on our products, please provide us feedback by phone or e-mail. Your suggestion will be much appreciated.

Chapter 1 Installing & Initializing Sangfor HCI Software

Hyper-Converged Infrastructure (HCI) is an infrastructure that integrates resources, such as compute, networking and storage, etc. It is often defined according to requirements of business system and can help to build data center and deploy business system more easily. It combines compute, networking and storage capabilities onto industry-standard x86 servers by using virtualization technologies. All the resources are aggregated into a resource pool on node basis that is easy to scale out.

Sangfor HCI software is installed on a physical server, and used to virtualize servers and resources of physical server (CPU/memory/storage, etc.), and to provide guest operating systems with complete hardware system functions and independent operating environment, which are called virtual machines.

This section introduces the installation of Sangfor HCI software and requirements for hardware. After the software is installed properly, you also need to configure it, and do debugging.

1.1. Hardware Requirements

Before installation, a number of physical servers are needed. Performance of virtual machines is determined by that of server's CPU, memory, and storage. The better performance of a physical server installed Sanfor HCI software, the better user experience of using virtual machine.

Additionally, there are some requirements for a server where you want to install HCI software:

- The server's CPU must support Intel Virtualization Technology (VT). For some servers, it is required to enable VT-x in BIOS.
- Memory of the server must be greater than 16GB.
- Free disk space of the server must be greater than or equal to 60GB. To run virtual machines, data disk is also required. You can use external iSCSI or FC storage, or build virtual storage by configuring SSD and HDD.
- The server must have at least 4 NICs.

1.2. Installing HCI Software

Install ISO file of the brand new Sanfor HCI operating system on a third-party server.

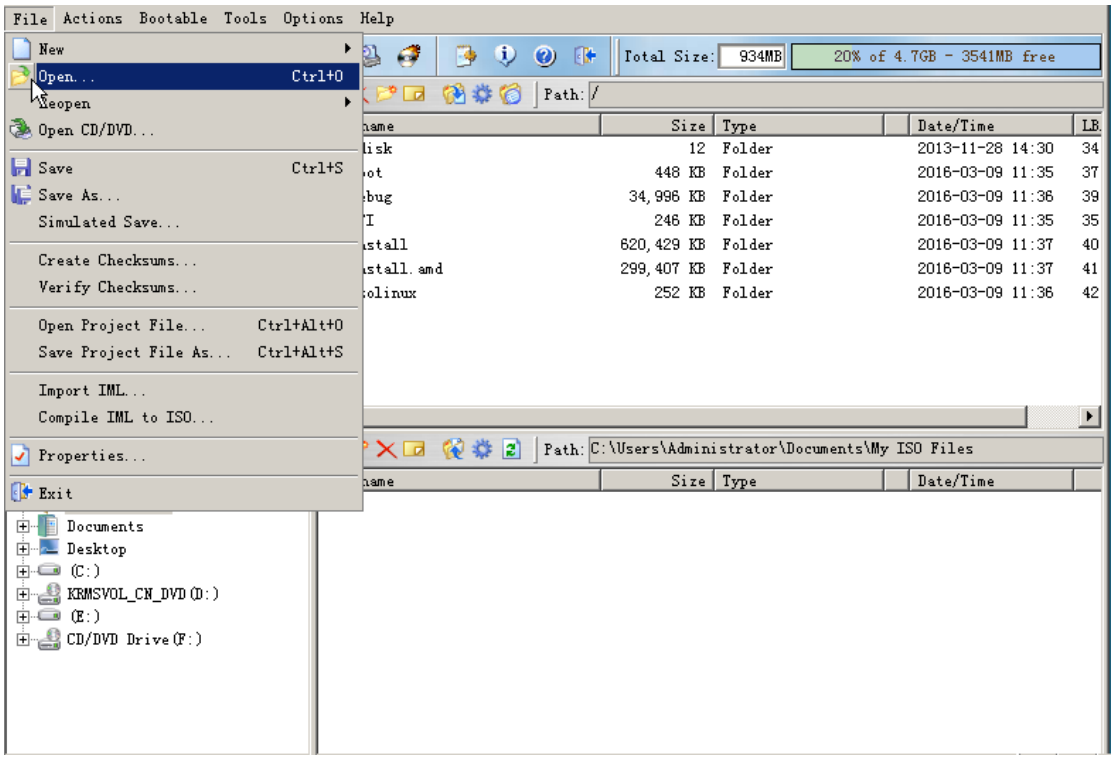
1.2.1. Writing Image File to USB Drive

Required software: UltraISO

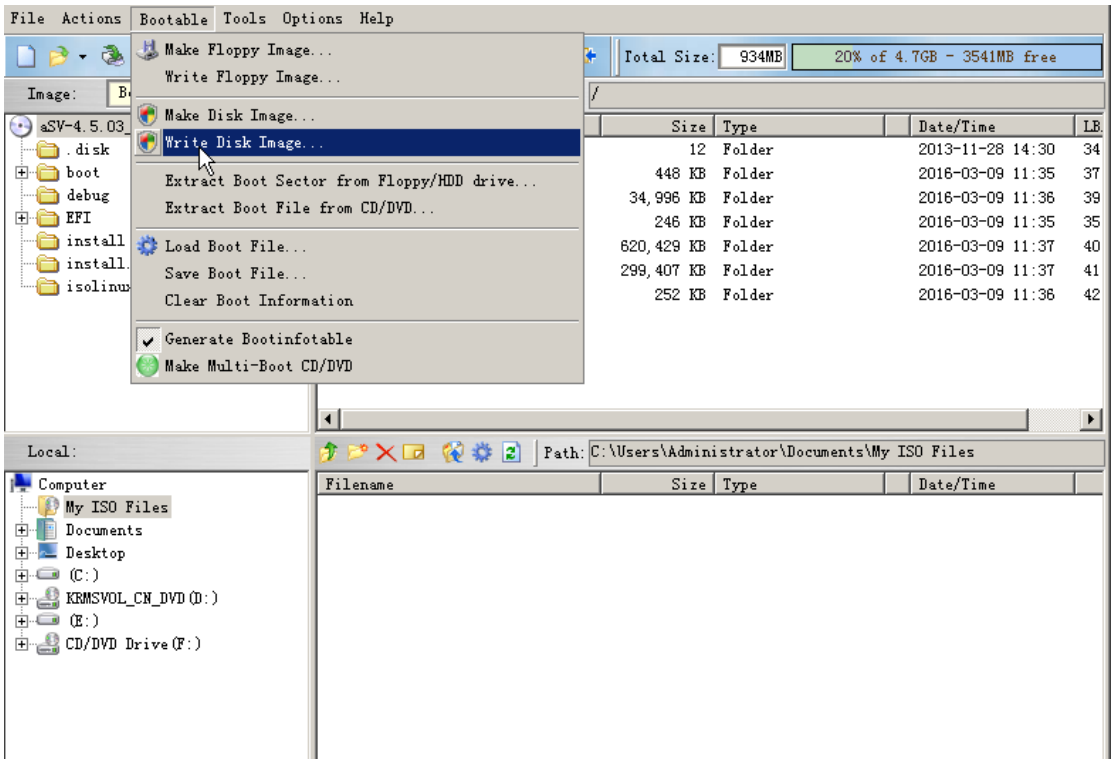
Steps: Insert a USB drive into PC, and then follow the steps below:

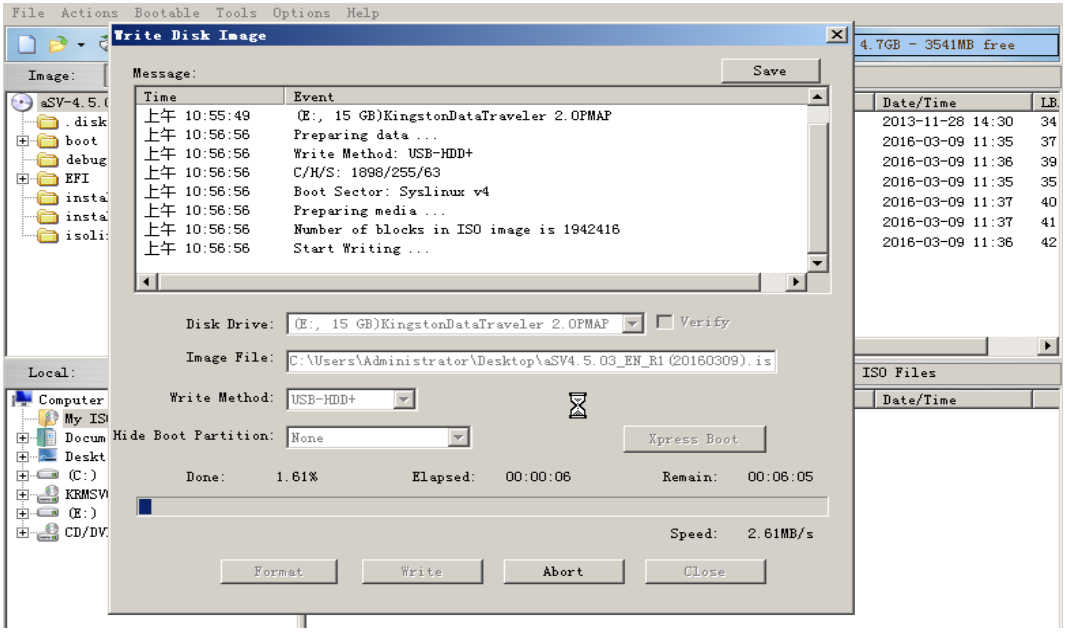
UltraISO should be the latest version; Write format of the USB drive should be USB-HDD or USB-HDD+, choose Verify to check whether the image file is written correctly; USB drive capacity should be greater than the size of ISO file.

1. Launch UltraISO.
2. Select **File > Open** and load ISO file of Sangfor HCI software from local disk.

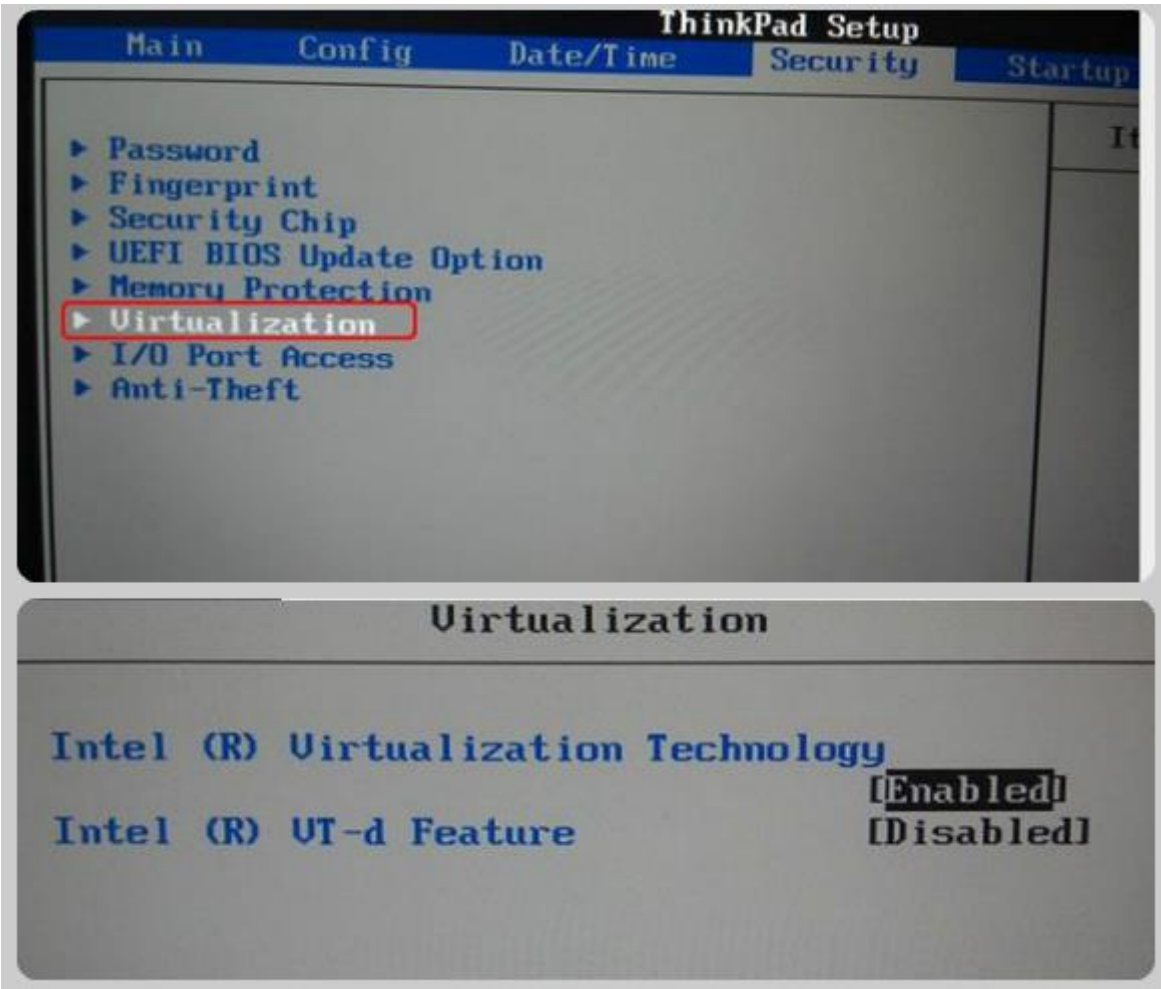


3. Select **Bootable > Write Disk Image** and choose the USB drive into which you want to write the image file. Then, click on **Write** button and keep others settings unchanged. You can remove the USB drive after the image file is written to the USB drive.



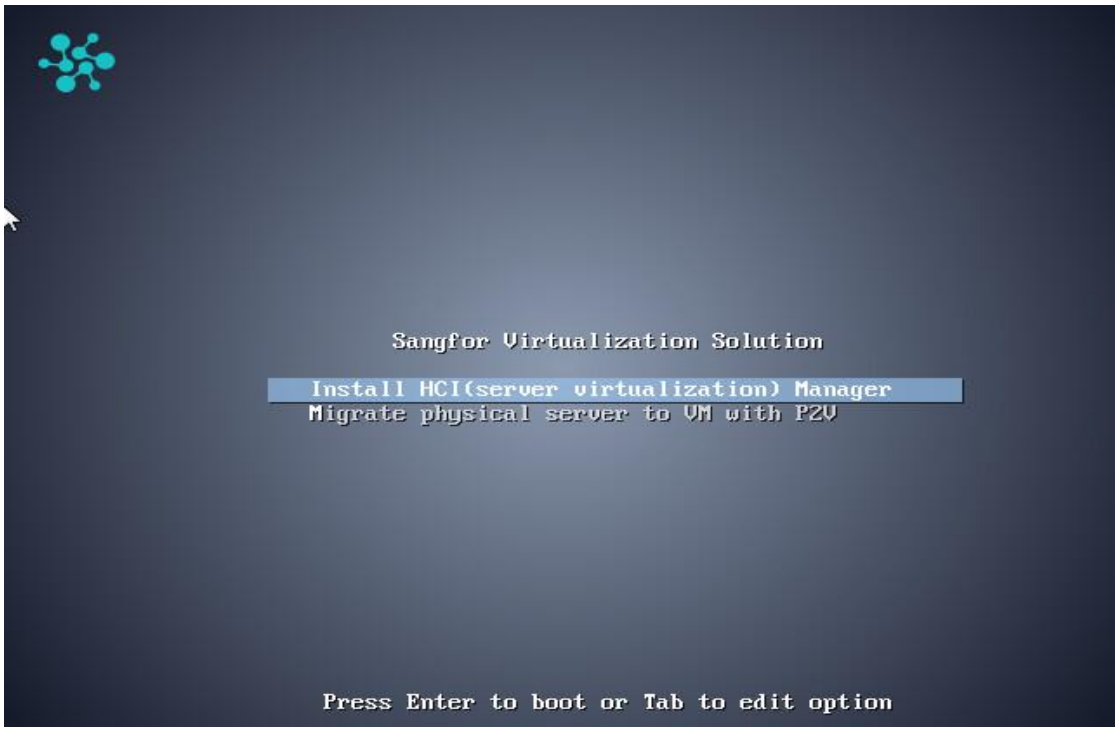


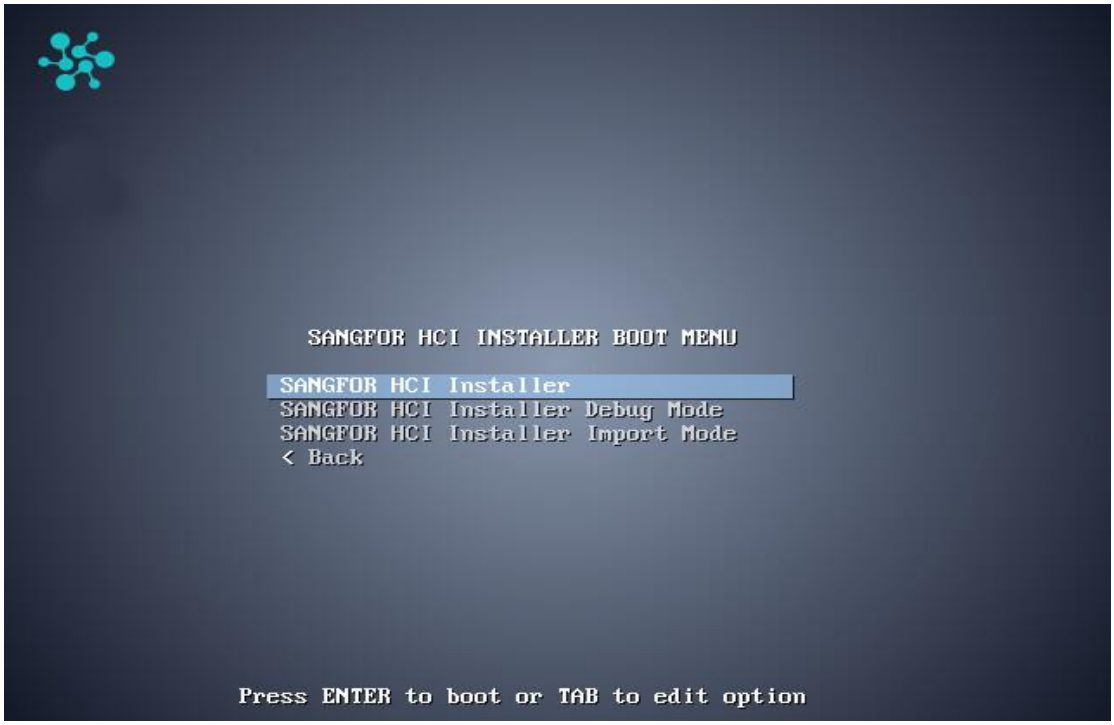
4. Enable **Virtualization Technology** in BIOS, as shown below (Note: BIOS settings vary from computer to computer).



1.2.2. Installation of Sangfor HCI Manager

Insert the USB drive into a server, and set the USB drive as the first boot device priority in BIOS settings. Reboot the computer and system enters the following page. Select **Install HCI (server virtualization) Manager**, and then press **ENTER** to enter installation page.





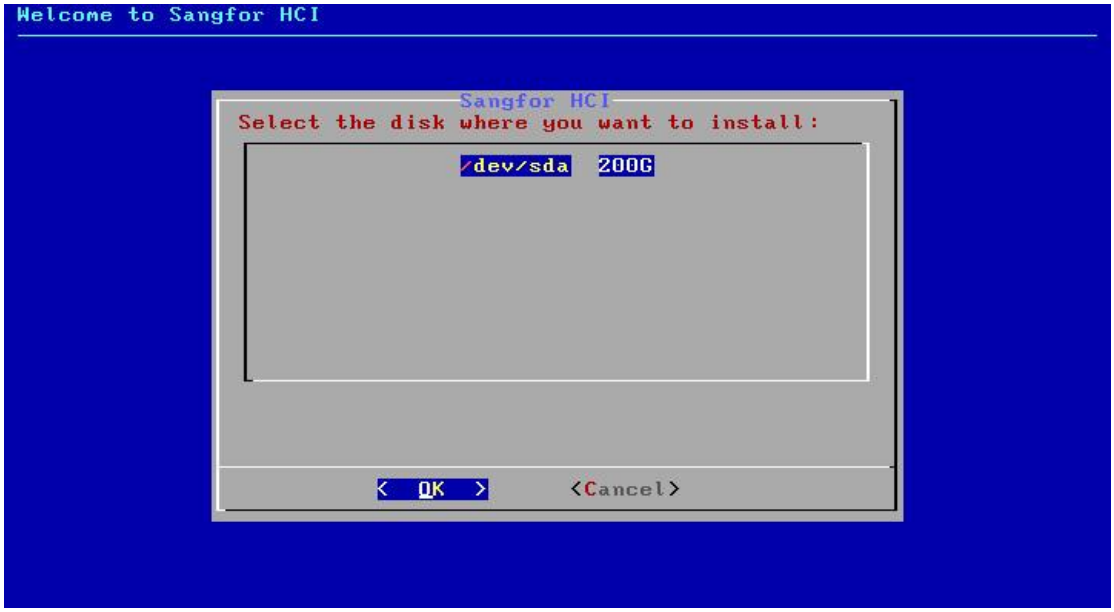
1. Select **SANGFOR HCI Installer** to begin installation.

Server's processor should be 64-bit Intel architecture. If it is AMD architecture, system will inform

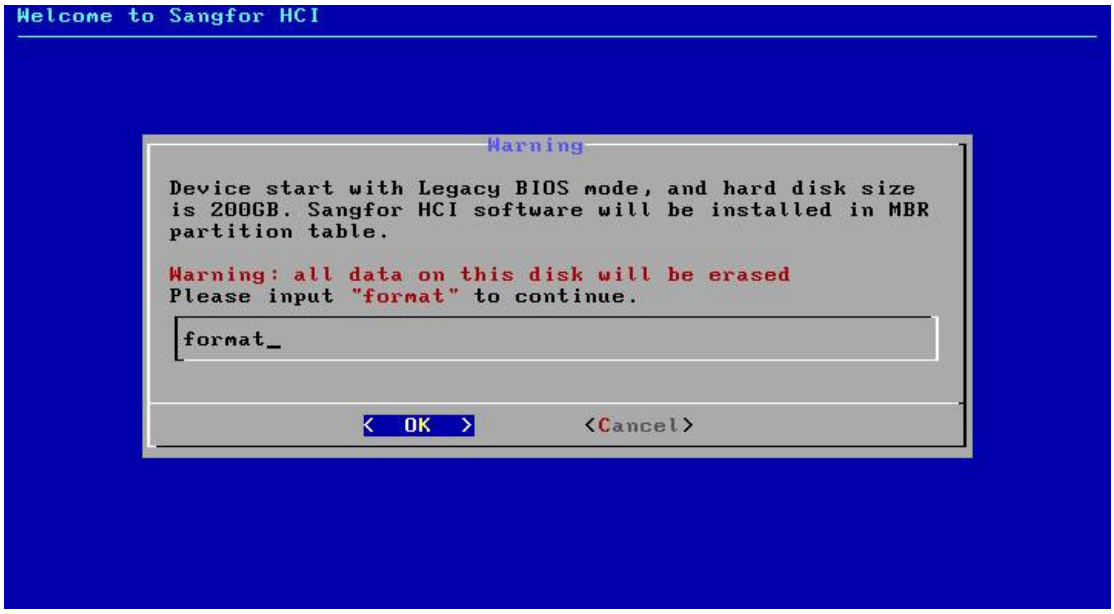
you that installation of Sangfor HCI manager is not supported by the current processor.

2. Select a disk where you want to install Sangfor HCI software and then select **OK**. If there is only one disk, you can select **OK** directly.

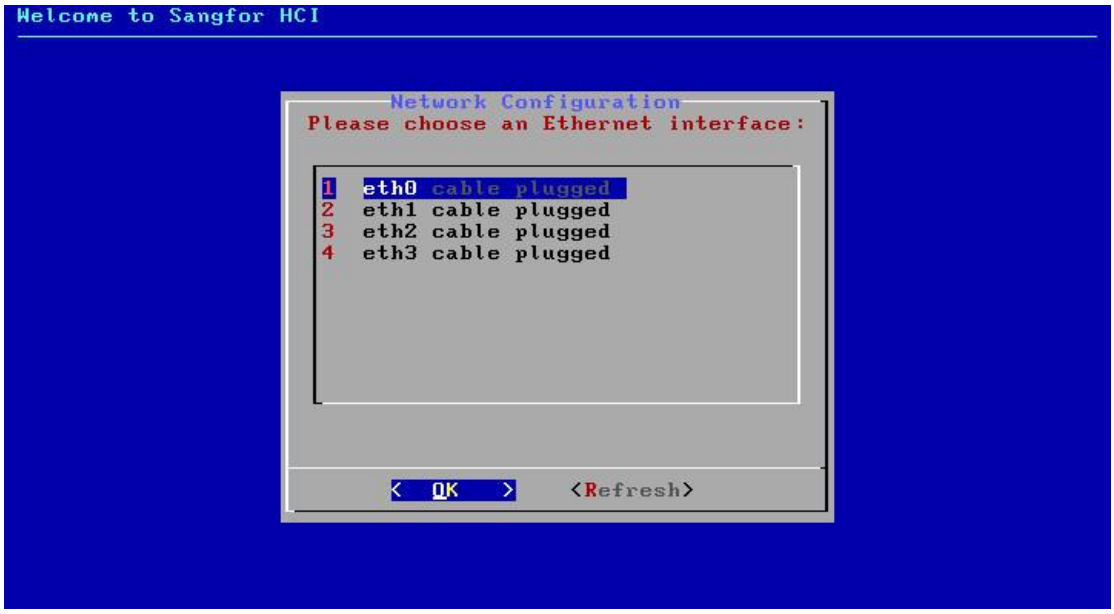
Capacity of the selected disk must be greater than 60GB. If it is greater than 2TB, it is better to use UEFI mode for installation.



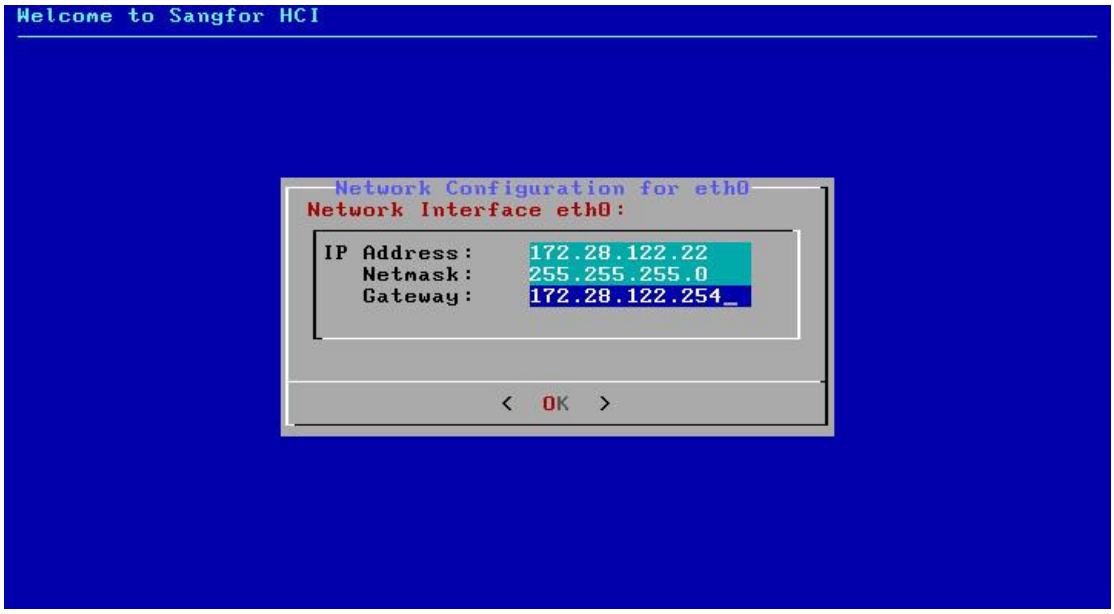
3. After the disk is selected, you will be prompted to format the disk. Enter **format** to confirm formatting disk, and select **OK** to continue installation. After you select **OK**, the **Disk Speed Tester** page will appear. To test disk speed, select **Yes**. To skip this step, select **No**.



4. After installing the Sangfor HCI software, you will be prompted to select an Ethernet interface and configure IP address for that interface.



If you skip the step of configuring Ethernet interface, eth0 interface will be chosen and assigned with the IP address 10.250.0.7, and gateway will be set to 255.255.255.0 by default. If there are more than one servers having Sangfor HCI software installed but their NICs are not configured, a same default IP address will be assigned to those NICs, resulting in IP address conflict.

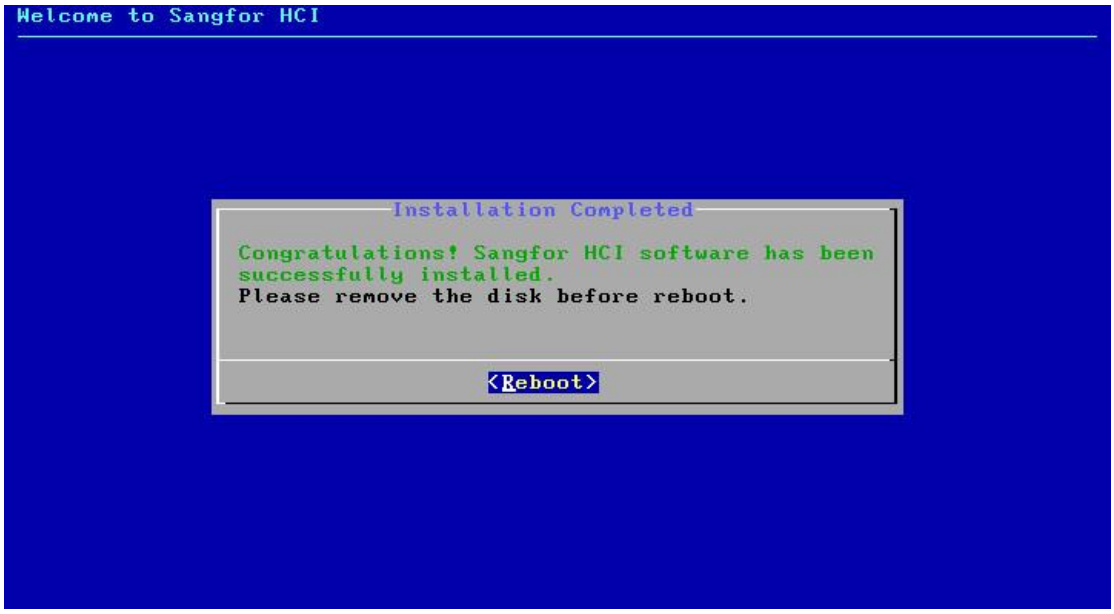


5. Select an Ethernet interface and set IP address, netmask and gateway address, then click **OK**.

Default gateway can only be set for one NIC. IP addresses configured for the selected interface and gateway should be on a same network segment, otherwise error may occur.

6. After the selected interface is configured, you will be asked whether to continue to configure another interface. Select **Yes** to return to network configuration page, or select **No** to finish the installation

7. After the installation completes, remove the USB drive and then select **Reboot** to restart the server.



Administrator can log into Web admin console of Sangfor HCI platform by entering https://IP address into browser address bar (that IP address is the IP address of the Ethernet interface selected on the network configuration page).

Web admin console of Sangfor HCI platform can only be accessed through the following browsers: Chrome, Firefox, IE11, IE10.

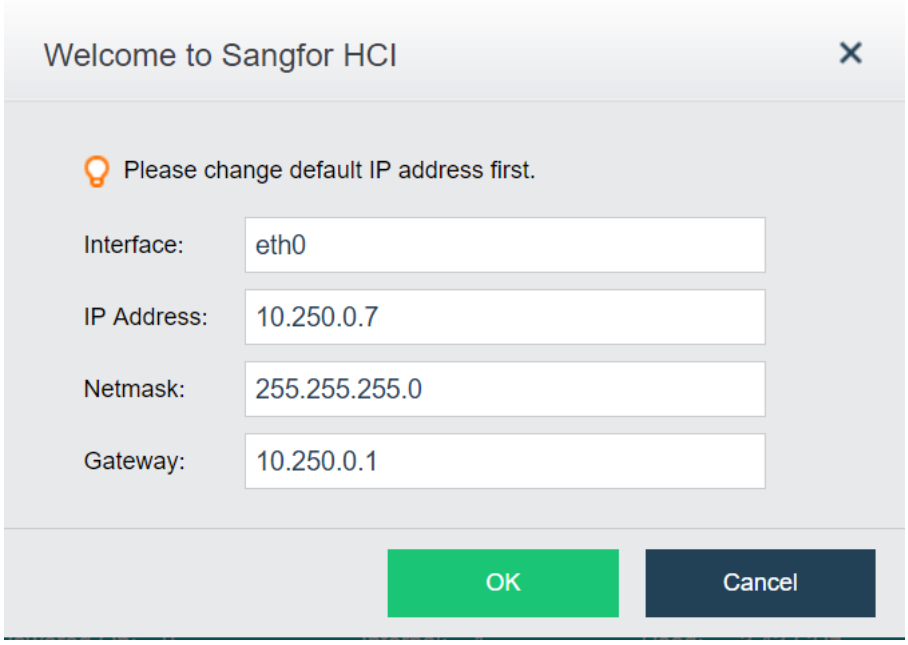
1.2.3. Initializing Sangfor aServer

Sangfor aServer has been pre-installed with Sangfor HCI operating system and configured with a management interface (eth0, default IP address: 10.250.0.7/24). To access Web admin console of Sangfor HCI platform on a PC, first configure the PC with an IP address on a same network segment with that management interface and connect it to the eth0 interface on the aServer. Then open your browser and enter https://10.250.0.7/ into address bar to log in to Sangfor HCI platform console.

Default username and password are admin. Administrator will be prompted to change default password upon first login. If the default password has not been changed for one month, administrator will be forced to change it.

Upon first login, administrator will be prompted to modify default IP address of management

interface, as shown below. If there are multiple aServer appliances deployed in network, default IP address of management interface on each aServer needs to be modified, and addresses of management interfaces must be on a same network segment.



1.3. Initializing Sangfor HCI Platform

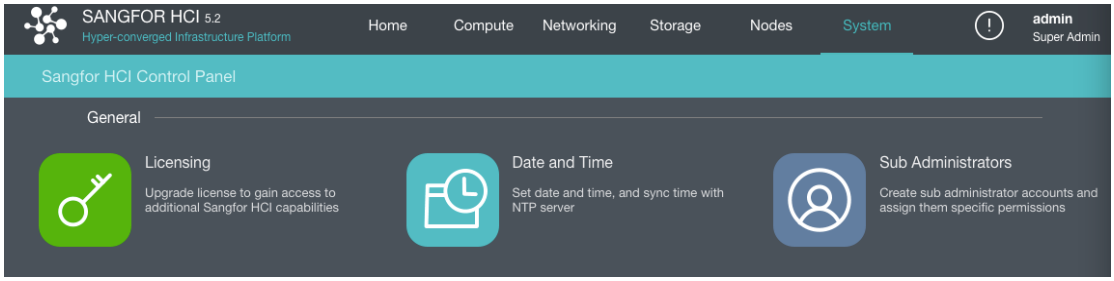
When you log into Web admin console of Sangfor HCI platform for the first time, a wizard will pop up to guide you through initialization of Sangfor HCI platform. To initialize Sangfor HCI platform, follow instructions in the wizard.

1.3.1. Configuring Cluster

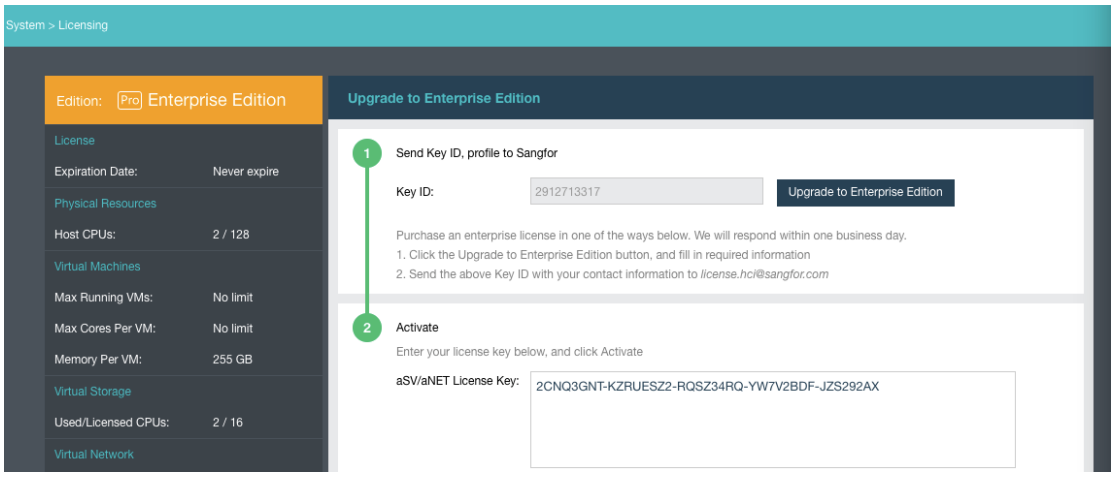
On Sangfor HCI platform, a cluster is created by adding multiple nodes in order to manage resources centrally. To create a cluster, you need to add hosts into that cluster.

1.3.1.1. Licensing

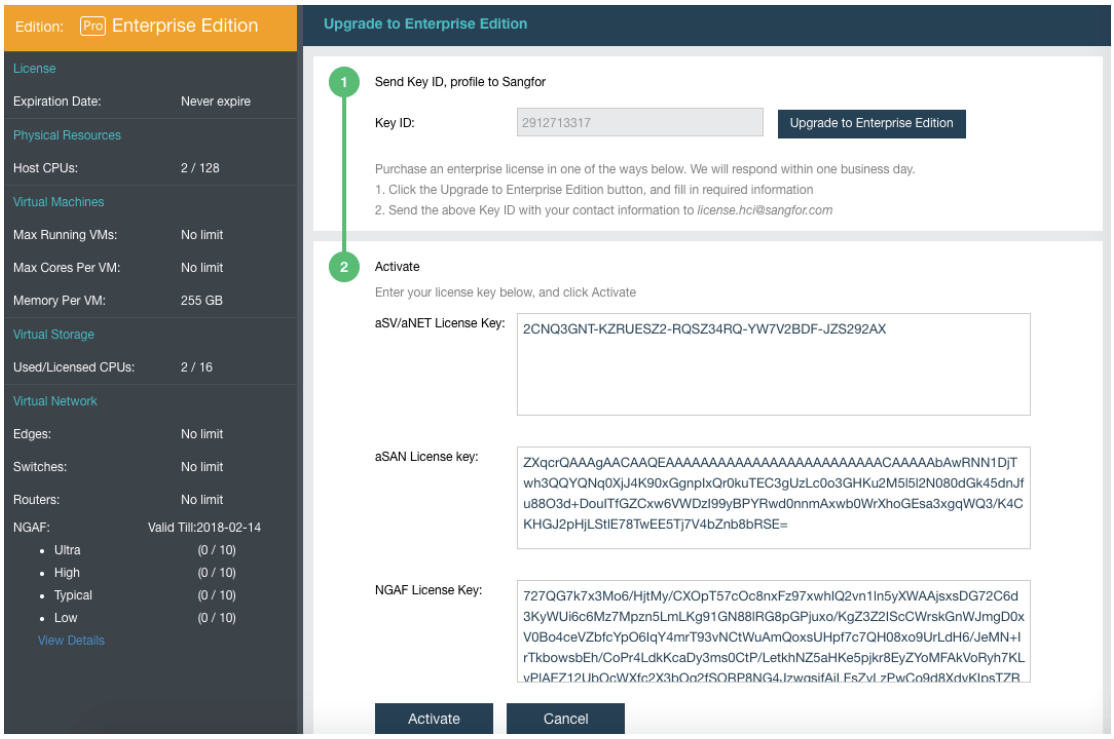
Go to Licensing page in System, as shown below:



To input license key, click **Edit License Key**.



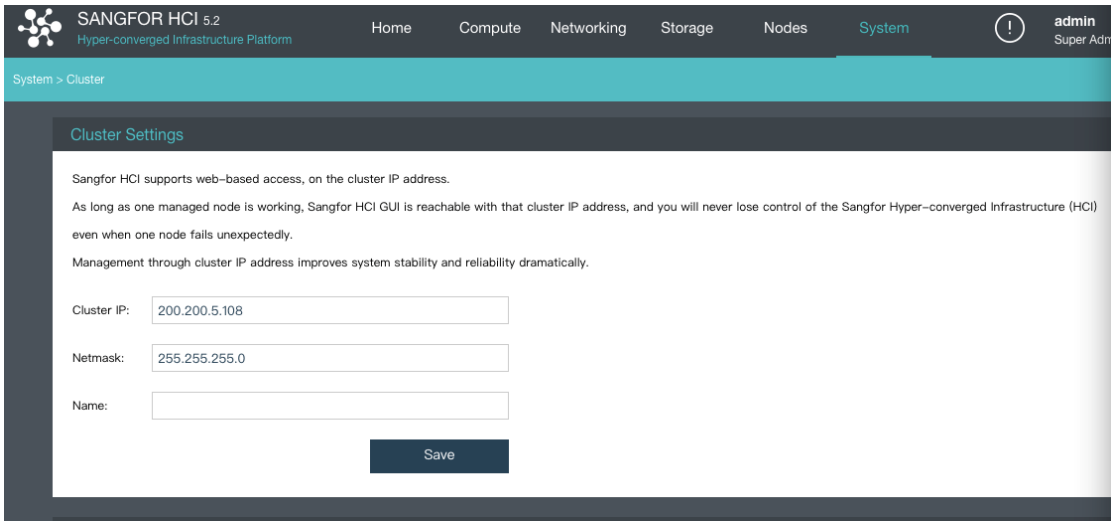
After clicking **OK**, you can check the license information on the left panel to determine whether the license key is activated successfully, as shown below:



1.3.1.2. Configuring Cluster IP Address

You can access Sangfor HCI GUI to manage virtual machines through cluster IP address when one node fails. To configure cluster IP address, go to **System > General > Cluster**.

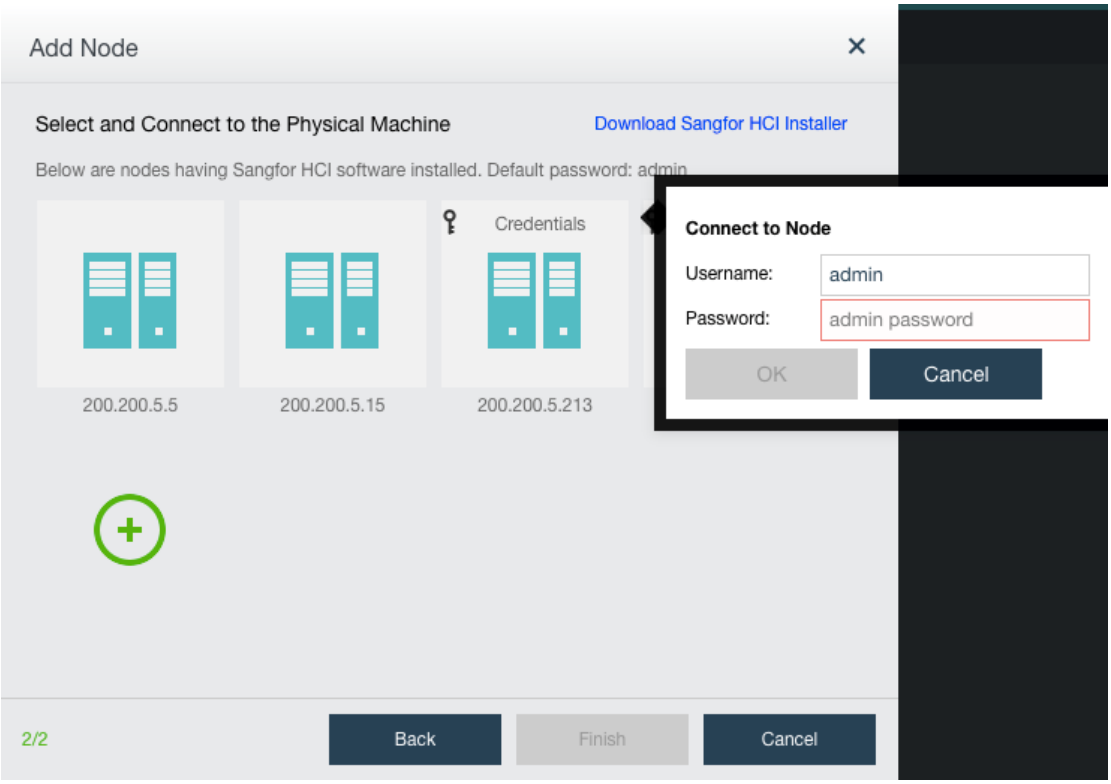
Note that cluster IP address and host NIC address cannot be the same, or else, it will result in IP address conflict.



1.3.1.3. Adding Node

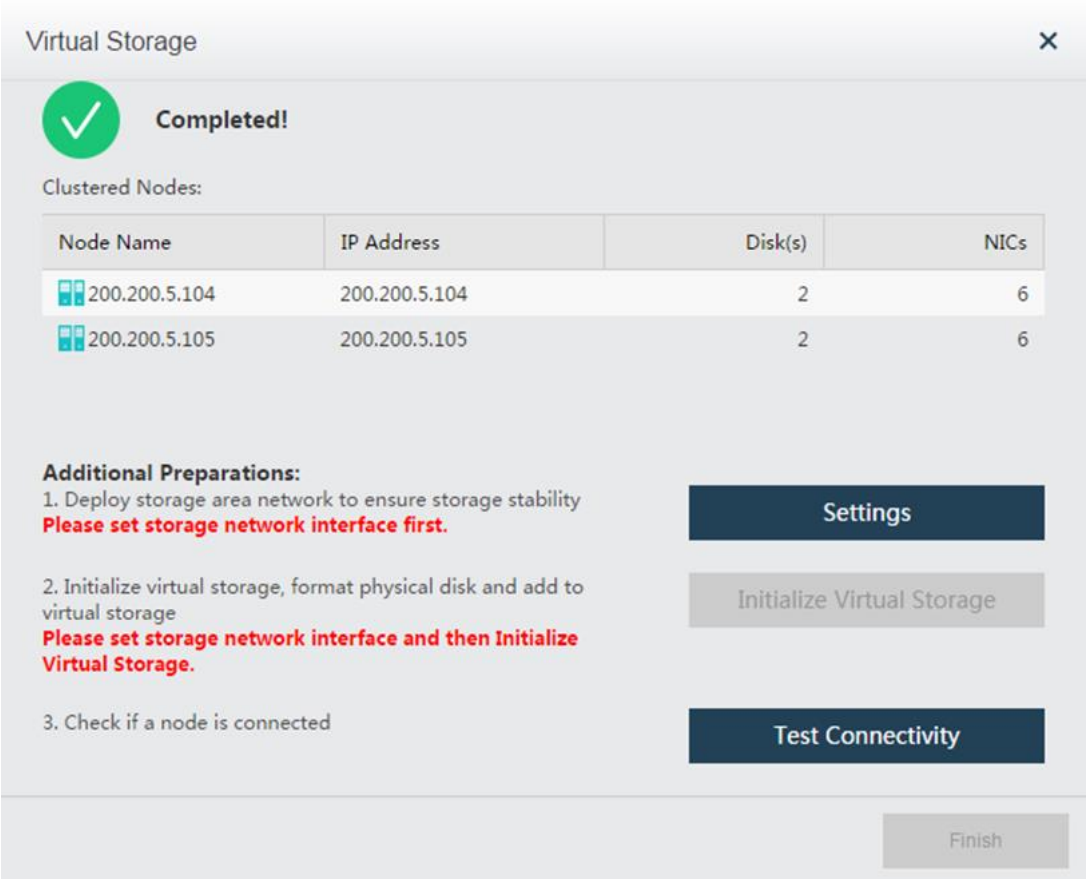
In **Nodes**, you can add node to cluster by clicking **Add Node**.

On the following page, select a node that you want to add to cluster and input the corresponding username and password. Once a node is chosen, node icon turns green, which indicates that node can be added to the cluster.



1.3.2. Initializing Virtual Storage

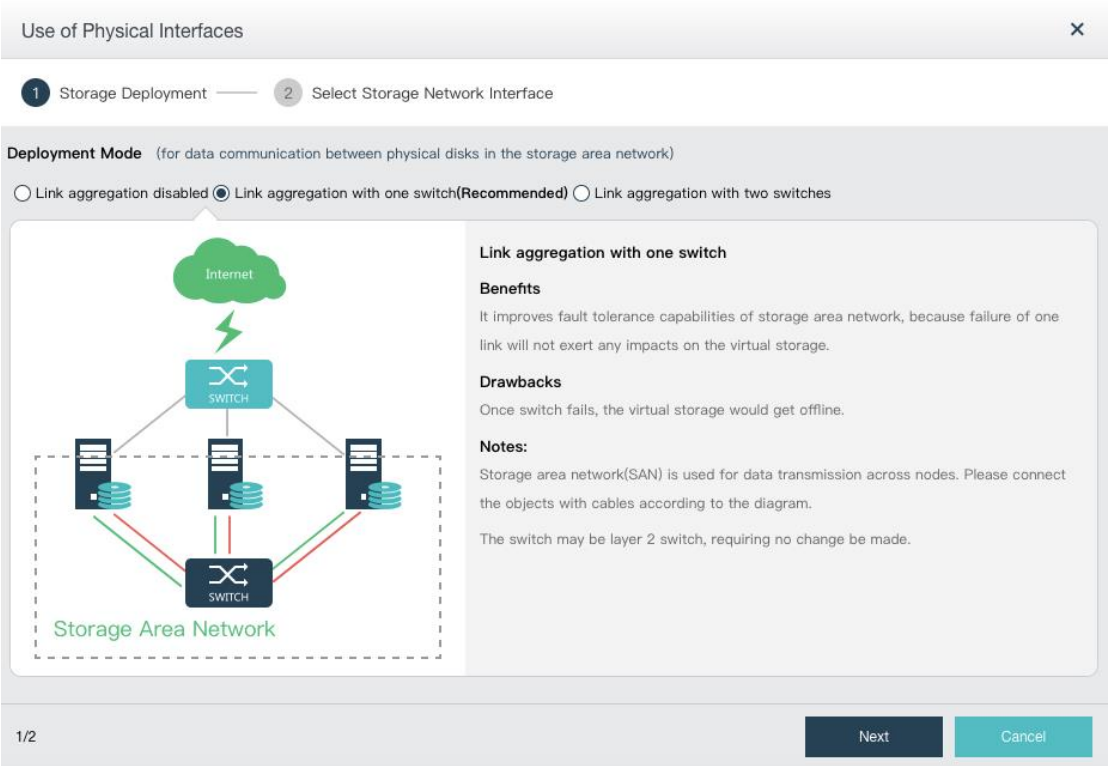
After a cluster is created, a wizard will pop up when you navigate to **Storage**, to guide you through initialization of virtual storage.



1.3.2.1. Configuring Storage Network Interface

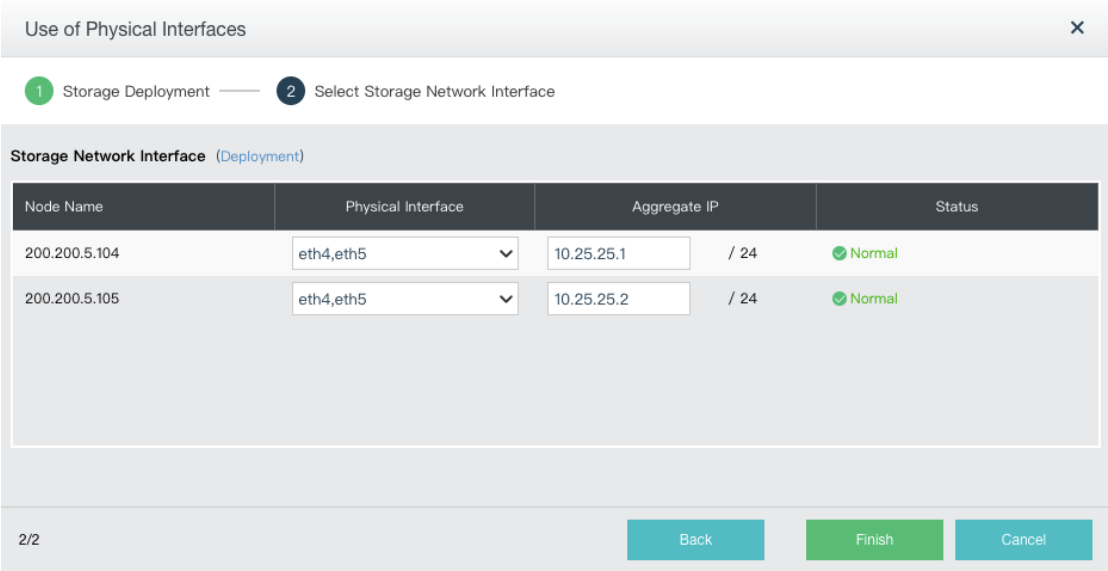
You can configure storage deployment mode by clicking on the **Settings** button on the above figure.

By default, eth0 is used as management interface and communication interface to synchronize configurations on Sangfor HCI platform. Storage network interface is used to synchronize file data on virtual storage. It is better to use separate interfaces as management interface and storage network interface. For storage deployment mode, **Link aggregation with one switch** is recommended.



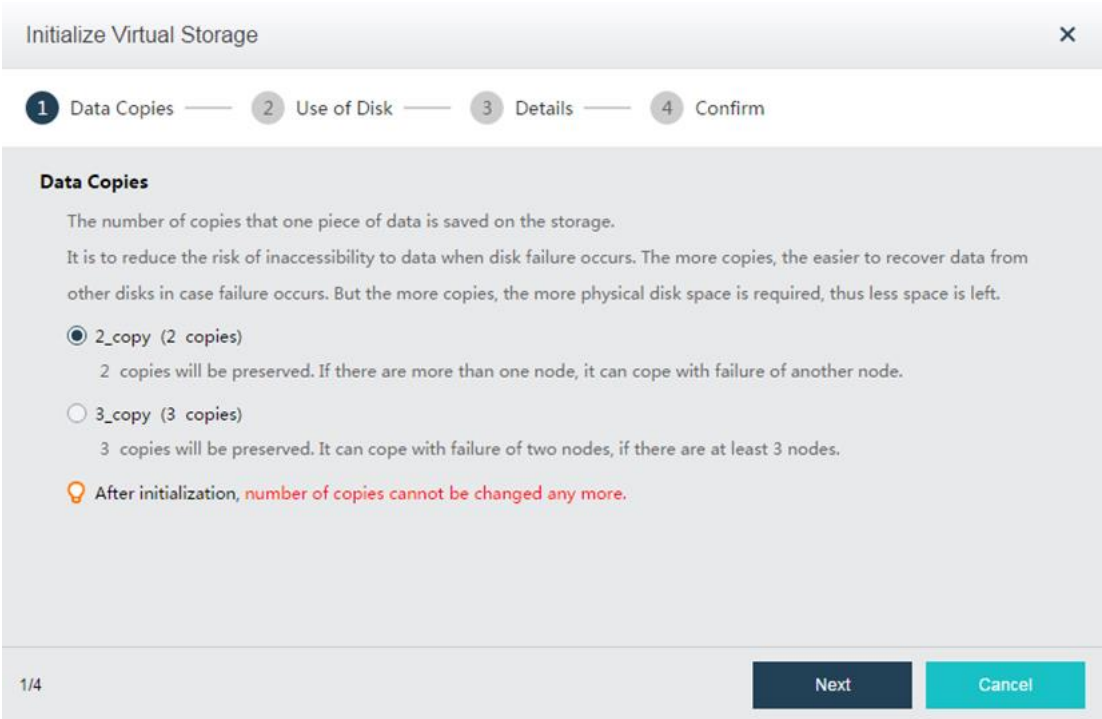
Each node communicates with another one using two physical interfaces which are connected to a same layer 2 switch. Storage network interfaces will be aggregated automatically without the need to configure link aggregation on switch. After the deployment mode is selected, you need to deploy the network according to the diagram illustrating deployment architecture of storage area network, and then select storage network interface for each node and configure IP address for that interface.

Storage area network is built after storage network interface is configured.



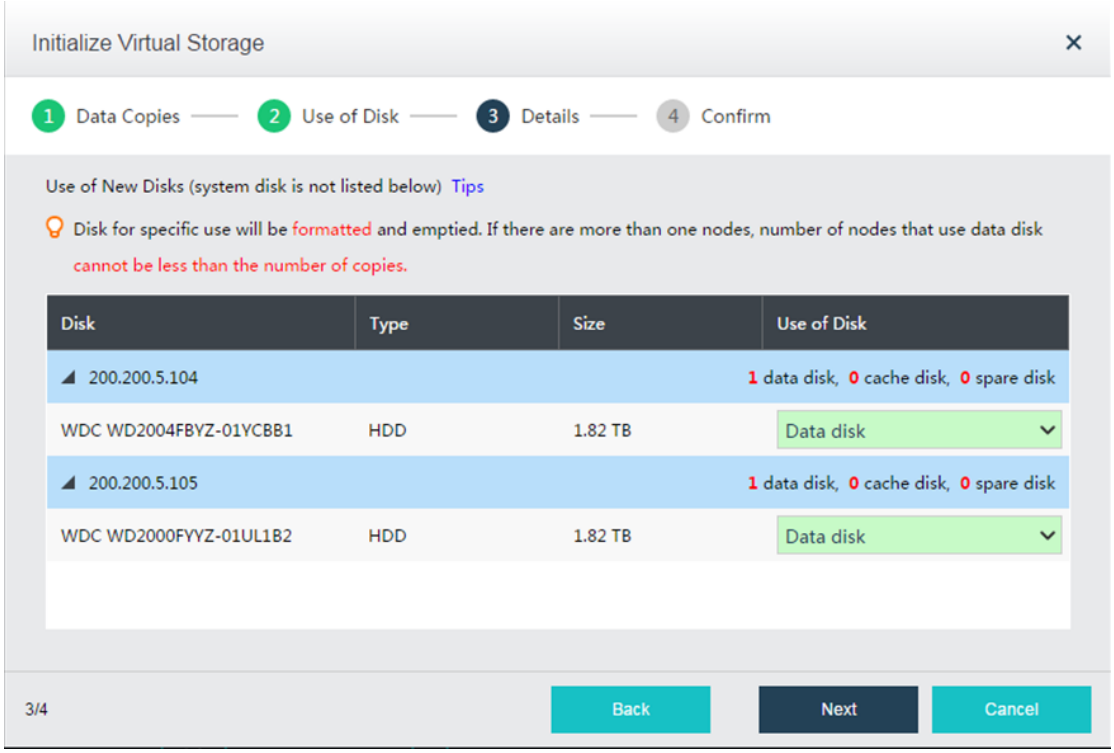
1.3.2.2. Configuring Data Copies and Disk

Data Copies: If virtual storage has not been initialized, navigate to **Storage** and the **Virtual Storage** dialog will pop up. To initialize virtual storage, click on **Initialize Virtual Storage** button in that dialog, and then the following dialog appears. First, you need to select number of data copies that one piece of data is saved on the storage. **2_copy** is recommended.

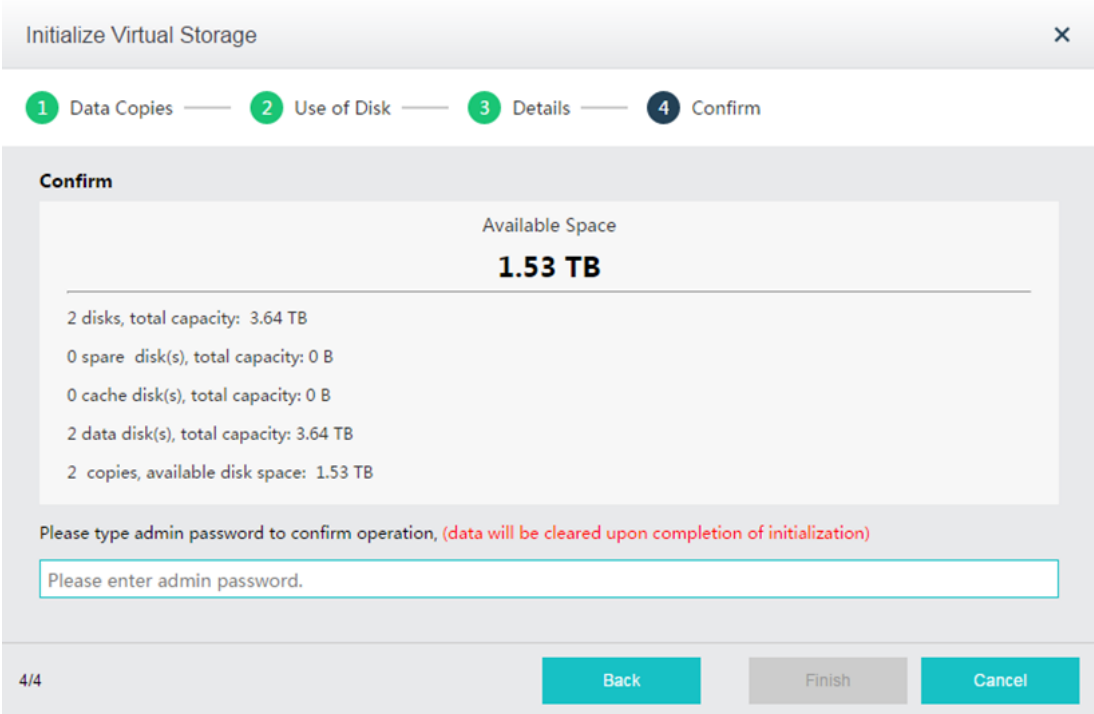


Use of Disk: Specify use of disk. A disk can be used for storing data, caching or used as spare disk. Generally, use SSD for caching to improve storage IO performance. To use SSD as cache disk, select the option **Use SSD as caching disk**.

Details: Specify use of each disk. System will discover disks of all nodes, and use HDD as data disk and SSD as cache disk by default. It is recommended to use default settings. You can also modify the default settings as per your need.

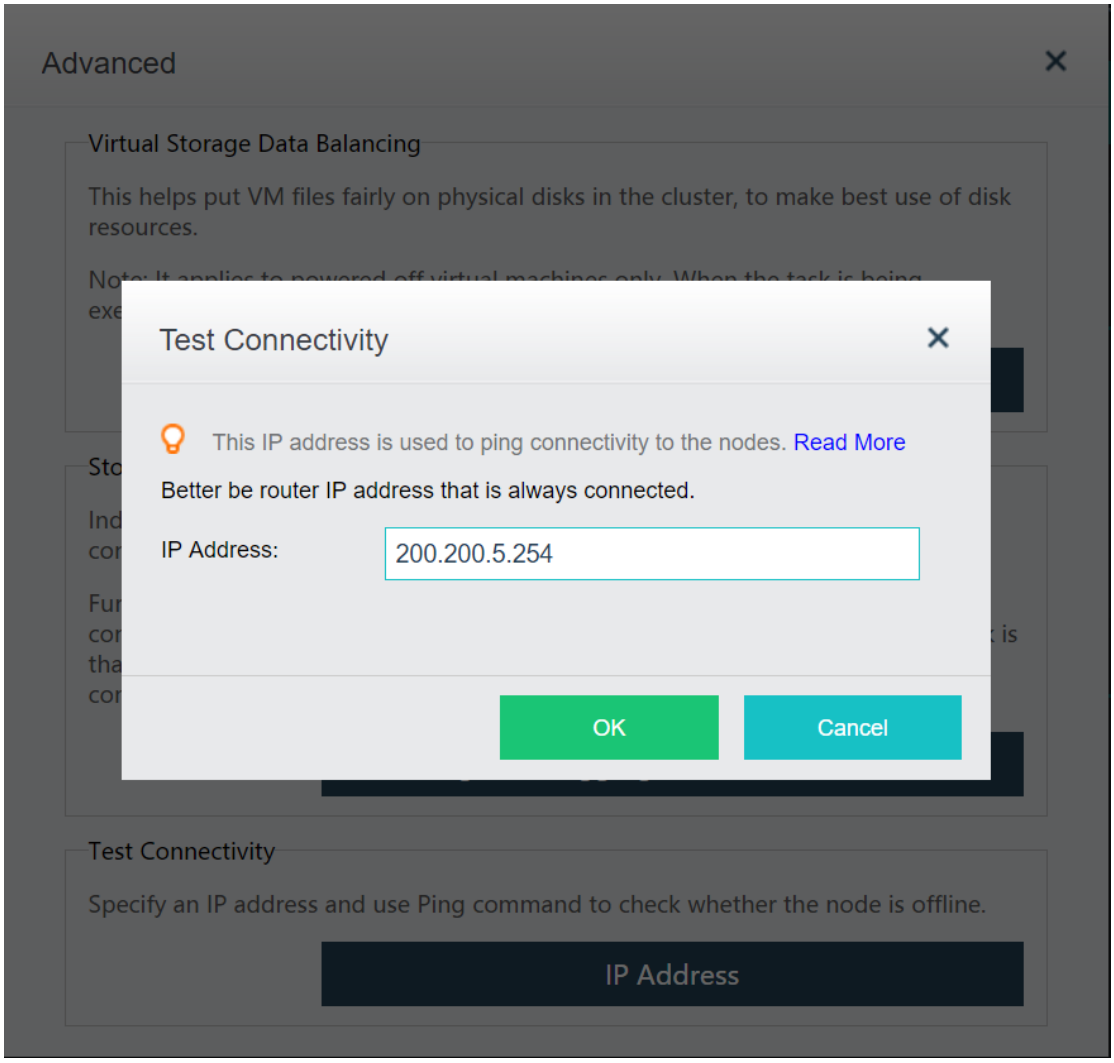


Confirm: The following page displays virtual storage configurations, including available disk space, number of data copies, and total number of disks. After confirming configurations, input administrator account password **admin**, and then click **Finish** to begin initialization of virtual storage.



1.3.2.3. Testing Connectivity

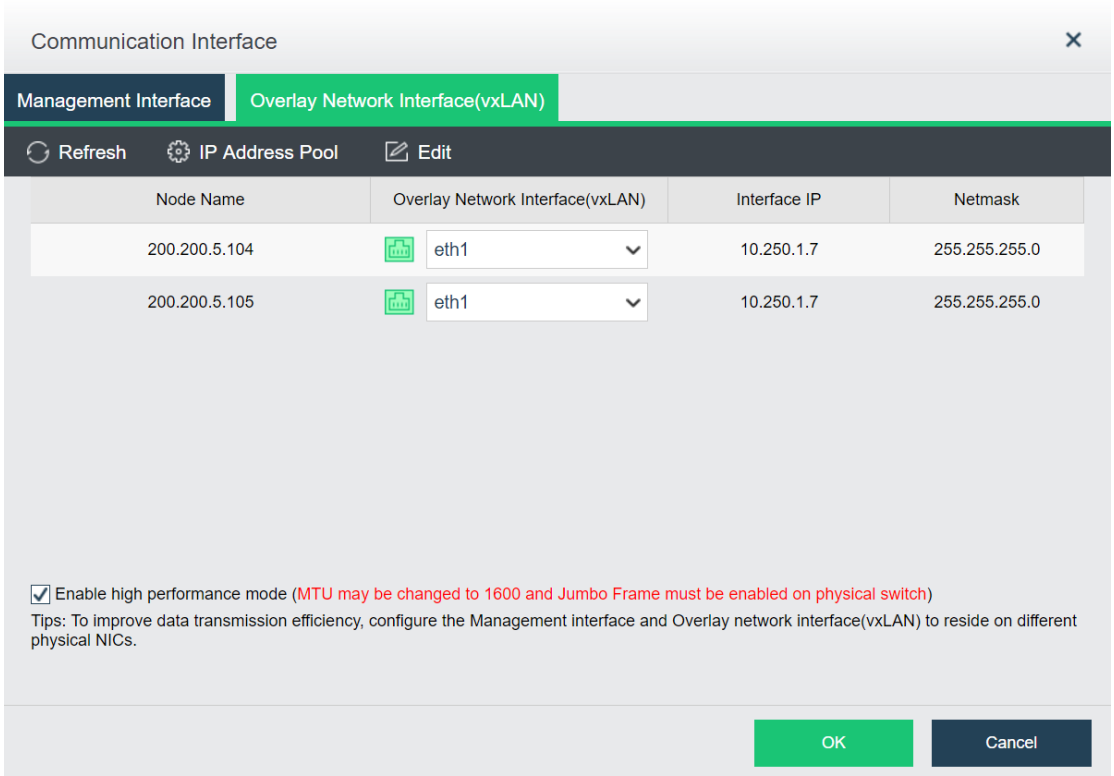
In the **Virtual Storage** dialog, click on **Test Connectivity** button to enter the following page. On that page, specify an IP address (it is often the gateway address) which should be allowed to ping, in order to check if the node is connected.



1.3.3. Configuring Overlay Network Interface

After a cluster is created, you need to configure overlay network interface for each node. Overlay network interface must be a Gigabit or 10-Gigabit interface and connected to a Gigabit or 10-Gigabit switch (If there are only two nodes, connect two overlay network interfaces directly without using any switch). To improve bandwidth and redundancy of overlay network interface, you can use an aggregate interface as an overlay network interface.

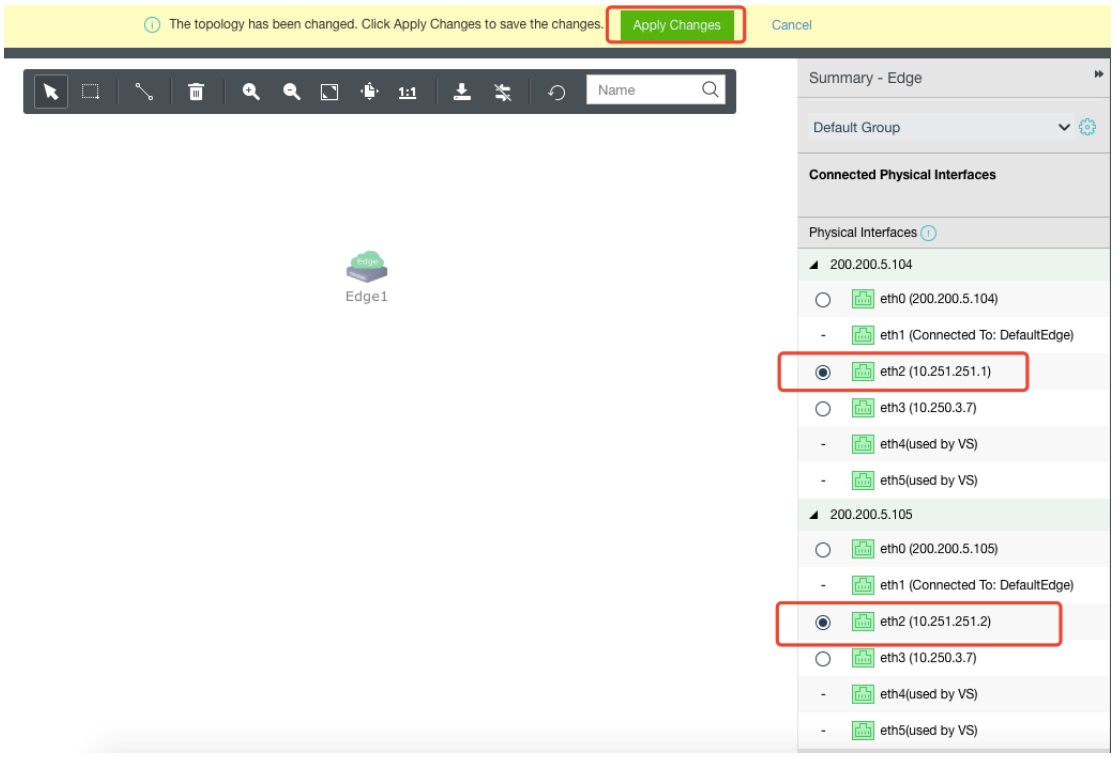
By default, management interface and overlay network interface are set to a same interface. To improve data transmission efficiency, configure the management interface and overlay network interface(VXLAN) to reside on different physical NICs. To configure overlay network interface, go to **Nodes > Communication Interface > Overlay Network Interface (VxLAN)**. Specify an overlay network interface for each node and configure a corresponding IP address and netmask.



To improve data transmission efficiency, enable high performance mode. In that mode, MTU will be changed to 1600 and therefore VXLAN encapsulated data will not be fragmented when being forwarded to physical network, but Jumbo Frame must be enabled on the physical switch connected to a host installed Sangfor HCI software.

1.3.4. Configuring Edge

If multiple nodes form a cluster and provide business service as a whole, a virtual machine may run on any node, therefore, an edge should be connected to an interface on each node and that interface should be connected a same L2 physical switch, ensuring that virtual network traffic can go into physical network through any node.



1.3.5. System Upgrade

For Sangfor aServer, the pre-installed operating system may not be the latest version. To gain better virtualization experience, it is better to upgrade the system to the latest version.

Before upgrade, enable **Maintenance Mode** first in **System > System Maintenance > Upgrade**. Then, click on the **Upgrade** button and upload a pkg update package. After the update package is uploaded successfully, click **Start**.

After upgrade completes, click **Restart All Nodes** to make upgrade operation take effect. Maintenance mode will be automatically disabled during restart of nodes.

After all nodes start up again, check running status of each node, and make sure nodes and virtual machines run properly after upgrade.

Chapter 2 Initial Login to Sangfor HCI Console

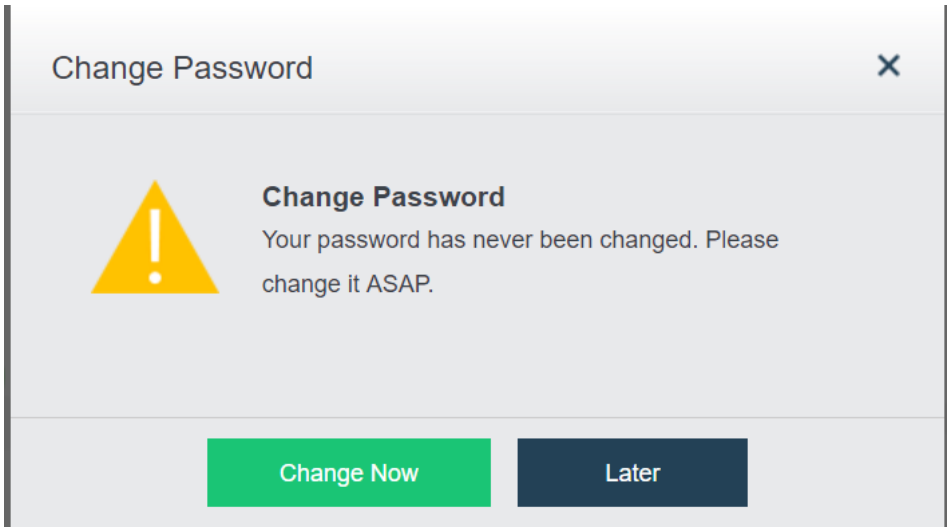
Sangfor HCI platform provides web-based administration. Administrators can access admin console of Sangfor HCI platform through its management interface address which is specified during installation of Sangfor HCI software.

If that management interface address is not specified during installation, the default IP address (10.250.0.7) will be used. Before logging into Sangfor HCI GUI, connect a physical interface on a PC to the first interface on the host where Sangfor HCI software is installed, and then configure an IP address on that PC, which should reside on the network segment 10.250.0.x. Open your browser and input https://10.250.0.7 into address bar to log into Sangfor HCI console, as shown below:

If that management interface address is specified during installation, access Sangfor HCI console through that specified IP address.

On the login page, as shown above, input username and password, and then click **Log In.** Both of the default username and password are **admin**.

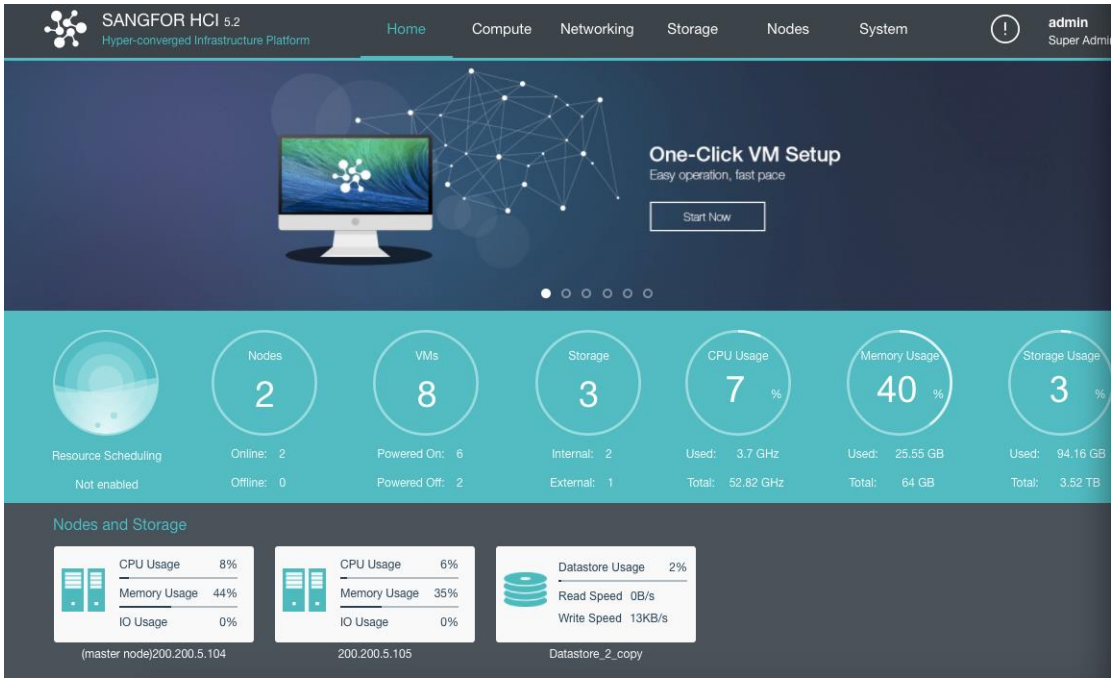
Upon successful login, the following dialog will pop up to prompt administrator to change password.



1) Sangfor HCI console can be accessed with the following browsers: IE11, Firefox, Chrome, etc.

2) The host installed Sangfor HCI software will be deemed as a clustered node by default. It can be added to other clusters, or regarded as a cluster controller so that other nodes can be added onto its HCI platform.

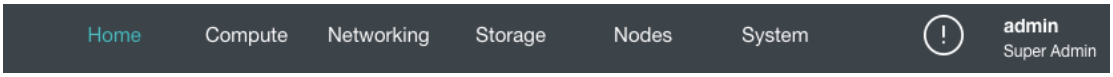
GUI of Sangfor HCI platform is shown below:



2.1. Viewing Home

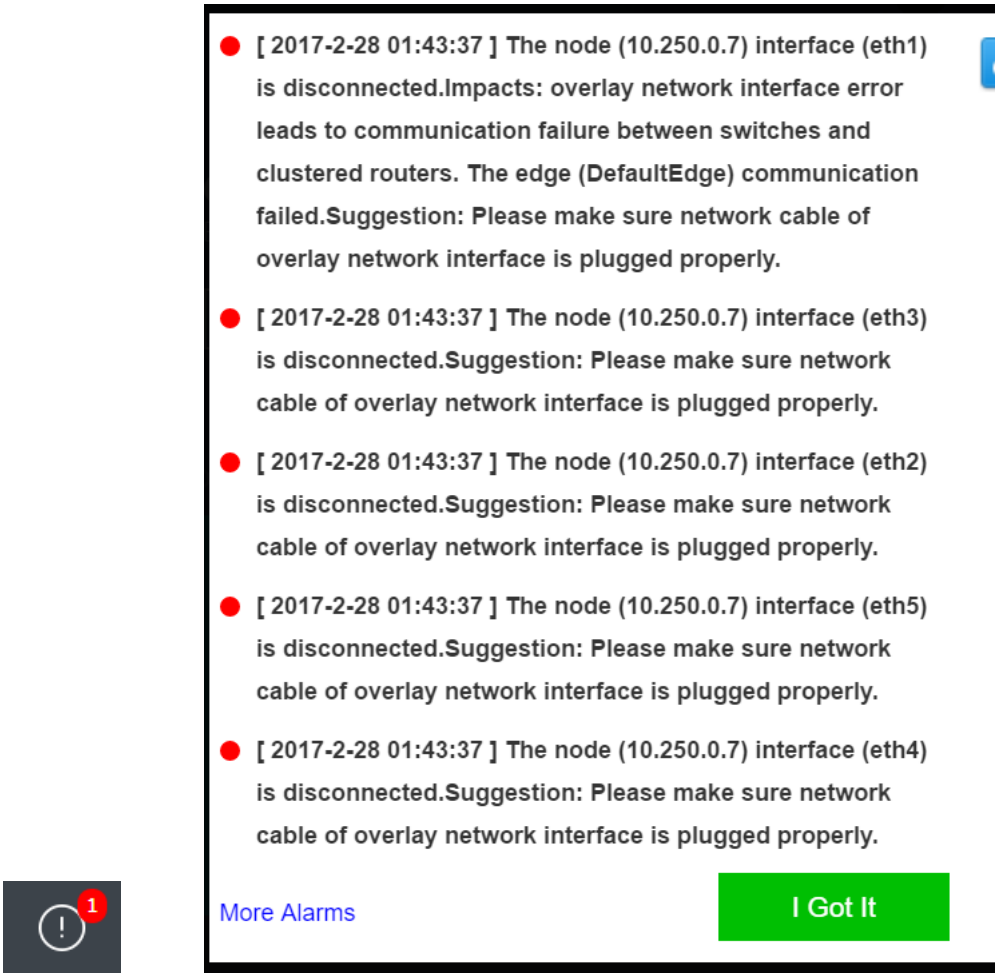
2.1.1. Navigation Bar

There are six modules on the navigation bar, as shown below:

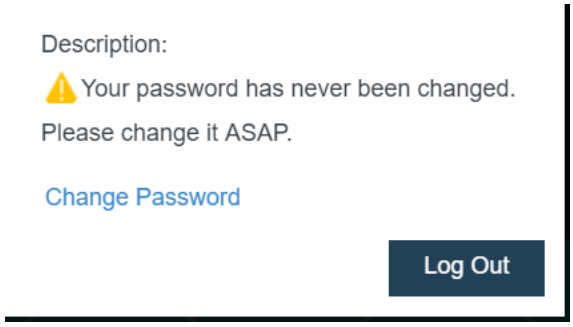


- ✓ **Home**: You can view information about nodes, virtual machines and storage.
- ✓ **Compute**: You can configure and manage virtual machines.
- ✓ **Networking**: You can build virtual network.
- ✓ **Storage**: You can view storage status and configure virtual storage.
- ✓ **Nodes**: You can configure and manage cluster, nodes and storage.
- ✓ **System**: You can configure system related settings: **Licensing**, **Date and Time**, **Sub Administrators**, **Alarm Options**, **Logs and Alarms**, **VM Backup and Recovery**, **System Backup and Restore**, **Upgrade**, **Cluster**, **Tech Support&Download**, etc.

To see alarm events, click on the following icon (the number on the icon means the number of the current alarm events). Then, you will see the latest 5 alarm events, as shown below



If administrator password is too weak, an exclamation mark will appear next to the administrator username. Click on the username and the following dialog will pop up.

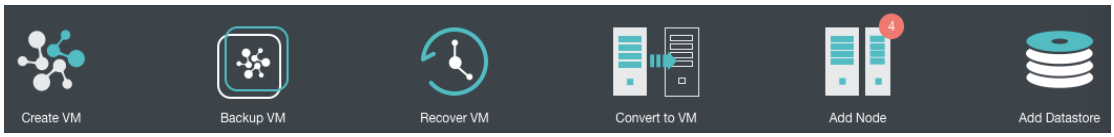


2.1.2. Slideshow

The slideshow will appear every time administrator navigates to **Home** and hide automatically later.

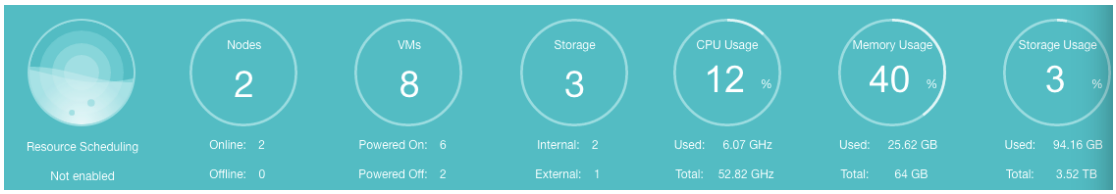
To hide the slideshow, click the icon .

Once the slideshow is hidden, the following buttons appear: **Create VM**, **Backup VM**, **Recover VM**, **Convert to VM**, **Add Node**, **Add Datastore**.



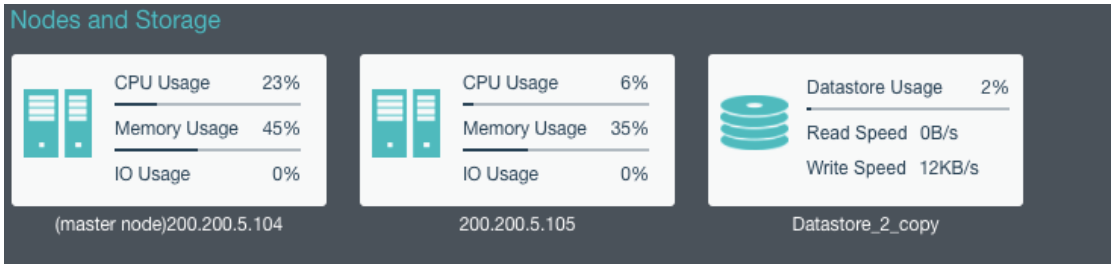
2.1.3. Viewing Resources

This section displays information about resource scheduling, nodes, VMs and storage, CPU usage, memory usage, and storage usage.



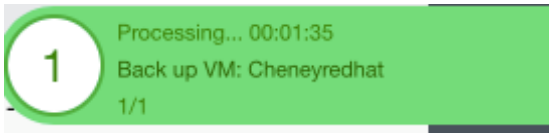
2.1.4. Viewing Nodes and Storage

A gray node icon indicates the node is offline. A red node icon indicates the node gives alarm, while red storage icon indicates the storage gives alarm. A blue node icon and storage icon indicate the node and storage operate properly.

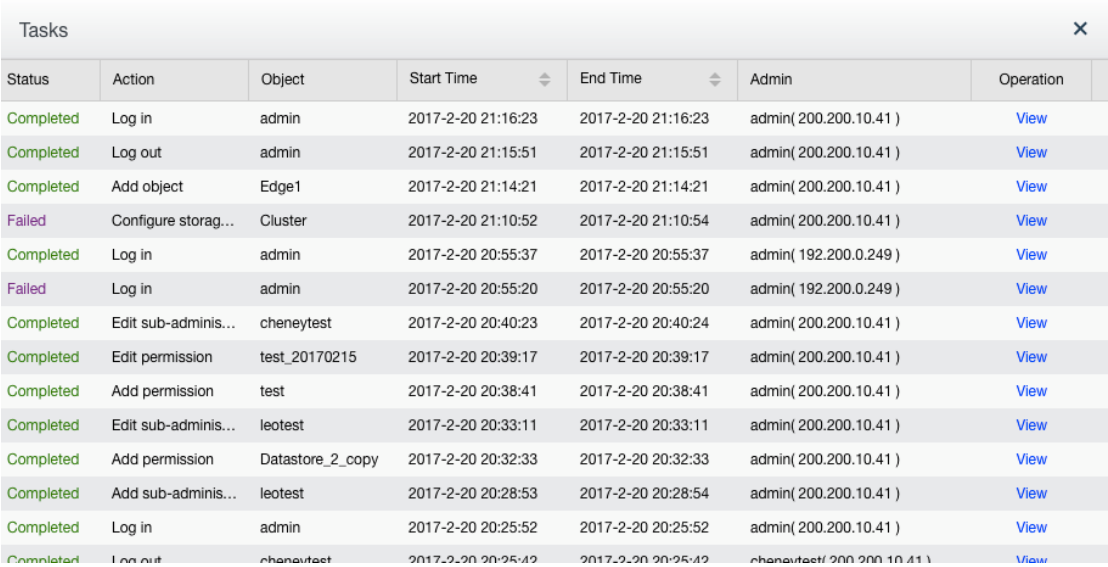


To view node details, click on the node name to enter its **Summary** page (For details, refer to the **Viewing Node Summary** section).

To view running tasks and logs, move your cursor above the following icon at the lower right corner.



To view detailed information, click on it and the following page pops up, which lists the latest admin logs.



Tasks

Status	Action	Object	Start Time	End Time	Admin	Operation
Completed	Log in	admin	2017-2-20 21:16:23	2017-2-20 21:16:23	admin(200.200.10.41)	View
Completed	Log out	admin	2017-2-20 21:15:51	2017-2-20 21:15:51	admin(200.200.10.41)	View
Completed	Add object	Edge1	2017-2-20 21:14:21	2017-2-20 21:14:21	admin(200.200.10.41)	View
Failed	Configure storag...	Cluster	2017-2-20 21:10:52	2017-2-20 21:10:54	admin(200.200.10.41)	View
Completed	Log in	admin	2017-2-20 20:55:37	2017-2-20 20:55:37	admin(192.200.0.249)	View
Failed	Log in	admin	2017-2-20 20:55:20	2017-2-20 20:55:20	admin(192.200.0.249)	View
Completed	Edit sub-adminis...	cheneytest	2017-2-20 20:40:23	2017-2-20 20:40:24	admin(200.200.10.41)	View
Completed	Edit permission	test_20170215	2017-2-20 20:39:17	2017-2-20 20:39:17	admin(200.200.10.41)	View
Completed	Add permission	test	2017-2-20 20:38:41	2017-2-20 20:38:41	admin(200.200.10.41)	View
Completed	Edit sub-adminis...	leotest	2017-2-20 20:33:11	2017-2-20 20:33:11	admin(200.200.10.41)	View
Completed	Add permission	Datastore_2_copy	2017-2-20 20:32:33	2017-2-20 20:32:33	admin(200.200.10.41)	View
Completed	Add sub-adminis...	leotest	2017-2-20 20:28:53	2017-2-20 20:28:54	admin(200.200.10.41)	View
Completed	Log in	admin	2017-2-20 20:25:52	2017-2-20 20:25:52	admin(200.200.10.41)	View
Completed	Log out	cheneytest	2017-2-20 20:25:42	2017-2-20 20:25:42	cheneytest(200.200.10.41)	View

2.2. Compute

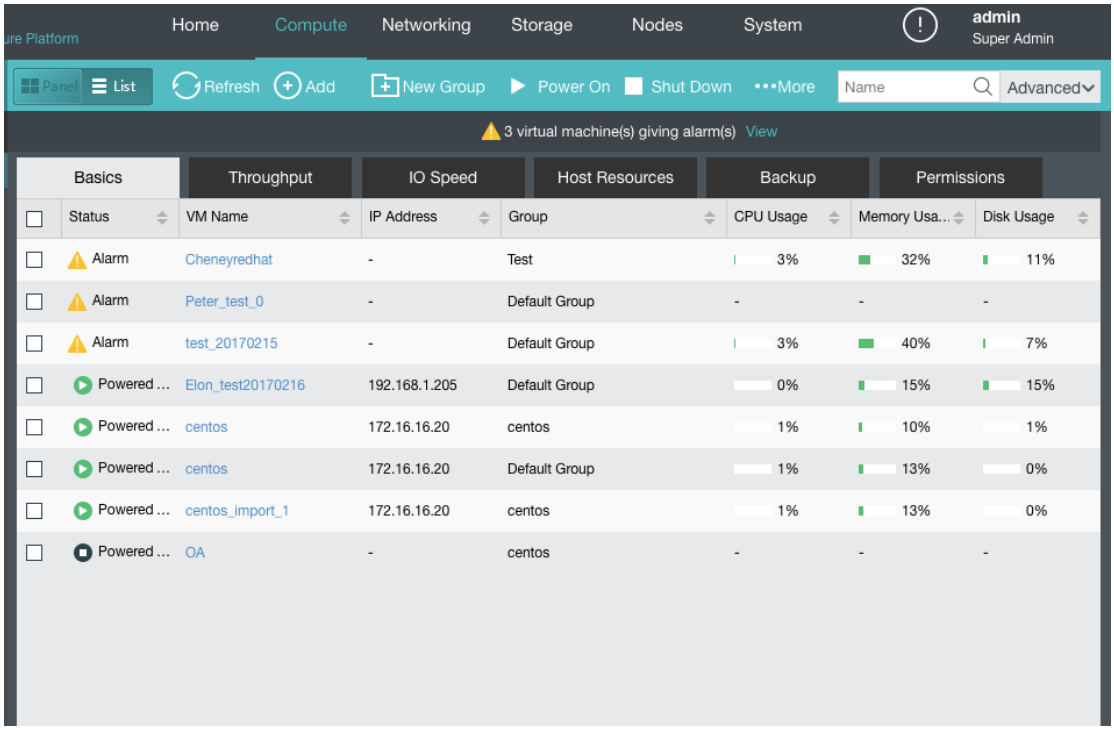
A virtual machine is an operating system simulated by specific software, running in an isolated environment. It can be installed with the operating system such as Windows, Linux, etc.

2.2.1. Toolbar

Navigate to **Compute** and you will see the following toolbar, as shown in the following figure. On the toolbar, there are the following items: **Panel/List**, **Refresh**, **Add**, **New Group**, **Recycle Bin**, **Select**, **Sort**, **Advanced**.

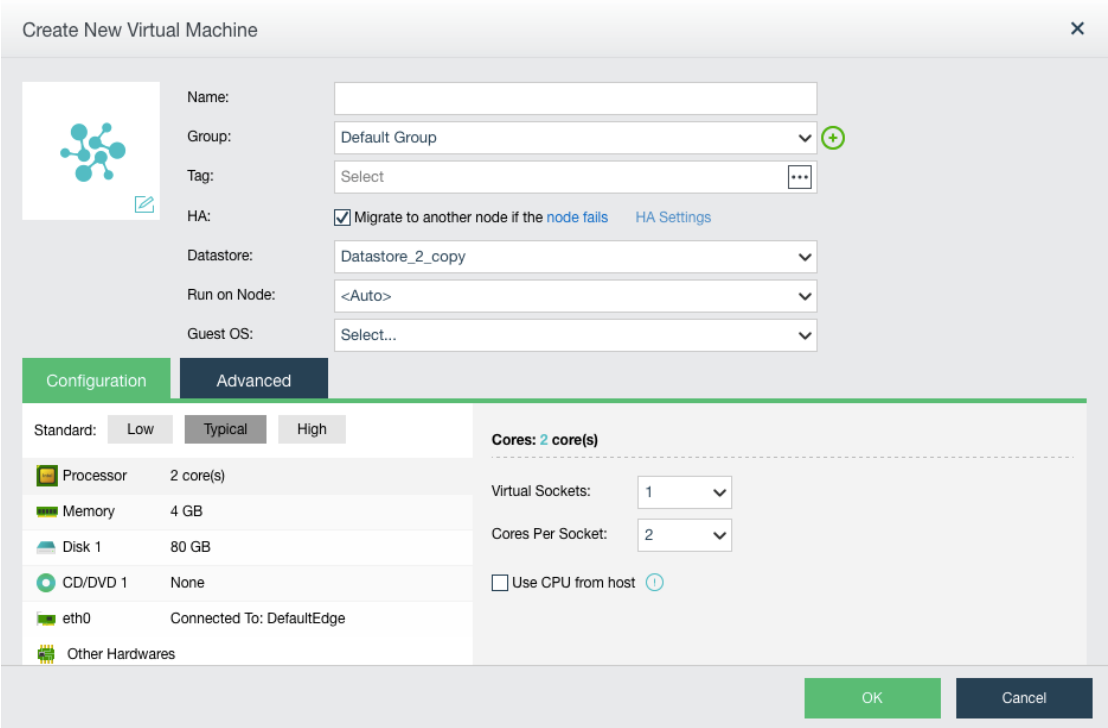
2.2.1.1. Viewing VMs by Panel or List

Virtual machines can be viewed by **Panel** or **List**. By default, virtual machines are displayed by **Panel**. To view VMs by **List**, click on **List**, as shown below:



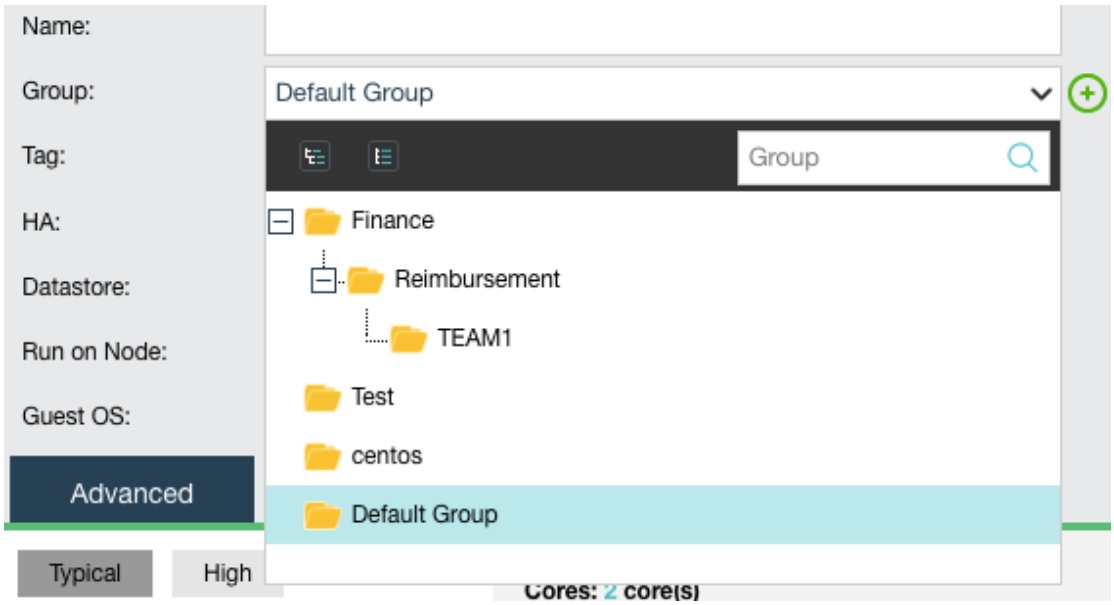
2.2.1.2. Creating Virtual Machine

To add a new virtual machine, click **Add** in **Compute** and then select **Create New Virtual Machine** to enter the following page.

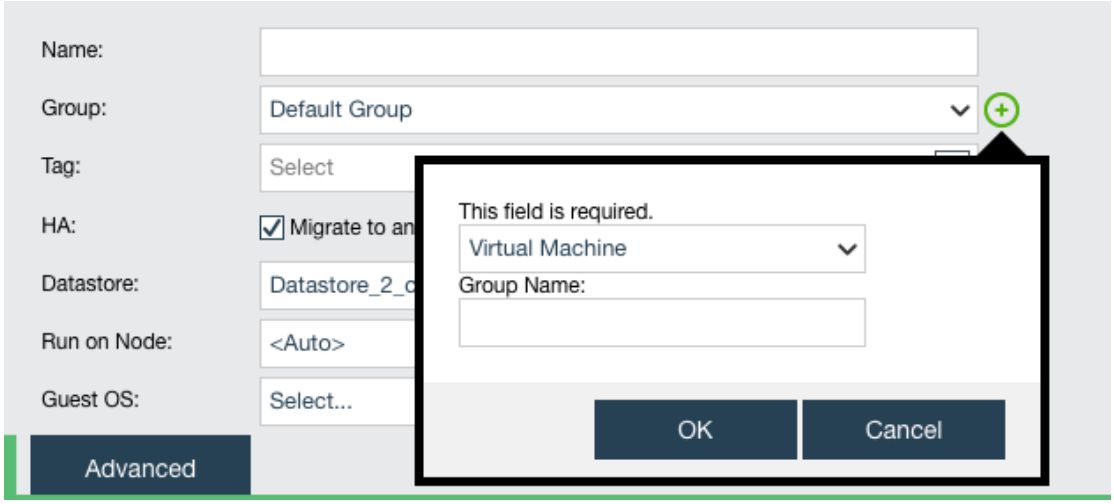


Name: Specifies a distinguishable name for the virtual machine.

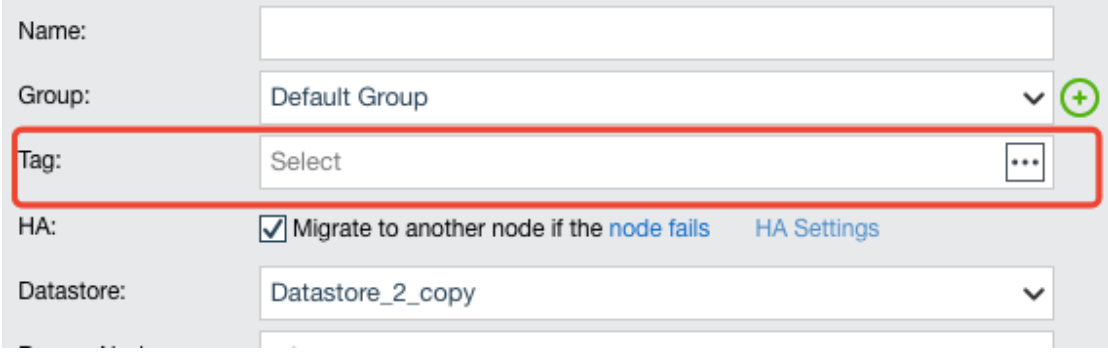
Group: Specifies a group to which this virtual machine will be added.



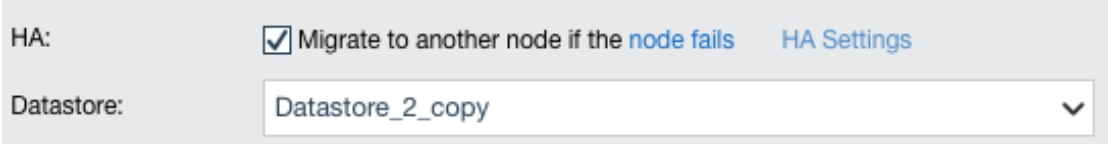
To add a new group, click on the icon.



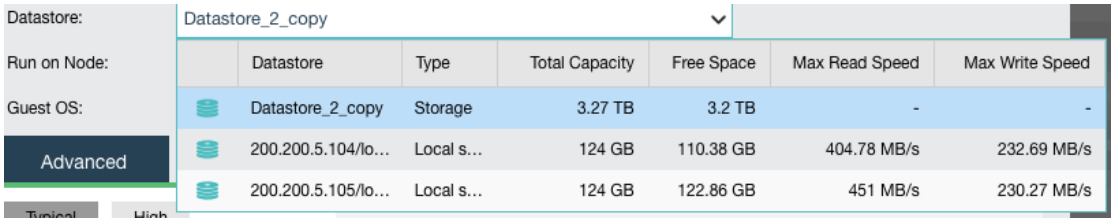
Tag: Specifies one or more than one tags for the virtual machine.



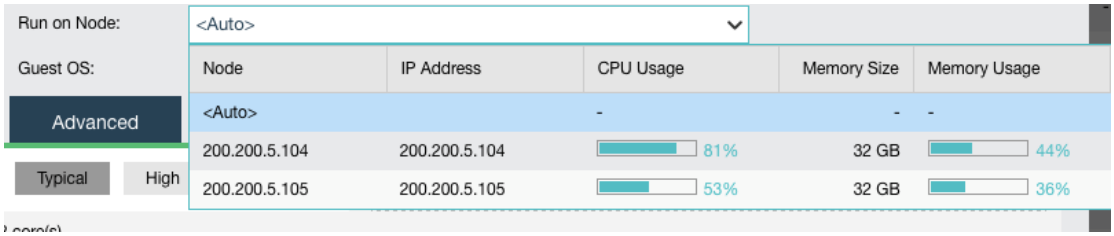
HA: If the option **Migrate to another node if the node fails** is selected, virtual machine will be recovered onto another node in case the node running the VM fails.



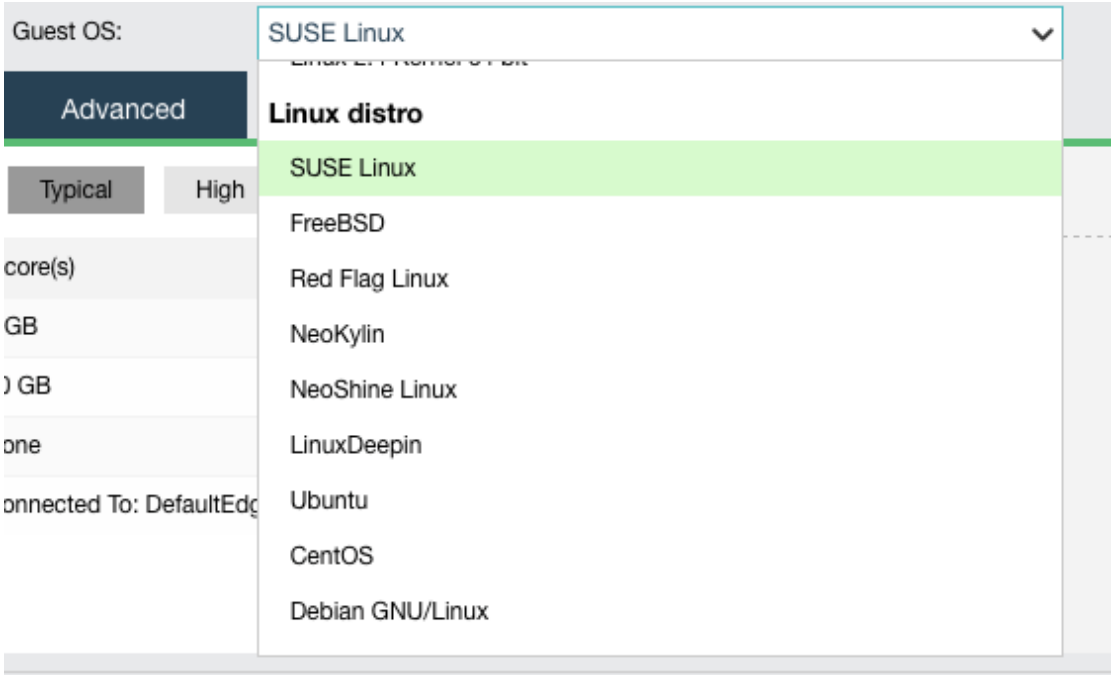
Datastore: Specifies a datastore to store virtual machine. HA is configurable only when a shared datastore is selected.



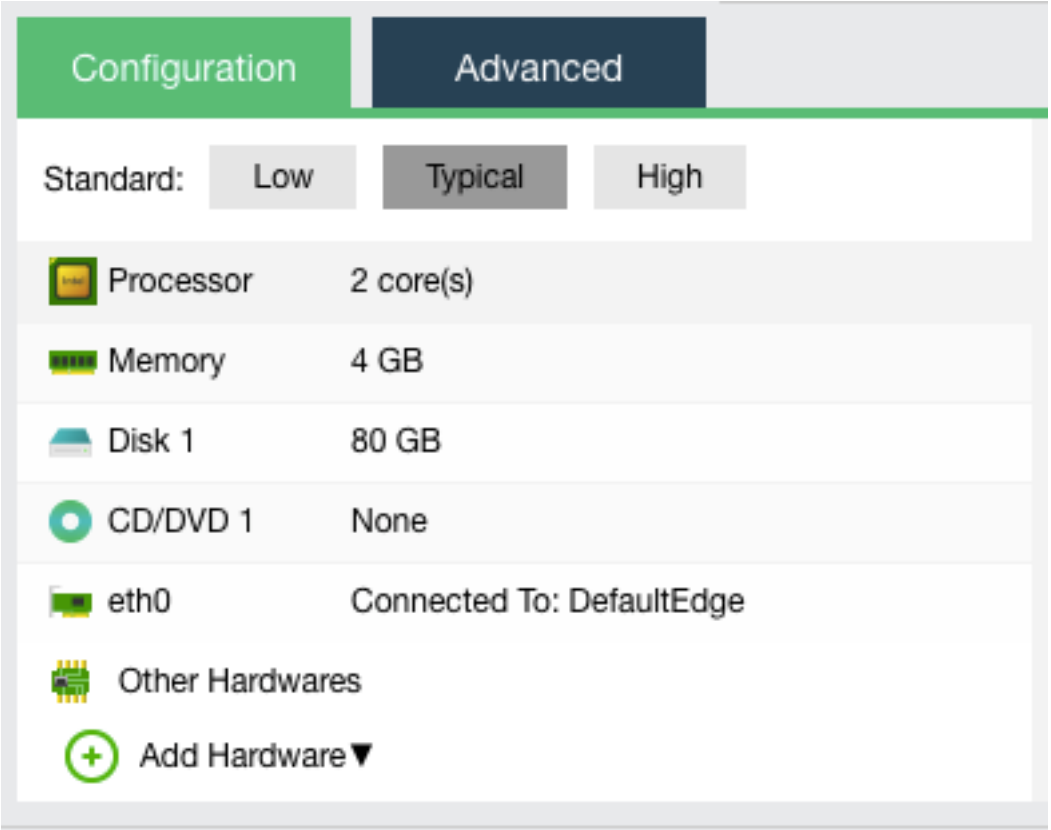
Run on Node: Specifies a node to run the virtual machine.



Guest OS: Specifies an operating system for the virtual machine. The following types of guest OSes are supported: **Windows**, **Linux**, **Sangfor** and **Others**. Sangfor operating system is used for software VDC (virtual desktop controller).

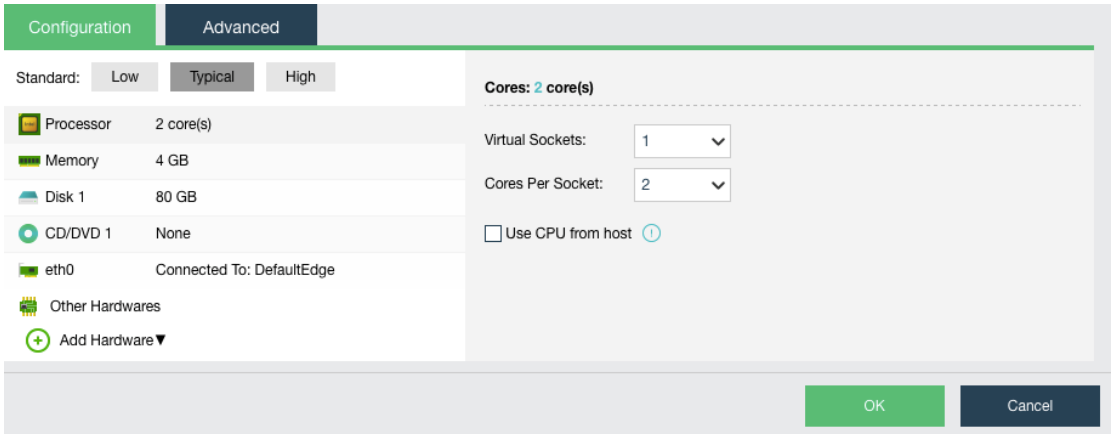


Configuration: It allows you to configure hardware resources, such as **Processor**, **Memory**, **Disk**, **CD/DVD** and **NIC**, etc. Configuration falls into **Low** configuration, **Typical** configuration and **High** configuration. If the current configuration fails to meet business requirements, you can configure the corresponding hardware resource as required, as shown below:

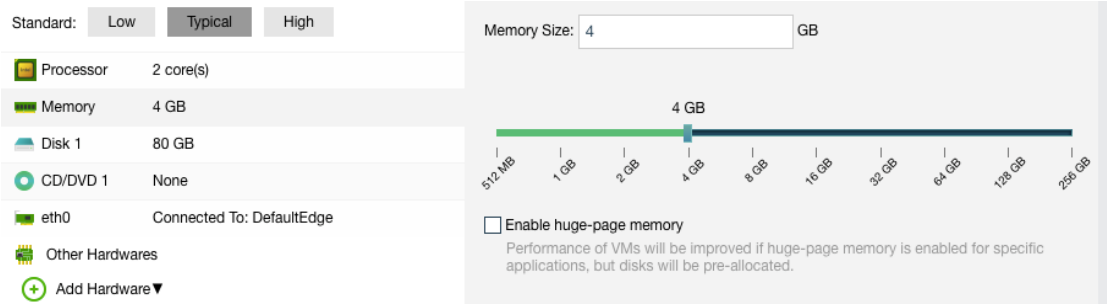


- **Default Low Configuration**: Single-core processor, 2 GB memory, 40 GB disk, one CD/DVD, one NIC.
- **Default Typical Configuration**: Dual-core processor, 4 GB memory, 80 GB disk, one CD/DVD, one NIC.
- **Default High Configuration**: Quad-core processor, 8 GB memory, 80 GB disk, one CD/DVD, one NIC.

Processor: Specifies the number of virtual sockets and cores per socket for the virtual machine respectively.

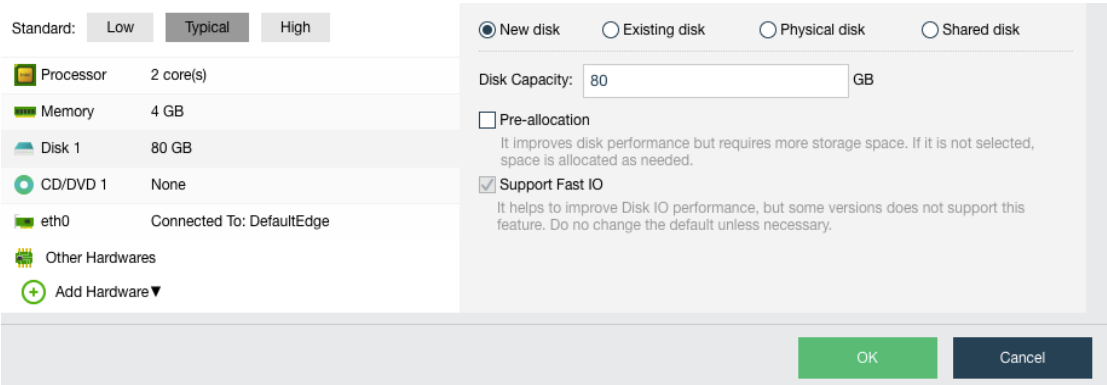


Memory: Specifies the memory size for the virtual machine. The minimum is 512 MB, and the maximum is 256 GB.

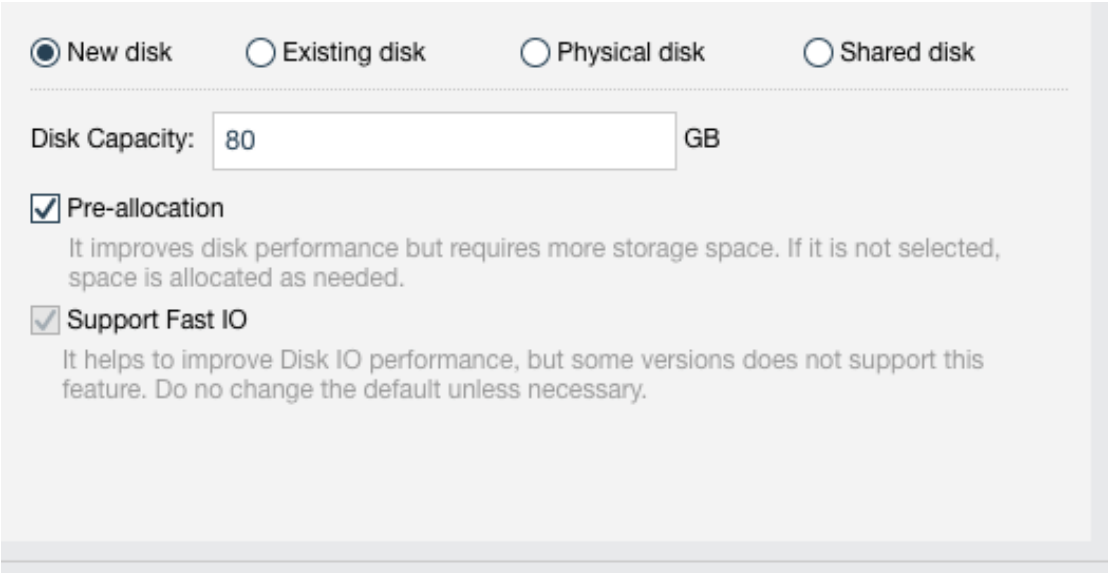


Disk: Specifies a disk for the virtual machine.

To specify a disk for a virtual machine that is not stored on local storage, make sure the disk is on a NFS, iSCSI or FC storage that the virtual machine has access to.



A disk can be created by three means: using a new disk, using an existing disk, using a physical disk. To use a new disk, select the option **New Disk** and configure the following fields:

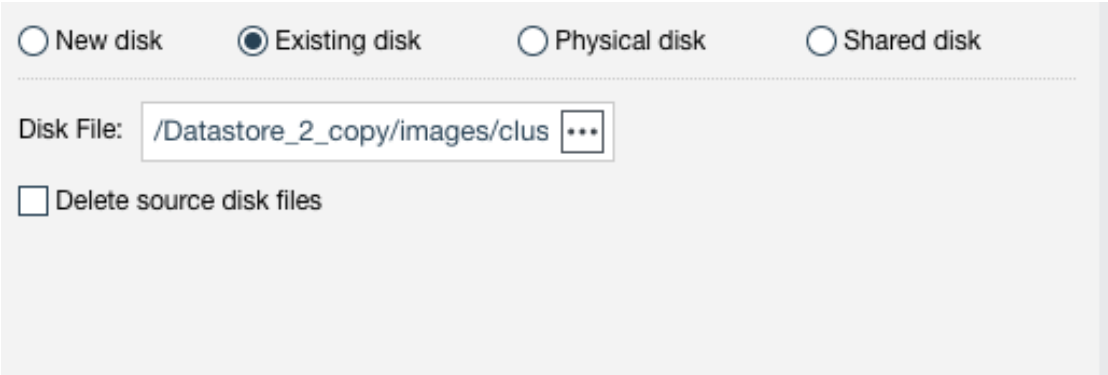


Disk Capacity: Specifies the capacity of the virtual disk, in GB.

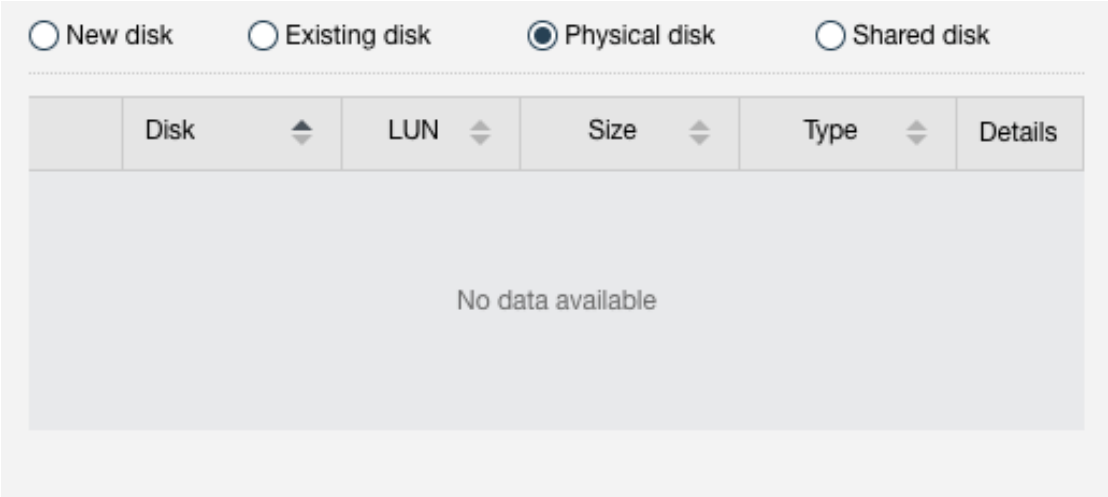
Pre-allocation: It improves disk performance but requires more storage space. If it is not selected, space is allocated as needed.

To use an existing disk, select the option **Existing Disk** and then select a qcow2 disk file.

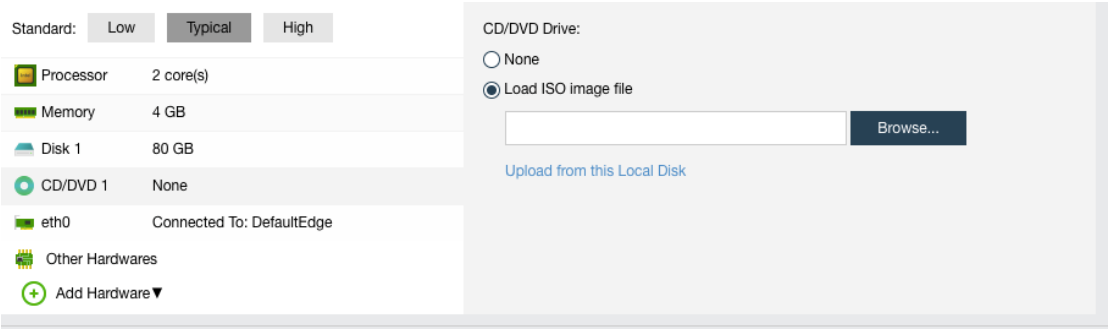
To delete the source disk file and create a new disk file, select the option **Delete source disk files**.



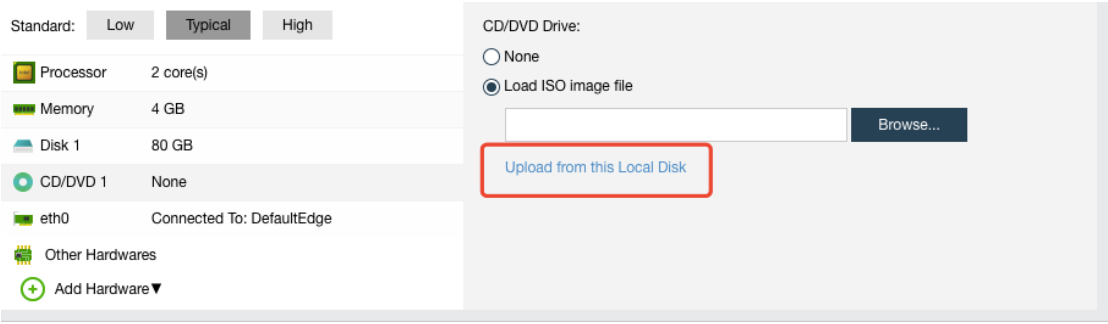
To use a physical disk, select the option **Physical Disk** and choose a physical disk which will be mapped to virtual machine.



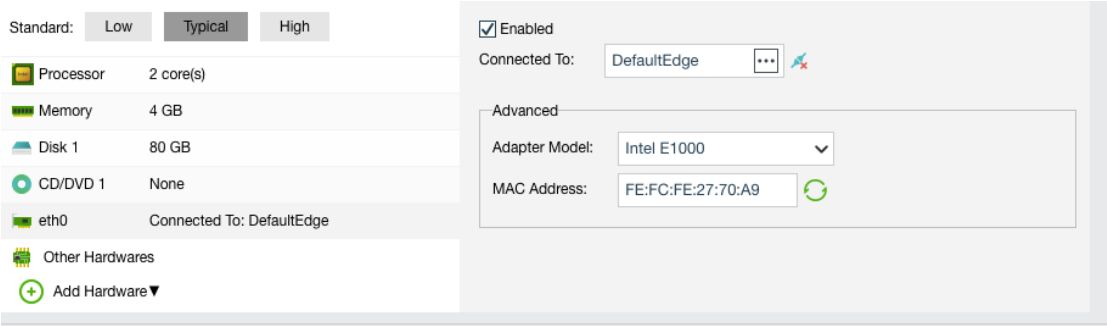
CD/DVD 1: Specifies an ISO image file of CD/DVD drive to be used by the virtual machine. It can also be **None**, which indicates that the virtual machine does not use CD/DVD drive.



If the option **Load ISO image file** is selected, you need to select the corresponding ISO image file. If there is no ISO image file, you can upload an image file to the datastore from local disk. Click **Upload from this Local Disk**, select an ISO image file and upload it.



eth0: Specifies what the virtual machine is connected to.



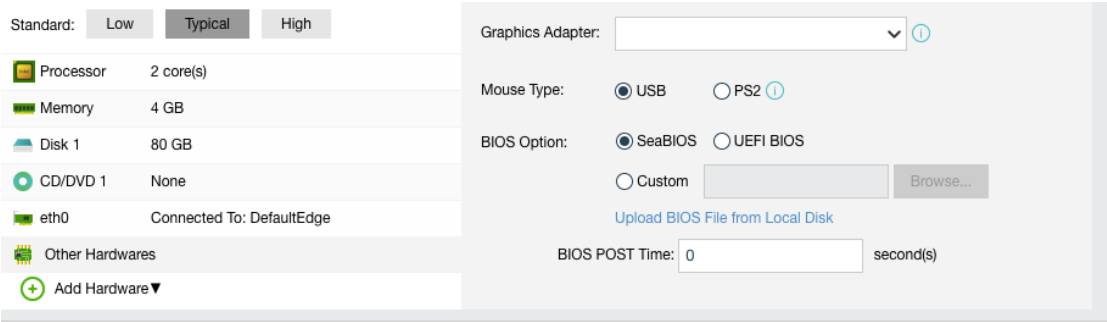
Enabled: If it is selected, it indicates that the specified virtual network adapter is enabled.

Connected To: Specifies an edge or a virtual switch to be connected to the virtual machine.

Adapter Model: Specifies the adapter model: Realtek RTL8139 or Intel E1000.

MAC Address: It can be automatically generated or manually specified. MAC address examples: 00-11-22-33-44-55, 00:11:22:33:44:55.

Other Hardware: Include **Graphics Adapter**, **Mouse Type** and **BIOS Option**.



Graphics **Adapter**: It has close relation with desktop display. If the selected graphics adapter is not supported by guest OS or display error exists, try another type of graphics adapter.

Mouse Type:

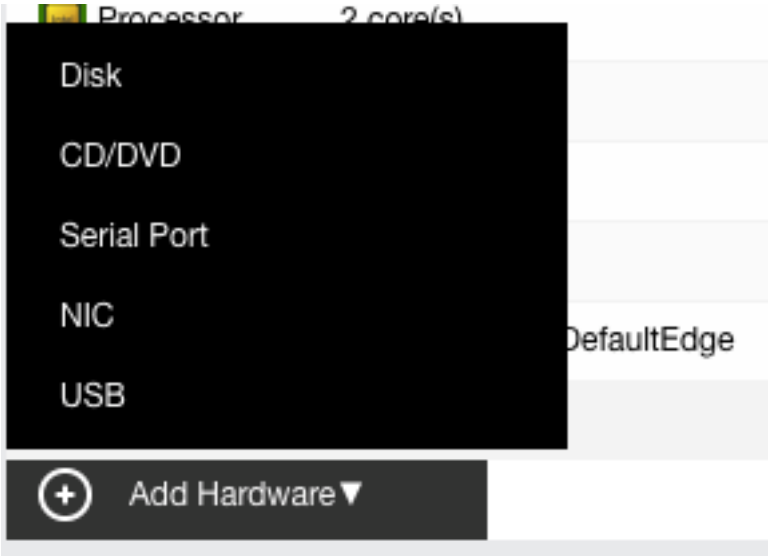
1. It is not recommended unless the virtual mouse does not work properly.

2. It takes effect after the console is re-opened.

3. Mouse type can be changed to PS2 if USB mouse refuses to work for some reason.

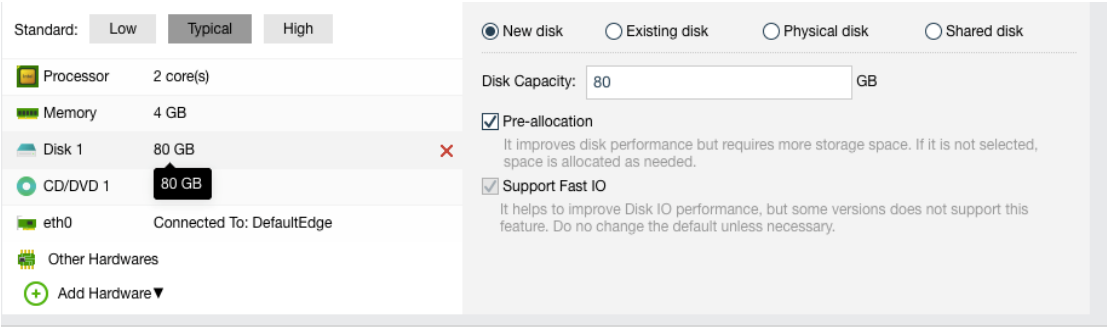
BIOS Option: Options are **SeaBIOS**, **UEFI BIOS** and **Custom**. You can also specify **BIOS POST Time**.

To add more hardware, click **Add Hardware**. Then, you can add disk, CD/DVD, serial port, NIC and USB as per your need.

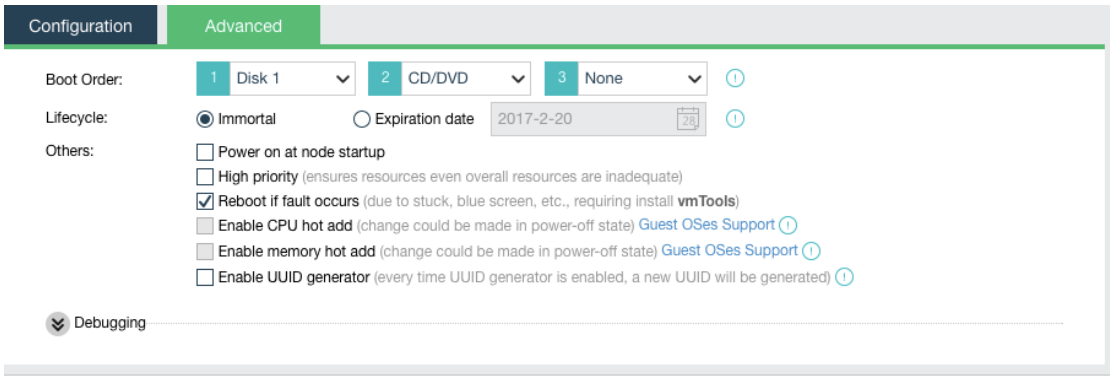


For example, click **Add Hardware** and select **Disk**. Then, disk 2 will be added to the configuration (as shown in following figure). You can add that disk by creating a new disk or using an existing disk.

To delete a disk, click on this icon.

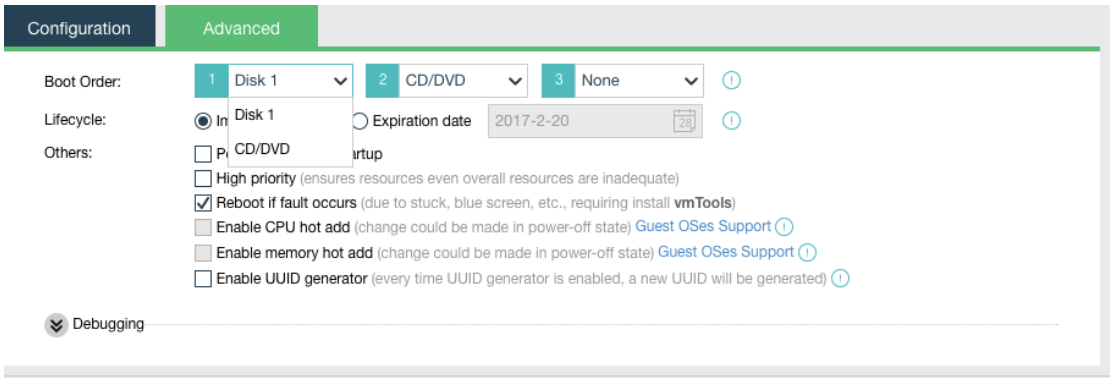


On the **Advanced** tab, you can configure more, such as **Boot Order**, **Lifecycle**, **Others** and **Debugging**.

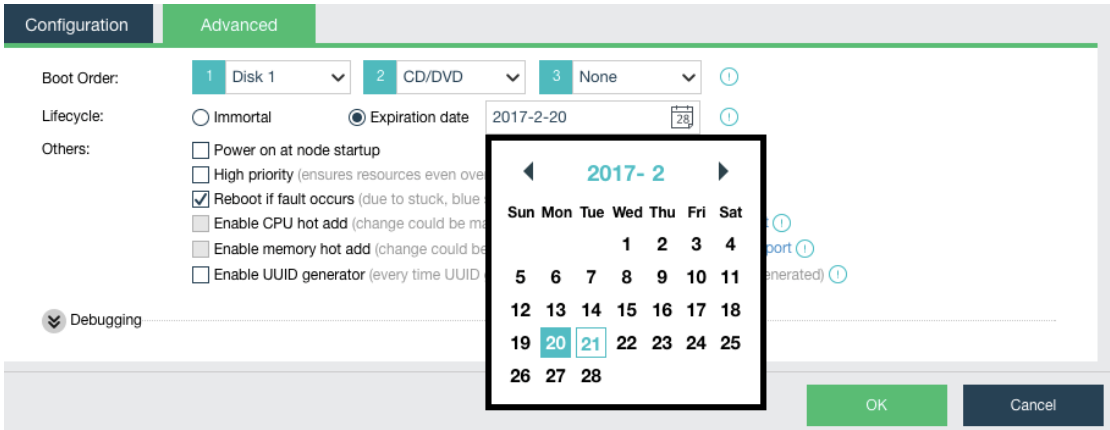


Boot Order: Specifies the boot order for virtual machine. You can choose an item (disk or CD/DVD)

from the pull-down list.



Lifecycle: Specifies virtual machine's lifecycle. It can be immortal or a specified expiration date. A powered-on virtual machine will occupy CPU and memory resources if it has not been used for a long period of time, while a powered-off virtual machine will occupy disk space if it has not been used for a long period of time. You can specify **Expiration Date** for **Lifecycle** so that you can delete the expired virtual machine when the end of its lifecycle is reached.



Power on at node startup: If it is selected, the virtual machine can automatically power on at node startup.

High priority: If it is selected, resources will be allocated to virtual machine preferentially in case that resources on the node are insufficient.

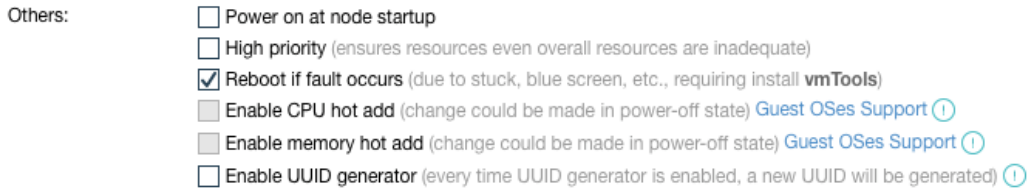
Reboot if fault occurs: If it is selected, the virtual machine will restart automatically when it is not responding due to stuck, blue screen, etc.

Enable CPU hot add: It enables CPU to be automatically added to a powered-on virtual machine.

Enable memory hot add: It enables memory to be automatically added to a powered-on virtual

machine.

Enable UUID generator: If it is selected, a new UUID will be generated.

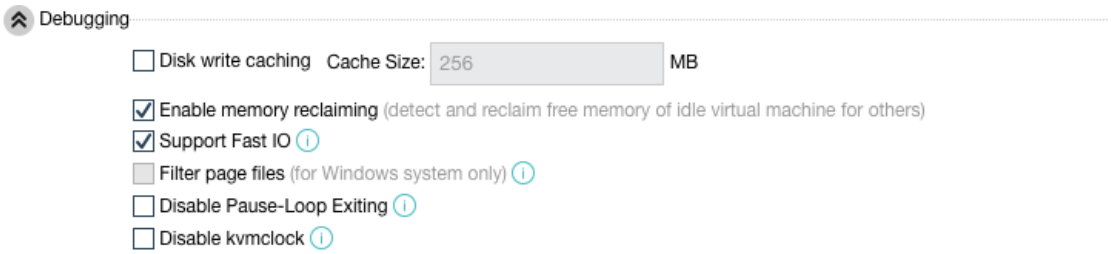


Debugging: There are the following options:

- **Disk write caching**: It can improve disk IO **efficiency**, because files in virtual disk are loaded to memory.
- **Enable memory reclaiming**: It enables system to detect and reclaim free memory of idle virtual machine for others.
- **Support Fast IO**; If it is enabled, all disks associated with the virtual machine will support Fast IO, which can dramatically improve IO performance.
- **Filter page files**: If it is selected, page files will not be backed up as so to save backup storage and time.

To disable **Pause-Loop Exiting**, select the option **Disable Pause-Loop Exiting**.

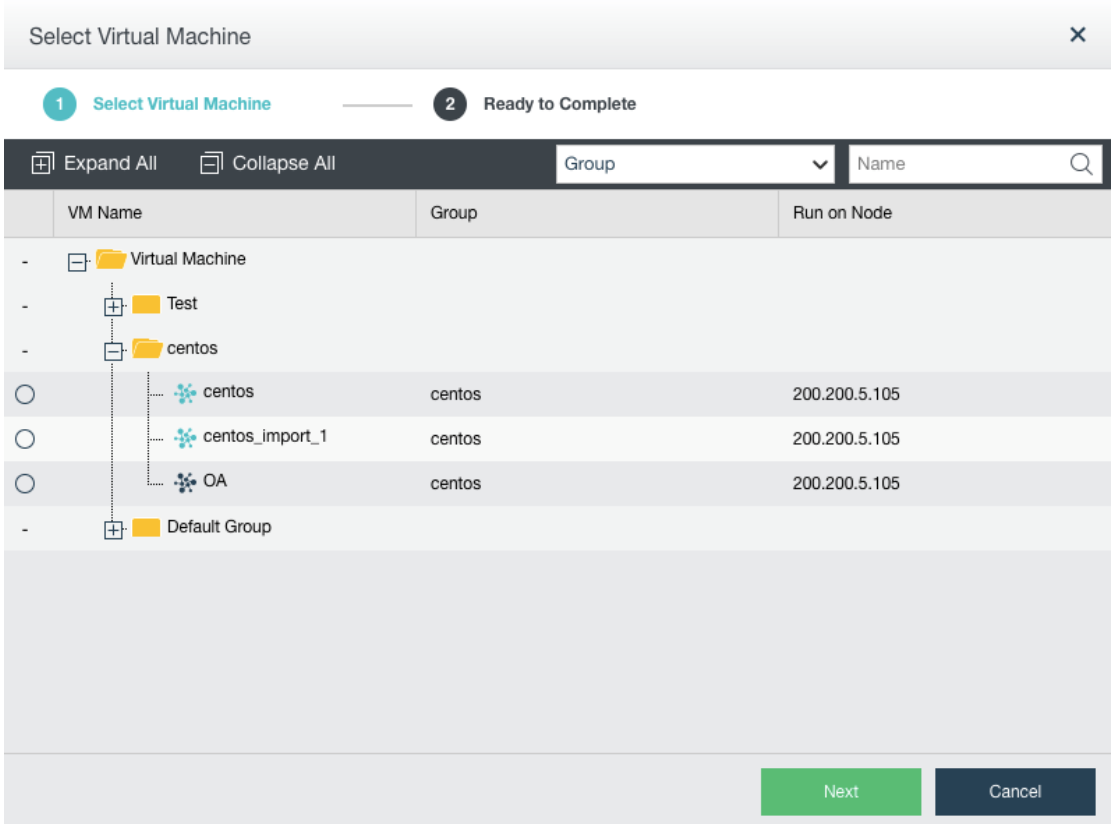
To disable, select the option **Disable kvmclock.**



2.2.1.3. Cloning Virtual Machine

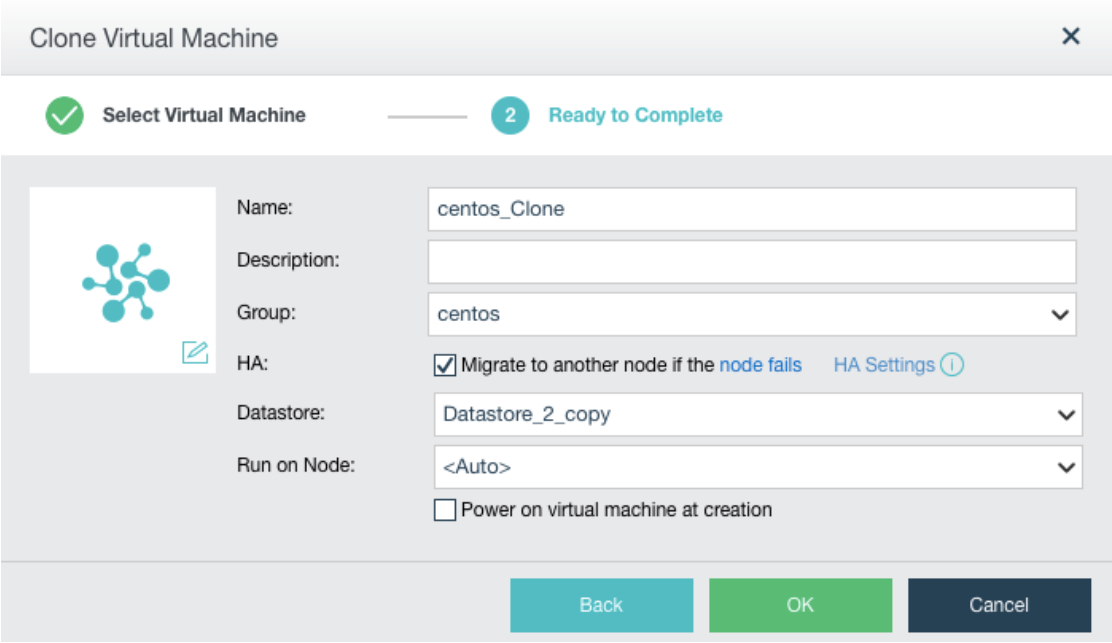
Cloning virtual machine means duplicating a virtual machine, which applies to virtual machines that can be used as sources for new virtual machines. The cloned resources will not affect source virtual machines.

To clone a virtual machine, click **Add** in **Compute** and select **Clone VM** on the **Create New Virtual Machine** page to enter the following page. On that page, select a virtual machine that you want to clone.



- A powered-off virtual machine cannot be cloned.
- A virtual machine being migrated or cloned cannot be cloned.
- Backup task will be canceled if the clone operation is performed against a virtual machine which is being backed up.
- Guest operating system settings of a cloned virtual machine retain the same as that of the source virtual machine, exclusive of MAC address. Thus, IP address of one of the two virtual machines should be modified, otherwise, it may result in IP address conflict.

Cloning a virtual machine creates a duplicate of a virtual machine, including VM configurations and disk files. On the following page, you can customize parameters of a clone.



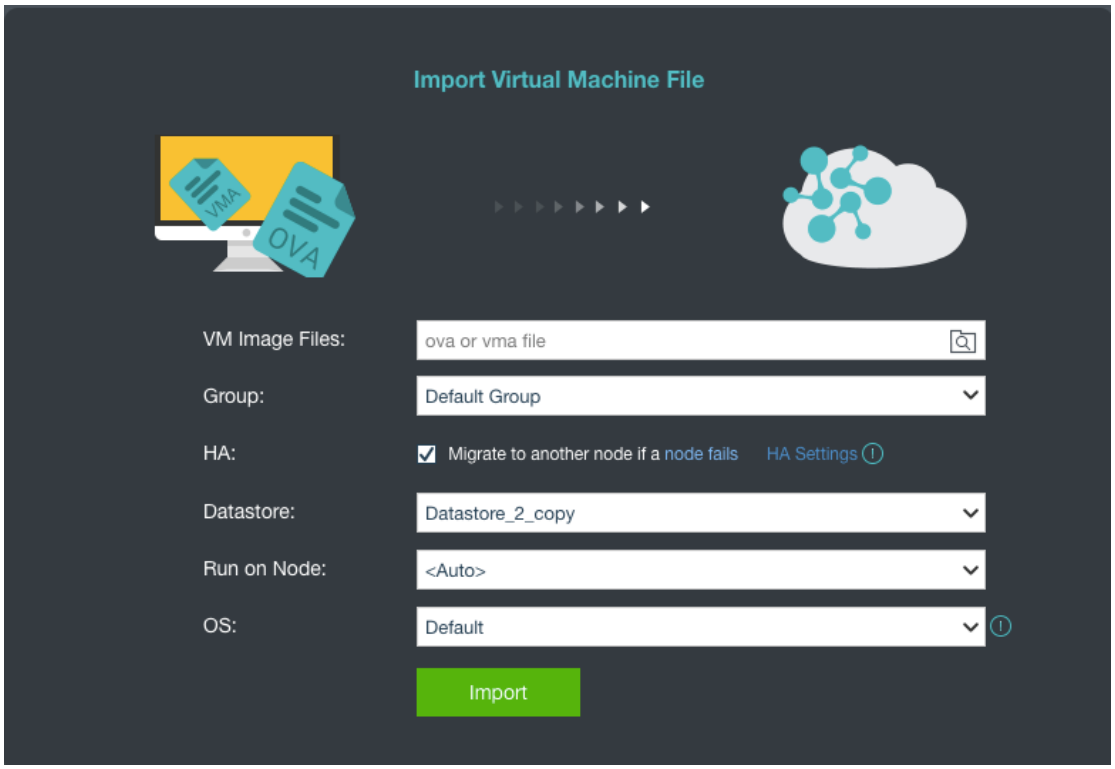
To clone a virtual machine, you need to specify the following parameters for the clone: **Name**, **Description**, **Group**, **HA**, **Datastore**, **Run on Node**. To have the cloned virtual machine powered on upon creation, select the option **Power on virtual machine at creation**.

The following factors will affect efficiency of clone task: amount of the source virtual machine data and performance of the server where Sangfor HCI software is installed.

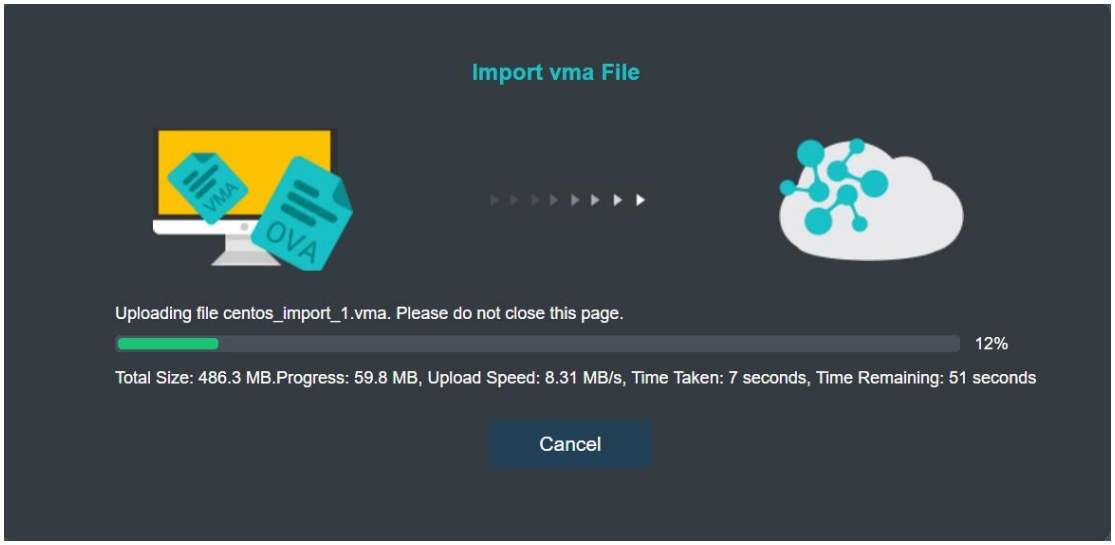
2.2.1.4. Importing Virtual Machine

The following types of VM files can be imported onto Sangfor HCI platform: OVA files exported from VMware virtualization platform, VMA files exported from other Sangfor HCI platforms.

To import a virtual machine file, click **Add** in **Compute**, select **Import Virtual Machine** on the **Create New Virtual Machine** page to enter the following page.



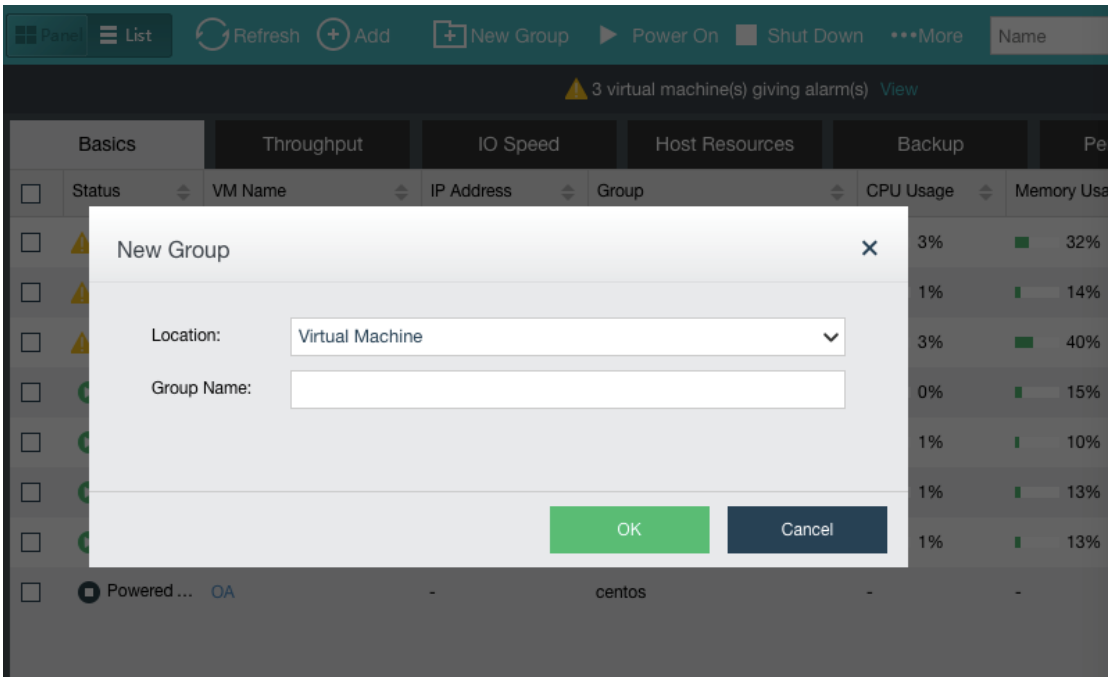
On the above page, select an ova file from local disk, specify **Group**, **Datastore**, **Run on Node** and **OS**, then click **Import**.



- If an ova file of a Windows based virtual machine is imported, driver of USB mouse needs to be updated and you will be prompted to install that driver.
- If an ova file of a Linux based virtual machine is imported, you need to configure IP address for NIC.

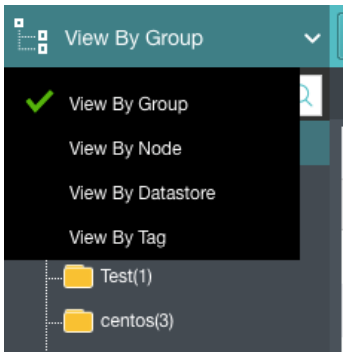
2.2.1.5. Adding New Group

In **Compute**, you can add a new group by clicking **New Group**. On the **New Group** page, as shown below, you need to specify a name for the new group.

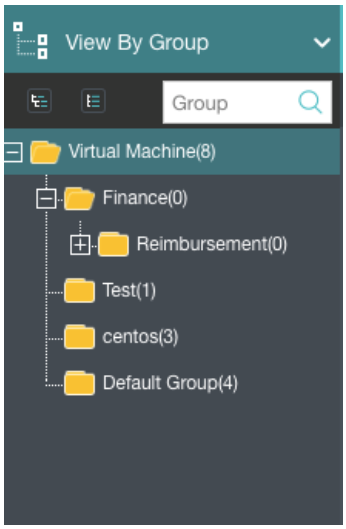


2.2.1.6. Viewing VMs

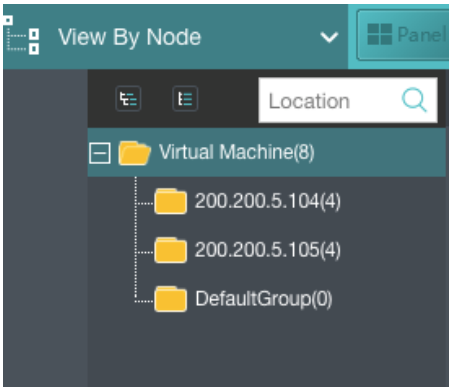
Virtual machines can be viewed by **Group**, **Node**, **Datastore** and **Tag**.



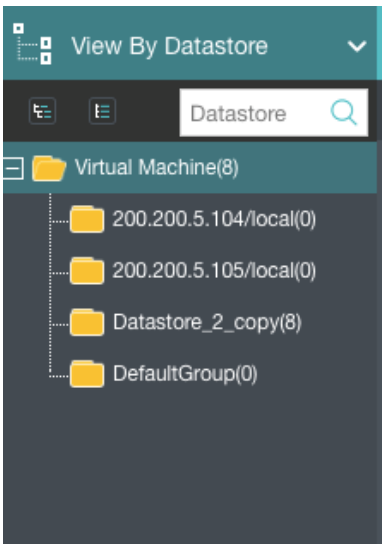
To view virtual machines by group, select **View By Group** in **Compute**, as shown below.



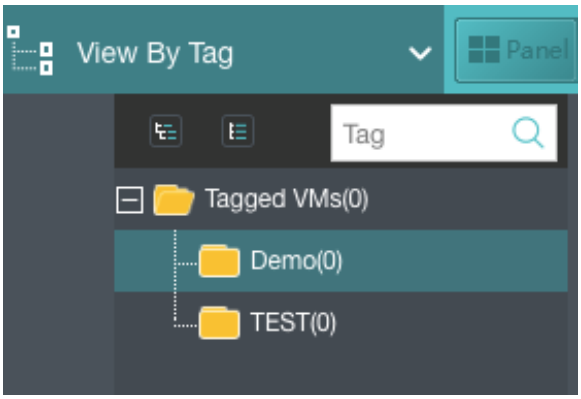
To view virtual machines by node, select **View By Node** in **Compute**, as shown below.



To view virtual machines by datastore, select **View By Datastore** in **Compute**, as shown below.

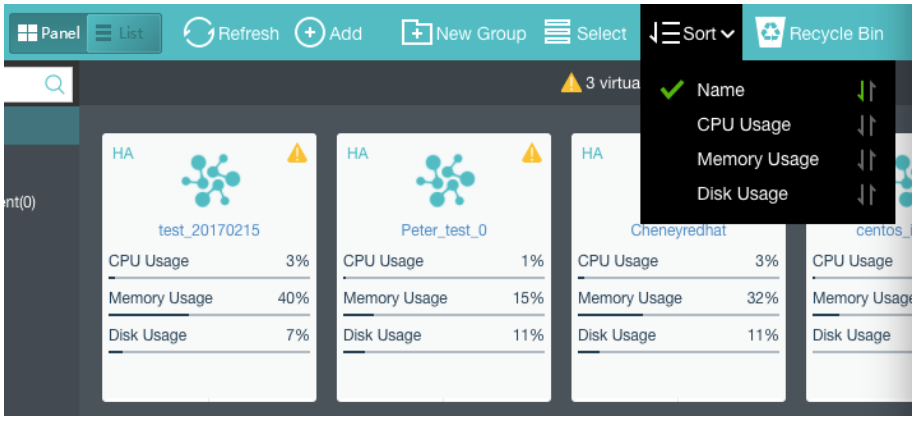


To view virtual machines by tag, select **View By Tag** in **Compute**, as shown below.



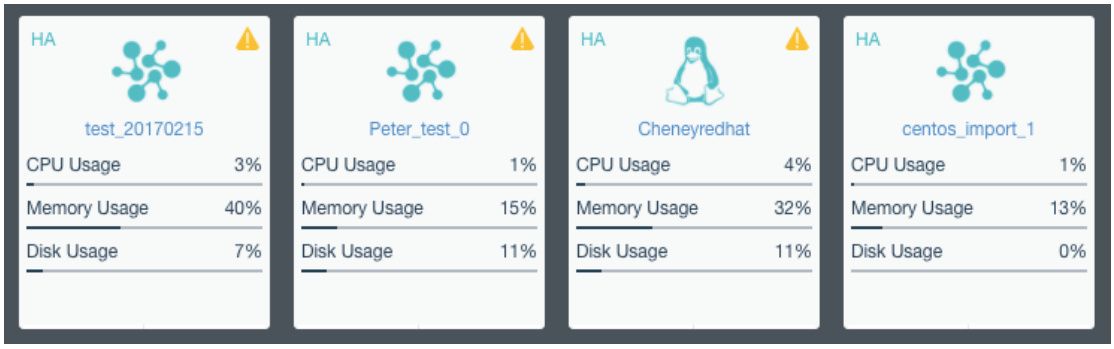
2.2.1.7. Sorting VMs

Virtual machines can be sorted by **Name**, **CPU Usage**, **Memory Usage**, **Disk Usage**.

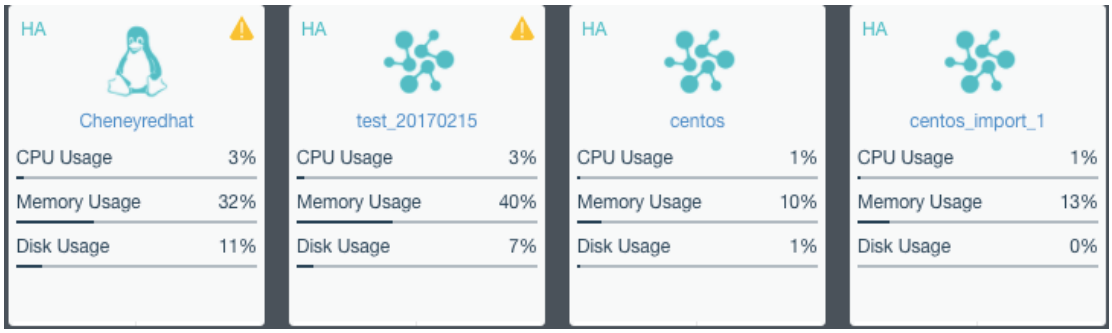


To sort virtual machines by name, select **Sort > Name**. You may click on the arrow to

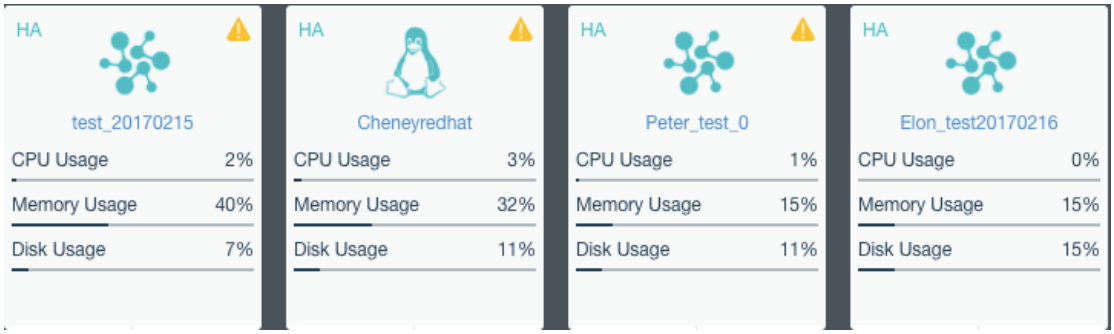
have VMs sorted in ascending or descending order.



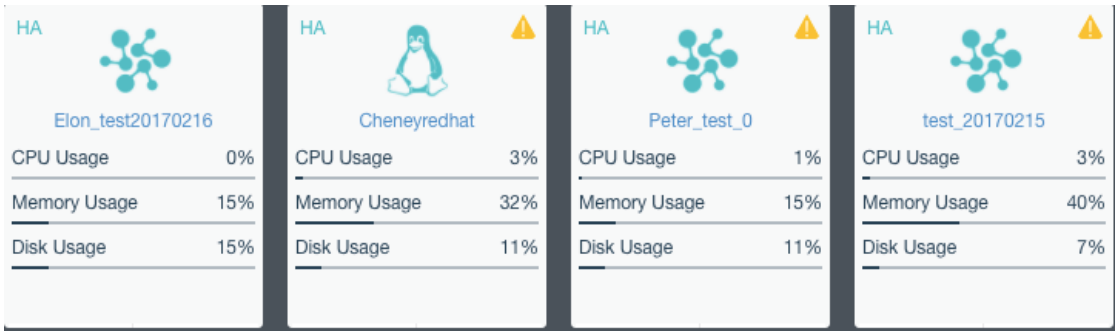
To sort virtual machines by CPU usage, select **Sort > CPU Usage**. By clicking on that arrow, virtual machines can be sorted based on CPU usage in ascending order or descending order (as shown in the following figure).



To sort virtual machines by memory usage, select **Sort > Memory Usage**. By clicking on that arrow, virtual machines can be sorted based on memory usage in ascending order or descending order (as shown in the following figure).



To sort virtual machines by disk usage, select **Sort > Disk Usage**. By clicking on that arrow, virtual machines can be sorted based on disk usage in ascending order or descending order (as shown in the following figure).



2.2.1.8. Batch Operation

Administrator can perform the following operations against multiple virtual machines: **Power On**, **Suspend**, **Shut Down**, **Power Off**, **Reset**, **Move**, **Edit**, **Delete**.

To power on virtual machines(s), select one or more than one virtual machines and then click on **Power On**.

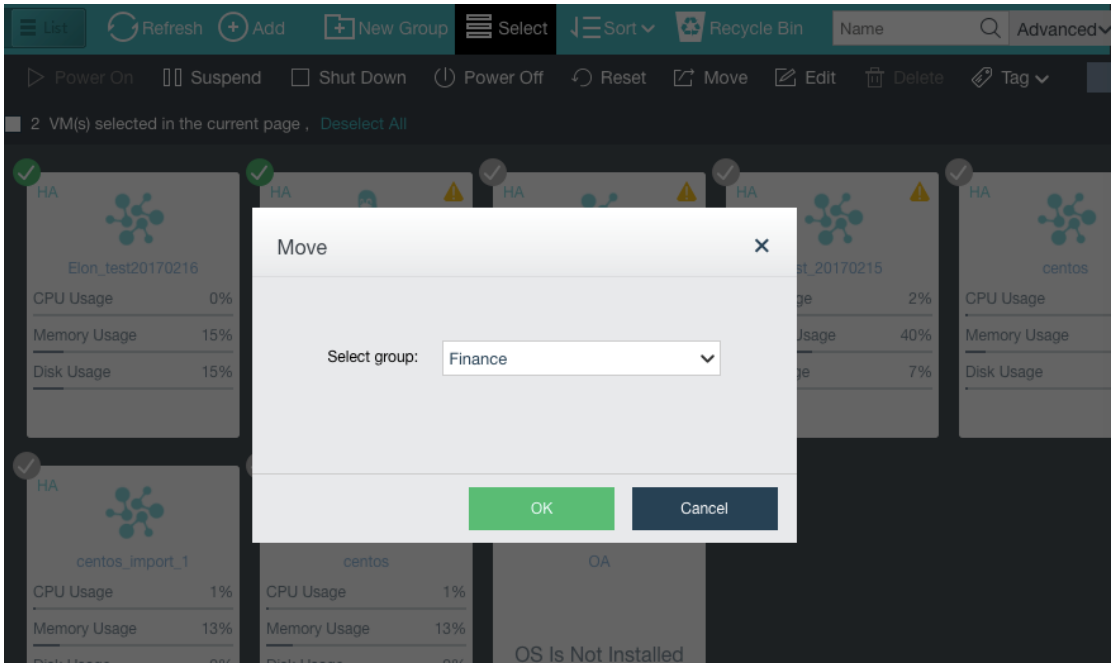
To suspend virtual machines(s), select one or more than one virtual machines and then click on **Suspend**.

To shut down virtual machines(s), select one or more than one virtual machines and then click on **Shut Down**

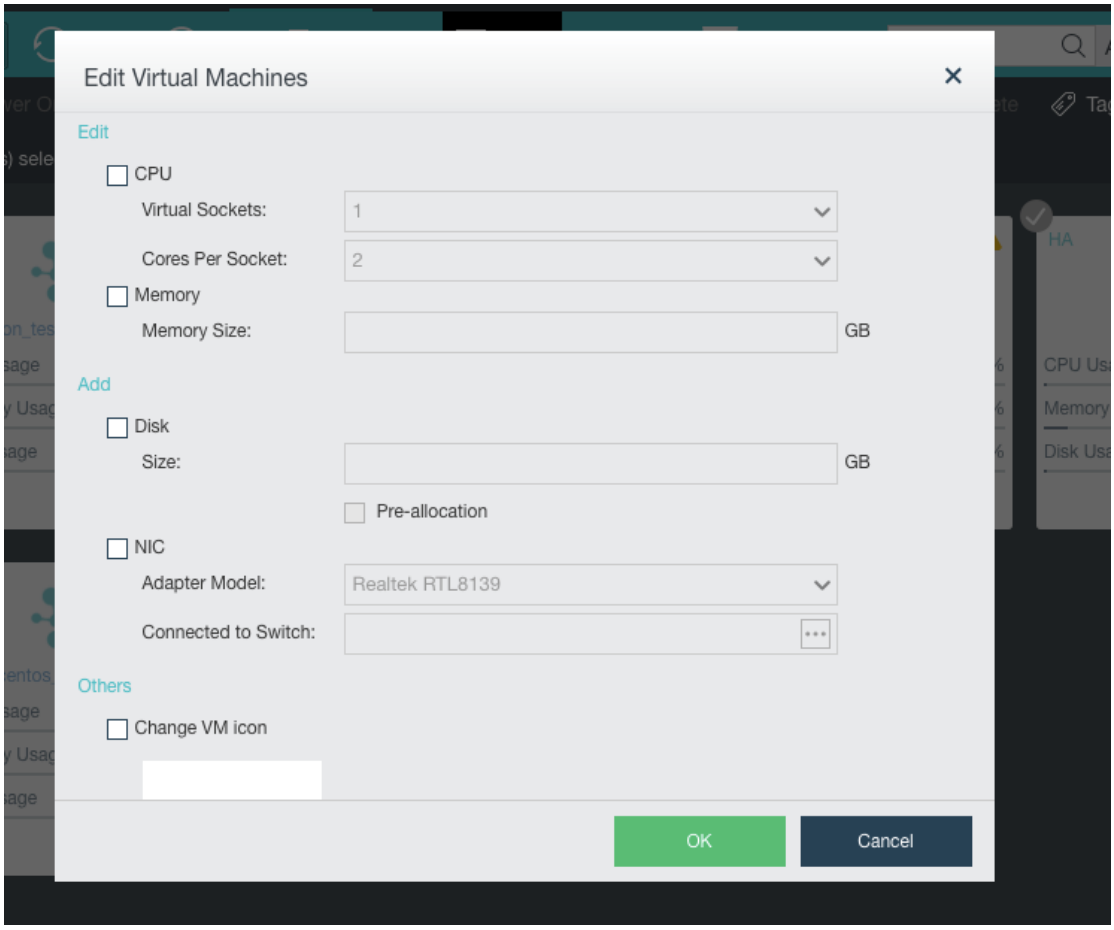
To power off virtual machines(s), select one or more than one virtual machines and then click on **Power Off**.

To restart virtual machines(s), select one or more than one virtual machines and then and click on **Reset**.

To move virtual machines(s) to a specific group, select one or more than one virtual machines and then click on **Move**.

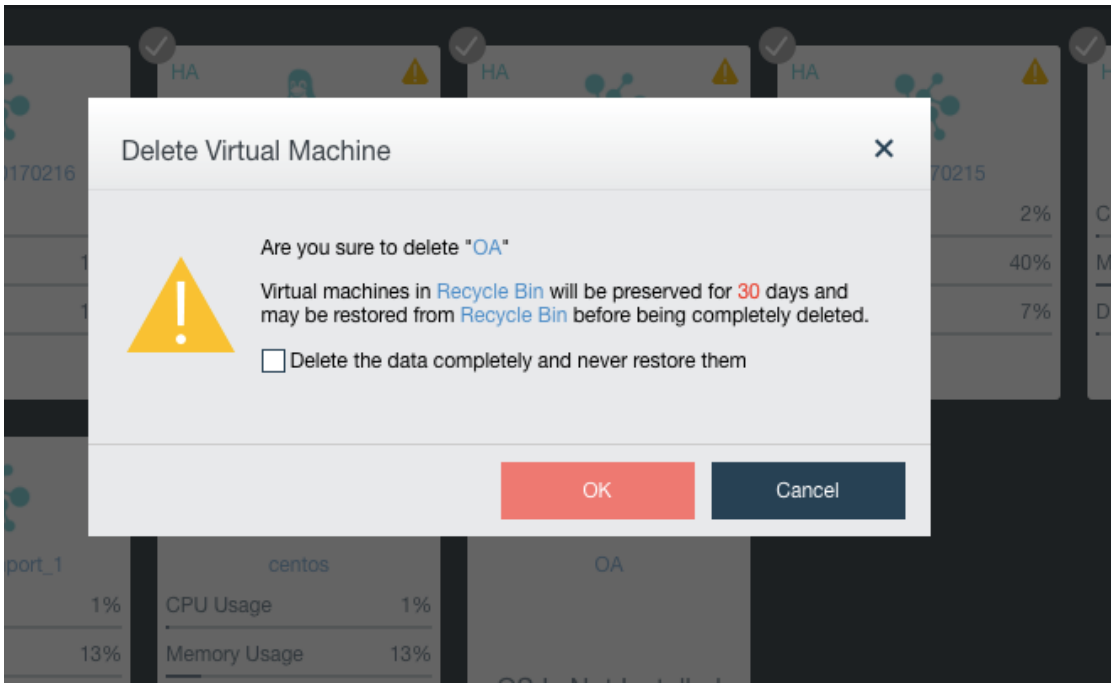


To edit virtual machines(s), select one or more than one virtual machines and then click on **Edit**.

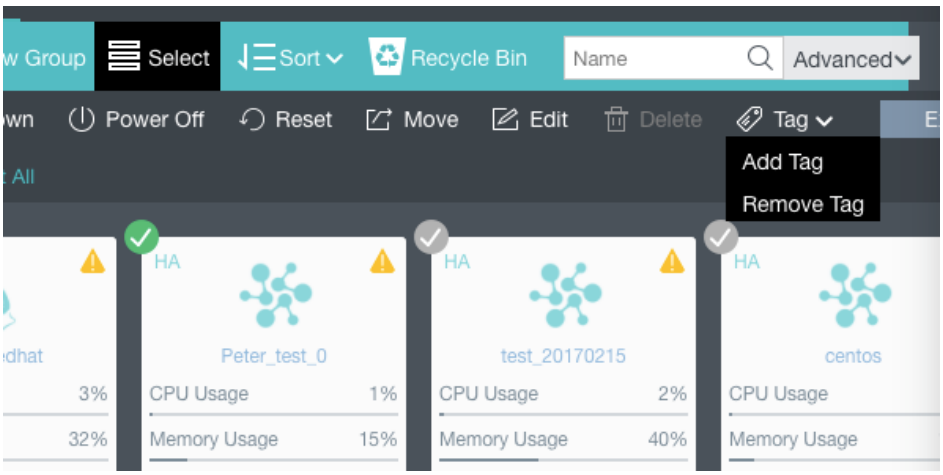


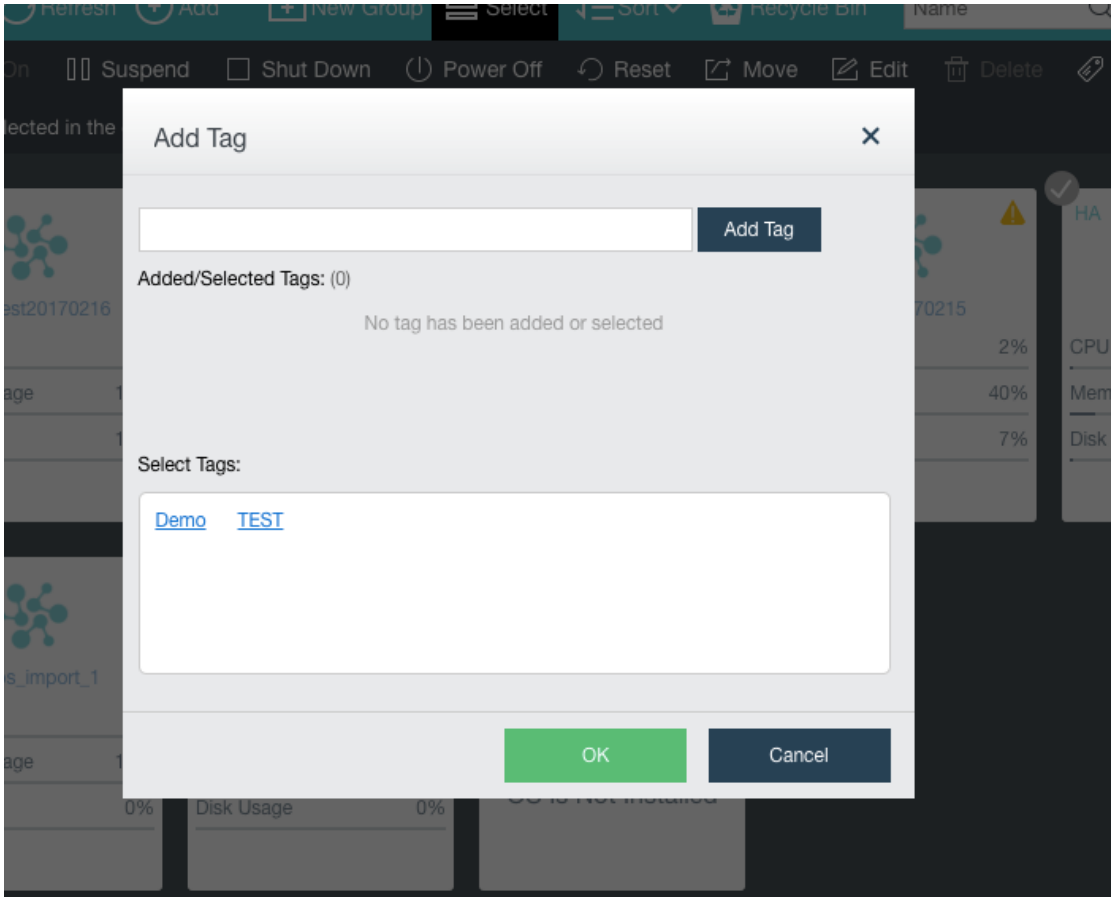
To delete virtual machines(s), select one or more than one virtual machines and then click on

Delete. Virtual machines will go to **Recycle Bin** after being deleted but can be recovered within 30 days. To delete virtual machine(s) permanently, select the option **Delete the data completely and never restore them**. Thus, configuration files and disk files of virtual machines will be deleted completely and cannot be restored any more.

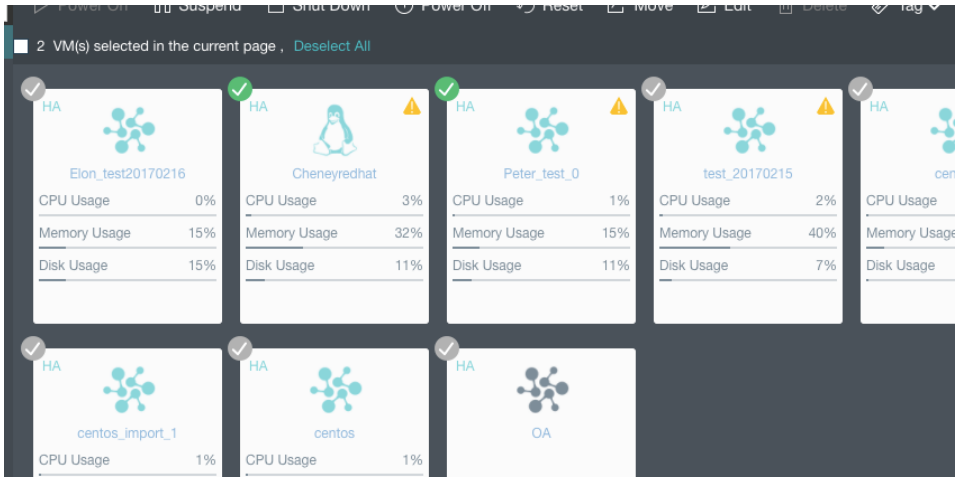


To add new tags to virtual machine(s), choose one or more than one virtual machines and select **Add Tag**. You can choose existing tags or add new tags for those virtual machines. To remove tags of virtual machine(s), choose one or more than one virtual machines and select **Remove Tag**.

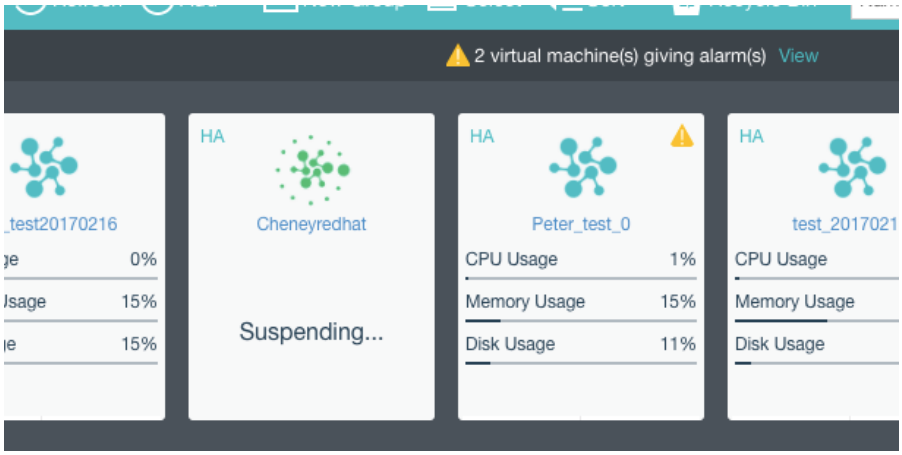




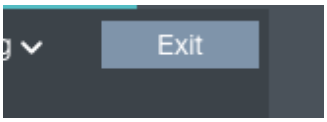
If a virtual machine is chosen, the color of the icon at the upper left corner of the corresponding card will turn to green from gray.



If a virtual machine is being powered on, suspended or shut down, there will be the corresponding information displayed on the card. For example, **Suspending**..., as shown in the following figure, shows that the virtual machine is being suspended.

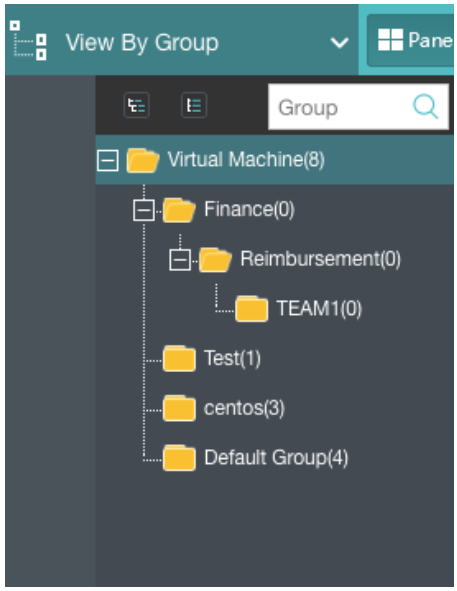


To exit editing virtual machines, click on the **Exit** button.



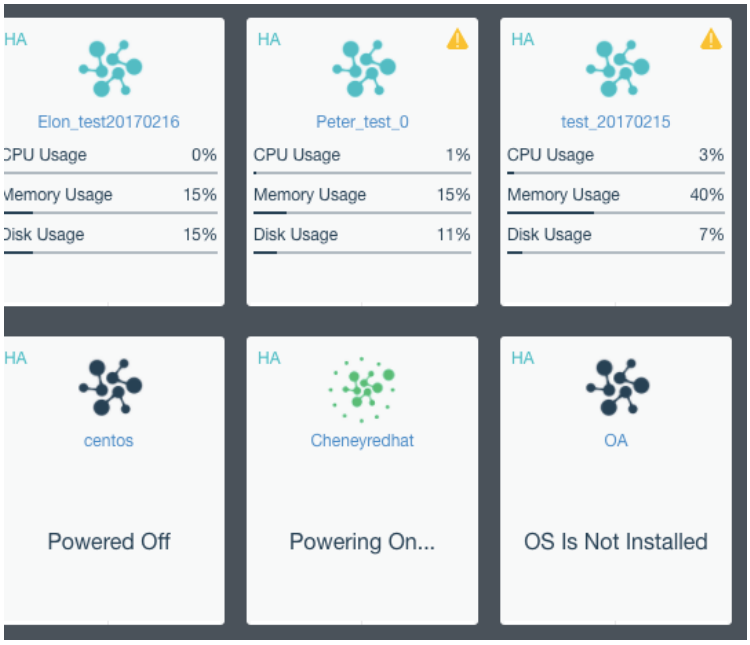
2.2.2. Viewing VM Groups

In **Compute**, you can click on the icon to expand VM groups or icon to collapse VM groups. To expand a specific group, click on the icon next to that group. To collapse a specific group, click on the icon.

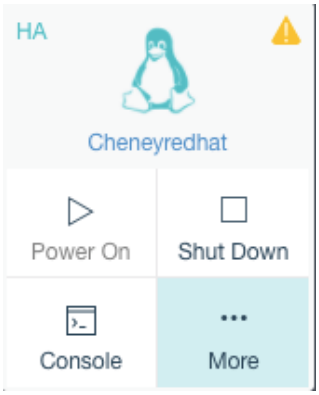


The number following a group name indicates the number of virtual machines in that group.

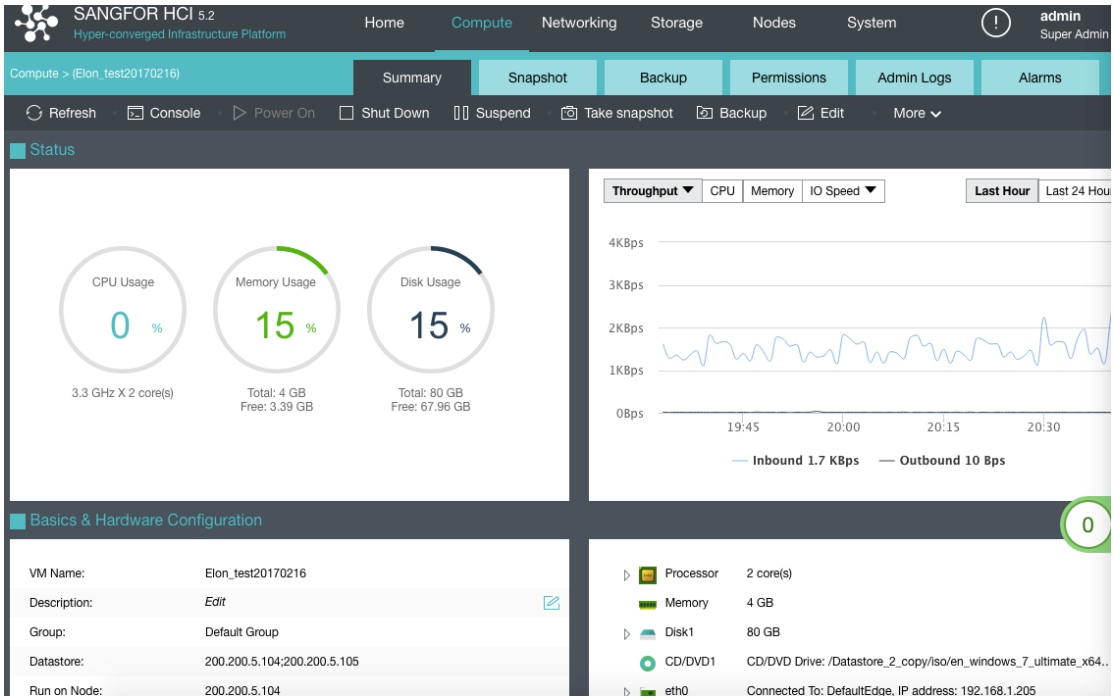
You can get the following information on virtual machine card: power status (powered on or powered off), CPU and memory usage. Blue VM icon indicates virtual machine is powered on, while gray VM icon indicates virtual machine is powered off.



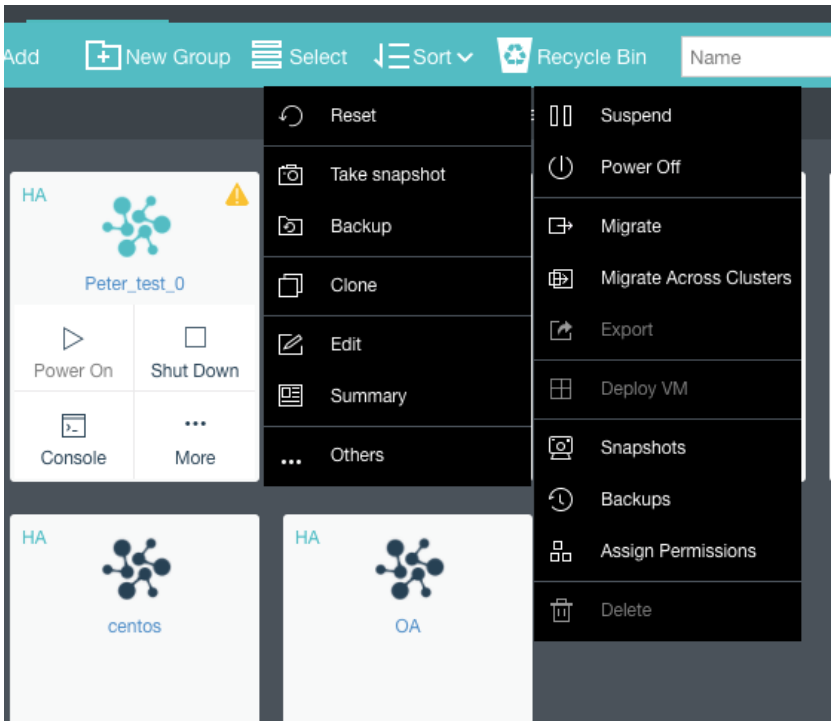
Move your cursor onto VM card and the following buttons will appear on that card, as shown in the following figure:



For virtual machine details, you can click on VM name to redirect to the **Summary** page, as shown below:



To perform more operation against virtual machine, click **More**, as shown below:

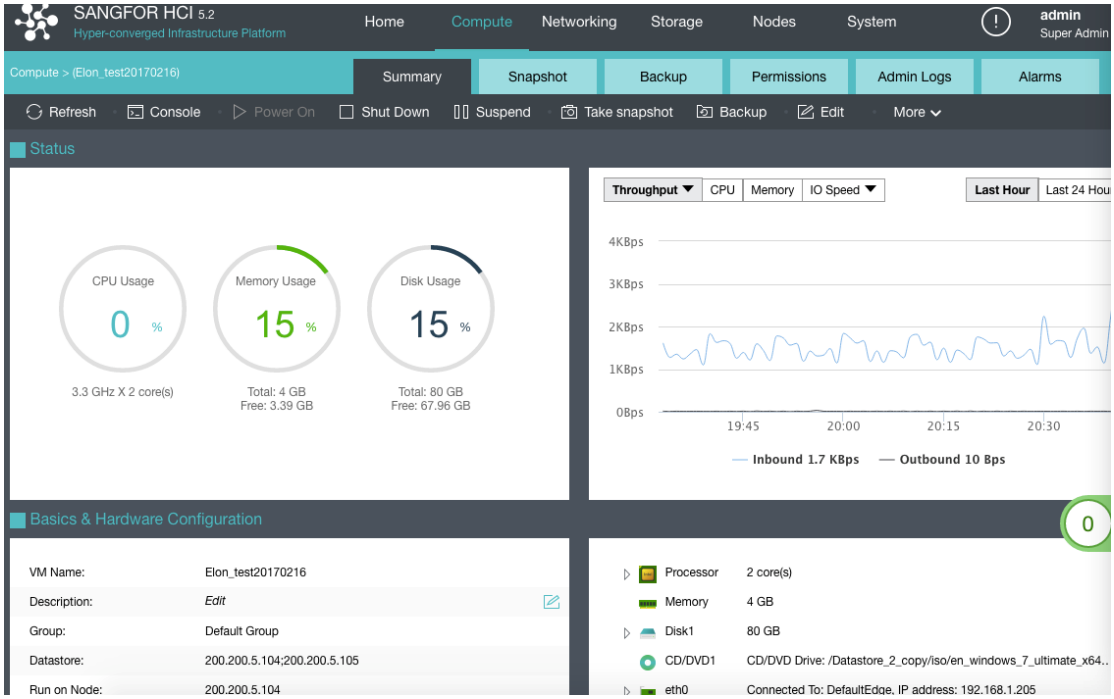


2.2.3. Viewing VM Info

You can view **Summary**, **Snapshot**, **Backup**, **Permissions**, **Admin Logs** and **Alarms**, as shown below.

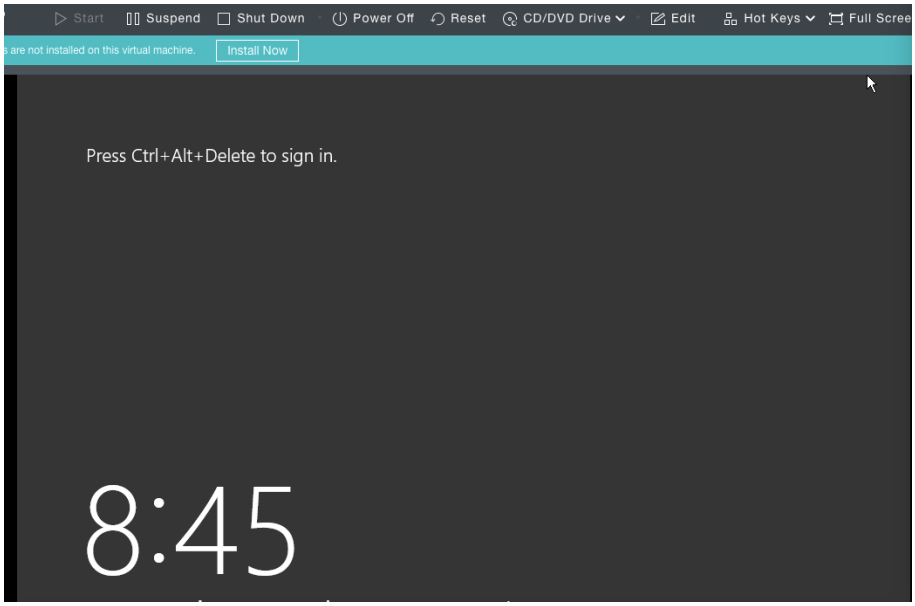
2.2.3.1. VM Summary

On the **Summary** page, you can perform such operations as **Power On**, **Shut Down**, etc., and view basic information and hardware configuration of virtual machine.



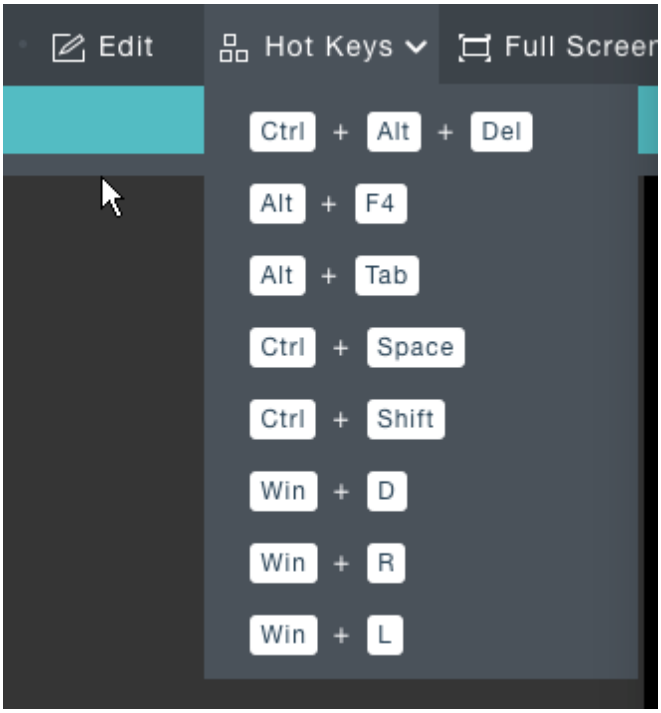
To refresh the **Summary** page, click **Refresh**.

To open virtual machine's console, click **Console** on the **Summary** page, or click on the **Console** button on the virtual machine card to enter the following page.



On the above page, you can perform the following operations: **Start**, **Suspend**, **Shut Down**, **Power Off**, **Reset**, **CD/DVD Drive**, **Edit**, **Hot Keys**, **Full Screen**, **Refresh**.

lists combinations of commonly-used keys.



To have console of the virtual machine displayed in full screen, click **Full Screen**. To exit full screen, click **Exit**.

If the console encounters error, you can click **Refresh**.

To power on virtual machine, click **Start**.

To shut down virtual machine, click **Shut Down**.

To suspend virtual machine, click **Suspend**.

To take snapshot of virtual machine, click **Take Snapshot**. For details, refer to 2.2.2.10

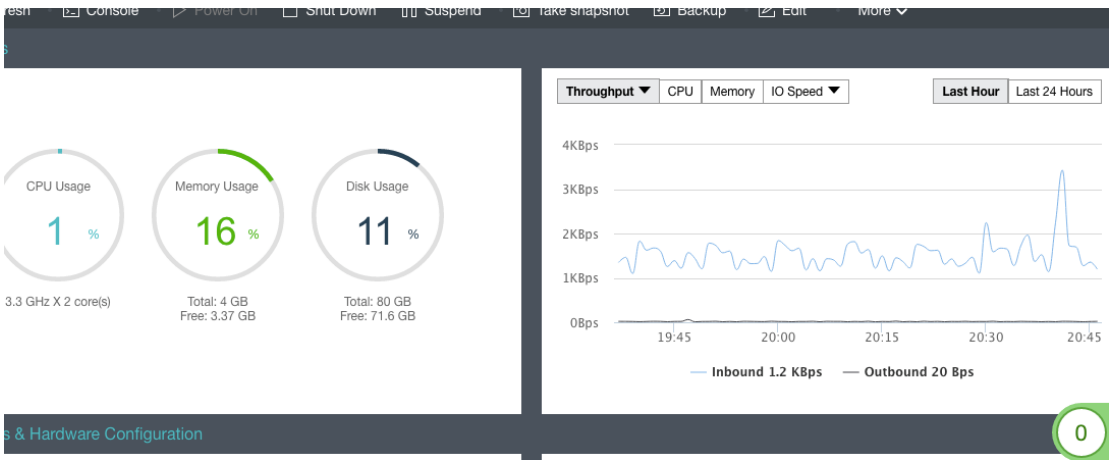
To back up virtual machine, click **Backup**. For details, refer to 2.2.2.11

To edit virtual machine, click **Edit.**

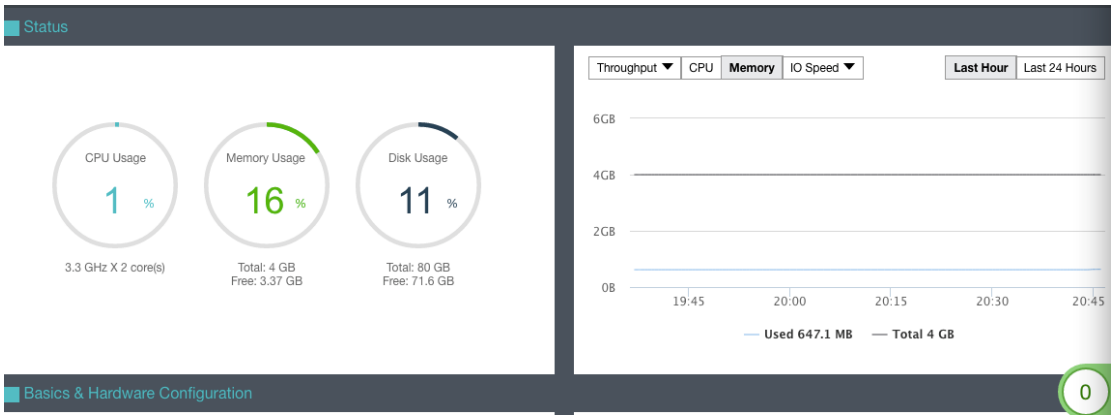
On the **Summary** page, you can perform the following operations by clicking **More**: **Power Off**, **Reset**, **Clone**, **Migrate**, **Export**, **Deploy VM**. **Update VM**, **Convert to VM**, **Convert to template**.

Status: Displays the following information about virtual machine: **CPU Usage**, **Memory Usage**, **Disk Usage**, **Throughput**, **CPU**, **Memory**, **IO Speed**, **IOPS**.

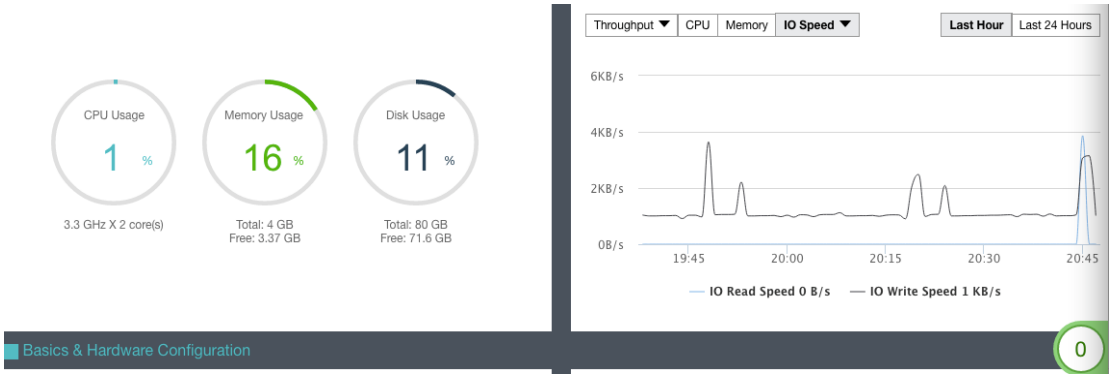
CPU Usage: Displays CPU usage of virtual machine. On the right side, you can view CPU usage in the last hour or 24 hours.



Memory Usage: Displays the total and free memory size, as well as memory usage. On the right side, you can view memory usage in the last hour or 24 hours.

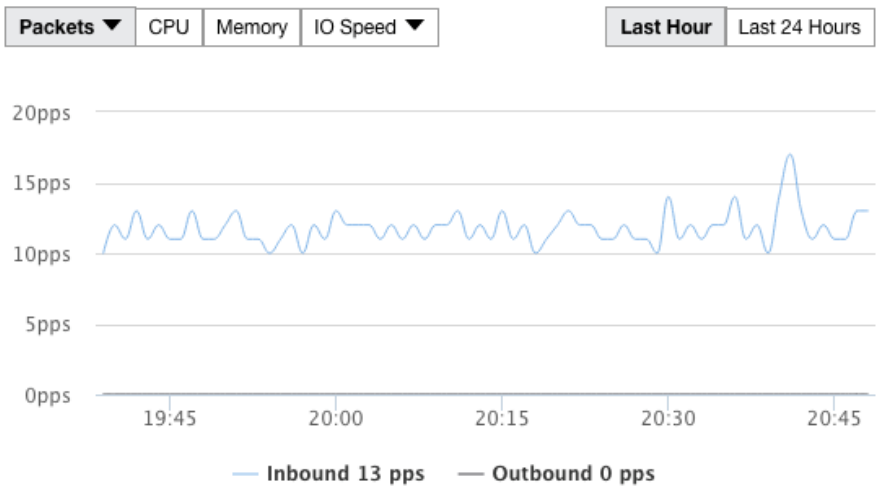


Disk Usage: Displays the total and free disk size, as well as disk usage. On the right side, you can view disk IO speed and IOPS.



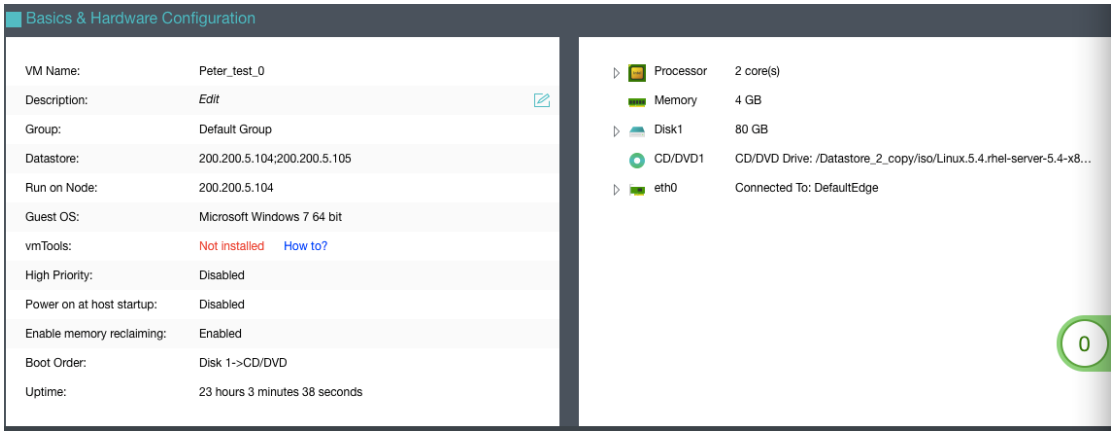
Throughput: Displays overall throughput.

Packets: Displays inbound and outbound packets per second.



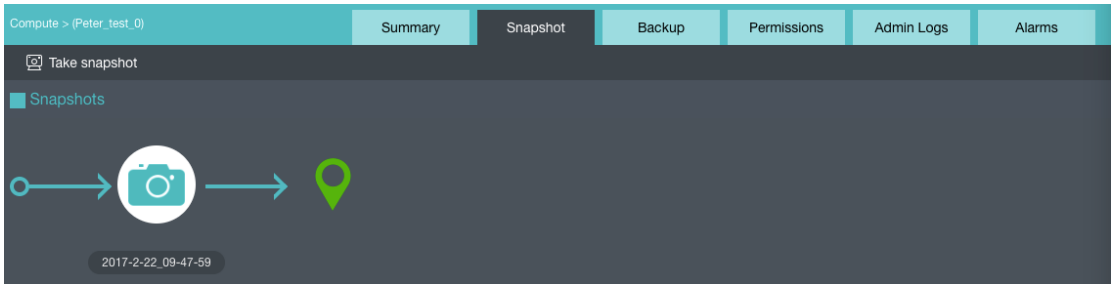
Basics & Hardware Configuration: Displays basic information and hardware configuration of

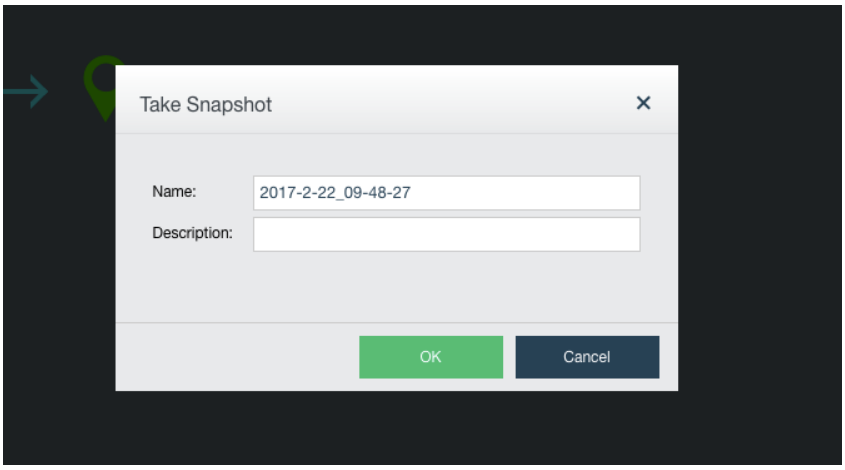
virtual machine. Basic information includes **Name**, **Description**, **Datastore**, **Run on Node**, **Guest OS**, **vmTools**, **High Priority**, **Power on at host startup**, **Boot Order**, **Uptime**.



2.2.3.2. Taking Snapshot

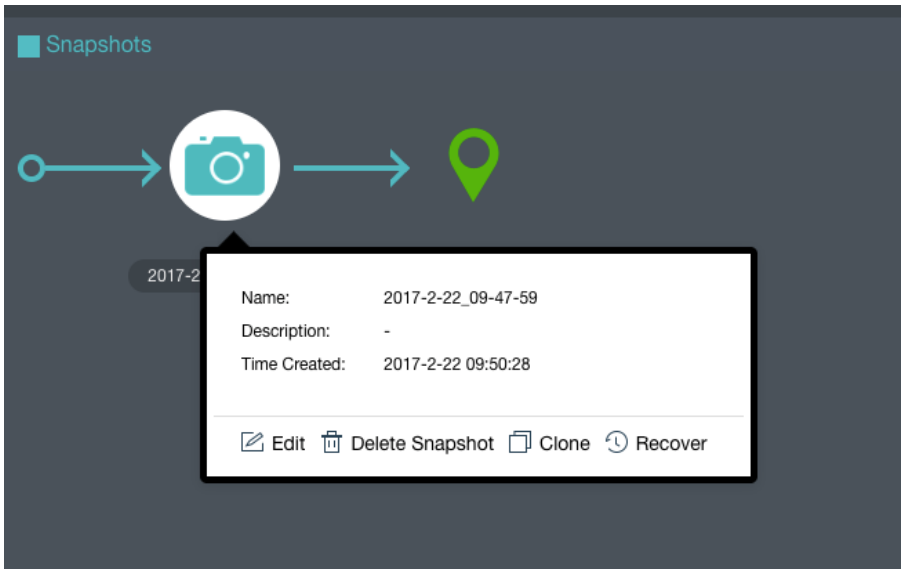
On the **Snapshot** page, you can view the snapshots you have taken and create new snapshot. To create a snapshot, click **Take Snapshot**.





On the above page, specify **Name** and **Description**. Then, click **OK**.

After a snapshot is created, you may click on the snapshot name and then a dialog pops up, as shown below:



To modify the snapshot name and description, click **Edit**.

To delete the snapshot, click **Delete Snapshot**.

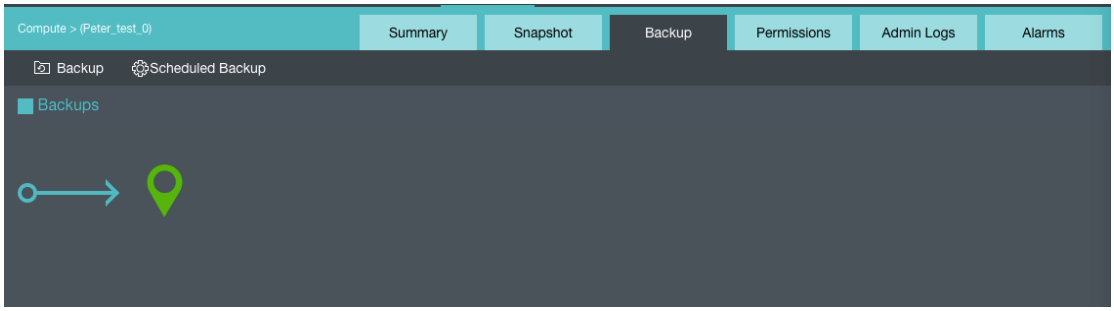
To clone a virtual machine from the snapshot, click **Clone**,

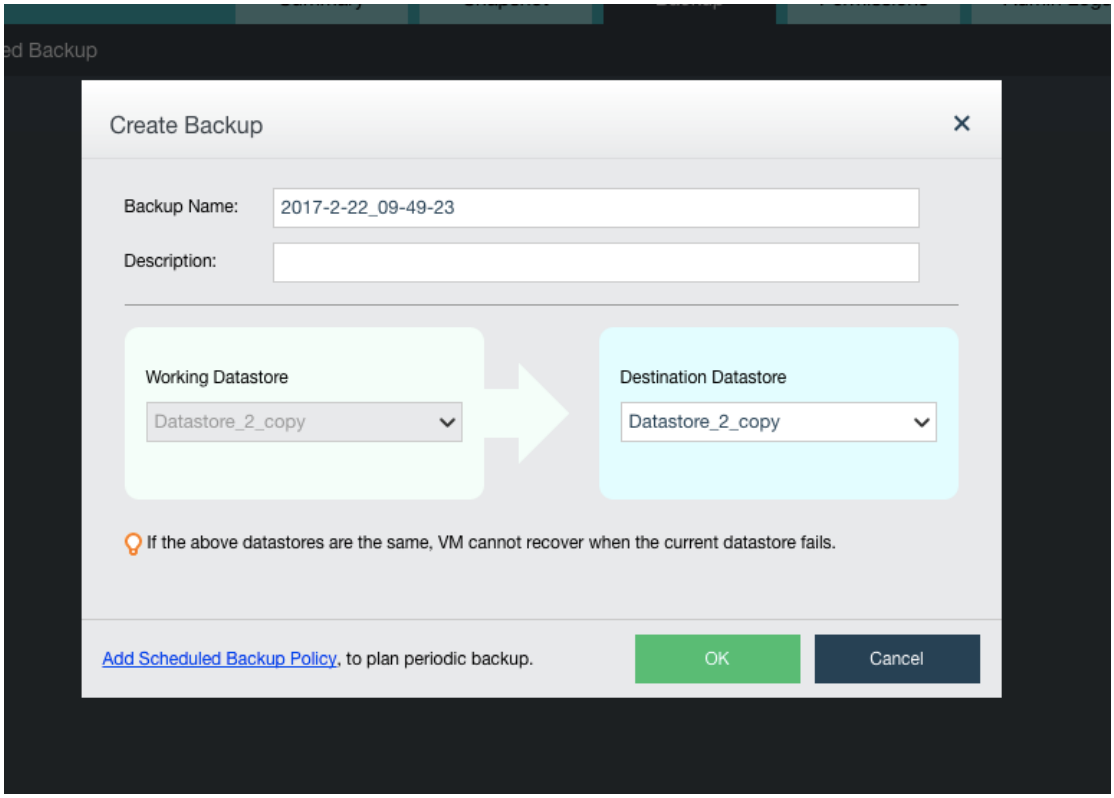
To recover virtual machine from snapshot, click **Recover**.

2.2.3.3. Backing up VM

Manual Backup

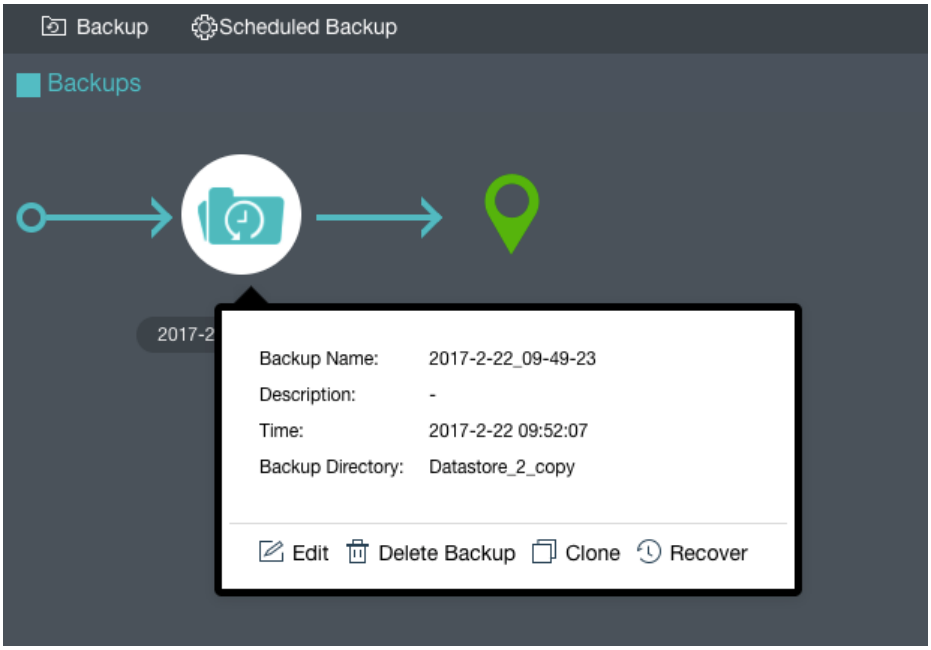
On the **Backup** page, you can back up virtual machine manually or have virtual machine backed up automatically. To back up virtual machine manually, you can click **Backup**.





Specify **Backup Name**, **Description** and **Destination Datastore**. Then, click **OK**.

After a backup is created, you may click on the backup name and then a dialog pops up, as shown below:



To modify backup name and description, click **Edit**.

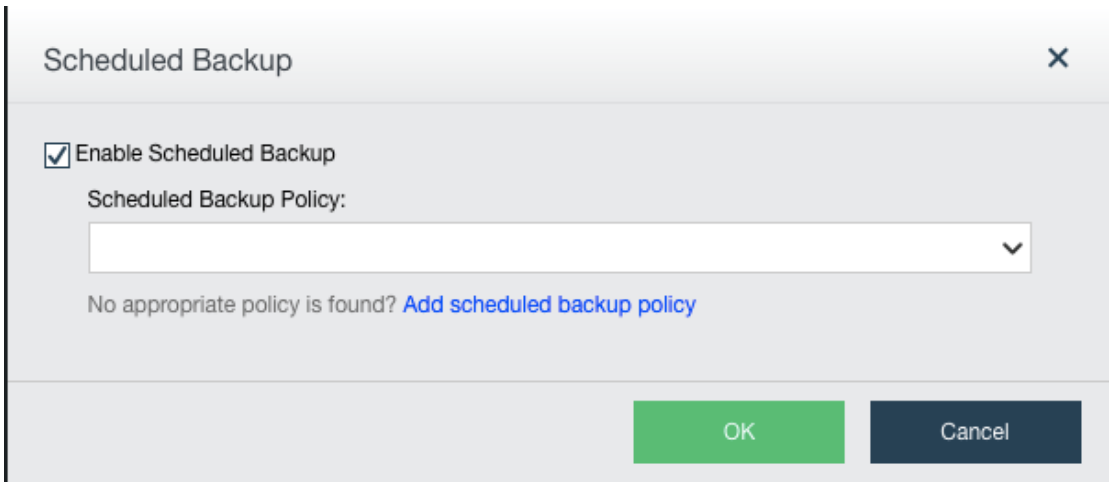
To delete a backup, click **Delete Backup**.

To clone a virtual machine from its backup, click **Clone**,

To recover a virtual machine from its backup, click **Recover**.

Scheduled Backup

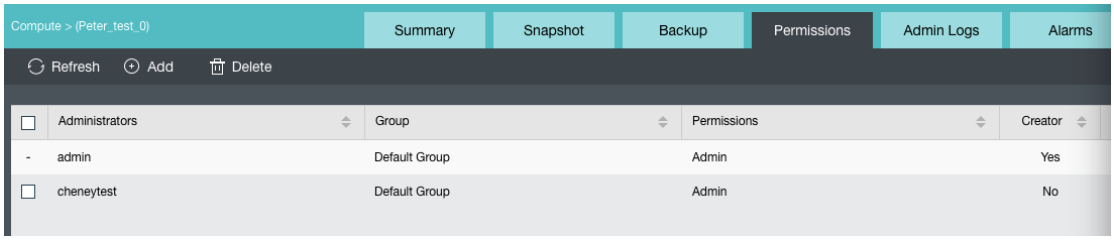
On the **Backup** page, you can also click **Scheduled Backup** to create a scheduled backup. On the following page, select the option **Enable Scheduled Backup** and choose a scheduled backup policy, then click **OK**.



For creation of scheduled backup policy, refer to **VM Backup and Recovery** section.

2.2.3.4. Permissions

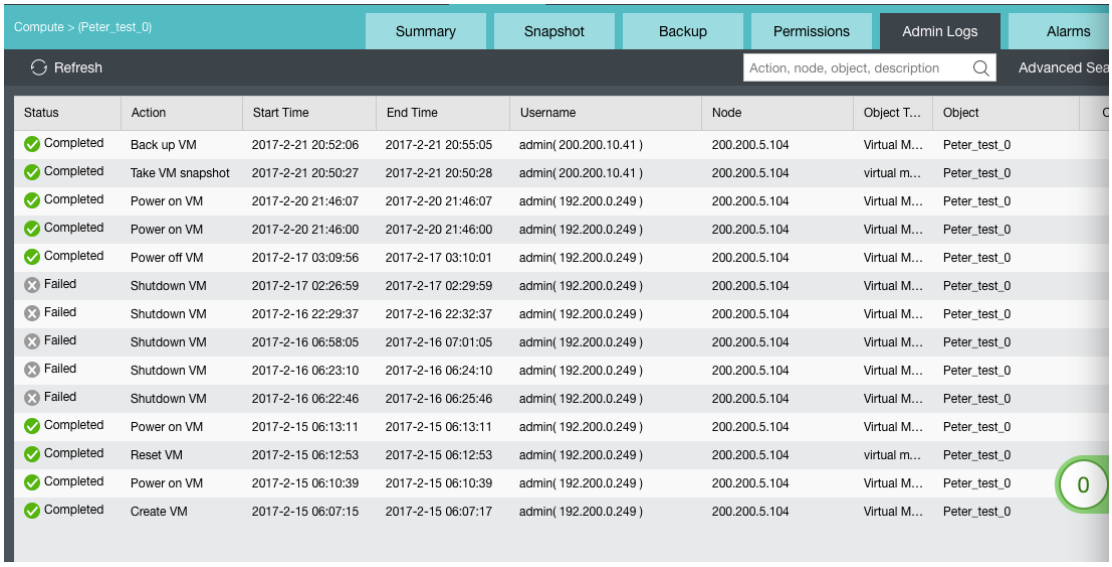
It displays which sub administrator has the permission of the virtual machine. The permission of the sub administrator is set by super admin in sub administrators.



For details, refer to Sub Administrators section.

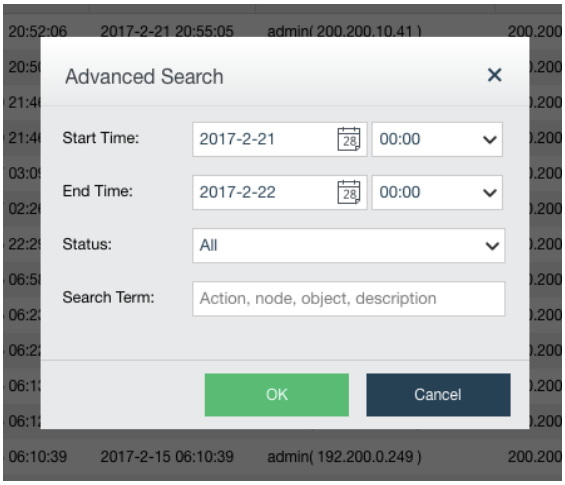
2.2.3.5. Viewing Admin logs

This section displays administrator logs which record various operations performed by administrator, such as creating a virtual machine. Each log contains the following information: **Status**, **Action**, **Start Time**, **End Time**, **Username**, **Node**, **Object Type**, **Object** and **Operation**. To view log details, click **View** in **Operation** column.



Status	Action	Start Time	End Time	Username	Node	Object T...	Object
Completed	Back up VM	2017-2-21 20:52:06	2017-2-21 20:55:05	admin(200.200.10.41)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Take VM snapshot	2017-2-21 20:50:27	2017-2-21 20:50:28	admin(200.200.10.41)	200.200.5.104	virtual m...	Peter_test_0
Completed	Power on VM	2017-2-20 21:46:07	2017-2-20 21:46:07	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Power on VM	2017-2-20 21:46:00	2017-2-20 21:46:00	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Power off VM	2017-2-17 03:09:56	2017-2-17 03:10:01	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Failed	Shutdown VM	2017-2-17 02:26:59	2017-2-17 02:29:59	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Failed	Shutdown VM	2017-2-16 22:29:37	2017-2-16 22:32:37	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Failed	Shutdown VM	2017-2-16 06:58:05	2017-2-16 07:01:05	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Failed	Shutdown VM	2017-2-16 06:23:10	2017-2-16 06:24:10	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Failed	Shutdown VM	2017-2-16 06:22:46	2017-2-16 06:25:46	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Power on VM	2017-2-15 06:13:11	2017-2-15 06:13:11	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Reset VM	2017-2-15 06:12:53	2017-2-15 06:12:53	admin(192.200.0.249)	200.200.5.104	virtual m...	Peter_test_0
Completed	Power on VM	2017-2-15 06:10:39	2017-2-15 06:10:39	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0
Completed	Create VM	2017-2-15 06:07:15	2017-2-15 06:07:17	admin(192.200.0.249)	200.200.5.104	Virtual M...	Peter_test_0

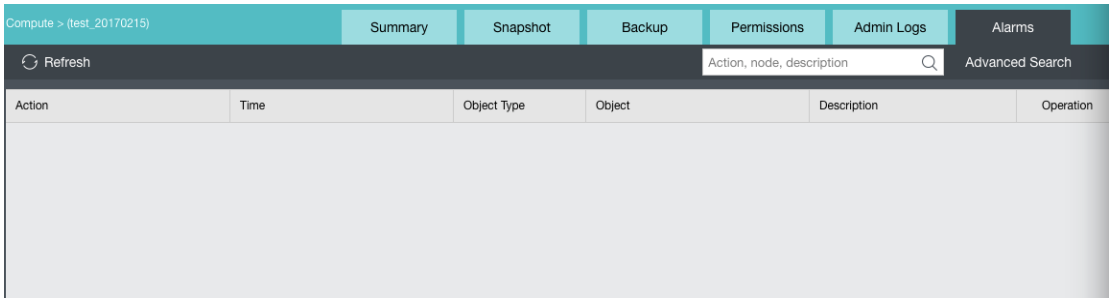
Logs can be searched by action, node, object and description. By clicking **Advanced Search**, you can also specify a period of time, status and search term to filter logs.



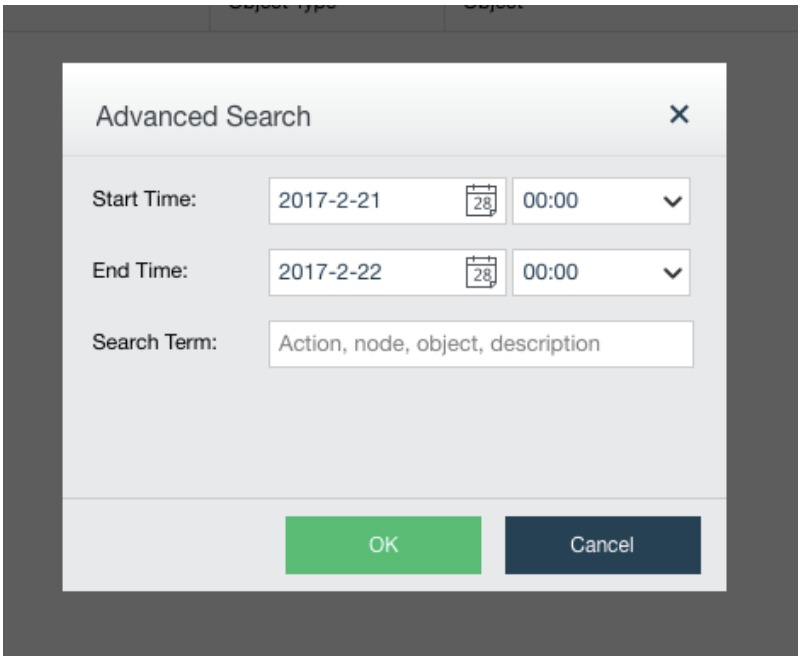
2.2.3.6. Viewing Alarms

On the **Alarms** page, you can view alarm logs. When an alarm-triggering threshold is reached, a

corresponding alarm will be triggered and an alarm log will be generated. If VM CPU usage exceeds threshold, alarm will be triggered. An alarm log includes the following information: **Action**, **Time**, **Object**, **Object Type**, **Description** and **Operation**. To view alarm log details, click **View** in **Operation** column. For how to configure alarm options, refer to **Configuring Alarm Options** section.

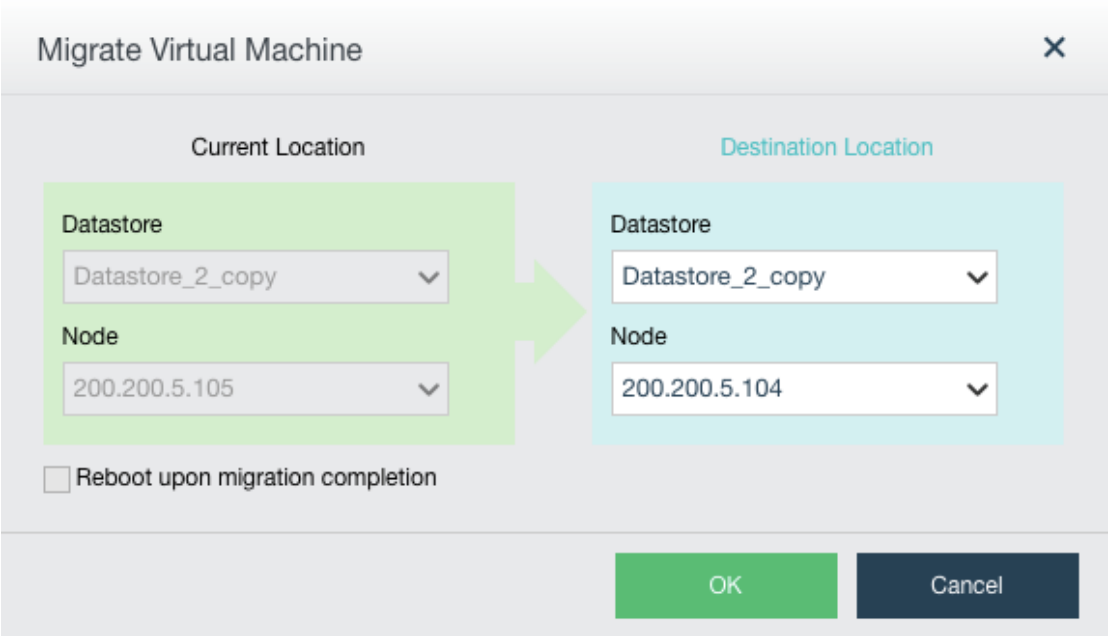


Alarm logs can be searched by action, node, object and description. By clicking **Advanced Search**, you can also specify a period of time, status and search term to filter logs.



2.2.4. Migrating Virtual Machine

A virtual machine can be migrated to another node or another datastore.



Current Location: Displays the current datastore and node.

- **Datastore**: Indicates the datastore where virtual machines are stored.
- **Node**: Indicates the node where virtual machine resides.

Destination Location: Displays the destination datastore and node.

If the option **Migrate to another node if the node fails** is selected, virtual machine will be automatically migrated to another node if node fails.

- **Node**: Indicates the destination node.
- **Datastore**: Indicates the destination datastore.

Selection of destination datastore depends on destination node. If the destination node is **Auto**, destination datastore can only be a shared datastore. If the destination node is specified, destination datastore can only be a local disk on that node, or a shared datastore.

To have virtual machine restart automatically after migration, select the option **Reboot upon migration completion**.

2.2.5. Converting Physical Machine to VM

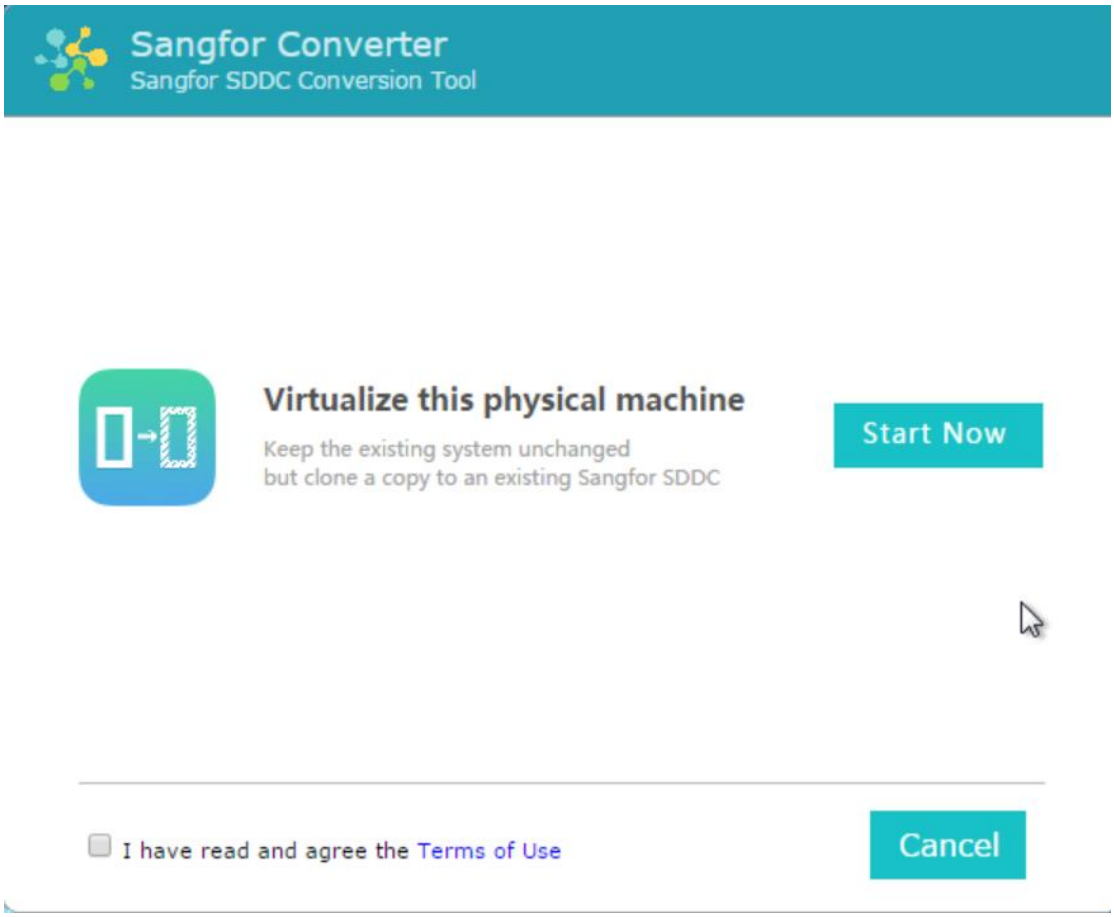
Sangfor Converter is designed for easy and quick migration of physical machines along with their operating systems and business to virtual machines managed by Sangfor HCI platform.

To migrate a physical server, it must meet the following requirements:

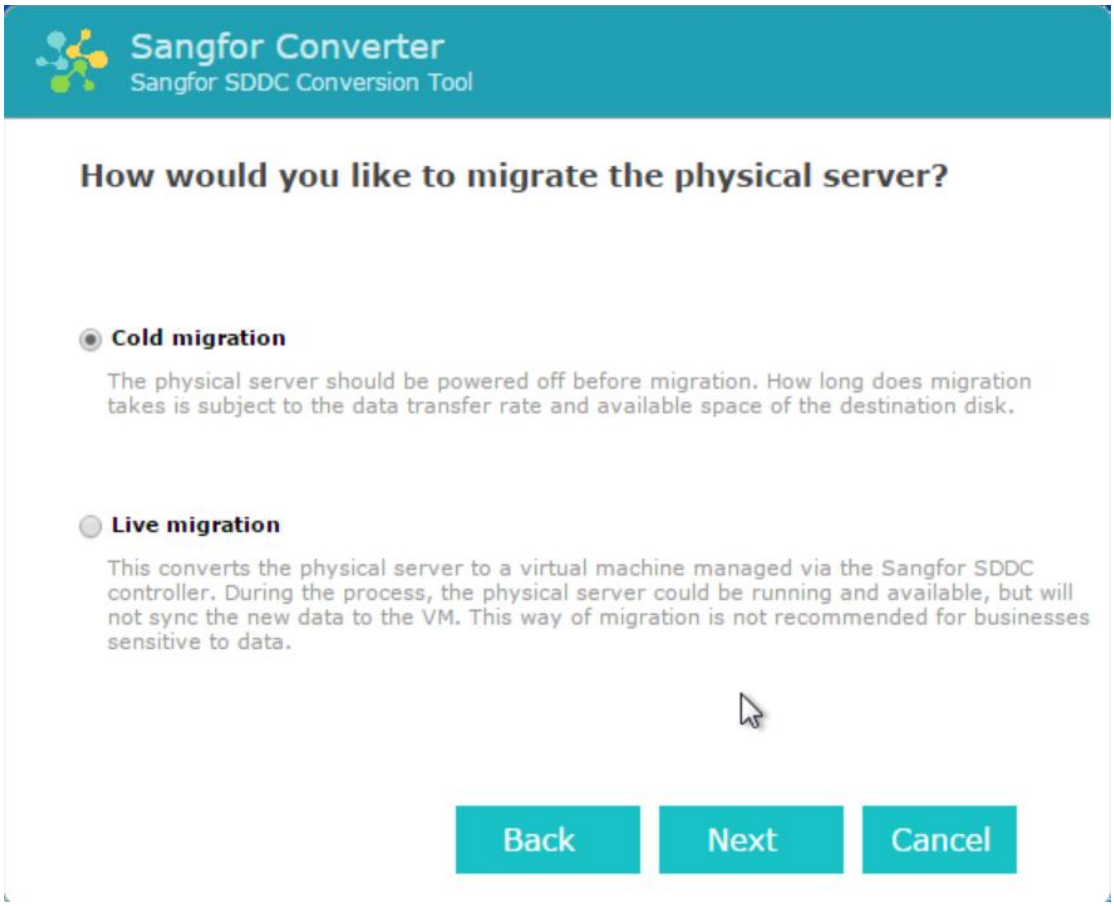
- **CPU**: 64bits
- **Memory**: >=2GB
- **Disk**: All supported except for dynamic disks
- **NICs**: >=1
- **OS**:32-bit or 64-bit Windows XP/7/2003/2008/2012, Linux (Kernel version 2.6.18 and later)

2.2.5.1. Converting Windows-based Server to VM

1. Download and install Sangfor Converter on Windows system, and then launch it. Select **Virtualize this physical machine** and click **Start Now**.

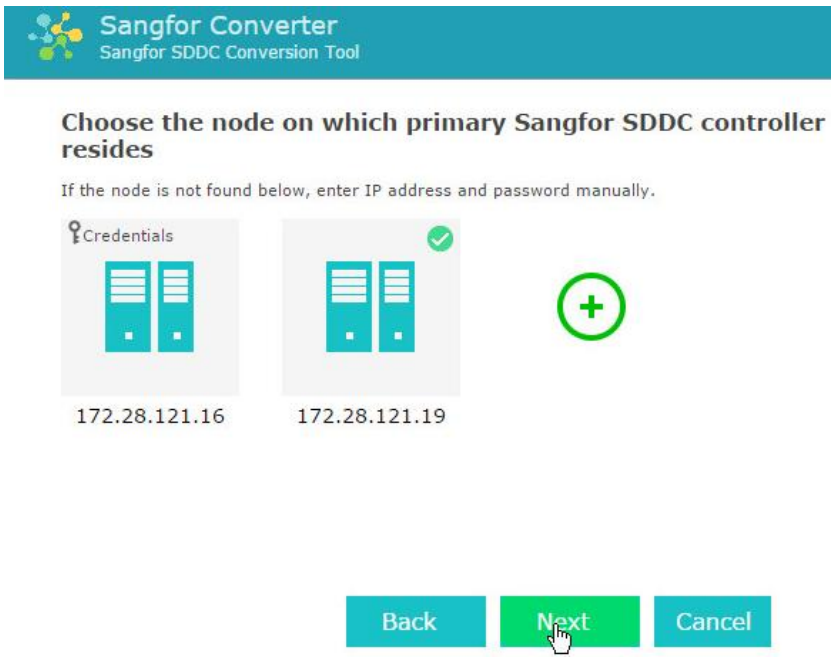


2. On the following page, select **Cold migration** or **Live migration.**

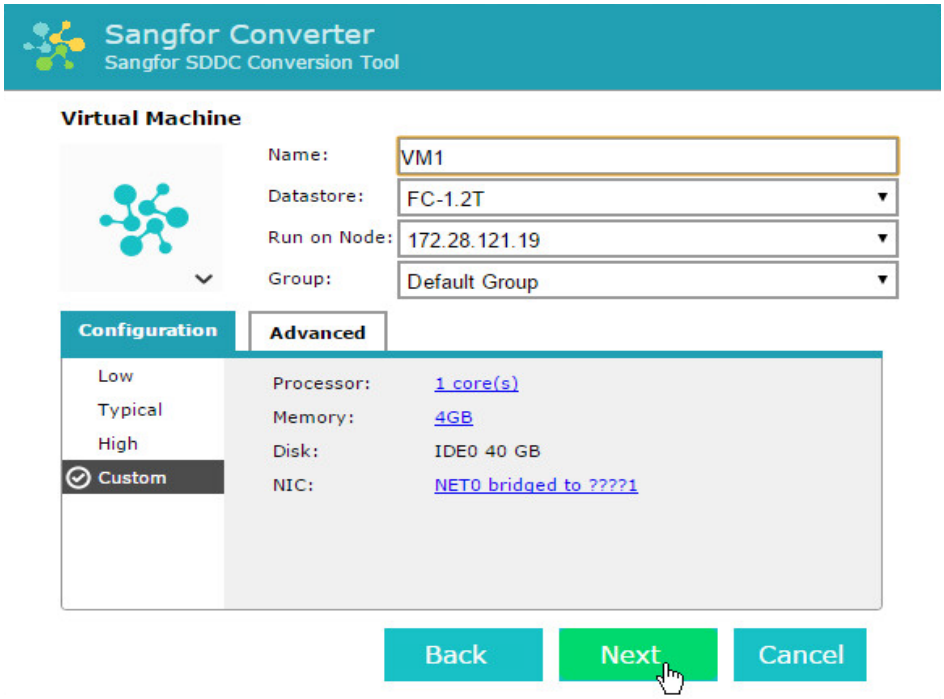


3. Select a target node. Target nodes on a same subnet as the physical server to be migrated will be discovered automatically. To migrate physical server to a node which resides on a different subnet, you need to add that node first by clicking the + icon and entering username and password.

Target node must be reachable from the physical server to be migrated. If there is a firewall appliance between them, access to that target node from that physical server must be allowed. Only cluster controllers residing on a same subnet as a physical server to be migrated will be discovered.



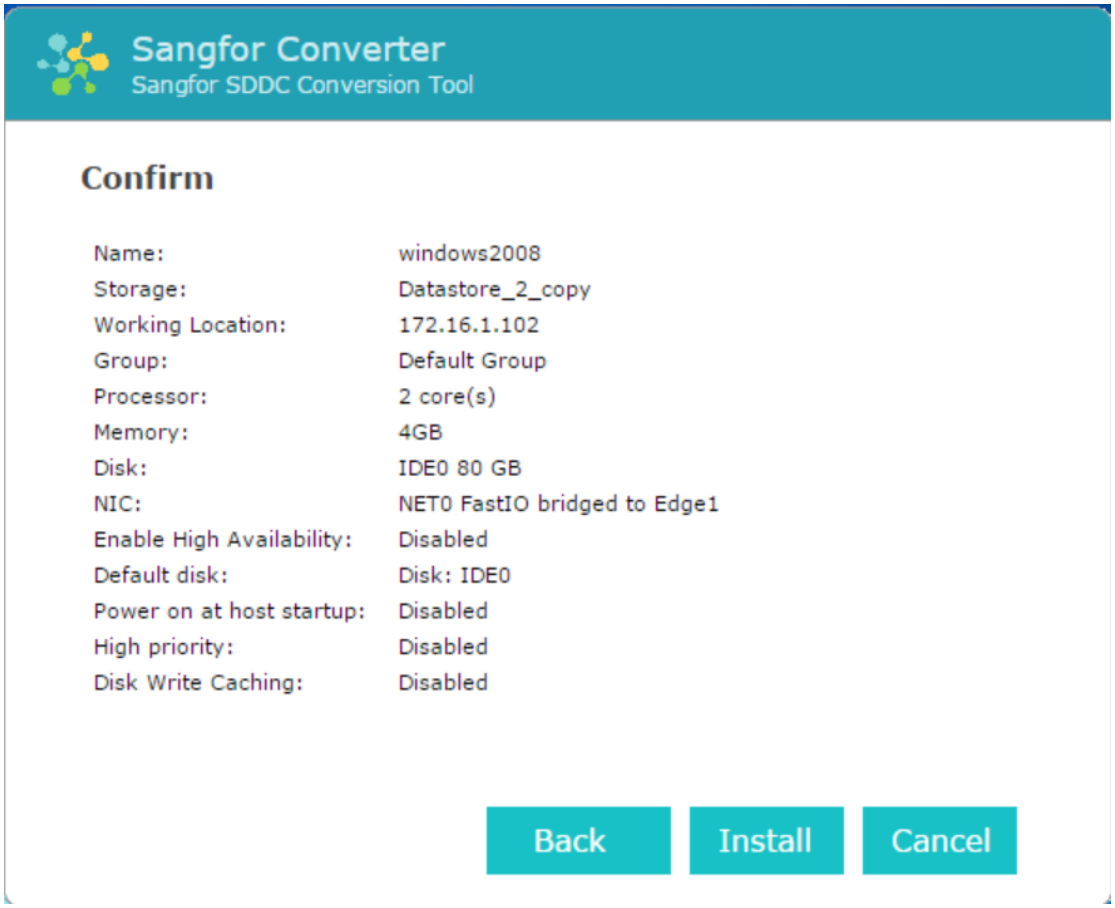
4. Configure the virtual machine to which the physical machine is converted, as shown below:



- Configure processor and memory according to the need for your business system.

- Disk cannot be configured. System will assign disks and disk size according to business system.
- You can add or delete NIC according to the need for your business system, and select a virtual switch to connect.

5. After the virtual machine is configured, you will enter the following page to confirm configurations. Then, click **Install**.



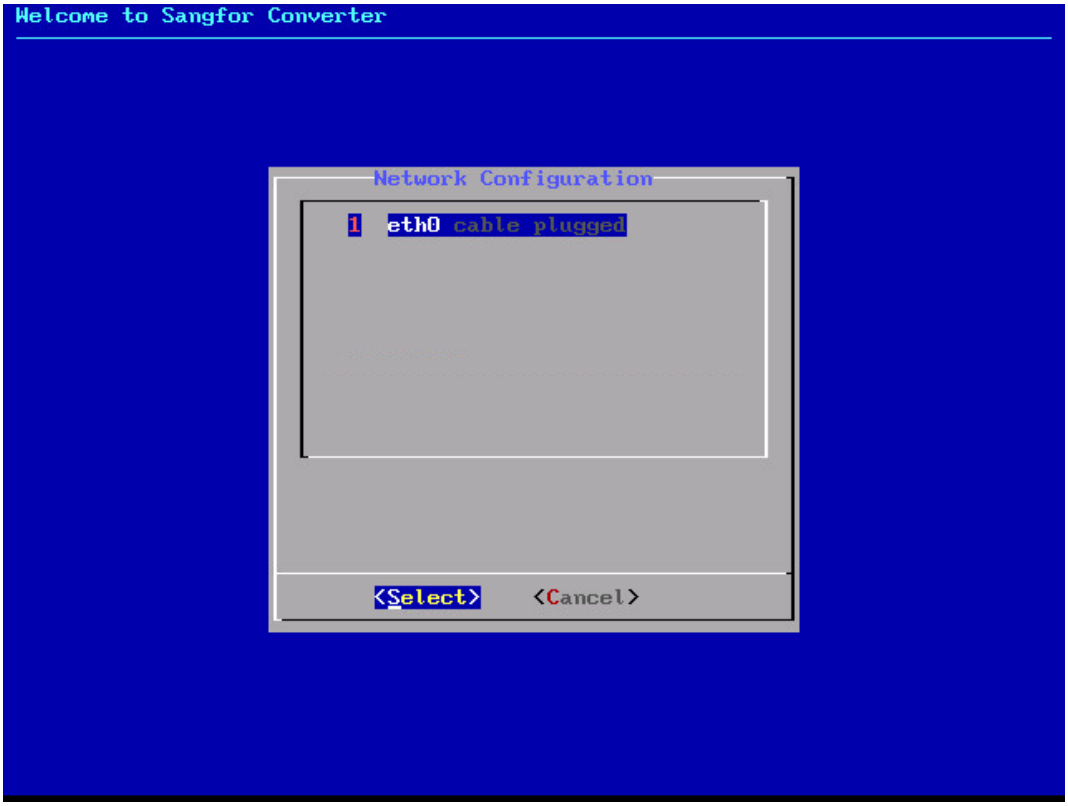
6. After installation of Sangfor Converter completes, you need to select an operation which will be performed upon migration completion. To see the migration process, log in to Web admin console of Sangfor HCI platform.

- Make sure that only one of the physical server and virtual machine is powered on and NCI address of that virtual machine is modified after migration is successful.
- Intermittent loss of network connection during migration is allowed, but not supported if servers are shut down
- If migration fails due to uncertain factors (e.g., power outage, etc.), physical server being migrated can enter its operating system by restarting it.

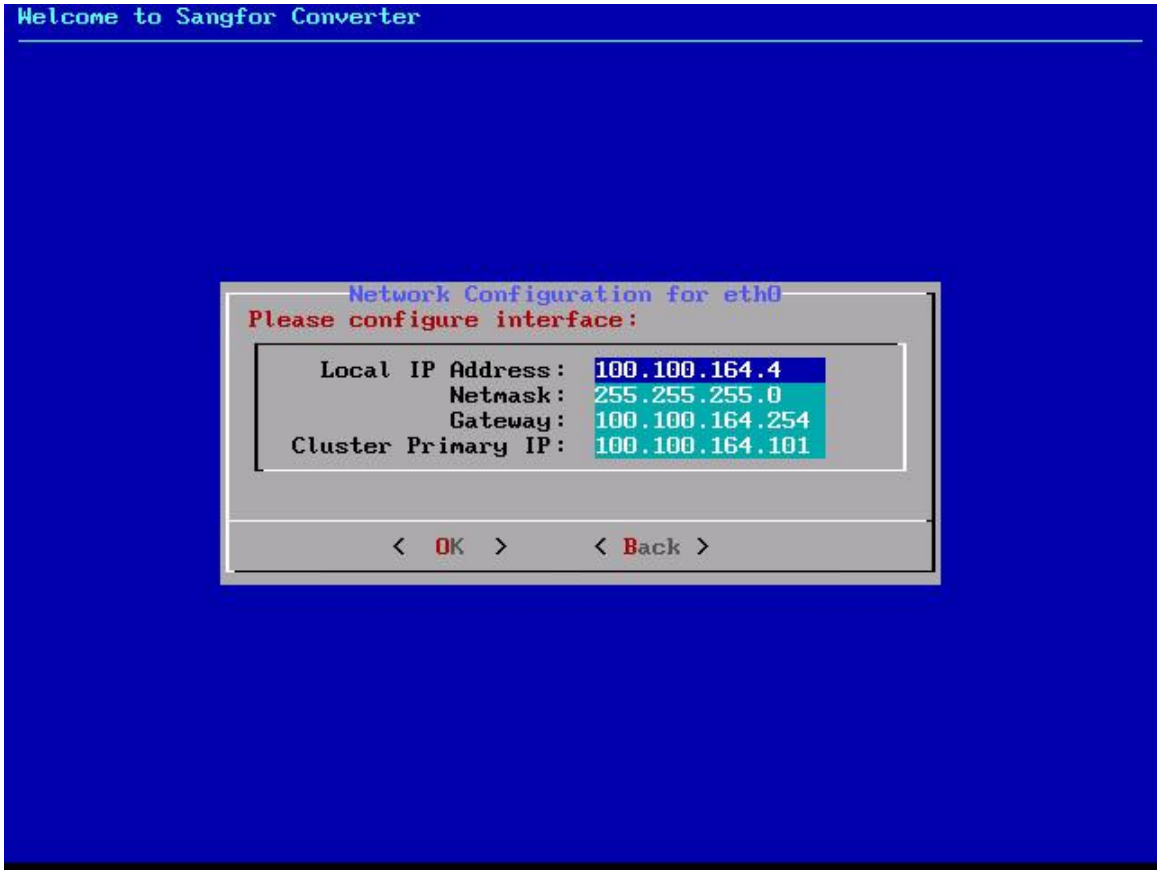
2.2.5.2. Converting Linux-based Server to VM

Insert the USB drive that Sangfor HCI software image file is written to, into a physical server running Linux, boot system from that USB drive, and select **Migrate physical server to VM with P2V**.

Network configuration is required before migration. Select a physical network interface on that physical server to communicate with target node having Sangfor HCI software installed.

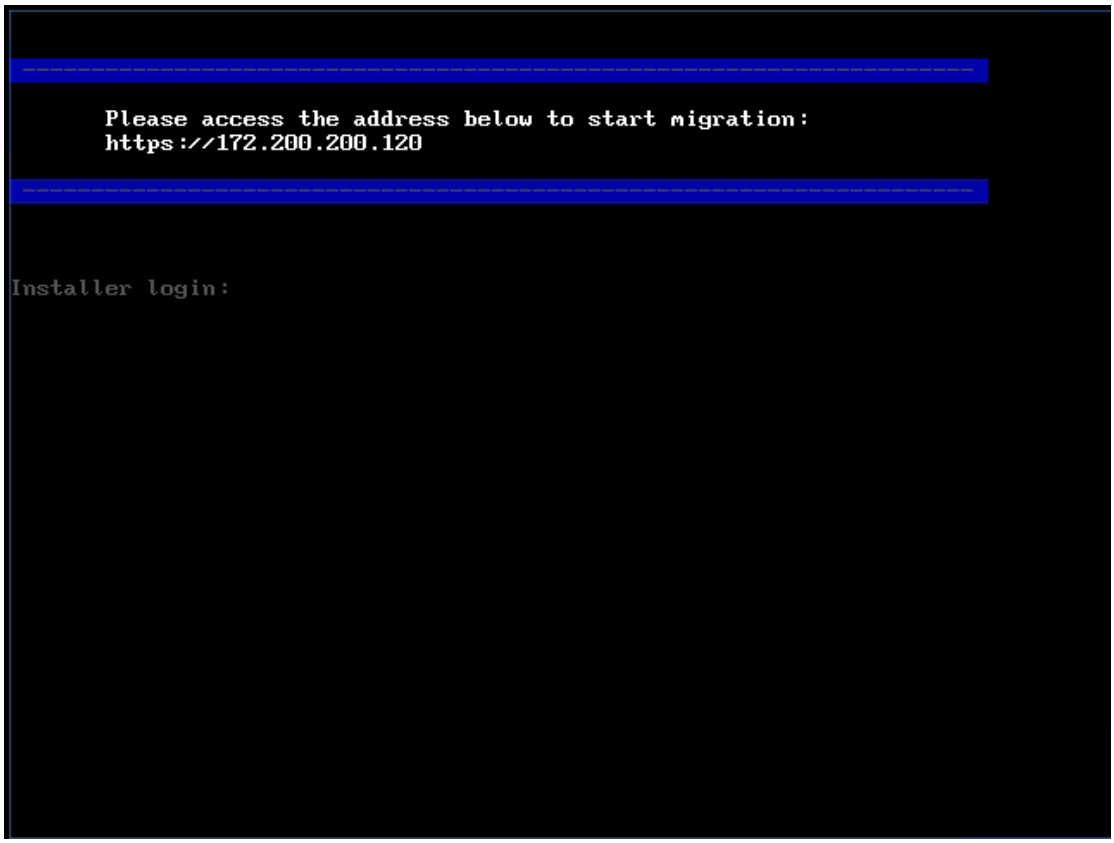


Configure IP address and netmask for the selected interface, and gateway, as well as IP address of target node having HCI software installed. Make sure the server to be migrated can access that target node.

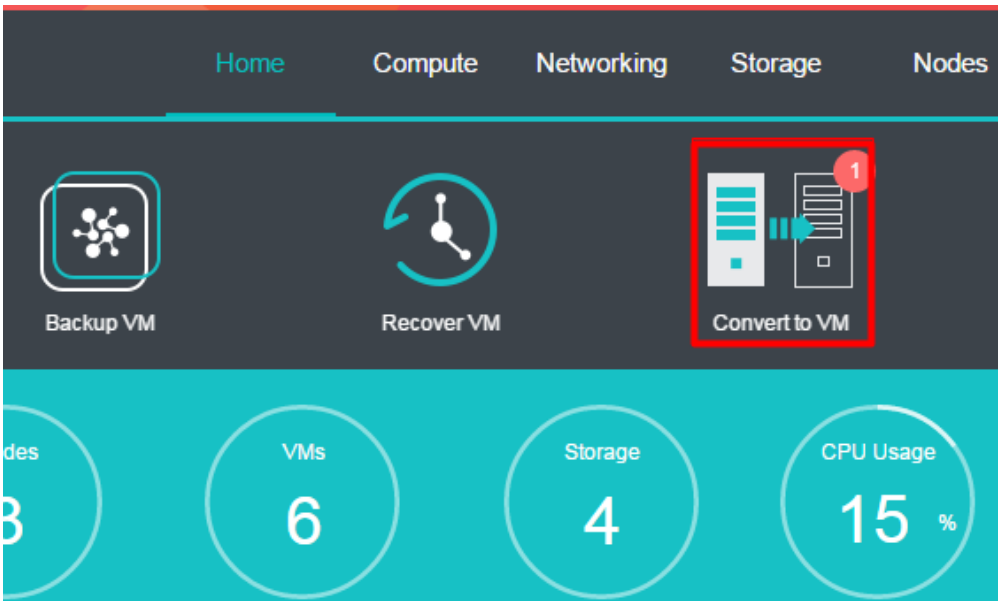


After network is configured, Sangfor Converter will check whether the server being migrated and that target node can communicate with each other. If communication fails, you may return to the network configuration page to modify network configuration. If communication succeeds, click **OK**.

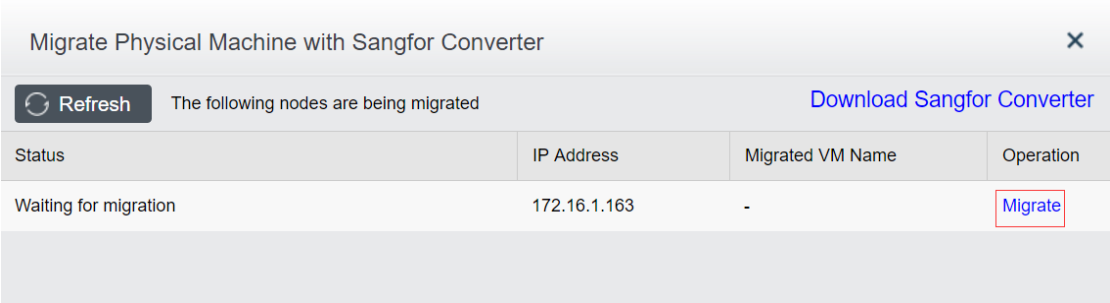
Once network connection is successful, the following page appears, which indicates that you can start migration of the physical server. The **Installer login** is used for troubleshooting in case that migration fails.



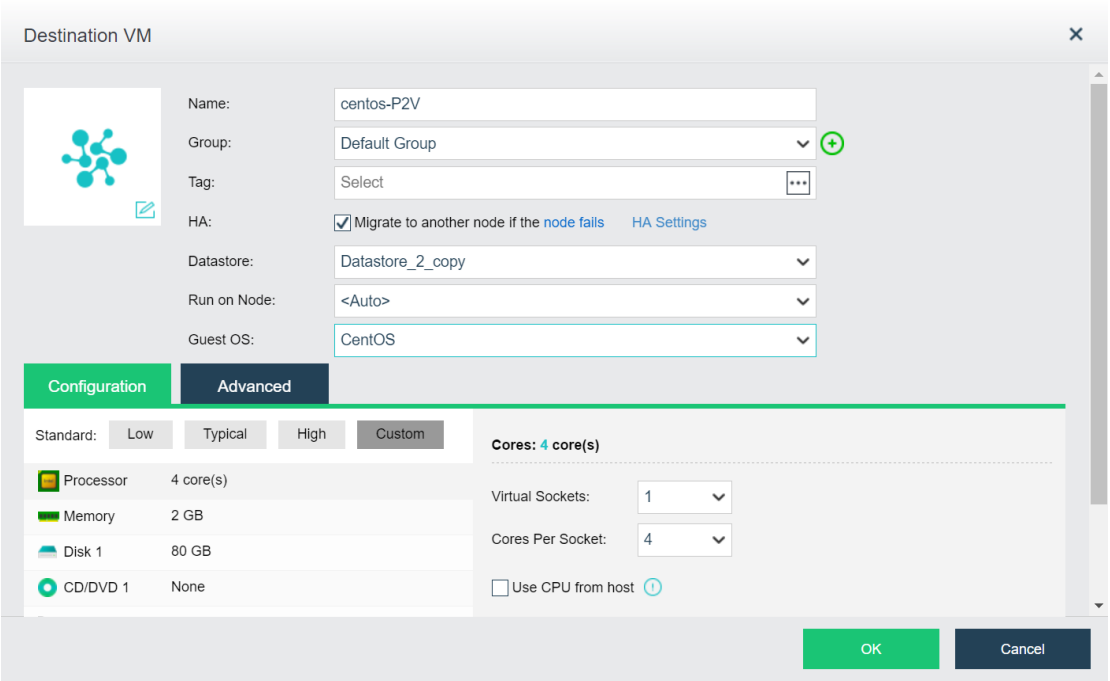
To view migration tasks, log in to Web admin console of Sangfor HCI platform and click **Convert to VM** in **Home**.



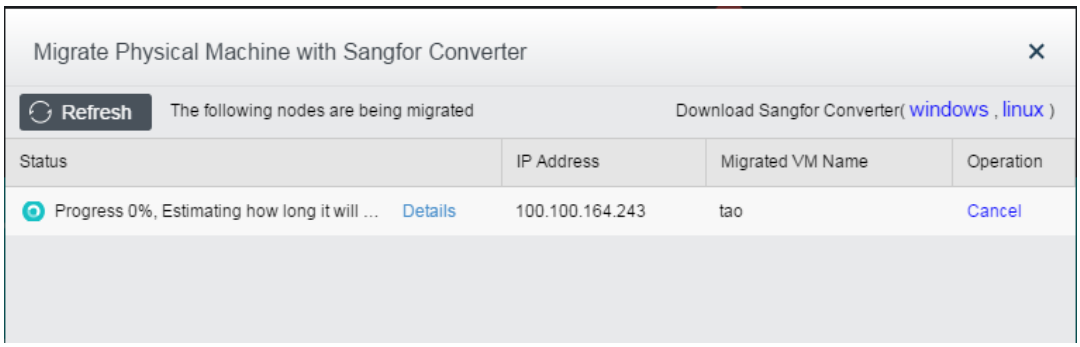
On the following page, you will see migration tasks and physical machines waiting for migration. To migrate a physical machine, you need to click **Migrate** to enter the **Destination VM** page and configure destination virtual machine.



On the **Destination VM** page, you need to specify **Name**, **Datastore**, **Run on Node**, and **Configuration**, etc.



Then, click **OK** to start migration.



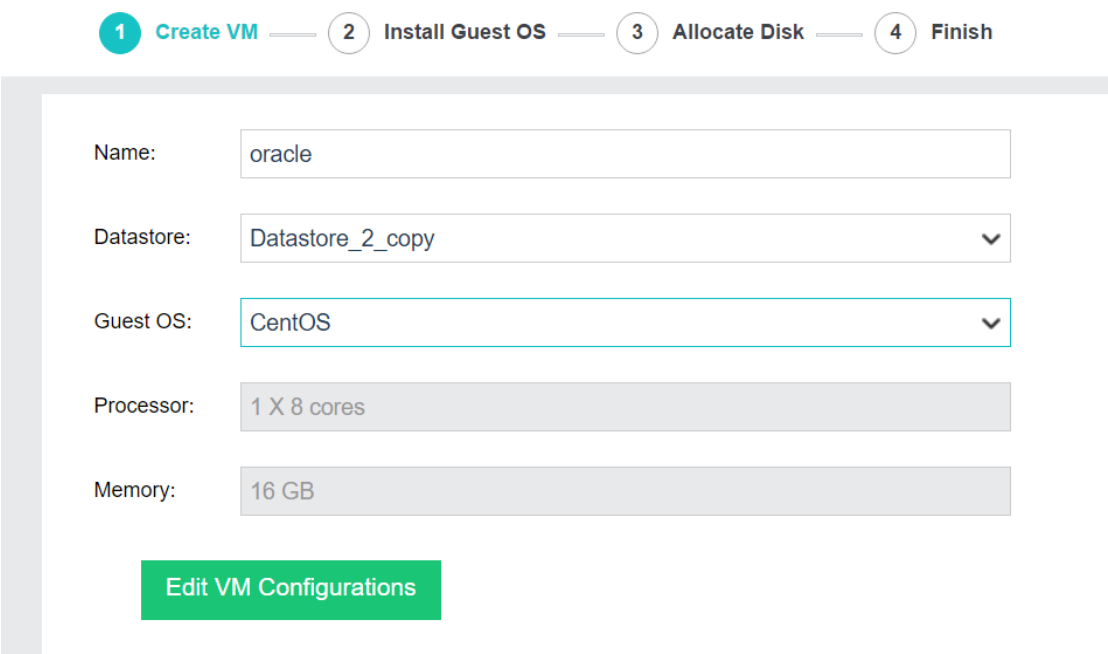
- Conversion of physical machine is supported by Sangfor HCI3.3 and later versions. Sangfor conversion tool for Windows based server is a separate exe file; for Linux based server, that tool is integrated into Sangfor HCI software.
- The progress of migration depends on physical network bandwidth and disk IO performance of the host having Sangfor HCI software installed.
- It is recommended that physical network bandwidth should be 1 Gbps at least.
- Since migration will affect disk performance of the host having Sangfor HCI software installed, it is recommended to perform migration when business system is not busy and make sure that the number of migration tasks is less than 3.
- Storage capability of Sangfor HCI platform should be larger than the used space of disk of the physical machine to be migrated, or else migration will fail.

2.2.6. Creating Standalone Oracle Database

In **Compute**, you can create a standalone Oracle database. More specifically, click **Add** in **Compute** and select **Create Standalone Oracle Database** on the **Create New Virtual Machine** page. Then, specify guest OS and other fields.

1. Create virtual machine.

The first step of creating standalone Oracle database is similar to creating new virtual machine. For how to create and configure virtual machine, see the **Creating Virtual Machine** section.

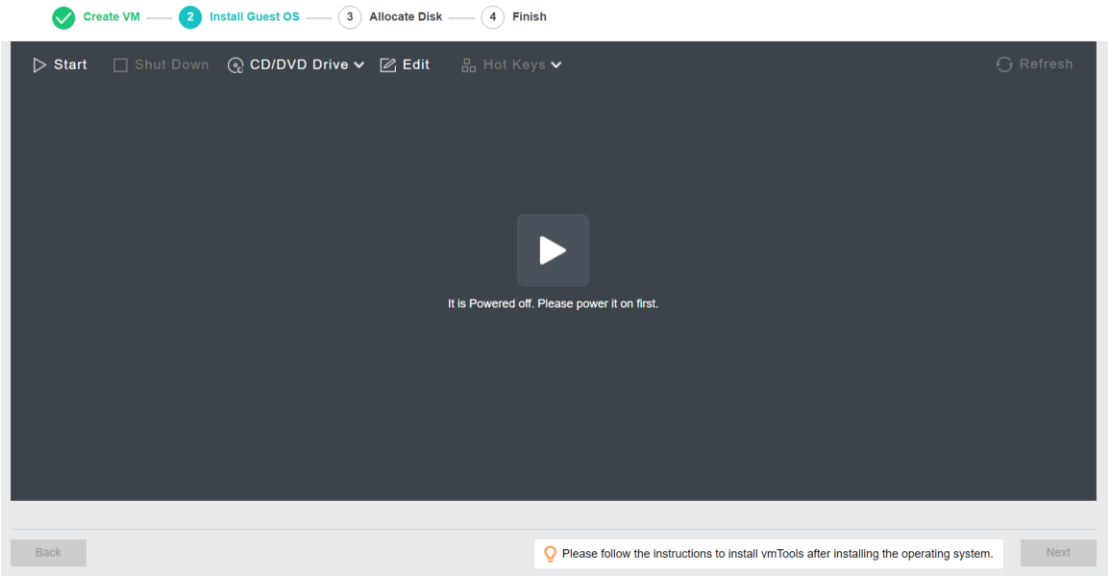


- **Name**: Specifies a distinguishable name for the virtual machine.
- **Datastore**: Specifies a datatore to store virtual machine. HA is configurable only when a shared datastore is selected.
- **Guest OS**: Specifies an operating system for the virtual machine. The following types of guest **OSes** are supported: **Windows**, **Linux**, **Sangfor** and **Others**.
- **Processor**: Specifies the number of virtual sockets and cores per socket for the virtual machine respectively.
- **Memory**: Specifies the memory size for the virtual machine. The minimum is 512 MB, and the maximum is 256 GB.

2. Install guest OS.

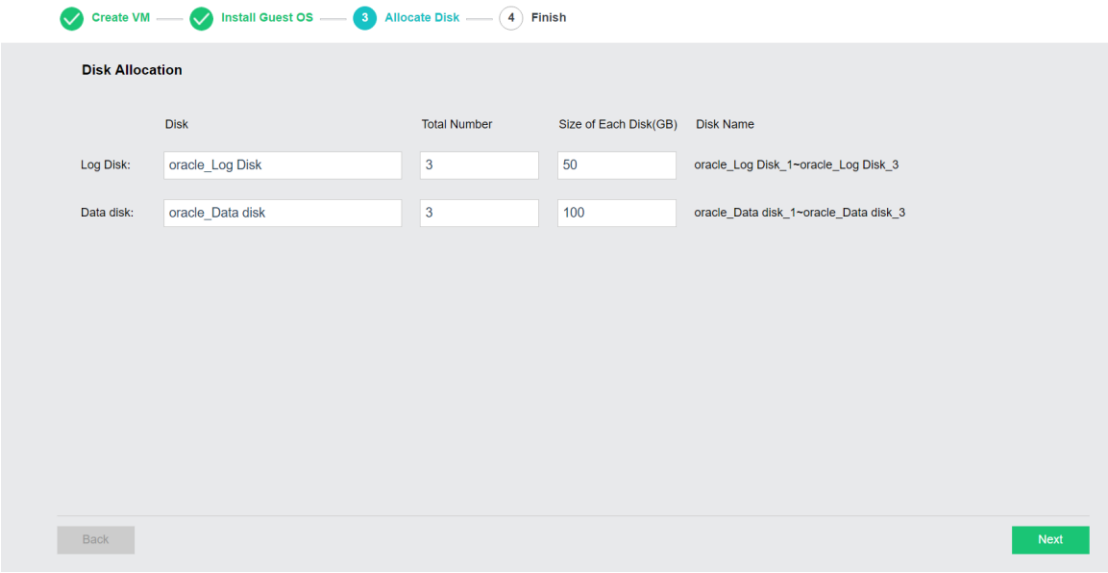
After VM name and guest OS are specified, click **Next** to install OS. If the image file of a specified guest OS has not been uploaded to Sangfor HCI platform, you may upload it in the same way of uploading an ISO image introduced in the **Creating Virtual Machine** section.

After guest OS is installed, vmTools must be installed before you go to the **Next** step.



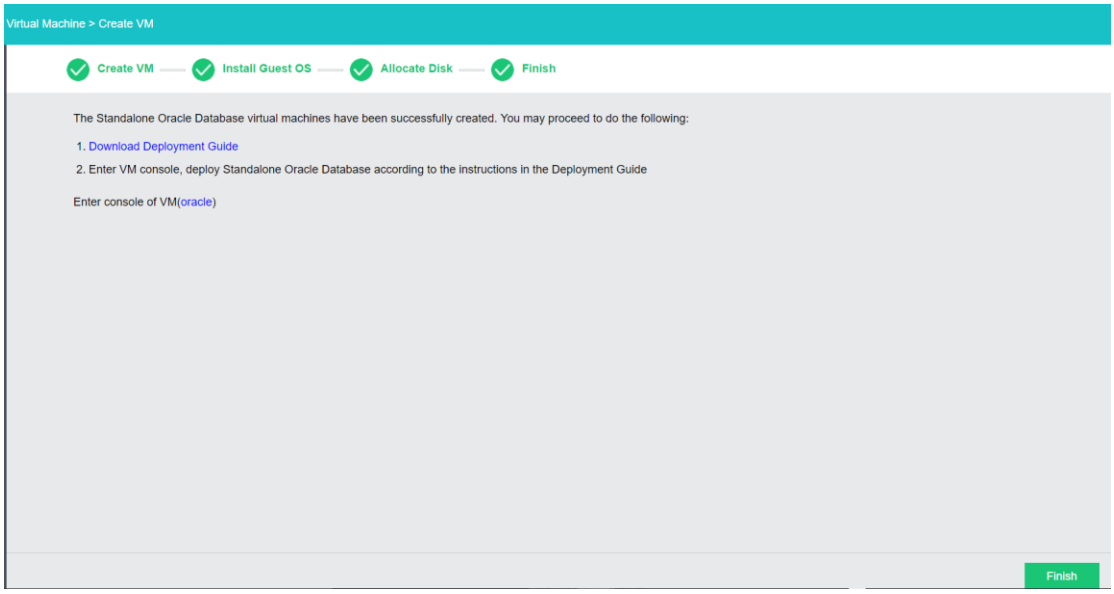
3. Allocate disk.

In this step, you need to configure log and quorum disks. More specifically, specify **Disk Name**, **Total Number**, **Size of Each Disk** on the following page.



- **Log Disk**: It is used to store Oracle database logs.
- **Data Disk**: It is used to store Oracle database data.

4. Come to **Finish**, as shown in the following figure. On that page, you may download deployment guide by clicking on the link **Download Deployment Guide**, or download it at http://wiki.sangfor.com.cn/images/3/32/Best_Practice_for_Oracle_single.pdf

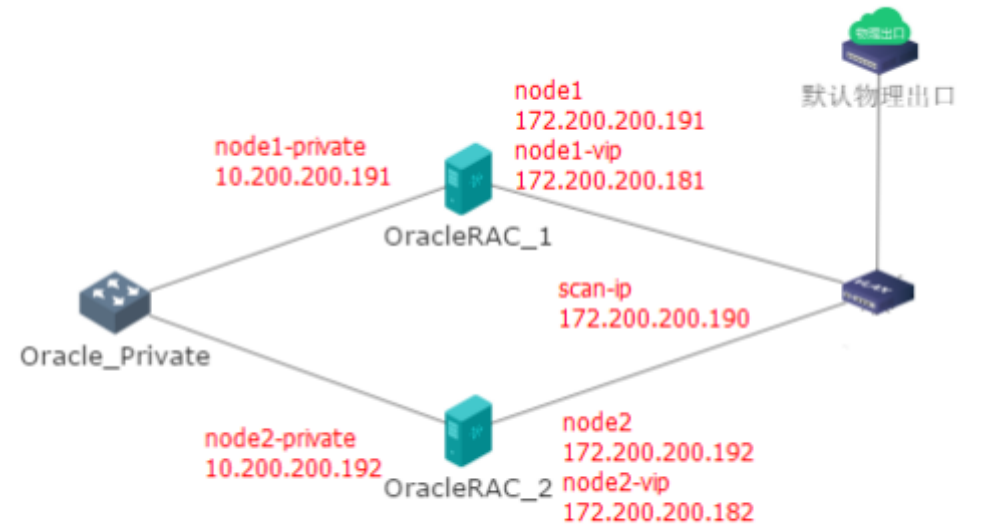


2.2.7. Creating Oracle RAC Database(Cluster)

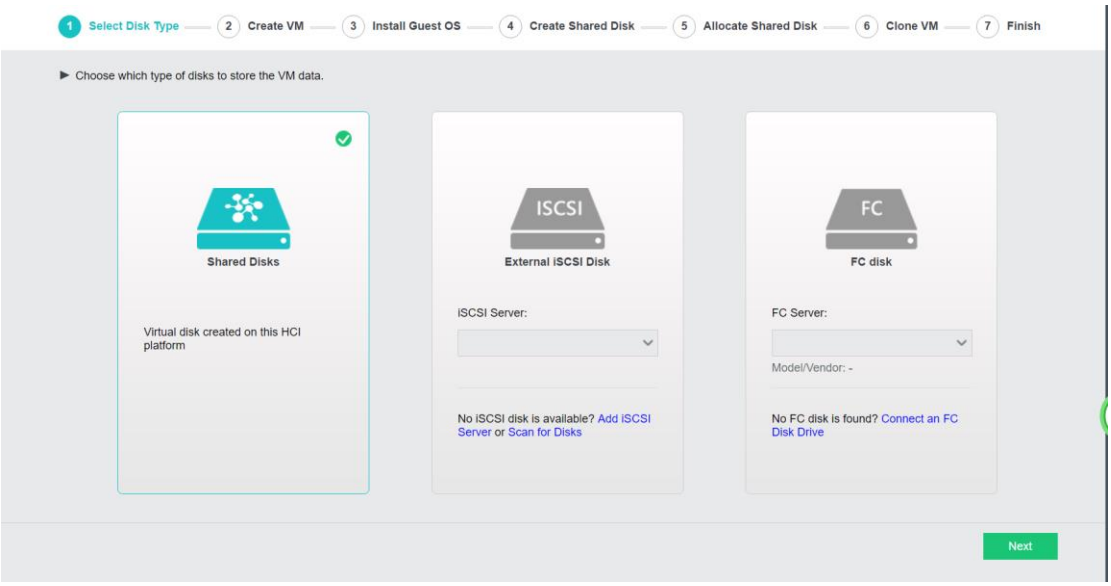
In **Compute**, you can create an Oracle RAC database. More specifically, click **Add** in **Compute** and select **Create Oracle RAC Database** on the **Create New Virtual Machine** page.

1. Select disk type.

Each node in Oracle RAC needs to be configured a public IP address, a virtual IP address and a private IP address at least. Therefore, a cluster has a public IP address. Address allocation and network deployment is shown below:

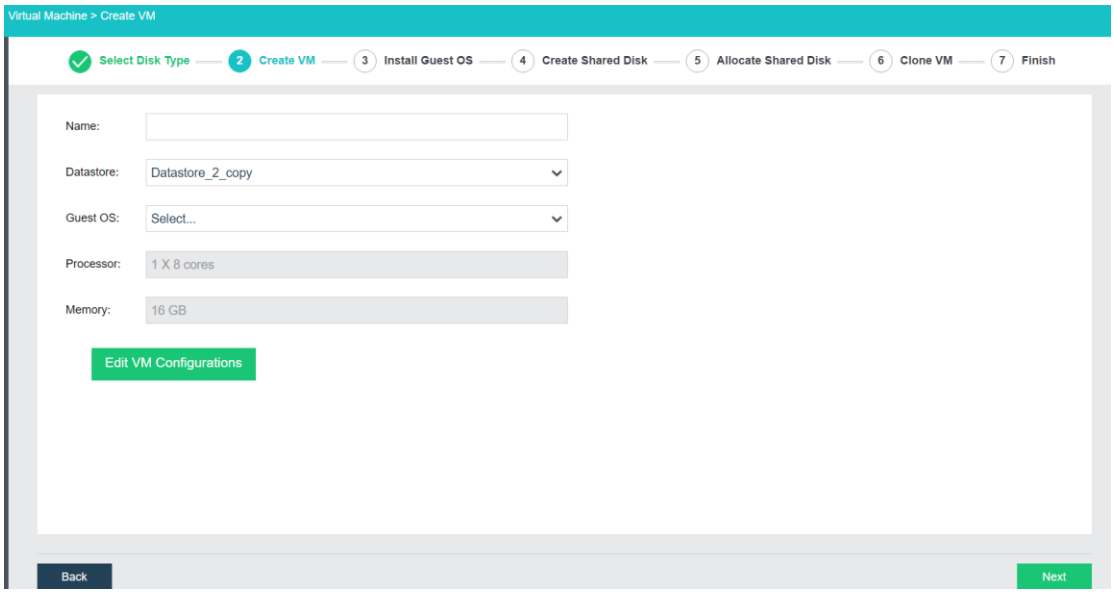


First, select a type of disk to store VM data: **Shared Disks**, **External iSCSI Disk** or **FC Disk**.



2. Create virtual machine.

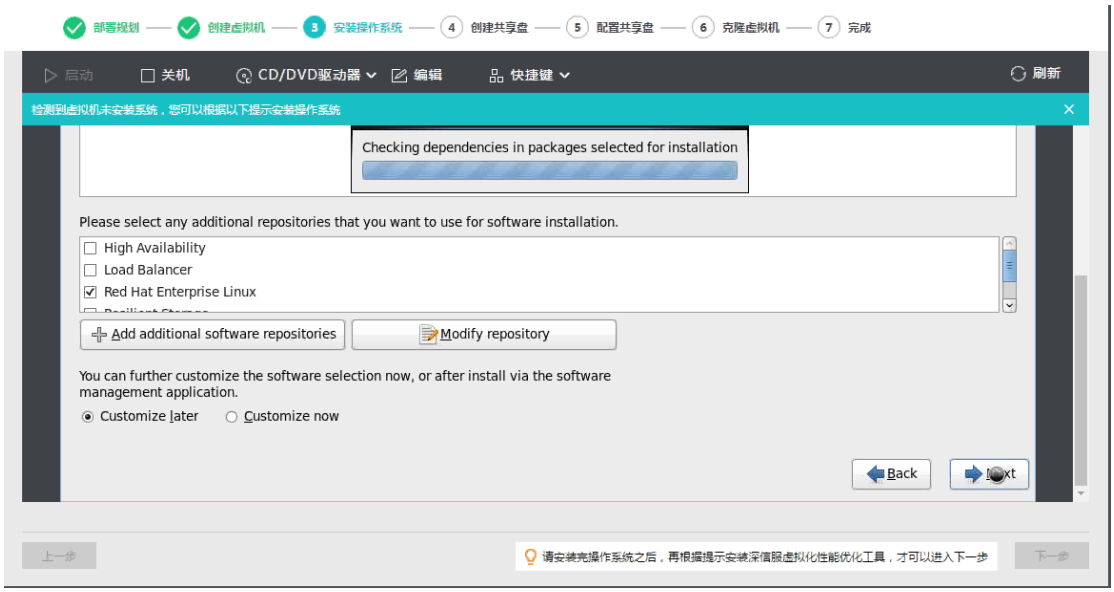
See **Creating Virtual Machine** section for how to create and configure virtual machine. Note that datastore must correspond to the type of disk you have chosen in the previous step.



3. Install guest OS.

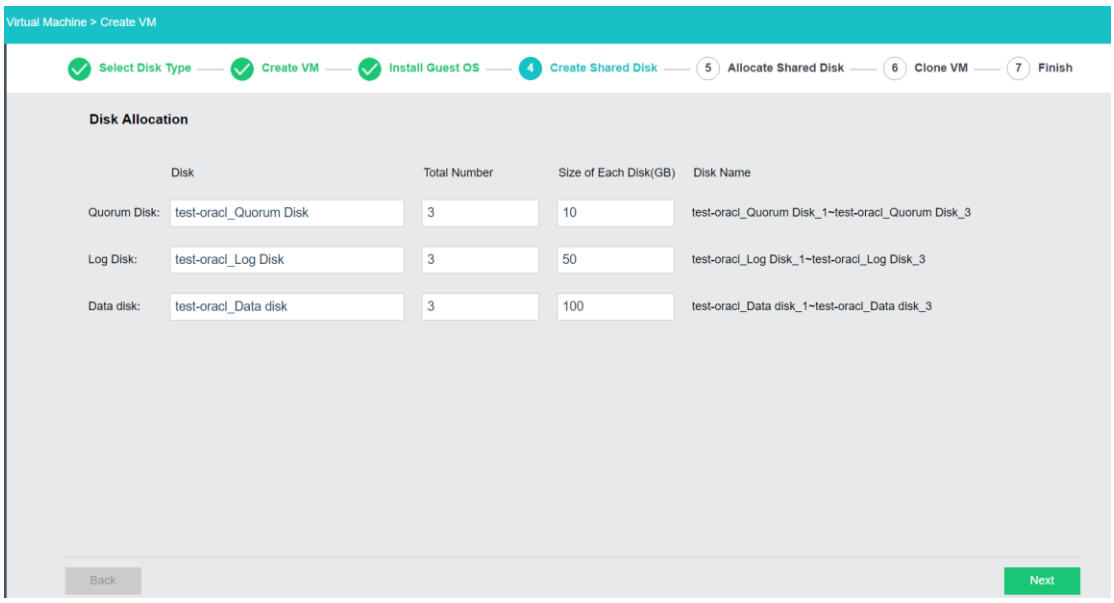
After VM name and guest OS are specified, click **Next** to install OS. If the specified guest OS has not been uploaded to Sangfor HCI platform, you may upload it in the same way of uploading an ISO image introduced in **Creating Virtual Machine** section.

After guest OS is installed, vmTools must be installed before you go to the **Next** step.



4. Create shared disk.

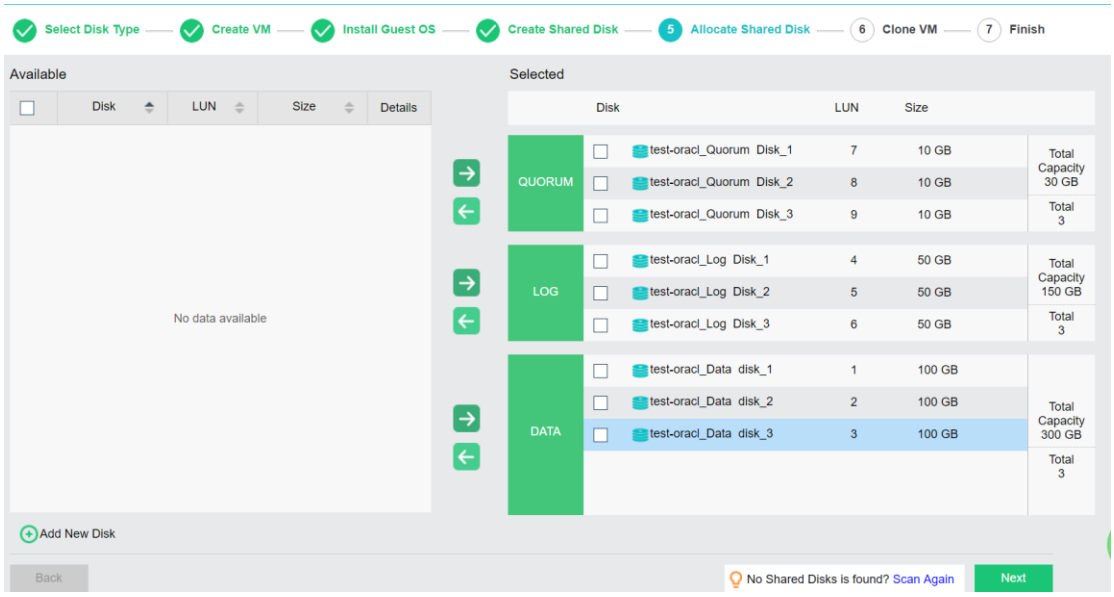
In this step, you need to configure log, quorum and data disks. More specifically, specify **Disk Name**, **Total Number**, **Size of Each Disk** on the following page.



- **Log Disk**: It is used to store Oracle database logs.
- **Data Disk**: It is used to store Oracle database data.
- **Quorum Disk**: It is used to provide quorum service.

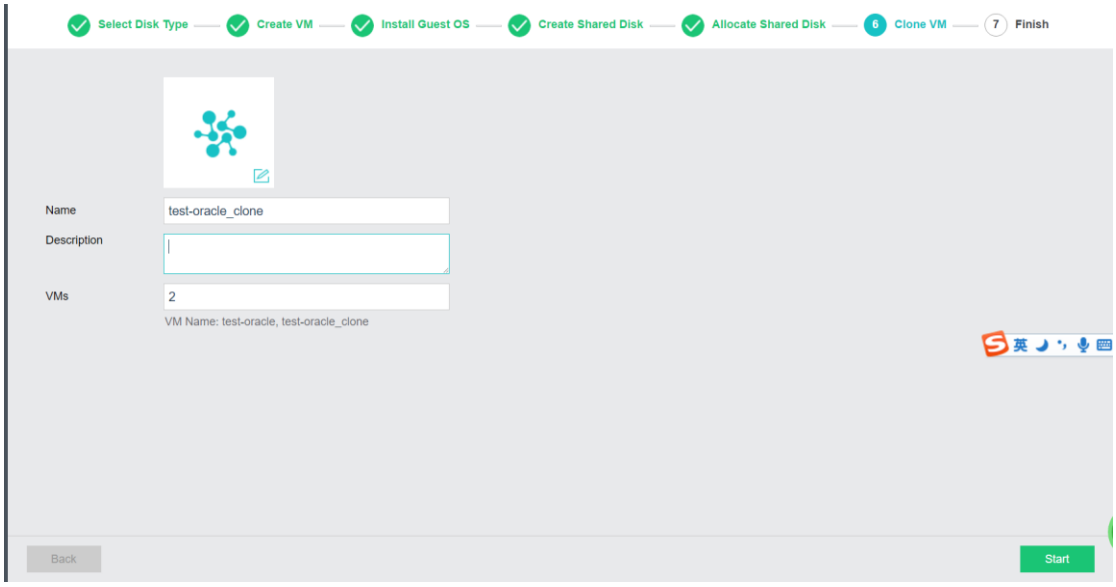
5. Allocate shared disk.

After shared disks are configured, you can allocate them.

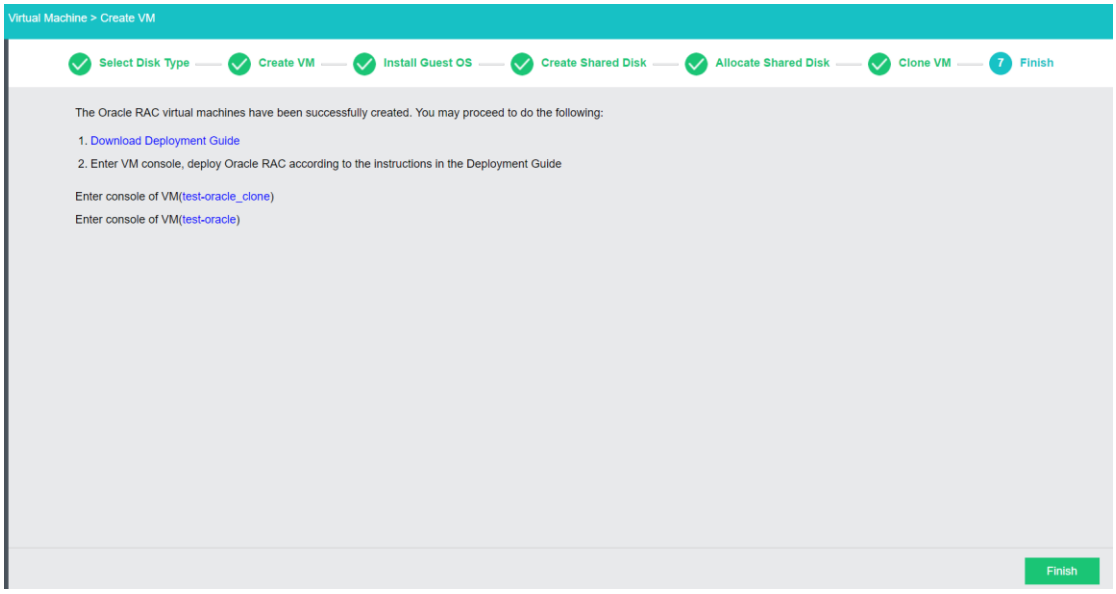


6. Clone virtual machine.

Here you may specify VM name, description and the number of virtual machines to be created, as shown below:

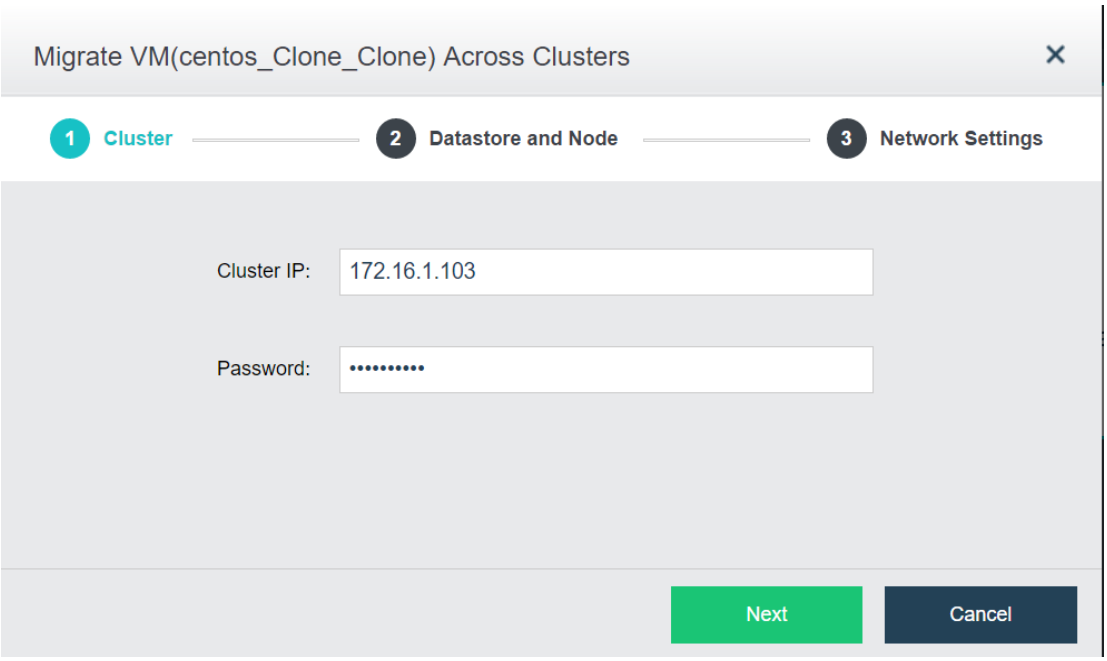


7. Come to **Finish** page, as shown in the following figure. On that page, you may download deployment guide by clicking on the link **Download Deployment Guide,** or download it at http://wiki.sangfor.com.cn/images/8/80/Best_Practice_for_Oracle_RAC.pdf



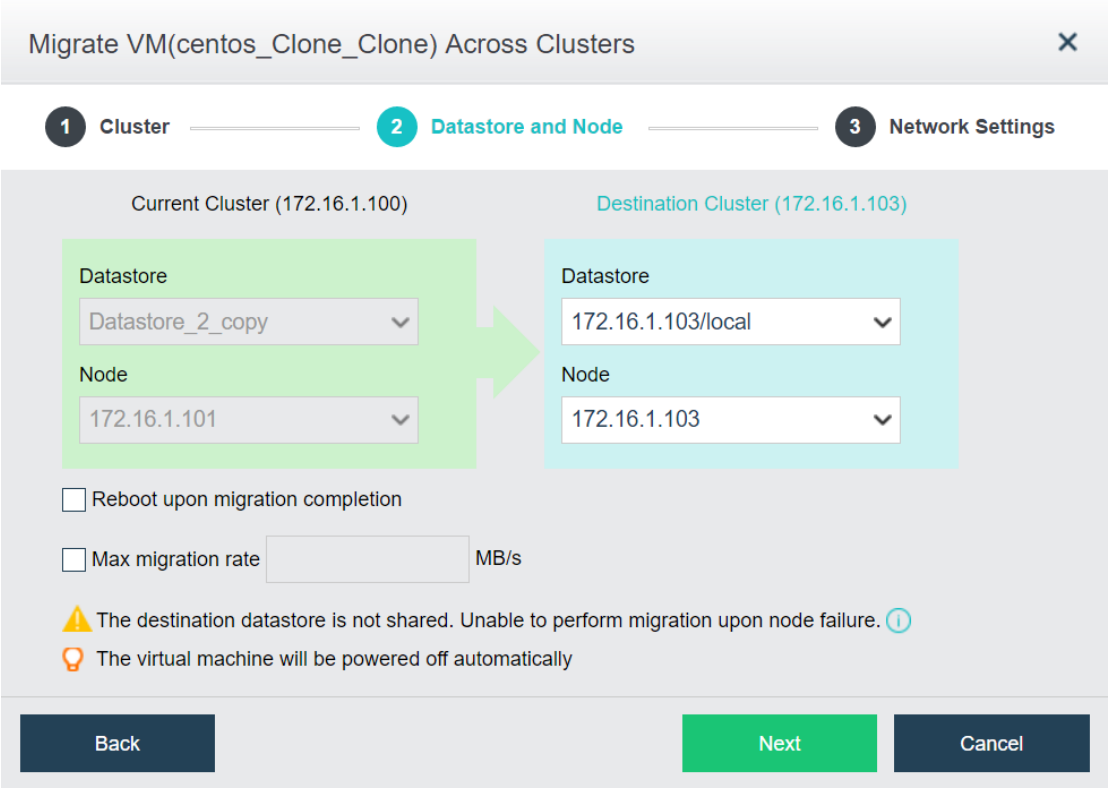
2.2.8. Migrating VM Across Clusters

This feature enables virtual machine to be migrated to another cluster. Additionally, live migration across clusters is supported.

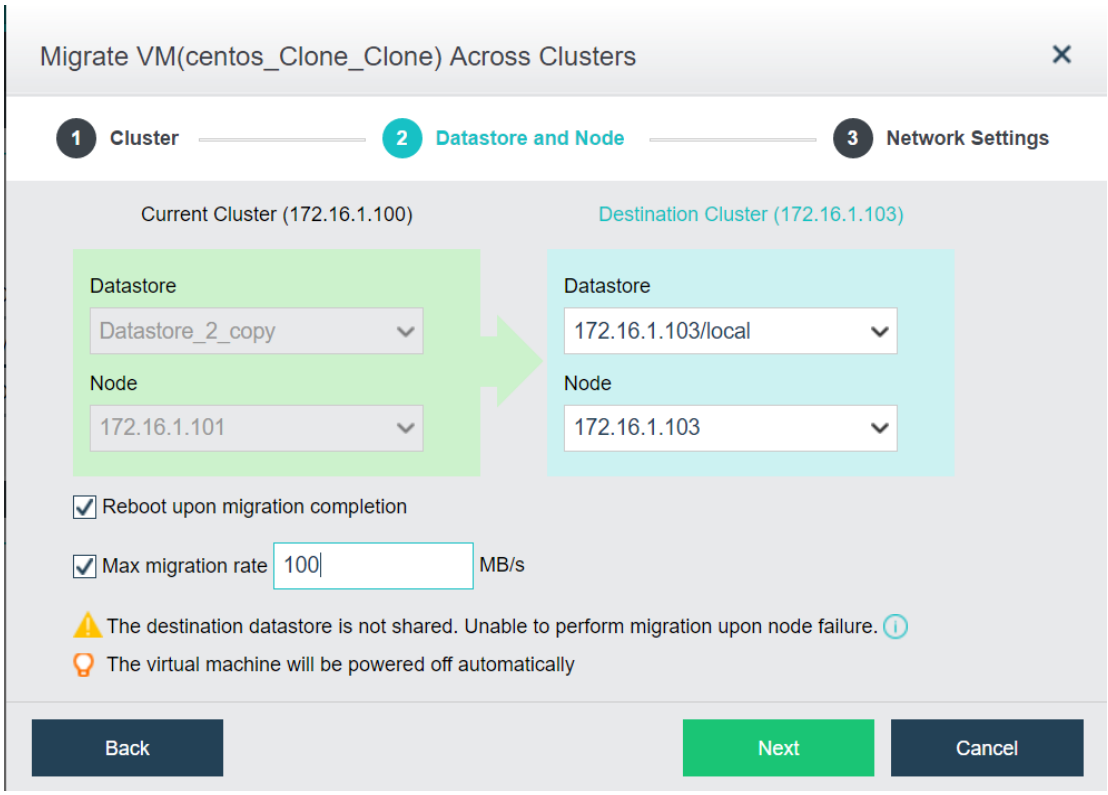


- **Cluster IP**: Specifies IP address of destination cluster.
- **Password**: Specifies admin password.

For live migration, virtual machine will be powered off automatically after being migrated to destination cluster.



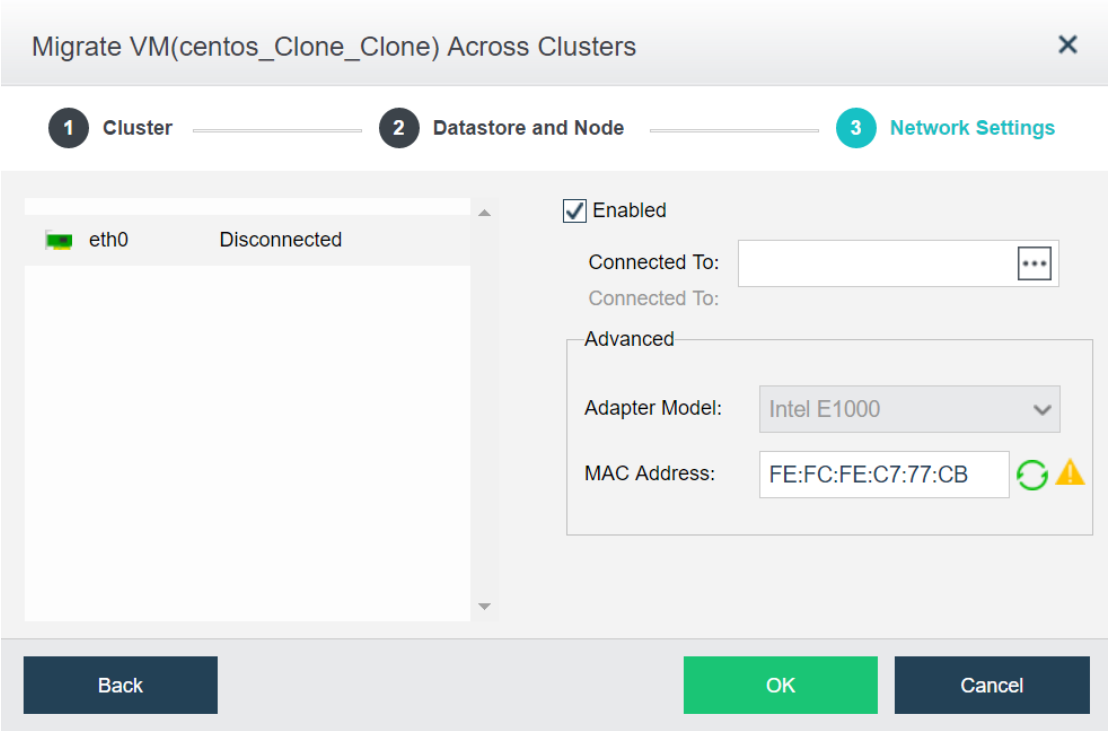
Cold migration is shown below:



- **Reboot upon migration completion**: It is applicable to cold migration only.
- **Max migration rate**: Specifies the maximum migration speed. The minimum is 5MB/s and the maximum is 1000MB/s. If you have no requirement for migration rate, you may leave the option

Max migration rate unselected. For live migration, max migration rate cannot be set so as to ensure data stability.

After specifying destination datastore and node, click **Next** to configure network.



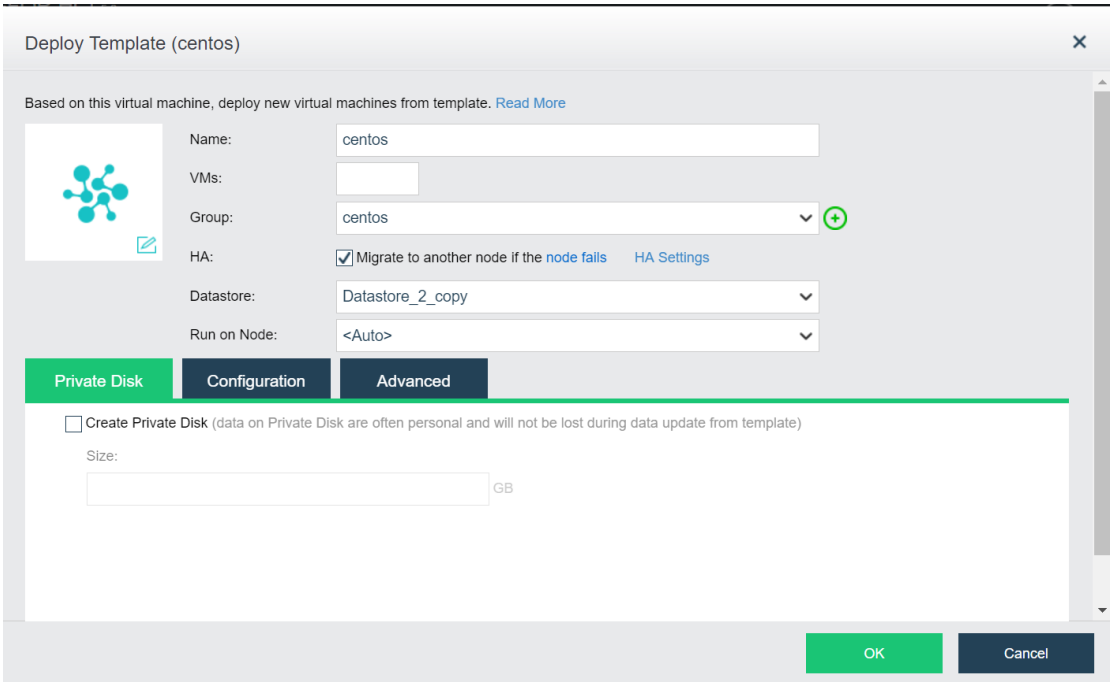
- **Connected To**: Specifies an edge in destination cluster, which is to be connected to the virtual machine.
- **Adapter Model**: Specifies model of network adapter.
- **MAC Address**: Specifies NIC MAC address for virtual machine. Upon migration completion, NIC MAC address will be modified by default. To change it back, you may edit **MAC Address** in the **Network Settings** step.

2.2.9. Deploying VM from Template

Generally, a VM template is a virtual machine which has been configured, and can be used to deploy multiple virtual machines of the same configurations. The difference from cloning VM is that disk files will not be replicated when a virtual machine is deployed from a template. Changes made to deployed virtual machine will be saved incrementally.

Deploy VM: Only the virtual machine converted to template can be used to deploy virtual

machines. Disk settings of the virtual machine after being converted to template cannot be changed any more. You can deploy new virtual machines when converting a virtual machine to template. Deployed virtual machines have the same configurations as its template.



- **Name**: Specifies name for deployed virtual machine(s).

Name of deployed VM depends on the **Name** and the number of virtual machines. For instance,. If **Name** is **vml** and **VMs** is set to 2, names of the two new virtual machines are **vml_0001** and **vml_0002** respectively.

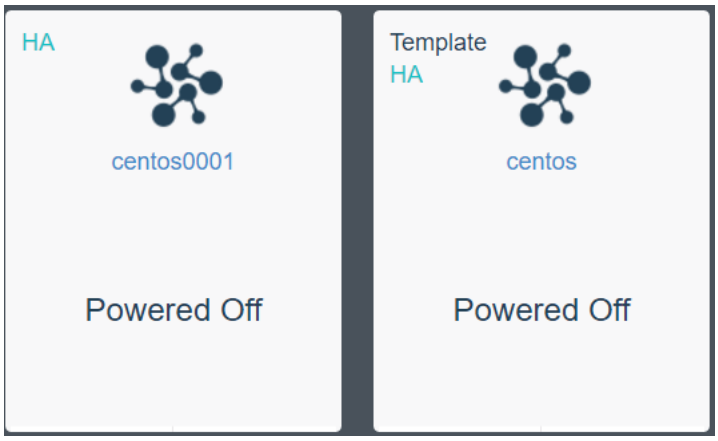
- **Migrate to another node if the node fails**: If this option is selected, deployed virtual machines will be automatically migrated to another node if node fails.

- **Datastore**: Specifies a datastore where configuration files of deployed virtual machines are stored.

- **Run on Node**: Specifies a node to run deployed virtual machines.

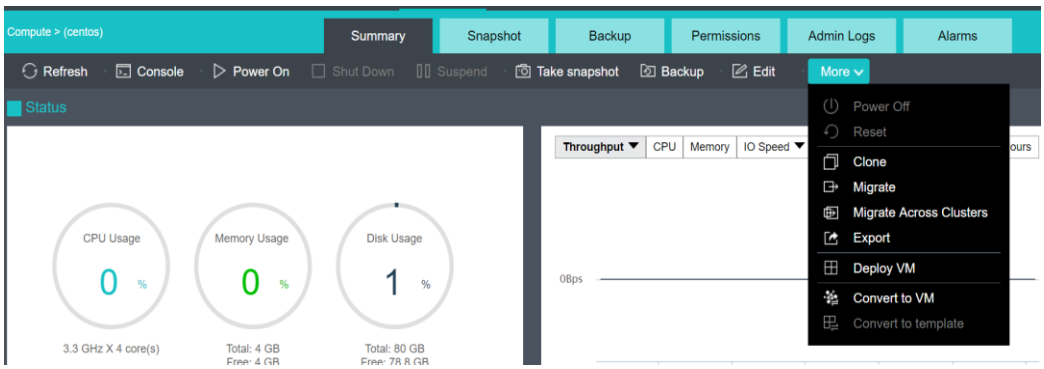
- **Create Private Disk**: You can create a private disk and assign a specified disk size to each deployed virtual machine.

After deploying virtual machine from template completes, go to VM template **Summary** page and click the number next to **Deployed VM (s)** to enter the following page to view deployed virtual machine.



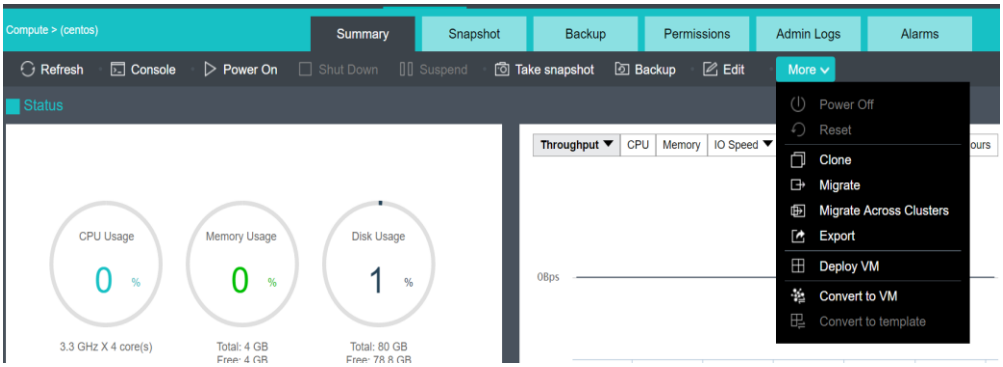
2.2.10. Converting Template to VM

You can convert a VM template to an ordinary virtual machine, but template must be powered off first before conversion. To convert template to VM, check whether that VM template is powered off first. If it is powered on, click **Power Off** or **Shut Down.** Then, select **More > Convert to VM** on the **Summary** page, as shown below:



2.2.11. Converting VM to Template

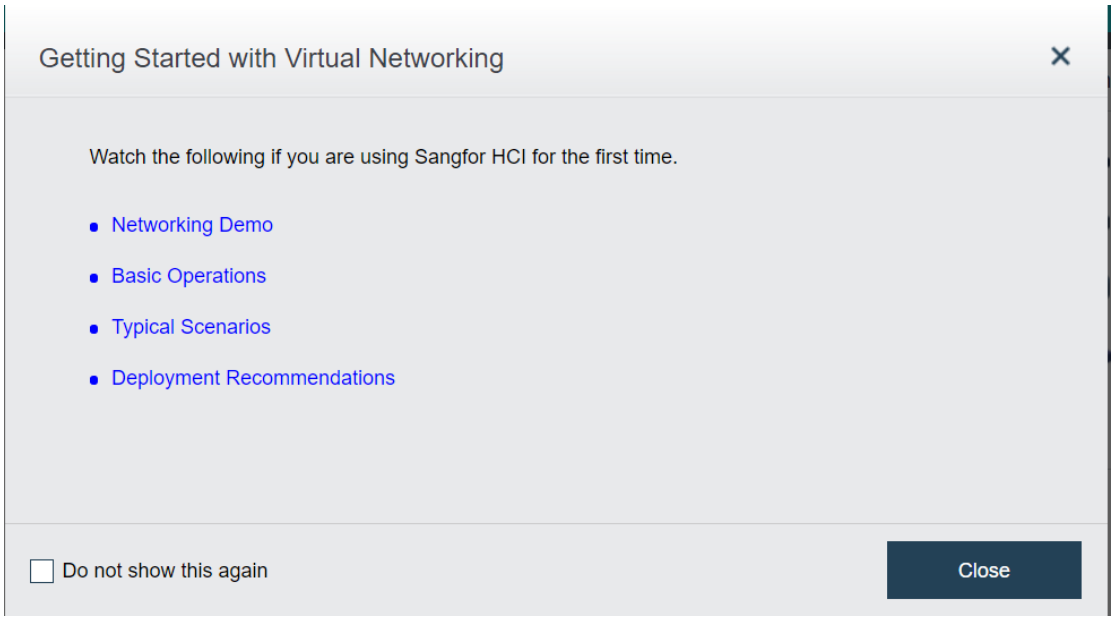
A virtual machine can be converted template so that it can be used as template to create multiple virtual machines. Before conversion, virtual machine must be powered off first. To convert VM to template, check whether that VM is powered off first. If it is powered on, click **Power Off** or **Shut Down.** Then, select **More > Convert to template** on the **Summary** page, as shown below:



2.3. Configuring Virtual Network

2.3.1. How To?

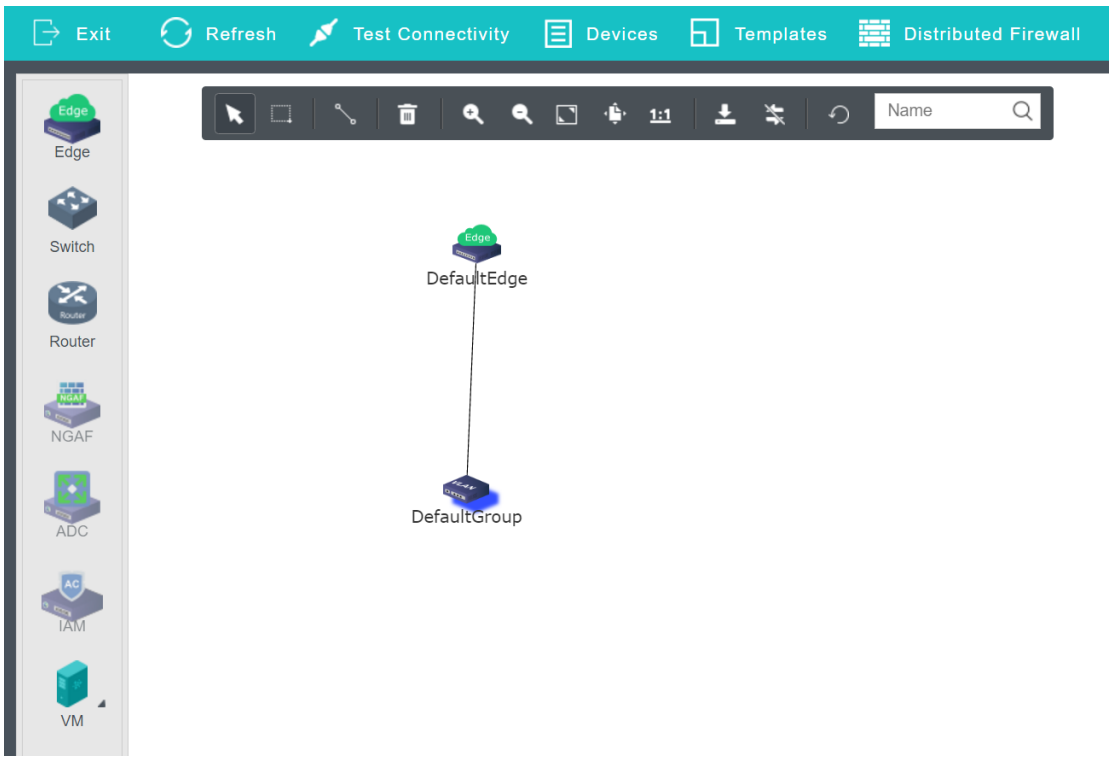
When you log in to Sangfor HCI platform for the first time, a wizard will pop up to guide you through virtual network deployment (You can also enter the wizard by clicking **How To** at the upper-right corner). The wizard contains the following information: **Network Demo**, **Basic Operations**, **Typical Scenarios** and **Deployment Recommendations**, as shown below:



2.3.2. Deploying Network Topology

In **Networking**, you can deploy virtual network topology. To edit network topology, you must enter editing status first, otherwise, the topology can only be viewed. Click **Edit** to enter editing status,

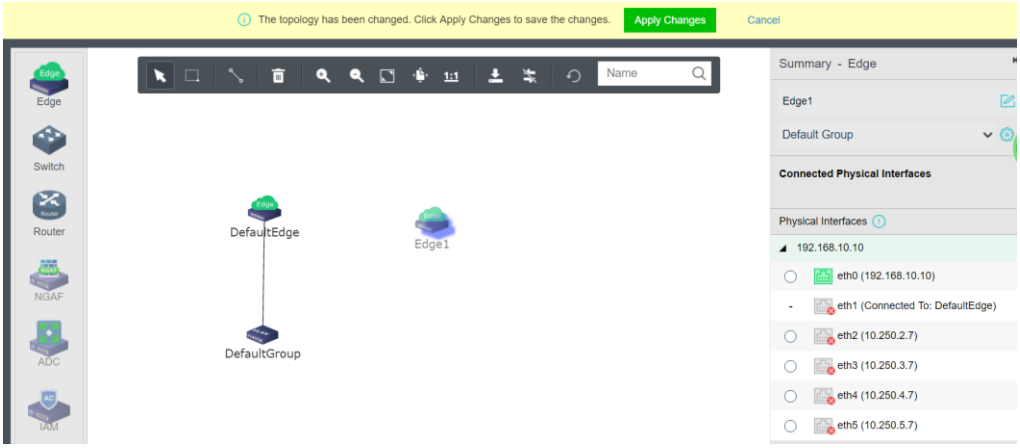
as shown below:



2.3.3. Configuring Edge

An edge connects physical network and virtual network. It uses physical interface or aggregate interface to connect to physical network in **Trunk** mode. When configuring edge, you need to specify port group. A port group consists of more than one interfaces with the same configuration (such as VLAN).

To deploy an edge, drag an edge onto the canvas from the left panel, select the physical interfaces that need to be connected and then click **Apply Changes**.

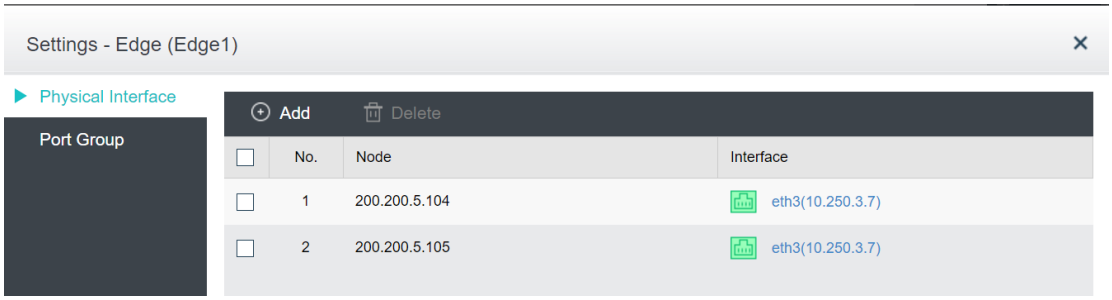


2.3.3.1. Viewing Edge Settings

Select an edge and click on **Settings** button on the right to enter edge settings page. On the **Settings** page, you can view and configure physical interface and port group.

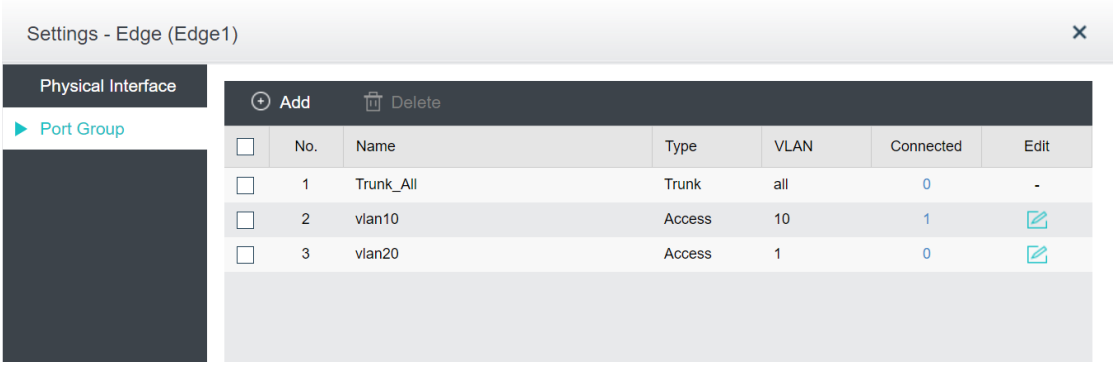
Configuring Physical Interface

On the **Physical Interface** tab, as shown below, you can add a new physical interface, delete or edit an existing physical interface. Each node should be specified a physical interface to be connected to a same edge, and that interface should be connected to a same L2 switch so as to ensure that virtual network traffic can go to physical network through any node.

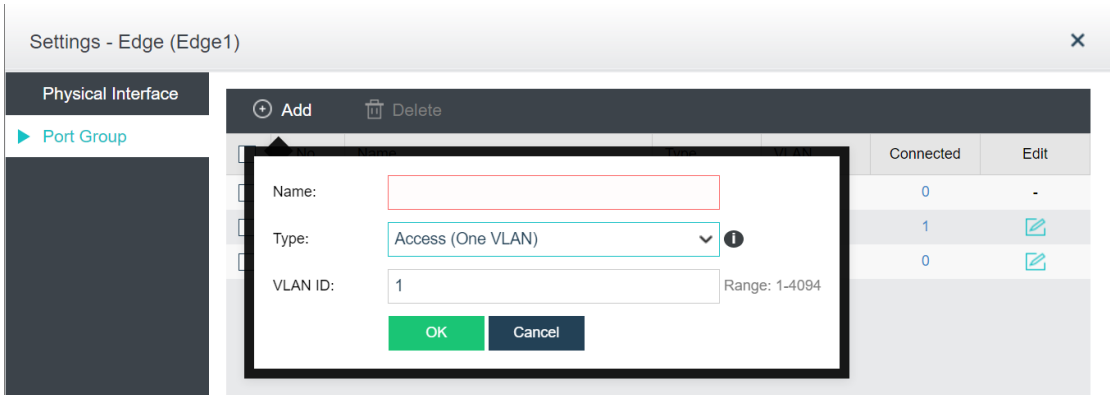


Configuring Port Group

On the **Port Group** tab, you can add a new port group, delete or edit an existing port group.



To add a new port group, click **Add** to enter the following page and configure related fields.



Name: Specifies a name for the port group.

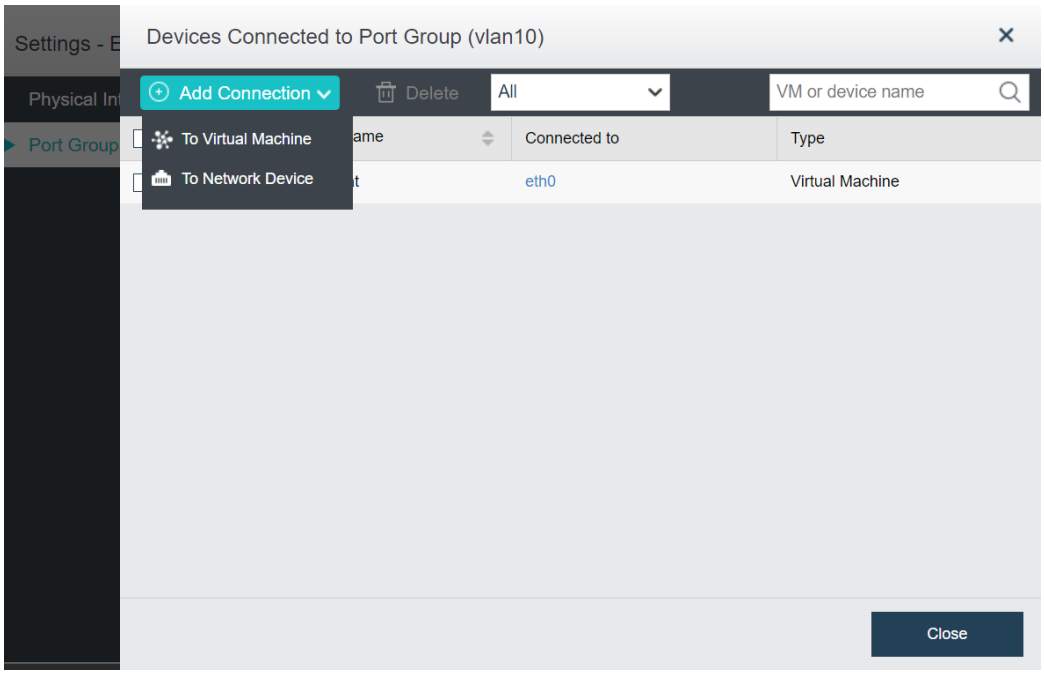
Type: Specifies the type of VLAN interface, **Trunk** or **Access**. Trunk port is used for VLAN trunking or VLAN aggregation. It allows packets that do not carry VLAN information, or carry VLAN information but VLAN ID is within specific VLAN range; if VLAN ID is not in VLAN range, packets will be rejected.

Access port is used for untagged VLAN. If it receives packets without carrying VLAN information, the packets will be tagged with specific VLAN IDs, which will be removed when the packets go out of that Access port. The packets with VLAN information are not allowed to go through this port.

VLAN ID: It is required when the type is **Trunk**.

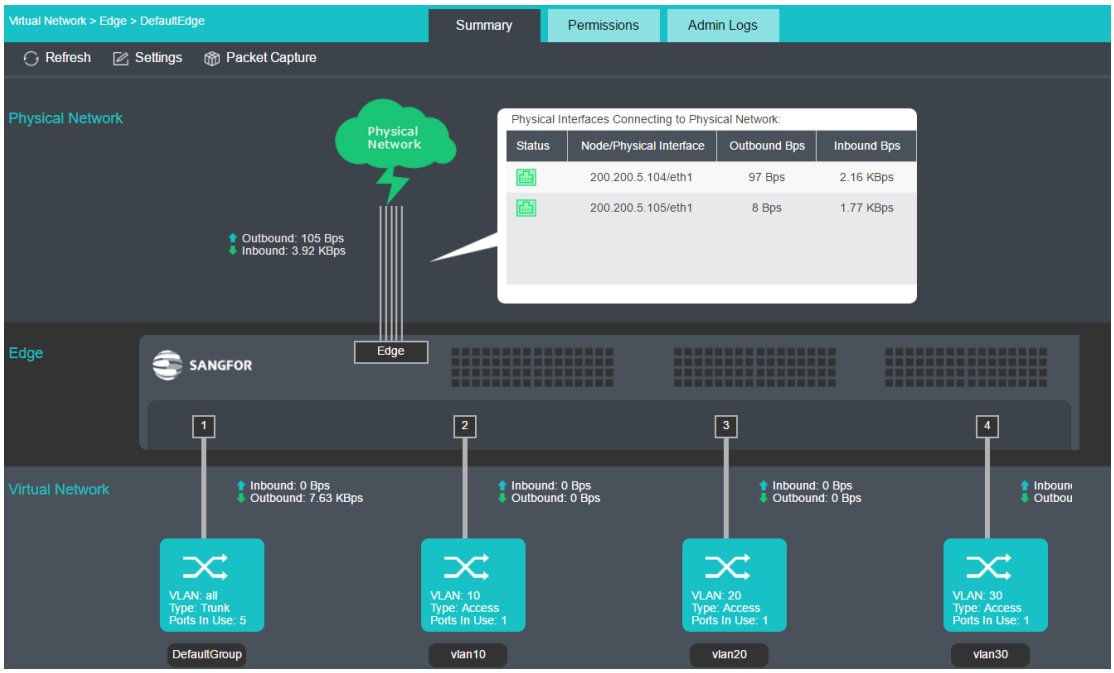
PVID: It is the default VLAN ID that will be tagged on the packets going through the switch but not carrying VLAN ID.

On the **Port Group** tab, you can click on the number in **Connected** column to enter the following page on which you can add connection to virtual machine, network device (including router, NGAF and ADC),



2.3.3.2. Viewing Edge Summary

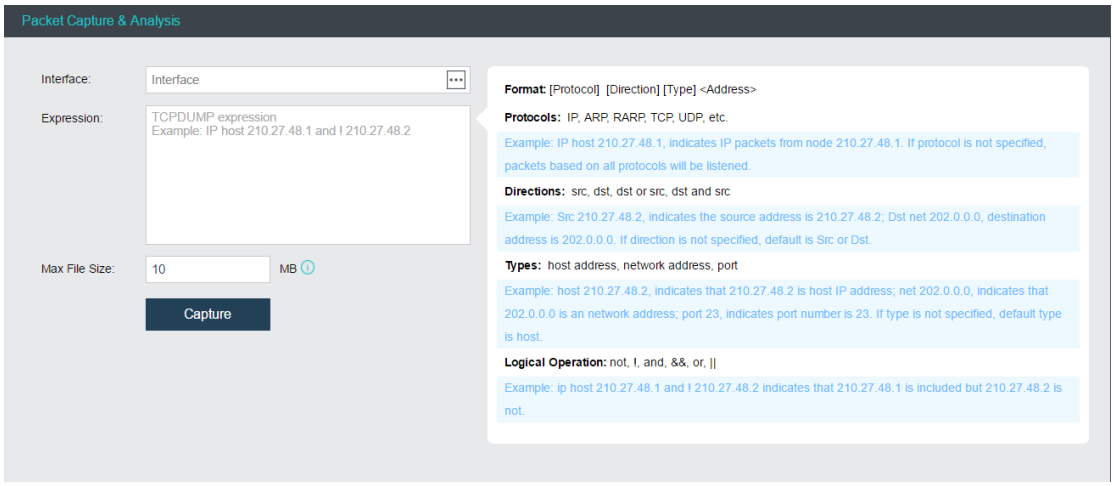
On the Summary page, you can view basic information of the edge, and the outbound and inbound rate of the edge and port group.



To reload the current page, click **Refresh**.

To change edge settings, click on **Settings**, and then configure physical interface and port group.

To capture and analyze packets, click **Packet Capture**, as shown below:

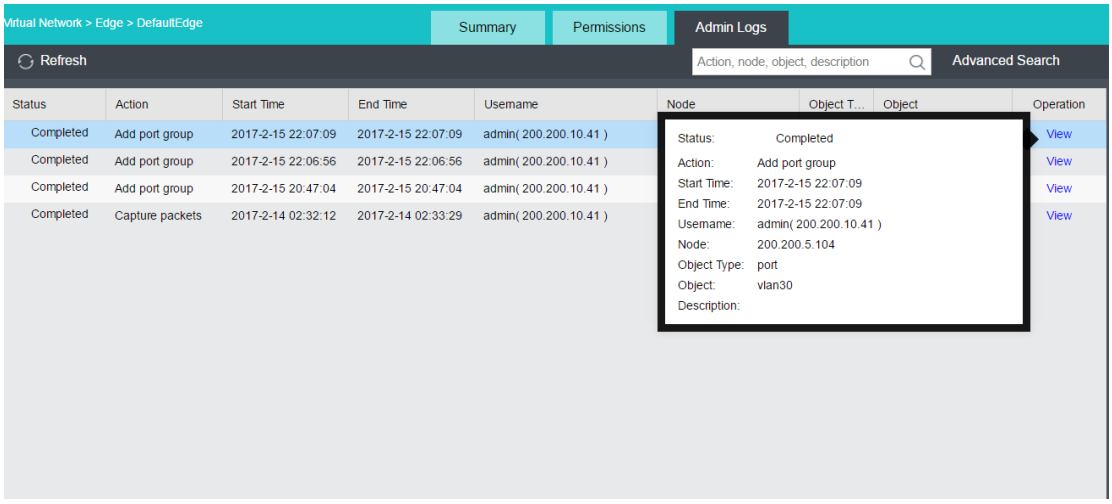


Interface: Specifies the interface. The packets passing through that interface will be captured.

Expression: Specifies expression to filter packets. On the right panel of the **Packets Capture & Analysis** page, it displays the expression formats.

Max File Size: Specifies the maximum size of the file. If a file size is larger than the maximum, capturing packet will stop.

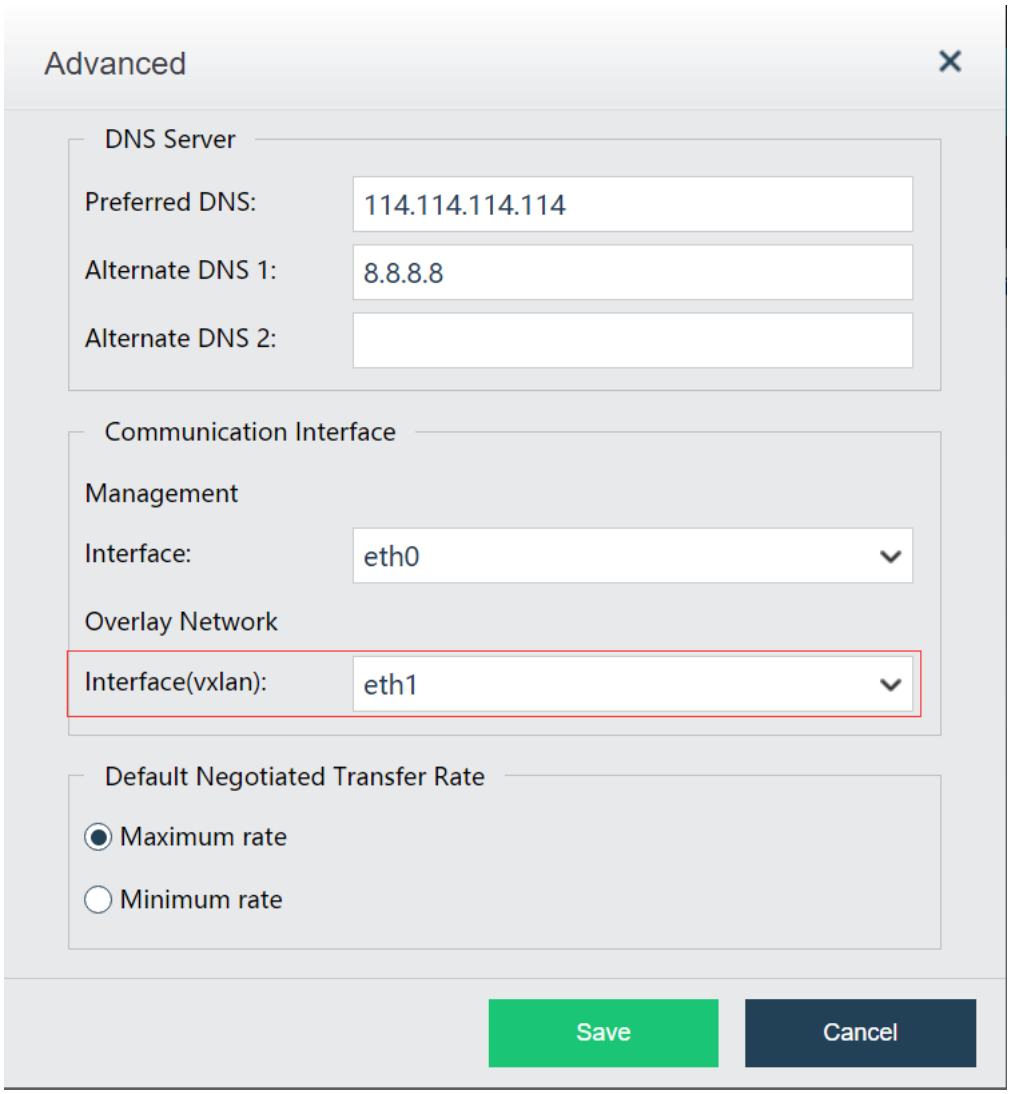
[Admin Logs]: Displays administrator logs, which record various operations performed by the administrator, such as creating edge. Each log contains the following information: **Status**, **Action**, **Start Time**, **End Time**, **Username**, **Node**, **Object Type**, **Object** and **Operation**. To view log details, click **View** in **Operation** column.



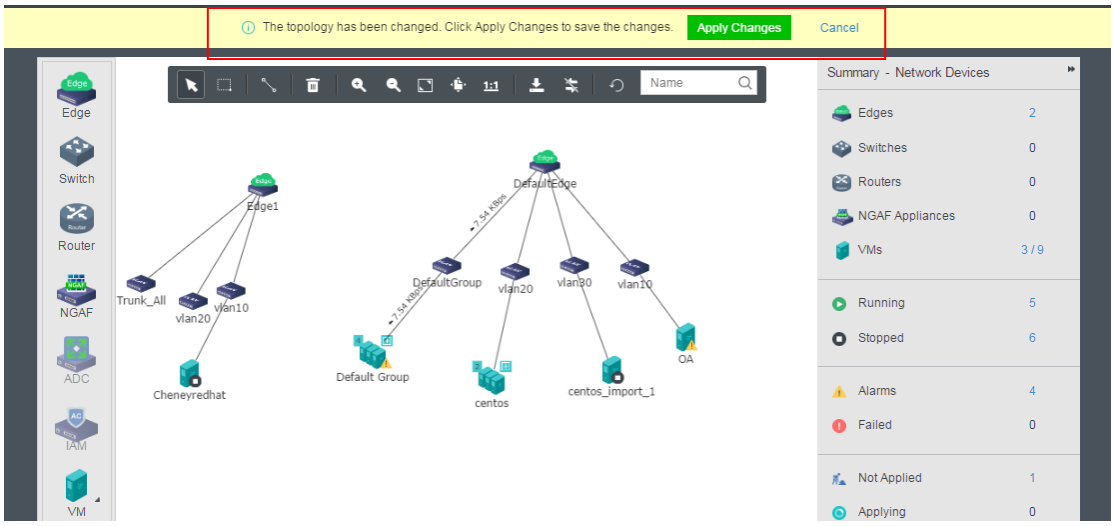
2.3.4. Configuring Virtual Switch

On a virtual switch, you can add connection, configure access control policy and broadcast storm prevention.

First, you need to check whether overlay network interfaces(VXLAN) of each node are configured on a same network segment. If they belong to different subnets, nodes cannot communicate with each other through a virtual switch. To check overlay network interface settings, select a node in **Nodes**, click **Summary** to enter node summary page and then click **Advanced** on the **Network** tab to enter the following page.

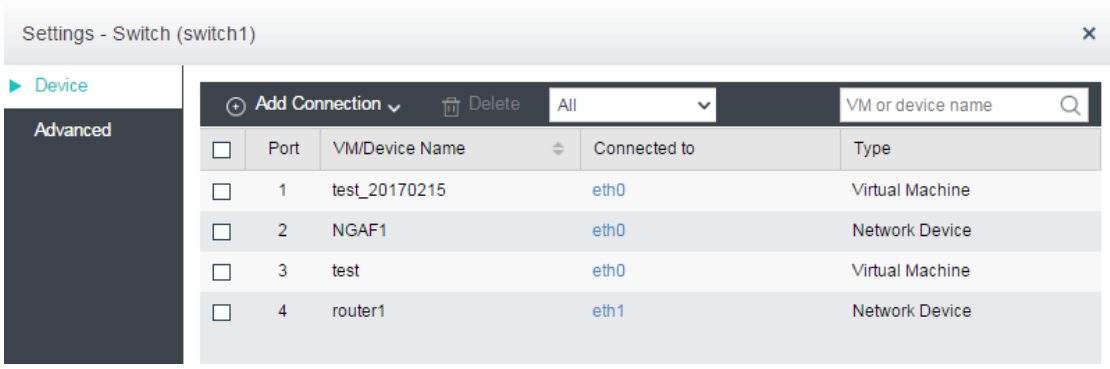


Navigate to **Networking** and then drag a virtual switch onto the canvas. To make the changes take effect, click **Apply Changes**.



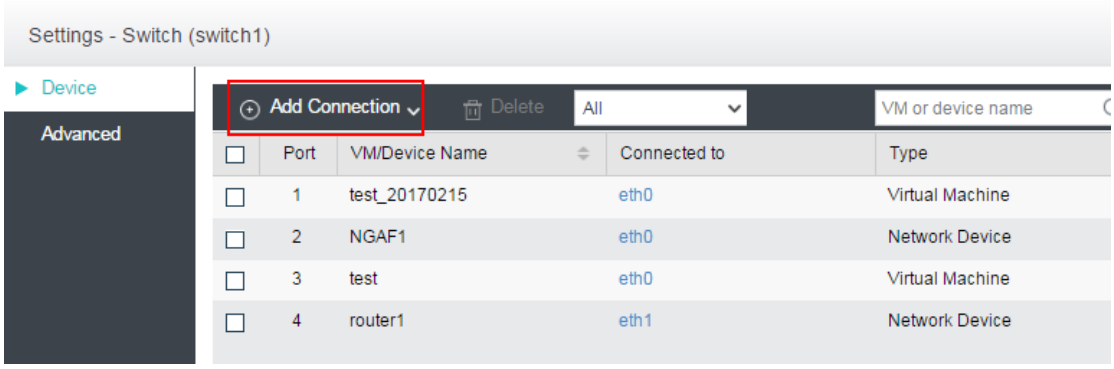
2.3.4.1. Viewing Switch Settings

Select a virtual switch and then you will view its configuration on the right. To configure switch, click **Settings** button to enter the **Settings** page, as shown below. On the following page, you can add connection and access control policy, and enable broadcast storm prevention.

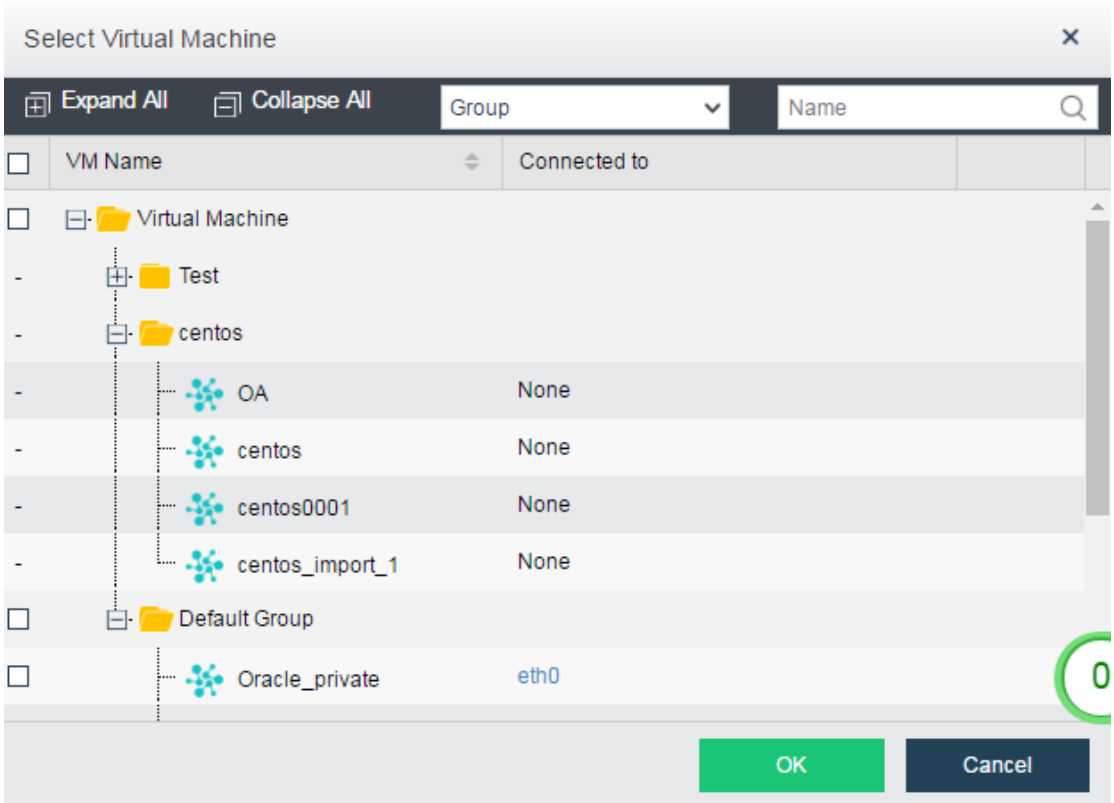


Adding Connection

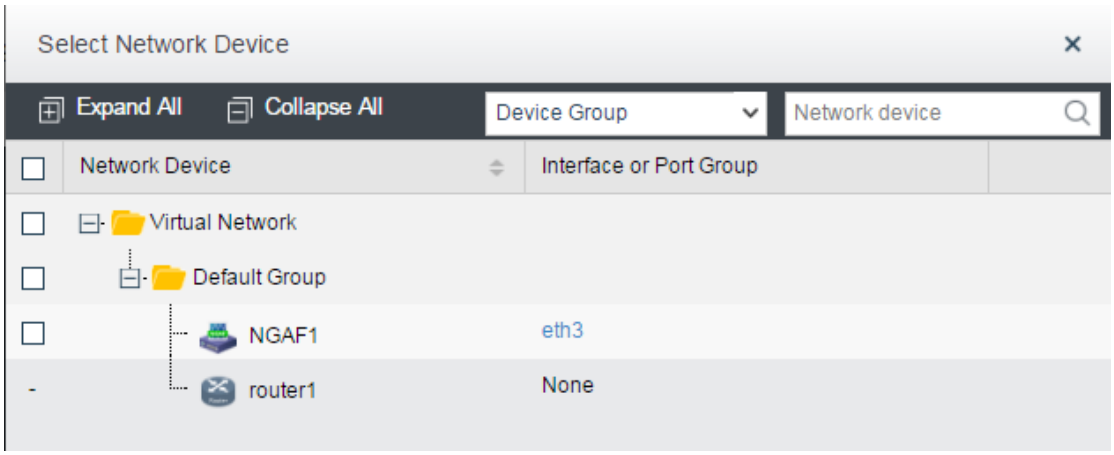
On the **Device** tab, you can add connection to virtual machines and network devices (such as router, NGAF, ADC), as shown below:



To add connection to a virtual machine, select **Add Connection > To Virtual Machine**, then select the VM that you want to connect to the switch. Click **OK** to save the settings.

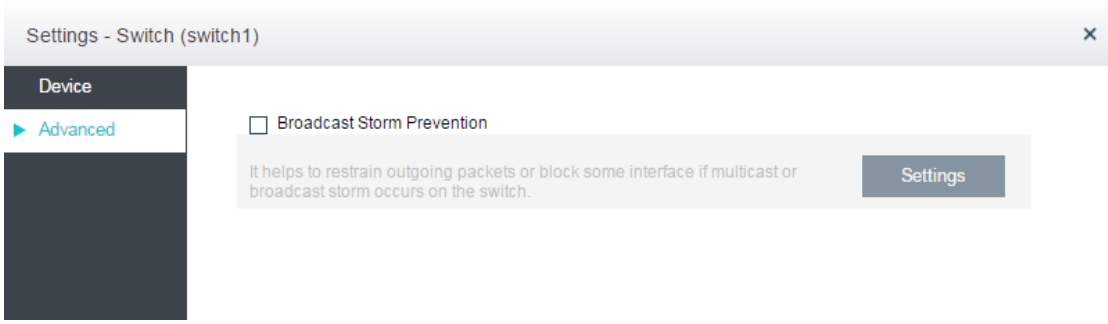


To add connection to a network device, select **Add Connection > To Network Device**, select the network device that you want to connect to the switch and then click **OK**, as shown below:

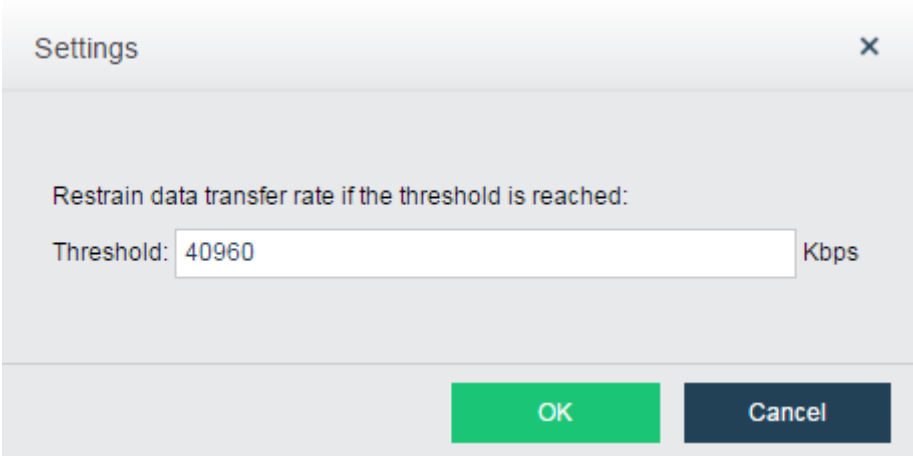


Configuring Advanced Settings

On the **Advanced** tab, you can enable and configure broadcast storm prevention which can help to restrain outgoing packets or block some interface if multicast or broadcast storm occurs on switch. Broadcast storm prevention is disabled by default.

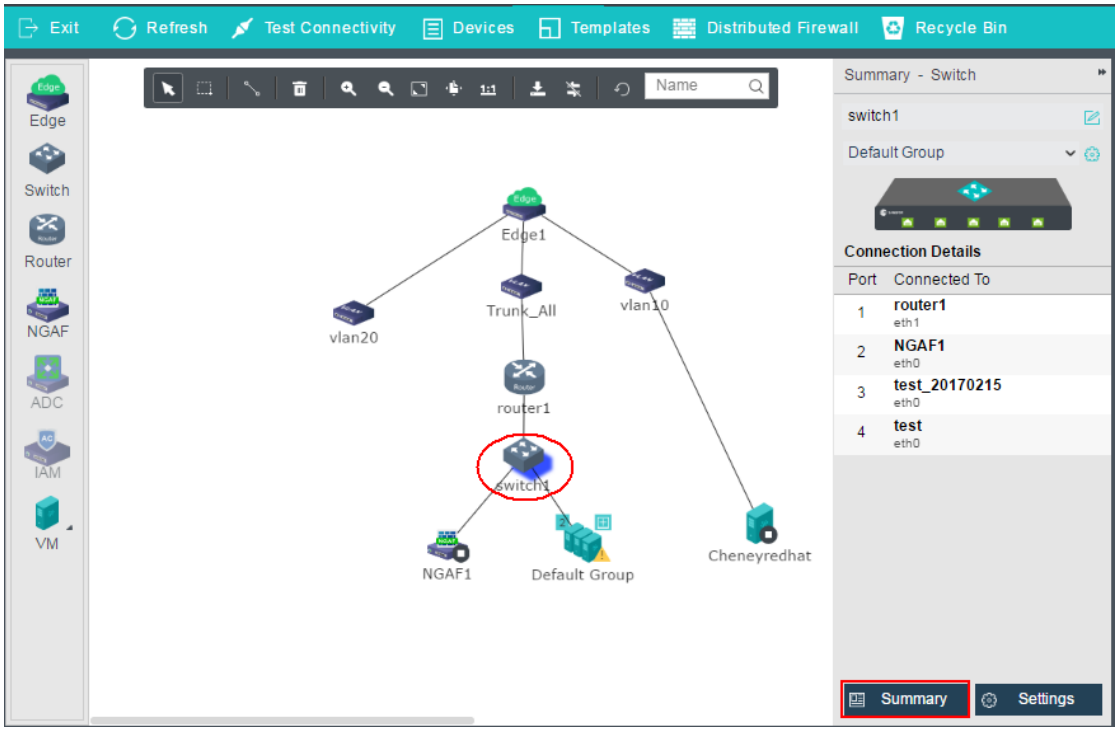


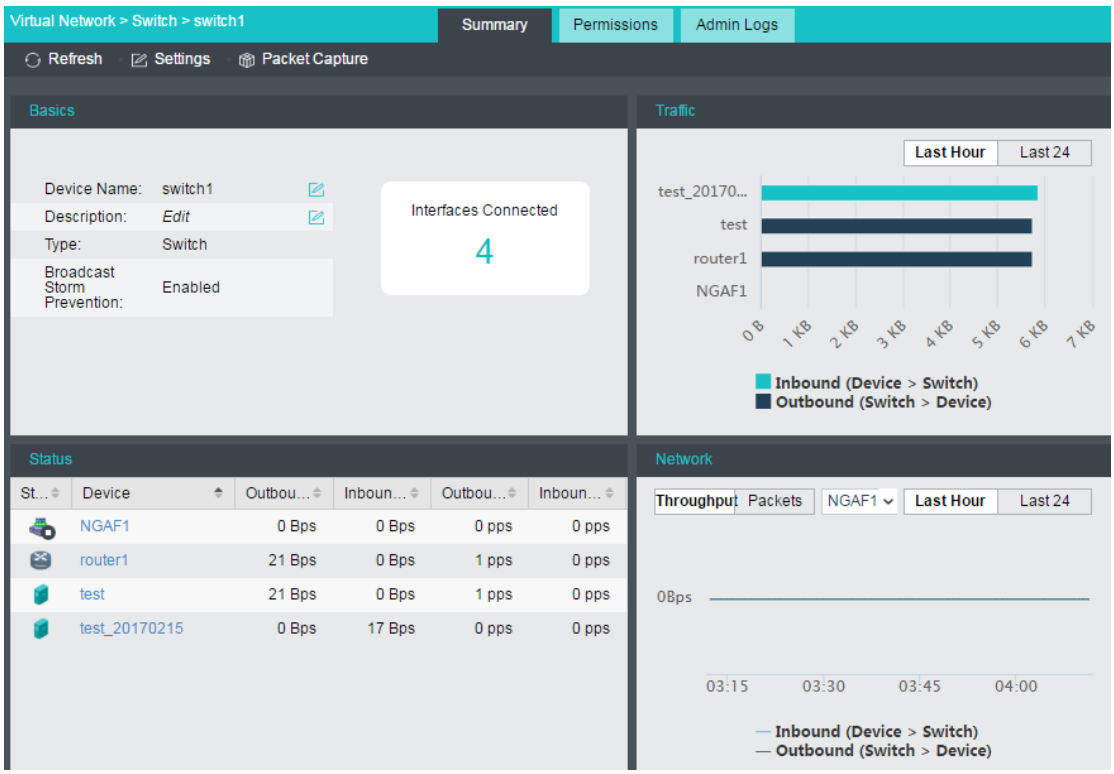
To configure broadcast storm prevention, click **Settings** to enter the following page and specify threshold.



2.3.4.2. Viewing Switch Summary

To view detailed settings of a switch, select the switch and click **Summary** button to enter switch summary page. On that page, you can view **Basics**, **Traffic**, **Status** and **Network**. To view admin logs, go to **Admin Logs** page.

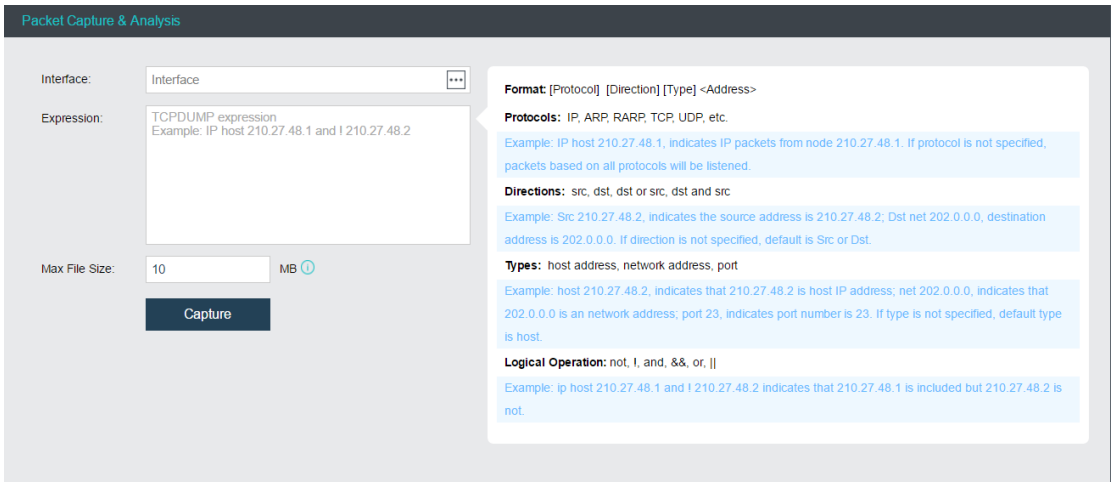




To reload the current page, click **Refresh**.

To configure the switch, click **Settings**.

To capture and analyze packets, click **Packet Capture**, as shown below:



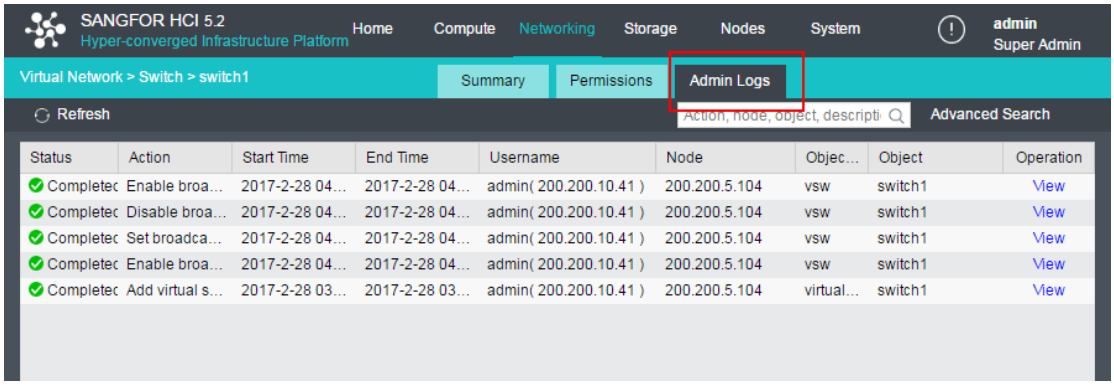
Interface: Specifies the interface. The packets passing through that interface will be captured.

Expression: Specifies expression to filter packets. On the right panel of the **Packets Capture & Analysis** page, it displays the expression formats.

Max File Size: Specifies the maximum size of the file. If a file size is larger than the maximum,

capturing packet will stop.

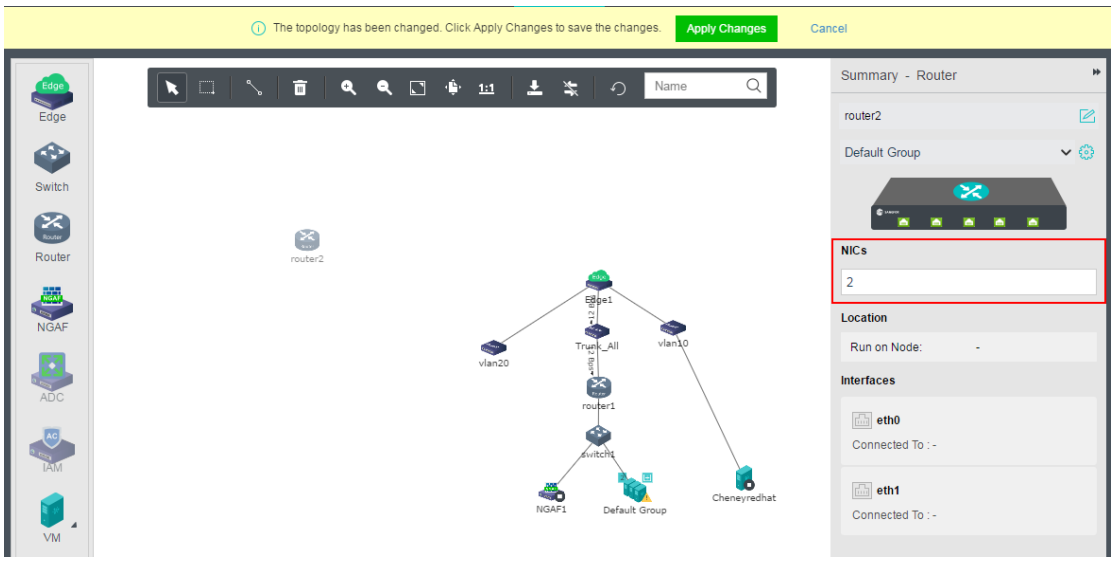
Admin Logs: Displays administrator logs, which record various operations on the switch, performed by administrator, such as adding connection. Each log contains the following information: **Status**, **Action**, **Start Time**, **End Time**, **Username**, **Node**, **Object Type**, **Object** and **Operation**. To view log details, click **View** in **Operation** column.



2.3.5. Configuring Virtual Router

On a virtual router, you can configure interface, VLAN subinterface, static route, NAT, access control, DHCP, DNS and high availability(HA).

To deploy a virtual router, go to **Networking**, enter editing status, drag a virtual router onto the canvas and then click **Apply Changes**, as shown in the following page. To edit router's name, select the router and edit its name on the right panel.

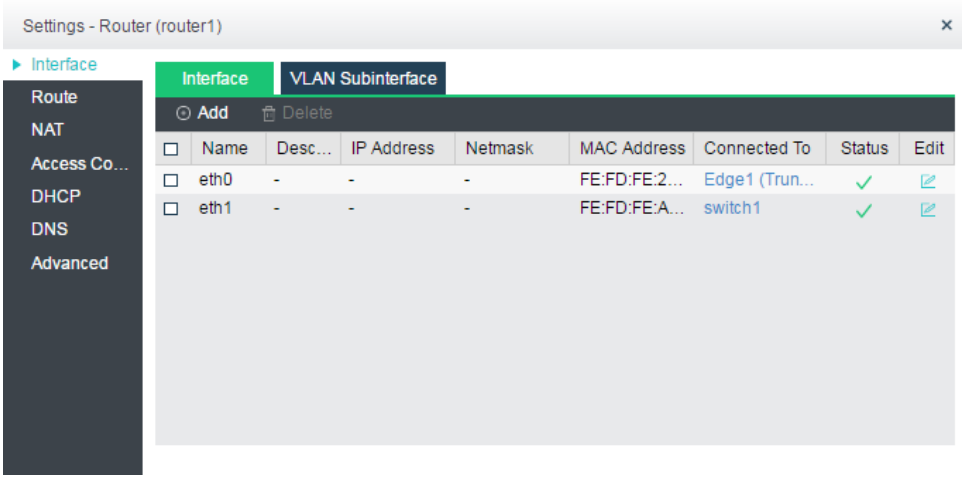


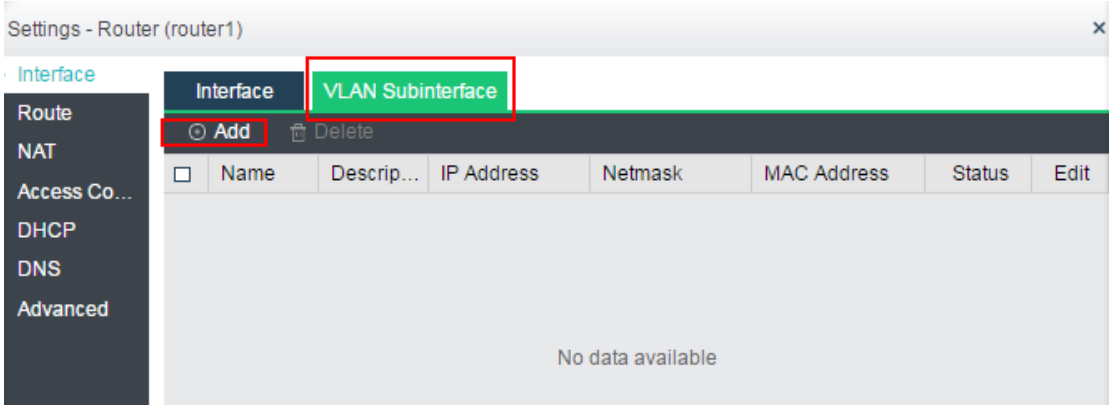
2.3.5.1. Viewing Router Settings

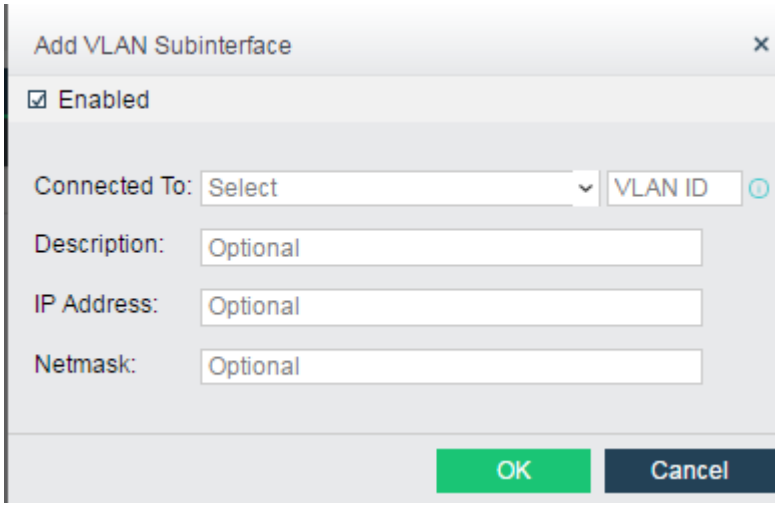
You can configure a virtual router by clicking **Settings** button to enter the **Settings** page. On that page, you can configure interface and VLAN subinterface, static route, NAT, access control policy, DHCP, DNS and high availability(HA).

Configuring Interface

On the **Interface** tab, you can configure the router's network interface and the corresponding VLAN subinterface.

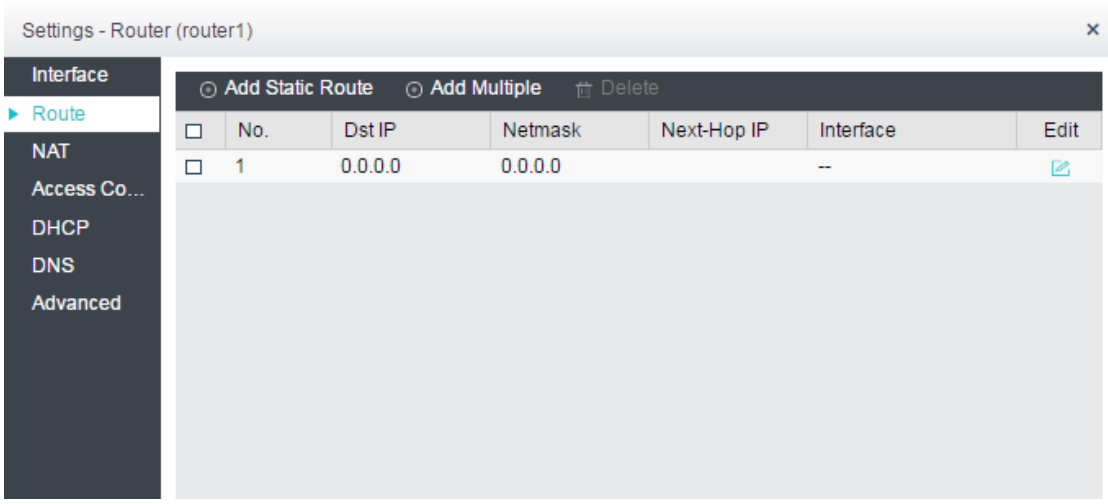




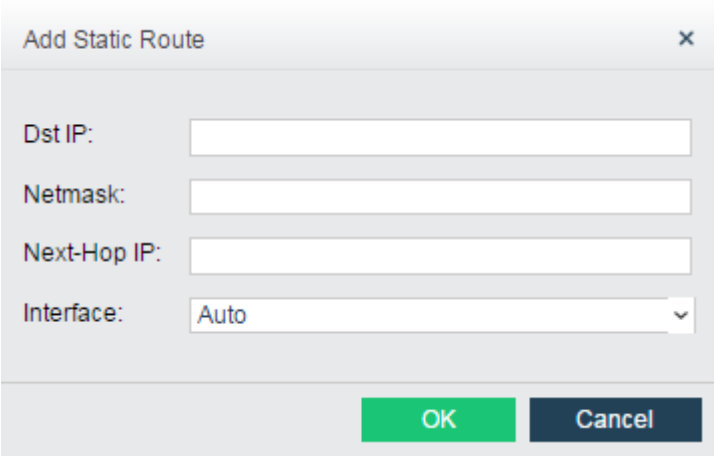


Configuring Static Route

On the **Route** tab, you can configure a static route, or multiple static routes at a time. Static route works when the router needs to send packets to various subnets.



To add a static route, click **Add Static Route** and configure related fields on the following page:



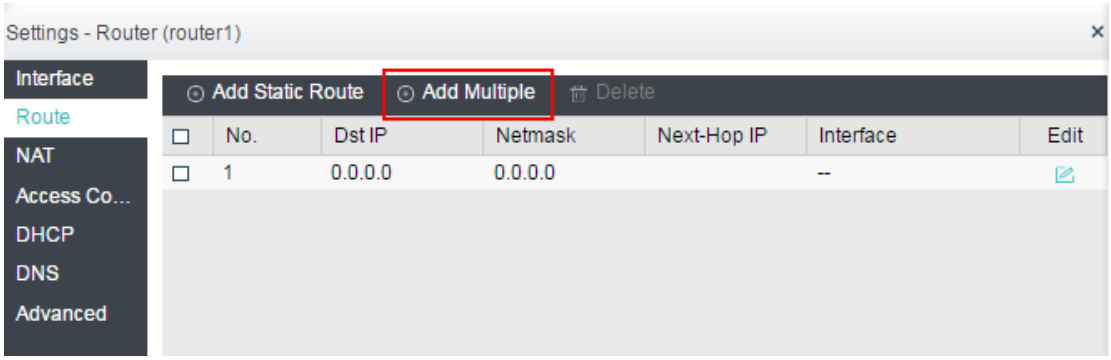
Dst IP: Specifies the destination IP address.

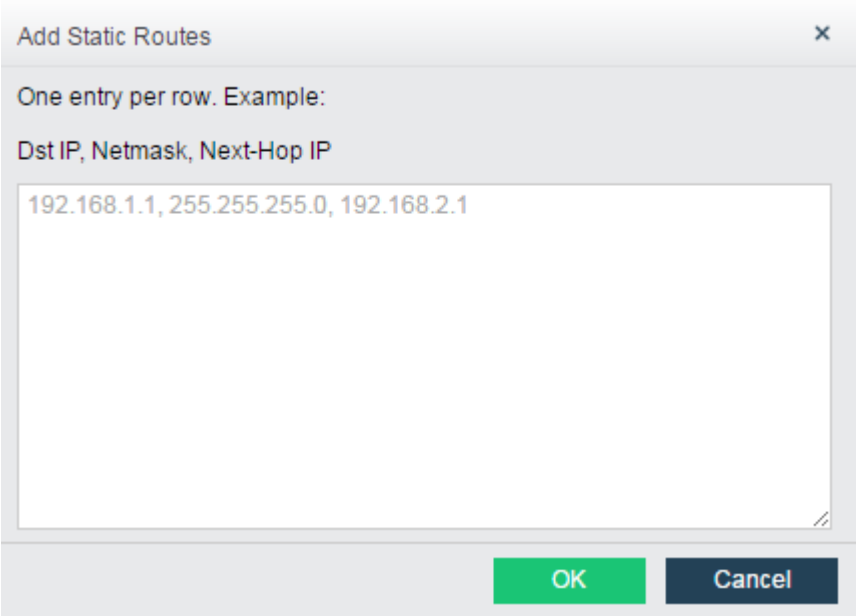
Netmask: Specifies netmask corresponding to the destination IP address.

[**Next-Hop IP**: Specifies the next-hop IP address.

Interface: Specifies the interface through which data is forwarded.

To add multiple static routes, click **Add Multiple** to enter the following page:

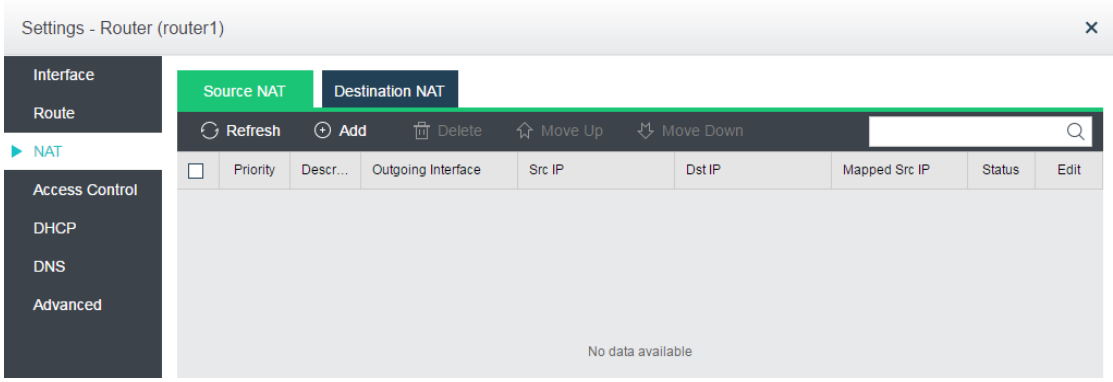




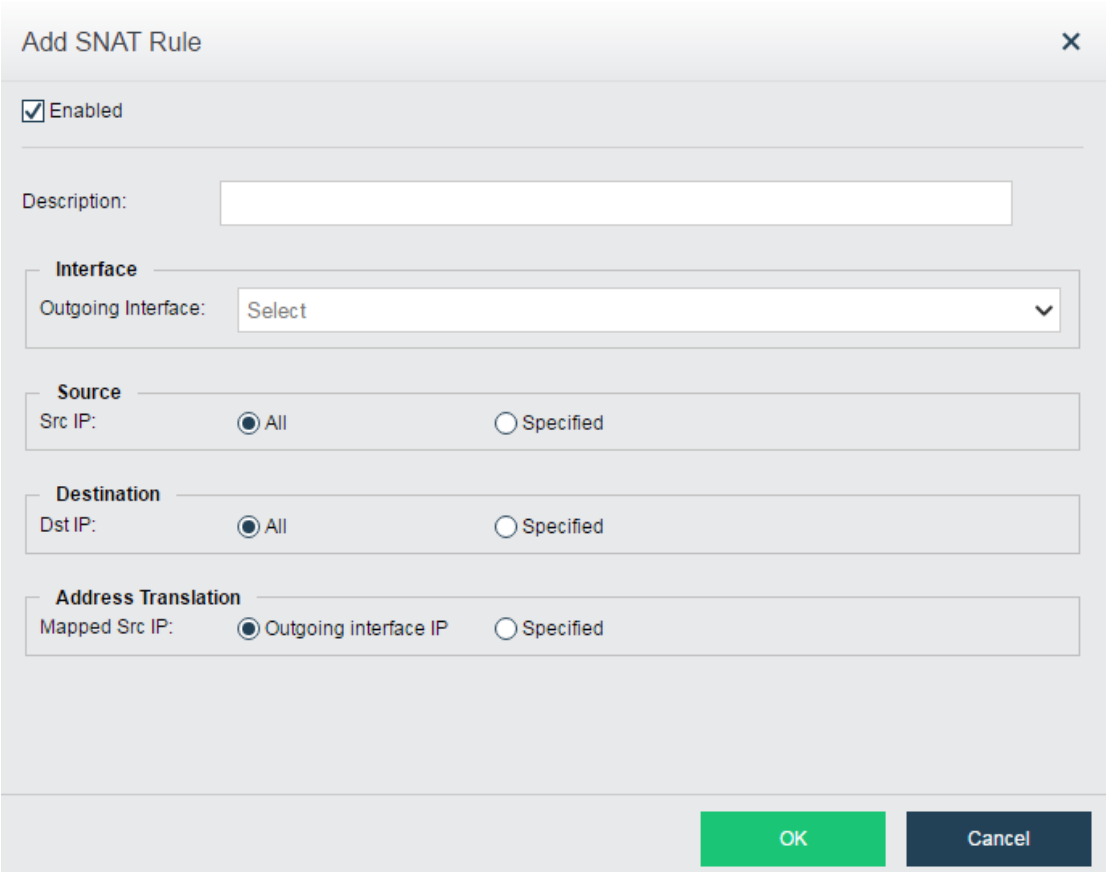
One static route per row. Example: destination IP address, netmask, next-hop IP address.

Configuring NAT Rule

On the **NAT** tab, you can configure SNAT and DNAT rules. SNAT is used to translate source IP address of a data packet, while DNAT is used to translate destination IP address of a data packet and commonly used to publish an internal service on a publicly accessible IP address.



To add a source NAT rule, click **Add** on the **Source NAT** tab and configure the fields on the following page:



Enabled: Select this option to enable the SNAT rule.

Description: Specifies description for the SNAT rule.

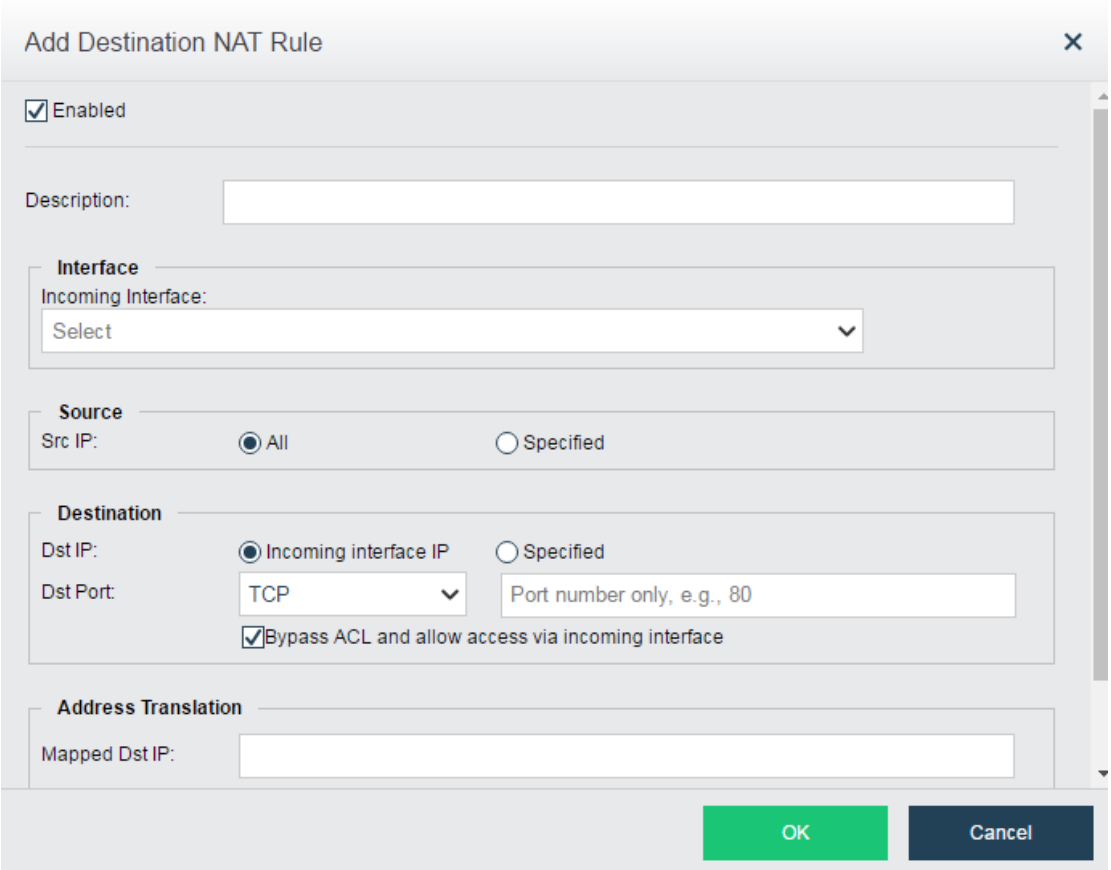
Interface: Specifies outgoing interface through which data is forwarded.

Source: Specifies source IP address. Options are **All** and **Specified**. If **Specified** is selected, only the IP addresses within the specified IP range will be translated

Destination: Specifies destination IP address. Options are **All** and **Specified**. If **Specified** is selected, only the source IP addresses of the packets routed to the specified destination IP address will be translated.

Address Translation: Specifies mapped source IP address. If **Outgoing interface IP** is selected, source IP address will be translated to the IP address of specified outgoing interface. If **Specified** is selected, source IP address will be translated to the specified IP address.

To add a DNAT rule, click **Add** on the **Destination NAT** tab, as shown below:



Enabled: Select this option to enable the DNAT rule.

Description: Specifies description for the DNAT rule.

Interface: Specifies the incoming interface through which inbound traffic flows into intranet.

Source: Specifies source IP address.

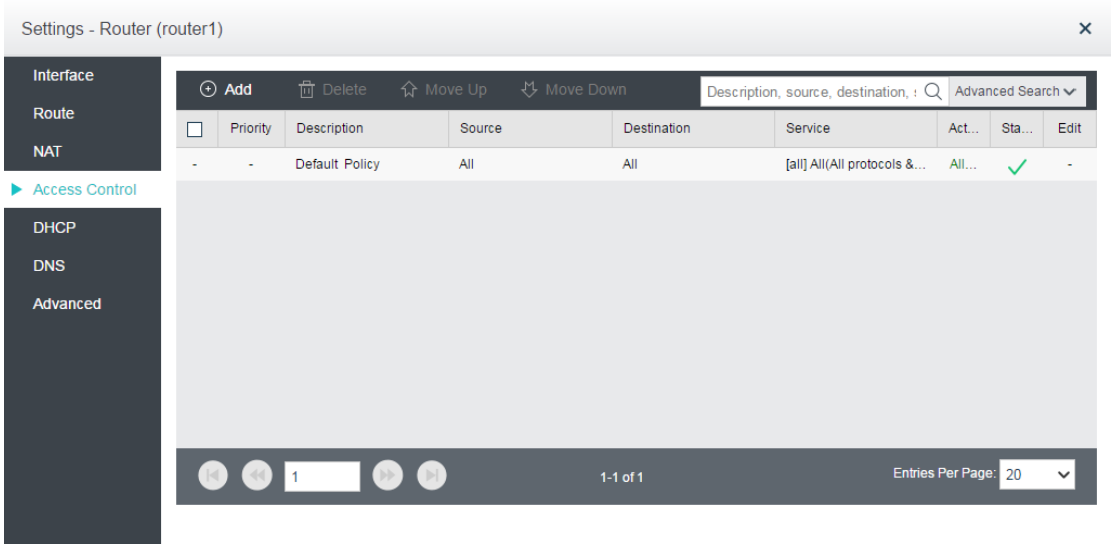
Destination: Specifies destination IP address and port. Destination IP address can be incoming interface address or a specified IP address. If **Incoming interface IP** is selected, the destination IP address will be translated to specified IP address only when the dst address is matching with the specified incoming interface address. To translate a destination port, you need to specify protocol, port number and mapped port. To bypass ACL and allow access via incoming interface, select the option **Bypass ACL and allow access via incoming interface**.

Address Translation: Specifies mapped destination IP address and mapped port.

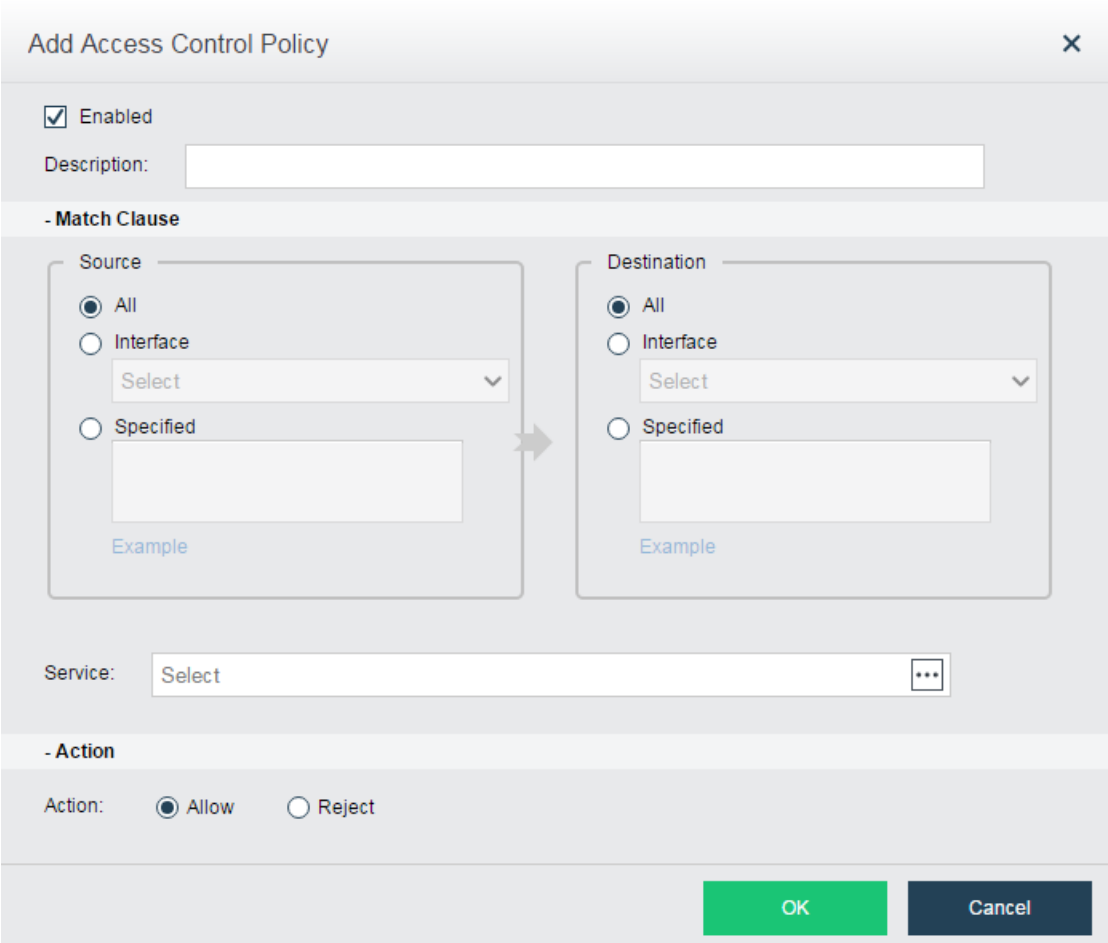
Configuring Access Control Policy

On the **Access Control** tab, you can add an access control policy. There is a default access control

policy which can be enabled or disabled but not deleted.



To add an access control policy, click **Add** to enter the following page:



Enabled: Select this option to enable the policy.

Description: Descriptive information of the policy.

Filter: Specifies **Source** and **Destination**.

All: Indicates any source or destination IP address.

Interface: Specifies source or destination interface.

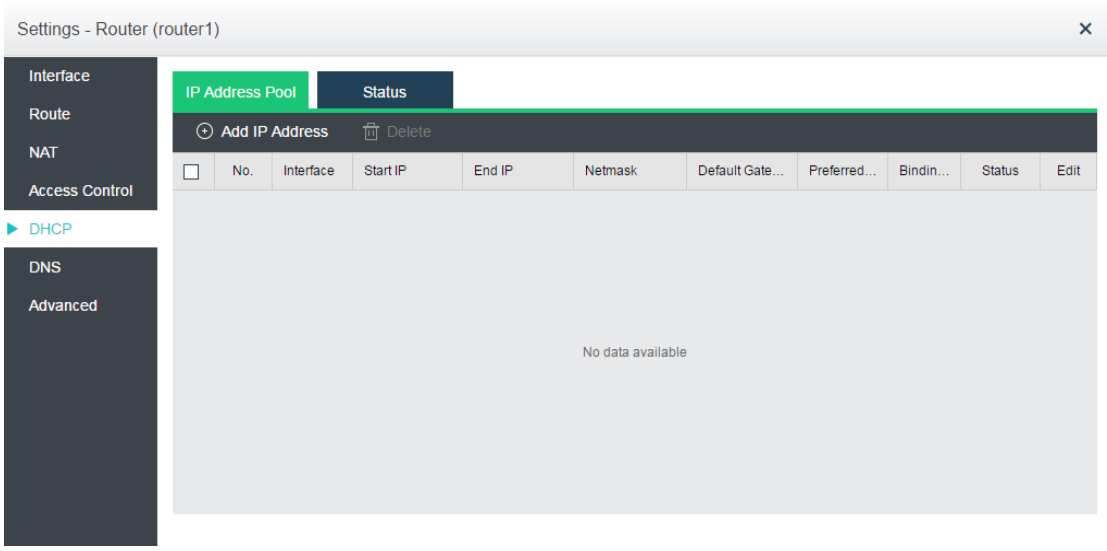
Specified: Specifies specific source or destination IP address.

Service: Specifies service, such as WEB, DNS and other services.

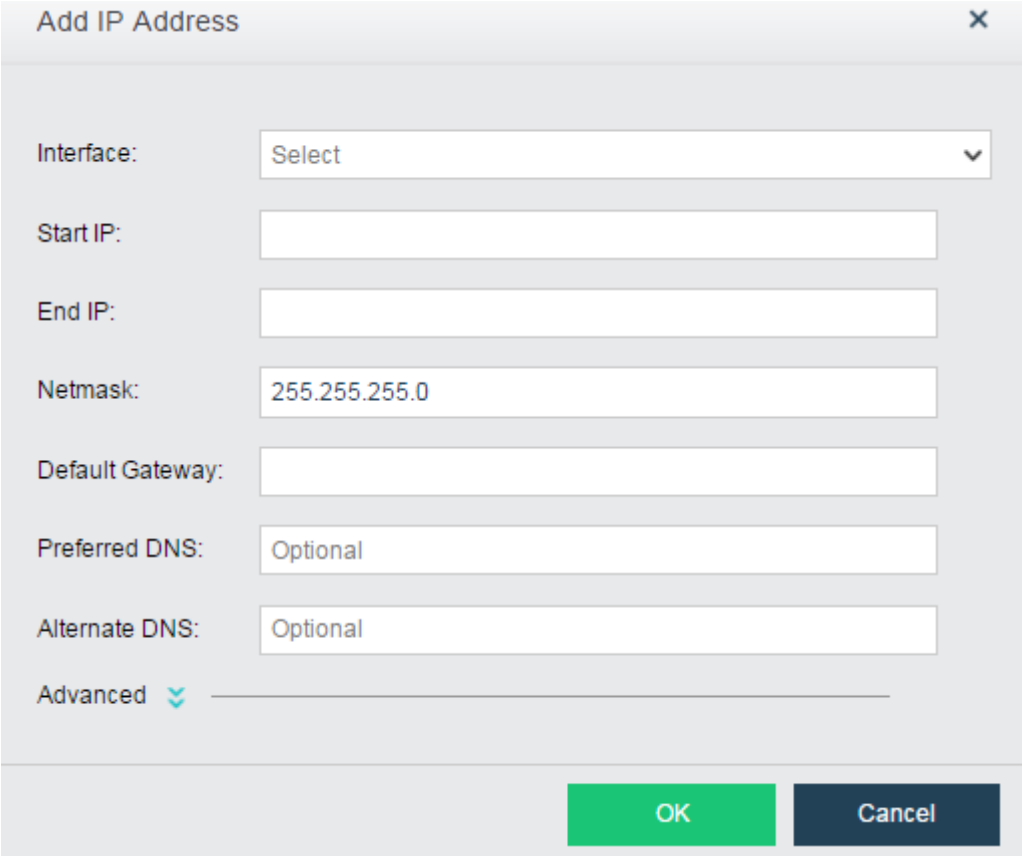
Action: Specifies action against matching packets. To allow the packets, select **Allow**. To reject packets, select **Reject**.

Configuring DHCP

DHCP is used to automatically assign IP addresses to virtual machines. You can configure DHCP address pool on the **IP Address Pool** tab and view status of assigned IP addresses on the **Status** tab.

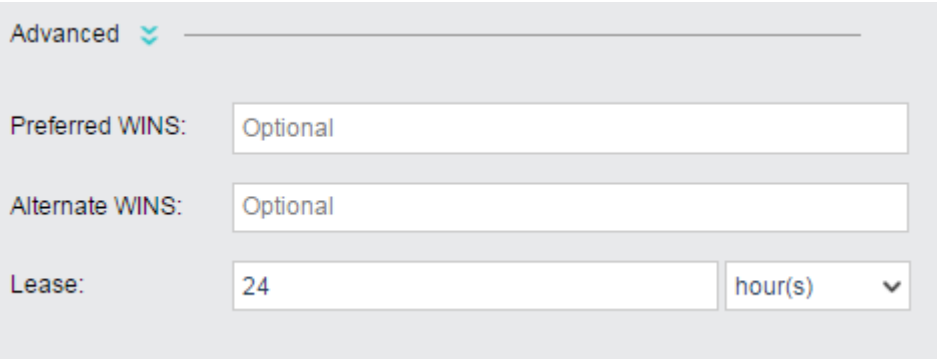


To add IP address pool, click **Add IP Address** on the **IP Address Pool** tab.

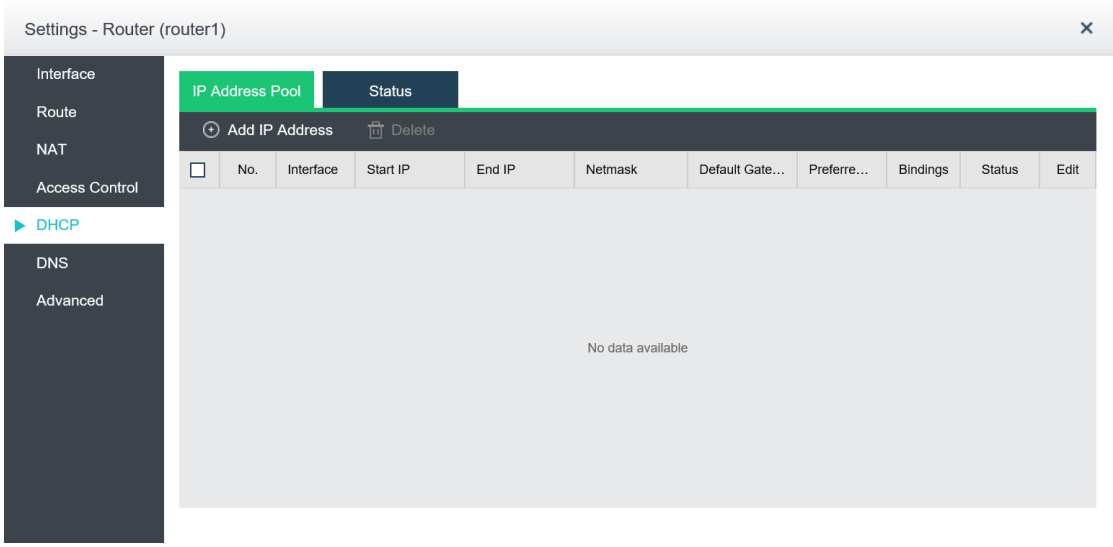


On the above page, specify Interface, **Start IP**, **End IP**, **Netmask**, **Default Gateway**, **Preferred DNS** and **Alternate DNS**.

Advanced: You can specify **Preferred WINS**, **Alternate WINS**, and **Lease**, as shown below:

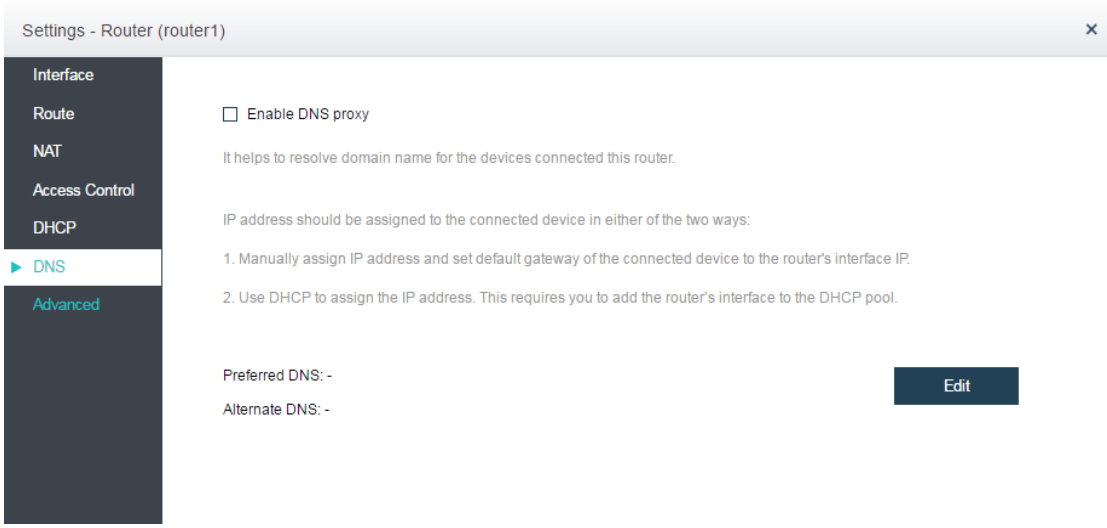


On the **Status** tab, it displays the following information: **Interface**, **IP Address**, **Host Name**, **MAC**, **Time Assigned**, **Lease Expiration** and **Bindings**. To bind IP address with a corresponding host, click **Bind** and specify MAC address. Thus, the IP address will be only assigned to the host with the specified MAC address.



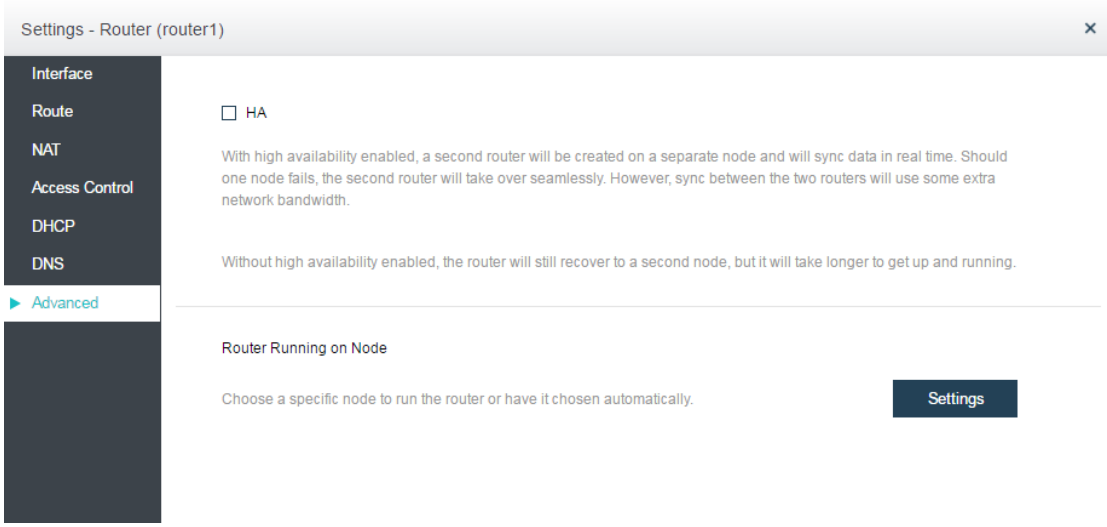
Configuring DNS

DNS proxy can help to resolve domain names for the devices connected to the virtual router. To edit DNS server, click **Edit**.



Configuring Advanced Settings

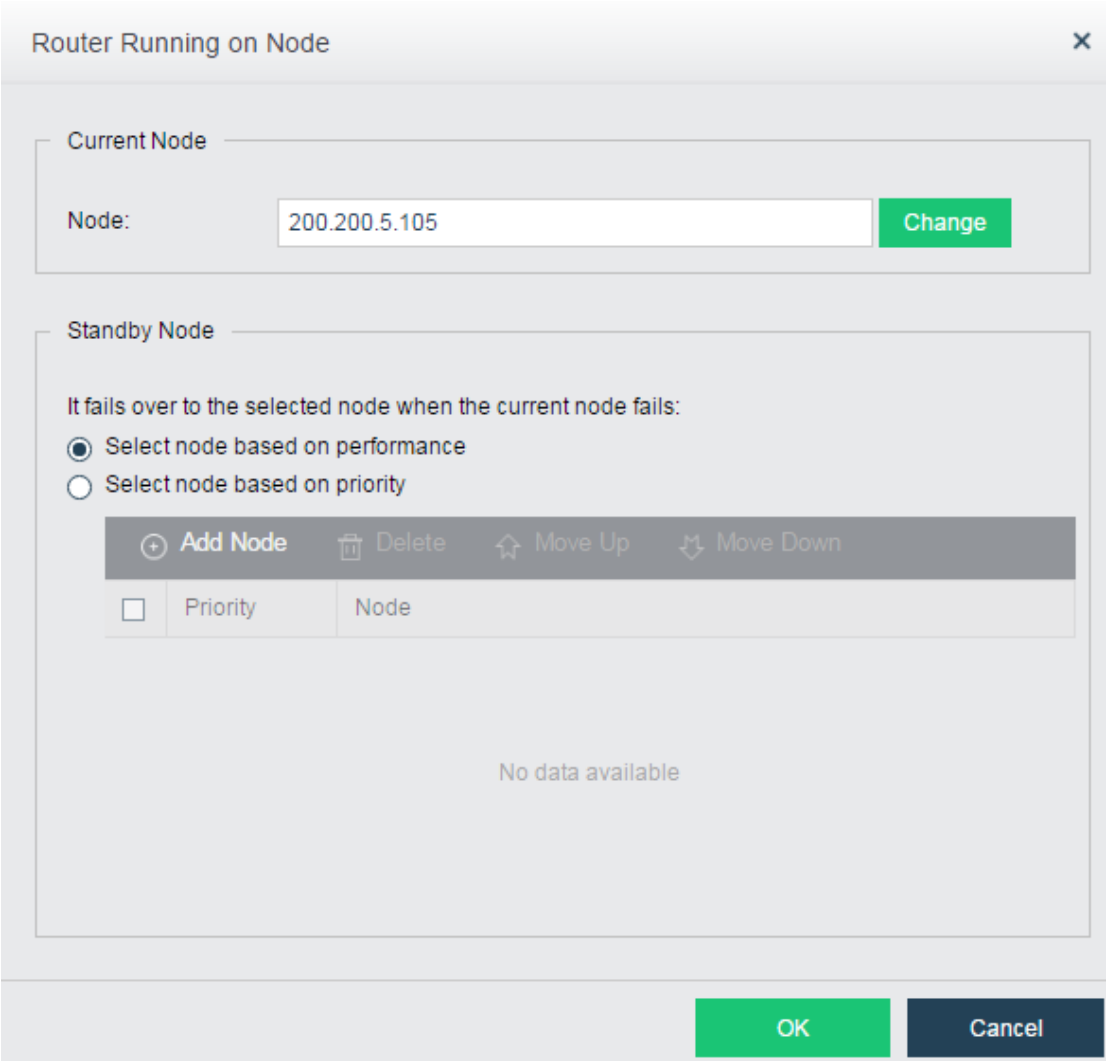
On the **Advanced** tab, you can enable high availability (HA) and specify a node to run virtual router.



To enable HA, select the option HA. If HA is enabled, a second router will be built on another node and synchronize data in real time. If one node fails, the second router will take over seamlessly. However, synchronizing data between the two routers will consume extra network bandwidth.

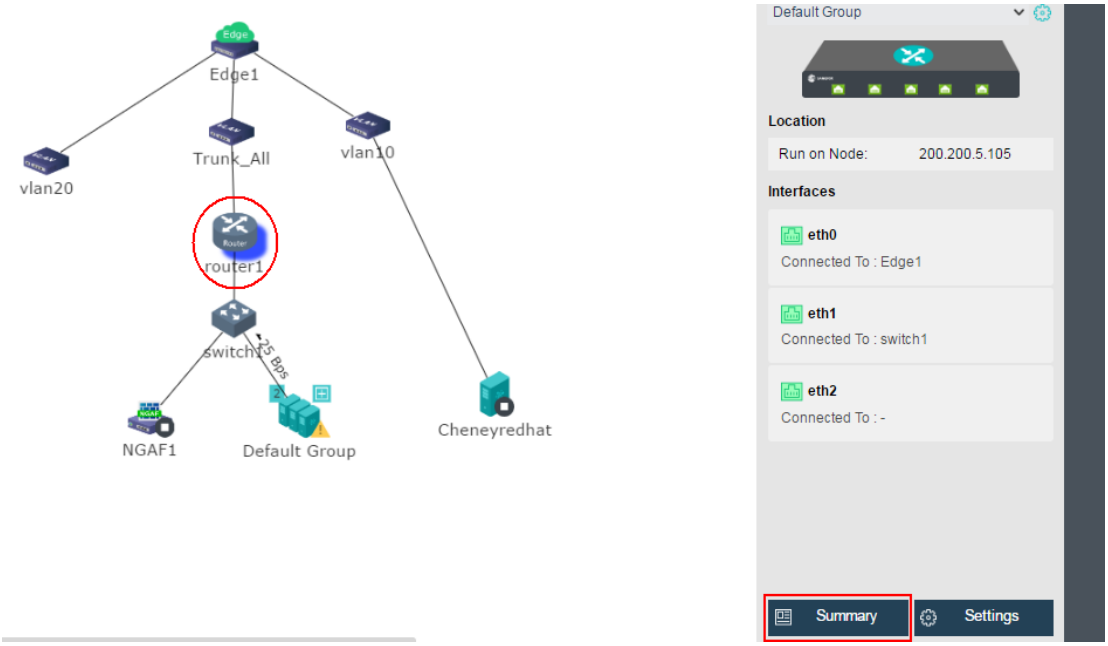
Without HA enabled, the router will be recovered on another node when the node running that router fails, but it will take a longer time.

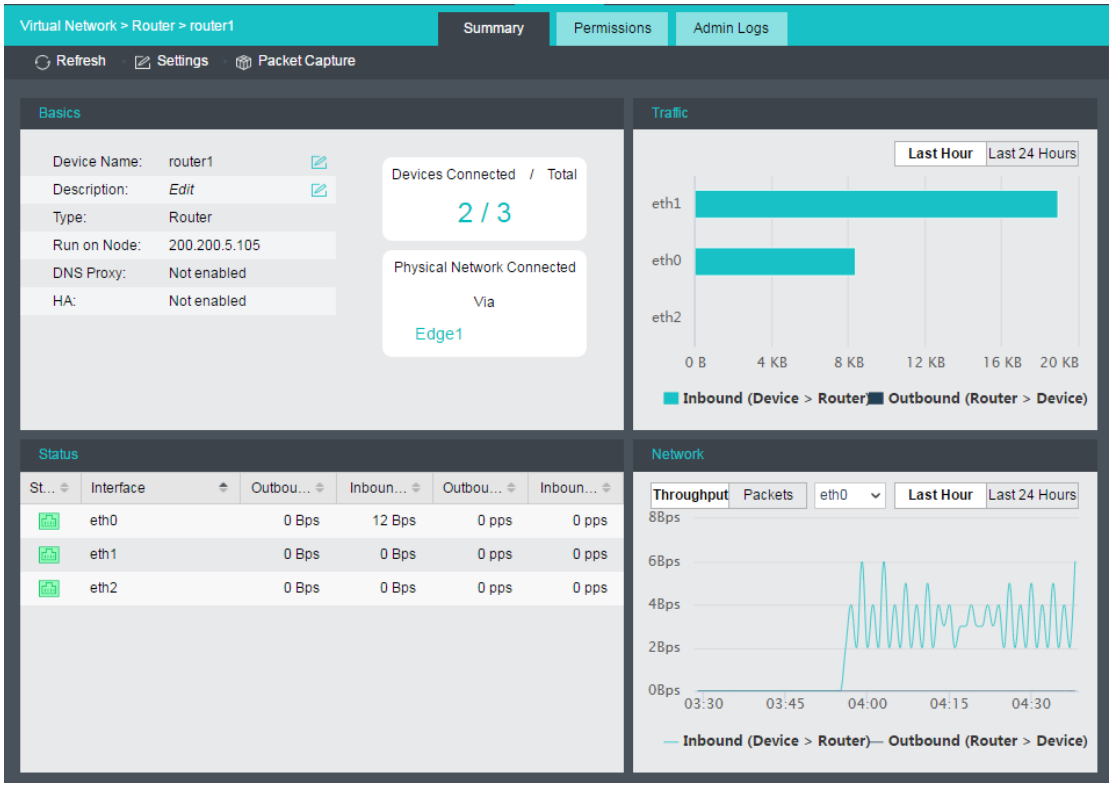
[**Router Running on Node**]: By default, the node where the router runs is automatically selected according to the settings on the following page. You can change the current node running the router as per your need.



2.3.5.2. Viewing Router Summary

You can view detailed information of a virtual router by selecting the router and clicking **Summary** button. On the **Summary** page, it displays **Basics**, **Traffic**, **Status** and **Network**. On the **Admin Logs** page, it displays administrator logs.

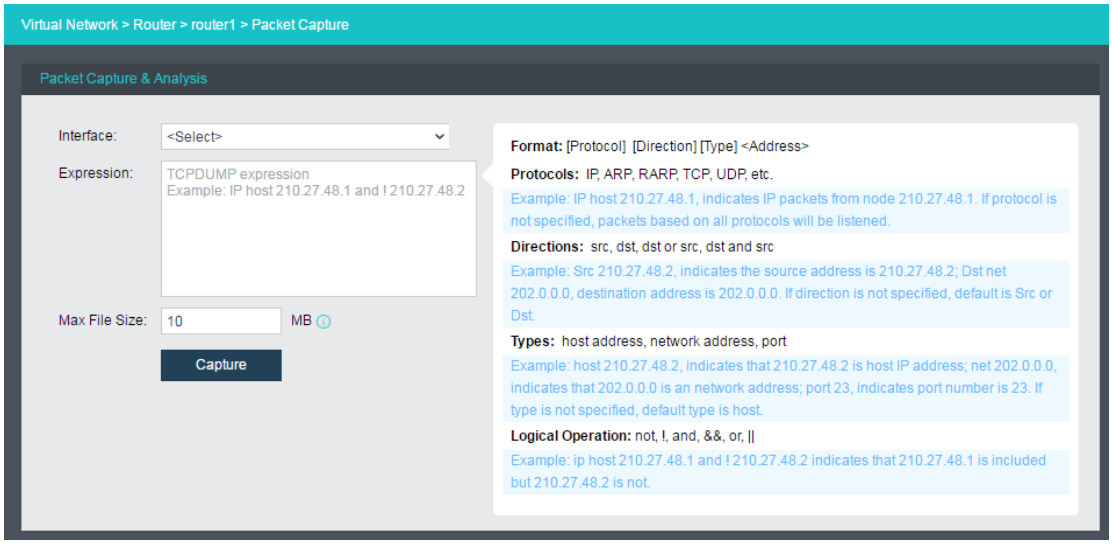




To reload the current page, click **Refresh**.

To configure the virtual router, click **Settings**.

To capture and analyze packets, click **Packet Capture**, as shown below:

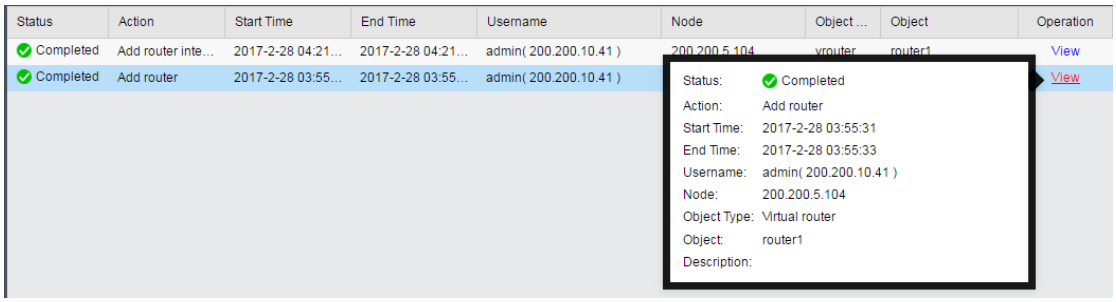


Interface: Specifies the interface. The packets passing through that interface will be captured.

Expression: Specifies expression to filter packets. On the right panel of the **Packets Capture & Analysis** page, it displays the expression formats.

Max File Size: Specifies the maximum size of the file. If a file size is larger than the maximum, capturing packet will stop.

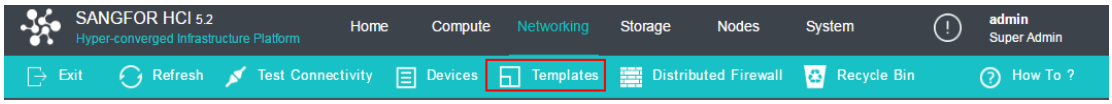
Admin Logs: This section displays administrator logs, which record various operations on the router, performed by administrator, such as adding an interface. Each log contains the following information: **Status**, **Action**, **Start Time**, **End Time**, **Username**, **Node**, **Object Type**, **Object** and **Operation**. To view log details, click **View** in **Operation** column.



2.3.6. Configuring Virtual Network Device

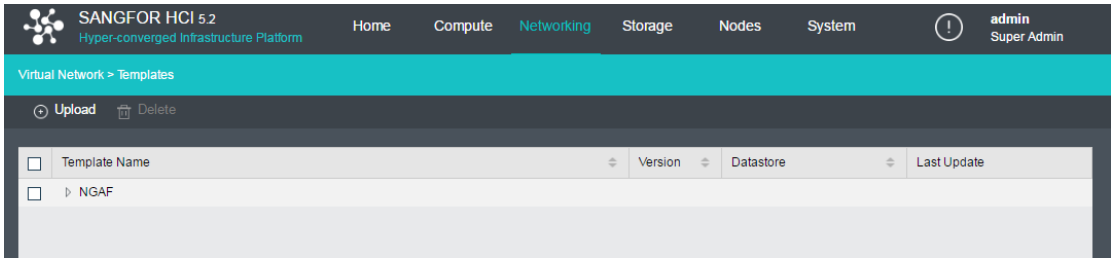
Currently, only the virtual network devices (NGAF and ADC) could be deployed into virtual network in **Networking**.

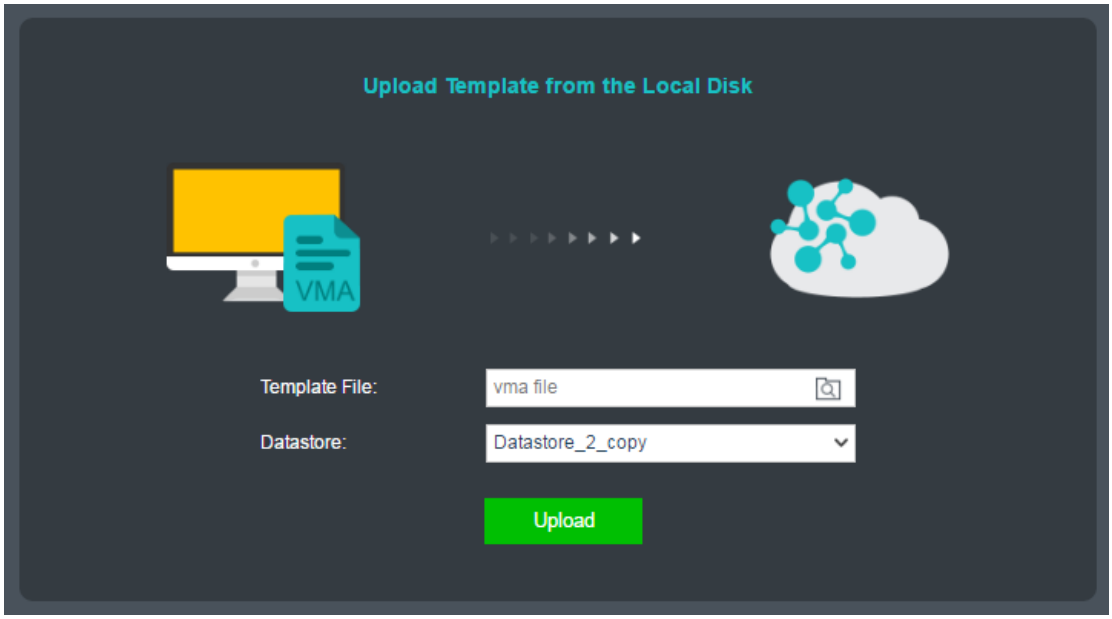
Navigate to **Networking** and click **Templates**, as shown below:



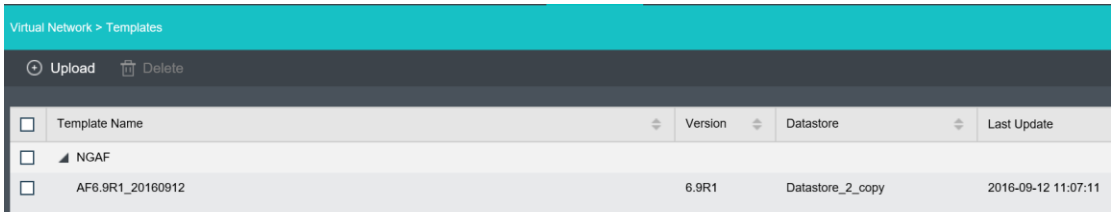
2.3.6.1. Uploading Template

In **Networking > Templates**, you can upload the .vma file of a virtual network device. To upload a template file, click **Upload**, select the vma file that you want to upload, and specify datastore. Then click **Upload** to start upload.

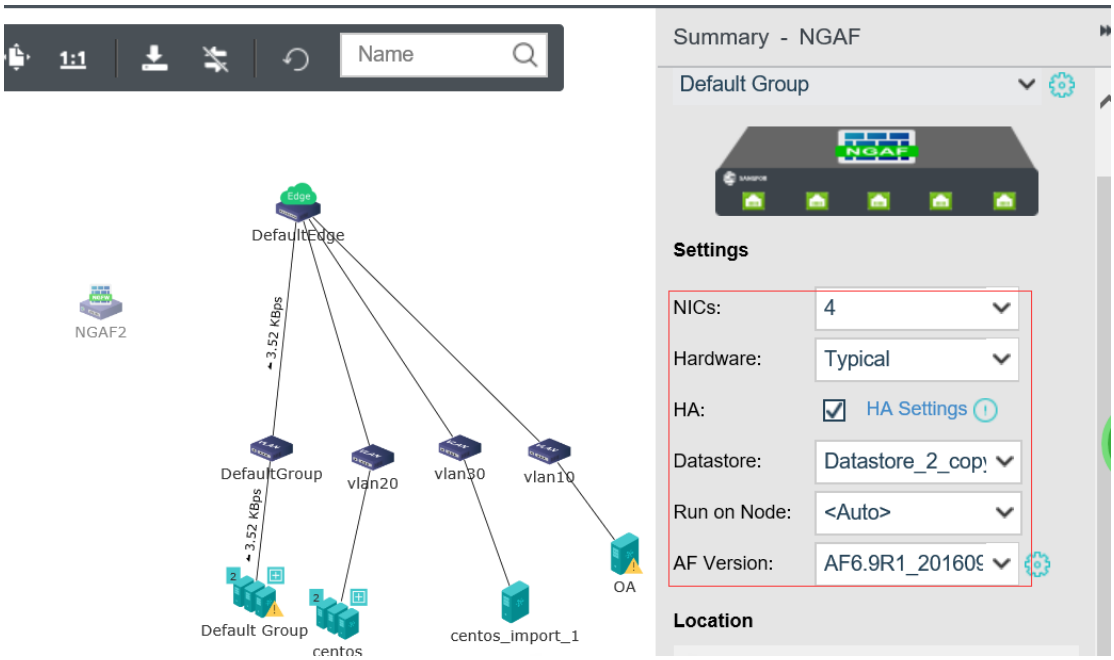




If the template file is uploaded successfully, you will see its information in the template list, as shown below:

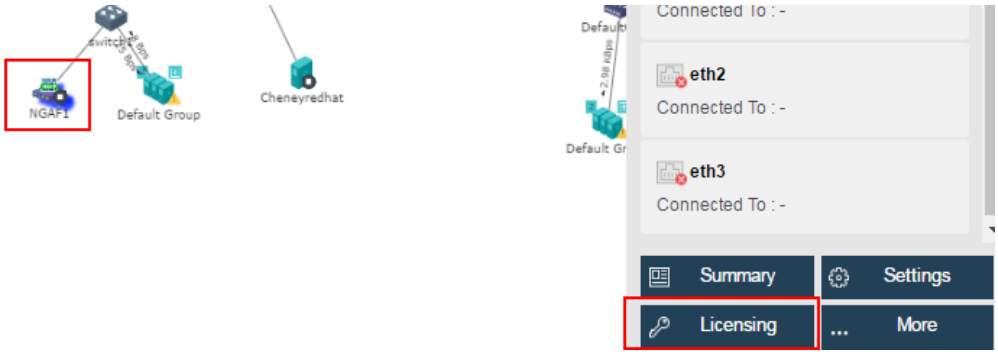


To create a virtual network device, drag the virtual network device onto the canvas and configure the basic information, then click **Apply Changes**.

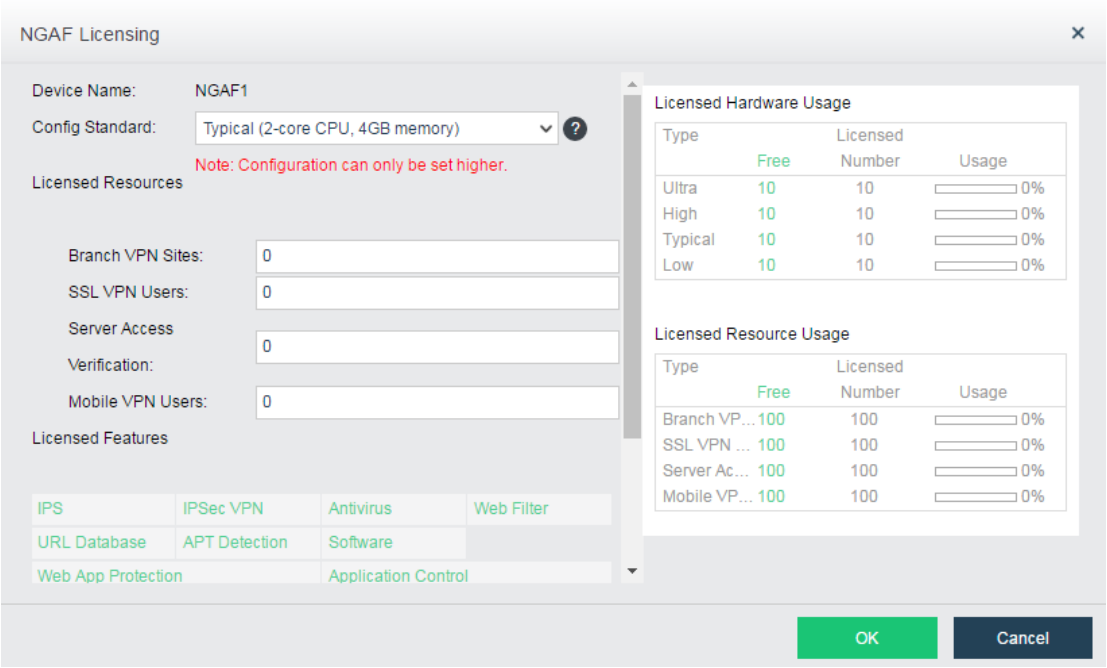


2.3.6.2. Licensing Virtual Network Device

After a virtual network device is created, you need to license it before using it.



To license virtual network device, click **Licensing** button, as shown below:



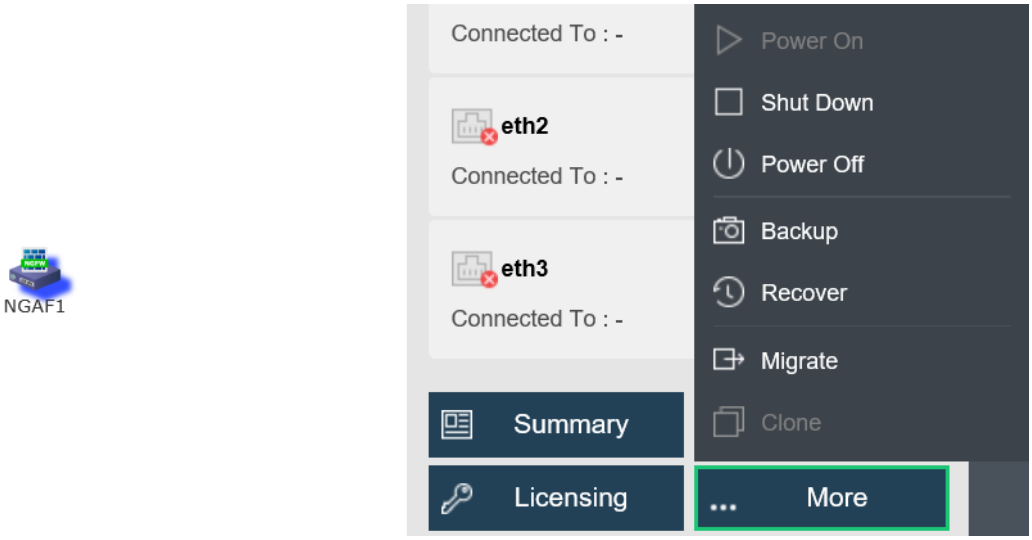
Device Name: Displays the name of virtual network device.

Config Type: Specifies configuration type of the virtual network device. Note that configuration can only be set higher.

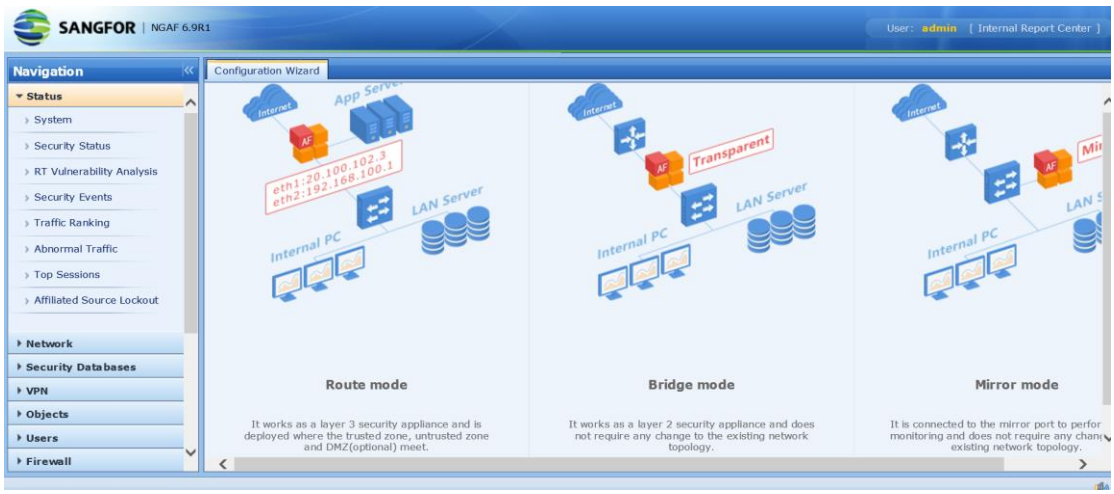
Licensed Resources: Specifies licensed resources of the virtual network device.

Licensed Features: Displays licensed functions.

When the virtual network device is successfully licensed, it will be automatically restarted and then you will see the **Web Console** and **More** buttons on the right panel in **Networking**. To perform more operations against the virtual network device, click **More**, and select an operation, such as **Shut Down**, **Power Off, Backup**, **Recover**, **Migrate** and **Clone**, etc.

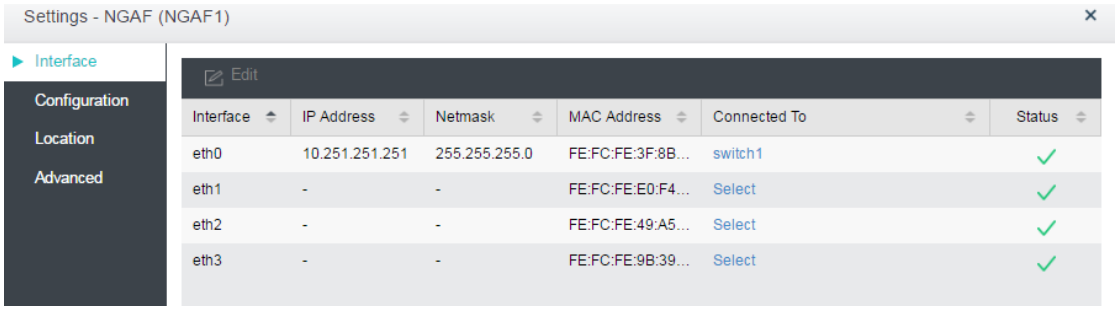


To enter Web admin console of virtual network device, click **Web Console**.



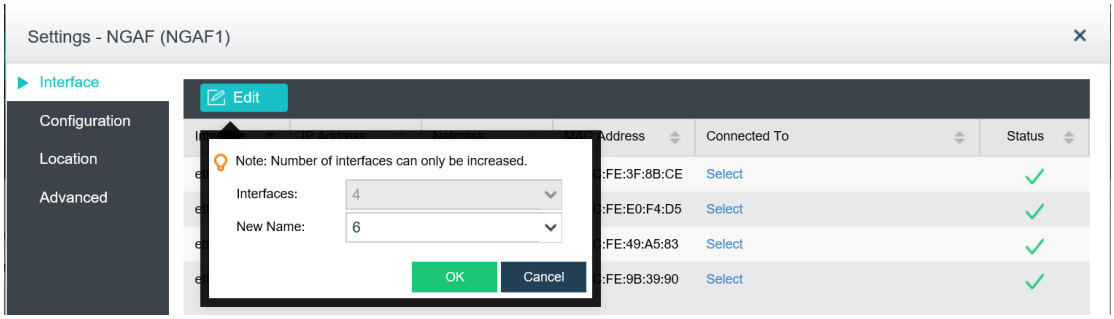
2.3.6.3. Configuring Virtual Network Device

To configure a virtual network device, select it and click on **Settings** button to enter settings page, as shown below:



Configuring Interface

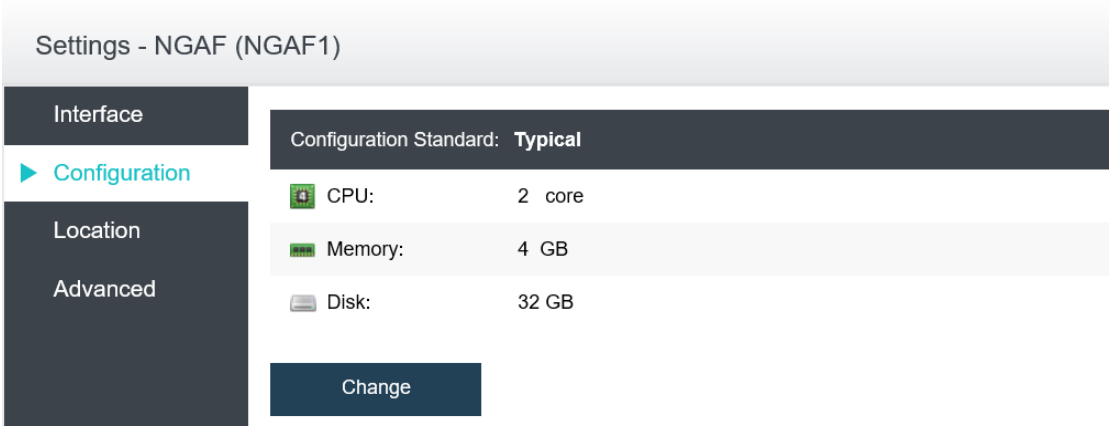
On the **Interface** tab, it displays the following information: **Interface**, **IP Address**, **Netmask**, **MAC Address**, **Connected To** and **Status**. To change number of interfaces, click **Edit**.



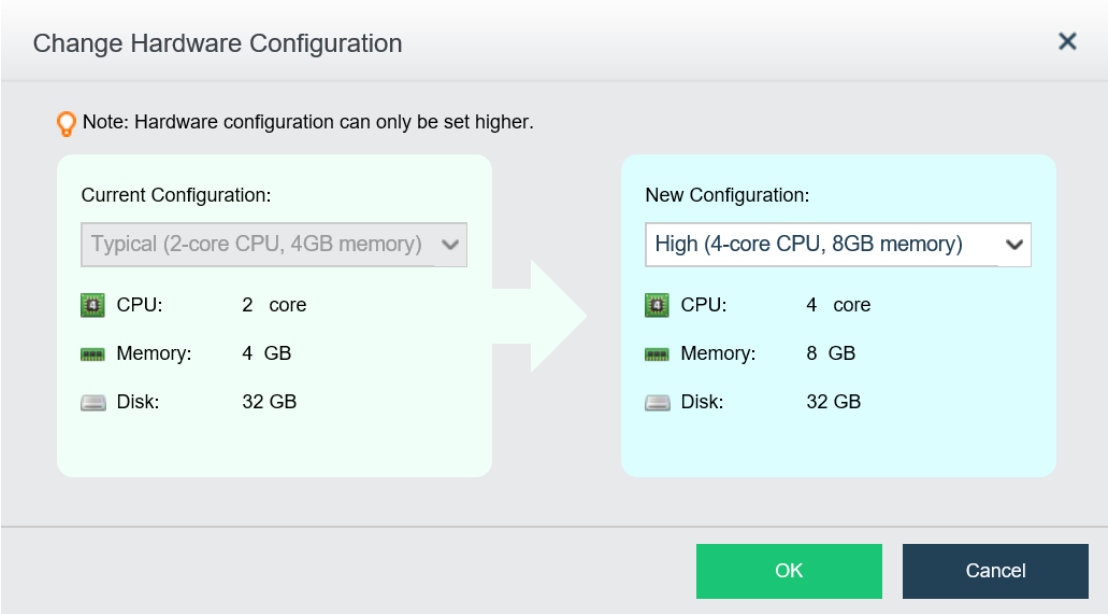
To enable an interface, click on the icon. To disable an interface, click on the icon.

Modifying Configuration

Hardware configuration is displayed on the **Configuration** tab, including CPU, memory and disk.



To change configuration of the virtual network device, click on the **Change** button to enter the following page:

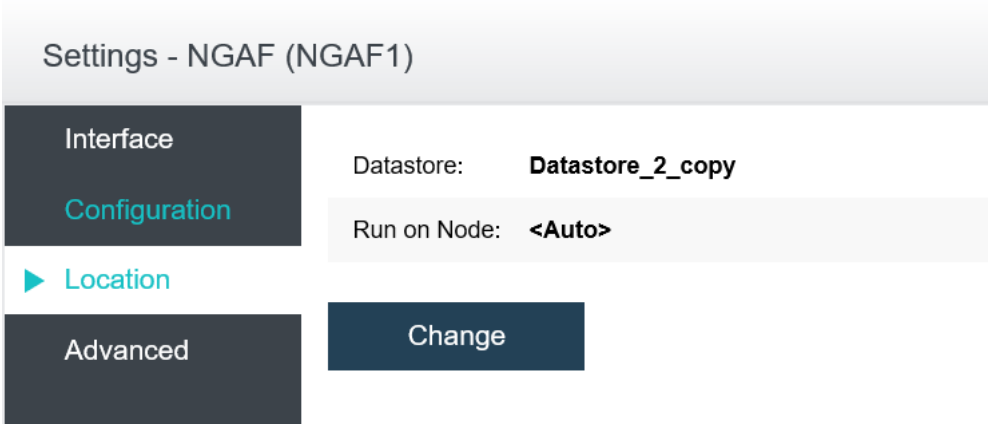


On the above page, you can modify hardware configuration.

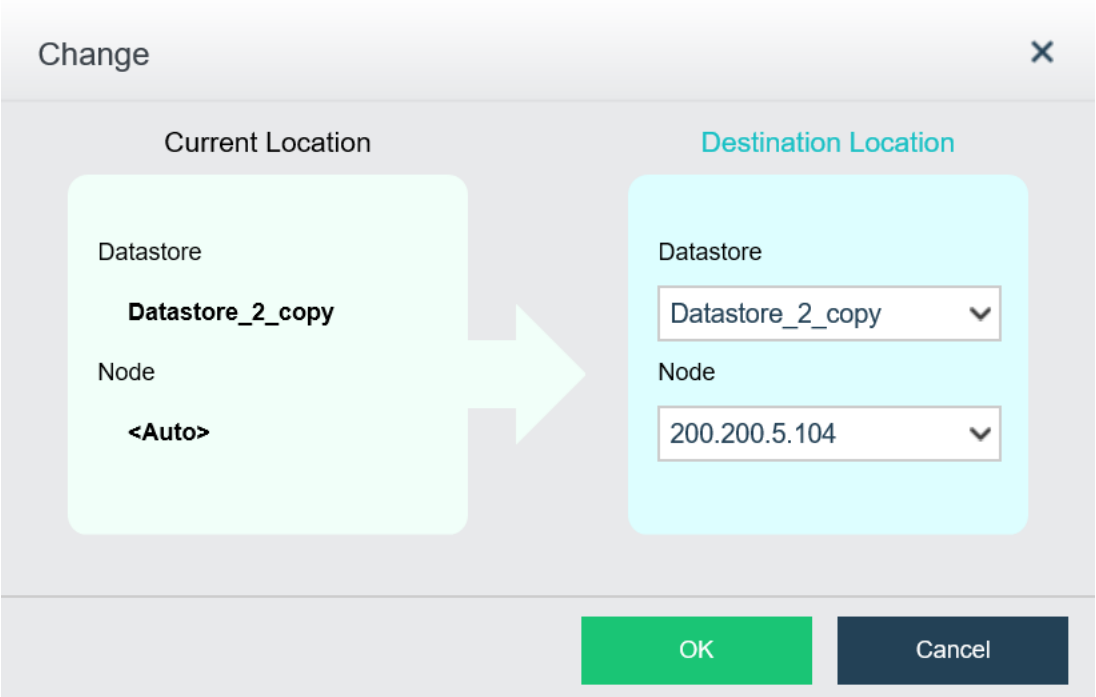
Hardware configuration can only be set higher.

Changing Location

On the **Location** tab, it displays the datastore where the virtual network device is stored and the node running the virtual network device.



To change the current location, click on the **Change** button to enter the following page and specify destination location.



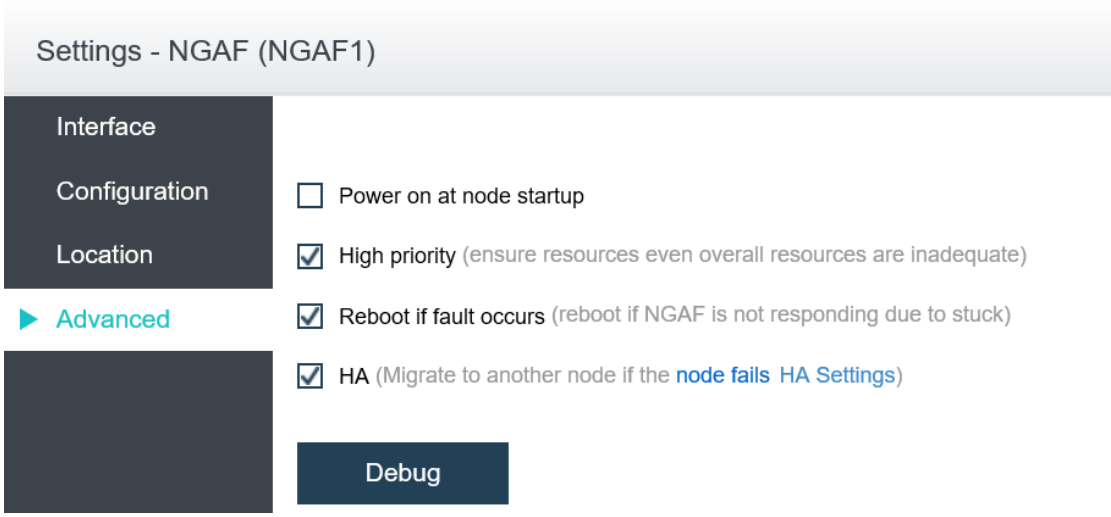
As shown above, the current location is displayed on the left side and the destination location can be specified on the right side.

If the destination datastore is not shared, HA will not be supported.

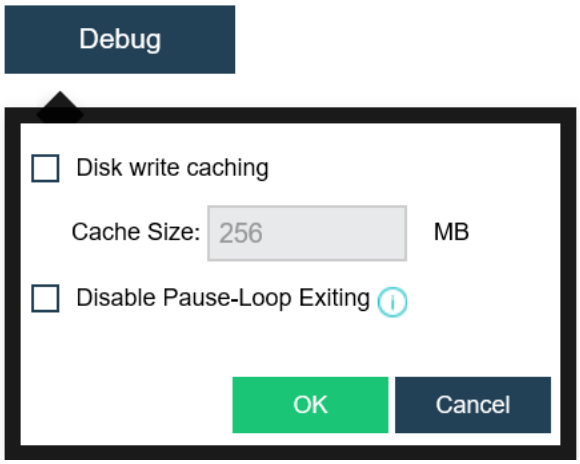
Configuring Advanced Options

On the **Advanced** tab, there are the following options:

- **Power on at node startup**: If it is selected, virtual network device can be automatically powered on upon node startup.
- **High priority**: It ensures that the virtual network device has enough resources even when overall resources are inadequate.
- **Reboot if error occurs**: If it is selected, virtual network device can be automatically restarted when it is not responding due to stuck.
- **HA**: It enables virtual network device to be migrated to another node when the node running that virtual network device fails.

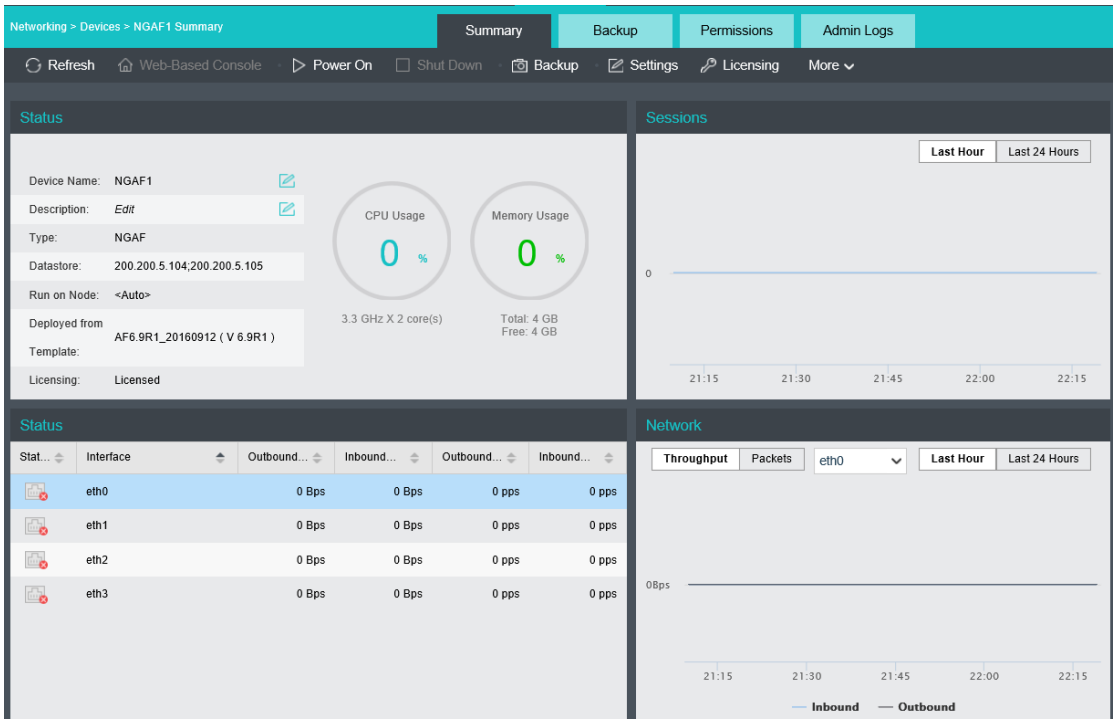


To configure debugging options, click **Debug** to enter the following page. On that page, you may select **Disk write caching**, which enables files on disks to be loaded to memory so as to improve disk IO performance.



2.3.6.4. Viewing Virtual Network Device Summary

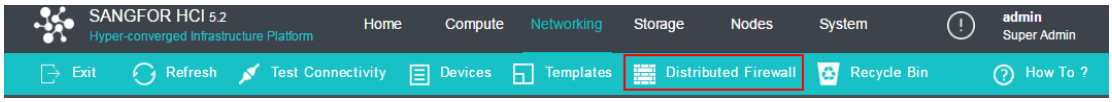
You can view detailed information of virtual network device by selecting that device and clicking **Summary** button. The following information are displayed on the **Summary** page: device status, sessions, connection status, and inbound and outbound rate. On the **Admin Logs** page, you can view detailed operation logs.



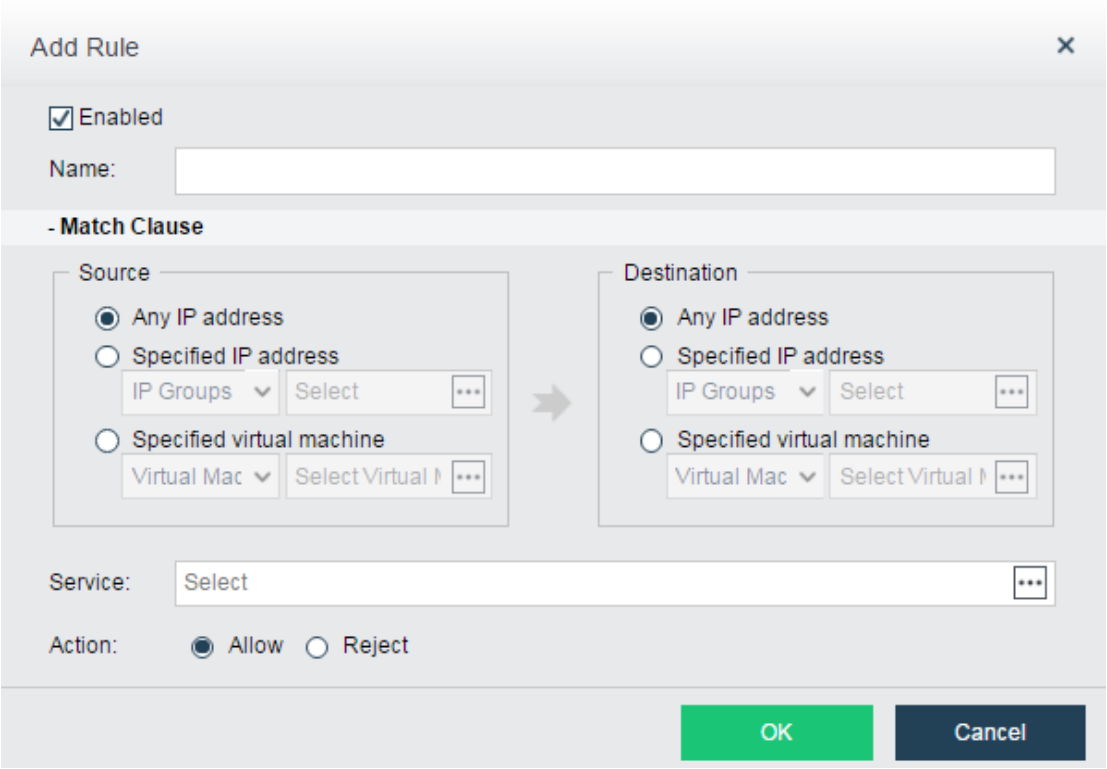
On the above page, you can perform the following operations: **Power On**, **Shut Down**, **Backup**, configuring **Settings**, **Licensing**. Click **More** to perform more operations, such as **Power Off**, **Migrate** and **Clone**.

2.3.7. Distributed Firewall

Sangfor HCI5.2 version provides a new function distributed firewall which can achieve control over access to any node based on virtual machine IP address, virtual machine, VM group or VM tag.



To configure a firewall rule, click **Distributed Firewall** in **Networking** and then click **Add** to enter the following page.

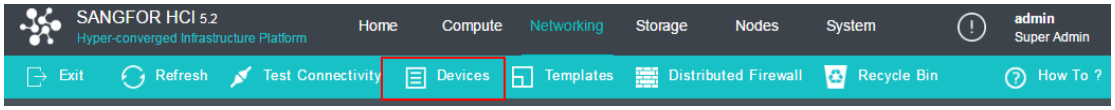


To enable firewall rule, select **Enabled**.

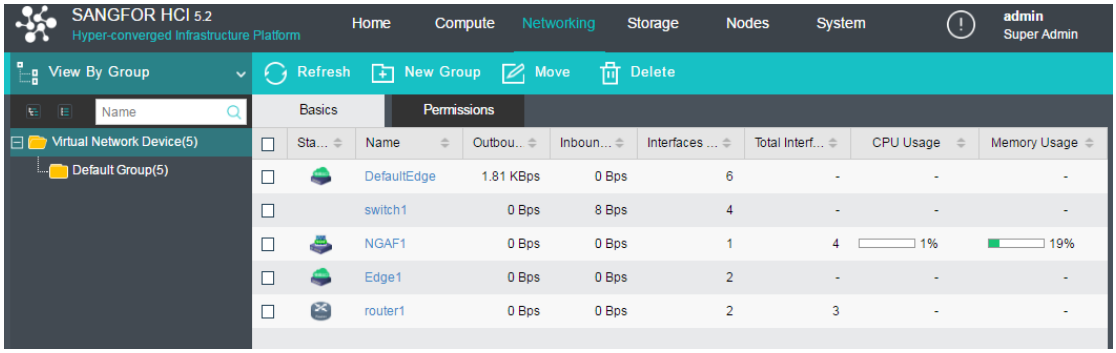
The following are contents included on the above page.

- **Name**: Specifies a distinguishable name for the firewall rule.
- **Match Clause**: For **Source** and **Destination**, options are **Any IP address**, **Specified IP address**, **Specified virtual machine**. If **Specified IP address** is selected, you can select **IP Groups** or **IP Addresses**. If **Specified virtual machine** is selected, you can select **Virtual Machine**, **VM Group**, or **Tags**.
- **Service**: Specifies service(s) to which the firewall rule applies.
- **Action**: Specifies action to matching service, **Allow** or **Deny**.

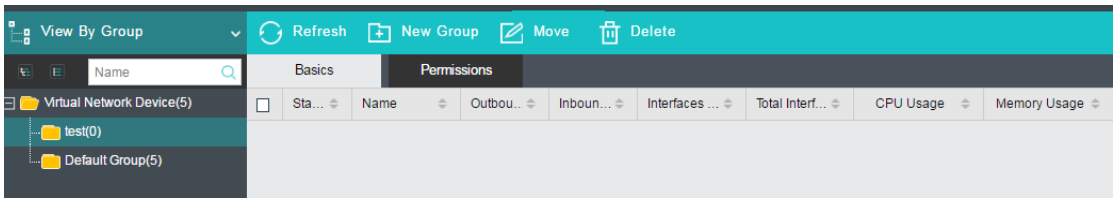
2.3.8. Viewing Devices



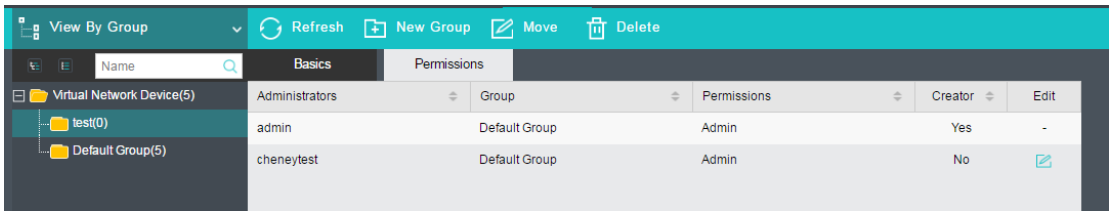
In **Networking > Devices**, it lists the following virtual network devices: virtual switches, edge, virtual routers, NGAF, IAM, vADC. On the **Basics** page, you can view the following information: **Status**, **Name**, **Outbound**, **Inbound**, **Interfaces**, **Total Interfaces**, **CPU Usage**, **Memory Usage**.



Virtual network devices can be created and added to different groups so that they can be managed by sub-administrators with different permissions.

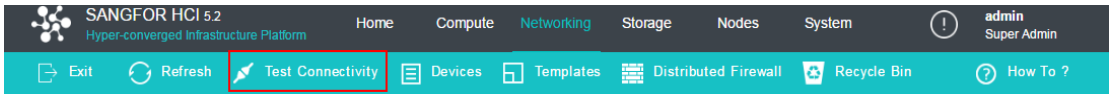


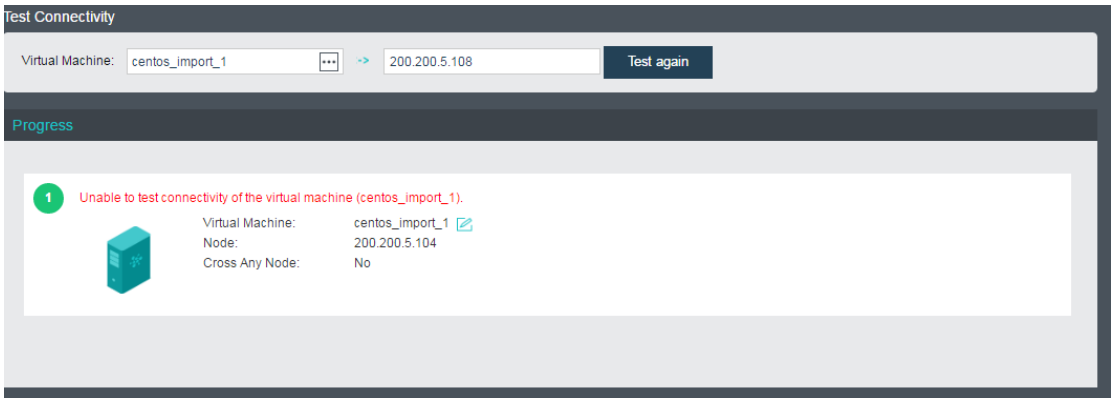
On the **Permissions** page, you can edit permission of virtual network devices. But you need to add virtual network resource in the **Sub Administers** to get access to **Permissions.**



2.3.9. Testing Connectivity

Test Connectivity tool can help administrators to quickly and easily troubleshoot network issues, which just requires administrator to specify source and destination addresses. To test connectivity, specify a source virtual machine and destination IP address, then click **Start**, as shown below:

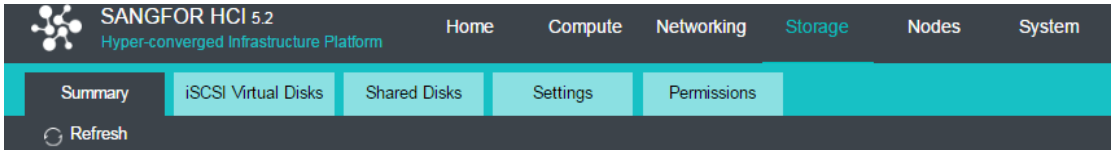




To test connectivity from a virtual machine, that virtual machine must be powered on and installed vmTools.

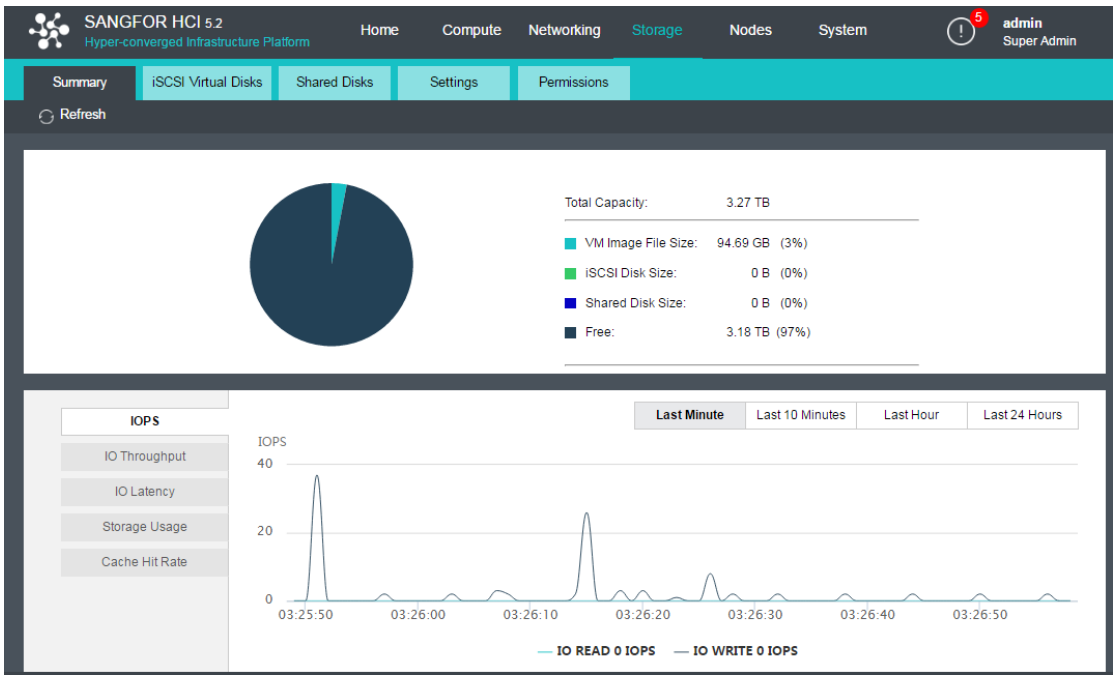
2.4. Virtual Storage

Navigate to **Storage** and you will see **Summary**, **iSCSI Virtual Disks**, **Shared Disks**, **Settings**, **Permissions** page, as shown below**.**

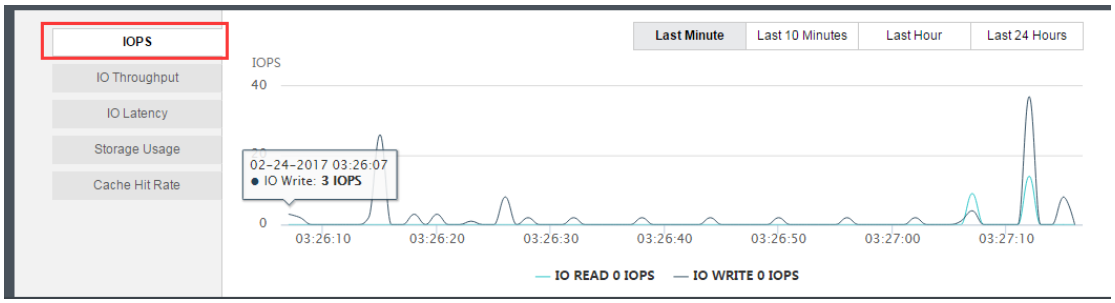


2.4.1. Viewing Storage Summary

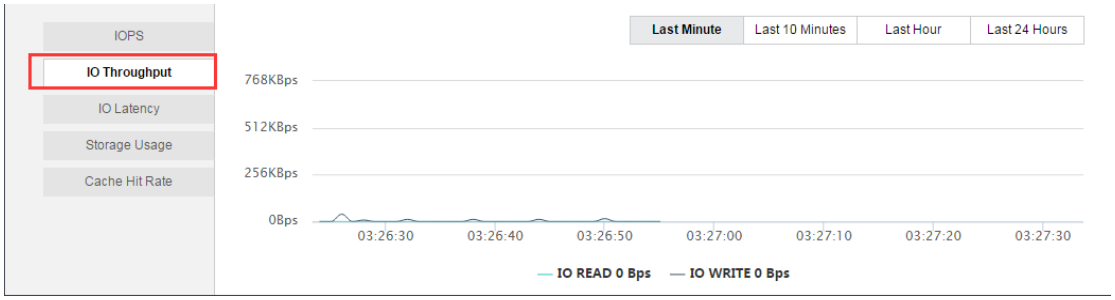
Virtual storage summary page is shown below:



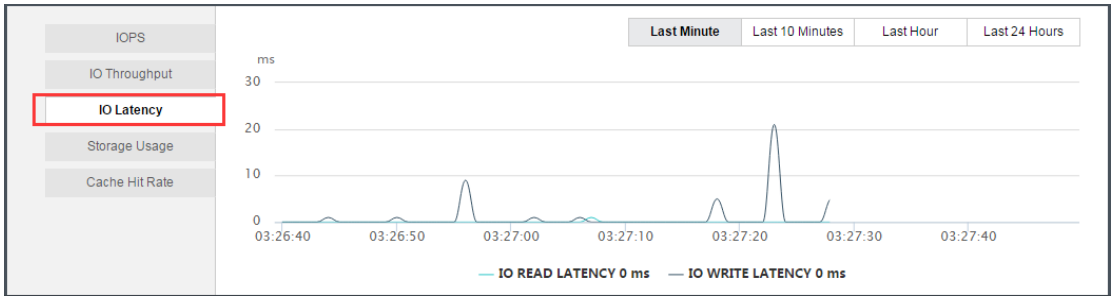
On the following graph, you may view **IOPS**, **IO Throughput**, **IO Latency**, **Storage Usage** and **Cache Hit Rate**.



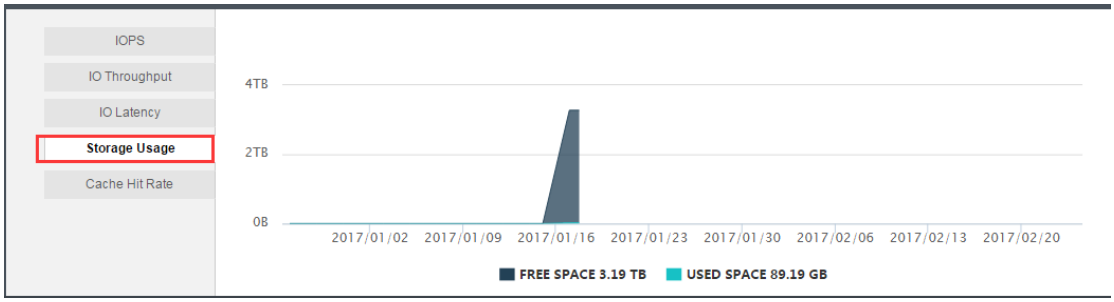
IOPS: Indicates virtual storage input/output operations per second, which represents IO performance of virtual storage.



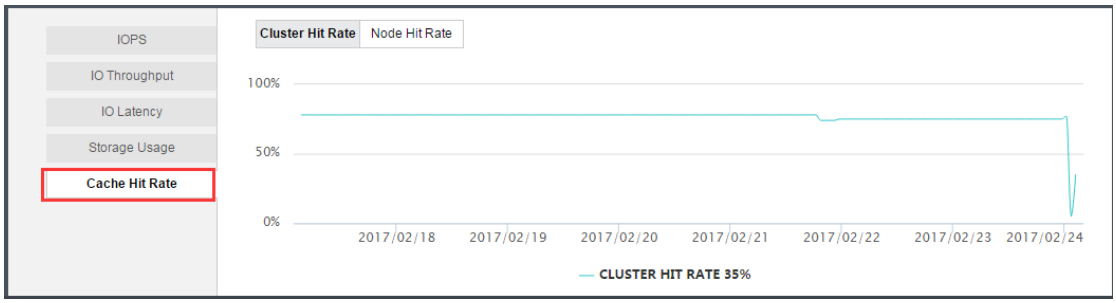
IO Throughput: Indicates bytes read/written by virtual storage per second, which represents IO throughput of virtual storage.



IO Latency: Indicates how long each write/read operation of virtual storage takes. Through IO latency trending graph, you may know storage IO load. If IO latency increases, it indicates that IO request is in queue and IO performance becomes poor. Generally, it indicates that IO load is low if the average IO latency is less than 30ms and that IO load is normal if the average IO latency is less than 60ms.

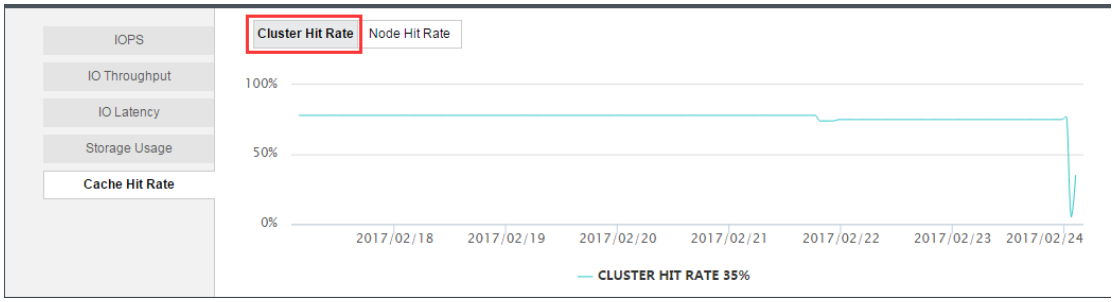


Storage Usage: Indicates virtual storage usage. The total size of used and free storage capacity, marked in different colors, means the total storage capacity. The above figure indicates that the total storage capacity becomes larger, indicating new disks have been added. Storage capacity will increase if a new node is added. As used storage space increases, available storage space decreases. The storage usage trending graph can record storage usage in the last 5 years at most. In that case, storage usage data is recorded once a day. Through the storage usage trending graph, customers can predict the need of expanding storage capacity in the future.

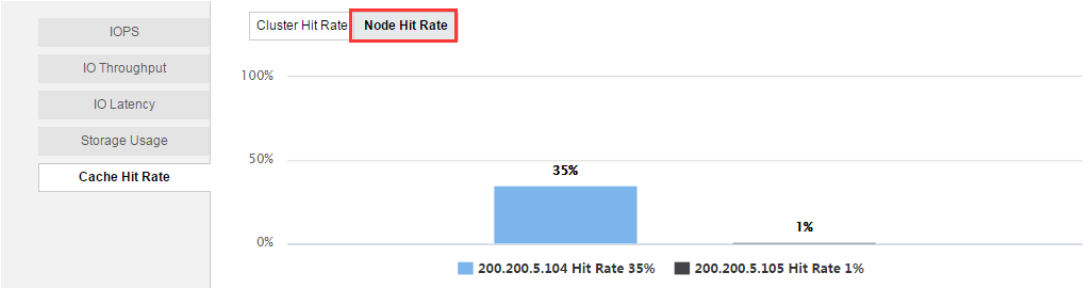


Cache Hit Rate: A cache hit occurs when the requested data is found in SSD, while a cache miss occurs when the requested data is not in SSD and should be returned from data disk. Cache hits to read operations means cache hit rate. **Cluster Hit Rate** graph shows the overall cache hit rate in

the cluster in the last 7 days.

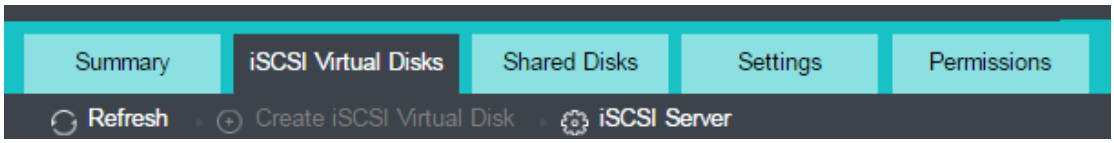


The bar graph of **Node Hit Rate**, as shown below, shows the average hit rate of different nodes.



2.4.2. Configuring iSCSI Virtual Disk

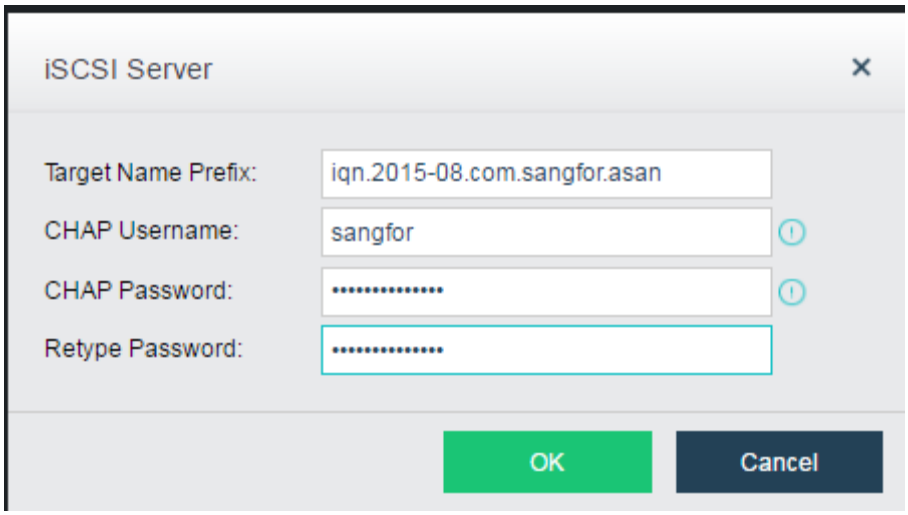
Virtual storage can be configured as an iSCSI sever so that part of virtual storage can be pre-allocated as iSCSI disks which can be accessed by iSCSI initiators.



The following introduces how to create iSCSI virtual disk for the first time.

1. Configure iSCSI server.

In **Storage > iSCSI Virtual Disks**, click **iSCSI Server** and configure the related fields on the following page.



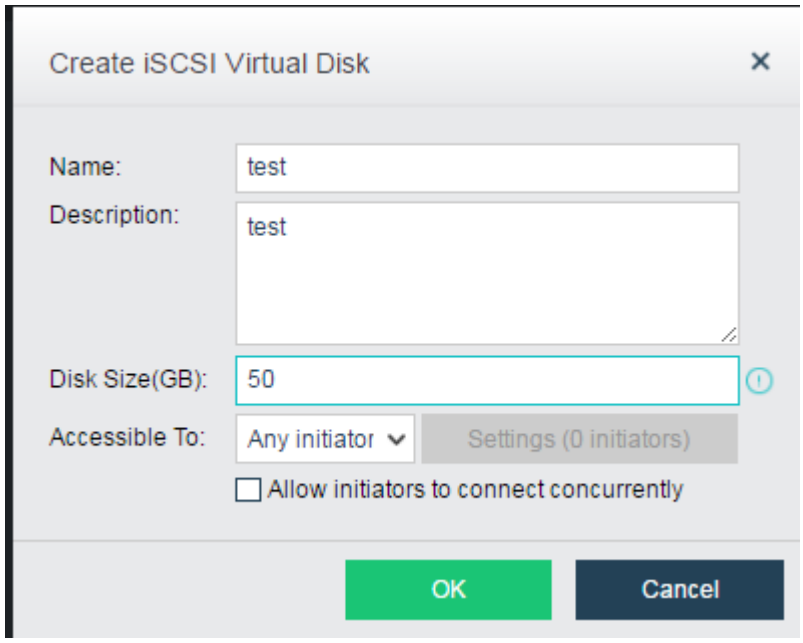
The following are contents included on the above page:

- **Target Name Prefix**: Specifies prefix of target name. Default format is iqn.date.com.sangfor.asan. The default is recommended.
- **CHAP Username**: Specifies CHAP username used by iSCSI initiator to connect to iSCSI server.
- **CHAP Password**: Specifies CHAP password used by iSCSI initiator to connect to iSCSI server.
- **Retype Password**: Retype CHAP password.

After the above fields are configured, click **OK** and the following dialog will pop up. To make changes take effect, select **Restart Now** to restart iSCSI service.

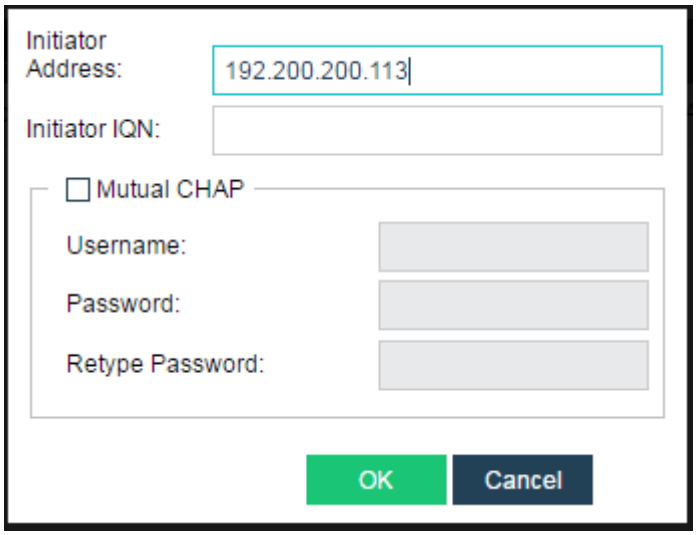
2. Create iSCSI virtual disk.

In **Storage > iSCSI Virtual Disks**, click **Create iSCSI Virtual Disk** to enter the following page:



The following are contents included on the above page:

- **Name**: It should contain digits, letters, dots and colons only. iSCSI disk name consists of the name specified here and target name prefix which is specified when configuring iSCSI server.
- **Description**: It is optional.
- **Disk Size**: Specifies size of the iSCSI disk. The maximum is 16TB(16348GB) and cannot exceed the available storage capacity.
- **Accessible To**: You can select **Any initiator** or **Specified initiator**.
- **Any Initiator**: If it is selected, the iSCSI disk can be accessed by any initiator as long as cluster IP address or node IP address, and CHAP username and password are provided correctly.
- **Specified Initiator**: If it is selected, click the **Settings (0 initiators)** button to configure iSCSI initiator. To add an iSCSI initiator, click **Add** on the **Initiator Settings** page to enter the following page.



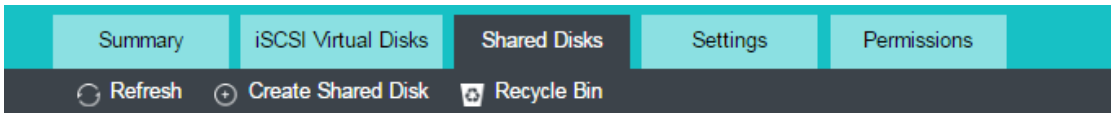
The following are contents included on the above page:

- **Initiator Address**: Specifies management interface address of initiator or cluster IP address.
- **Initiator IQN**: Indicates device name of iSCSI initiator. One of **Initiator Address** and **Initiator IQN** is required at least.
- **Mutual CHAP**: If it is selected, **Username**, **Password** and **Retype Password** fields are required. This option is optional. If mutual CHAP has not been configured on iSCSI initiator, do not select this option. iSCSI disk cannot be accessed by iSCSI initiator if the correct CHAP username and password are not provided when mutual CHAP has been configured on that iSCSI initiator and that initiator is required to be authenticated by iSCSI server as well.

To enable iSCSI disk to be accessed by multiple initiators concurrently, select the option **Allow initiators to connect concurrently**. For the sake of data security, that option is deselected by default.

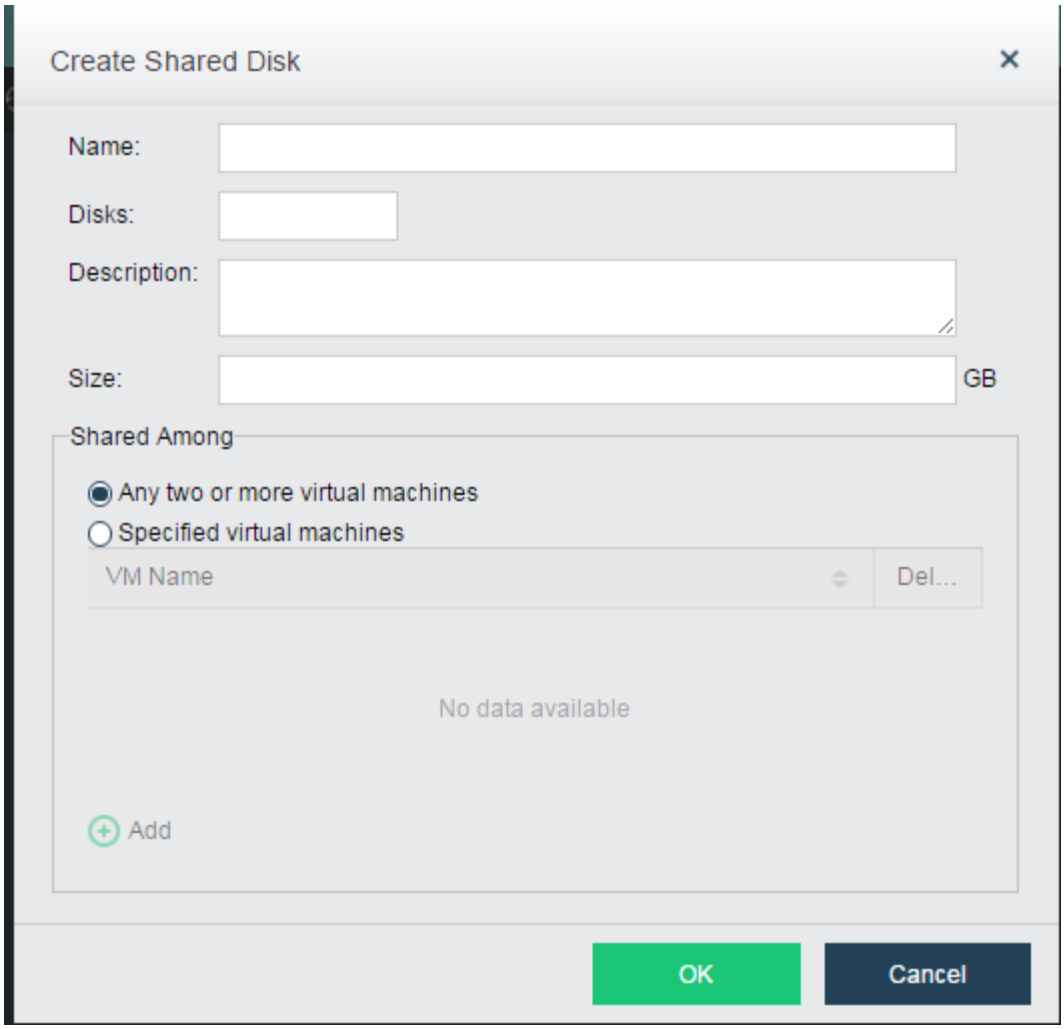
2.4.3. Configuring Shared Disk

A shared disk can be mapped and used by more than one virtual machines that run compatible applications. Note that if the disk is shared by virtual machines running different applications that do not support disk sharing, disk data may get damaged. However, that is not a problem for Oracle RAC database environment, which supports disk sharing among nodes in RAC (Real Application Clusters)



1. Click **Create Shared Disk** in **Storage > Shared Disks** to create a shared disk.

   On the **Create Shared Disk** page, as shown below, configure the related fields.



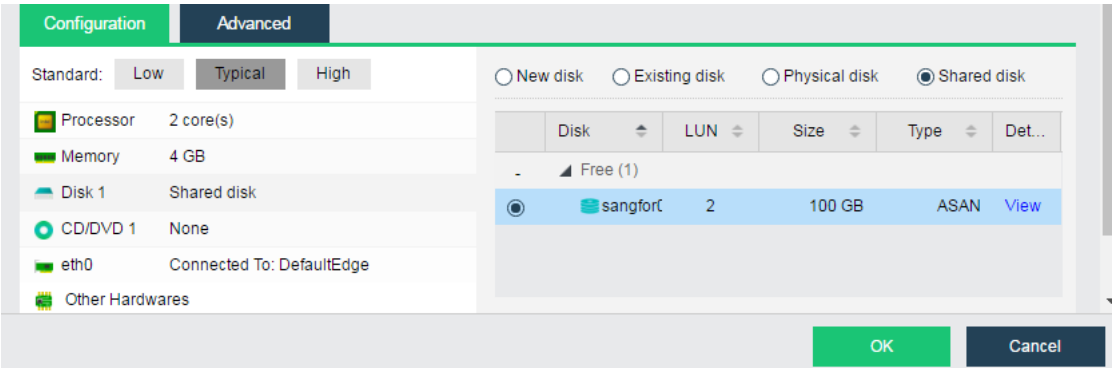
The following are contents included on the above page:

- **Name**: Specifies a distinguishable name of shared disk. It can only contain Chinese characters, digits, letters, space and half or full length of the following special characters: ()[]{}@|._-+
- **Disks**: Specifies the number of shared disks.
- **Description**: It is optional.
- **Size**: Species size of shared disk. The maximum is 1TB(1024GB).
- **Shared Among**: You may select **Any two or more virtual machines** or **Specified virtual machines**.
- **Any two or more virtual machines**: If it is selected, it indicates that shared disk(s) can be accessed by any virtual machine.
- **Specified virtual machines**: If it is selected, you need to specify virtual machines. Only the

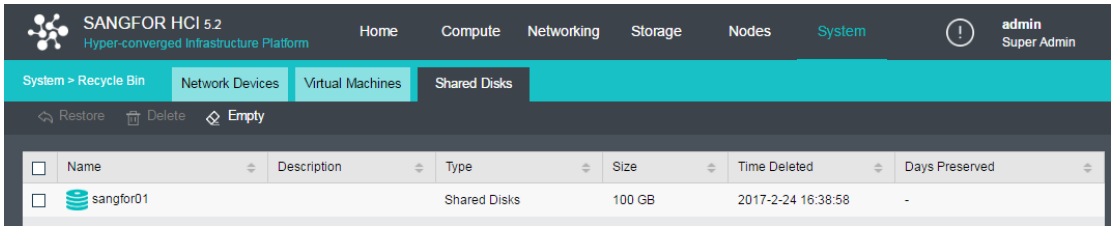
selected virtual machines can access shared disk(s).

2. Edit a virtual machine to associate a shared disk with that virtual machine.

On the **Edit Virtual Machine** page, select **Add Hardware** > **Disk** and choose **Shared disk**, as shown below:

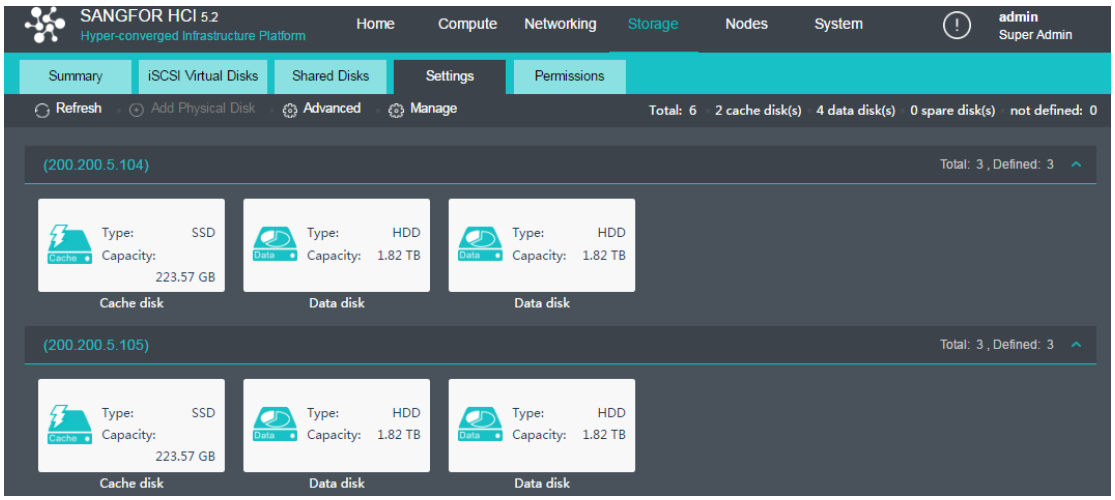


A shared disk can be deleted. After deletion, it will go to **Recycle Bin**. In **Recycle Bin**, you can restore it or delete it permanently.

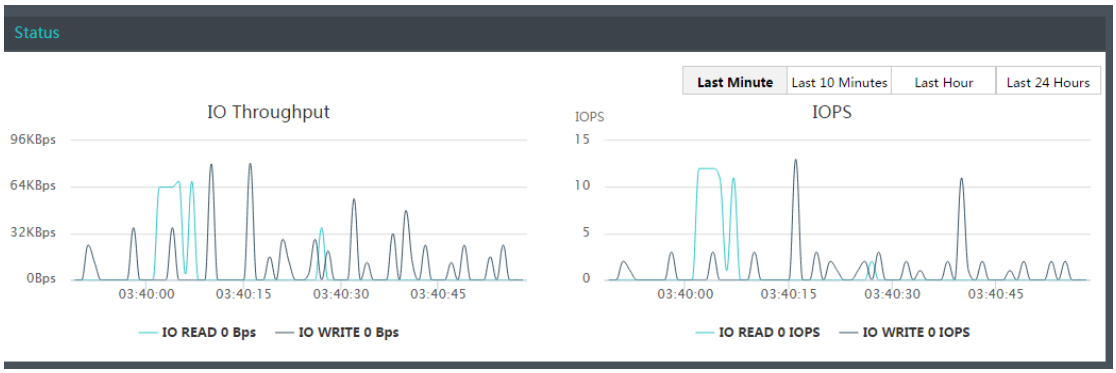


2.4.4. Settings

On the **Settings** page, you can view the disks that have been added to virtual storage and basic disk information, such as disk capacity, disk type (HDD or SDD), data disk or cache disk, as shown below.



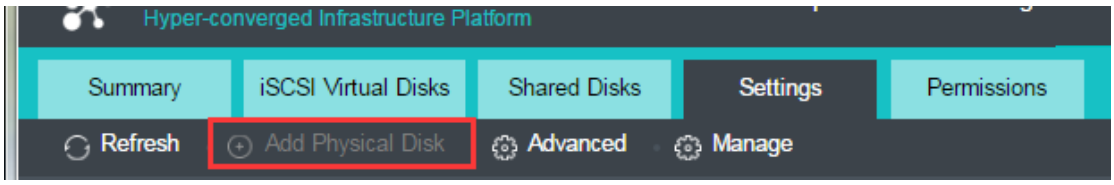
By clicking a disk, you can view the disk details, such as disk IO throughput, IOPS, disk tag, etc.



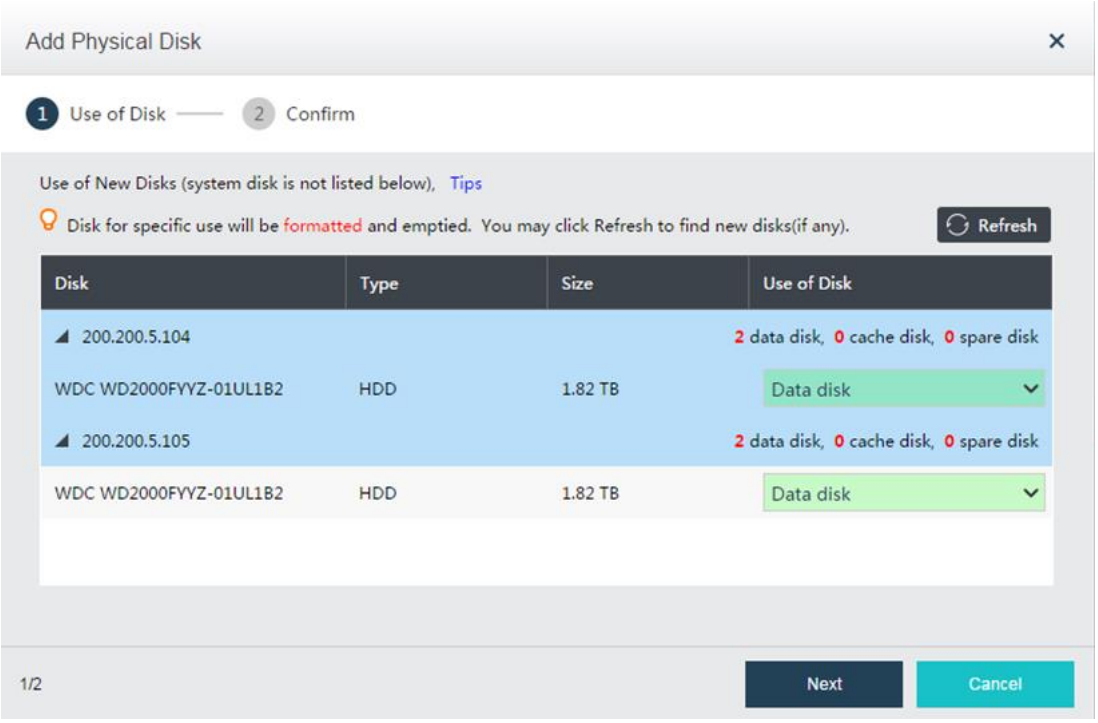
2.4.4.1. Adding Physical Disk

You may expand virtual storage or add new disks by adding physical disk.

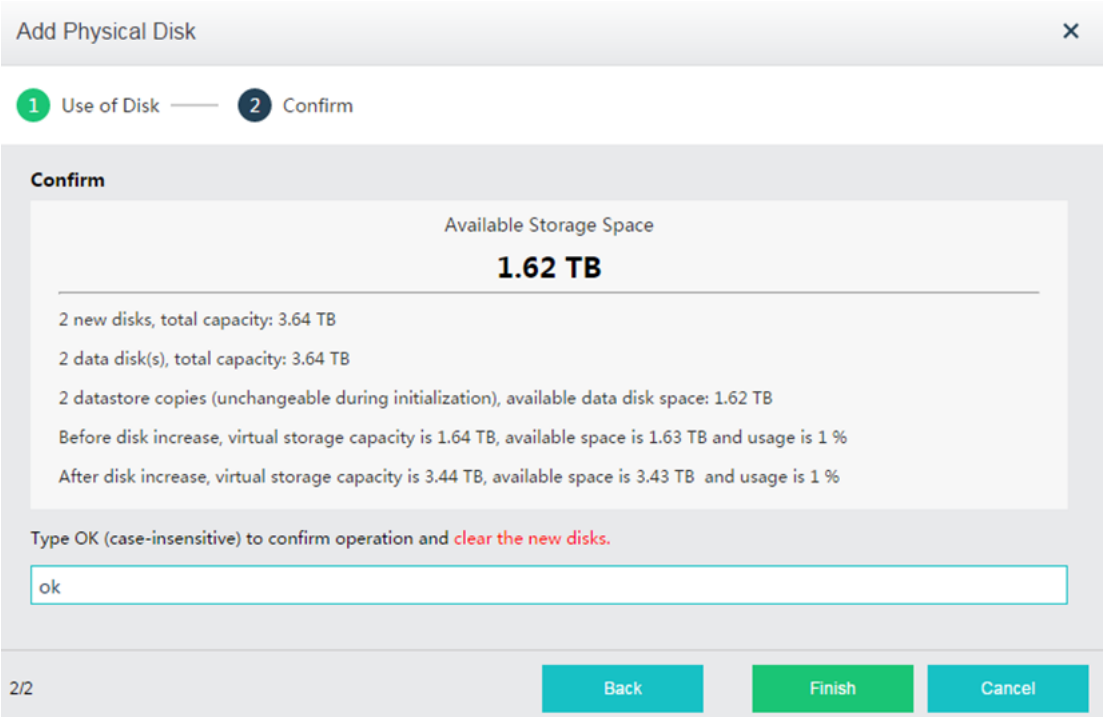
If two new disks are inserted into two nodes respectively, a green icon with the number of newly-discovered disks will appear on the **Add Physical Disk** button in **Storage > Settings**, as shown below.



To add new disk, click **Add Physical Disk** to enter the following page where newly-discovered disks are listed.



To add new disk to virtual storage, follow instructions to format that disk,

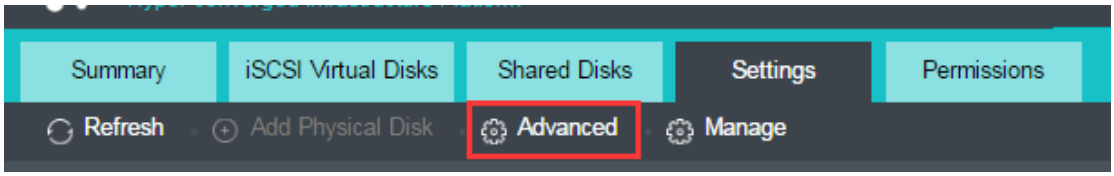


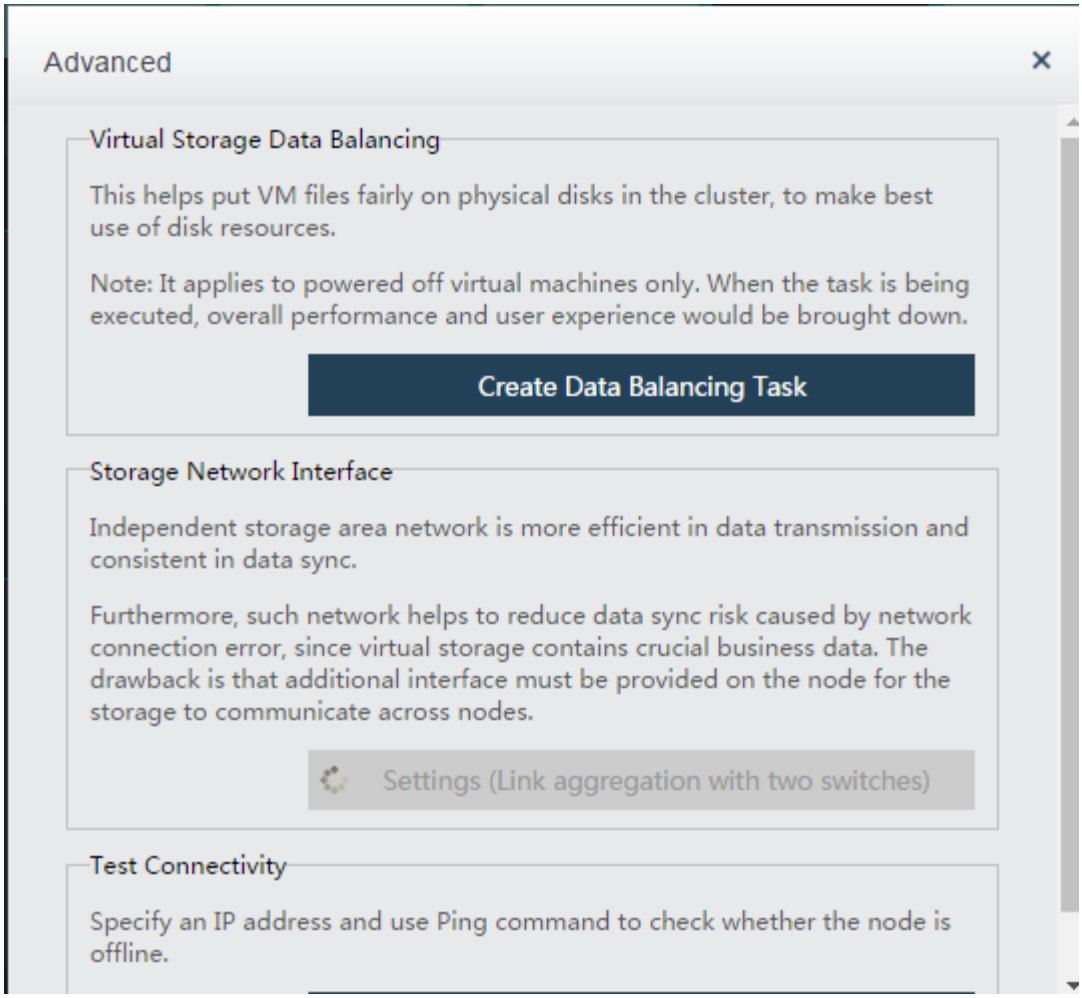
The number of new disk to be added should be multiple of datastore copies. For instance, if

number of datastore copies is 2, the number of new disks to be added should be 2 or 4, etc.

2.4.4.2. Advanced Settings

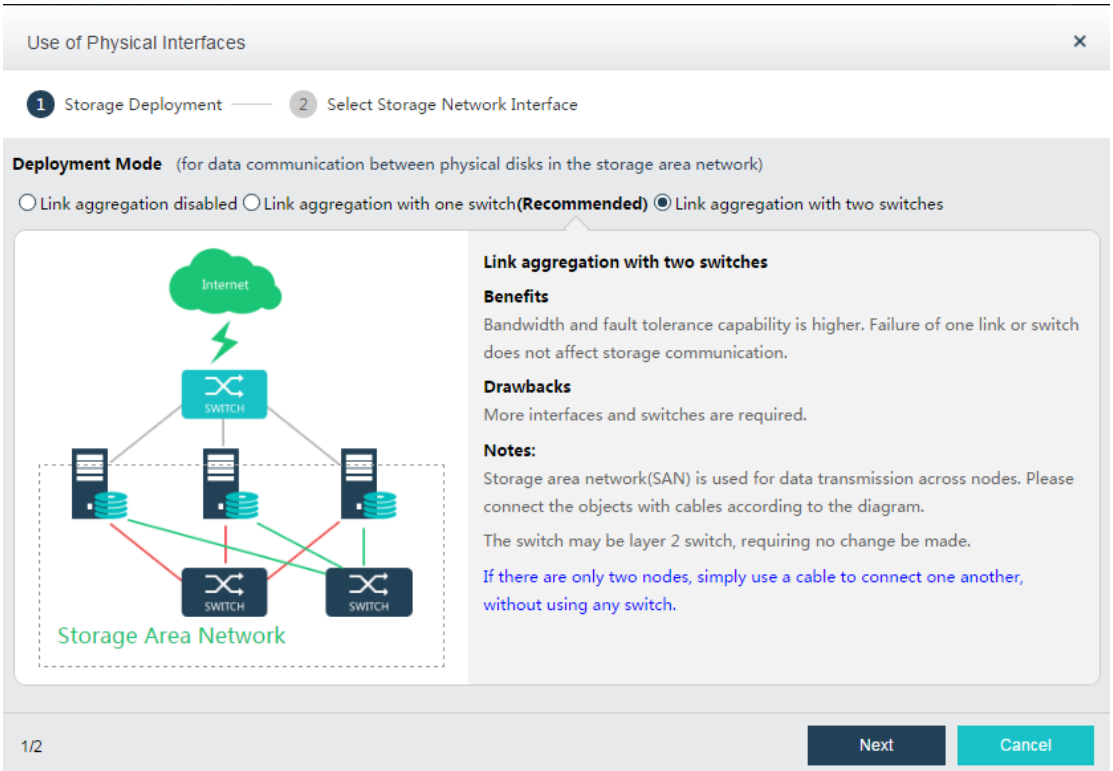
You can modify **Storage Network Interface** and **Test Connectivity** settings by clicking **Advanced** in **Storage > Settings**, as shown below.



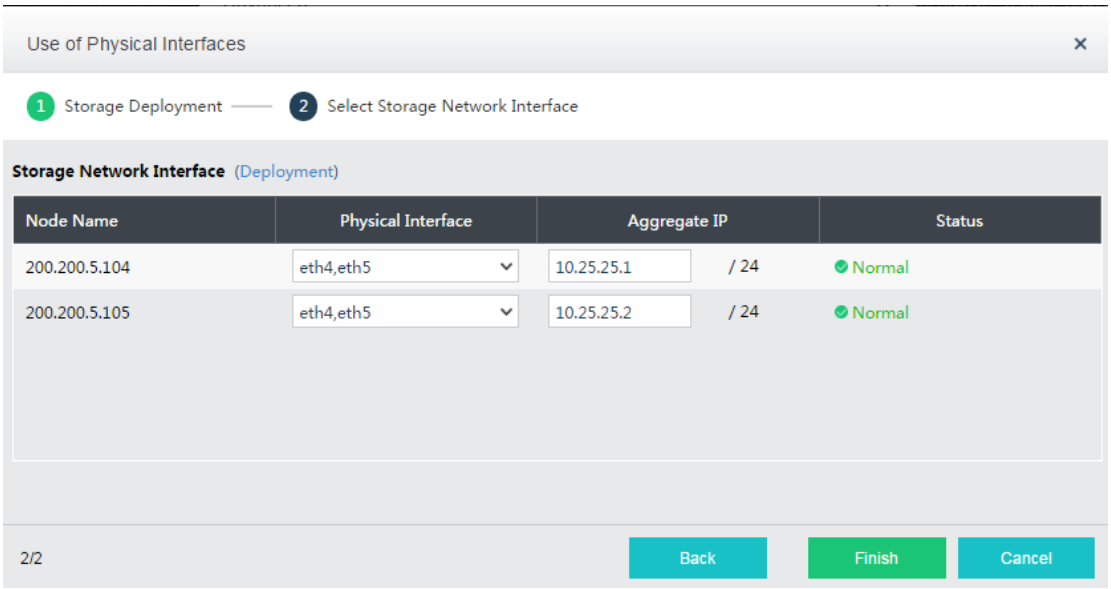


Storage Network Interface: You can change deployment mode (**Link aggregation disabled**, **Link aggregation with one switch**, **Link aggregation with two switches**)

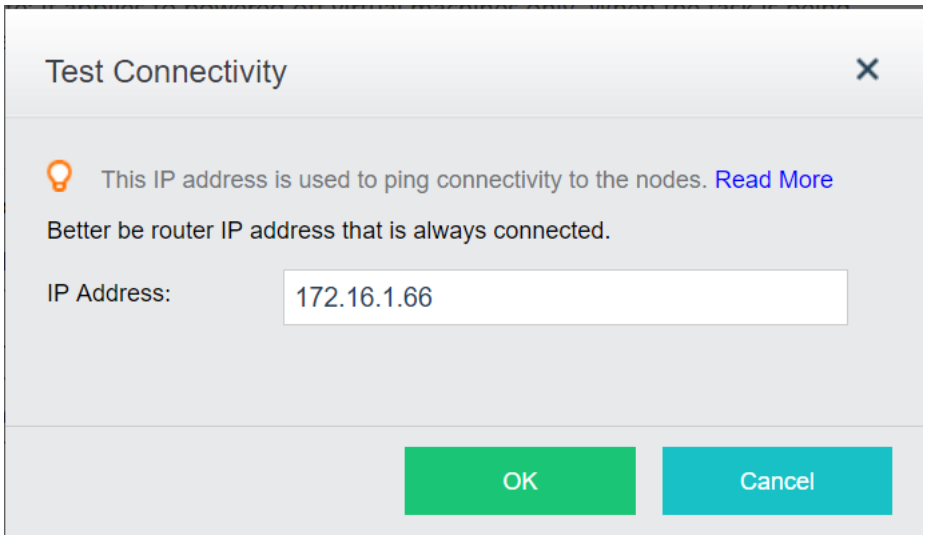
Take changing deployment mode to **Link aggregation with one switch** for example, select the option **Link aggregation with one switch(Recommended)** first, as shown below:



Click **Next** to configure storage network interface, and then click **Finish**.

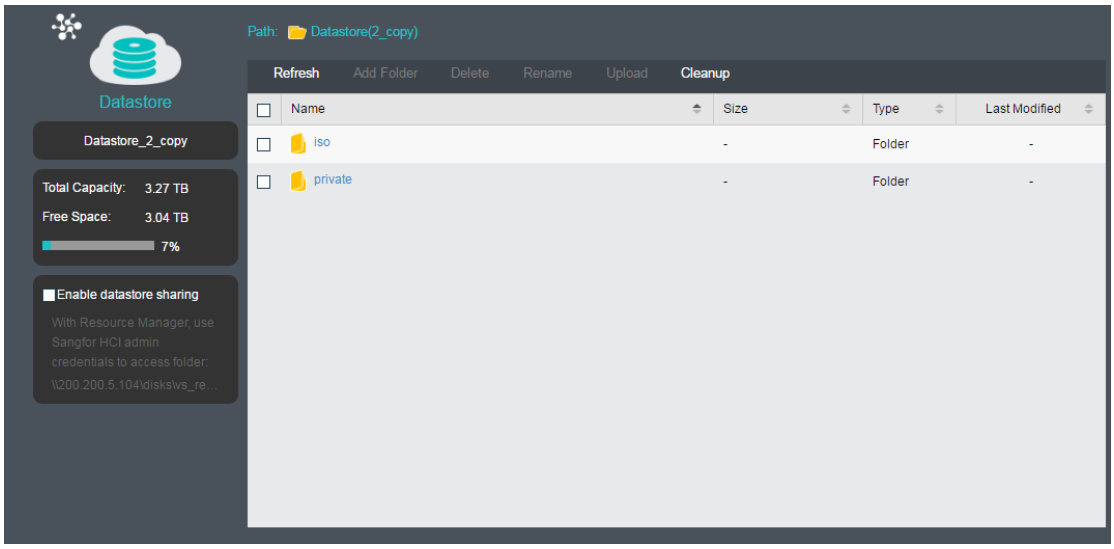


Test Connectivity: It is used to test whether the node is offline. First, you need to specify an IP address which should better be router IP address.



2.4.4.3. Managing Datastore

In **Storage > Settings**, click **Manage** to enter the following page. Here you can manage datastores and basic folders.

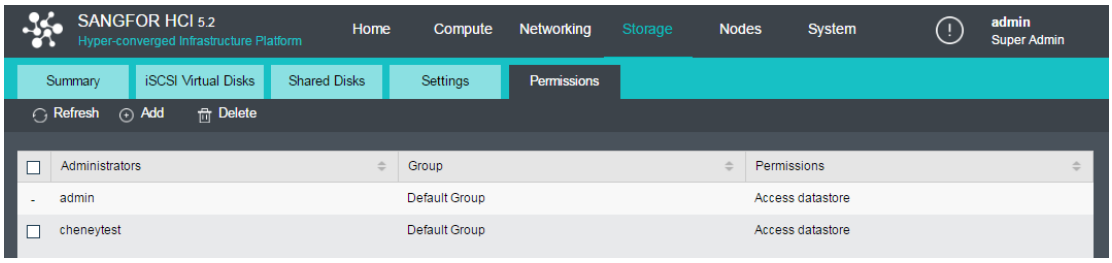


Enable datastore sharing: If this option is selected, you can access virtual storage through the directory displayed under that option.

2.4.5. Permissions

Virtual storage permission is used to assigned to sub-administrator to manage datastore. To add permission in **Storage > Permissions**, you need to add the permission of accessing datastore in

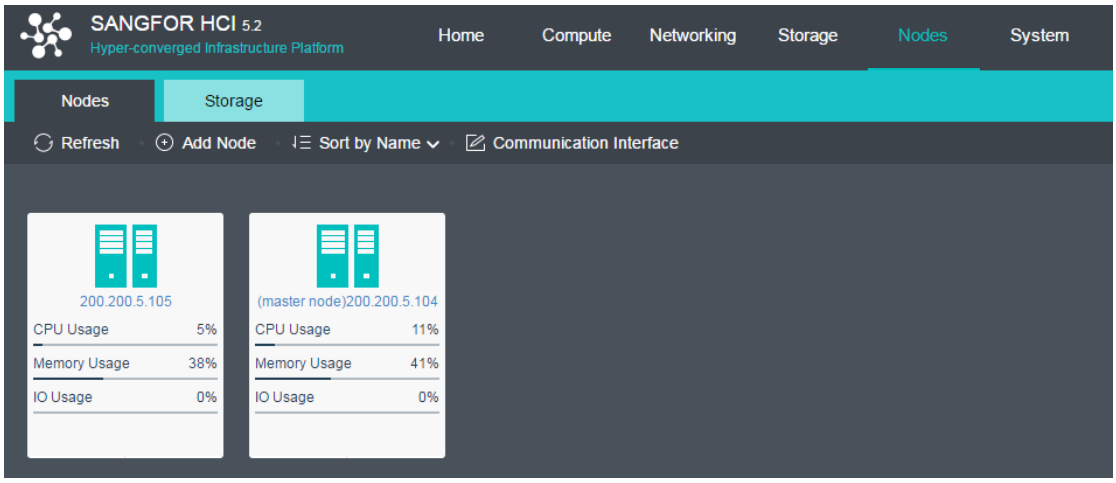
System > Sub Administrators > Permissions first.



For details, refer to **Sub Administrators** section.

2.5. Nodes

Navigate to **Nodes** and you will see the following page:

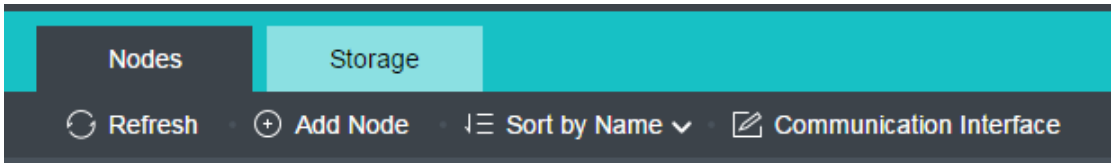


2.5.1. Viewing Nodes

All nodes are listed on the **Nodes** page. You can view basic node information, such as node name, node IP address, CPU usage, memory usage, and IO usage.

2.5.1.1. Toolbar

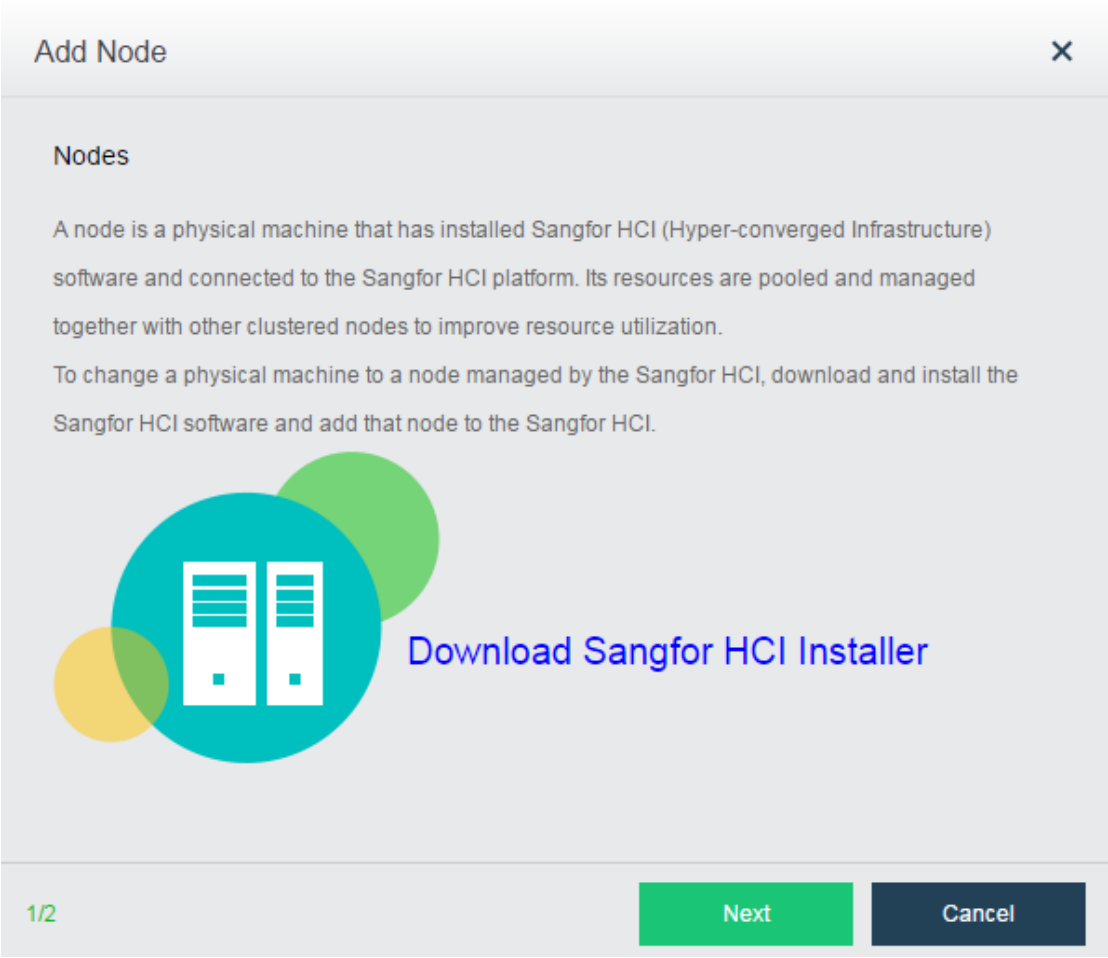
On the **Nodes** page, you can perform the following operations: **Refresh**, **Add Node, Sort by Name**, **CPU Usage**, **Memory Usage** or **IO Usage**, and **Communication Interface**.

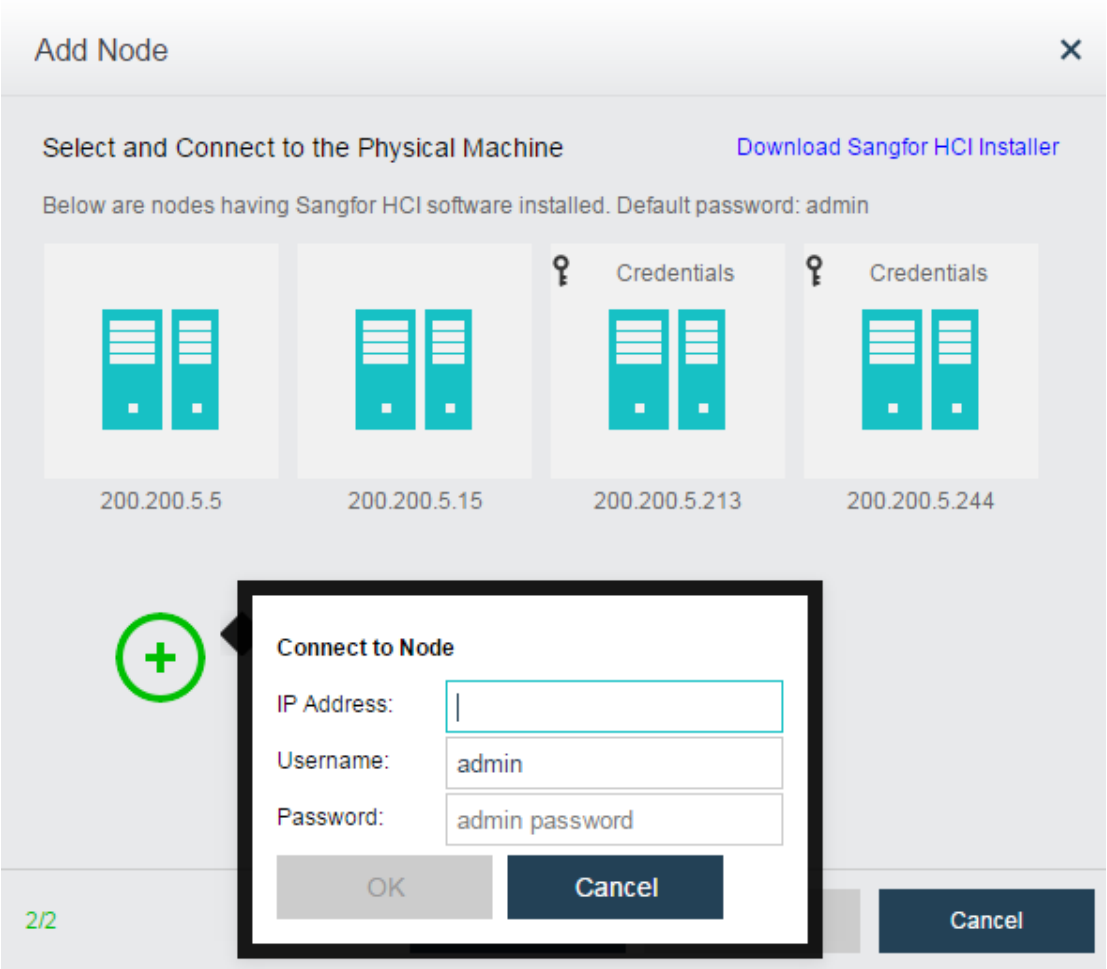


2.5.1.2. Adding Node

A node is a physical machine that has installed Sangfor HCI software and connected to Sangfor HCI platform. Its resources are pooled and managed together with other clustered nodes to improve resource utilization.

To add a node, click **Add Node** to enter the following page. To change a physical machine to a node managed by Sangfor HCI, download and install the Sangfor HCI software and add that node to the Sangfor HCI platform. Then click **Next**.





IP Address: Specifies IP address of the node installed Sangfor HCI software.

Username: Specifies administrator's username of that node.

Password: Specifies administrator's password of that node.

Finally, click **Finish**.

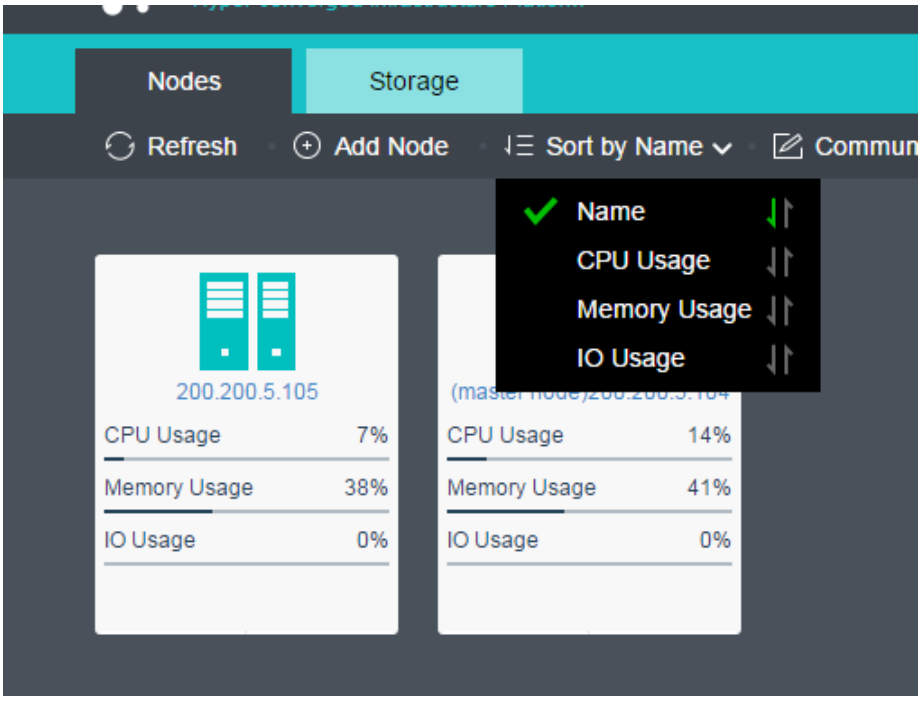
- A node can be added to a cluster only. If a node has been added to a cluster and you want to add it to another cluster, it must be removed from that cluster first.
- Versions of HCI software installed on the nodes to be added to a same cluster must be consistent.
- Management interface IP addresses of the nodes to be added to a same cluster must reside

on a same network segment.

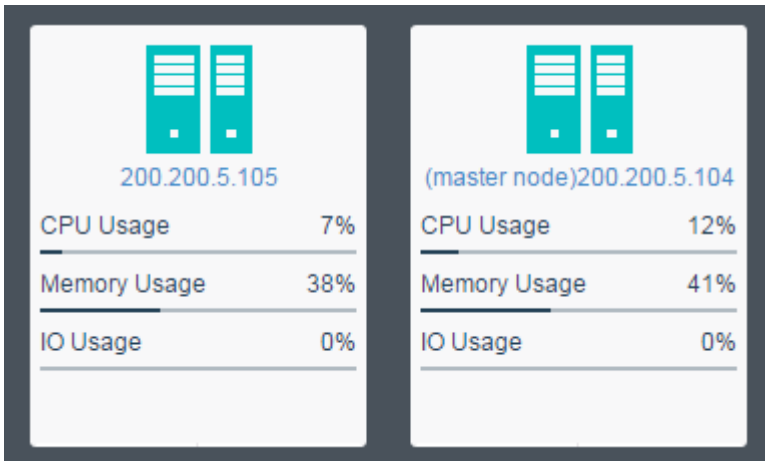
- On the **Add Node** page, it lists the automatically-discovered nodes which reside on a same subnet but have not been added to the cluster.
- You may add a new node by clicking the 『+』 icon and then input the its IP address, username and password.
- If a node with default password **admin** is selected, there is no need to specify password again.
- If a node whose password is not **admin** is selected, you need to specify its password.

2.5.1.3. Sorting Nodes

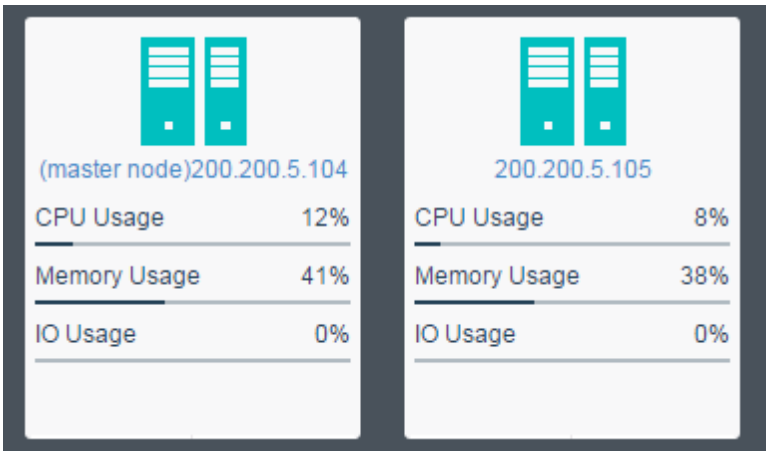
Nodes can be sorted by name, CPU usage, memory usage, or IO usage.



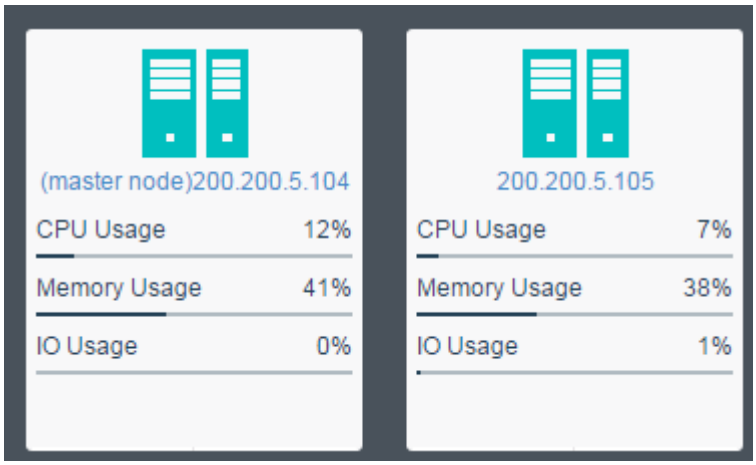
To sort nodes by name, select **Sort by Name**. Additionally, by clicking on the arrow, nodes can be sorted in ascending order or descending order.



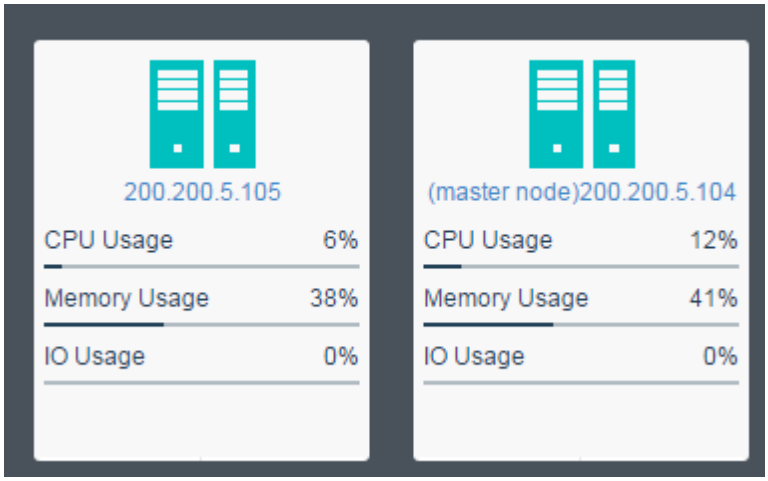
To sort nodes by CPU usage, select **Sort by CPU Usage**. By clicking on that arrow, nodes can be sorted by CPU usage in ascending order or descending order (as shown in the following figure).



To sort nodes by memory usage, select **Sort by Memory Usage**. By clicking on that arrow, node can be sorted by memory usage in ascending order or descending order (as shown in the following figure).

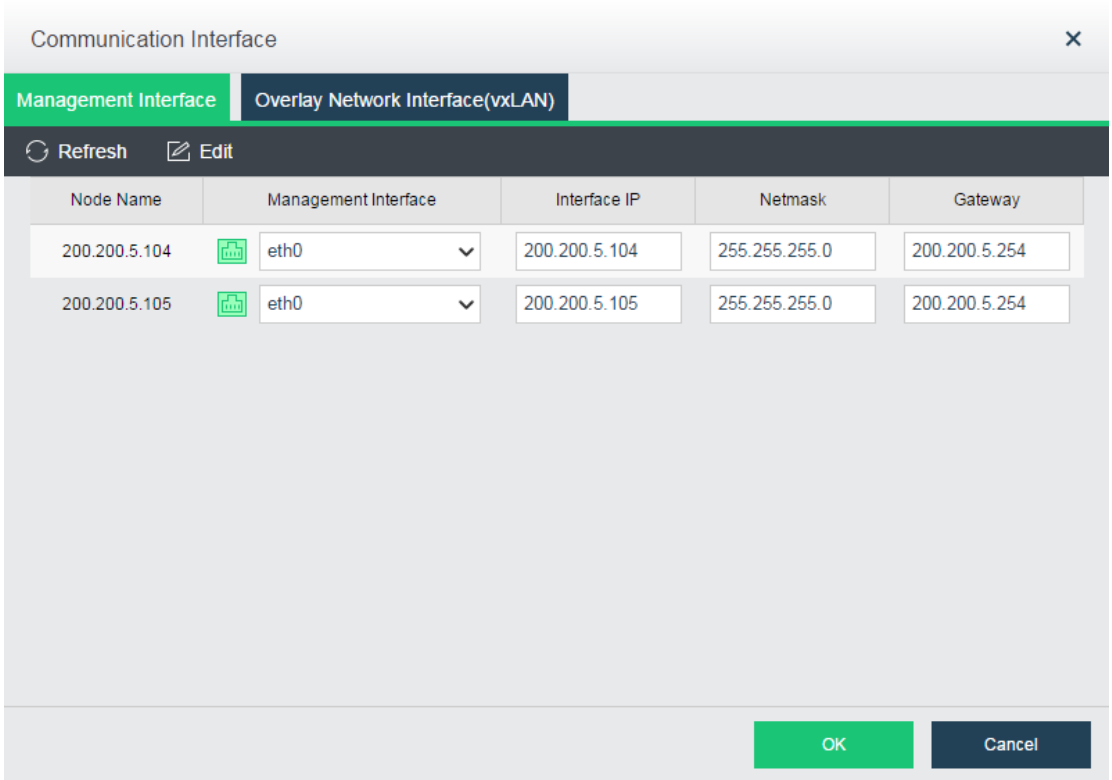


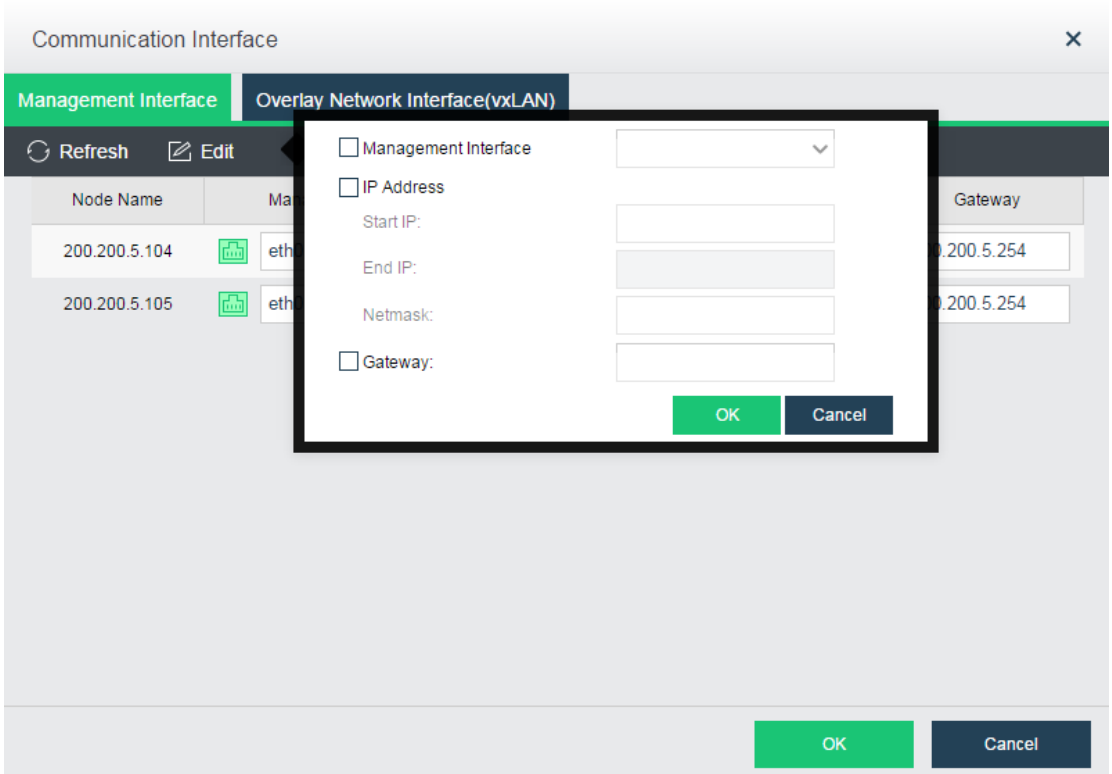
To sort nodes by IO usage, select **Sort by IO Usage**. By clicking on that arrow, nodes can be sorted by memory usage in ascending order or descending order (as shown in the following figure).

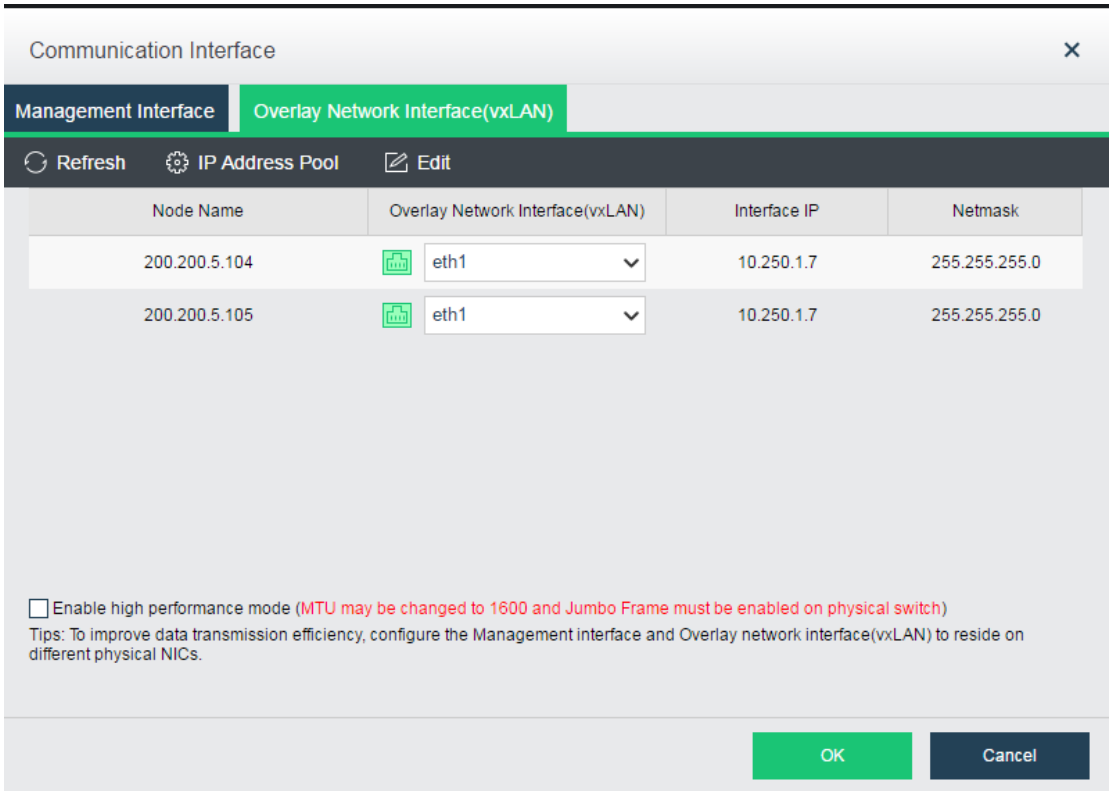


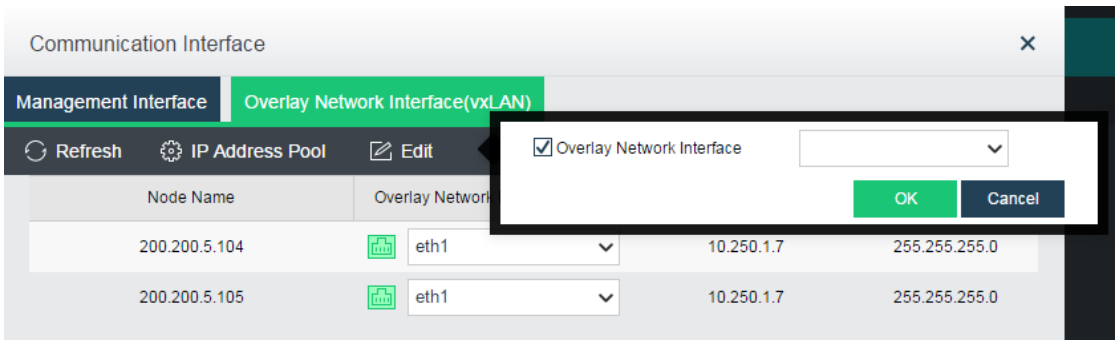
2.5.1.4. Configuring Communication Interface

You can configure management interfaces and overlay network interfaces by clicking **Communication Interface** on the **Nodes** page, as shown below.




Communication Interface
Management Interface
Overlay Network Interface(vxLAN)
Refresh
Edit
Node Name
Gateway
200.200.5.104
200.200.5.105
Management Interface
IP Address
Start IP:
End IP:
Netmask:
Gateway:
OK
Cancel
OK
Cancel

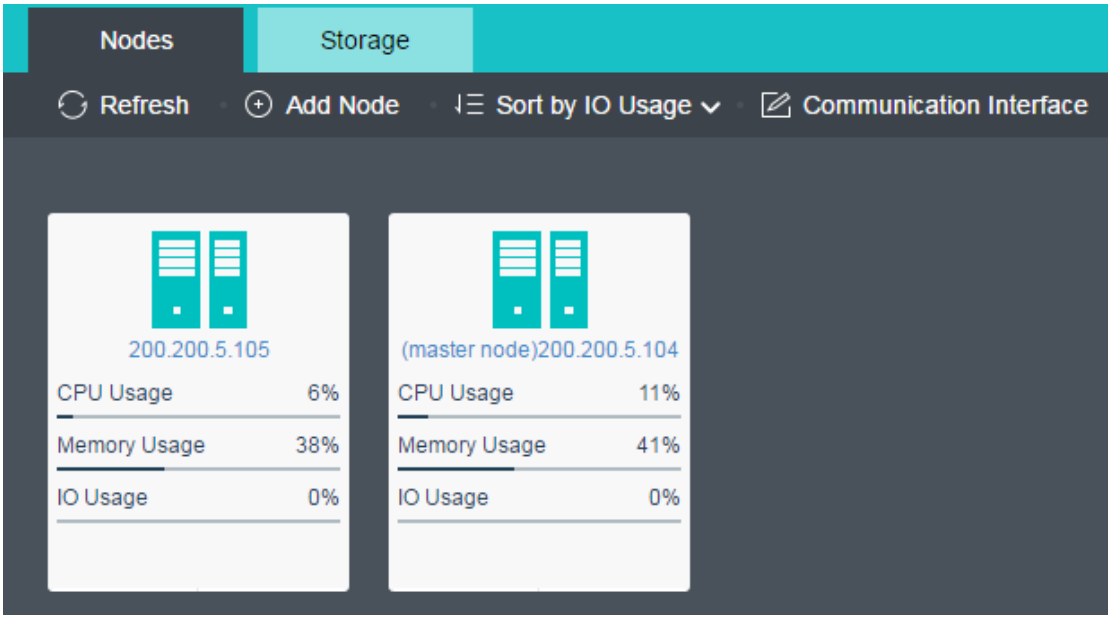

Communication Interface
Management Interface
Overlay Network Interface(vxLAN)
Refresh
IP Address Pool
Edit
Node Name
Overlay Network Interface(vxLAN)
Interface IP
Netmask
200.200.5.104
eth1
10.250.1.7
255.255.255.0
200.200.5.105
eth1
10.250.1.7
255.255.255.0
Enable high performance mode (MTU may be changed to 1600 and Jumbo Frame must be enabled on physical switch)
Tips: To improve data transmission efficiency, configure the Management interface and Overlay network interface(vxLAN) to reside on different physical NICs.
OK
Cancel



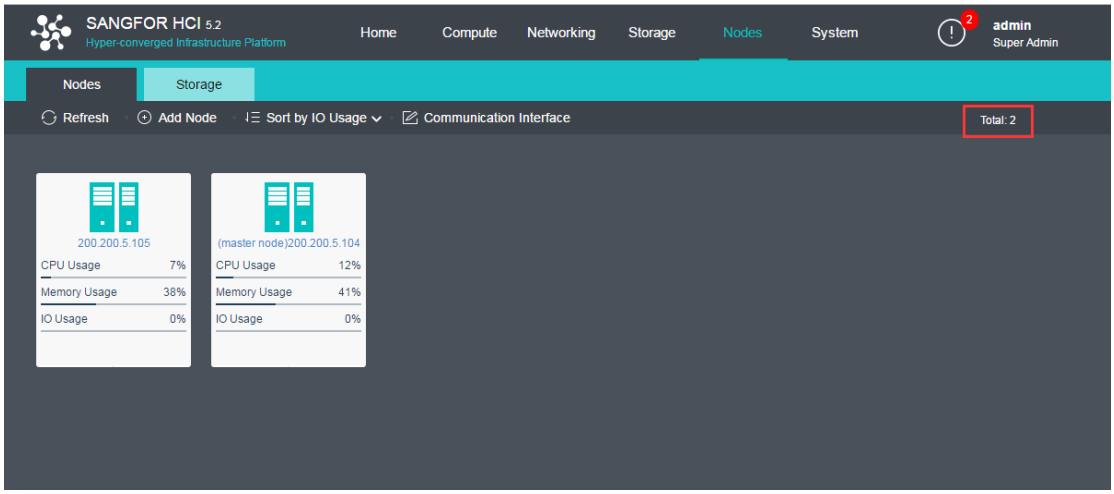
Enable high performance mode: If this option is selected, MTU of overlay network interfaces will be changed to 1600 so that VXLAN encapsulated data will not be fragmented when being forwarded to physical network, but Jumbo Frame must be enabled on the physical switch connected to a host installed Sangfor HCI software.

2.5.2. Viewing Node Information

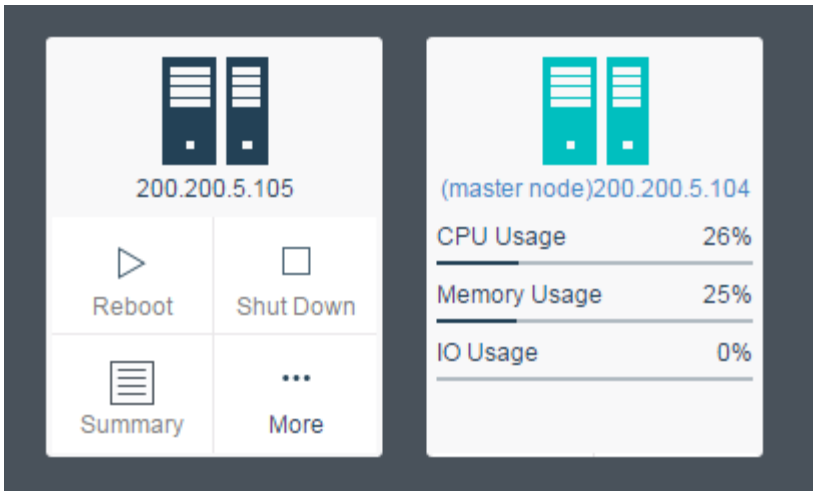
The **Nodes** page is shown below:



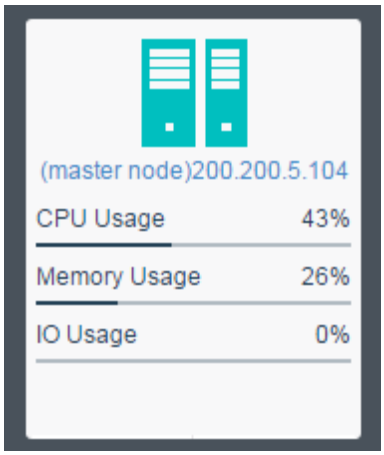
On the upper-right corner of the **Nodes** page, you may see the total number of nodes, as shown below



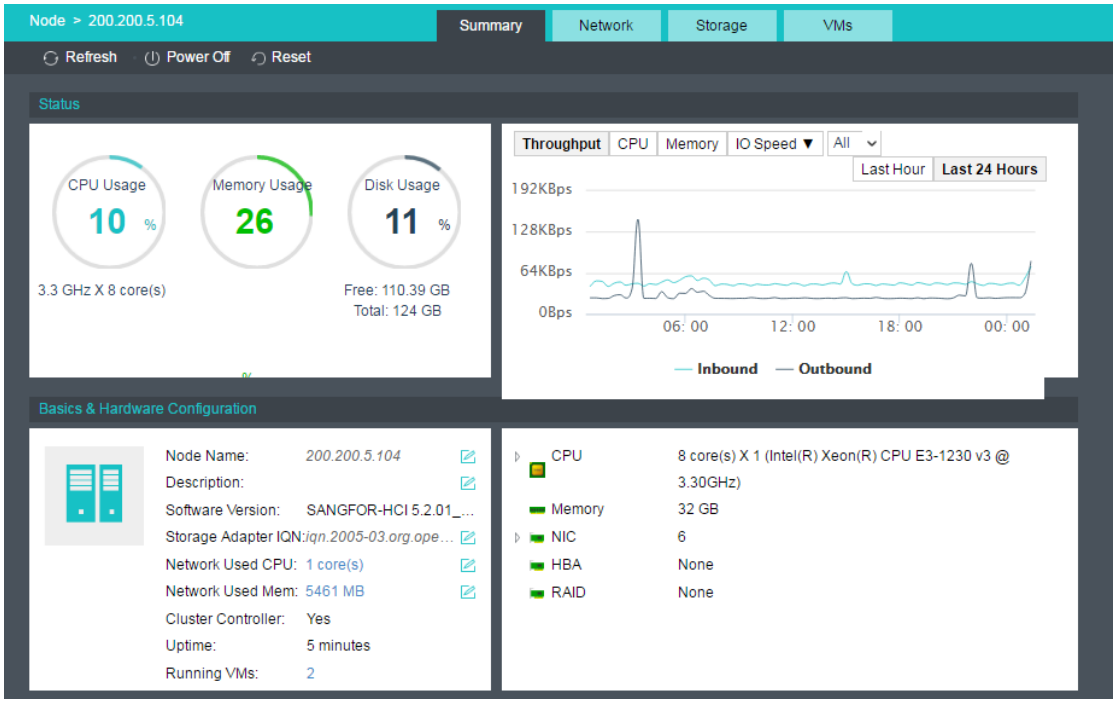
The color of node card indicates node status. Grey indicates the node is powered off, while blue indicates the node is powered on and read indicates the node is giving alarm. Additionally, there are more information on the node card, such as CPU usage, memory usage and IO usage, etc.



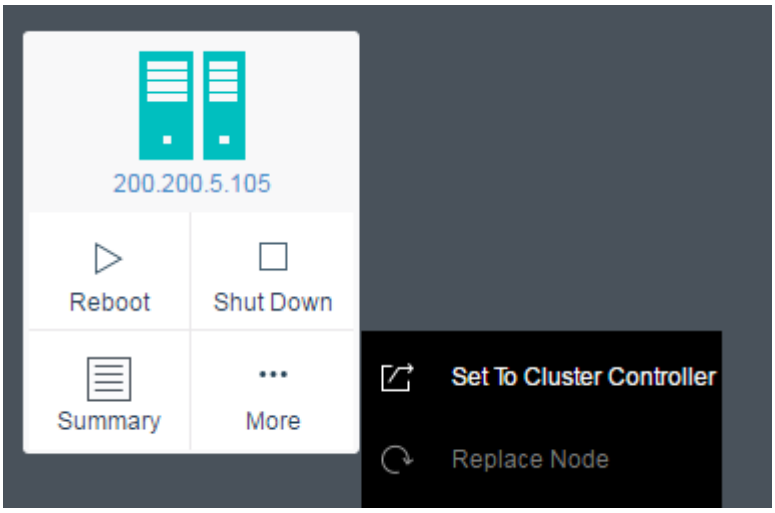
Move your cursor onto node card and you will see the following buttons: **Reboot**, **Shut Down**, **Summary**, **More**, as shown below:



To enter node summary page, you may click on node name.

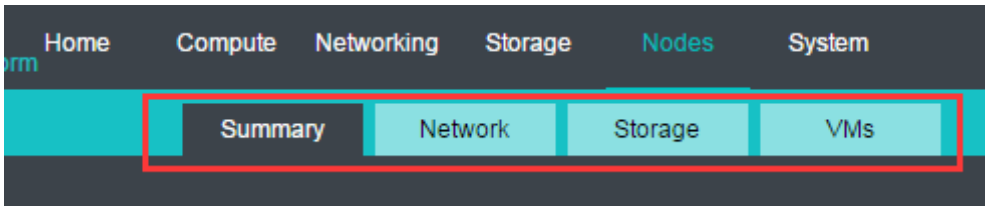


To set a node to cluster controller, you may click **More**.



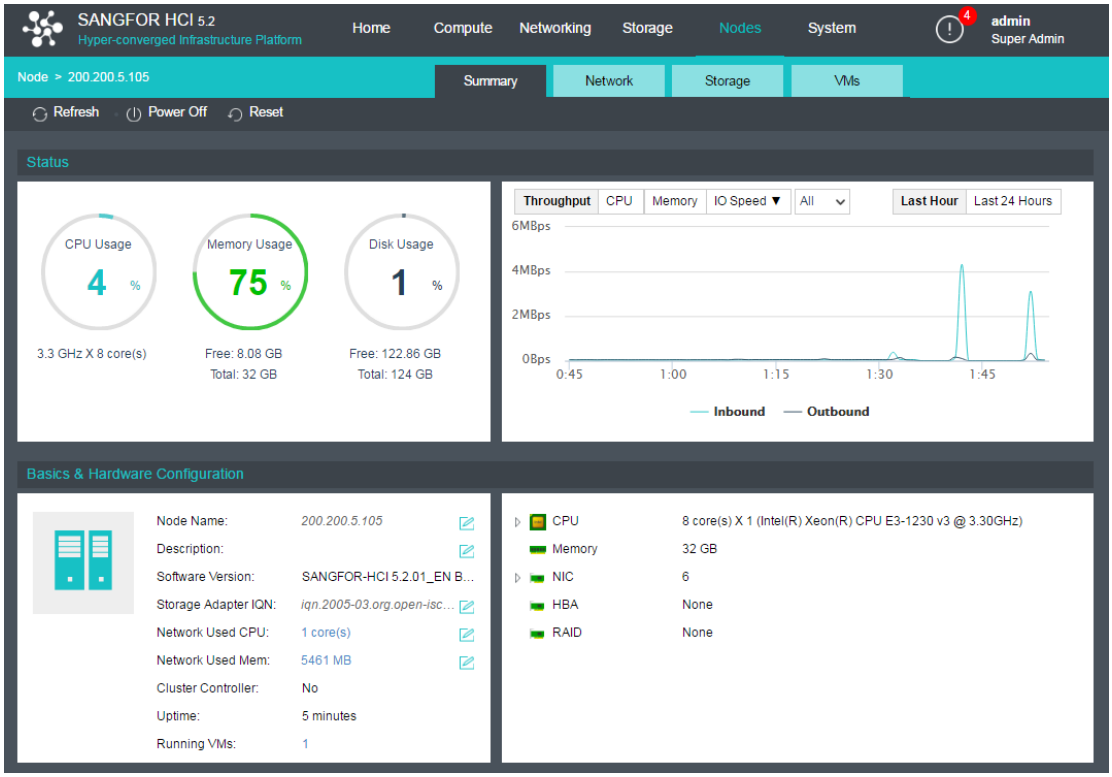
2.5.3. Viewing Node Summary

There are the following parts: **Summary**, **Network**, **Storage**, **VMs,** as shown below:



2.5.3.1. Viewing Node Information

On the **Summary** page, you can view node status, basics and configuration information.

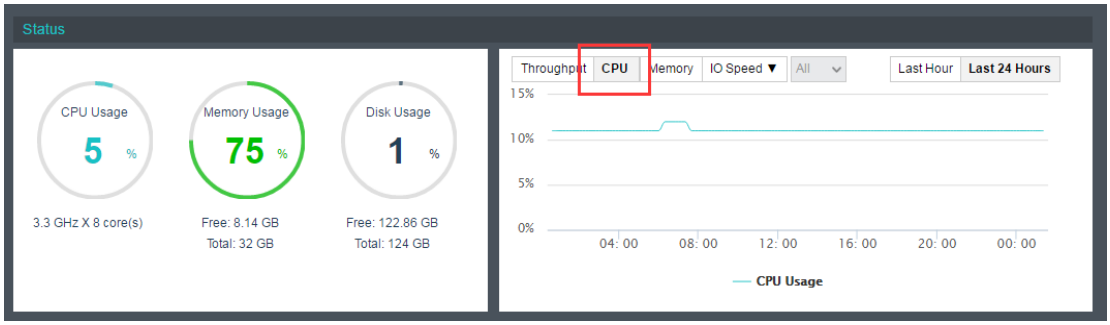


To power off node, click **Power Off**.

To reset node, click **Reset**.

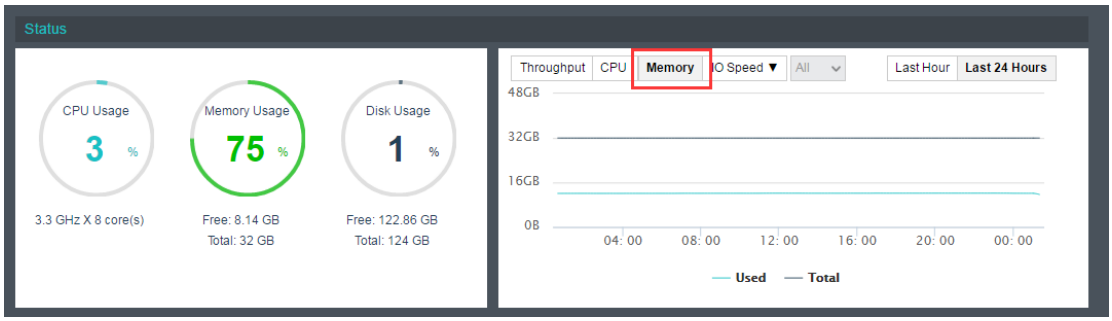
Status: This section displays CPU usage, memory usage, disk usage, throughput, CPU usage trending, memory usage trending and IO speed.

CPU Usage: Displays CPU usage of node. On the right side, you can view CPU usage in the last hour or 24 hours.

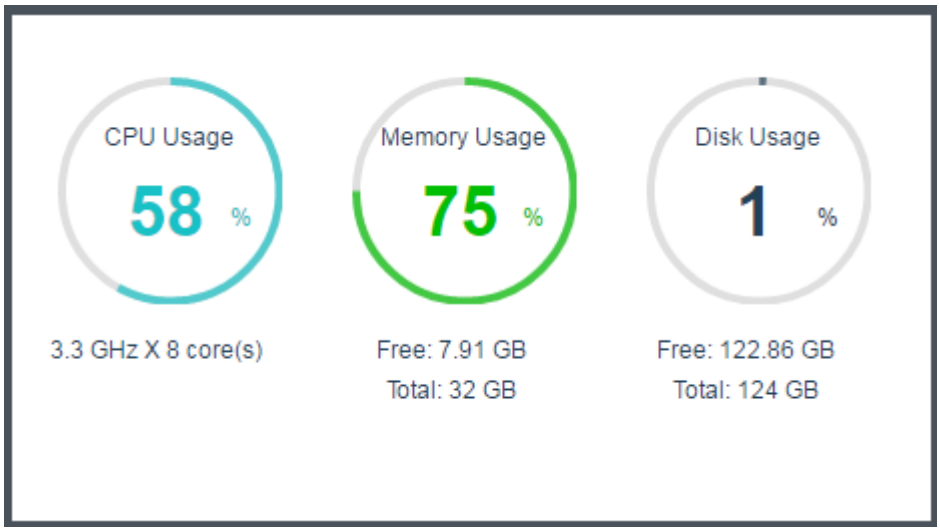


Memory Usage: Displays the total and free memory size, as well as memory usage. On the right

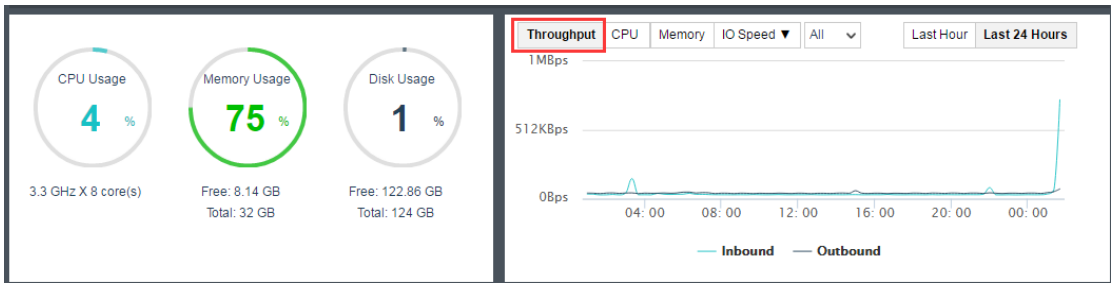
side, you can view memory usage in the last hour or 24 hours.



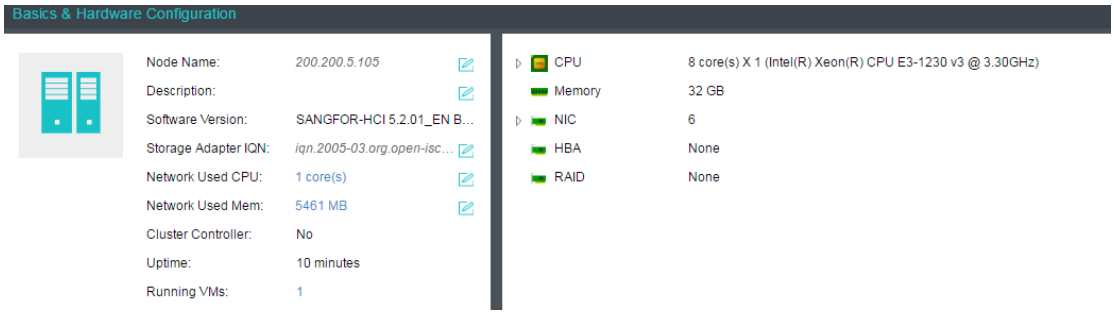
Disk Usage: Displays the total and free disk size respectively, as well as disk usage.



Throughput: Displays the trending of node throughput.



Basics & Hardware Configuration: This section displays basic information and hardware configuration of node. Basic information includes **Node Name**, **Description**, **Software Version**, **Storage Adapter IQN**, **Network Used CPU**, **Network Used Mem**, **Cluster Controller**, **Uptime**, **Running VMs**. Hardware configuration is listed on the right side. (**Node Name**, **Description**, **Storage Adapter IQN**, **Network Used CPU** and **Network Used Mem** are editable).

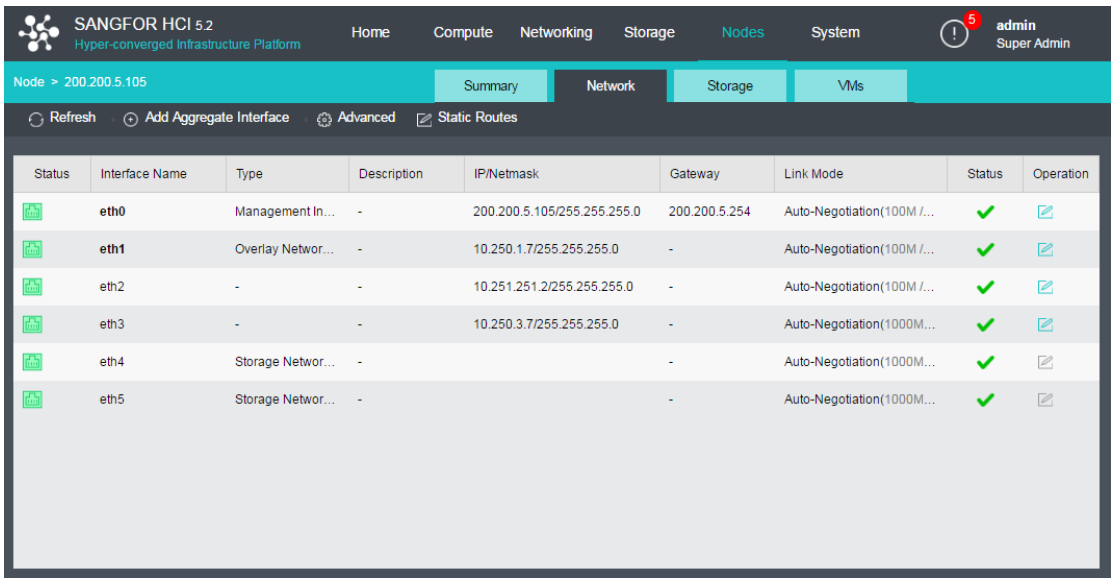


2.5.3.2. Network

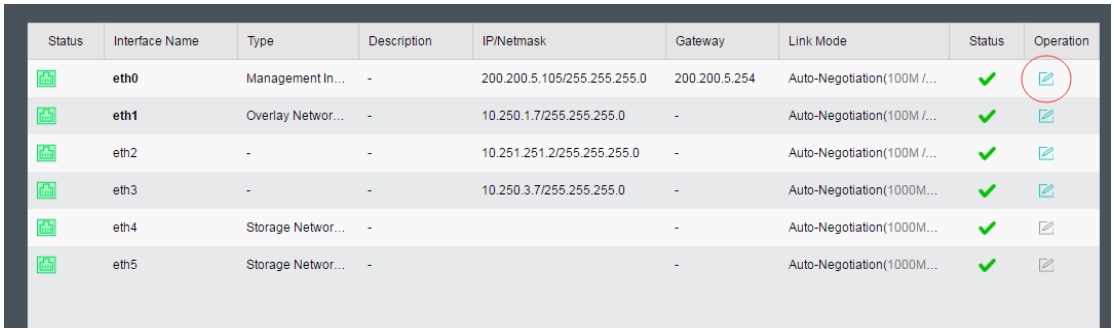
On the **Network** page, you can view physical interface information and configure advanced settings.

Viewing Interface Settings

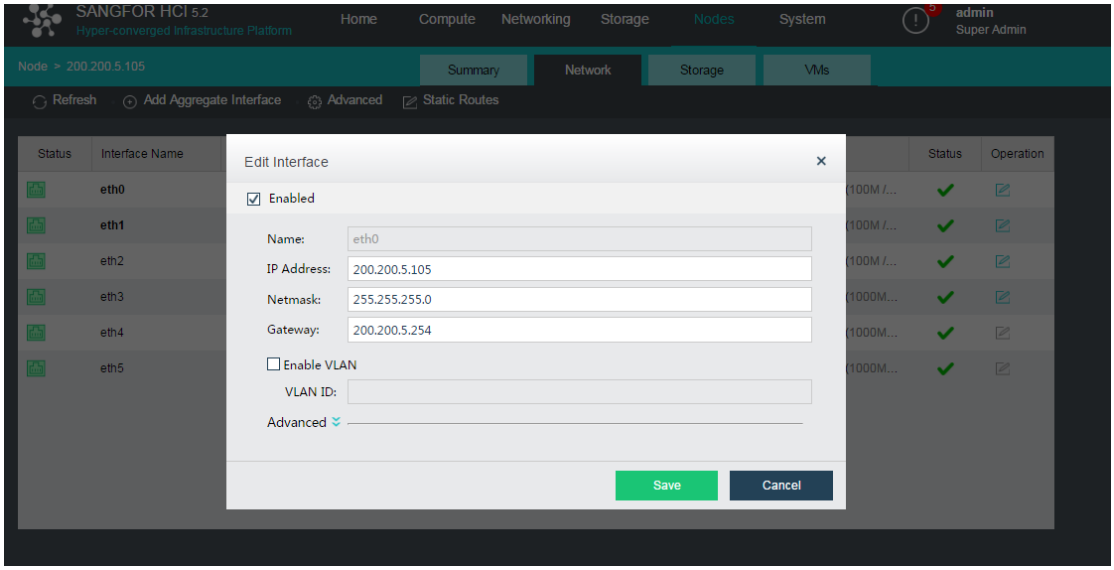
You can view the following information of physical interfaces on the **Network** page: **Status**, **Interface Name**, **IP Address**, **Link Mode**, etc.



To edit interface, click **Edit** in **Operation** column to enter the **Edit Interface** page.

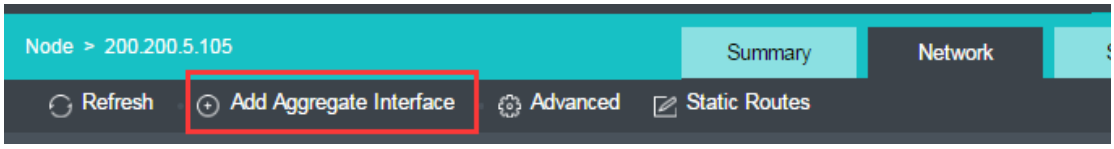


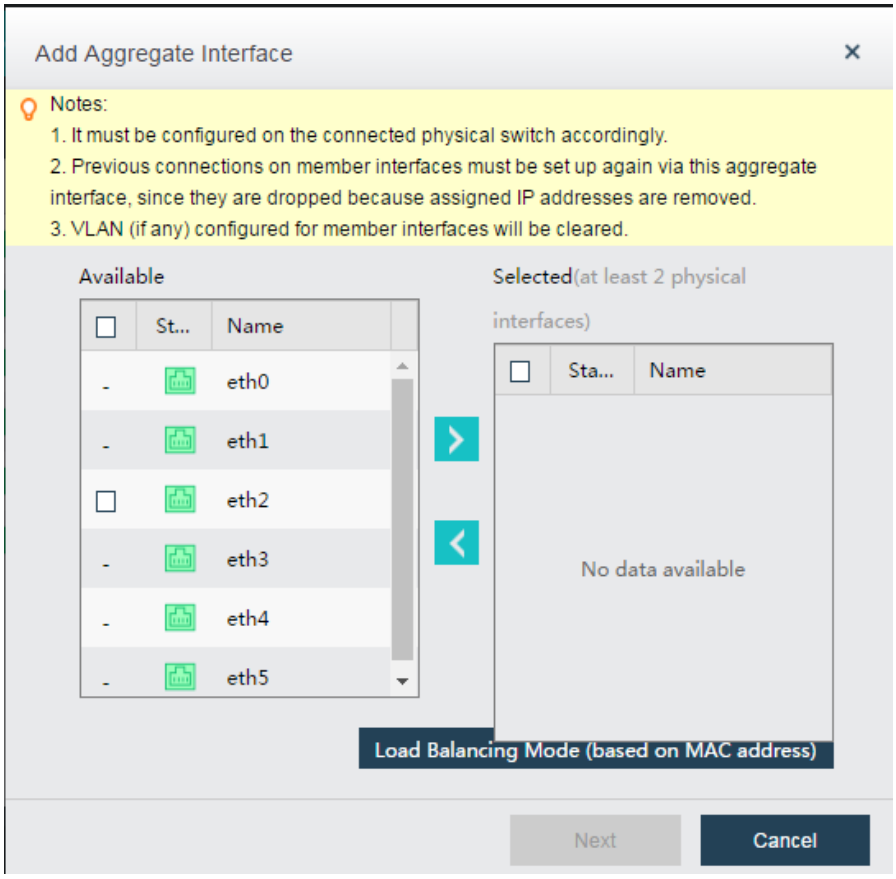
On the following page, you can modify interface settings exclusive of **Name** and **MAC address**.

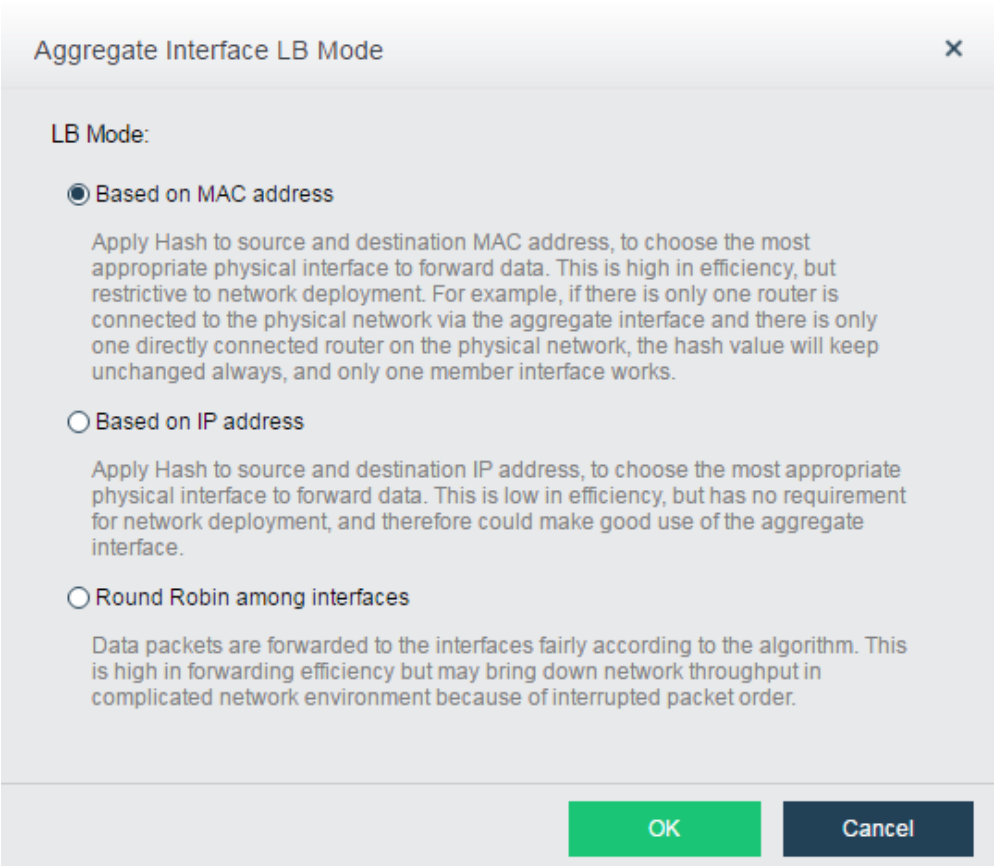


Adding Aggregate Interface

Aggregate interface can enhance data transmission performance and provide redundancy function. If a member interface fails, traffic data can go through other member interface, which ensures business service continuity. With aggregate interface, load balance can be achieved based on IP address or MAC address.



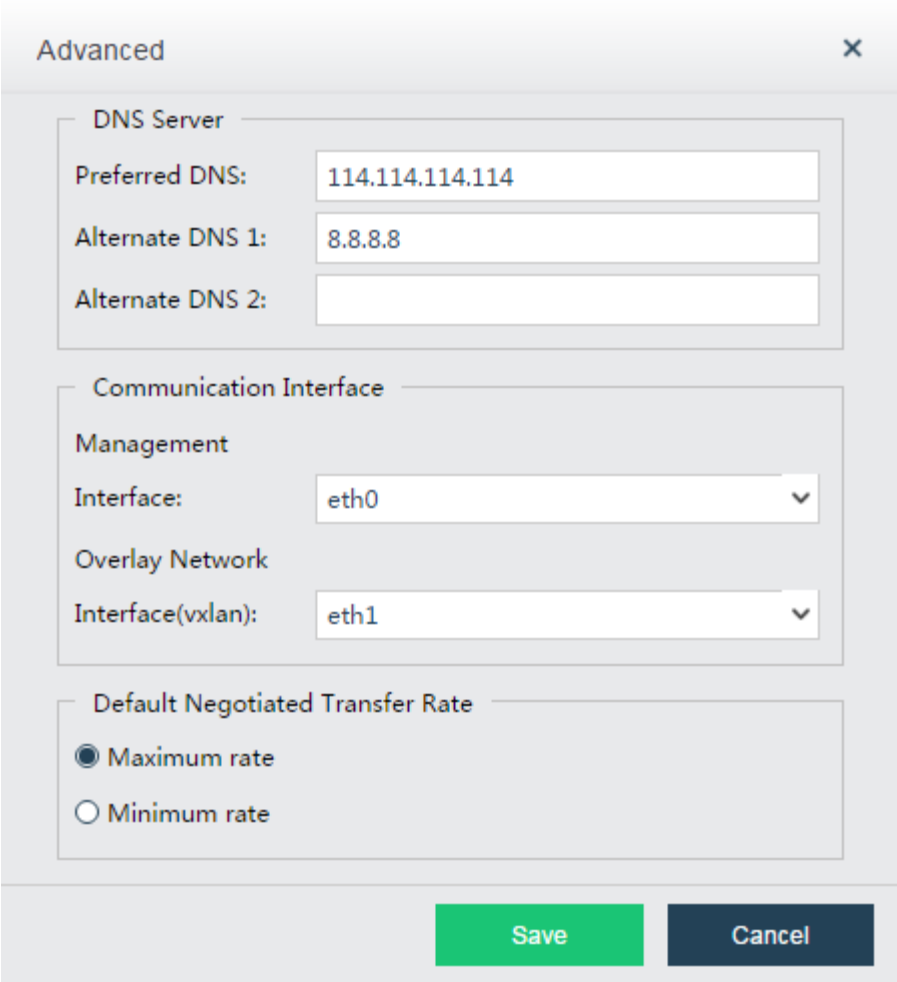

Add Aggregate Interface
Notes:
1. It must be configured on the connected physical switch accordingly.
2. Previous connections on member interfaces must be set up again via this aggregate interface, since they are dropped because assigned IP addresses are removed.
3. VLAN (if any) configured for member interfaces will be cleared.
Available
St...
Name
eth0
eth1
eth2
eth3
eth4
eth5
Selected(at least 2 physical interfaces)
Sta...
Name
No data available
Load Balancing Mode (based on MAC address)
Next
Cancel


Aggregate Interface LB Mode
LB Mode:
Based on MAC address
Apply Hash to source and destination MAC address, to choose the most appropriate physical interface to forward data. This is high in efficiency, but restrictive to network deployment. For example, if there is only one router is connected to the physical network via the aggregate interface and there is only one directly connected router on the physical network, the hash value will keep unchanged always, and only one member interface works.
Based on IP address
Apply Hash to source and destination IP address, to choose the most appropriate physical interface to forward data. This is low in efficiency, but has no requirement for network deployment, and therefore could make good use of the aggregate interface.
Round Robin among interfaces
Data packets are forwarded to the interfaces fairly according to the algorithm. This is high in forwarding efficiency but may bring down network throughput in complicated network environment because of interrupted packet order.
OK
Cancel

- Aggregate interface must be configured on connected physical switch accordingly, otherwise network may be disconnected.
- Previous connections on member interfaces must be set up again via aggregate interface, since they are dropped because assigned IP addresses are removed.

Configuring Advanced Settings

On the **Network** page, you can configure **DNS Server**, **Communication Interface** and **Default Negotiated Transfer Rate** by clicking **Advanced**, as shown on the following page.



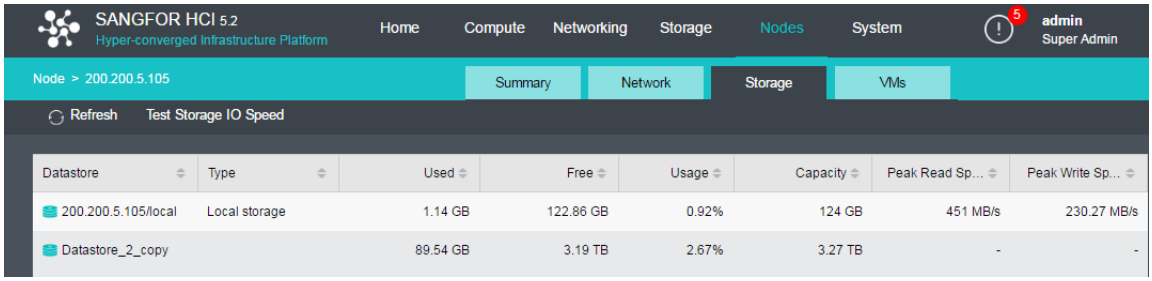
DNS Server: It is required when node needs to connect to the Internet to resolve domain name. For instance, DNS server should be configured when the node accesses NFS server through its domain name, synchronizes time with NTP server, or sends alarm email. Up to 3 DNS servers can

be configured.

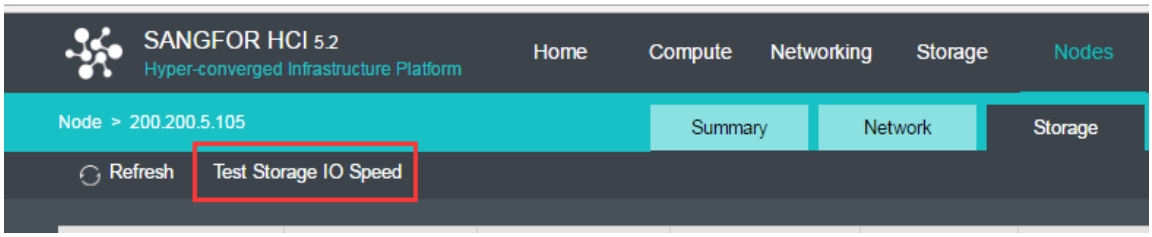
Communication Interface: It includes management interface which is used to manage nodes, and overlay network interface(VXLAN). Overlay network interface is a physical interface used for communication among virtual machines. If there are more than one physical interfaces on host, you need to specify one interface for host communication. IP addresses of communication interfaces should be on a same subnet.

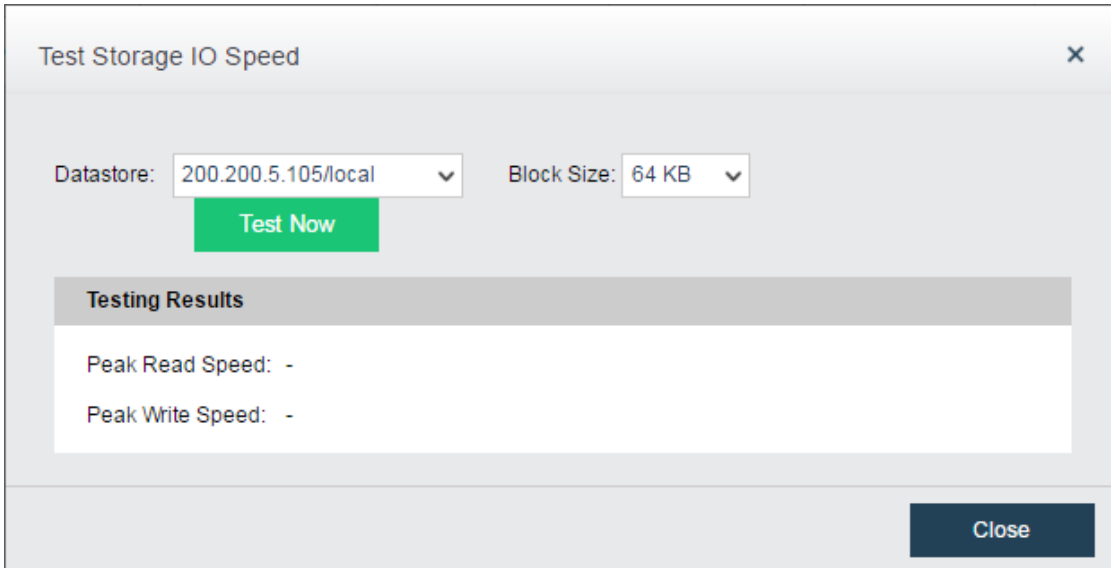
2.5.3.3. Viewing Storage

On the **Storage** page, you can view the information of datstores that the node has access to. If a datastore is online, you may see its detailed information, such as **Used**, **Free**, **Capacity**, ect. If that datastore is offline, **Used**, **Free** and **Capacity** will be zero.



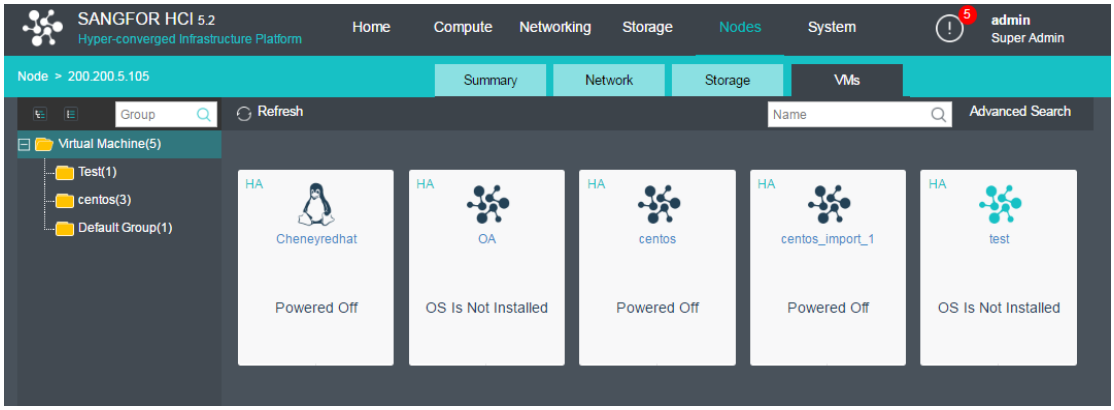
Test Storage IO Speed: It is used to test the peak write and read IO speed.



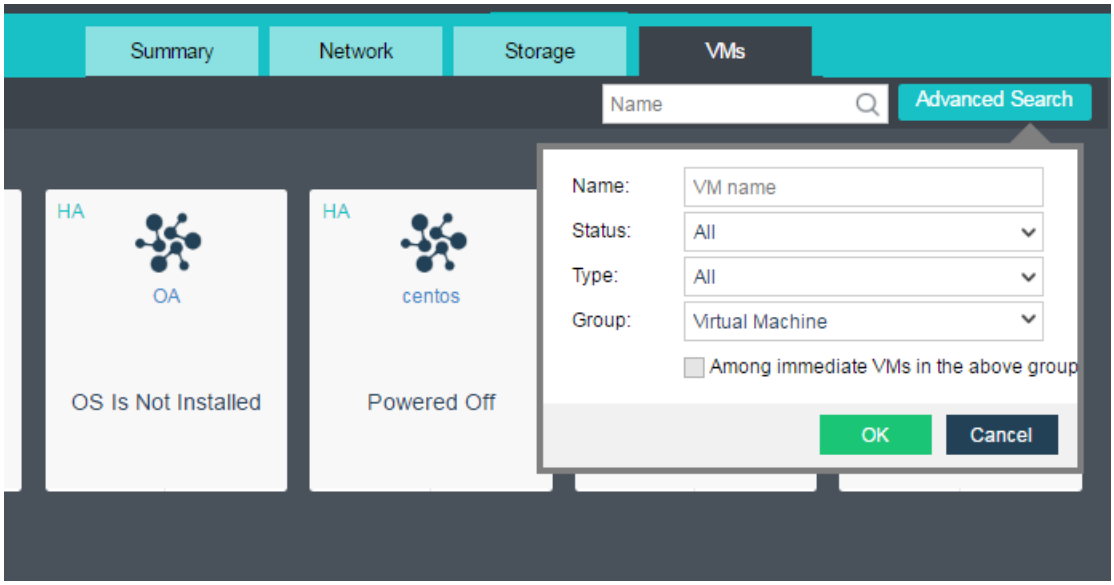


Viewing VMs

On the **VMs** page, you can view the virtual machines running on the node. Those virtual machines are displayed by group (Virtual machines not running on that node will not be displayed).



Fuzzy match is supported. You can search for virtual machine by VM name or click **Advanced Search** to search for virtual machine by VM status, type and group.

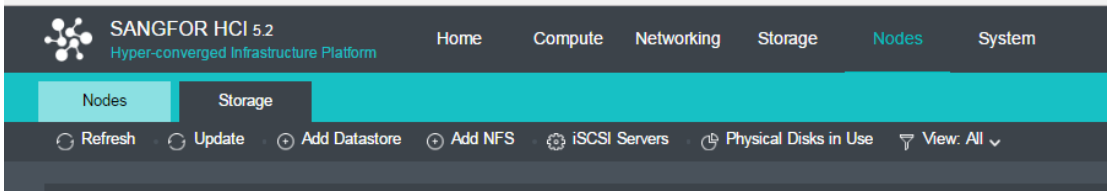


2.5.4. Storage

Storage falls into FC storage, iSCSI storage and local storage. Sangfor HCI virtualizes storage and makes hardware-related storage settings hidden. Storage space of a host relies on physical disk size but can be expanded by using external storage. Local storage is provided by local disks on the node installed Sangfor HCI software and can only be accessed by the host where that storage resides but not accessed by other hosts.

2.5.4.1. Toolbar

On the **Storage** page, as shown below, you can refresh page, update datastore status, add datastore, add NFS, configure iSCSI servers, view physical disks in use and view datastore by storage type.



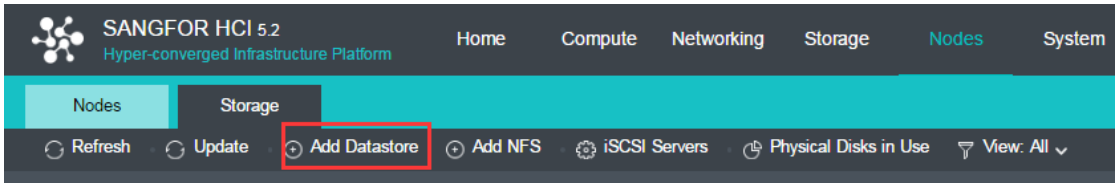
2.5.4.2. Adding Datastore

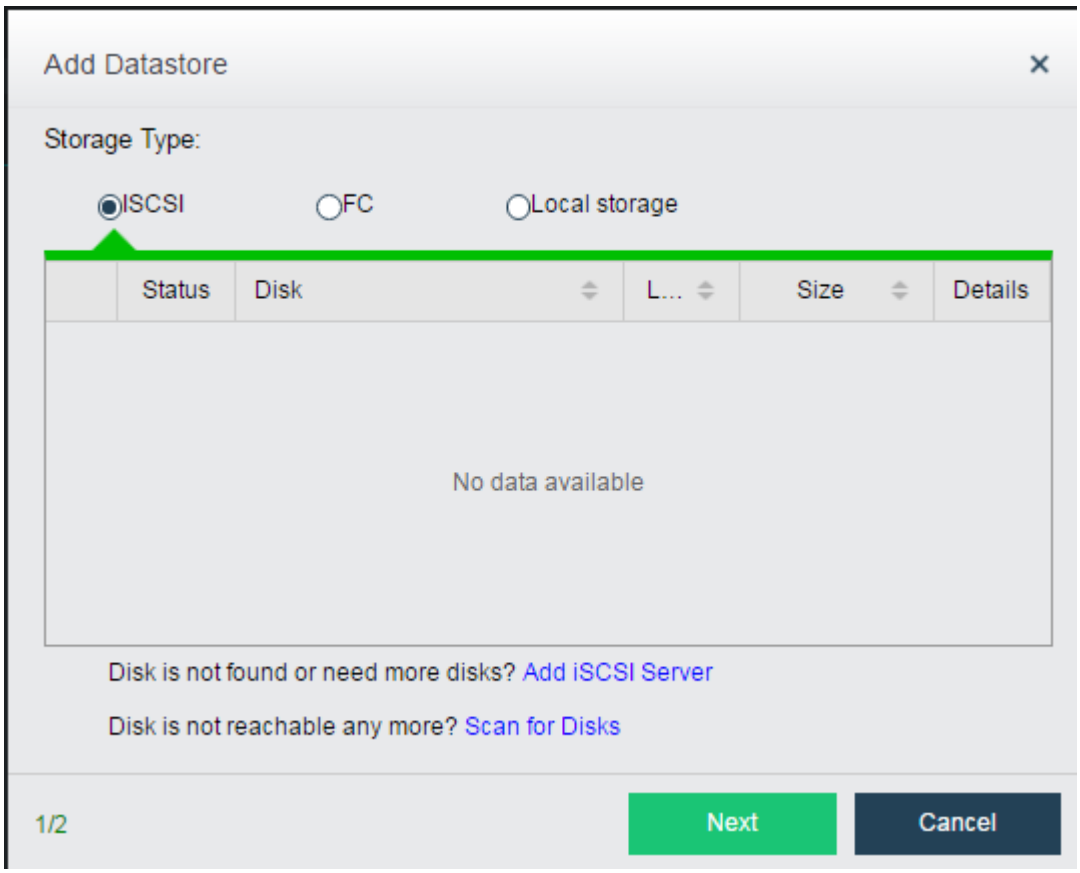
You can add iSCSI, FC or local storage by clicking **Add Datastore** in **Nodes > Storage**.

Adding iSCSI Type of Datastore

iSCSI is a P2P protocol and used to transmit storage IO data blocks over Internet Protocol(IP) network. It defines the rule and method of sending and receiving block-level storage data over TCP/IP network. More specifically, SCSI commands and data should be encapsulated into TCP/IP packets before being forwarded.

To add iSCSI type of datastore, click **Add Datastore** in **Nodes > Storage**, select **iSCSI** as **Storage Type** and then choose a disk on the following page.

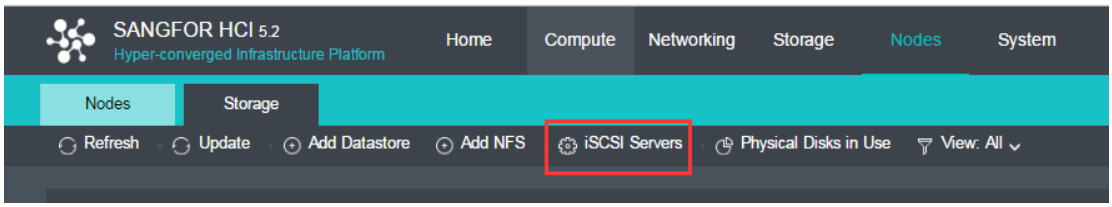


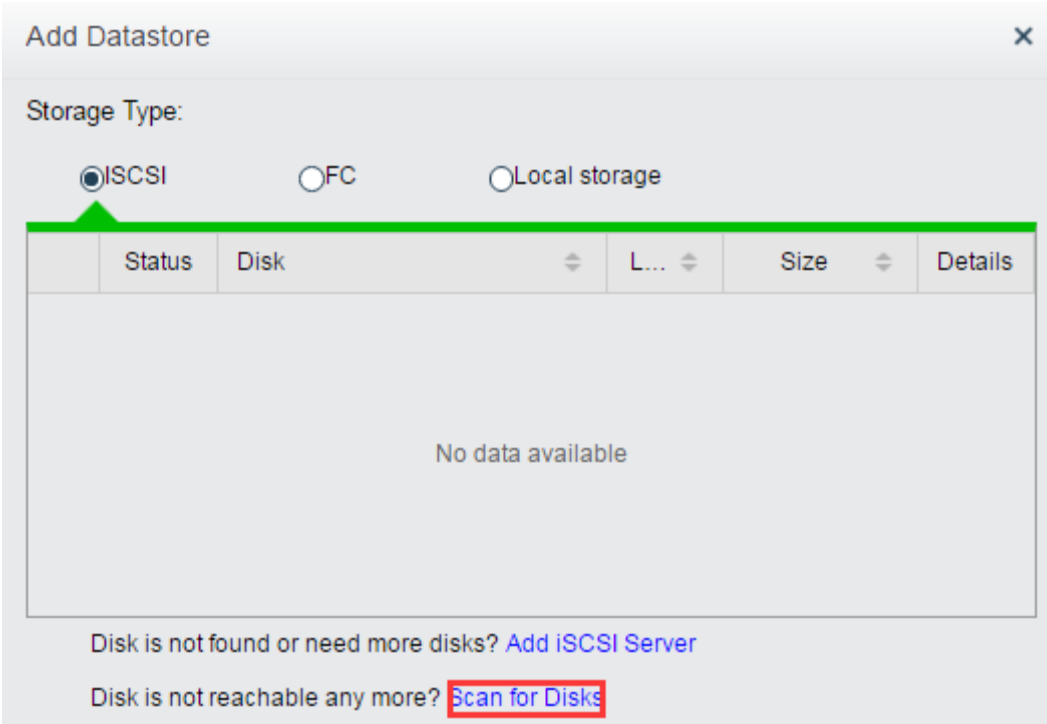


Before adding iSCSI type of datastore, you need to add iSCSI server in **Nodes > Storage > iSCSI Servers**. iSCSI disks will be automatically discovered when iSCSI server settings are saved.

If any new iSCSI disk has been added but not listed here, you may click **Scan for Disks** to find new

iSCSI disks.





Datastore: Specifies a distinguishable name for the datastore. Datastore name should contain 2-16 characters consisting of digits, letters, underscores, dots and hyphens only, and begin and end with letter or digit.

Connect To Node: Only the selected nodes have access to the datastore being added.

If any virtual machines are stored on the datastore, you can select the option **Recover existing virtual machines on this datastore as well** to recover existing virtual machines.

Select nodes and then click **OK** to save the settings or click **Cancel** to give up the changes.

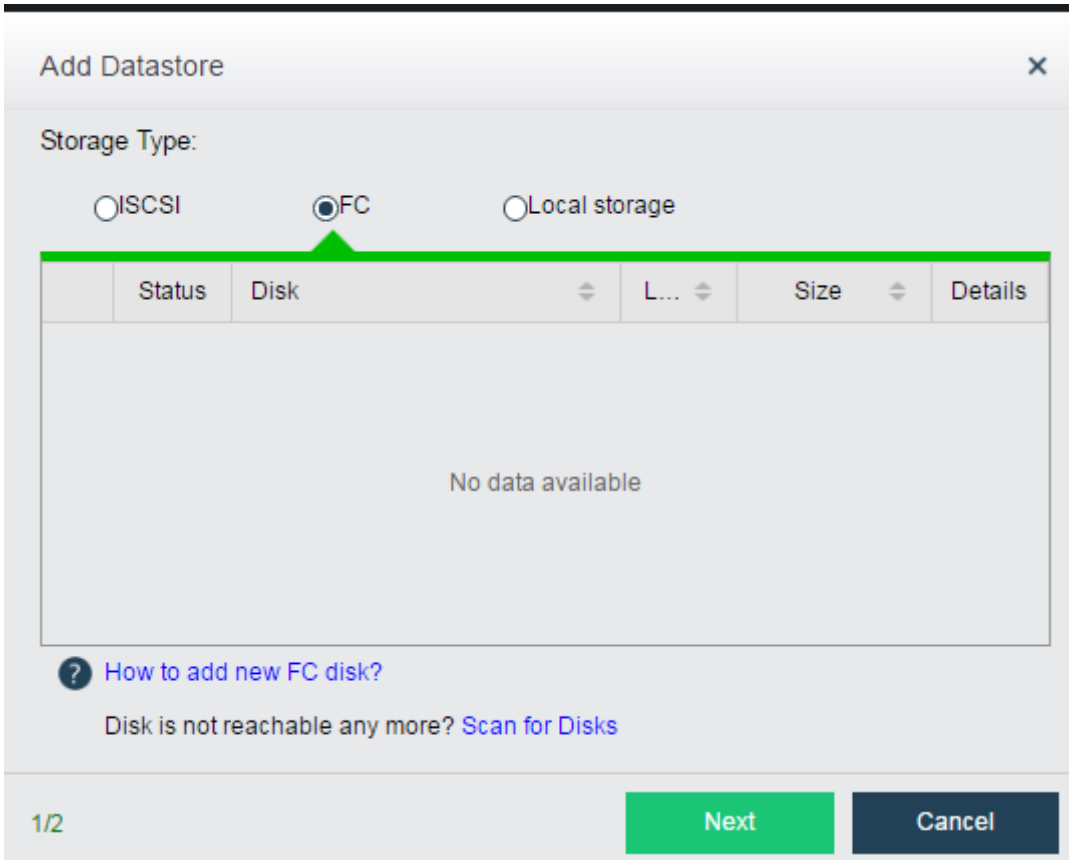
If the new disk being added has not been formatted, you will be prompted to format it when adding it into storage. Note that formatted data cannot be restored any more.

Adding FC Type of Datastore

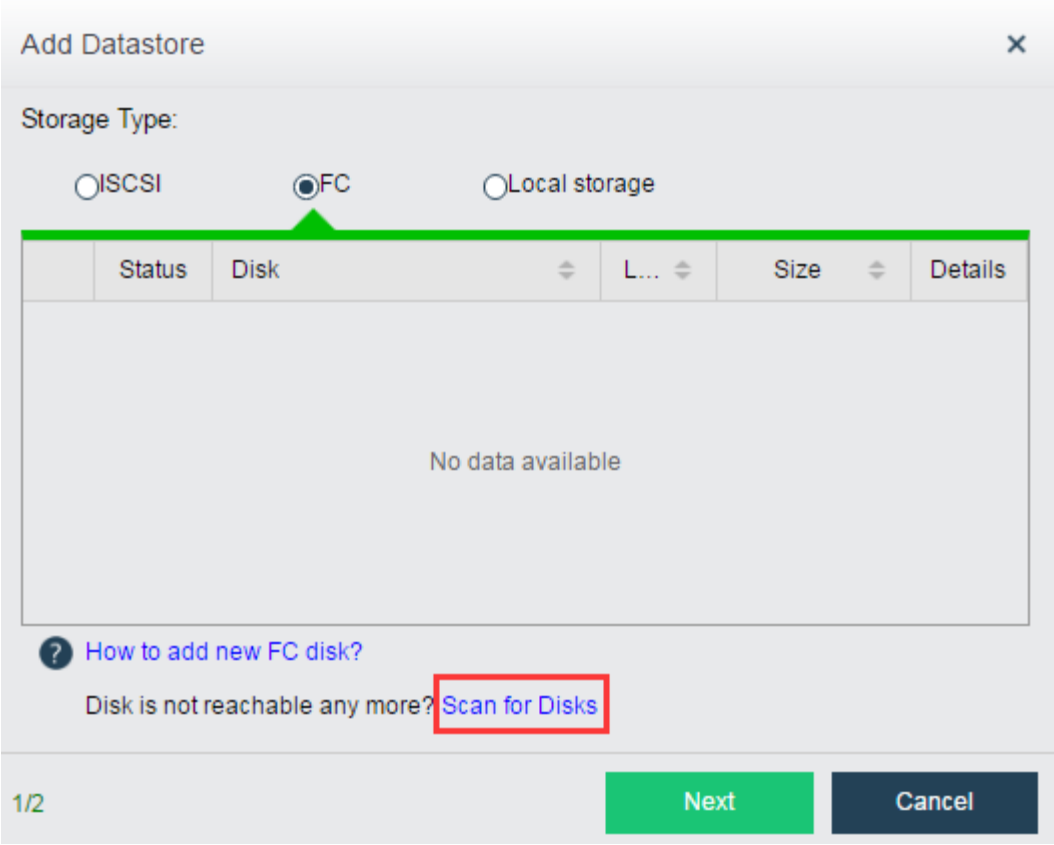
Fibre channel(FC) adopts Fibre Channel over IP (FCIP) to connect storage devices in TCP/IP

network. FCIP transmits Fibre Channel data by establishing a tunnel between two peers. Generally, it builds storage area network through DWDM and dark fibre.

FC storage connected to hosts will be automatically discovered by Sangfor HCI platform but needs to be added to storage before being used.



If there is any FC disk that has not been found, you can click **Scan for Disks**.



Datastore: Specifies a distinguishable name for the datastore. Datastore name should contain 2-16 characters consisting of digits, letters,

Connect To Node: Only the selected nodes can access the datastore being added.

If any virtual machines is stored on the datastore, you can select the option **Recover existing virtual machines on this datastore as well** to recover existing virtual machines.

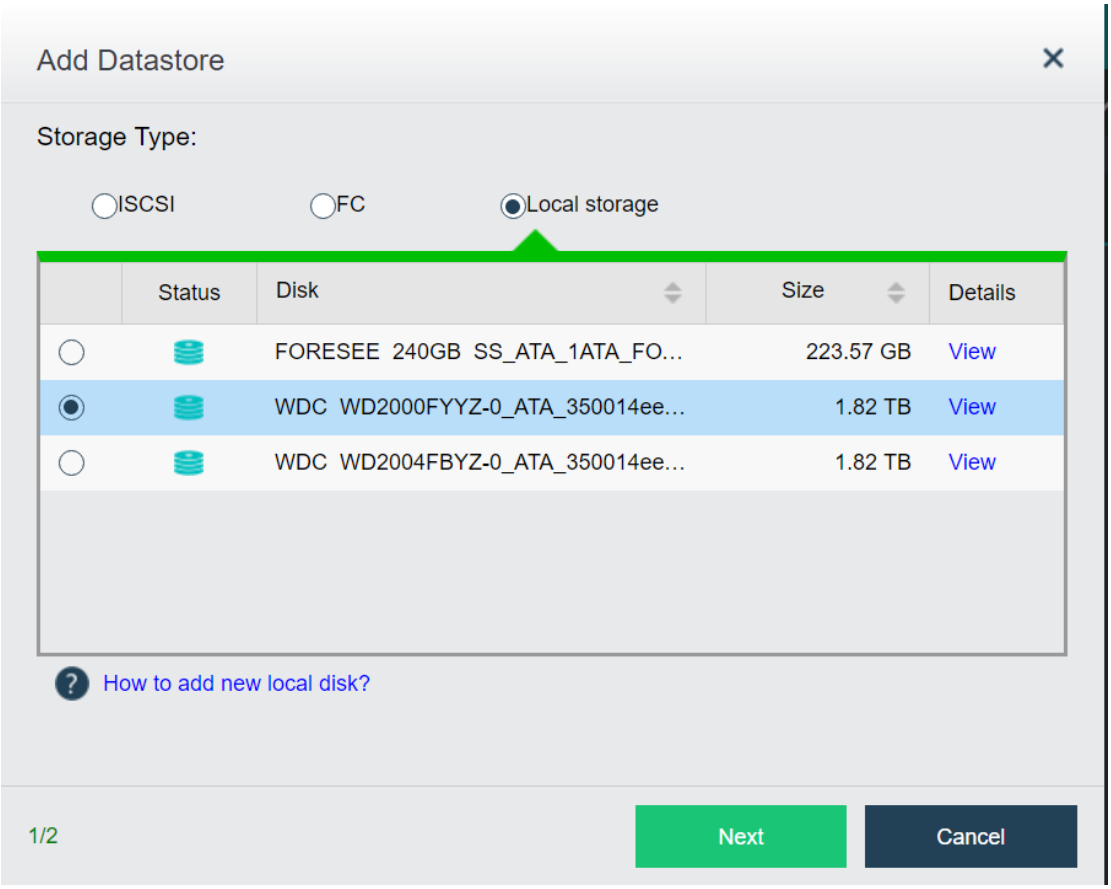
Then, click **OK** to save settings or click **Cancel** to give up the changes.

If the new disk being added has not been formatted, you will be prompted to format it when adding it into storage. Note that formatted data cannot be restored any more.

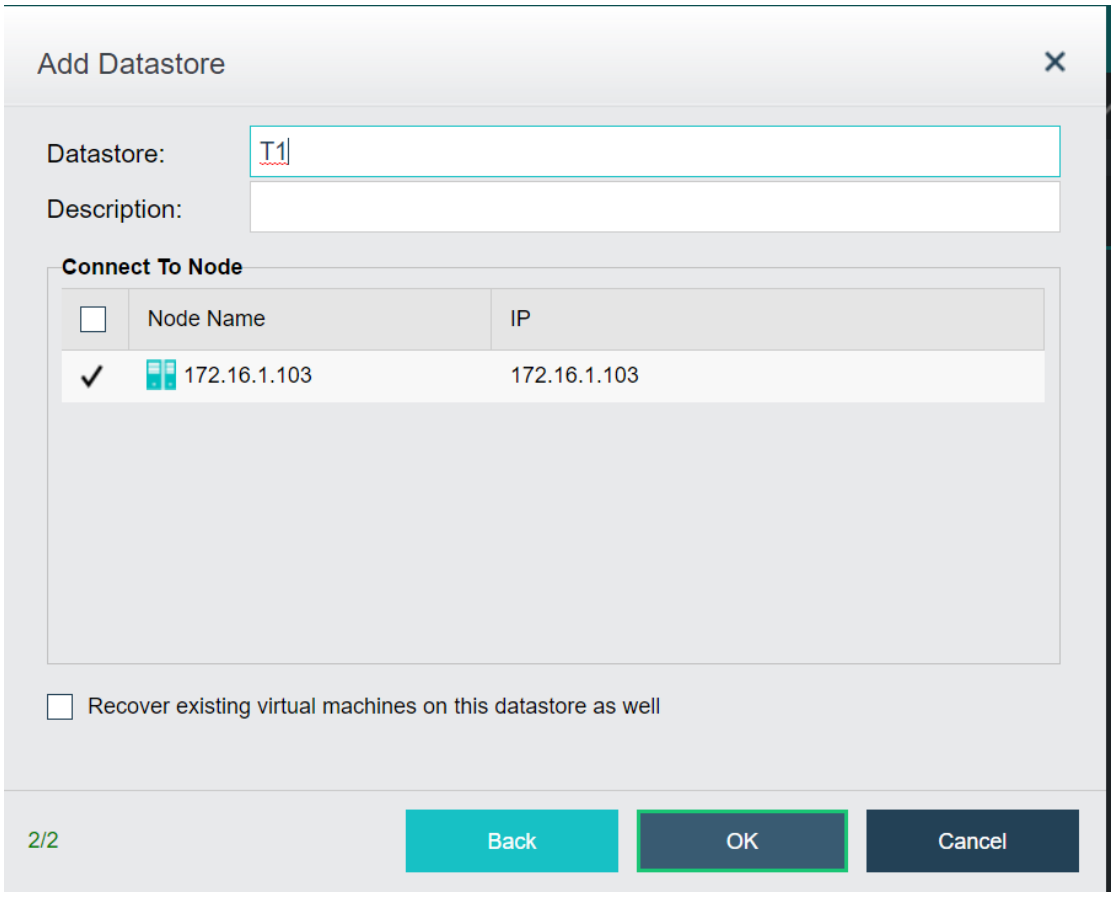
Adding Local Storage

Local storage is provided by local disks on the node installed Sangfor HCI software. It can only be accessed by the host where that storage resides but not accessed by other hosts.

If there is any new disk that has been added on the node, you can add it to virtual storage by adding local storage.



Select a disk that you want to add and then click Next to enter the following page.



Datastore: Specifies a distinguishable name for the datastore. Datastore name should contain 2-16 characters consisting of digits, letters, underscores, dots and hyphens only, and begin and end with a letter or a digit.

Connect To Node: Displays the node that the local disk being added belongs to.

If any virtual machines is stored on the datastore, you can select the option **Recover existing virtual machines on this datastore as well** to recover existing virtual machines.

Then, click **OK** to save settings or click **Cancel** to give up the changes.

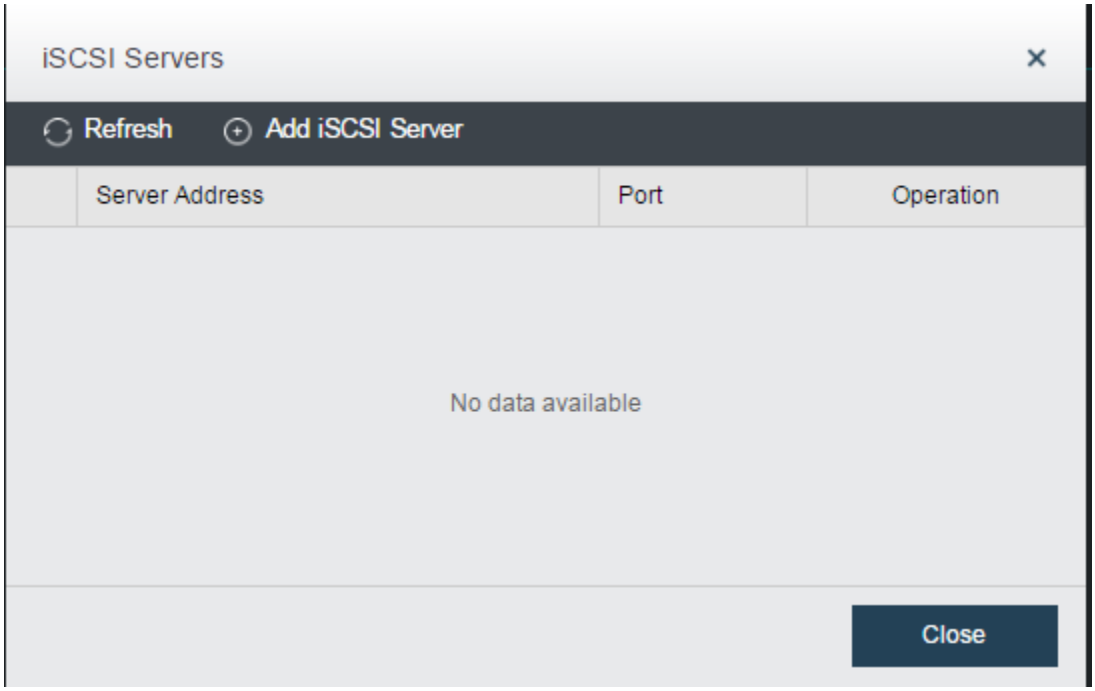
If the local disk has not been formatted, you will be prompted to format it when adding it into storage. Note that formatted data cannot be restored any more.

2.5.4.3. iSCSI Servers

You need to configure **iSCSI Servers** before adding iSCSI type of datastore. Click **iSCSI Servers** in **Nodes > Storage** to enter the following page.

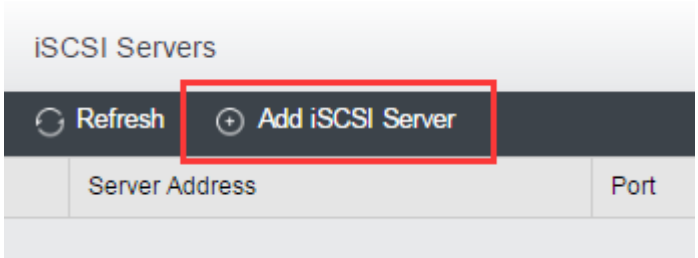
Then, click **Add iSCSI Server**. iSCSI disks will be automatically discovered when iSCSI server settings

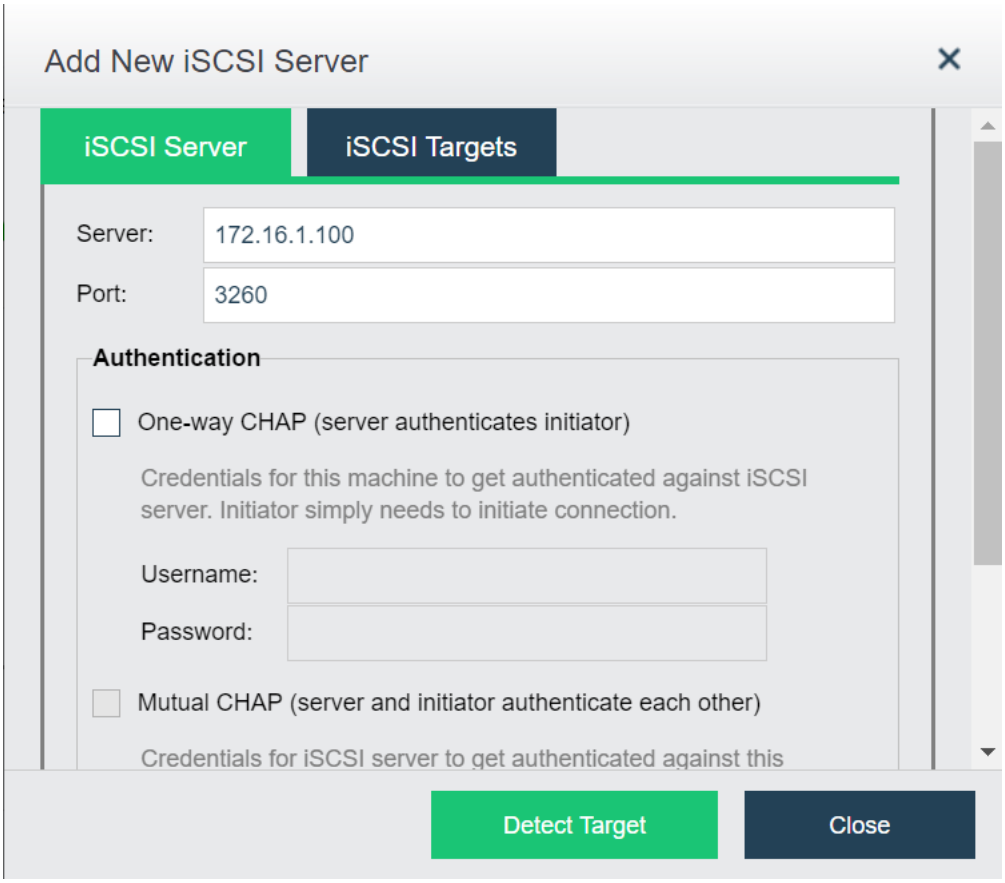
are saved.



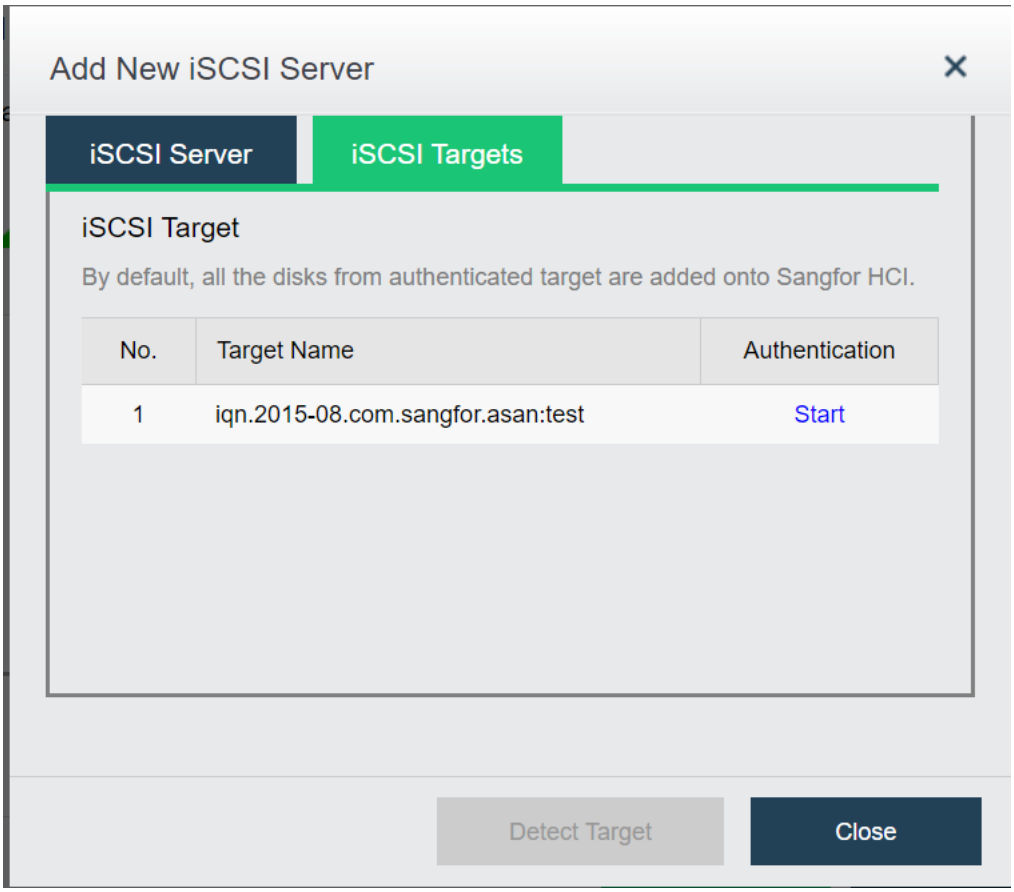
On the **Add New iSCSI Server** page, you need to specify IP address and port of iSCSI server.

If iSCSI server needs to authenticate initiator, you need to select **One-way CHAP**, and specify the corresponding **Username** and **Password**. iSCSI uses CHAP authentication, including one-way CHAP and mutual-way CHAP authentication, which depends on authentication settings on iSCSI server.



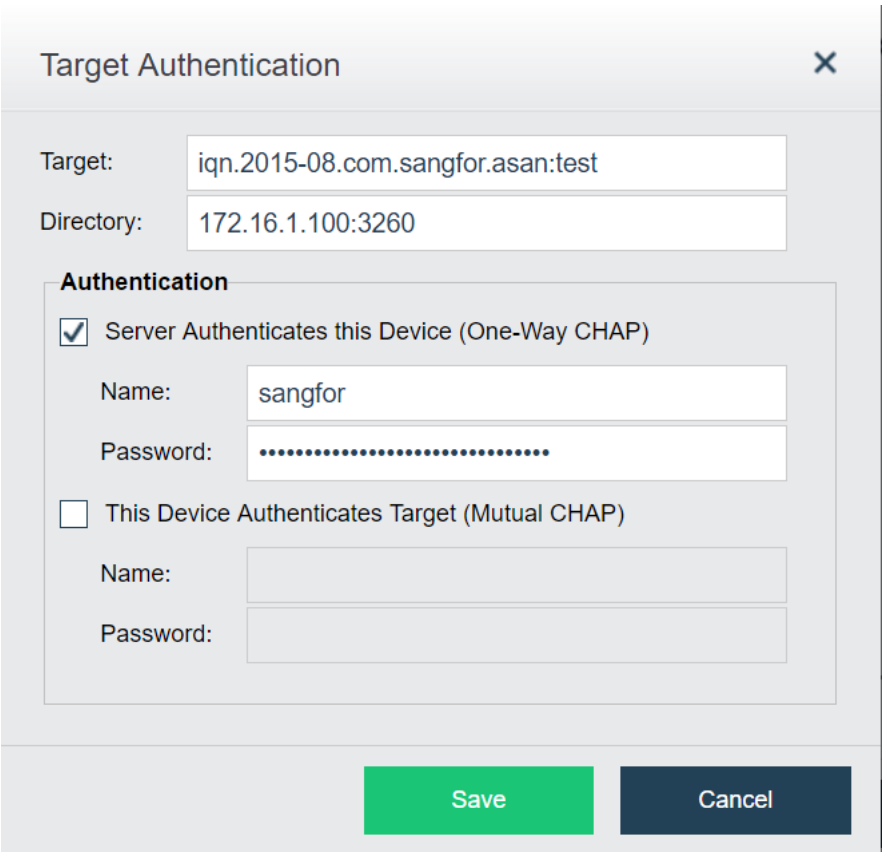


After username and password are specified, click **Detect Target**. On the **iSCSI Targets** tab, as shown below, click **Start** to start authentication.



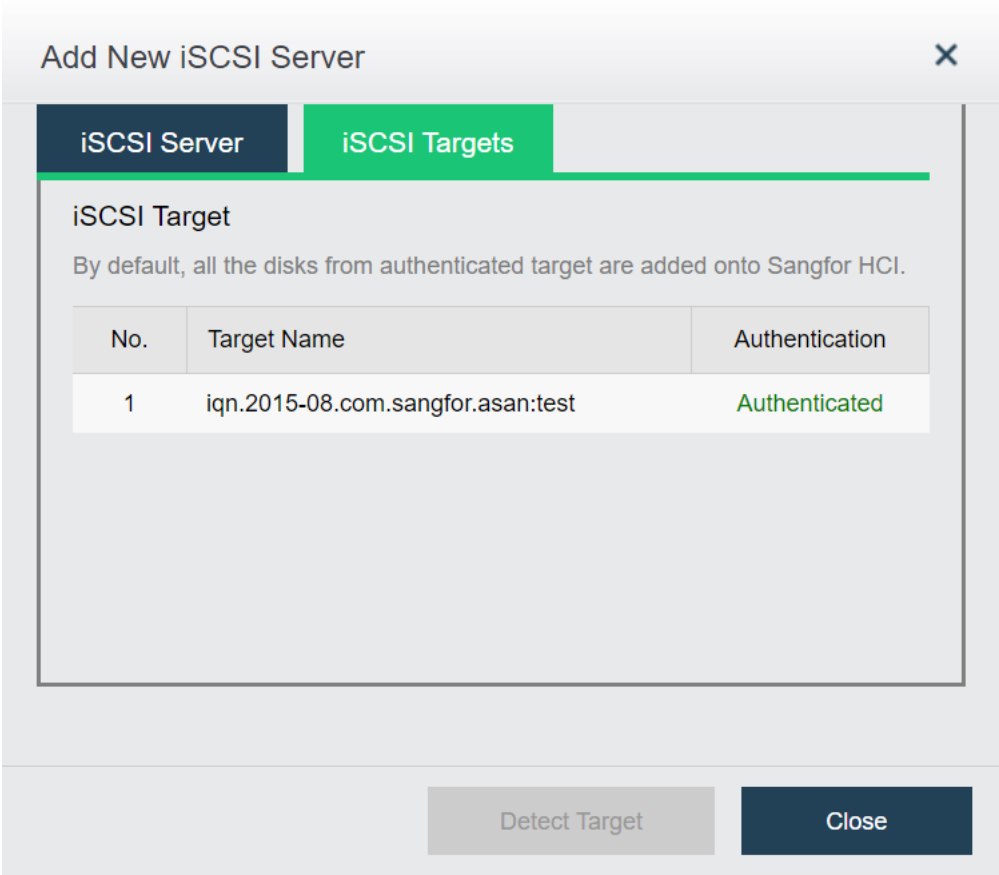
In some environment, iSCSI server may require each iSCSI disk to perform different authentication.

In this case, you need to provide the corresponding credentials after clicking **Start**.



CHAP authentication method configured for iSCSI target should be the same as iSCSI server, **One-way CHAP** or **Mutual-way CHAP**.

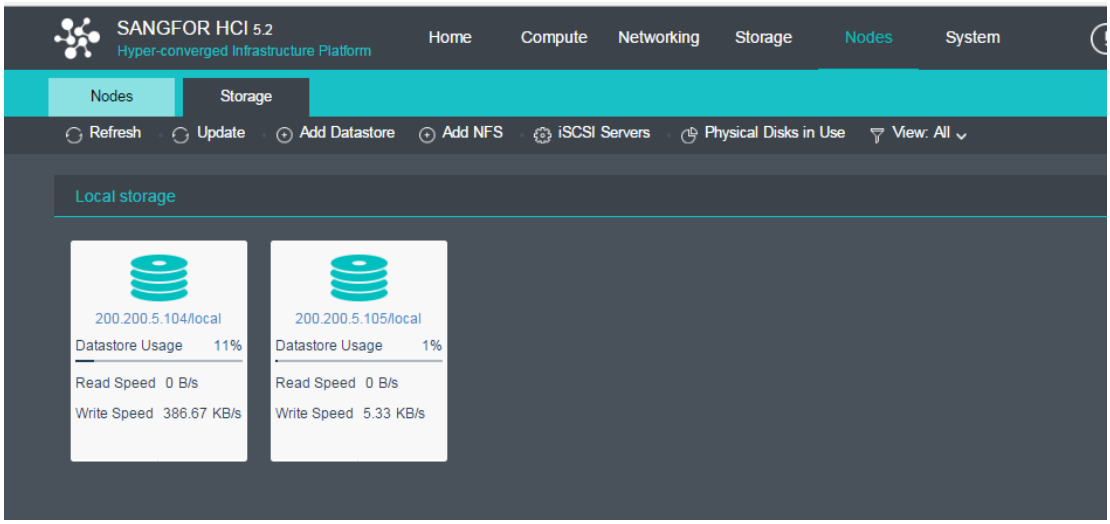
After saving authentication information on **Target Authentication** page, you can view the authentication result on the following page. **Authenticated** indicates that authentication is successful.



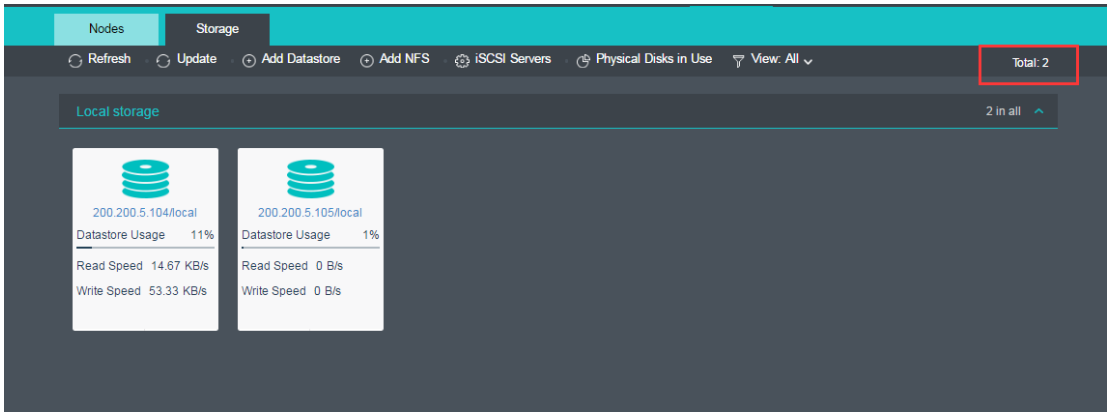
Then iSCSI disks will be automatically discovered and listed on **Add Datastore** page so that you can add them to storage.

2.5.5. Updating Datastore Status

Datastores are displayed by storage type, as shown below.

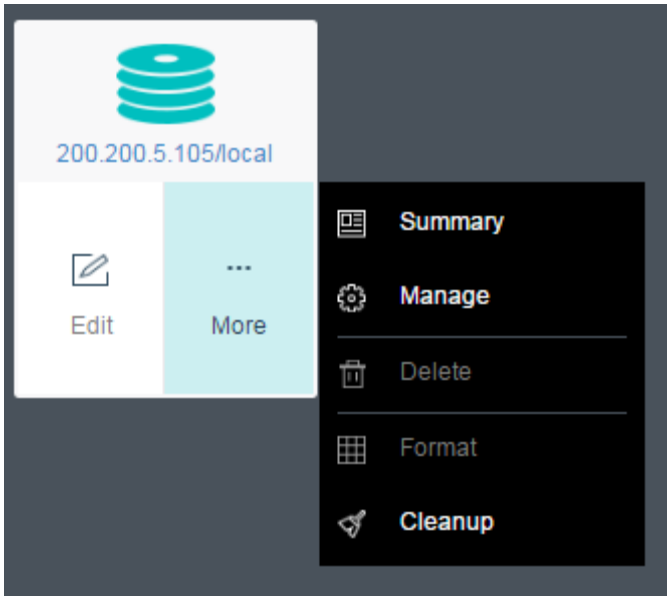


Number of datastores is shown at the upper-right corner of the **Storage** page, as shown below.

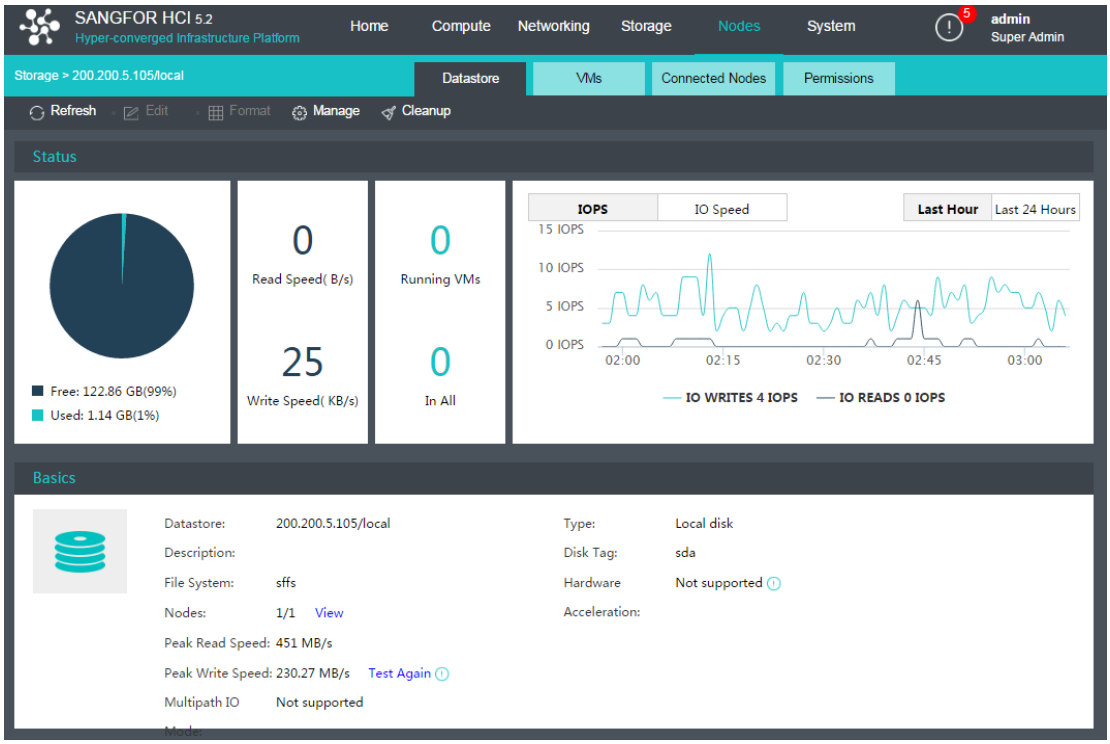


You can know datastore status from the color of datastore card. Blue indicates datastore operates normally. Red indicates datastore is giving alarm or offline. What's more, you can get the following information on datastore card, such as **Datastore Usage**, **Read Speed** and **Write Speed**.

Move your cursor onto datastore card and you will see more buttons: **Edit** and **More**. To perform more operations, click **More**, as shown below:



To view detailed information of a datastore, click on datastore name to redirect to the **Datastore** page, as shown in the following figure.

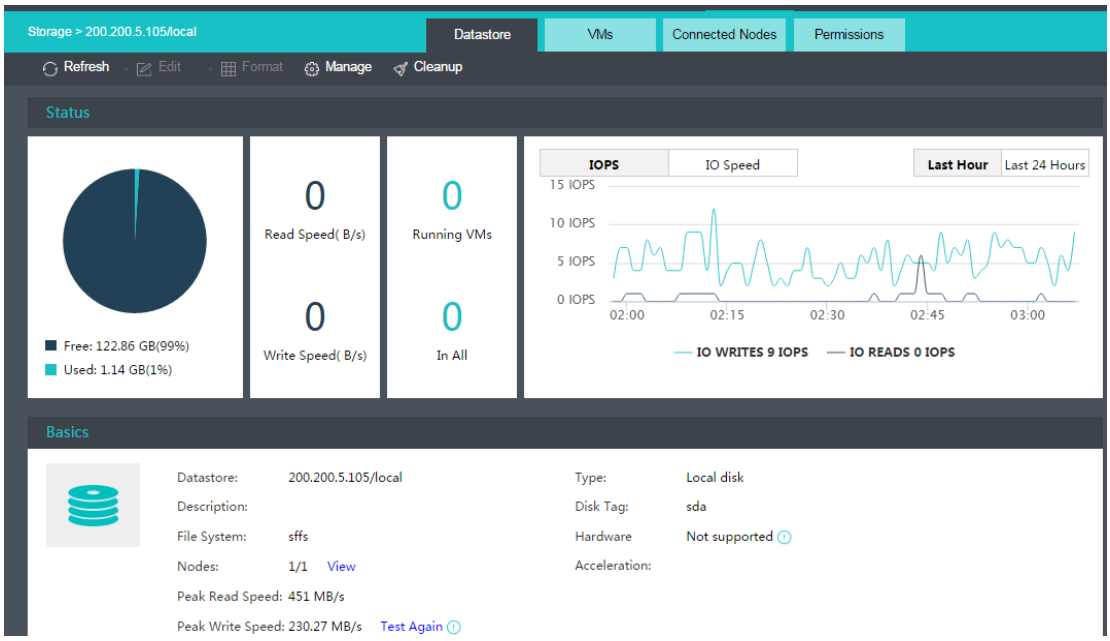


2.5.6. Viewing Datastore Summary

You can also go to the **VMs**, **Connected Nodes** or **Permissions** page to view more information.

2.5.6.1. Viewing Datastore Info

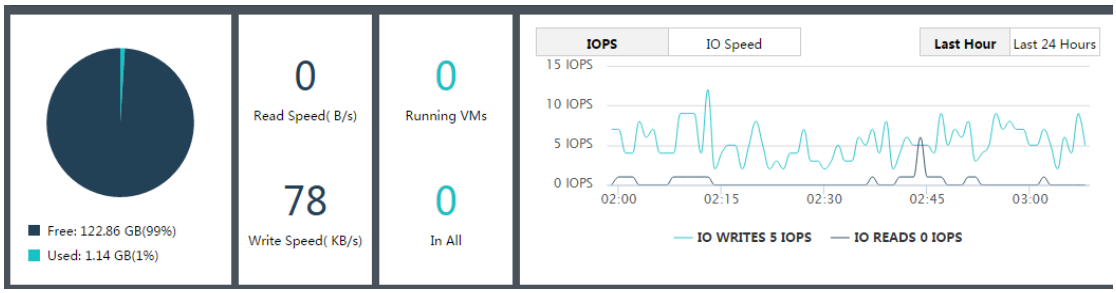
On the **Datastore** page, you can view **Status** and **Basics**.



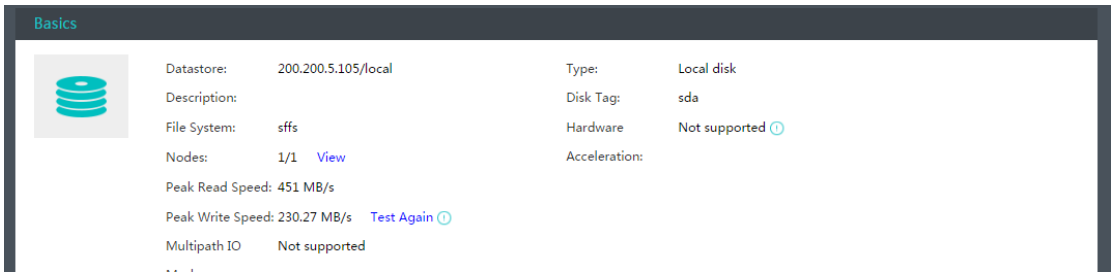
Edit: You can click it to change datastore name and **Connected Nodes** settings (Local storage cannot be edited by default).

Format: You can click it to format the datastore. Once datastore is formatted, data on it will be deleted and cannot be restored any more (Local storage cannot be formatted by default).

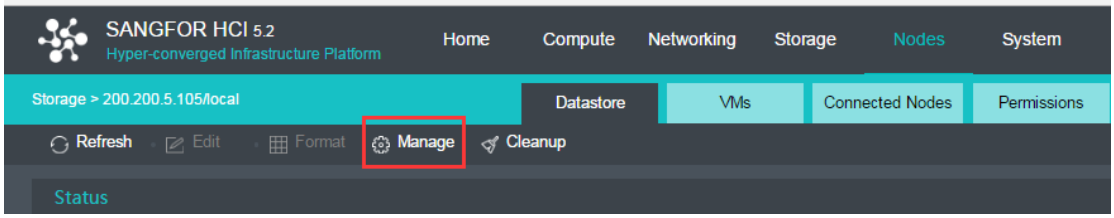
Status: This section displays used and free datastore space, read speed, write speed, running VMs, all VMs, IOPS and IO speed (in the last hour or 24 hours).

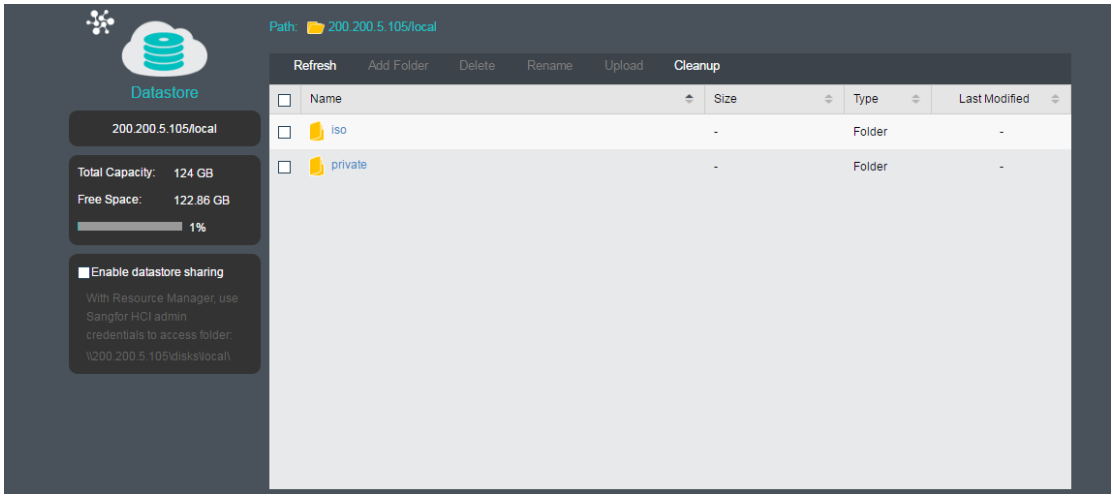


Basics: This section displays basic datastore information, including **Datastore**, **Description**, **File System**, **Nodes**, **Type**, **Disk Tag**, etc.

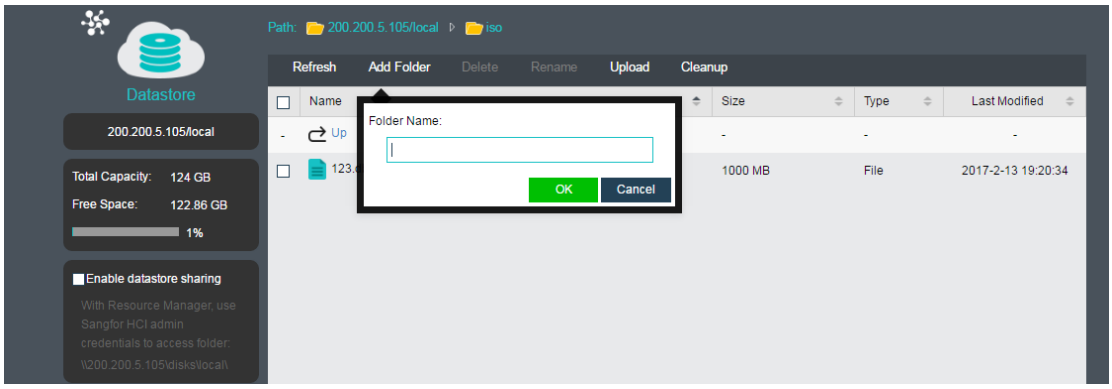


To manage datastore, click **Manage** to enter the following page. On that page, you can perform the following operations: **Refresh**, **Add Folder**, **Rename** and **Upload**.





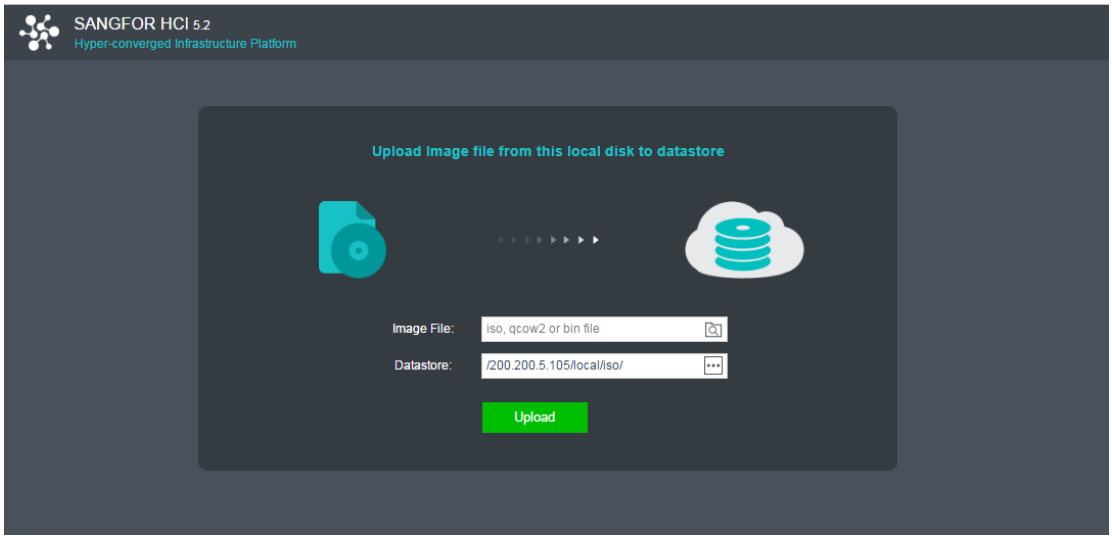
To add a folder, you may click **Add Folder**.



To delete a file or folder, select that file or folder and click **Delete**.

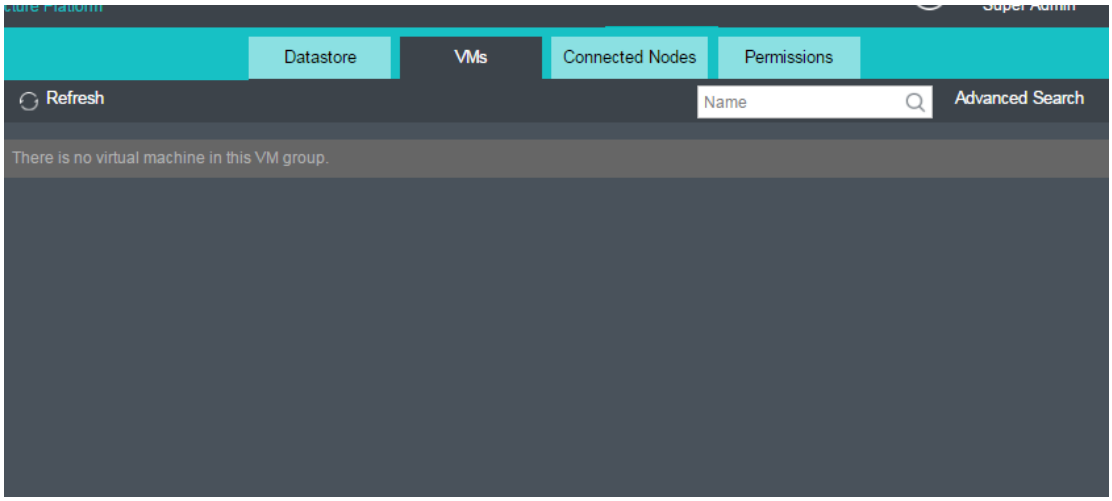
To rename a file or folder, select that file or folder and then click **Rename**.

To upload a file to a specific folder, select that folder and click **Upload**. For example, the following page shows uploading an ISO image file to ISO folder.

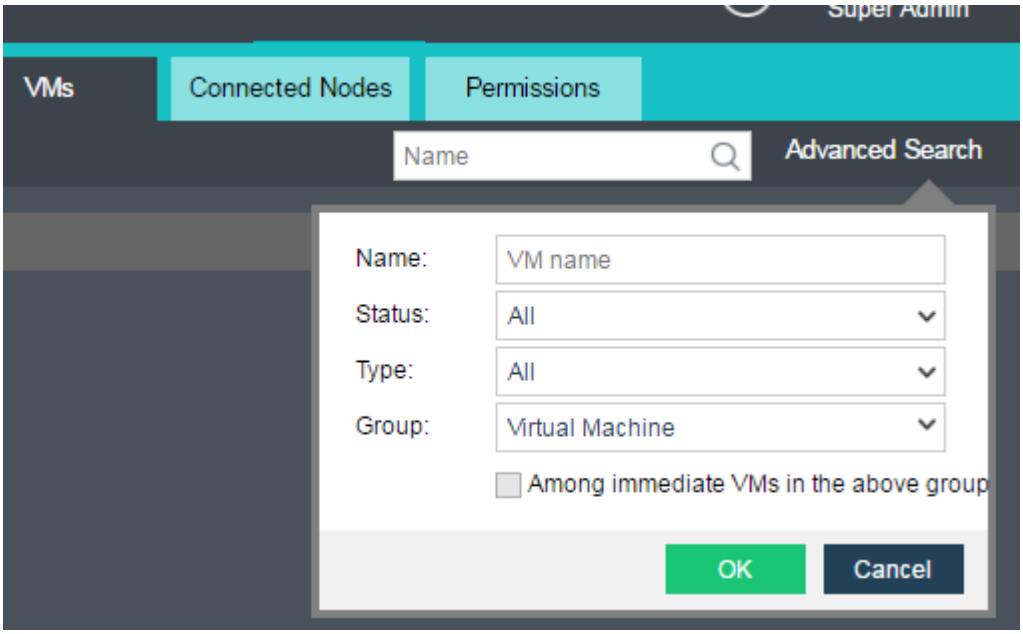


2.5.6.2. Viewing VMs

On the **VMs** page, you can view the virtual machines stored on that datastore. Those virtual machines are displayed by group (Virtual machines will not be displayed that are not stored on the datastore).

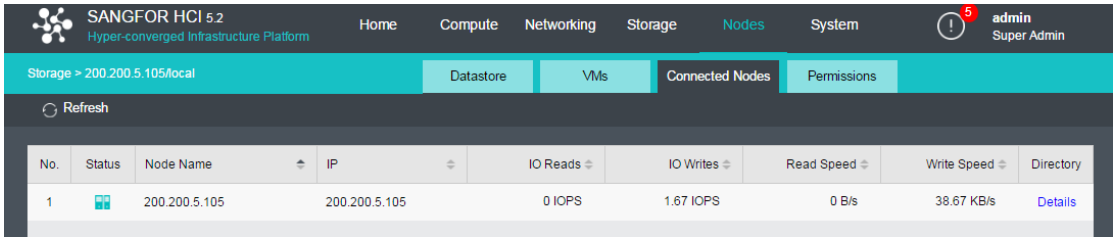


Fuzzy match is supported. You can search for virtual machine by VM name or click **Advanced Search** to search for virtual machine by VM status, type and group.



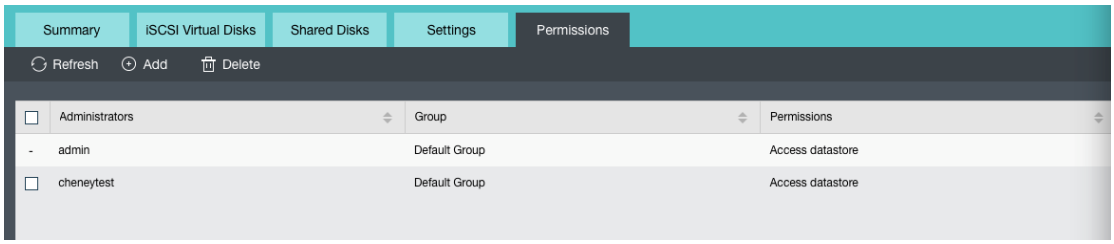
2.5.6.3. Viewing Connected Nodes

On the **Connected Nodes** page, you can view the nodes which have access to the datastore. Those nodes are displayed by group. Node that nodes which cannot access the datastore will not be displayed.



2.5.6.4. Permissions

Storage permission is coordinated with permission assigned by administrator in sub-administration, you can only modify it after adding storage resource in Sub Administrators.



For details, refer to **Sub Administrators** section.