



HCI

User Manual

Version 6.2.0



Change Log

Date	Change Description
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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 6.0.1 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 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: <i>http://10.254.254.254:1000</i>

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>	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

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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.

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Chapter 1 Installing & Initializing Sangfor HCI

Software

Sangfor HCI software provides an Enterprise-class cloud management platform which 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 is a suit of software which 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.



aSV refers to management software or operating system of Sangfor HCI, if not otherwise specified.

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 the server's performance, the better virtual machine's user experience will be.

Additionally, there are some requirements for the physical server on which you want to install the Sangfor HCI software.

The server's CPU must support Intel Virtualization Technology(VT) or AMD-V. 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

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configuring SSD and HDD.

The server must have at least 4 NICs.

1.2 Installing Sangfor HCI Software

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

1.2.1 Writing Image File to USB Drive

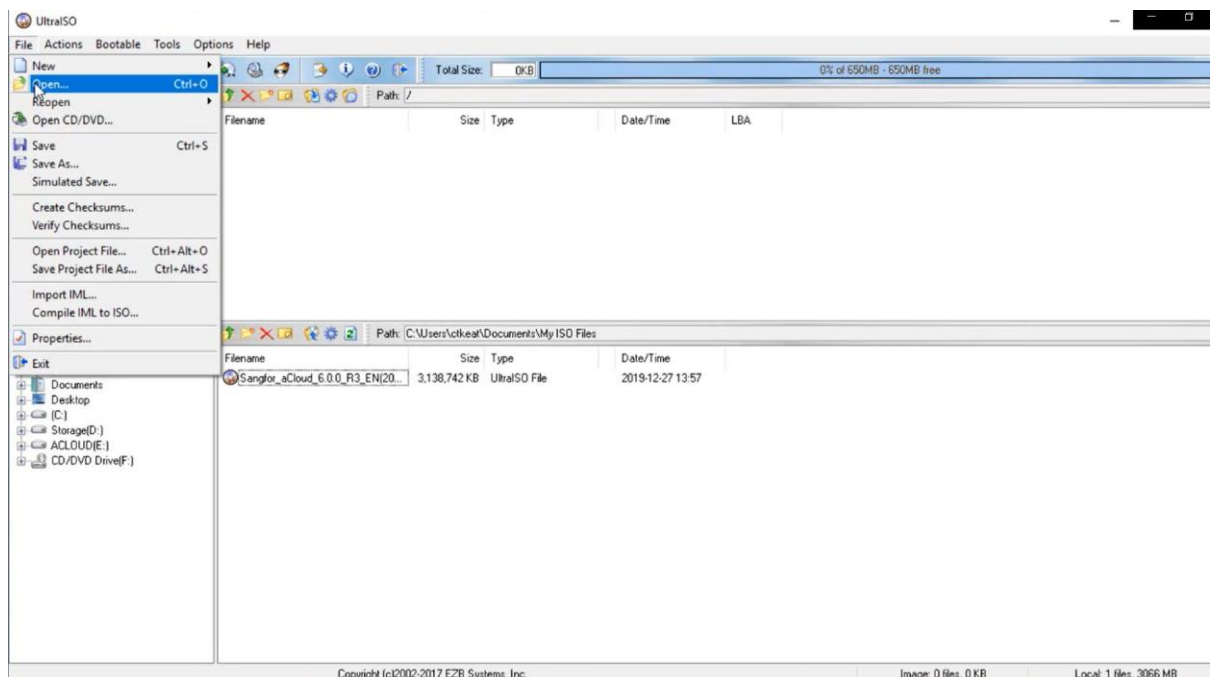
Required software: UltraISO

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.

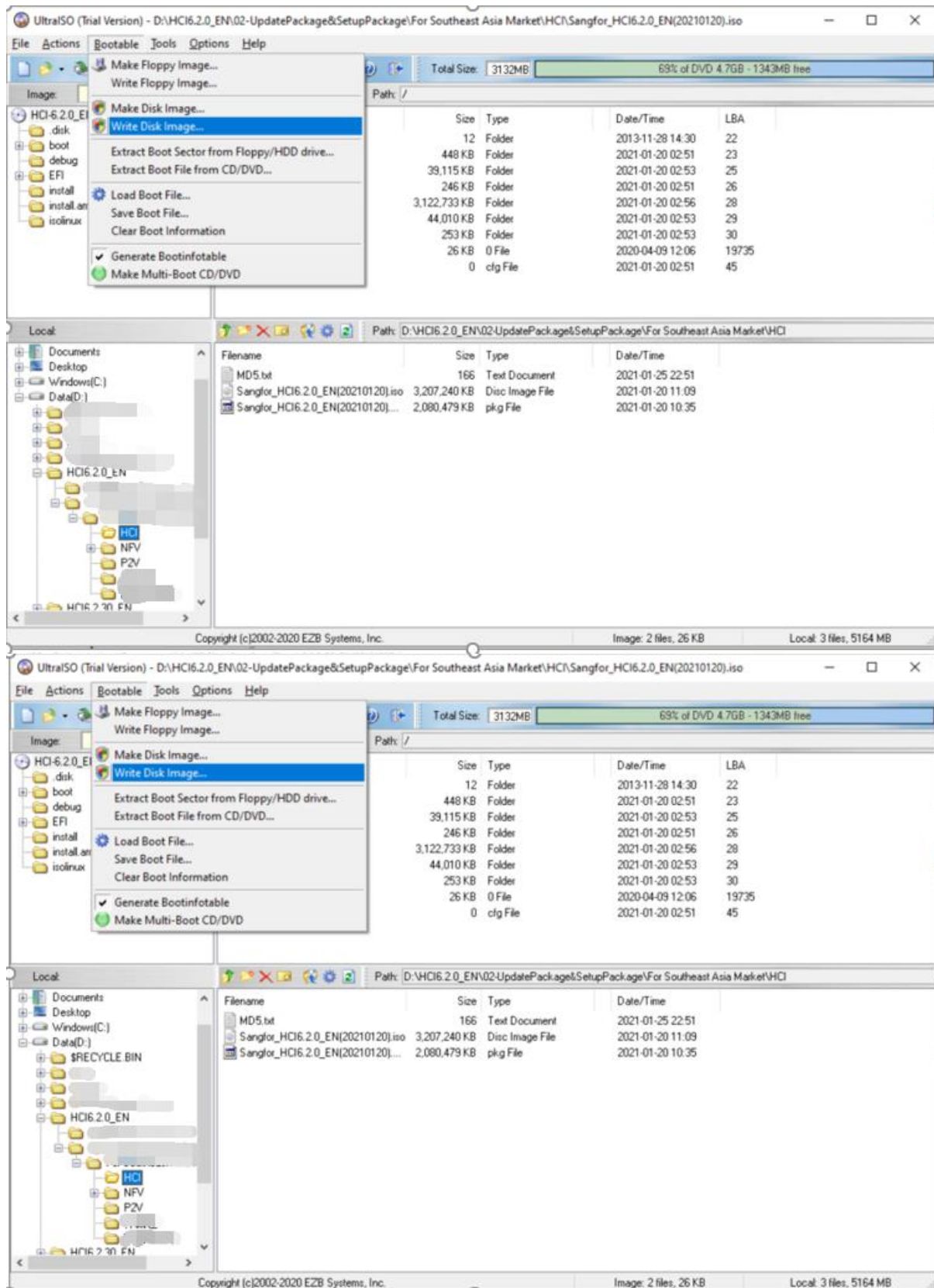


3. Select **Bootable > Write Disk Image** and choose the USB drive into which you want to write the image file. Then, click on **Write** button and keep others settings unchanged. You can remove the USB drive after the image file is written to the USB drive.

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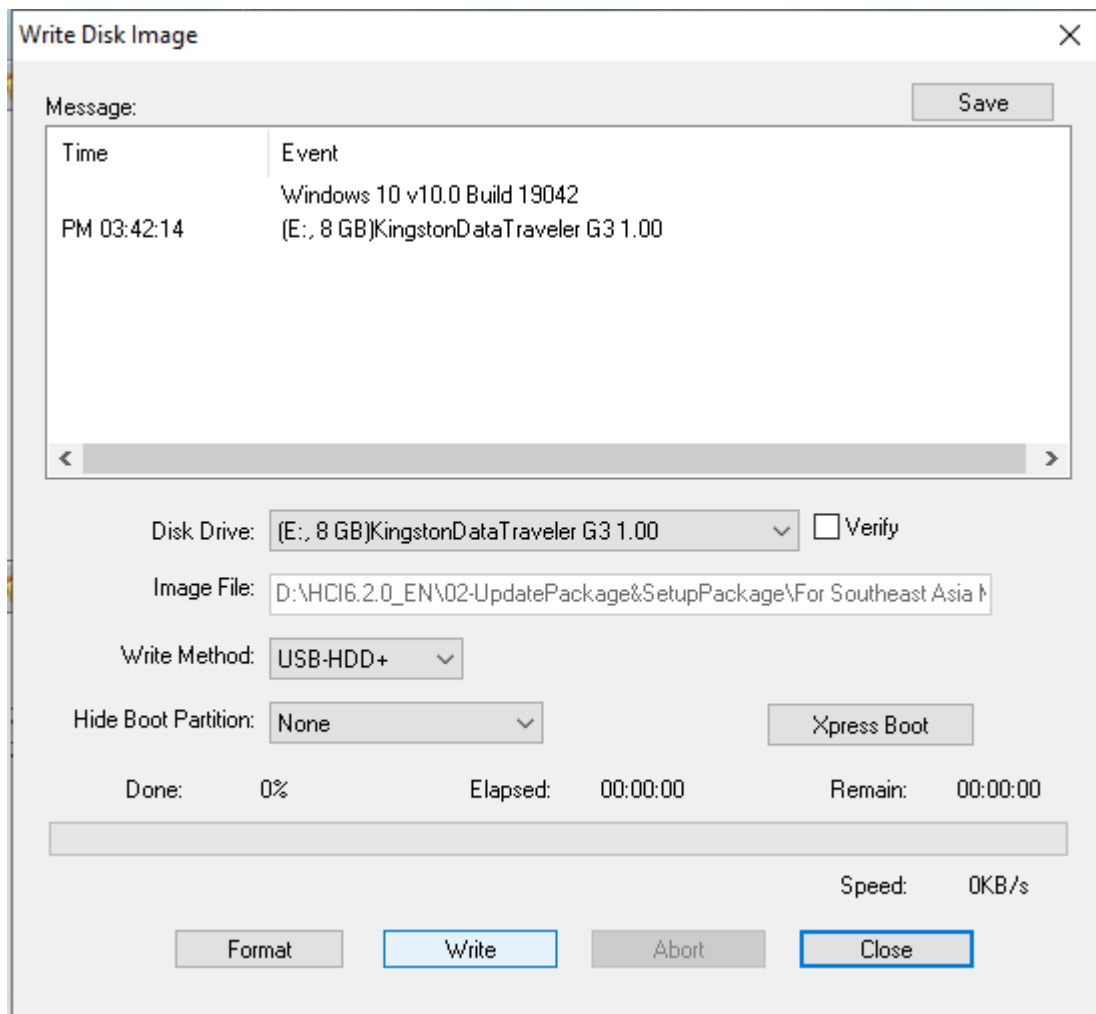
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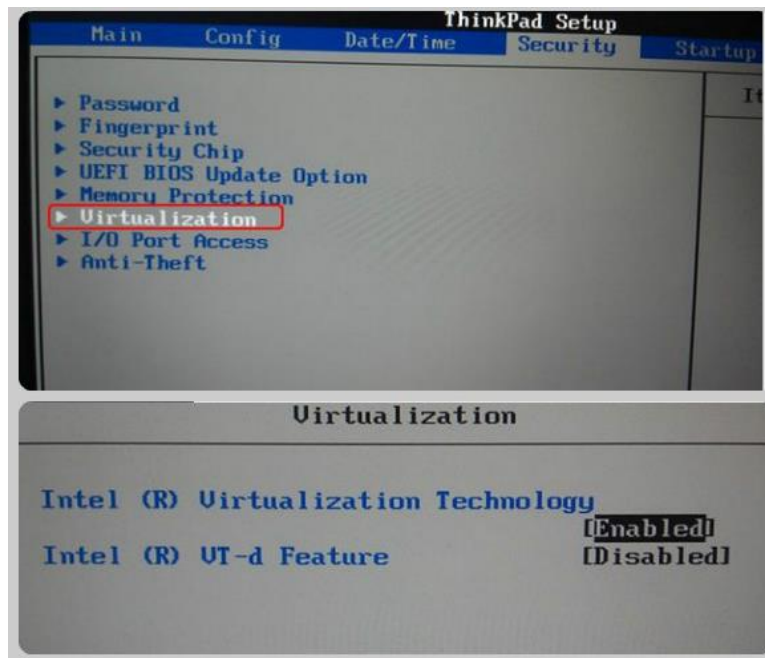


4. Enable **Virtualization Technology** in BIOS, as shown below (Note: BIOS settings vary from computer to computer).

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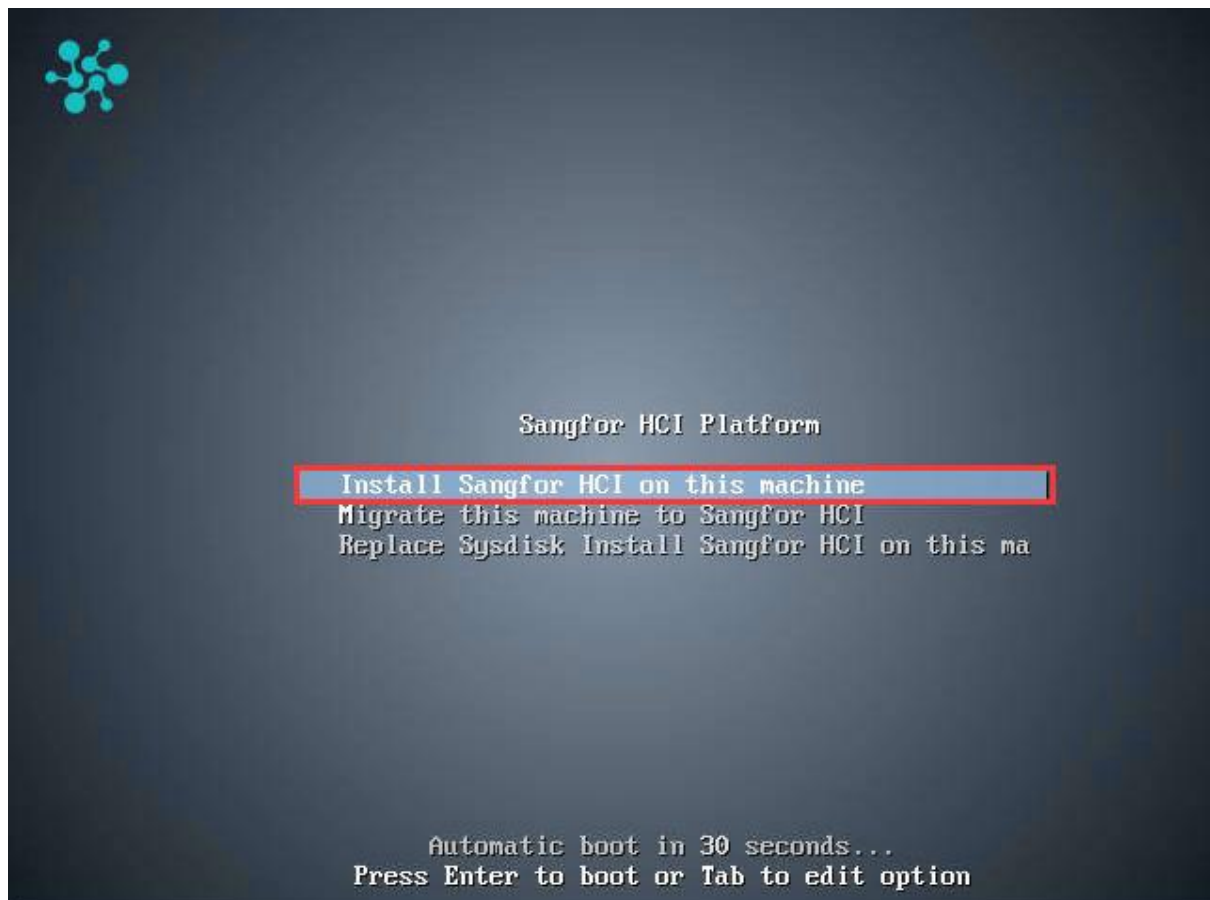
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1.2.2 Installation of Sangfor HCI Manager

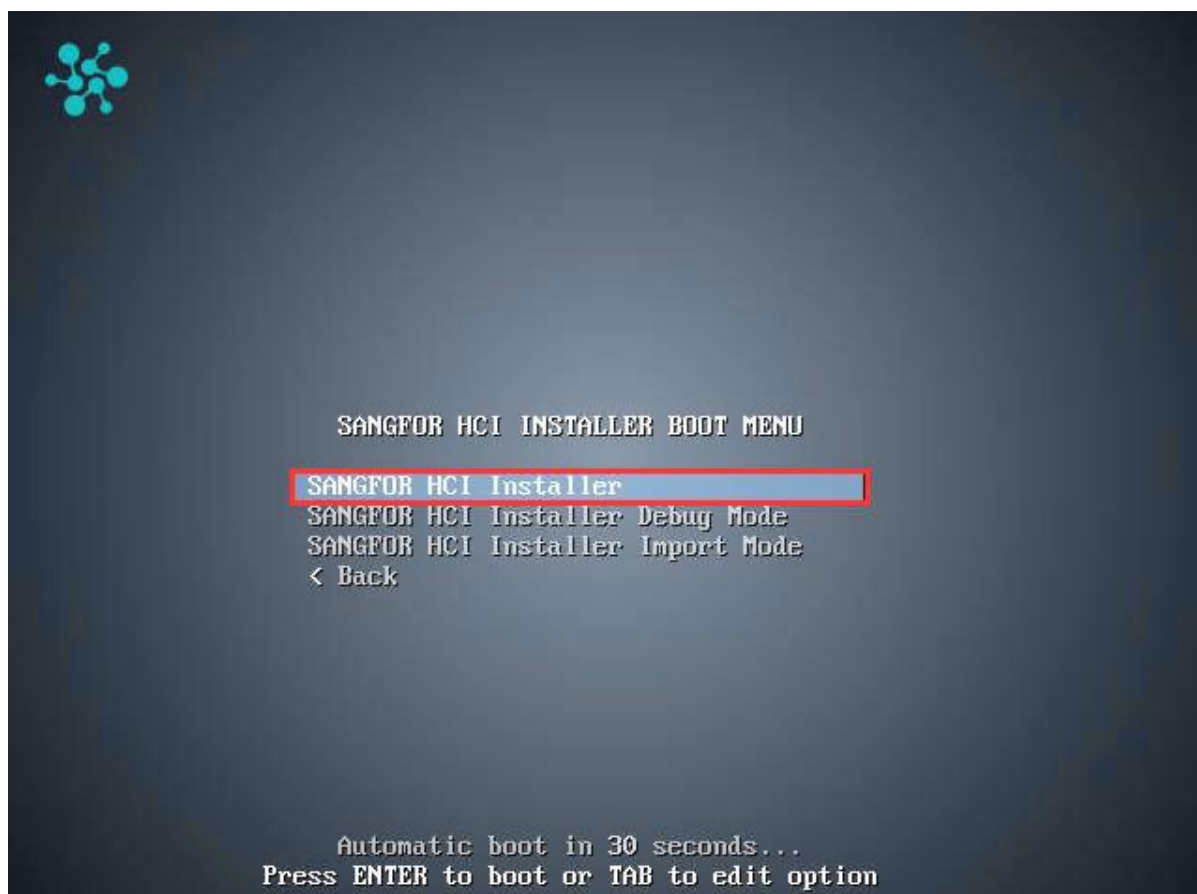
Insert the USB drive into a server, and set the USB drive as the first boot device priority in BIOS settings. Reboot the computer and system enters the following page. Select **Install Sangfor HCI on this machine**, and then press **ENTER** to enter installation page.



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



For versions earlier than Sangfor HCI5.0, only 64-bit Intel CPU processor is supported. Starting from Sangfor HCI5.0 and later versions, AMD processor is also supported.

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.

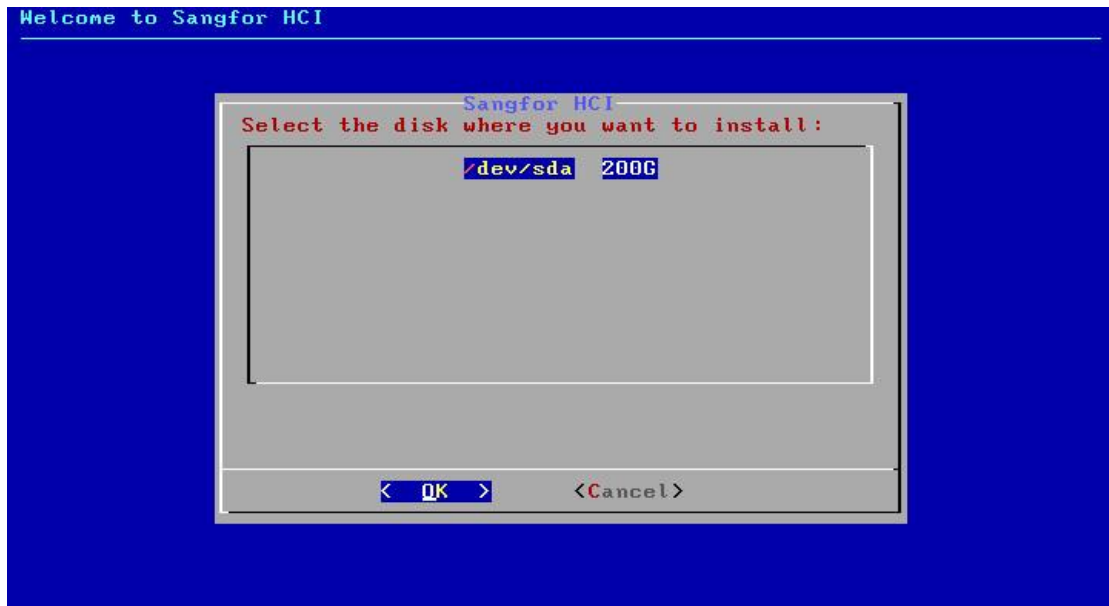


Capacity of the selected disk must be greater than 60GB. If it is greater than 2TB, it is better to use UEFI mode for installation.

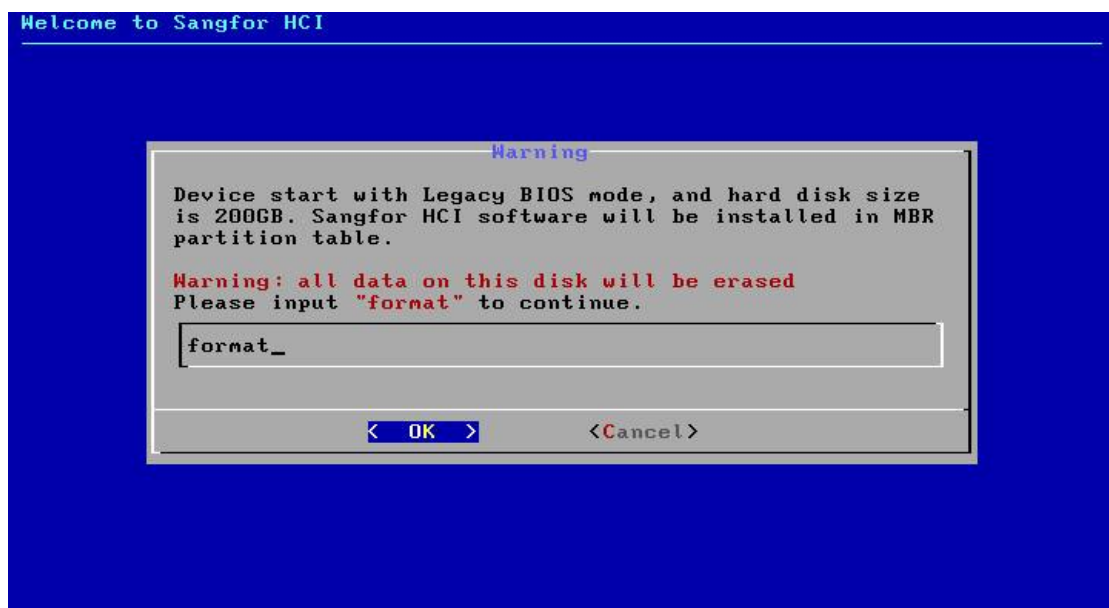
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After the disk is selected, you will be prompted to format the disk. Enter "format" to confirm formatting disk, and select **OK** to continue installation. After you select **OK**, the **Disk Speed Tester** page will appear. To test disk speed, select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

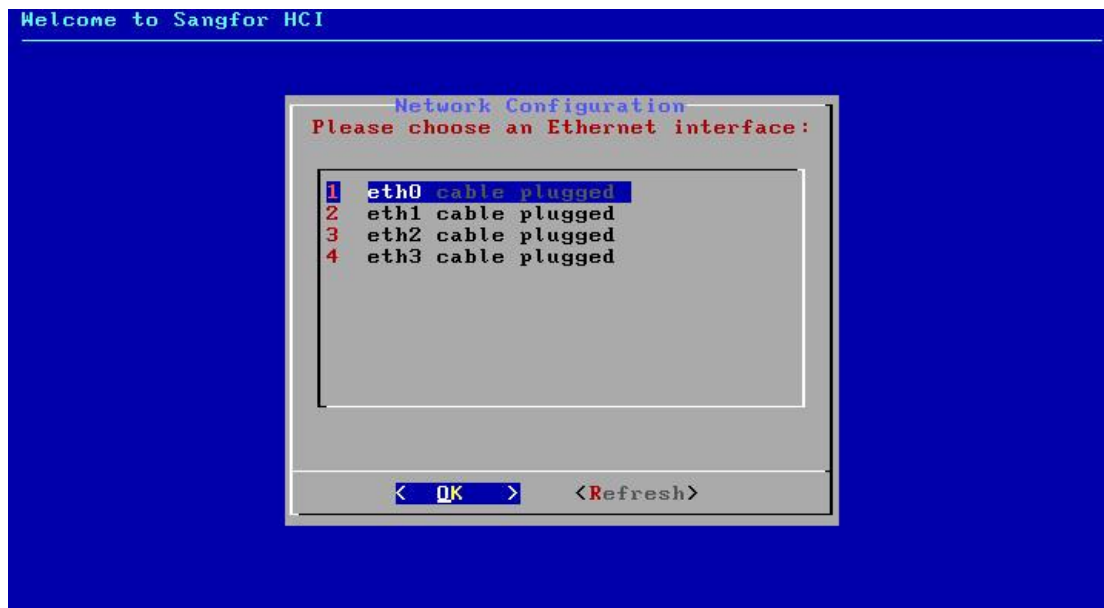


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After installing the Sangfor HCI software, you will be prompted to select an Ethernet interface and configure IP address for that interface.

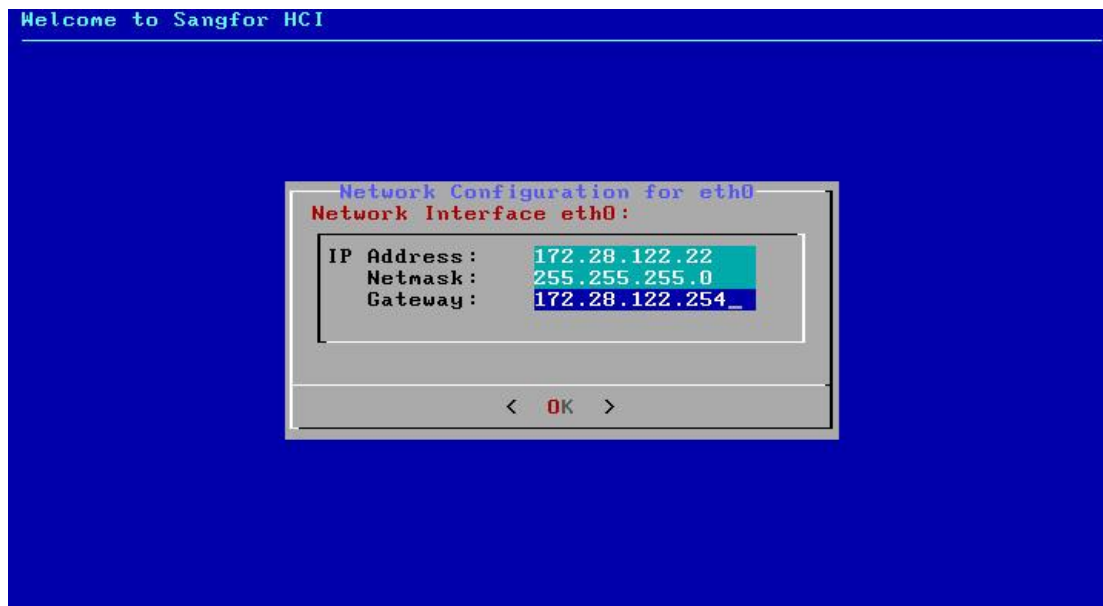


If you skip the step of configuring Ethernet interface, eth0 interface will be chosen and assigned with the IP address 10.250.0.7, and gateway will be set to 255.255.255.0 by default. If there are more than one servers having Sangfor HCI software installed but their NICs are not configured, a same default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

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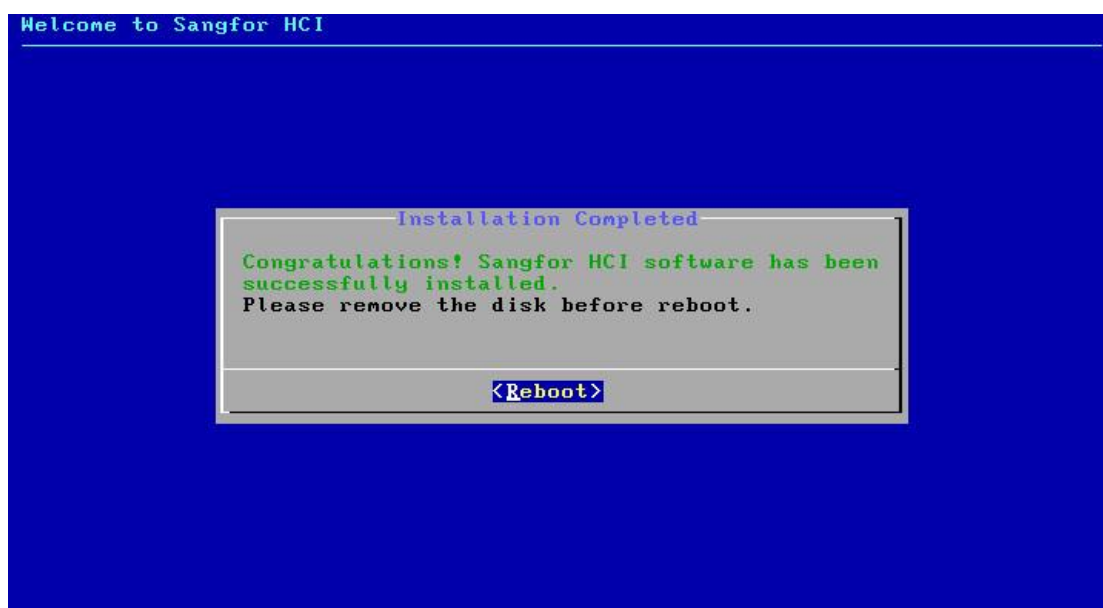
Select an Ethernet interface and set IP address, netmask and gateway address, then click **OK**.



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.

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

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



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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 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 aServers 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.

Welcome to Sangfor HCI

Please change default IP address first.

Interface: eth0

IP Address: 10.250.0.7

Netmask: 255.255.255.0

Gateway: 10.250.0.1

OK Cancel

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1.3 Initializing Sangfor HCI Platform

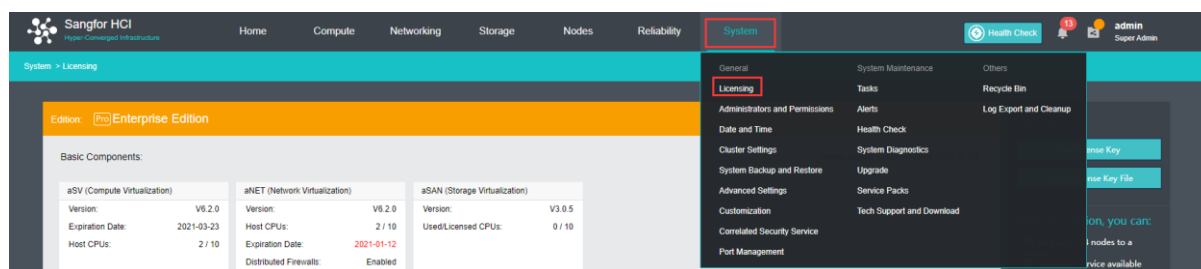
When you log into Web admin console of Sangfor HCI platform for the first time, a wizard will pop up to guide you through initialization of Sangfor HCI platform. To initialize Sangfor HCI platform, follow the instructions in the wizard.

1.3.1 Configuring Cluster

On Sangfor HCI platform, a cluster can be 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 Authorization

Insert a USB key containing license key information into the cluster controller, and then go to **System > General > Licensing**, as shown below:

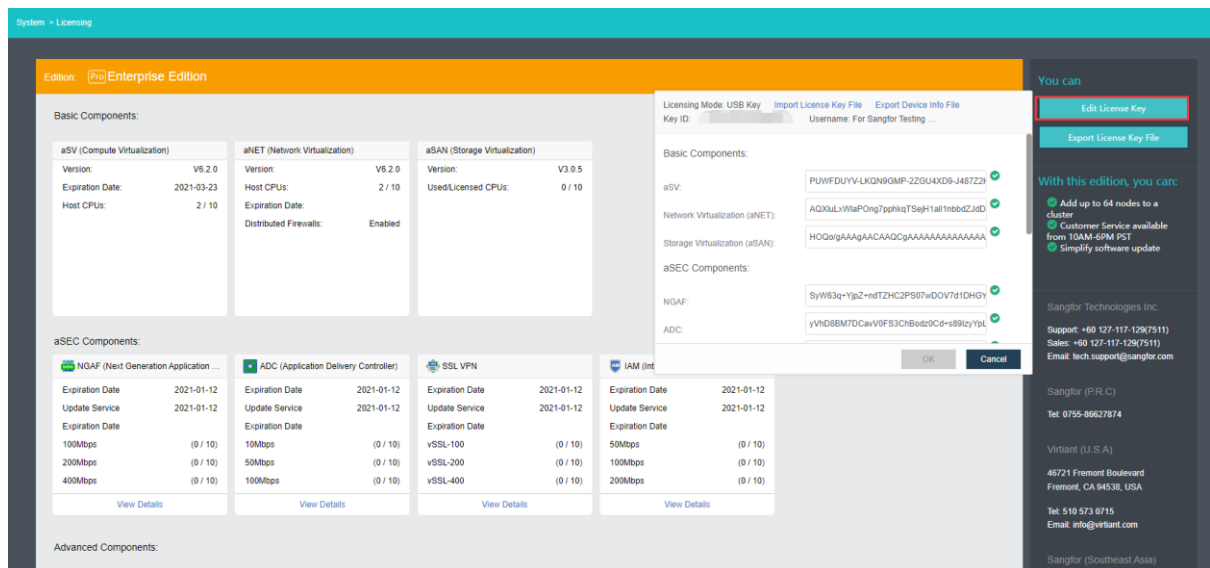


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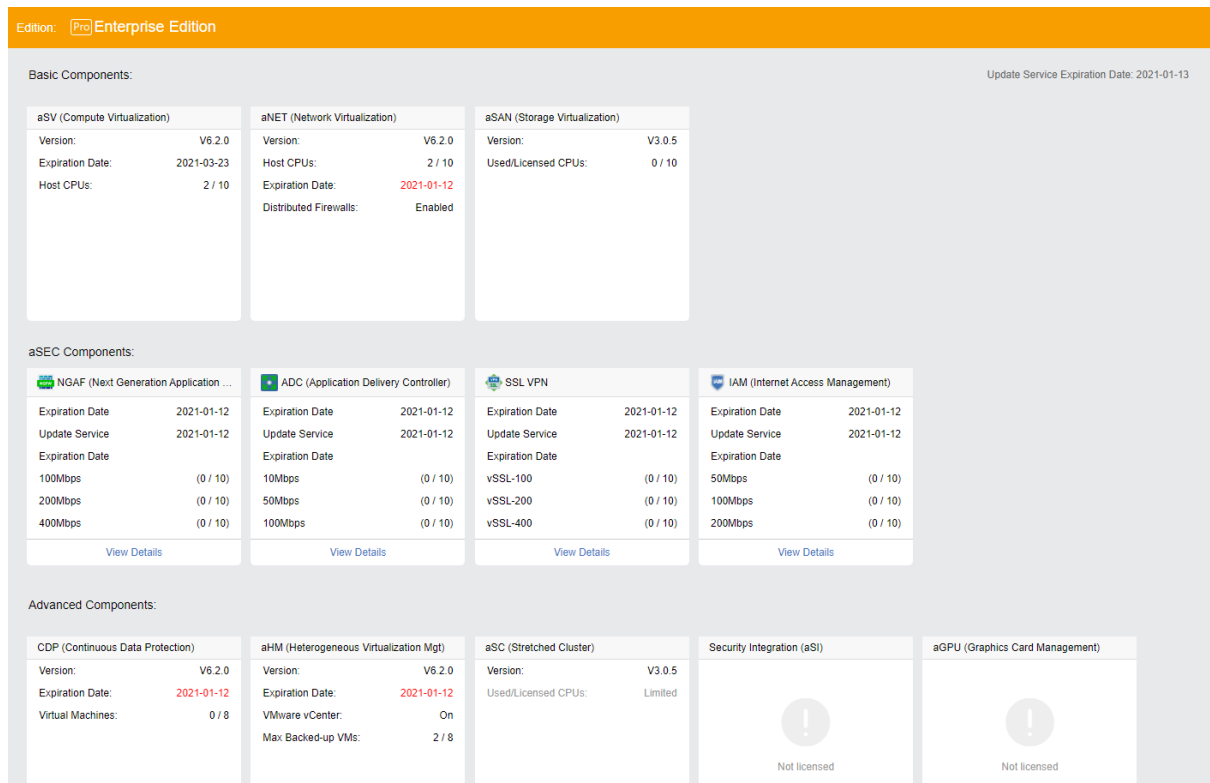
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To input license key, click **Edit License Key > Import License Key File**.



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:



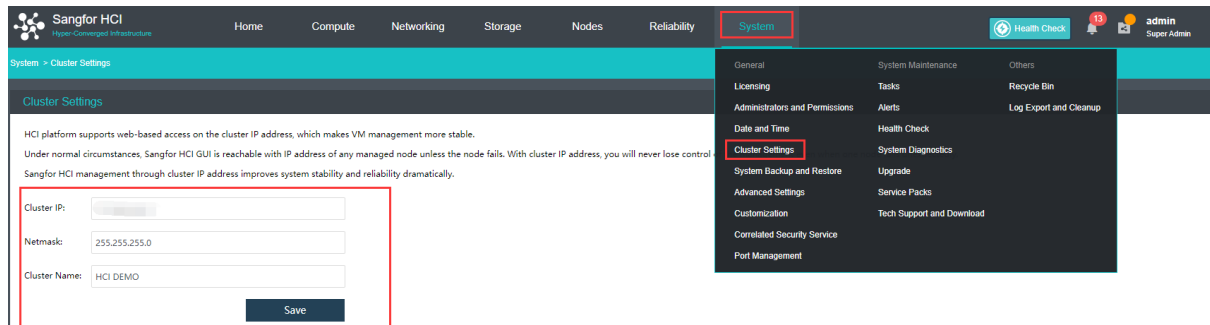
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1.3.1.2 Configuring Cluster IP Address

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



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

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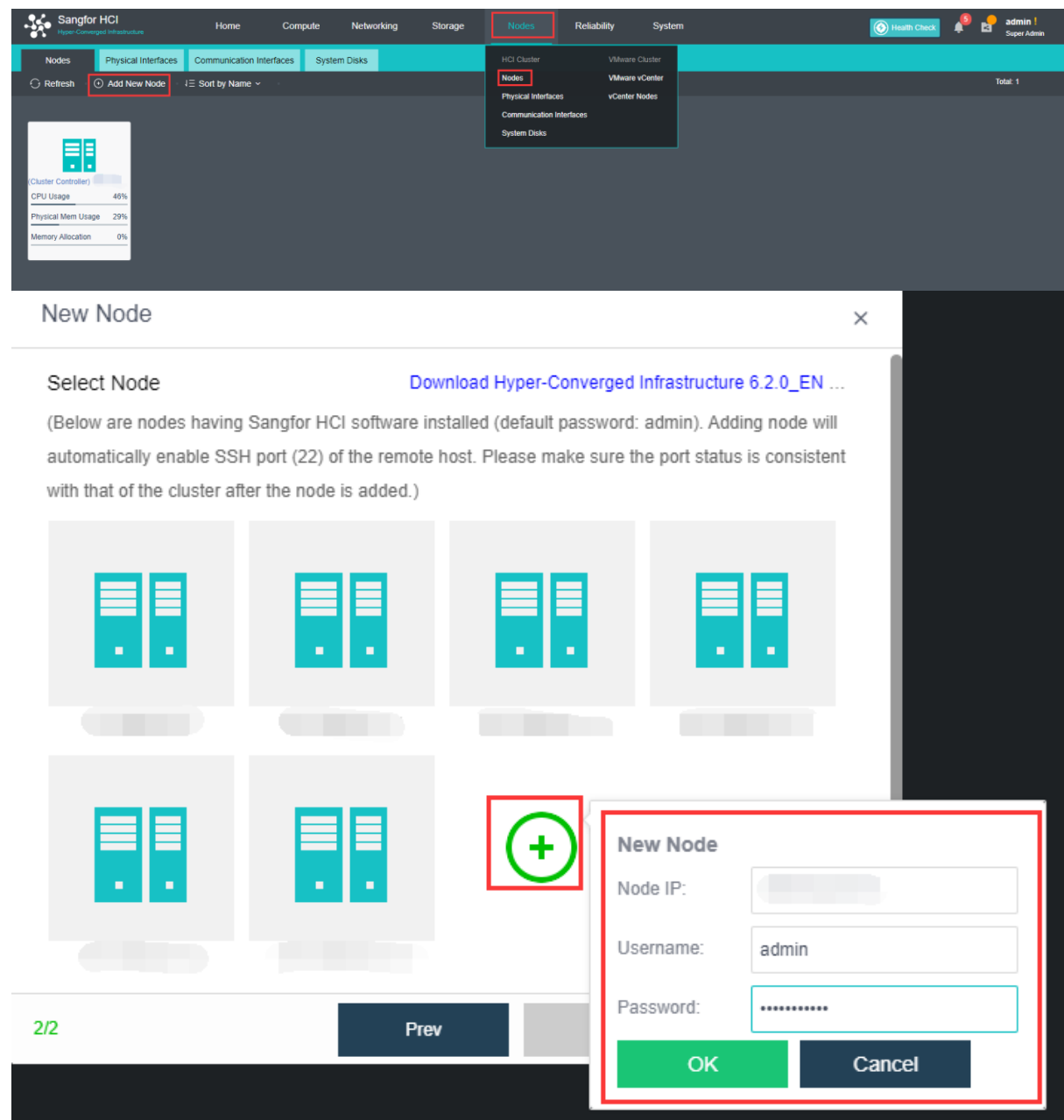
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1.3.1.3 Adding Node

In **Nodes**, you can add node to a 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.



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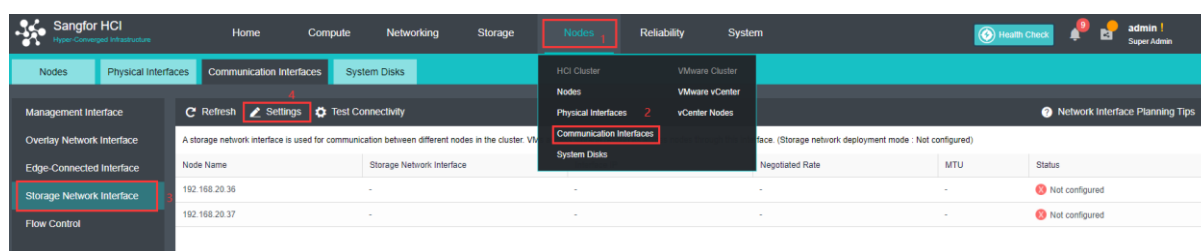
1.3.2 Initializing Virtual Storage

1.3.2.1 Configuring Storage Network Interfaces

Go to **Storage** and click **Settings** on the dialog that pops up to configure storage deployment mode.

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.

- a. Navigate to **Nodes > Communication Interfaces > Storage Network Interface**, and select **Settings**.



- b. Specify the interface mode from dedicated mode or shared mode. In this case, dedicated mode will be used.


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Settings
×

1 Specify Interface Mode
2 Specify Deployment Mode
3 Select Storage Network Interface




Storage Network Interface

Dedicated Mode (recommended)

Use a physical interface exclusively as storage network interface to achieve more stable bandwidth and better performance for virtual storage.

✓



Storage Network Interface Other Communication Interfaces

Shared Mode

Use one physical interface as storage network interface and logical interfaces of other functions when number of physical interfaces are insufficient.

✓

Next
Cancel

- c. Specify the deployment mode of the storage network interface. In this case, Link aggregation disabled will be use.

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Settings

×

✓ Specify Interface Mode

2 Specify Deployment Mode

3 Select Storage Network Interface

Deployment Mode (for data communication among clustered nodes)

☒ Link aggregation disabled

☐ Link aggregation with one switch

☐ Link aggregation with two switches

Link Aggregation Disabled

Benefits

Independent storage area network is higher in stability.

Drawbacks

Storage on the node will be inaccessible if one link fails.

Notes

Storage area network (SAN) is used for data transmission across nodes. Please connect the nodes with cables according to the diagram.

Layer 2 switch can be used, no change required.

If there are only two nodes, simply use a cable to connect one another, without using any switch.

Prev

Next

Cancel

- d. Lastly, specify the interface used for storage network and configure the corresponding IP address for communication.

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Settings ×

✓ Specify Interface Mode
✓ Specify Deployment Mode
3 Select Storage Network Interface

Node Name	Physical Interface	Interface IP	Status
192.168.20.36	eth0	10.251.251.1 / 24	✓ Normal
192.168.20.37	eth1	10.251.251.2 / 24	✓ Normal

Prev
OK
Cancel

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 digram 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.

Nodes

Physical Interfaces

Communication Interfaces

System Disks

Management Interface

Overlay Network Interface

Edge-Connected Interface

Storage Network Interface

Flow Control

Refresh

Settings

Test Connectivity

Network Interface Planning Tips

A storage network interface is used for communication between different nodes in the cluster. VMs access storage resources across nodes through this interface. (Storage network deployment mode: Dedicated mode - Link aggregation with two switches)

Node Name	Storage Network Interface	Interface IP	Negotiated Rate	MTU	Status
192	eth2, eth3	10.251.251.1	1000Mbps	1500	Normal
192	eth2, eth5	10.251.251.2	1000Mbps	1500	Normal

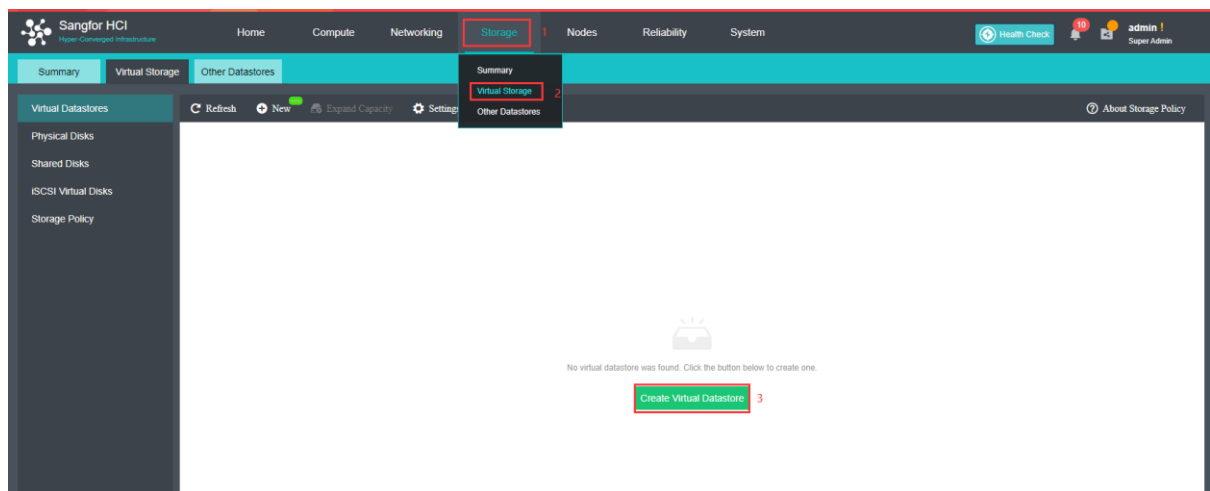
Configuring Datastore Type and Disks

1. Navigate to Storage > Virtual Storage, select **New** or **Create Virtual Datastore**.

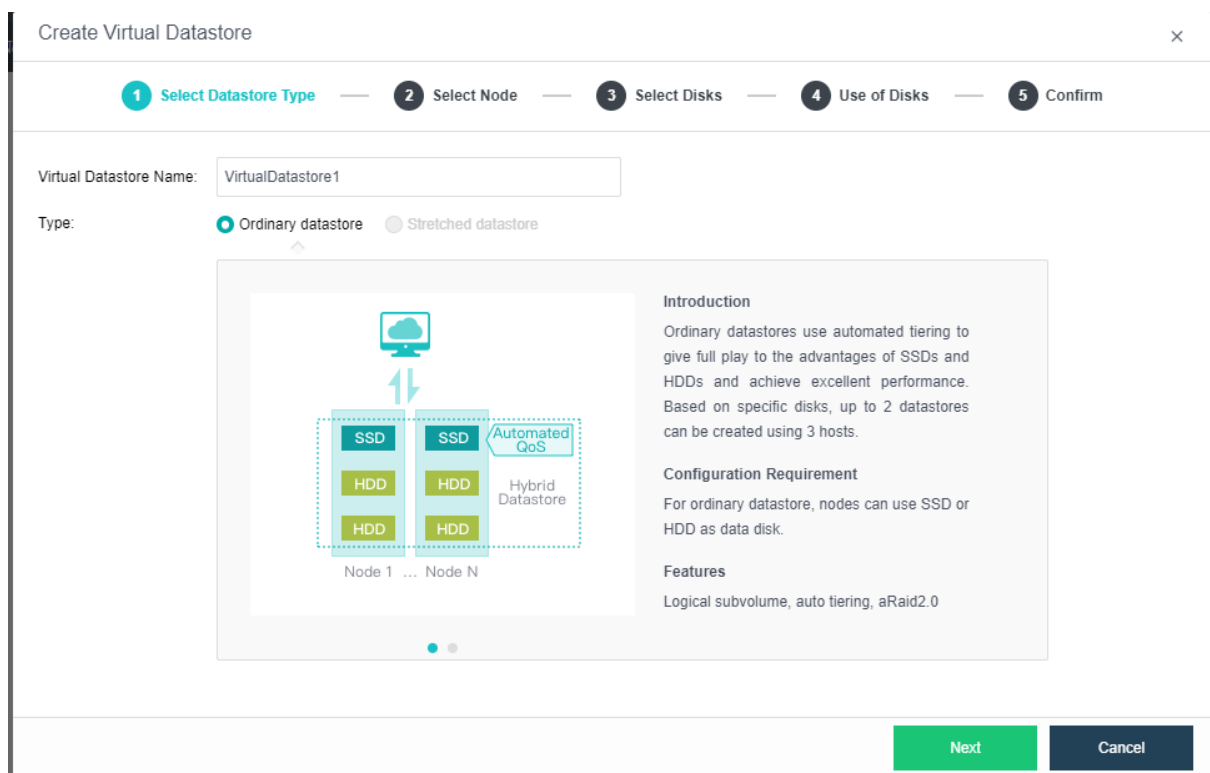
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2. Select datastore type, in this case Ordinary datastore will be created.



3. Select corresponding method and nodes to create virtual datastore, as currently creating very first virtual datastore, **[Use disks on new hosts]** will be use.

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Create Virtual Datastore

×

✓ Select Datastore Type

2 Select Node

3 Select Disks

4 Use of Disks

5 Confirm

ⓘ Ordinary datastore can be created based on specific disks. Disks on the same hosts can be used to create up to 2 datastores. [Configuration Guide](#)

Method: ☒ Use disks on new hosts ☐ Use unused disks added to existing datastores

Select new hosts which have not been added to any virtual datastore to create a new datastore:

2 node(s) selected

<input checked="" type="checkbox"/>	Node Name	Node IP	Total SSDs	Total HDDs
<input checked="" type="checkbox"/>	192.168.20.36	192.168.20.36	1	2
<input checked="" type="checkbox"/>	192.168.20.37	192.168.20.37	1	2

Best Practice: Less than 12 nodes associated with a datastore

Prev

Next

Cancel

Create Virtual Datastore

✓ Select Datastore Type

✓ Select Node

3 Select Disks

4 Use of Disks

5 Confirm

Select disks to be added to the datastore

Selected: 2 SSDs, 4 HDDs

Quick Select

✓	Disk	Type	Size
✓	192.168.20.36		
✓	Disk 0	SATA SSD	223.57 GB
✓	Disk 2	SATA HDD	1.82 TB
✓	Disk 1	SATA HDD	1.82 TB
✓	168.20.37		
✓	INTEL SSDSC2BB240G6 PHWA546603DZ...	SATA SSD	223.57 GB
✓	WDC WD2000FYYZ-01UL1B2 WD-WMC1P...	SATA HDD	1.82 TB
✓	WDC WD2000FYYZ-01UL1B2 WD-WMC1P...	SATA HDD	1.82 TB

Prev

Next

Cancel

Create Virtual Datastore

✓ Select Datastore Type

✓ Select Node

✓ Select Disks

4 Use of Disks

5 Confirm

Expand All

Collapse All

Edit Disk Group

About Disk Grouping ?

▼ Node: 192.168.20.36

Data disk : 2 Cache disk : 1

Disk Group	Disk	Type	Disk Size	Use of Disk
Group 1	Disk 0	SSD	223.6 GB	Cache disk
	Disk 2	HDD	1.8 TB	Data disk
	Disk 1	HDD	1.8 TB	Data disk

▼ Node: 192.168.20.37

Data disk : 2 Cache disk : 1

Disk Group	Disk	Type	Disk Size	Use of Disk
Group 1	INTEL SSDSC2BB240G6 PHWA546603DZ240AGN	SSD	223.6 GB	Cache disk
	WDC WD2000FYYZ-01UL1B2 WD-WMC1P0H9DRCJ	HDD	1.8 TB	Data disk

Prev

Next

Cancel

6. Confirm on the details and proceed with the virtual datastore creation.

Create Virtual Datastore

✓ Select Datastore Type

✓ Select Node

✓ Select Disks

✓ Use of Disks

5 Confirm

Confirm Configuration of Ordinary datastore (VirtualDatastore1):

2	7.28 TB ⓘ	7% ⓘ	3.62 TB	Not supported ⓘ
Nodes	Raw Capacity	Cache Disk Ratio	2-replica Storage Capacity	3-replica Storage Capacity

Virtual Datastore:

Node Name	Disk Groups	Cache Disks	Data Disks	Data Disk Size	Cache Disk Size
192.168.20.36	1	1	2	3.64 TB	223.57 GB
192.168.20.37	1	1	2	3.64 TB	223.57 GB

Prev

OK

Cancel

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

Create Virtual Datastore

✓ Basics

✓ Select Node

3 Specify Fault Domains

✓ Use of Disk

5 Confirm

Confirm Configuration of Virtual Datastore (VirtualDatastore1):

3.62 TB

Available Space

7.28 TB

Total Space

2

Nodes

2

Replicas

Virtual Datastore:

Node Name	Disk Groups	Cache Disks	Data Disks	Spare Disks	Free Disks	Total Space
192.168.20.192	1	1	2	0	0	3.64 TB
192.168.20.191	1	1	2	0	0	3.64 TB

Back

OK

Cancel

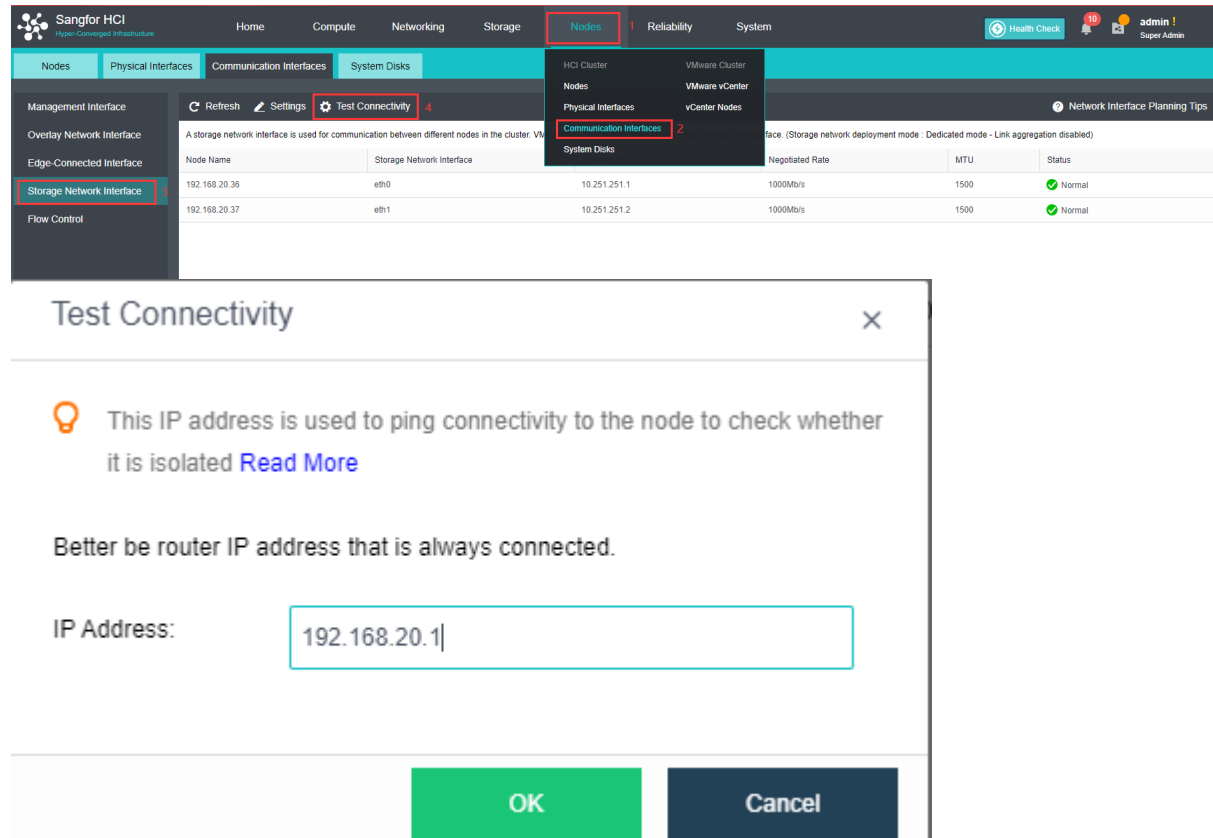
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Testing Connectivity

On 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 a 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.

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The screenshot shows the Sangfor HCI Management Console. The 'Nodes' tab is selected in the top navigation bar. A dropdown menu is open, showing 'Communication Interfaces' selected. The 'Settings' dialog for 'Overlay Network Interface' is displayed, showing a table with two nodes and their network configurations.

Node Name	Overlay Network Interface	Interface IP	Netmask
192.168.20.36	eth4	172.16.10.1	255.255.255.0
192.168.20.37	eth0	172.16.10.2	255.255.255.0

Below the table, there is a checkbox labeled 'Enable high performance mode' with a warning message: '(MTU will be changed to 1600 and therefore Jumbo Frame must be enabled on physical switch to avoid network failure)'. At the bottom right, there are 'OK' and 'Cancel' buttons.

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.

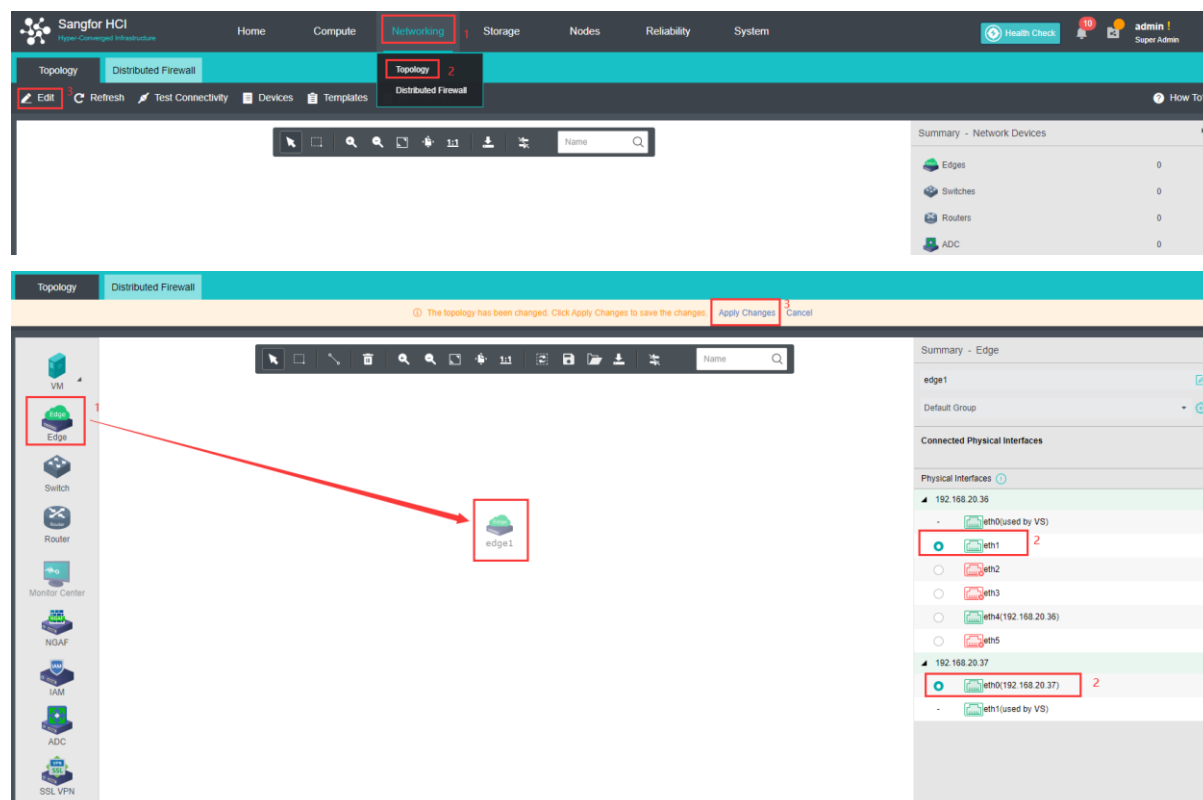
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1.3.4 Configuring Edge

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.



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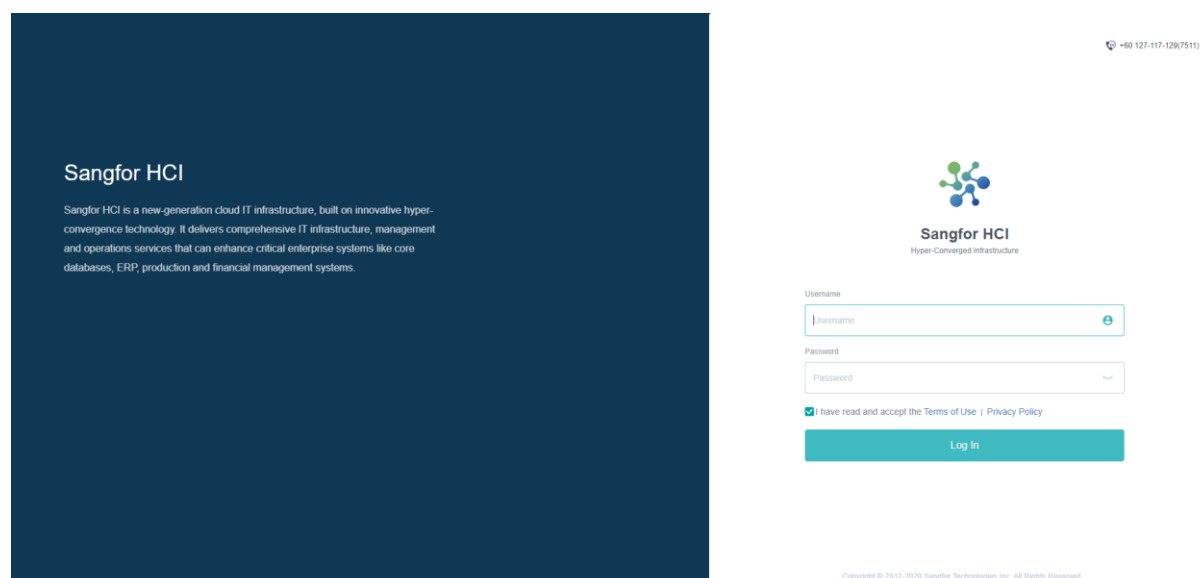
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Chapter 2 Initial Login to Sangfor HCI Console

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 the 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 browser and enter <https://10.250.0.7> into the address bar to log into Sangfor HCI GUI, 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, enter username and password, and then click **Log In**. Default username and password are **admin/admin**.

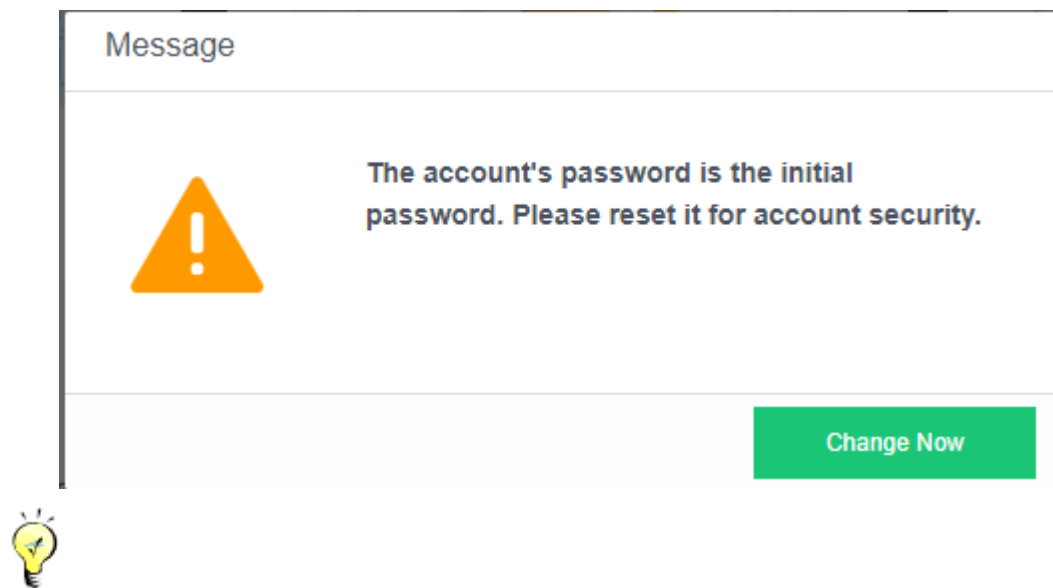
Upon successful login, the following dialog box will pop up to prompt administrator to

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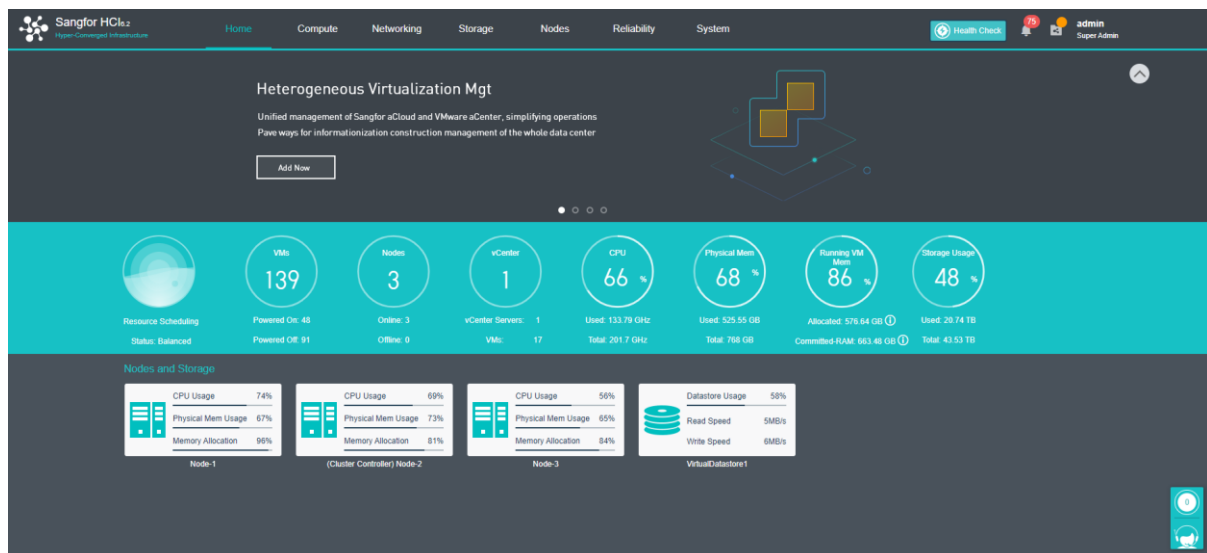
change password.



- Sangfor HCI console can be accessed with the following browsers: IE11, Firefox, Chrome, etc.
- The host installed Sangfor HCI software is taken as a clustered node by default. It can be added to other clusters, or be regarded as a cluster controller so that other nodes can be added onto its HCI platform.

Log in to Sangfor HCI Web admin console and a QR code will pop up , and you can scan the QR code to verify software edition.

GUI of Sangfor HCI platform is shown below:



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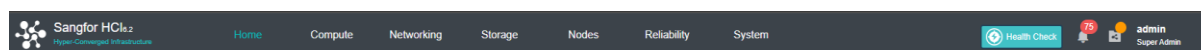
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2.1 Home

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, storage, CPU usage, memory usage and storage usage.
- ✓ **Compute:** You can configure and manage virtual machines.
- ✓ **Networking:** You can configure virtual network.
- ✓ **Storage:** You can view storage status and configure virtual storage.
- ✓ **Nodes:** You can configure and manage cluster, nodes and storage.
- ✓ **Reliability:** You can configure scheduled backup, snapshot, HA, resources scheduling, VM scheduling, UPS.
- ✓ **System:** It includes **General**, **System Maintenance** and **Others**. **General** includes Licensing, Date and Time, System Administrators and Permissions, Alarm Options, Cluster Settings, System Backup and Restore, VMware vCenter and VM Backup and Recovery, etc. **System Maintenance** includes Tech Support & Download, Logs and Alarms, Upgrade, Health Check and Customization, User Management, Work Orders, etc. **Others** includes Recycle Bin and HA & Resource Scheduling etc.
- ✓ **Health Check:** It checks cluster environment to find and locate issues, and offers solutions for discovered issues.

To view alarm events, click the following icon (the number on the icon indicates the number of the current alarm events) to view the latest 5 alarm events, as shown below:

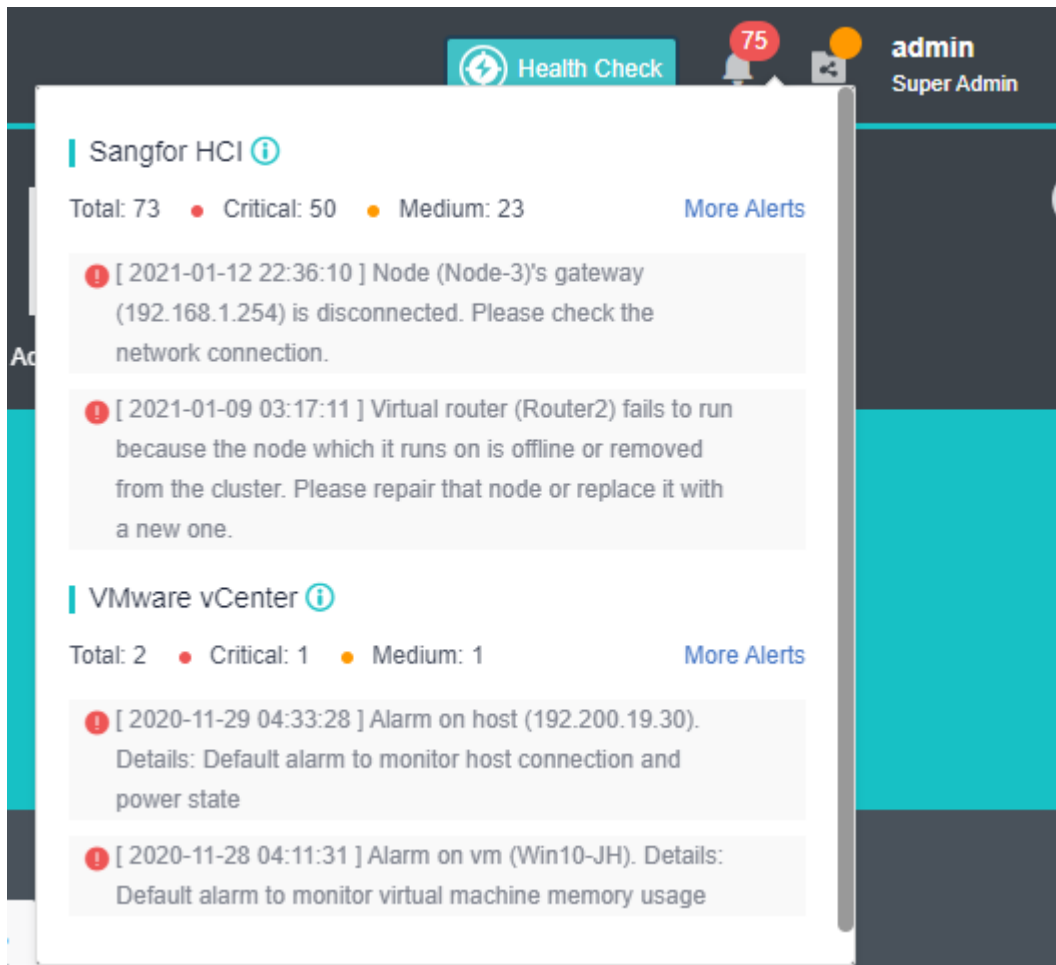


The number beside the exclamation mark indicates the number of alarms. To view details of the alarms for SANGFOR HCI and VMware vCenter(if any is added), click on the exclamation mark.

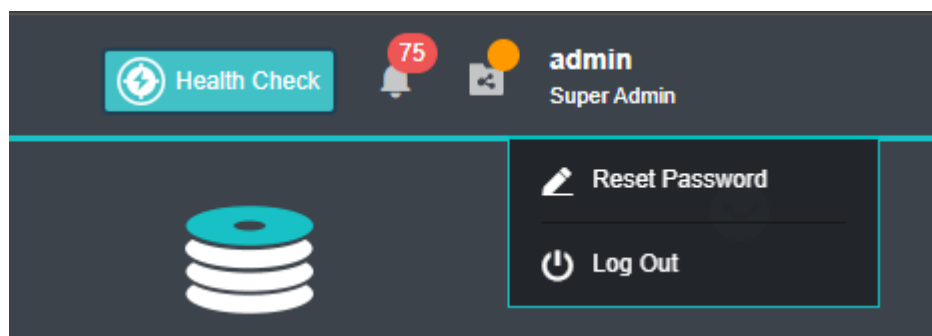
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To change admin password, click on the “**admin Super Admin**”located on the right top of web ui.



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Reset Password
×

Current Password:

New Password:
i

Confirm Password:

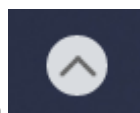
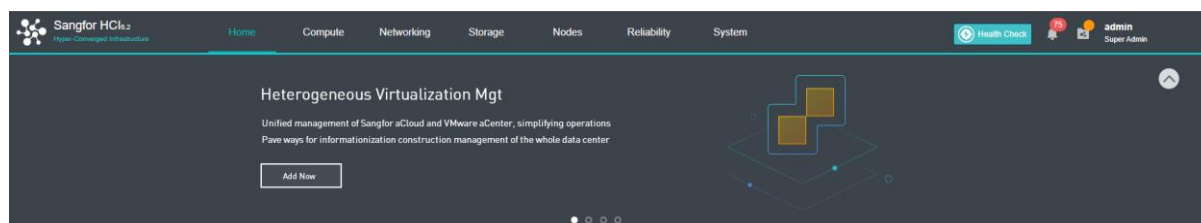
OK
Cancel



Password should contain 8-64 characters which must consist of any two of the following: upper-case characters, lower-case characters, digits and the special characters: ~`@#%&<>""',;_-^\$.*+?=:|{}()[]\

2.1.2 Slideshow

The slideshow appears every time the administrator navigates to **Home** and later hides automatically.



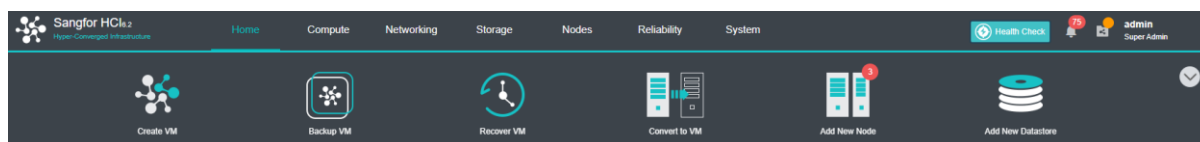
To hide the slideshow, you can click the icon on the upper right corner.

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

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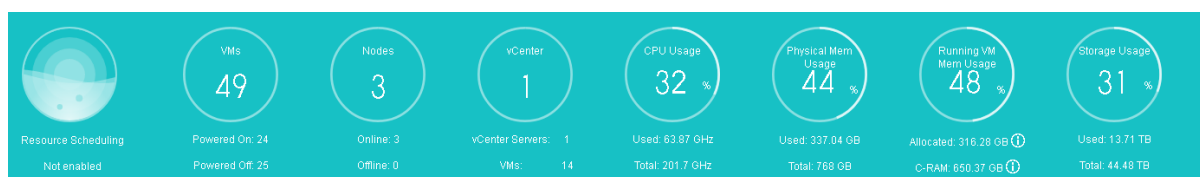
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2.1.3 Viewing Resources

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 that the node is offline. A red node icon indicates the node gives alarm, while red storage icon indicates the storage is offline. Blue node icon and storage icon indicate that 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 **2.5.3.1 Node Summary** section).

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

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

Tasks ×						
All						
Status	Action	Object	Start Time	End Time	Admin	Operation
Completed	Power on VM	USER_acmp-c55f	2018-11-14 10:06:36	2018-11-14 10:06:36	Administrator (192.168.19.17...	View
Completed	Log in	admin	2018-11-14 09:56:27	2018-11-14 09:56:27	admin(192.168.1.213)	View
Failed	Log in	admin	2018-11-14 09:56:21	2018-11-14 09:56:21	admin(192.168.1.213)	View
Completed	Reset VM	windows7_clone...	2018-11-14 09:53:44	2018-11-14 09:54:17	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 09:49:48	2018-11-14 09:49:53	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 08:48:29	2018-11-14 08:48:34	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 07:47:19	2018-11-14 07:47:24	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 06:45:23	2018-11-14 06:45:28	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 05:44:07	2018-11-14 05:44:11	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 04:42:38	2018-11-14 04:42:43	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 03:41:16	2018-11-14 03:41:21	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 02:50:20	2018-11-14 02:50:25	Administrator (192.168.19.17...	View
Completed	Import backups	Windows server ...	2018-11-14 01:48:58	2018-11-14 01:49:03	Administrator (192.168.19.17...	View

If you have any questions about HCI, you can click on the LiveChat option at the lower right corner to do online consultation.




After clicking the online consultation option, you will be redirected to the following page to ask for your personal information.

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Welcome to LiveChat



Our agents are not available right now. You may submit a case by using the Open a Support Case function on the homepage of Sangfor Community, or you may leave a message here and we'll get back to you as soon as we can.

Your name: *

E-mail: *

Subject: *


Message: *


Leave a message

Fill in the personal information and click Start the Chat. The page will jump to the online consultation page, then you can directly ask your question.

...

Welcome to LiveChat

 **Technical Support**
Technical Support

 Technical Support 10:36

Hello. How may I help you?

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2.2 Compute

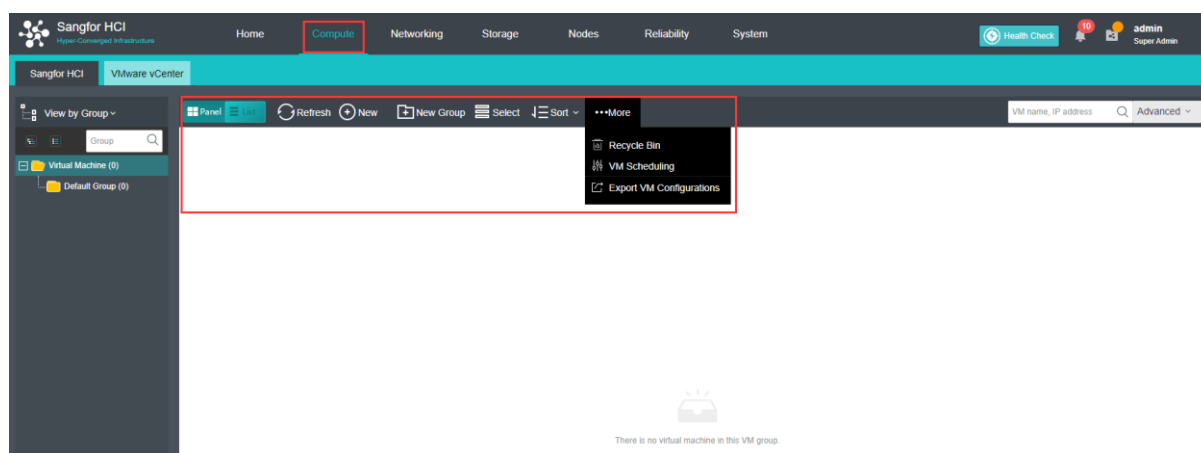
A virtual machine is an operating system simulated by specific software, running in an isolated environment. It can be installed with the operating system such as Windows, Linux, etc.



VMware vCenter can be added to and managed on Sangfor HCI platform.

2.2.1 Managing Virtual Machines on Sangfor HCI

Navigate to **Compute** and you will see the following toolbar, as shown in the following figure. On the toolbar, there are the following items: **View By Group/Node/Datastore/Tag, Panel/List, Refresh, New, New Group, Select, Sort, Recycle Bin, VM scheduling, Export vm configurations and Advanced.**

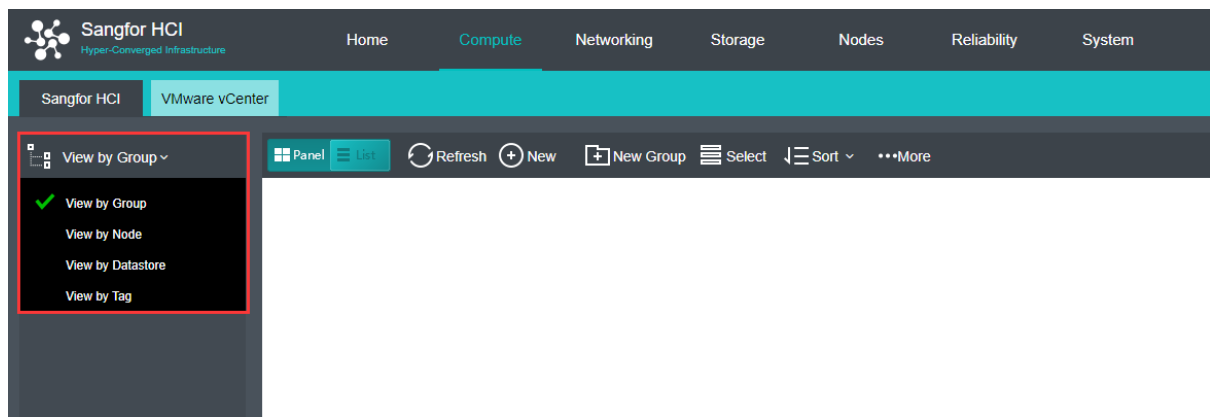


Virtual machines can be viewed by **Group, Node, Datastore** or **Tag**.

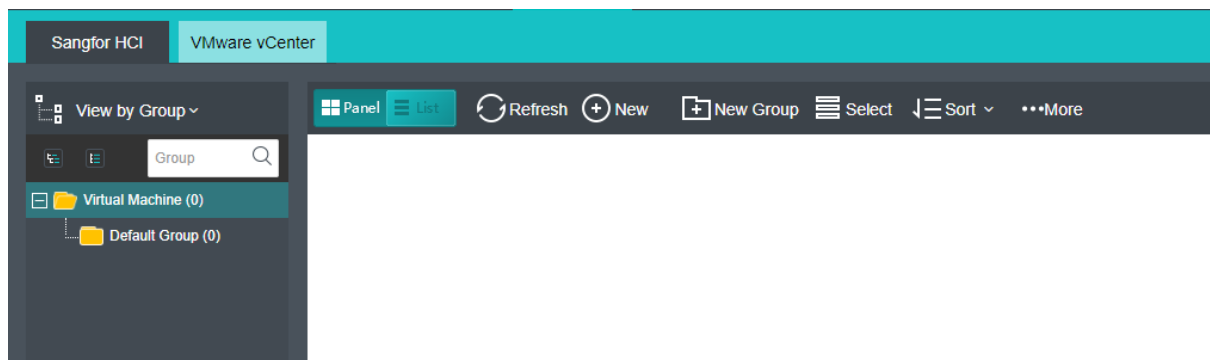
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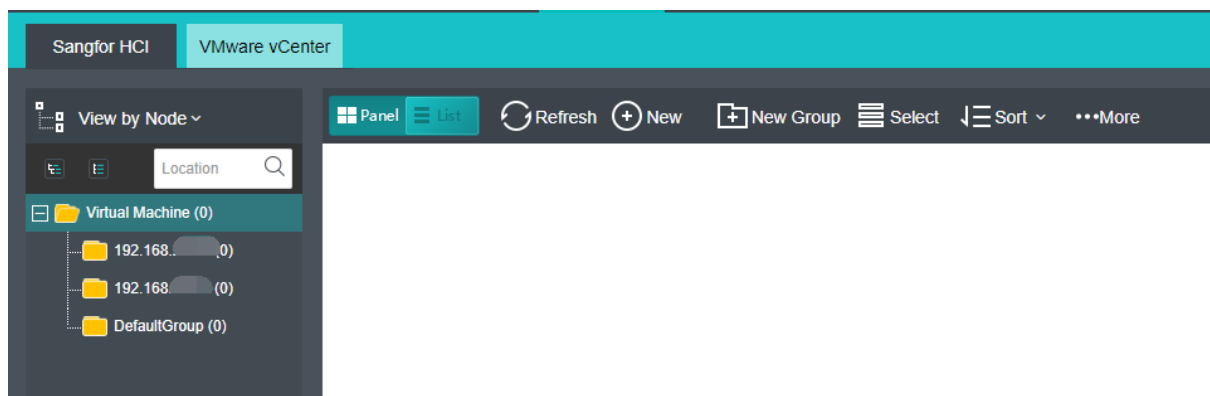
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To view virtual machines by group, select **View By Group** in **Compute**, as shown below.



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

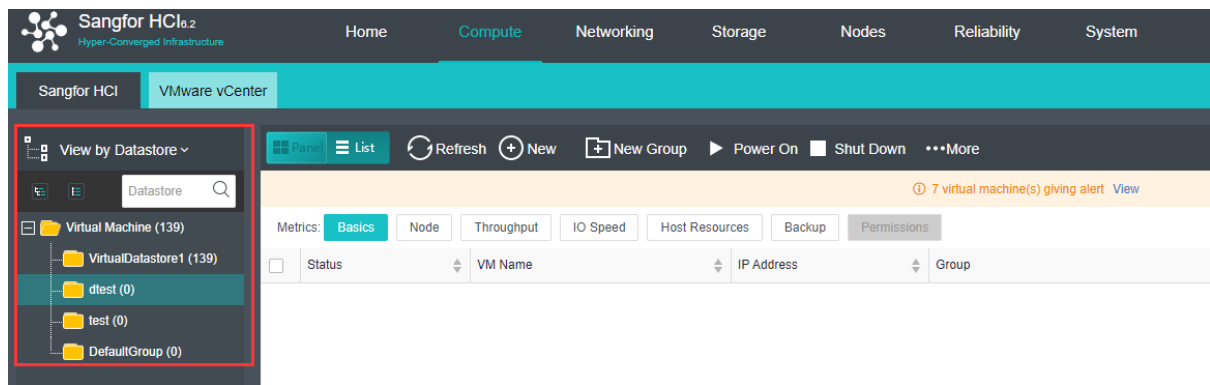


To view virtual machines by datastore, select **View By Datastore** in **Compute**, as shown below.

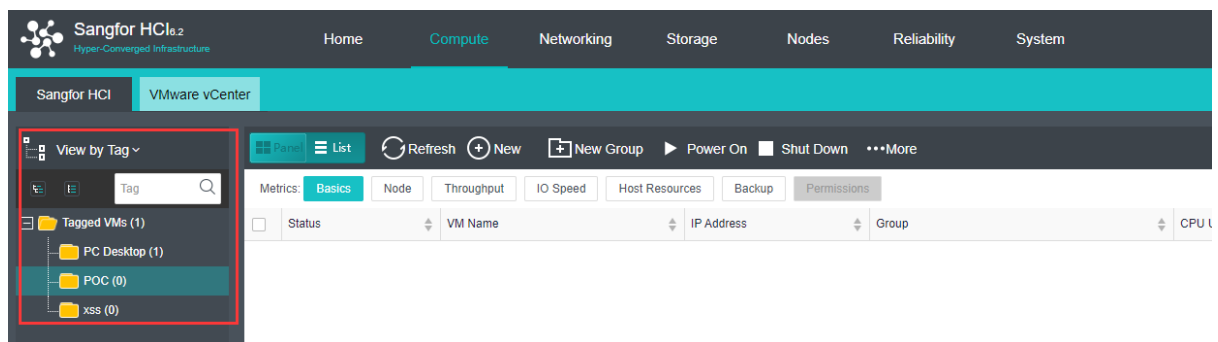
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To view virtual machines by tag, select **View By Tag** in Compute, as shown below.



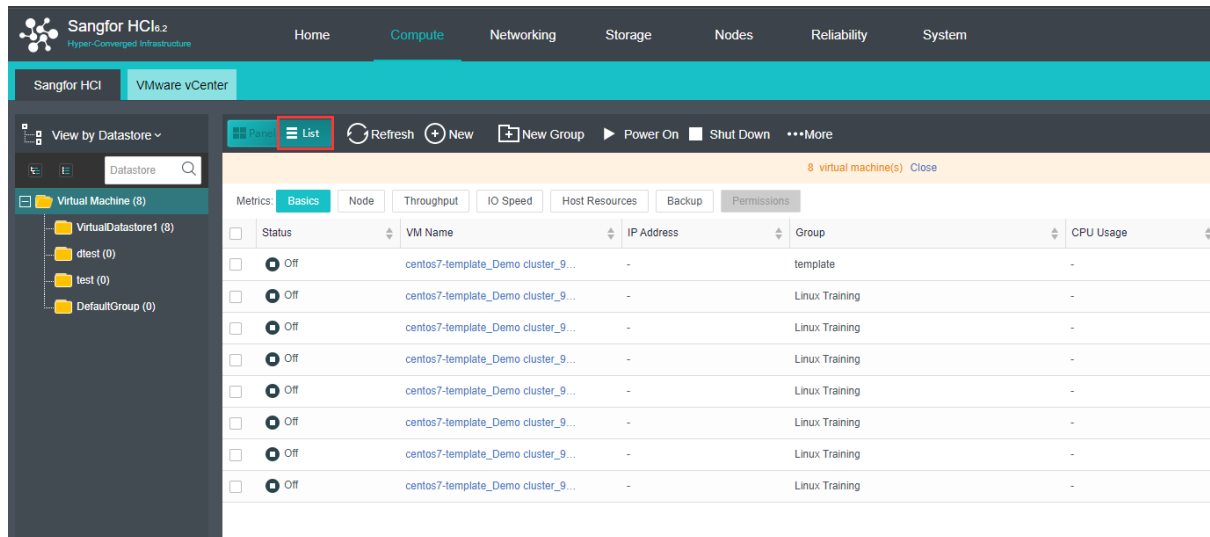
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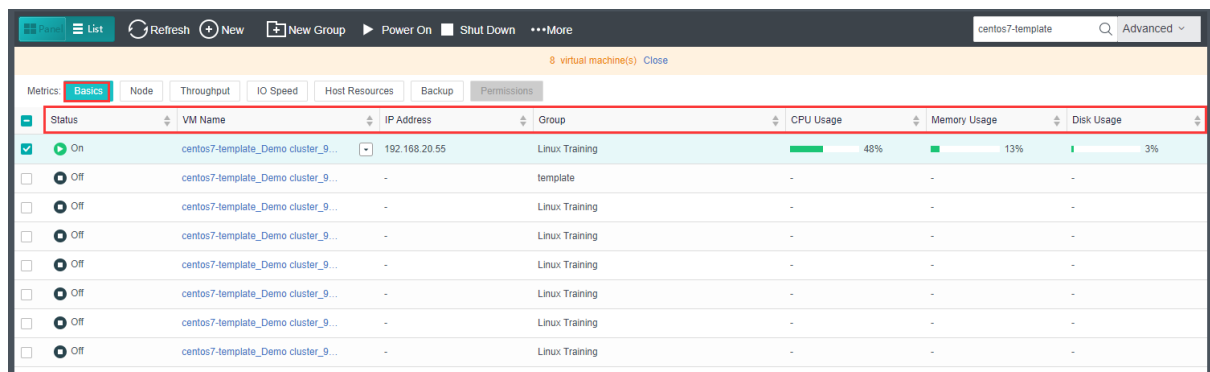
2.2.1.1 Viewing VMs by Panel or List

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:

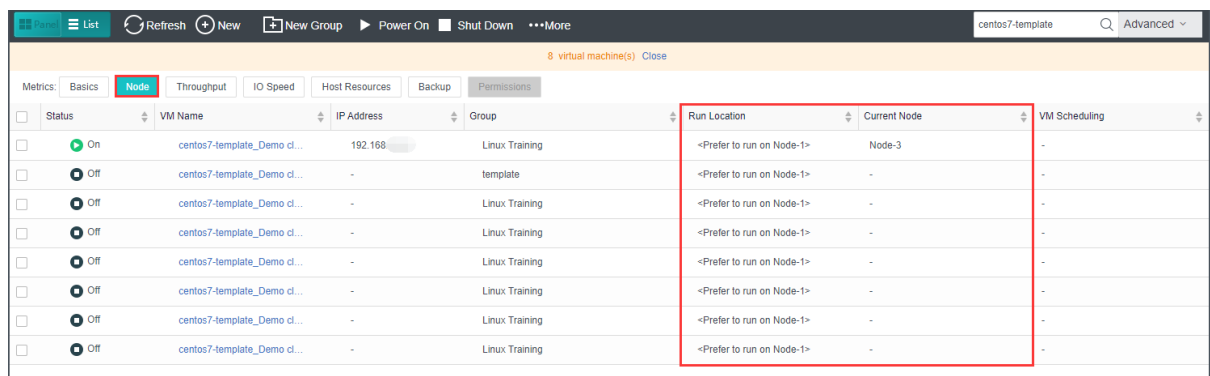


VM details are displayed, as shown below:

Basics: Displays basic information of virtual machines.



Node: Display the node where the VM is running on.

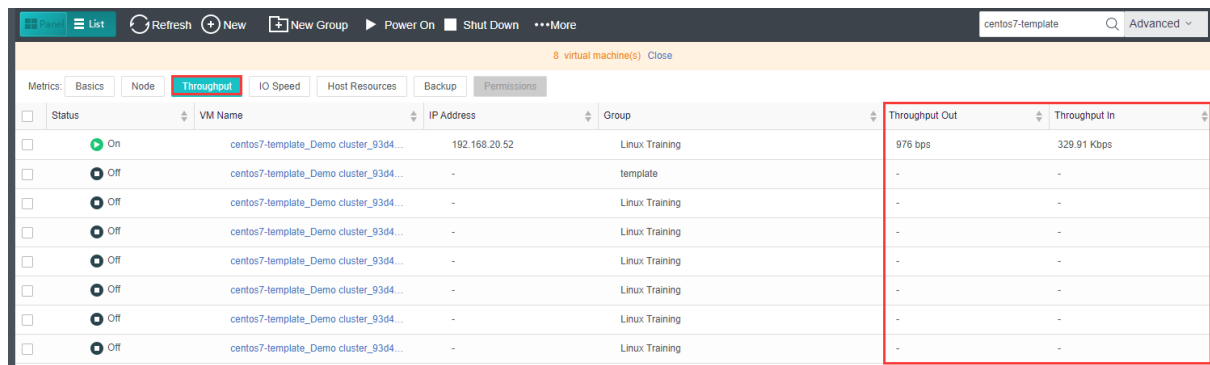


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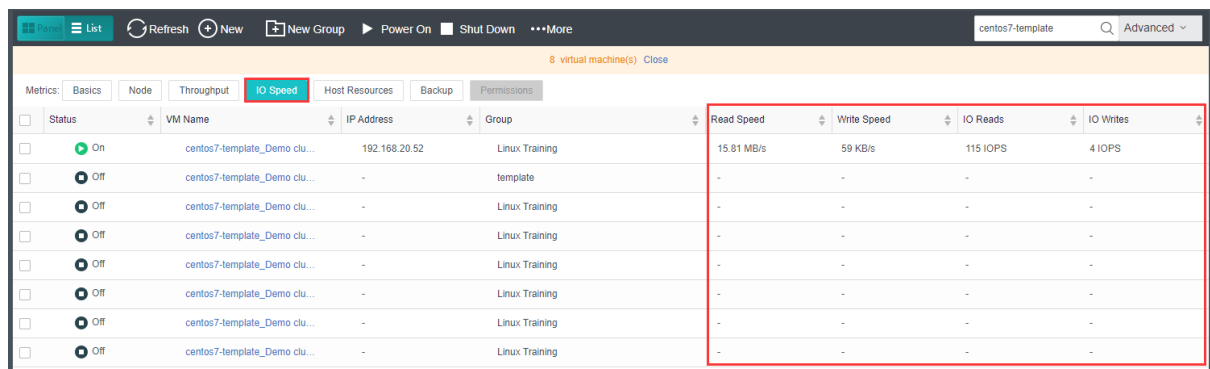
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Throughput: Displays outbound and inbound speed.



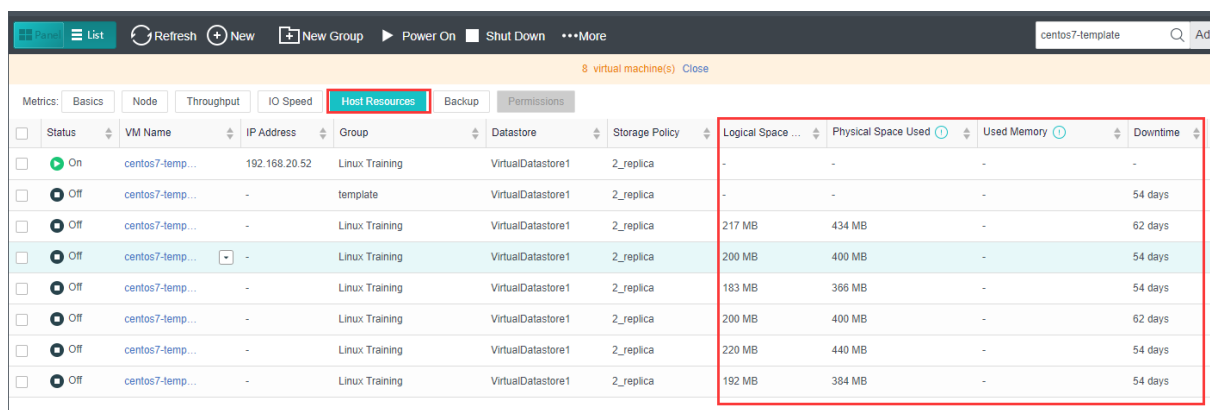
Status	VM Name	IP Address	Group	Throughput Out	Throughput In
On	centos7-template_Demo cluster_93d4...	192.168.20.52	Linux Training	976 bps	329.91 Kbps
Off	centos7-template_Demo cluster_93d4...	-	template	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-
Off	centos7-template_Demo cluster_93d4...	-	Linux Training	-	-

IO Speed: Displays IO speed.



Status	VM Name	IP Address	Group	Read Speed	Write Speed	IO Reads	IO Writes
On	centos7-template_Demo clu...	192.168.20.52	Linux Training	15.81 MB/s	59 KB/s	115 IOPS	4 IOPS
Off	centos7-template_Demo clu...	-	template	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-
Off	centos7-template_Demo clu...	-	Linux Training	-	-	-	-

Host Resources: Displays used resources and downtime.



Status	VM Name	IP Address	Group	Datastore	Storage Policy	Logical Space ...	Physical Space Used	Used Memory	Downtime
On	centos7-temp...	192.168.20.52	Linux Training	VirtualDatastore1	2_replica	-	-	-	-
Off	centos7-temp...	-	template	VirtualDatastore1	2_replica	-	-	-	54 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	217 MB	434 MB	-	62 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	200 MB	400 MB	-	54 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	183 MB	366 MB	-	54 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	200 MB	400 MB	-	62 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	220 MB	440 MB	-	54 days
Off	centos7-temp...	-	Linux Training	VirtualDatastore1	2_replica	192 MB	384 MB	-	54 days

Backup: Displays backup information of virtual machines and backup file size.

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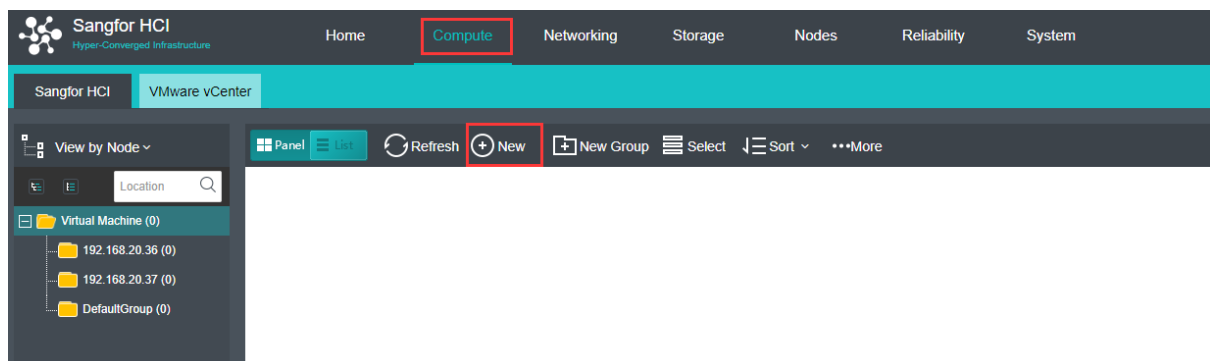
Status	VM Name	IP Address	Group	Scheduled Bac...	Backup Repository	Backup File Size	Latest Backup
On	centos7-template_Demo cluste...	192.168.20.52	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	template	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-
Off	centos7-template_Demo cluste...	-	Linux Training	Off	-	-	-

Permissions: Displays admin permissions.

Administrator	Group	Permissions	Creator	Edit
admin	Default Group	Super administrator	Yes	-
sangfor	Default Group	Admin	No	

2.2.1.2 Creating Virtual Machine

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



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Create New Virtual Machine


×

Choose a way to create a new virtual machine.




Create New Virtual Machine

Create a new virtual machine from an ISO image file.




Create Standalone Oracle Database

Use the wizard to create a new standalone Oracle database.




Clone VM

Clone an existing virtual machine.




Create Oracle RAC Database (cluster)

Use the wizard to create an Oracle RAC database.



Import Virtual Machine

Import a new virtual machine from a local file on this PC.




Create SQL Server

Use the wizard to create a new SQL Server.

Create New Virtual Machine

×



Name:

Group:

Default Group

▼

Tag:

Select

...

HA:

☒ Migrate VM to another node if the node fails
 [HA Settings](#)

Datastore:

VirtualDatastore1

▼

Storage Policy:

2_replica

▼

+

Run Location:

<Auto>

▼

Guest OS:

Select which type of OS to install...

▼

High Priority:

☐ Guarantee resources for VM operation and recovery ⓘ

Configuration

Advanced

Standard: Low Typical High

Processor

8 core(s)

Memory

16 GB

Disk 1

120 GB

CDROM 1

None

Cores:

8

Virtual Sockets:

1

▼

Cores Per Socket:

8

▼

OK

Cancel

Name: Specifies a distinguishable name for the virtual machine.

Group: Specifies a group to which this virtual machine belongs.

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Name:

Group:

Tag:

HA:

Datastore:

Storage Policy:

Run Location:

Guest OS:

High Priority:

Default Group

Group

+

Configuration

Advanced

Standard: Low Typical High

Cores: 8

Processor 8 core(s)

Memory 16 GB

Disk 1 120 GB

CD/DVD 1 None

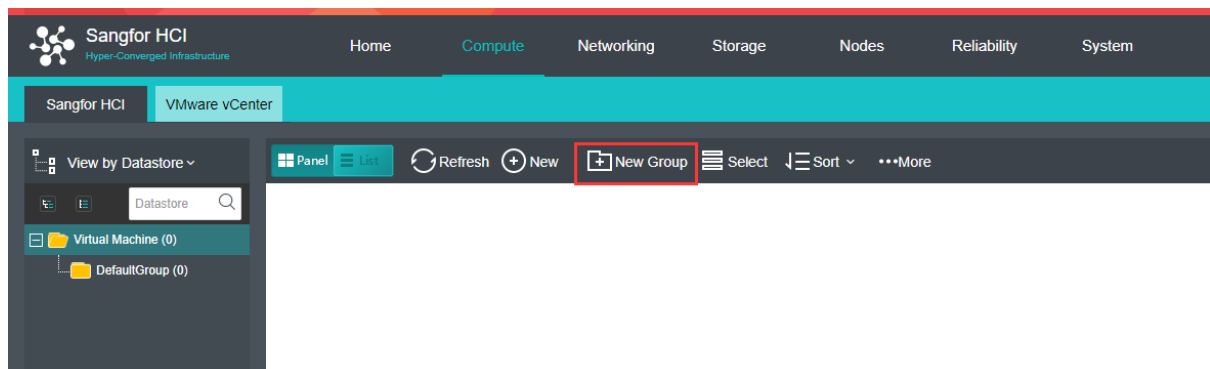
Virtual Sockets: 1

Cores Per Socket: 8

OK

Cancel

To add a new group, click “add new group”



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New Group

×

Location:

Virtual Machine

Group Name:

New group

OK

Cancel

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

Add New Tag

×

Add Tag

Added/Selected Tags: (0)

No tag has been added or selected

Select Tags:

OK

Cancel

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.

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Name:

Group:

Default Group

Tag:

Select

HA:

☒ Migrate VM to another node if the node fails
 [HA Settings](#)

Datastore:

VirtualDatastore1

Storage Policy:

2_replica

Run Location:

<Auto>

Guest OS:

Select which type of OS to install...

High Priority:

☐ Guarantee resources for VM operation and recovery ⓘ

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

Name:

Group:

Default Group

Tag:

Select

HA:

☒ Migrate VM to another node if the node fails
 [HA Settings](#)

Datastore:

VirtualDatastore1

Storage Policy:

No.	St...	Datast...	Type	Total	Free	Max Read Speed	Max Write Speed
1		Virtual...	Virtual ...	36.26 TB	15.53 TB	573.99 MB/s	178.33 MB/s
2		dtest	Local ...	3.64 TB	3.64 TB	12 MB/s	45.96 MB/s
3		test	Local ...	3.64 TB	3.61 TB	192.43 MB/s	91.21 MB/s

Run Location:

Guest OS:

High Priority:

Configuration

Advanced

Standard: Low Typical High

Processor

8 core(s)

Memory

16 GB

Disk 1

120 GB

CPUs

8

Virtual Sockets:

1

Cores Per Socket:

8

OK

Cancel

Storage Policy: Specifies the number of replication and performances.

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Create New Virtual Machine

Name:

Group: Default Group

Tag: Select

HA: ☒ Migrate VM to another node if the node fails HA Settings

Datastore: VirtualDatastore1

Storage Policy: 2_replica

Policy Name	Replicas	Automated QoS	Stripe Width	Replica Defrag
2_replica	2 replicas	Medium level of perfo...	Adaptive	Adaptive
2_replica_high_perform...	2 replicas	High level of performa...	Adaptive	Adaptive
3_replica	3 replicas	Medium level of perfo...	Adaptive	Adaptive
3_replica_high_perform...	3 replicas	High level of performa...	Adaptive	Adaptive

Run Location:

Guest OS:

High Priority:

Configuration Advanced

Standard: Low Typical High

Processor 8 core(s)

Memory 16 GB

Disk 1 120 GB

Cores: 8

Virtual Sockets: 1

Cores Per Socket: 8

OK Cancel

Run on Node: Specifies a node on which the virtual machine runs.

Create New Virtual Machine

Name:

Group: Default Group

Tag: Select

HA: ☒ Migrate VM to another node if the node fails HA Settings

Datastore: VirtualDatastore1

Storage Policy: 2_replica

Run Location: <Auto>

Node	IP Address	CPU Usage	Memory Size	Memory Usage	Allocatable
<Auto>	-	-	-	-	-
Node-1	192.168.1.1	78%	256 GB	66%	49.19 GB
Node-2	192.168.1.2	82%	256 GB	73%	81.76 GB
Node-3	192.168.1.3	74%	256 GB	66%	73.66 GB

Processor 8 core(s)

Memory 16 GB

Disk 1 120 GB

Cores: 8

Virtual Sockets: 1

Cores Per Socket: 8

OK Cancel

Guest OS: Specifies an operating system for the virtual machine. The following types of guest OSes are supported: Sangfor, Windows, Linux, Linux distributions and others. Sangfor

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operating system is mainly for software aCenter.

The screenshot displays the 'Create New Virtual Machine' window. On the left, there's a configuration summary table:

Configuration	
Processor	8 core(s)
Memory	16 GB
Disk 1	120 GB
OS/Type	Windows

The main configuration area on the right includes fields for Name, Group (Default Group), Tag (Select), HA (checked: Migrate VM to another node if the node fails), Datastore (VirtualDatastore1), Storage Policy (2_replica), Run Location (<Auto>), Guest OS (dropdown menu), and High Priority. The Guest OS dropdown is expanded, showing a list of operating systems: Sangfor Technologies Inc., Sangfor Cloud Platform, and a list of Windows Server versions (2019 64 bit, 2016 64 bit, 2012 64 bit, 2008 32 bit, 2008 64 bit, 2003 32 bit, 2003 64 bit). The High Priority section has tabs for Standard, Low, Typical, and High.

High priority: Once it is selected, resources will be preferentially allocated to virtual machine if overall resources are inadequate.

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Create New Virtual Machine

Name:

Group:

Tag:

HA: ☒ Migrate VM to another node if the node fails [HA Settings](#)

Datastore:

Storage Policy:

Run Location:

Guest OS:

High Priority: ☒ Guarantee resources for VM operation and recovery ⓘ

Configuration | **Advanced**

Standard: ☐ Low ☒ Typical ☐ High

Processor: 8 core(s)

Memory: 16 GB

Disk 1: 120 GB

Cores:

Virtual Sockets:

Cores Per Socket:

OK **Cancel**

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:

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Create New Virtual Machine ×

Datastore: VirtualDatastore1
 Storage Policy: 2_replica +
 Run Location: <Auto>
 Guest OS: Select which type of OS to install...
 High Priority: ☐ Guarantee resources for VM operation and recovery ⓘ

Configuration
Advanced

Standard: Low Typical High

	Processor	8 core(s)
	Memory	16 GB
	Disk 1	120 GB
	CD/DVD 1	None
	eth0	Connected To: edge2

Other Hardware
+ Add Hardware ▼

Cores: 8

Virtual Sockets: 1

Cores Per Socket: 8

☒ Enable NUMA Scheduler ⓘ

☐ Use CPU from host (this can be edited only when VM is shut down) ⓘ

☐ Para-virtualized clock (this can be edited only when VM is shut down) ⓘ

☐ Enable CPU hot add (this can be edited only when VM is shut down)

Guest OSES Supported ⓘ

OK
Cancel

- **Default Low Configuration:** 4 processor, 8 GB memory, 60 GB disk, one CD/DVD, one NIC.
- **Default Typical Configuration:** 8 processor, 16 GB memory, 120 GB disk, one CD/DVD, one NIC.
- **Default High Configuration:** 16 processor, 32 GB memory, 120 GB disk, one CD/DVD, one NIC.

Processor: Specifies the number of virtual sockets and cores per socket for the virtual machine respectively. Once Cores field is configured, Virtual Sockets and Cores Per Socket fields will be automatically filled with optimum values, so as to achieve best VM performance.

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The screenshot shows the 'Configuration' window with the 'Advanced' tab selected. On the left, under 'Standard', there are three tabs: 'Low', 'Typical' (selected), and 'High'. Below these are hardware configuration items: Processor (8 core(s)), Memory (16 GB), Disk 1 (120 GB), CD/DVD 1 (None), eth0 (Connected To: edge2), and Other Hardware. On the right, under 'Cores', there are settings for 'Cores' (8), 'Virtual Sockets' (1), and 'Cores Per Socket' (8). Below these are four checkboxes: 'Enable NUMA Scheduler' (checked), 'Use CPU from host' (unchecked), 'Para-virtualized clock' (unchecked), and 'Enable CPU hot add' (unchecked). Each unchecked checkbox has a tooltip indicating it can only be edited when the VM is shut down. A link 'Guest OSes Supported' is also present.

Enable NUMA Scheduler: Once enabled, memory access and VM performance will be enhanced. To enable NUMA scheduler for VM, go to **System > Advanced Settings** to enable NUMA scheduler first. To project NUMA topology into a virtual machine, make sure that virtual machine has more than 8 cores and vmTools have been installed.

Use CPU from host: Live migration might be affected because of the tight association between the virtual machine and the host CPU.

Para-virtualized clock: It is applicable to Windows virtual machines only. It can improve performance of Windows virtual machines running database but requires the option Use CPU from host to be enabled.

Enable CPU hot add: Once CPU hot-add is enabled, CPU resources can be hot-added manually for the virtual machine.

Memory: Specifies the memory size for the virtual machine. The minimum is 1 GB, and the maximum is 4 TB.

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ConfigurationAdvanced

Standard: LowTypicalHigh

Processor8 core(s)

Memory16 GB

Disk 1120 GB

CD/DVD 1None

eth0Connected To: edge2

Other Hardware

Add Hardware ▼

Memory Size: 16 GB

16 GB

1 GB2 GB4 GB8 GB16 GB32 GB64 GB128 GB256 GB512 GB1 TB2 TB4 TB

☐ Enable huge-page memory ⓘ
 VM performance will be improved if huge-page memory is enabled for specific applications, but disks will be pre-allocated.

☐ Enable memory hot add (this can be edited only when VM is shut down)
[Guest OSes Supported ⓘ](#)

Enable memory hot add: Once memory hot-add is enabled, memory resources can be hot-added manually for the virtual machine.

Disk: Specifies the 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.

ConfigurationAdvanced

Standard: LowTypicalHigh

Processor4 core(s)

Memory8 GB

Disk 160 GB

CD/DVD 1None

eth0Connected To: edge2

Other Hardware

Add Hardware ▼

Method: ☒ New disk ☐ Existing disk ☐ Physical disk ☐ Shared disk

Disk Capacity: 60 GB

Allocation: ☒ Dynamic provisioning

Dynamically allocate additional disk space based on demand to enhance disk performance and utilization.

☐ Thin provisioning

Allocate space based on actual data size as needed, saving space.

☐ Pre-allocating

Pre-allocate a fixed amount of space. This enhances disk performance but wastes more storage space.

☐ Support Virtio

It helps to improve disk IO performance, but some OS versions do not support this feature. Do not change the default unless necessary. Supported operating systems are Linux later than 2.6.18 and Windows except Windows 2000. Windows requires vmTools to be installed.

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Configuration | **Advanced**

Standard: **Low** | Typical | High

Processor 4 core(s)

Memory 8 GB

Disk 1 60 GB

CD/DVD 1 None

eth0 Connected To: edge2

Other Hardware

Add Hardware ▼

Advanced

Storage Policy: 2_replica

Changing storage policy will only have impacts on this virtual disk but not on other virtual disks used for specific scenarios.

New disk: You may choose to create a new disk or use an existing disk. If you'd like to create a new disk, configure related fields on the following page:

Method: ☒ New disk | ☐ Existing disk | ☐ Physical disk | ☐ Shared disk

Disk Capacity: 60 GB

Allocation: ☒ Dynamic provisioning
Dynamically allocate additional disk space based on demand to enhance disk performance and utilization.

☐ Thin provisioning
Allocate space based on actual data size as needed, saving space.

☐ Pre-allocating
Pre-allocate a fixed amount of space. This enhances disk performance but wastes more storage space.

☐ Support Virtio
It helps to improve disk IO performance, but some OS versions do not support this feature. Do not change the default unless necessary. Supported operating systems are Linux later than 2.6.18 and Windows except Windows 2000. Windows requires vmTools to be installed.

Disk Capacity: Specifies the capacity(GB) of the virtual disk.

Dynamic provisioning : Allocate space based on pre-allocated space and actual demands, to enhance disk performance and utilization.

Thin Provisioning: Allocate space based on actual data size as needed, saving space.

Pre-allocating: Pre-allocate a fixed amount of space, enhancing disk performance but wasting more storage space.

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Support Virtio : It helps to improve Disk IO performance, but some versions does not support this feature. Do not change the default unless necessary.

Existing disk: To use an existing disk, select the option **Existing disk** and then select the corresponding disk file.

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








	Disk	LUN	Size	Type	Details
<input type="radio"/>	INTEL ...	0	447.1...	Local storage	View
▲ Used (1)					
<input type="radio"/>	INTEL ...	0	447.1...	Local storage	View

Shared disk: To use a shared disk, select the option **Shared disk**.

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Method: <input type="radio"/> New disk <input type="radio"/> Existing disk <input type="radio"/> Physical disk <input checked="" type="radio"/> Shared disk					
	Disk	LUN	Size	Storage Policy	Details
-	 Oracle ...	1	100 GB	3_replica_hi...	View
-	 Oracle ...	21	100 GB	3_replica_hi...	View
-	 Oracle ...	22	100 GB	3_replica_hi...	View
-	 Oracle ...	23	50 GB	3_replica_hi...	View
-	 Oracle ...	24	50 GB	3_replica_hi...	View
-	 Oracle ...	25	50 GB	3_replica_hi...	View
-	 Oracle ...	26	10 GB	3_replica_hi...	View

To allow more than one virtual machines mount a same disk, be sure that those virtual machines support mutex during write operation (such as in Oracle RAC environment), or else, data on the disk will get damage.

Message

?

Please be sure that this virtual machine can share disk with the existing virtual machine("clbtest") and mount the disk, to create Oracle RAC.

Notes: To allow more than one virtual machines mount a same disk, be sure that those virtual machines support mutex during write operation (such as in Oracle RAC environment), or else, data on the disk will get damaged.

Type **OK** (case-insensitive) to confirm operation

OK

Cancel

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

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Configuration		Advanced
Standard: Low Typical High		CD/DVD Drive:
<div> <div>Processor</div> <div>8 core(s)</div> </div> <div> <div>Memory</div> <div>16 GB</div> </div> <div> <div>Disk 1</div> <div>120 GB</div> </div> <div> <div>CD/DVD 1</div> <div>None</div> </div> <div> <div>eth0</div> <div>Connected To: edge1</div> </div>		<div> <input type="radio"/> None </div> <div> <input checked="" type="radio"/> Load ISO image file </div> <div> <input type="text"/> <div>Browse</div> </div> <div> Upload from this Local PC </div>

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 may upload an image file to the datastore from local disk. Click **Upload from this Local Disk**, select an ISO image file and upload it.

Configuration		Advanced
Standard: Low Typical High		CD/DVD Drive:
<div> <div>Processor</div> <div>8 core(s)</div> </div> <div> <div>Memory</div> <div>16 GB</div> </div> <div> <div>Disk 1</div> <div>120 GB</div> </div> <div> <div>CD/DVD 1</div> <div>None</div> </div> <div> <div>eth0</div> <div>Connected To: edge1</div> </div>		<div> <input type="radio"/> None </div> <div> <input checked="" type="radio"/> Load ISO image file </div> <div> <input type="text"/> <div>Browse</div> </div> <div> <div>Upload from this Local PC</div> </div>
<div> <div>Other Hardware</div> <div>Add Hardware ▼</div> </div>		

eth0: Specifies what the virtual machine is connected to.

Configuration		Advanced
Standard: Low Typical High		<input checked="" type="checkbox"/> Enable
<div> <div>Processor</div> <div>8 core(s)</div> </div> <div> <div>Memory</div> <div>16 GB</div> </div> <div> <div>Disk 1</div> <div>120 GB</div> </div> <div> <div>CD/DVD 1</div> <div>None</div> </div> <div> <div>eth0</div> <div>Connected To: edge1</div> </div>		<div> <div>Connected To:</div> <div>edge1</div> <div>...</div> </div> <div> <div>Advanced</div> <div> <div> <div>Adapter Model:</div> <div>Realtek RTL8139</div> </div> <div> <div>MAC Address:</div> <div>FE:FC:FE:01:18:09</div> </div> <div> <div>IP Address:</div> <div>Takes effect after vmTools is installed</div> </div> </div> </div>
<div> <div>Other Hardware</div> <div>Add Hardware ▼</div> </div>		<div> <div>Guest OSes Supported</div> <div> <input type="checkbox"/> IPv4 address <input type="checkbox"/> IPv6 address </div> </div>

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Processor	8 core(s)	IP Address: It takes effect after vmTools is installed. Guest OSes Support Edit IPv4 Address IP Address: 10.123.123.10 Netmask: 255.255.255.0 Gateway: 10.123.123.1 Preferred DNS: 8.8.8.8 Alternate DNS: - IPv6 Address IP Address: 2001:db8:85a3::8a2e:370:7334 Prefix Length: 64 Gateway: 2001:db8:85a3::8a2e:370:7335 Preferred DNS: - Alternate DNS: -
Memory	8 GB	
Disk 1	100 GB	
Disk 2	120 GB	
CD/DVD 1	CD/DVD Drive	
eth0	Connected To: Switch0425, IP Address: 1...	
Other Hardwares Add Hardware		

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.

Support IPv4 and IPv6 address: Support IPv4 and IPv6 address: It can set IPv4 and IPv6 addresses on the network card. It only supports certain Guest OS and required to install the VM tools as well.

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

Configuration Advanced

Standard: Low Typical High

Processor 4 core(s)

Memory 8 GB

Disk 1 60 GB

CD/DVD 1 None

eth0 Connected To: edge2

Other Hardware

+ Add Hardware ▼

Built-in Graphics: QXL graphics adapter ⓘ

Mouse Type: ☒ USB ☐ PS2 ⓘ

Keyboard Type: QWERTY(USA) ▼

BIOS Option: ☒ SeaBIOS ☐ UEFI ⓘ
☐ Specified

Browse

Upload BIOS File from Local PC

BIOS POST Time: 0 second(s)

Built-in Graphics: Options are **Standard VGA graphics adapter**, **VMWare compatible graphics adapter**, **QXL graphics adapter** and **Cirrus graphics adapter**. Graphics adapter has close relation with desktop display. If selected graphics adapter is not supported by guest OS or display error exists, try another type of graphics adapter.

Mouse Type: Options are **USB** and **PS2**.

Keyboard Type: QWERTY (USA) and QERTY (Italy).



This is not recommended unless the virtual mouse does not work properly or USB mouse refuses to work for some reason. It takes effect after the console is re-opened. Mouse type can be changed to PS2 if USB mouse refuses to work for some reason.

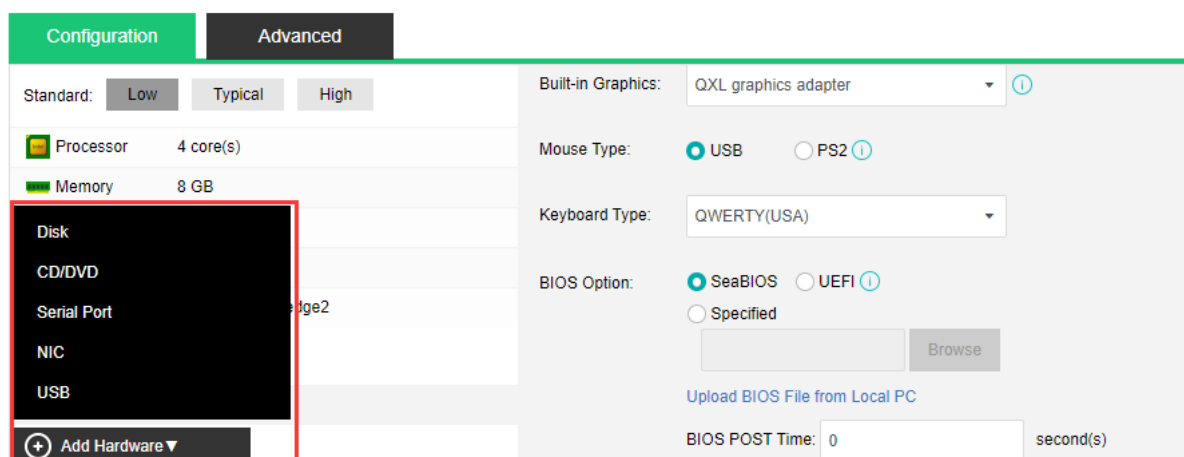
BIOS Option: Options are **SeaBIOS**, **UEFI BIOS** and **Custom**. You can also specify **BIOS POST Time**.


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

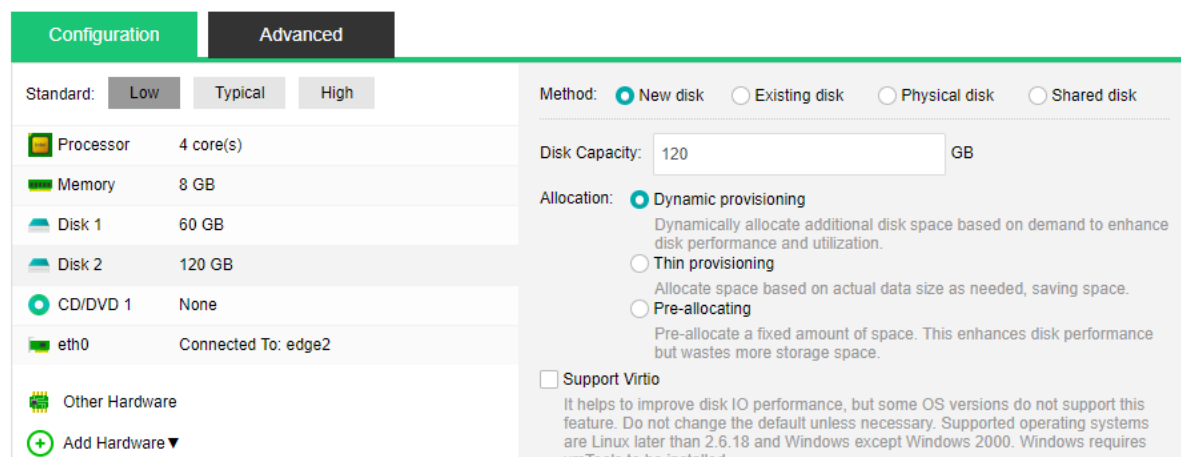
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For example, click **Add Hardware** and select **Disk**. Then, disk 2 will be added to the configuration (as shown in following figure). You can add that disk by creating a new disk or using an existing disk. To delete a disk, click on this  icon.



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

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Configuration **Advanced**

Boot Order: 1 Disk 1 2 CD/DVD 3 None ⓘ

Lifecycle: ☒ Immortal ☐ Expiration Date 2021-01-12 ⓘ

Hostname: ☒ Default hostname ☐ Specified ⓘ Guest OSes Supported ⓘ

Others: ☐ Power on at node startup ☒ Reboot if fault occurs (due to crash, blue screen, etc., requires **vmTools** installed) ☐ Enable UUID generator (auto generate UUID) ⓘ ☐ Enable disk encryption ⓘ

Debugging

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

Configuration **Advanced**

Boot Order: 1 Disk 1 2 CD/DVD 3 None ⓘ

Lifecycle: ☒ Immortal ☐ Expiration Date 2021-01-12 ⓘ

Hostname: ☒ Default hostname ☐ Specified ⓘ Guest OSes Supported ⓘ

Others: ☐ Power on at node startup ☒ Reboot if fault occurs (due to crash, blue screen, etc., requires **vmTools** installed) ☐ Enable UUID generator (auto generate UUID) ⓘ ☐ Enable disk encryption ⓘ

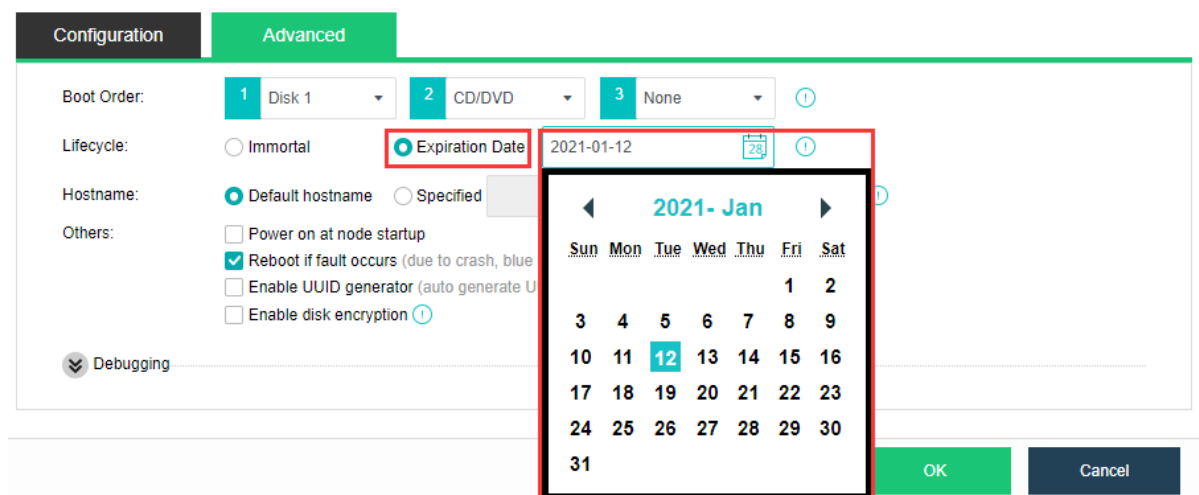
Debugging

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 may delete the expired virtual machine when the end of its lifecycle is reached.

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Others includes the following options:

Power on at node startup: Once it is selected, virtual machine will be automatically powered on once the node starts up.

Reboot if fault occurs: Once it is selected, virtual machine will be automatically restarted in case of stuck, blue screen. To make this option take effect, vmTools should be installed.

Enable UUID generator: Every time UUID generator is enabled, a new UUID will be generated. Universally Unique Identifier, UUID in short, is an identifier of a virtual machine. Certain software running on the VM need the UUID to work properly. Please do not change this at will, since changes of UUID may cause some functionalities to be invalid. You may choose to re-generate UUID for the new virtual machine while cloning virtual machine or deploying virtual machine from a template.

To show more options, click on Debugging and you will see the following options:

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The image shows a screenshot of a virtual machine configuration window, specifically the 'Advanced' tab. The 'Debugging' section is highlighted with a red box. It contains several checkboxes: 'Memory reclaiming' (checked), 'Support Virtio' (unchecked), 'Filter page files (for Windows system only)' (unchecked), 'Disable Pause-Loop Exiting' (unchecked), and 'Disable kvmclock' (unchecked). Above these are other settings like 'Boot Order', 'Lifecycle', 'Hostname', and 'Others'.

Enable memory reclaiming: Once it is enabled, free memory of idle virtual machines will be detected and reclaimed for other virtual machines.

Support Virtio: Once it is enabled, all disks associated with this virtual machine will support Virtio, to improve IO performance, but some software versions do not support this feature. Please do not change the default setting unless necessary.

Filter page files: Once it is enabled, it helps to save backup storage and time. Page files will not be filtered when a virtual machine is backed up during powered-off status. It takes effect after vmTools are installed. This debugging option is for Windows system only.

Disable Pause-Loop Exiting: Once it is selected, Pause-Loop Exiting will be disabled. Select this option to avoid VM EXIT caused by PAUSE instruction of VM, which improves adaptive spinning performance of multi-core VM (more than 16 cores) to some extent but requires extra costs of physical CPU. The default is recommended unless otherwise required.

Disable kvmclock: Once it is selected, kvmclock will be disabled. On Linux kernel 2.6.32 or earlier version, you may disable kvmclock to improve system stability.

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

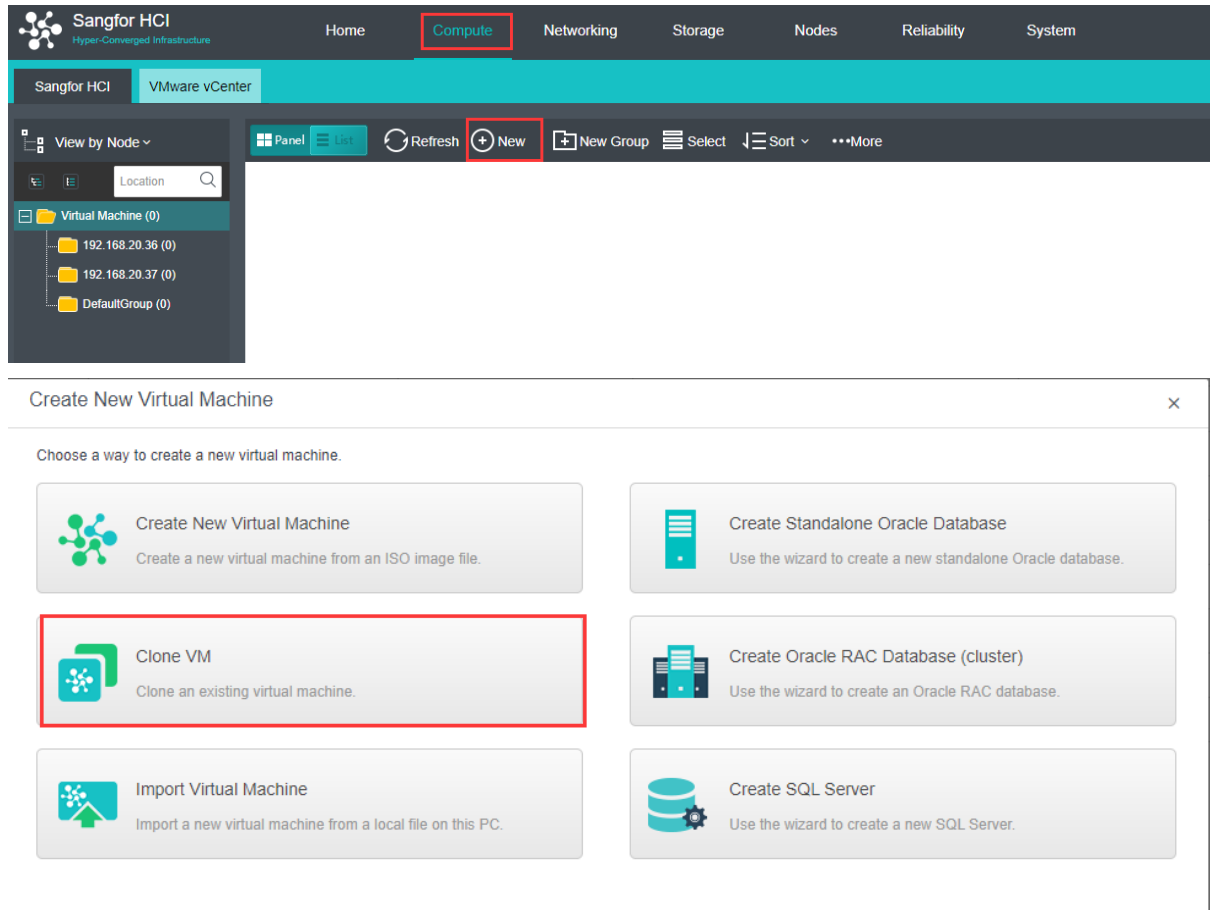
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affect source virtual machines.

To clone a virtual machine, click **New** 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.



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Select Virtual Machine

×

1 Select Virtual Machine

2 Ready to Complete

Expand All

Collapse All

Group

Name

Q

VM Name	Group	Run Location
+		
+		
-		
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-3
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
<input type="radio"/>	centos7-template_Demo clust...	Linux Training Node-1
+		

Next

Cancel



- A powered-off virtual machine cannot be cloned.
- A virtual machine being migrated or being 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 remain 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.

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Select Virtual Machine

2

Ready to Complete



Name:	<input type="text" value="centos7-template_Demo cluster_93d4077e0003_Clone"/>	
Number of Clones:	<input type="text" value="1"/>	Clone Name(s): centos7-template_Demo cluster_93d4077e0003...
Description:	<input type="text"/>	
Group:	<input type="text" value="Linux Training"/>	
Clone Type:	<input type="text" value="Instant Full Clone (recommended)"/>	
	<input type="checkbox"/> Power on clone at creation	
HA:	<input checked="" type="checkbox"/> Migrate to another node if the node fails HA Settings	
Datastore:	<input type="text" value="VirtualDatastore1"/>	
Storage Policy:	<input type="text" value="Use original storage policy: 2_replica"/>	
Run Location:	<input type="text" value="Auto"/>	
Hostname:	<input type="text" value="Optional"/>	Guest OSES Supported
Network Connection:	<input type="checkbox"/> Enable NIC of cloned VM	
NIC:	eth0	To: <input type="text"/> Network Settings

Prev

OK

Cancel

To clone a virtual machine, you need to specify the following parameters for the clone: **Name, VM number, Description, Clone Type, Group, HA, datastore, Storage Policy, Run on Node, Hostname, Network Connection, and NIC**. To have the cloned virtual machine powered on upon creation, select the option **Power on virtual machine at creation**.

There are three types of cloning available starting from version 6.0.1:

a. Instant Full Clone

Description: Instantly clone the selected virtual machine as a new independent virtual machine. Instant full clone is the default clone option for 3 nodes and above which recommended to be use.

Features:

1. Cloning process can be complete in short time.

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2. The disk file of the clone VM is independent to the original VM
3. Performance will not be affected after cloning is completed.

Requirement: Required 3 nodes and above to support. The datastore of both source virtual machine and cloned virtual machine must be in virtual storage.

b. Linked Clone

Description: Clone the virtual machine by linking the disk file to the original virtual machine. This method is recommended to be used during development and testing phase while the performance is not the essential point.

Features:

1. Cloning process can be complete in short time.
2. The disk file of the clone VM is dependent to the original VM and storage occupation can be reduced.
3. Performance might be slightly affected after cloning is completed.

Requirement: Required 3 nodes and above to support. The datastore of both source virtual machine and cloned virtual machine must be in virtual storage.

c. Full Clone

Description: Perform full clone of the selected virtual machine and create a new independent virtual machine.

Features:

1. The disk file of the clone VM is independent to the original VM.
2. Datastore of the source and cloned VM can be external storage.



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

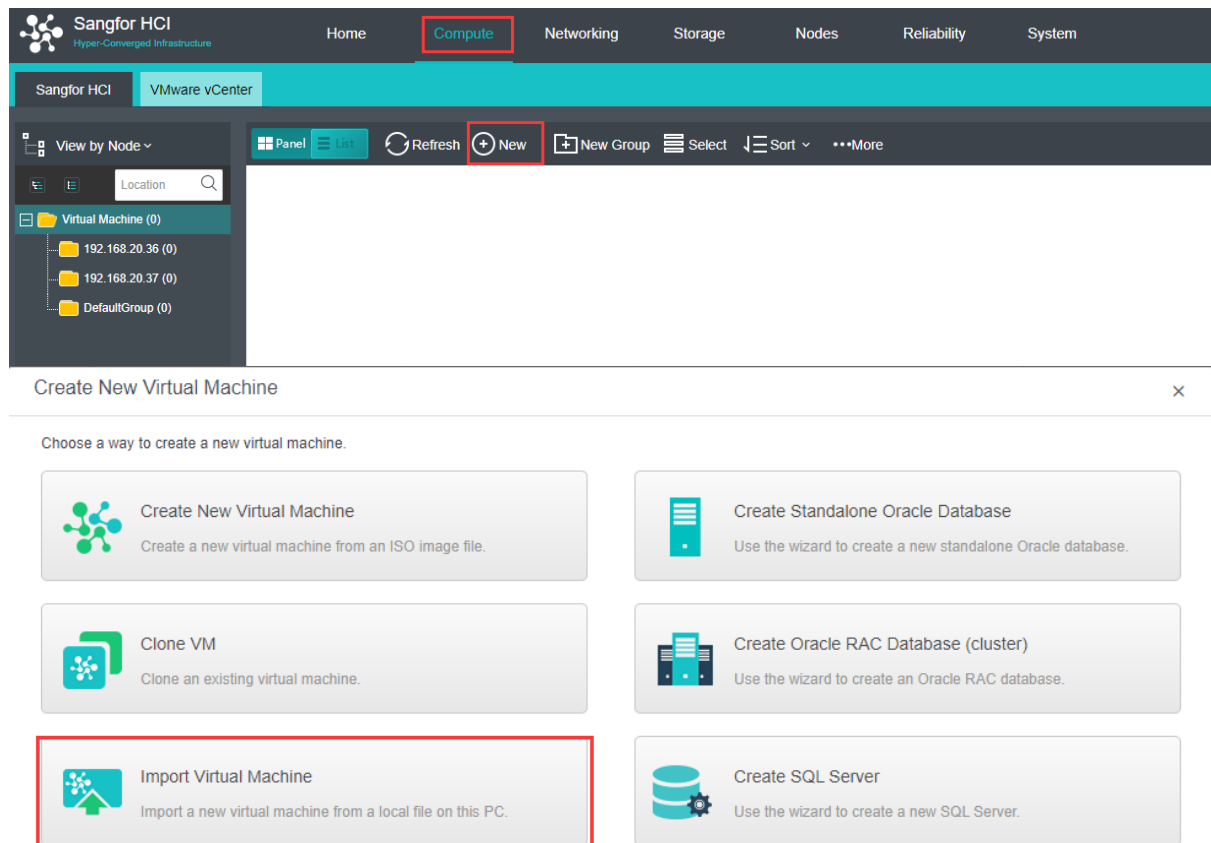
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The following types of VM files can be imported onto Sangfor HCI platform: OVA files exported from VMware virtualization platform, VMA files exported from other Sangfor HCI platforms.

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





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Import Virtual Machine File







① QXL graphics adapter will be used by default after VM is imported. If display issue occurs after startup, change the graphics adapter manually.

File Type:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> OVA or VMA ▼ </div> <p style="font-size: 0.8em; margin-top: 5px;">To use a vhd, vhdx or qcow2 image file, choose Existing disk and then select that image file when configuring disk for virtual machine.</p>
VM Image Files:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> ova or vma file  </div>
Group:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> Default Group ▼ </div>
HA:	<div style="display: flex; align-items: center;"> <input checked="" type="checkbox"/> Migrate to another node if the node fails HA Settings ① </div>
Datastore:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> VirtualDatastore1 ▼ </div>
Storage Policy:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> 2_replica ▼ </div>
Run Location:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> <Auto> ▼ </div>
OS:	<div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between;"> Default ▼ </div> ①

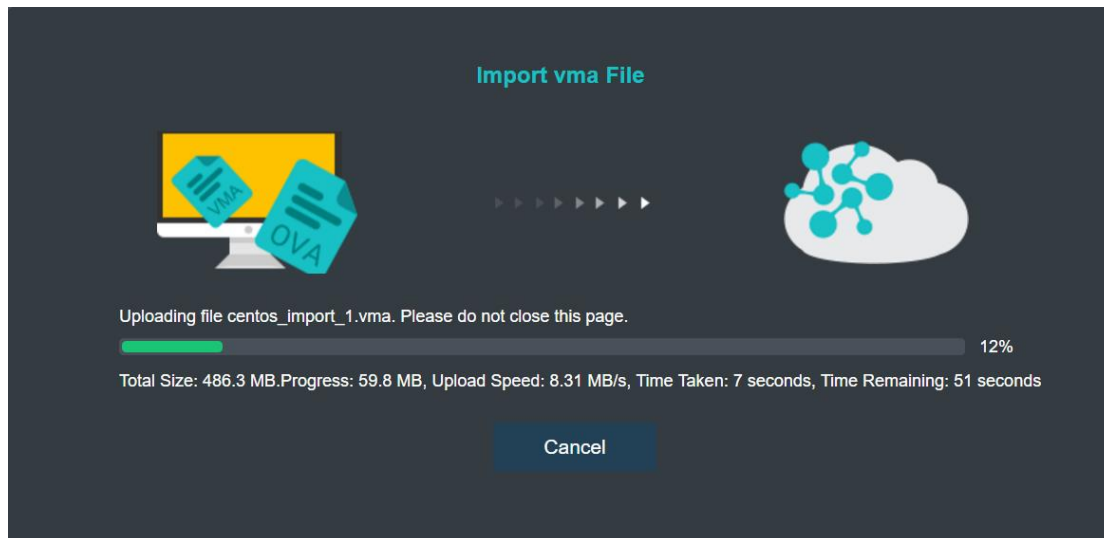
Import

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

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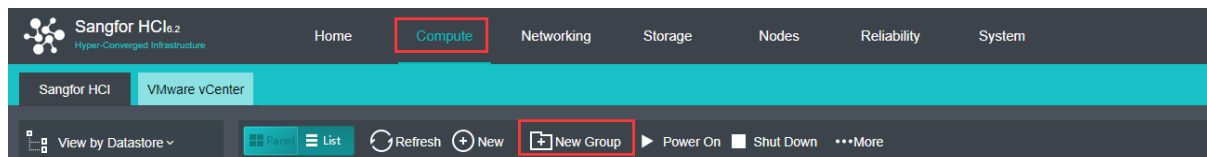
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- If an ova file of a Windows based virtual machine is imported, USB mouse driver needs to be updated and you will be prompted to install that driver.
- If an ova file of a Linux based virtual machine is imported, you need to configure IP address for NIC.
- After the ova file is imported, the virtual machine will be automatically created. The Import Virtual Machine File page can be closed while the virtual machine is being created.

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.



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New Group

Location:

Virtual Machine

Group Name:

OK

Cancel

2.2.1.6 Sorting Virtual Machines

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

While for the List View, you can sort the virtual machines with any option.

The image shows two screenshots of the Sangfor HCI vCenter interface. The top screenshot shows the 'Panel View' with a 'Sort' dropdown menu open, listing options: Name, CPU Usage, Memory Usage, and Disk Usage. The bottom screenshot shows the 'List View' with a table of virtual machines. The table has columns for Status, VM Name, IP Address, Group, CPU Usage, Memory Usage, and Disk Usage. The first row is highlighted with a red box.


Status	VM Name	IP Address	Group	CPU Usage	Memory Usage	Disk Usage
On	centos7-template_Demo cluster_5364077e0001	192.168.20.52	Linux Training	3%	32%	3%
Off	centos7-template_Demo cluster_5364077e0002	-	template	-	-	-
Off	centos7-template_Demo cluster_5364077e0003	-	Linux Training	-	-	-
Off	centos7-template_Demo cluster_5364077e0004	-	Linux Training	-	-	-
Off	centos7-template_Demo cluster_5364077e0005	-	Linux Training	-	-	-
Off	centos7-template_Demo cluster_5364077e0006	-	Linux Training	-	-	-
Off	centos7-template_Demo cluster_5364077e0007	-	Linux Training	-	-	-

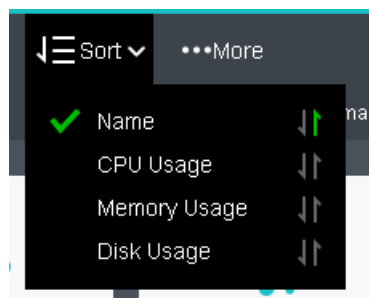
To sort virtual machines by name, select **Sort > Name** in **Compute**. You may click on the

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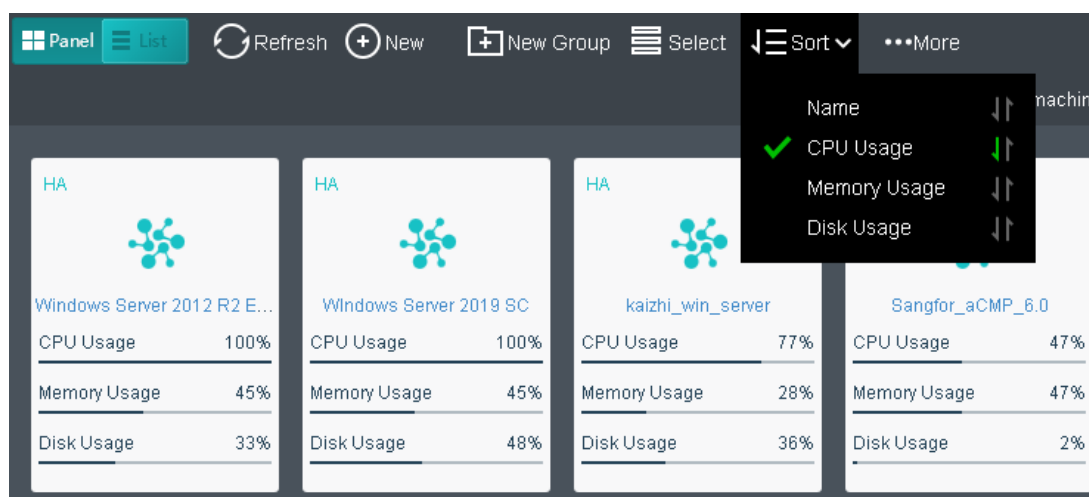
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arrow  to sort VMs in ascending or descending order.



To sort virtual machines by CPU usage, select **Sort > CPU Usage** in **Compute**. By clicking on that arrow, virtual machines can be sorted based on CPU usage in ascending order or descending order. The following figure shows that the virtual machines are sorted by CPU usage in a descending order.

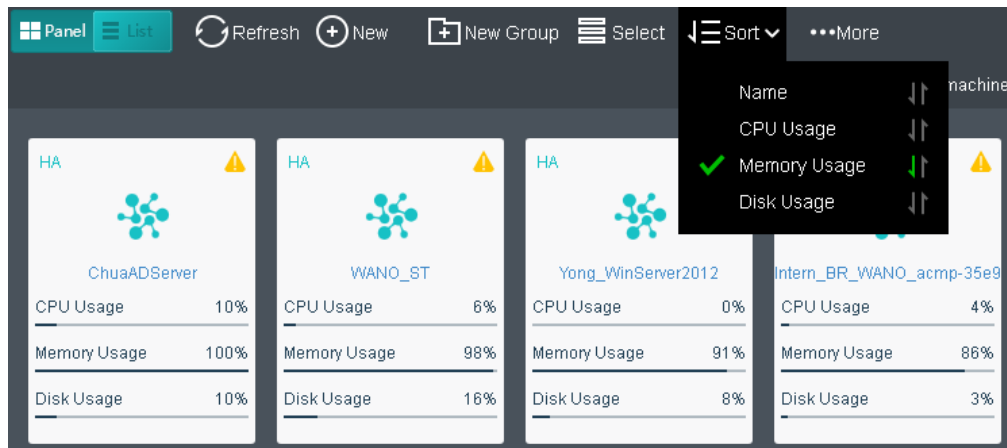


To sort virtual machines by memory usage, select **Sort > Memory Usage** in **Compute**. By clicking on that arrow, virtual machines can be sorted by memory usage in ascending or descending order. The following figure shows that the virtual machines are sorted by memory usage in a descending order.

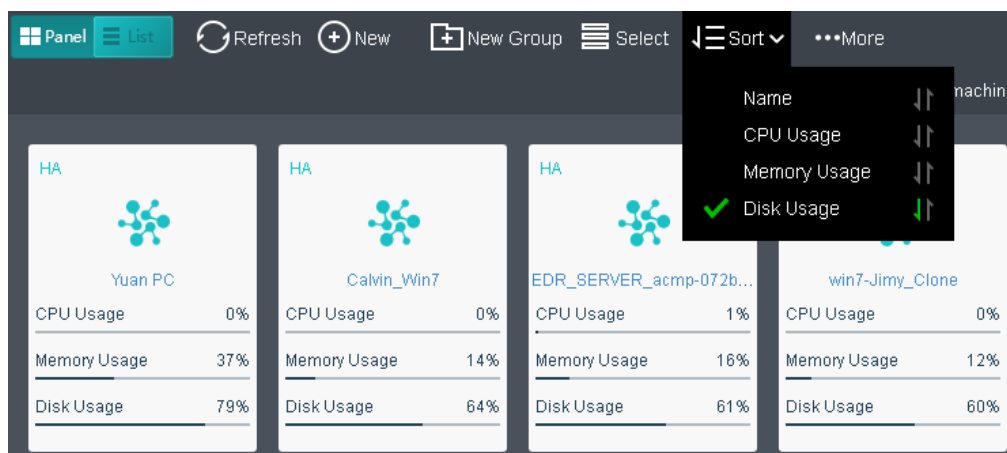
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To sort virtual machines by disk usage, select **Sort > Disk Usage** in **Compute**. By clicking on that arrow, virtual machines can be sorted by disk usage in ascending or descending order. The following figure shows that the virtual machines are sorted by disk usage in a descending order.



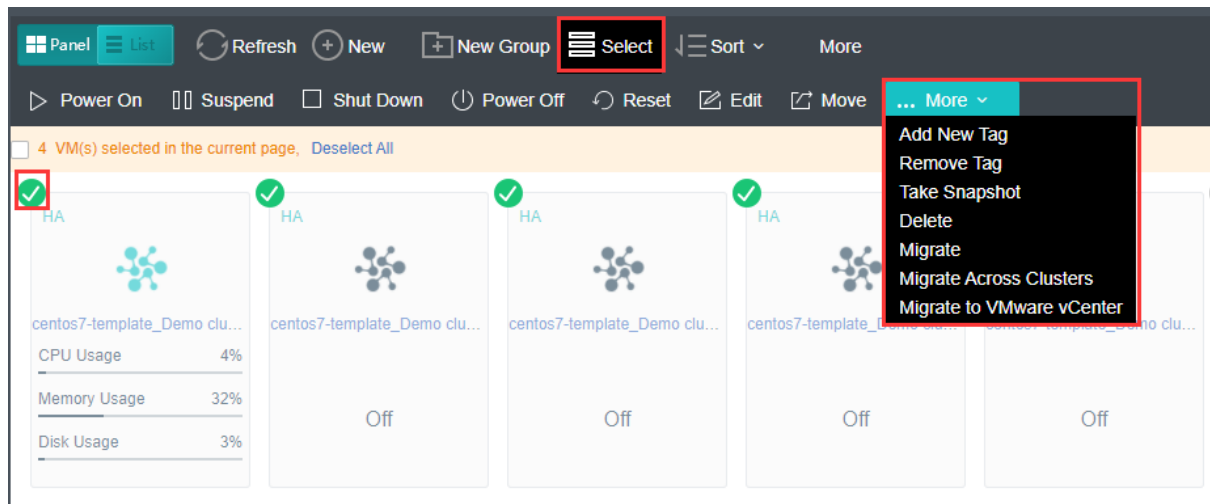
2.2.1.7 Batch Operation

Administrator can perform the following operations against multiple virtual machines: **Power On, Suspend, Shut Down, Power Off, Reset, Move, Edit, Add New Tag, Remove Tag, Take Snapshot, Delete, Migrate, Migrate Across Clusters, and Migrate to Vmware vCenter.**

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

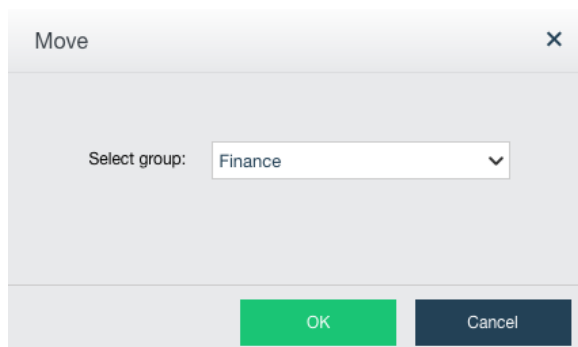
Suspend -To suspend virtual machines(s), select one or more than one virtual machines and then and click on Suspend.

Shut Down -To shut down virtual machine(s), select one or more virtual machines and then click on Shut Down.

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

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

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



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

Edit Virtual Machines

×

Edit

☐ CPU

Virtual Sockets:1

Cores Per Socket:2

☐ Memory

Memory Size:GB

☐ Other Hardware

Keyboard Type:QWERTY(USA)

Add

☐ Disk

Size:GB

Allocation:

☒ Dynamic provisioning

Dynamically allocate space based on pre-allocated space and actual demands, which may enhance disk performance and utilization.

☐ Pre-allocation

Pre-provision a fixed amount of space, which may enhance disk performance but waste space.

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☐ NIC

Adapter Model: Realtek RTL8139

Connected to Switch: ...

Others

☐ Change VM icon



☐ Change reboot mode

☐ Power on VM at host startup

☐ Change priority

☐ High priority

☐ Change lifecycle

☒ Unlimited ☐ Expiry date 2021-01-12

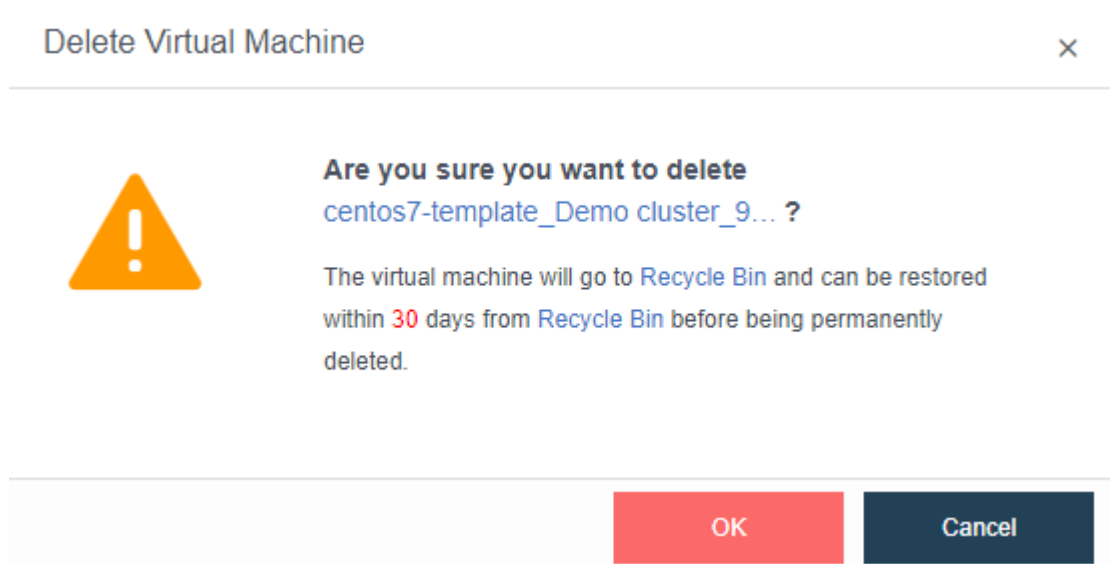
OK Cancel

Delete - 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 and 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.

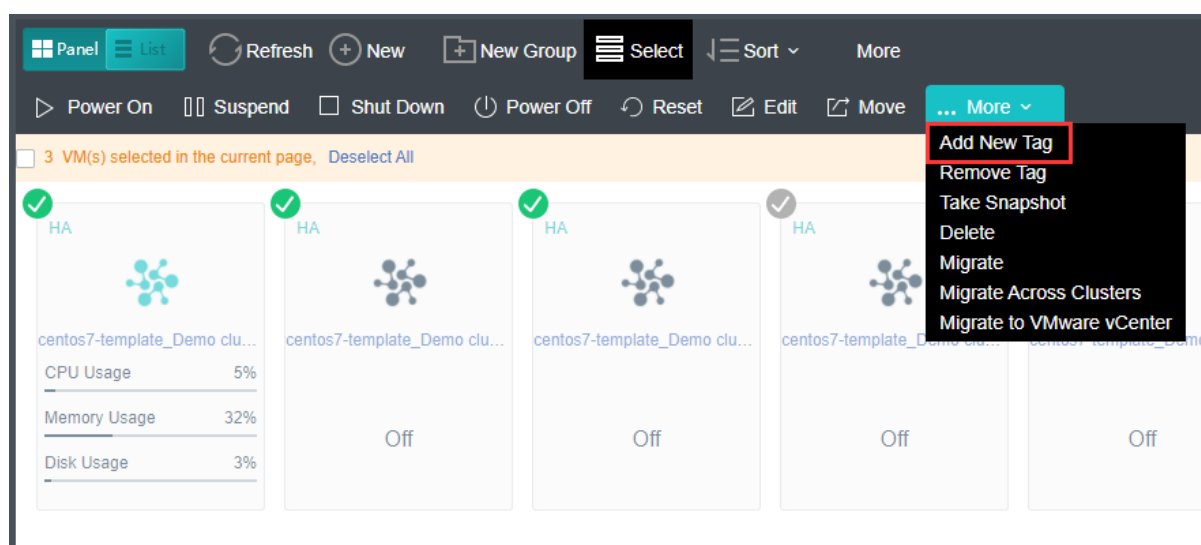
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Add Tag -To add new tags to virtual machine(s), choose one or more than one virtual machines and select **Add Tag**. You can choose the existing tags or add new tags for those virtual machines. To remove tags of virtual machine(s), choose one or more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



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Add Tag

×

Add Tag

Added/Selected Tags: (0)

No tag has been added or selected

Select Tags:

[PC Desktop](#)
[POC](#)
[xss](#)

OK

Cancel

Take Snapshot – To take a snapshot according to the VM, choose one or more than one virtual machines and select Take Snapshot.

Take Snapshot

×

Selected VM(s): 3

Name:

2021-01-12_23-40-33

This name will be applied to all snapshot files of the selected virtual machines.

Description:

OK

Cancel

Migrate – To migrate the VM, choose one or more than one virtual machines and select Migrate.

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Migrate Across Cluster - To migrate the VM across cluster , choose one or more than one virtual machines and select Migrate Across Cluster.

Migrate Across Clusters ×

1 Cluster

2 Destination Location

3 Specify Storage Policy

Cluster IP:

Cluster IP address or cluster controller IP address

Password:

admin password

Next

Cancel

Migrate Across Clusters ×

1 Cluster

2 Destination Location

3 Specify Storage Policy

Current Cluster (192.168.20.2)

Selected	Datastore	Run Lo...	Status
centos...	Virtual...	<Prefer...	▶ Po...
centos...	Virtual...	<Prefer...	■ Off
centos...	Virtual...	<Prefer...	■ Off

Destination Cluster (192.200.19.20)

Group: Default Group

Datastore: VirtualDatastore1

Run Location:

Connected To:

Migrate VM to another node when host resources are inadequate.

☐ Power on virtual machine when migration is complete

☐ Max migration speed per VM

MB/s

Prev

Next

Cancel

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1 Cluster — 2 Destination Location — 3 Specify Storage Policy

VM Name	Storage Policy
centos7-template_Demo cluster_93d4077e0006	2_replica
centos7-template_Demo cluster_93d4077e0001	2_replica
centos7-template_Demo cluster_93d4077e0007	2_replica

Prev

OK

Cancel

Migrate to VMware vCenter - To migrate the VM to VMware vCenter, choose one or more than one virtual machines and select Migrate to VMware vCenter.

Migrate Virtual Machines from SANGFOR aCloud platform to VMware vCenter
✕

Current Location: SANGFOR aCloud

Selected	Status
S_NAS2	Alarm
Yong_WinServer2012	Powered On

Destination Location: VMware vCenter

vCenter: vcenter
Group: vcenter/CTI ESXi/Discovered v
Datastore: datastore1
Run on Node: vcenter/CTI ESXi/192.200.19.3

☒ Auto shut down the migrated virtual machine in SANGFOR aCloud to complete migration
This will have the virtual machine power off automatically before migration completes to have the new changes synced to the destination location. If you do not want the virtual machine to power off at unexpected time and interrupt the services being offered via that virtual machine, do not select this option. You may power off the virtual machine manually when migration completes.

☒ Auto power on the virtual machine in VMware vCenter upon migration completion

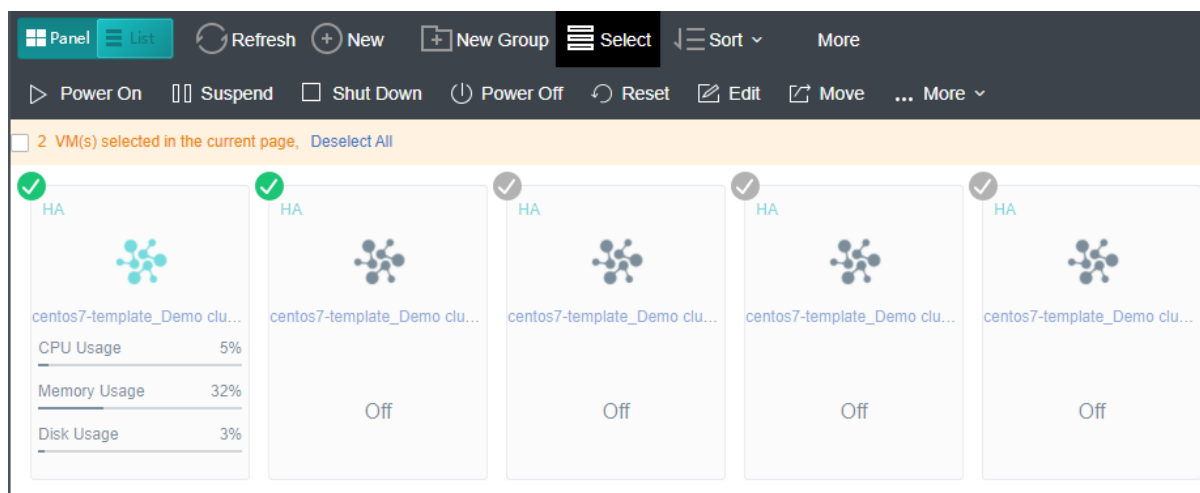
OK
Cancel

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.

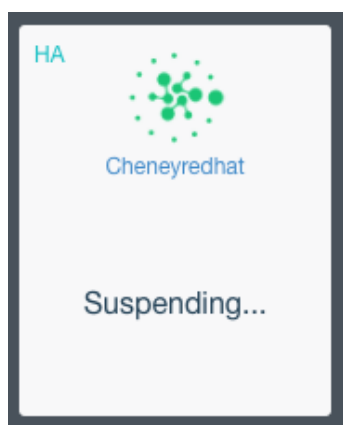
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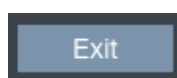
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If a virtual machine is being powered on, suspended or shut down, there will be the corresponding information displayed on the panel. For example, **Suspending**, as shown in the following figure, shows that the virtual machine is being suspended.



To exit from selecting the virtual machines, click on the **Exit** button on the upper right corner.



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2.2.1.8 Deploying Oracle/SQL Server

2.2.1.8.1 Creating Standalone Oracle Database

To create a standalone Oracle database, follow the steps described below:

1. Go to **Compute**, click **New** and then select **Create Standalone Oracle Database** on the **Create New Virtual Machine** page.
2. Create virtual machine. For how to create a virtual machine, see the **2.2.1.2 Creating Virtual Machine** section.

Virtual Machine > Create VM

1 Create VM — 2 Install Guest OS — 3 Allocate Disk — 4 Finish

Name:

Datastore:

Run on Node:

Guest OS:

Processor:

Memory:

[Edit VM Configurations](#)

Name: Specifies a distinguishable name for the virtual machine.

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

Run on Node: Specifies the 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.

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 1TB.

3. Install guest OS.

After VM name and guest OS are specified, click **Next** to install OS. If the image file of a

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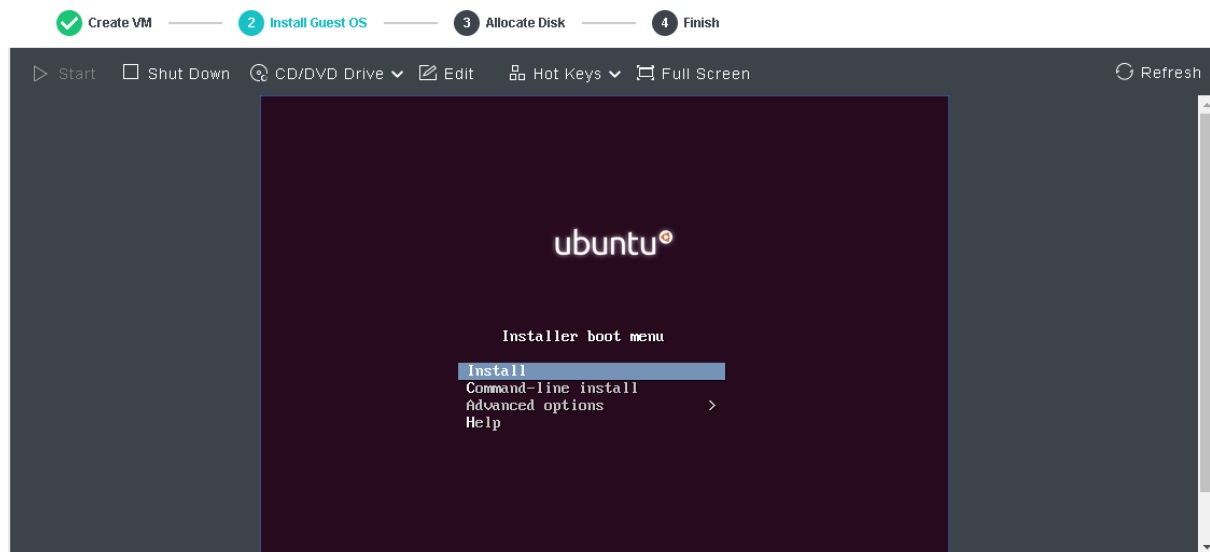
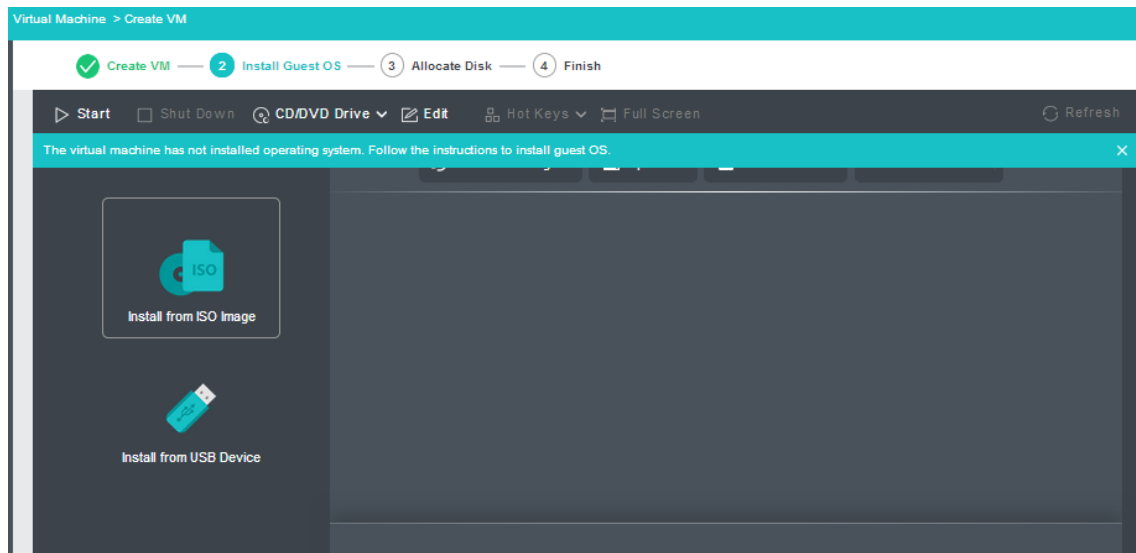
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specified guest OS has not been uploaded to Sangfor HCI platform, you may upload it in the same way of uploading an ISO image introduced in the **2.2.1.2 Creating Virtual Machine** section.



After guest OS is installed, vmTools must be installed before you go to next step.



4. Configure use of 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.

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Virtual Machine > Create VM

✓ Create VM —
 ✓ Install Guest OS —
 3 Allocate Disk —
 4 Finish

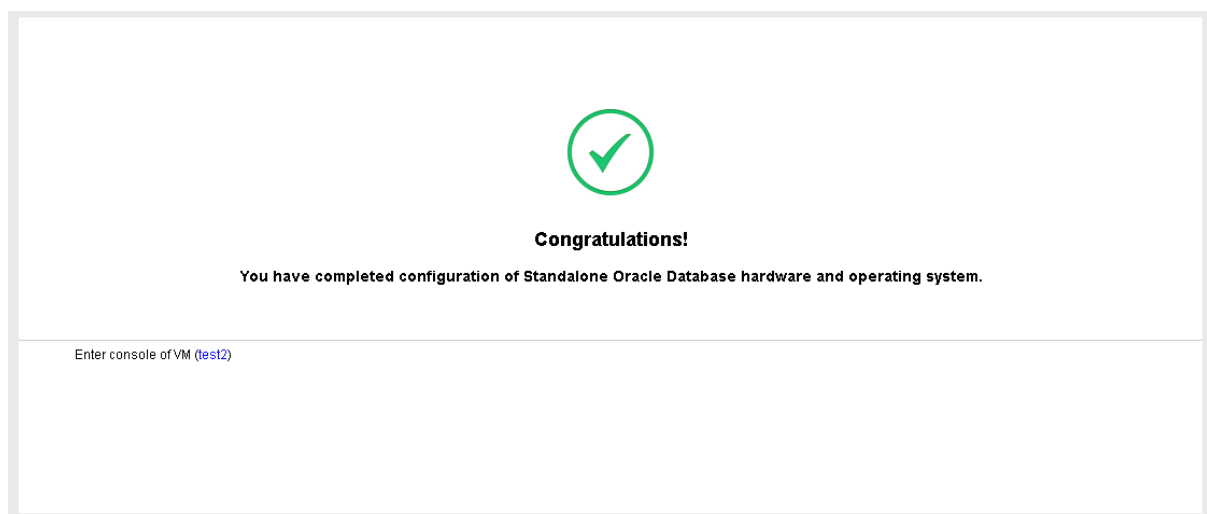
Disk Planning

	Disks	Size of Disk (GB)
Log Disk:	<input type="text" value="3"/>	<input type="text" value="50"/>
Data disk:	<input type="text" value="3"/>	<input type="text" value="100"/>

Log Disk: It is used to store Oracle database logs.

Data Disk: It is used to store Oracle database data.

- After you have configured standalone Oracle database, you may download deployment guide by clicking **Download Deployment Guide** in the following figure.



2.2.1.8.2 Creating Oracle RAC Database (cluster)

To create Oracle RAC database(cluster), follow the steps described below:

- Go to **Compute**, click **New** and then select **Create Oracle RAC Database** on the **Create New Virtual Machine** page.

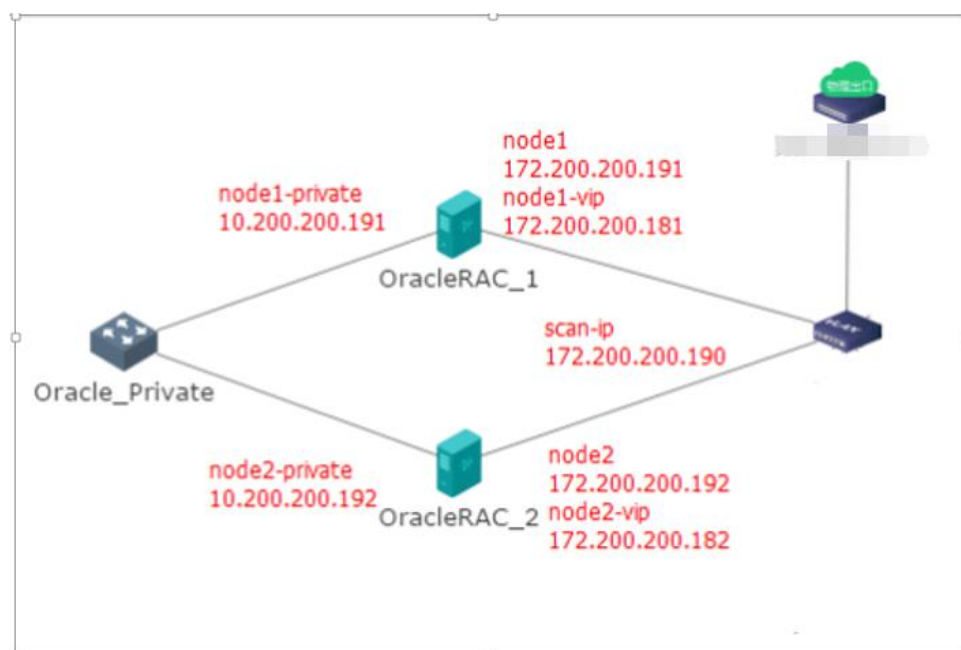
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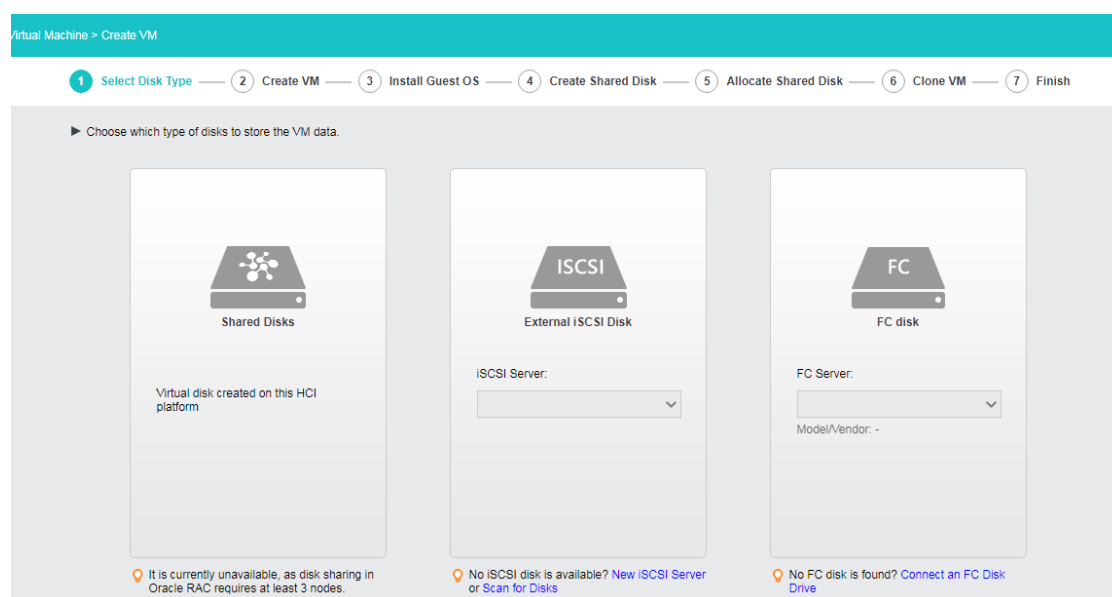
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2. Select disk type.

Each node in Oracle RAC needs to be configured a public IP address, a virtual IP address and a private IP address at least, and 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**, **FC Disk**.



3. Create virtual machine.

See the **2.2.1.2 Creating Virtual Machine** section for how to configure virtual machine. Note that datastore must correspond to the type of disk you have chosen in the previous

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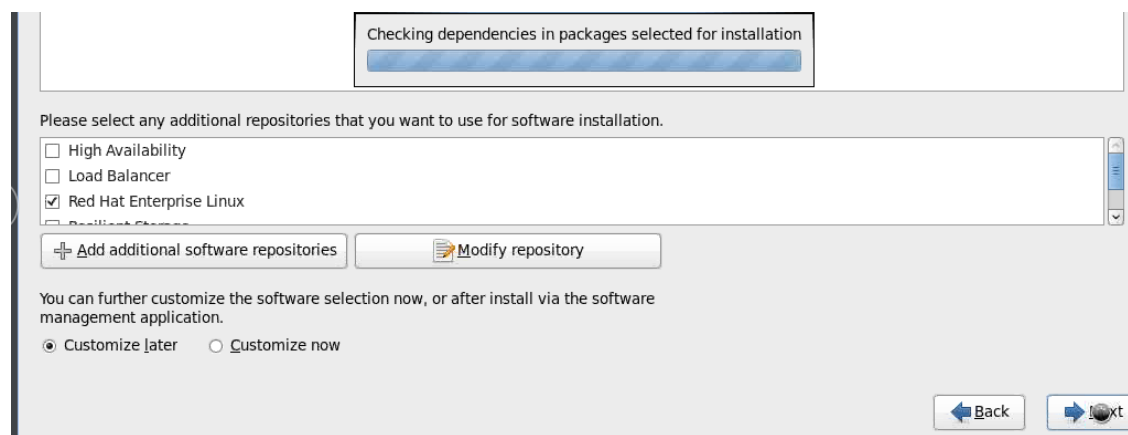
step.

4. 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 **2.2.1.2 Creating Virtual Machine** section.



After guest OS is installed, vmTools must be installed before you go to next step.



5. 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**.

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.

6. Allocate shared disks.

After shared disks are configured, you may allocate them.

7. Clone virtual machine.

Here, you may specify VM name, description and the number of virtual machines to be created.

8. Click **OK** to save the settings.

Creating SQL Server

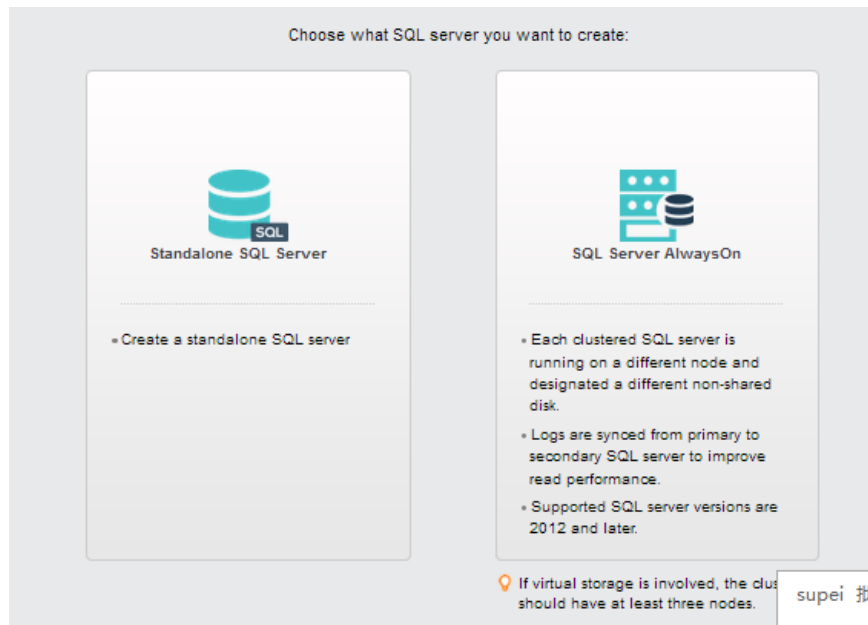
Sangfor Technologies

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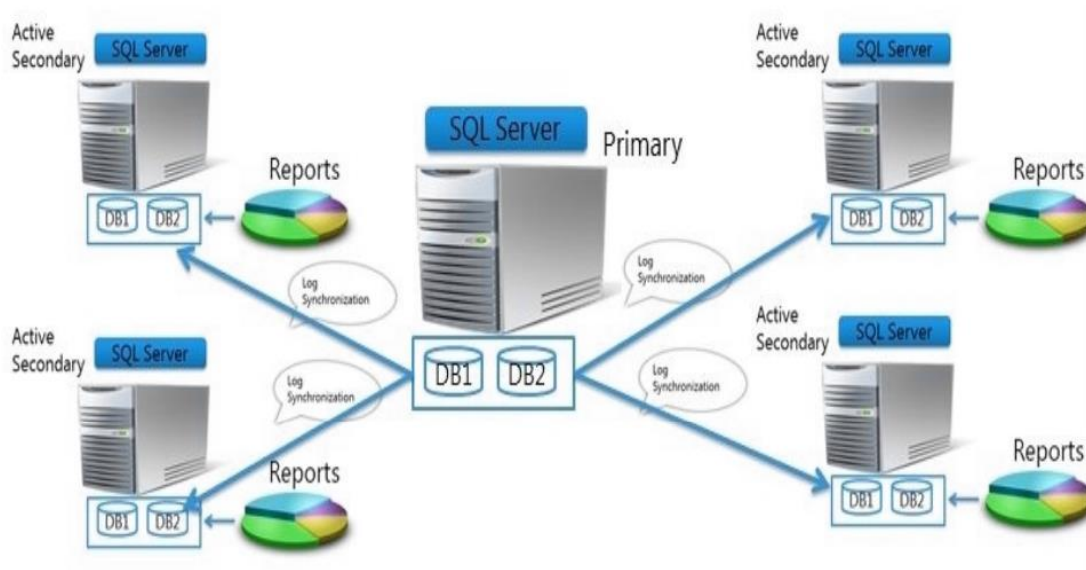
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To create SQL server, do as follows:

1. Select **SQL Server AlwaysOn**, as shown below:



2. Select disk type.



On the two nodes in an AlwaysOn availability group that host two SQL servers, the network adapter name and use should be the same. For example, both the eth0 ports on the two nodes are business interfaces and both the eth1 ports are heartbeat interfaces.

3. Create virtual machine

See **2.2.1.2 Creating Virtual Machine** section for how to configure virtual machine.

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Virtual Machine > Create VM

1 Create VM — 2 Install Guest OS — 3 Clone VM — 4 Allocate Disk — 5 Configure Scheduling Policy

Name: test1

Datastore: ISCSI

Run on Node: <Auto>

Guest OS: Windows Server 2016 64 bit

Processor: 2 X 8 cores

Memory: 2 GB

Edit VM Configurations

4. 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 next step.

Virtual Machine > Create VM

✓ Create VM — 2 Install Guest OS — 3 Clone VM — 4 Allocate Disk — 5 Finish

▶ Start □ Shut Down 🔍 CD/DVD Drive ✎ Edit ⚙ Hot Keys ↻ Refresh

The virtual machine has not installed operating system. Follow the instructions to install guest OS.

Install from ISO Image

Install from USB Device

JAGUAR7000-1.1.1-170522-1802.iso	Install Now
SangforVMSTool.iso	Install Now
drbl-live-xfce-2.2.0-22-i686-pae.iso	Install Now
OracleLinux-R7-U4-Server-x86_64-dvd.iso	Install Now
Windows server 2008 r2.iso	Install Now
ubuntu-16.04.3-server-amd64.iso	Install Now
ubuntu-16.04.3-amd64.iso	Install Now



- After guest OS is installed, firewall must be disabled.
- As for database, SQL Server 2012 Enterprise SP1 is recommended (SQL Server 2012 and Sangfor Technologies

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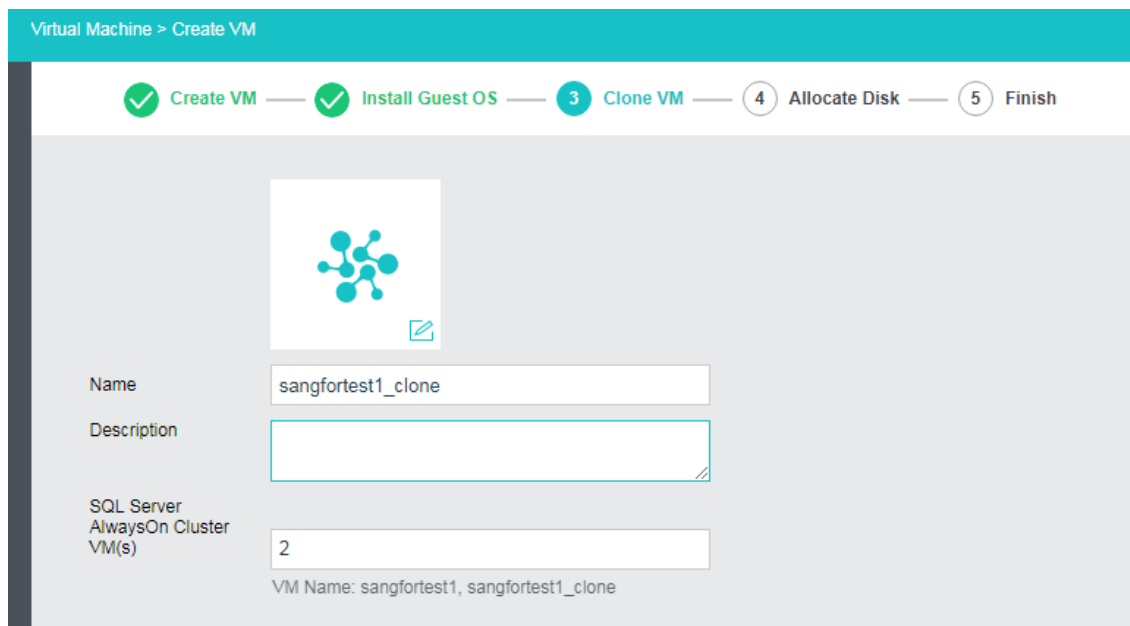
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later versions are also supported). As for operating system, Windows Server 2012 R2 Datacenter is recommended(Windows Server 2008 R2 and later versions are also supported).

5. Clone virtual machine.


After one SQL server AlwaysOn virtual machine is created, you may create other virtual machines by cloning the previous one so as to enhance deployment efficiency and to ensure that the configurations of all SQL server AlwaysOn virtual machines are exactly the same.

As for number of cloned SQL Server AlwaysOn nodes, enter the number directly. For example, to create two SQL server AlwaysOn virtual machines, enter 2.



Virtual Machine > Create VM

✓ Create VM — ✓ Install Guest OS — 3 Clone VM — 4 Allocate Disk — 5 Finish



Name: sangfortest1_clone

Description:

SQL Server AlwaysOn Cluster VM(s): 2

VM Name: sangfortest1, sangfortest1_clone

6. Allocate disks.

Allocate disks by specifying number of log disks, data disks and database root disks and size of each disk respectively.

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✓ Create VM — ✓ Install Guest OS — ✓ Clone VM — 4 Allocate Disk — 5 Finish

Disk Planning

	Disk	Disks	Size of Each Disk(GB)	Eventual Disk Name(s)
Log Disk:	sangfortes_Log Disk	3	100	sangfortes_Log Disk_1~sangfortes_Log Disk_3
Data disk:	sangfortes_Data disk	3	80	sangfortes_Data disk_1~sangfortes_Data disk_3
Database Root Disk:	sangfortes_Database Root Disk	1	100	sangfortes_Database Root Disk_1

Back Next

Log Disk: It is used to store log files of SQL server.


Data Disk: It is used to store data of SQL server.

Quorum Disk: It is used to store logs and data files of system database tempdb.

- Click **OK** to save the settings.

After configuration, you may download deployment guide by clicking **Download Deployment Guide**.

✓ Create VM — ✓ Install Guest OS — ✓ Clone VM — ✓ Allocate Disk — 5 Finish



Congratulations!

You have completed configuration of SQL Server AlwaysOn Cluster hardware and operating system.

- [Download Deployment Guide](#)
- Enter VM console, deploy SQL Server AlwaysOn Cluster according to the instructions in the Deployment Guide

Enter console of VM(sangfortest1_clone)

Enter console of VM(sangfortest1)





Finish

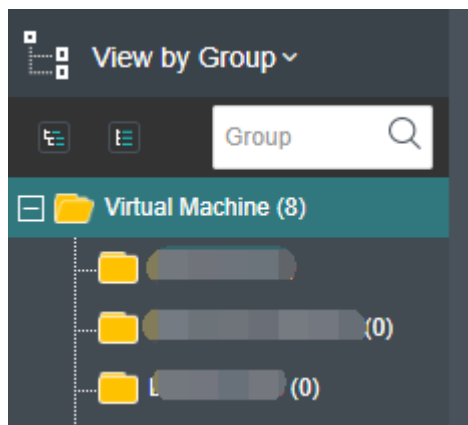
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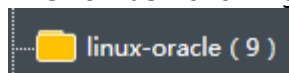
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2.2.1.9 Viewing VM Groups







In **Compute**, all VM groups can be expanded or collapsed by clicking on the   button. To expand or collapse a specific group, click on the  &  button next to that group.



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



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

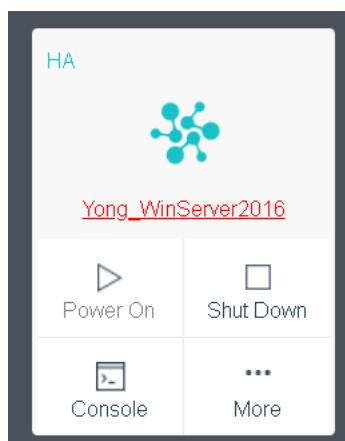
<div>HA</div> <div></div> <div>Elion_test20170216</div> <div><div>CPU Usage0%</div><div>Memory Usage15%</div><div>Disk Usage15%</div></div>	<div>HA</div> <div></div> <div>Peter_test_0</div> <div><div>CPU Usage1%</div><div>Memory Usage15%</div><div>Disk Usage11%</div></div>	<div>HA</div> <div></div> <div>test_20170215</div> <div><div>CPU Usage3%</div><div>Memory Usage40%</div><div>Disk Usage7%</div></div>
<div>HA</div> <div></div> <div>centos</div> <div>Powered Off</div>	<div>HA</div> <div></div> <div>Cheneyredhat</div> <div>Powering On...</div>	<div>HA</div> <div></div> <div>QA</div> <div>OS Is Not Installed</div>

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

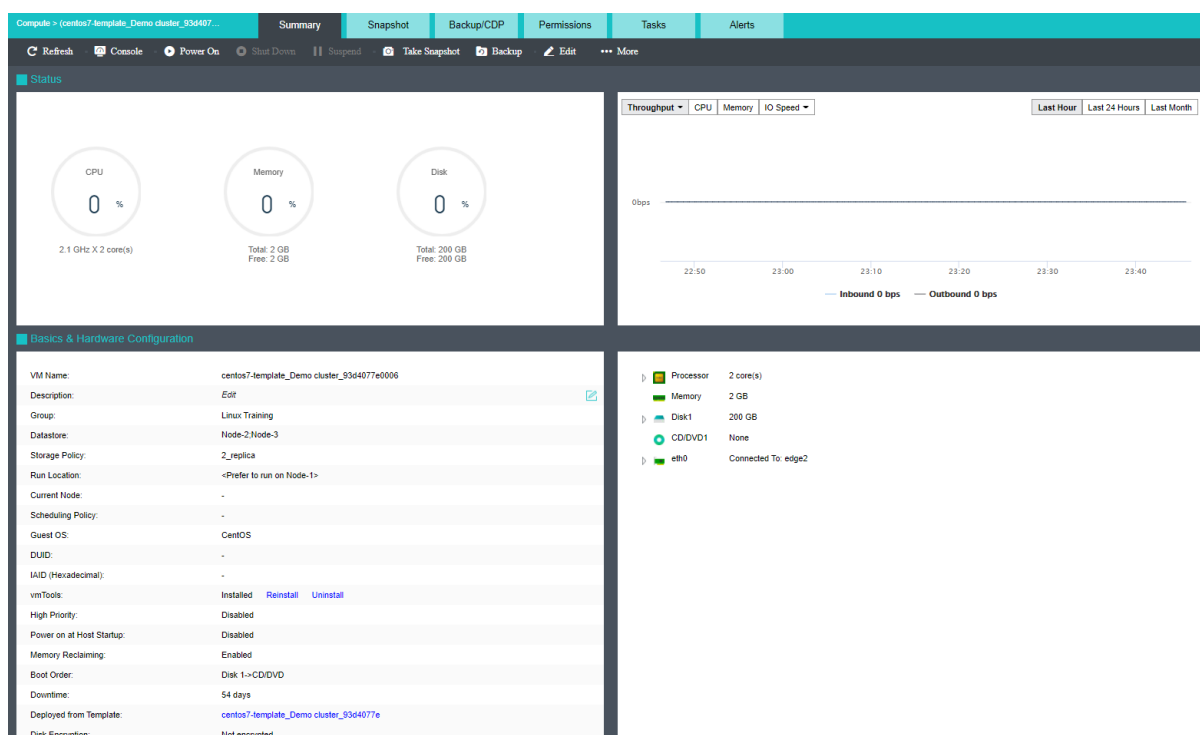
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For virtual machine details, you may click on VM name to redirect to the **Summary** page, as shown below:

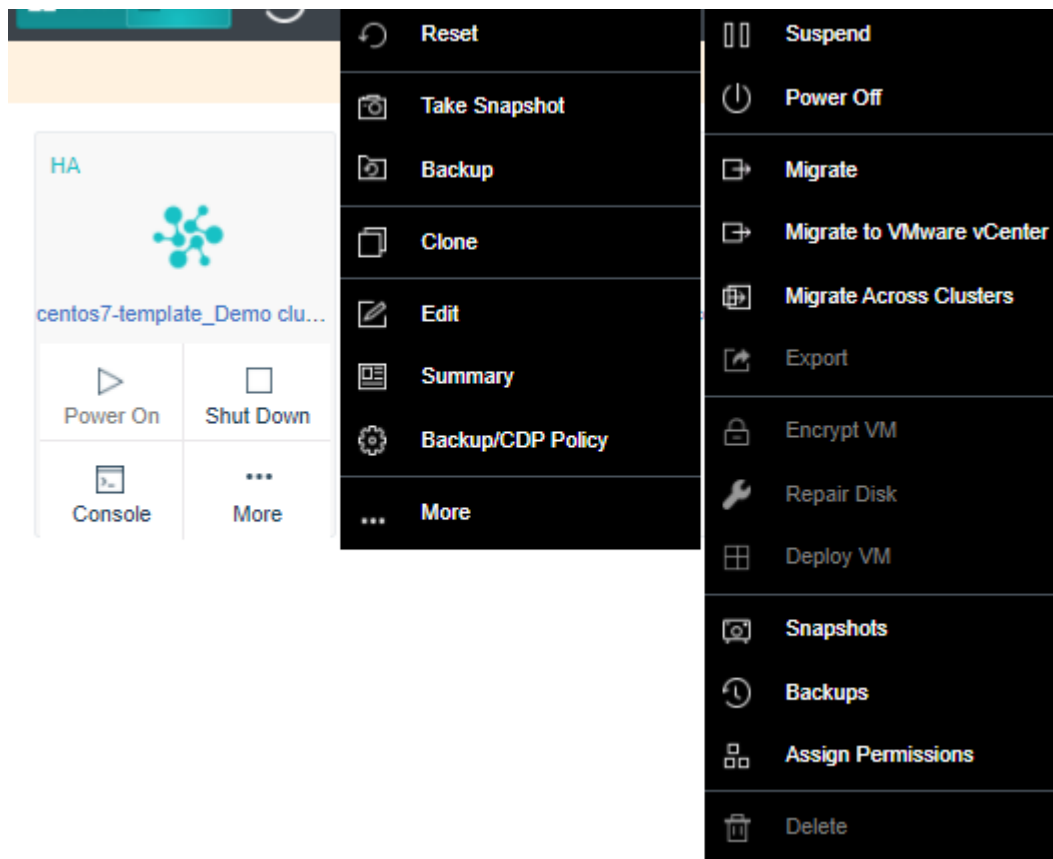


To perform more operations against virtual machine, click **More**, as shown below:

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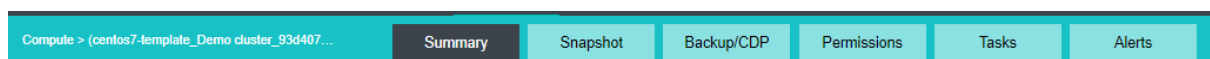
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If VMware vCenter is not added to Sangfor HCI platform, the option Migrate to VMware vCenter will not be displayed.

2.2.1.10 Viewing VM Details

There are the following tabs: **Summary**, **Snapshot**, **Backup/CDP**, **Permissions**, **Tasks** and **Alerts**, as shown below.

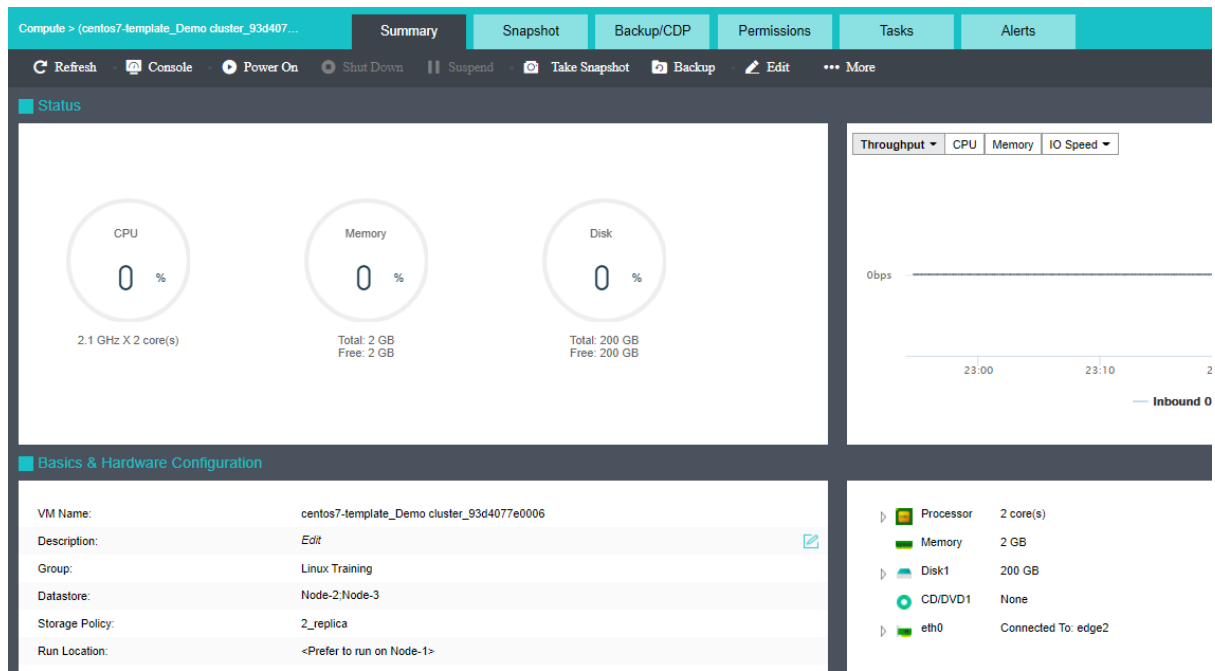


On the **Summary** tab, you may perform such operations as **Power On**, **Shut Down**, etc., and view basic information and hardware configurations of virtual machine.

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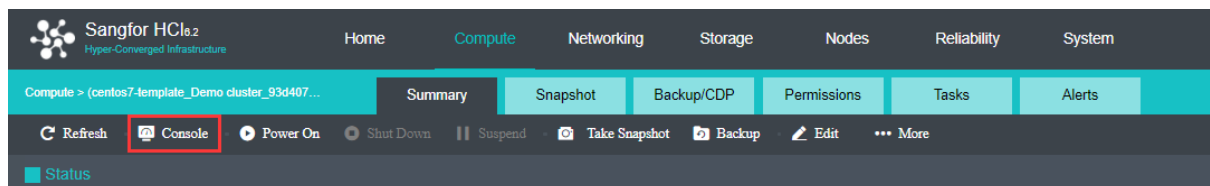
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To refresh the **Summary** page, click on **Refresh** on the upper left corner.

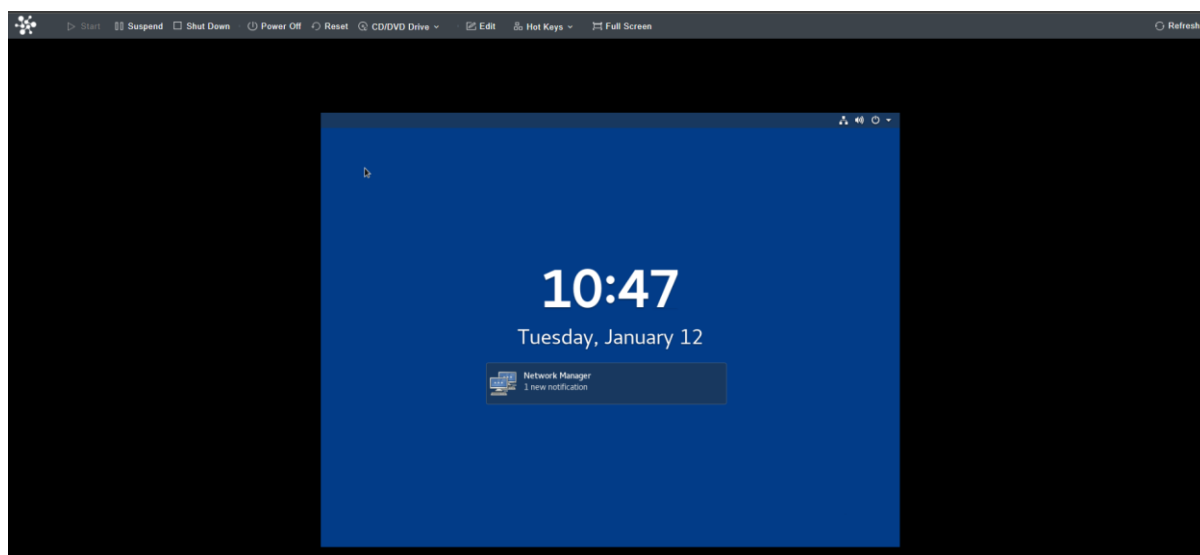
To open virtual machine's console, click **Console** on the **Summary** page, or click on the **Console** button on the virtual machine panel to enter the following page.



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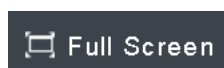
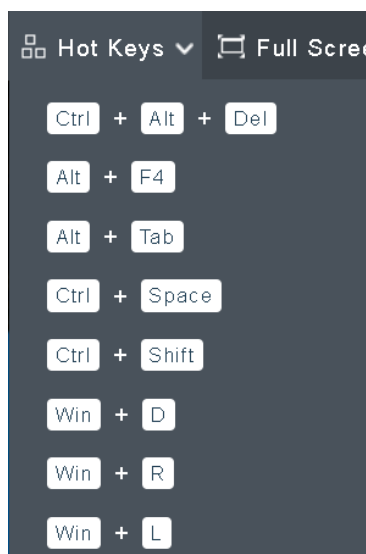
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On the above page, you can perform the **following** operations: **Start, Suspend, Shut Down, Power Off, Reset, CD/DVD Drive, Edit, Hot Keys, Full Screen, Refresh.**



Hot keys lists combinations of commonly-used keys.



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

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

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To power on virtual machine, you may click **Power On**.

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

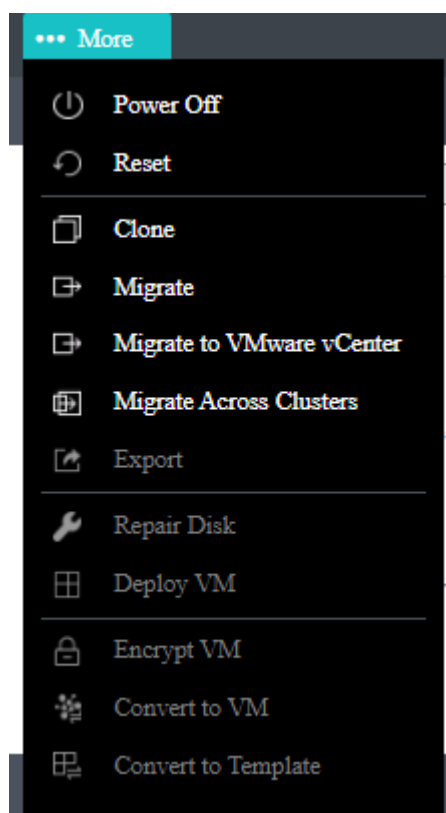
To suspend virtual machine, you may click **Suspend**.

To take snapshot of virtual machine, you may click **Take Snapshot**.

To back up virtual machine, you may click **Backup**.

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

On the **Summary** page, you may perform the following operations by clicking **More: Power Off, Reset, Clone, Migrate, Migrate to VMware vCenter, Migrate Across Clusters, Export, Repair Disk, Deploy VM, Convert to VM, Convert to template**, as shown below:



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If VMware vCenter is not added to Sangfor HCI platform, the option Migrate to VMware vCenter will not be displayed.

2.2.1.11 Migrating VM

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

Current Location: Displays the current datastore and node of the virtual machine.

Datastore: Indicates the datastore where virtual machines is stored.

Storage Policy: Indicates the number of replication.

Current Node: Indicates the node where virtual machine resides.

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Destination Location: Displays the destination datastore and node.

Destination Node: Indicates the node where virtual machine resides.

Datastore: Indicates the destination datastore. For virtual machines that have been mounted any physical disk, migration to another datastore is not allowed before the physical disk is removed.

Which destination datastore can be chosen 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.

2.2.1.11.1 Migrating Physical Machine


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.

Migrate Physical Machine with SANGFOR Converter

Introduction

SANGFOR Converter lets you quickly and easily migrate a physical Windows machine along with its operating system and business to a virtual machine controlled by Hyper-Converged Infrastructure.

Download SANGFOR Converter onto your local disk, launch the executable file and click on Virtualize this physical machine.



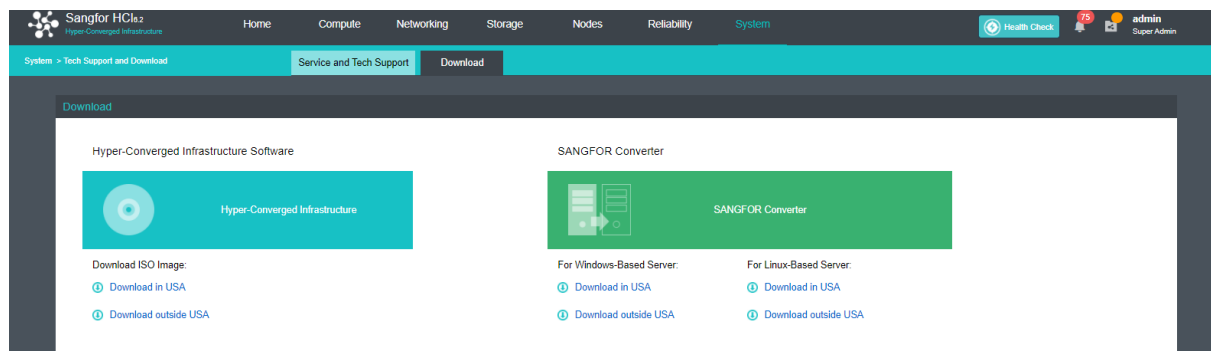
Download SANGFOR Converter 6.2.0_EN Build 20201116

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To download Sangfor converter, click **Download Sangfor Converter** and you will be redirected to the following page:



Requirements for physical servers:

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)

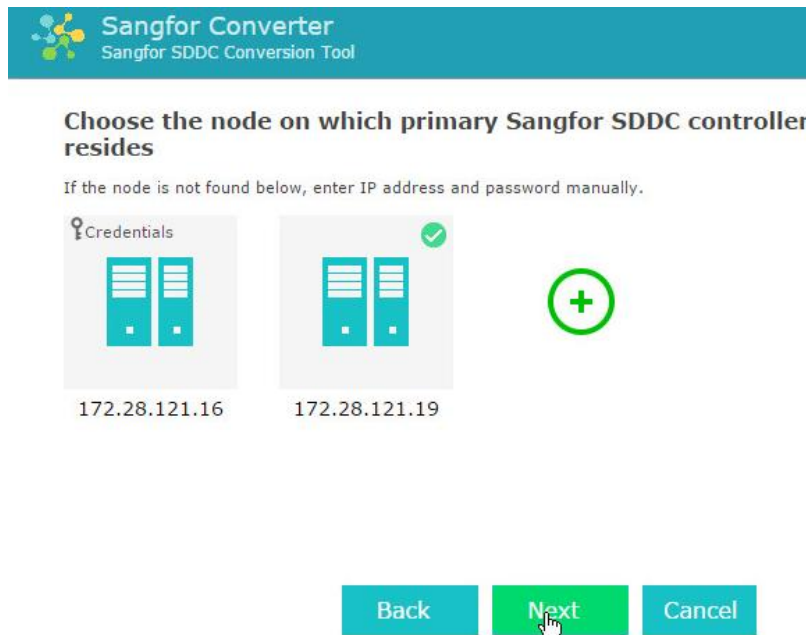
2.2.1.11.1.1 Converting Windows-based Server to VM

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

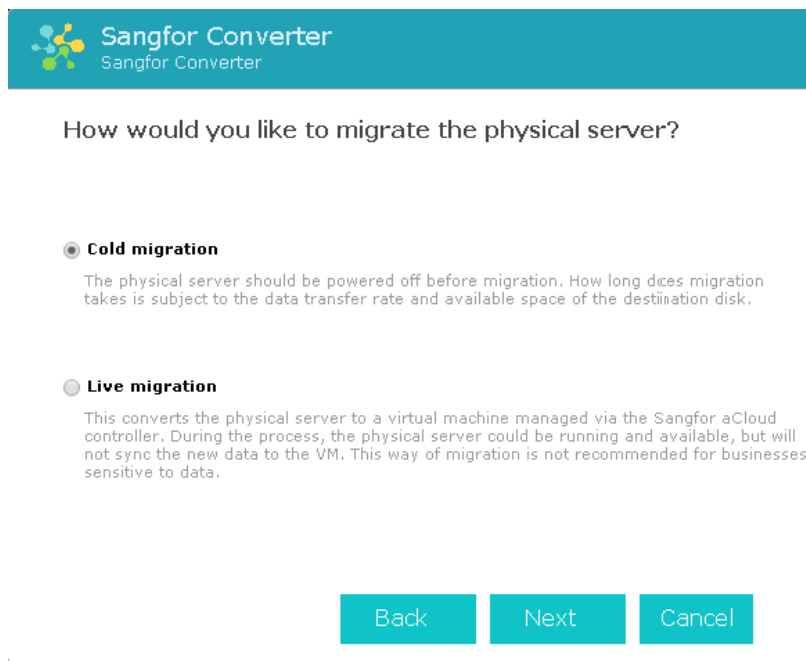
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On the following page, select **Cold migration** or **Live migration**,



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 『+』 and entering username and password.

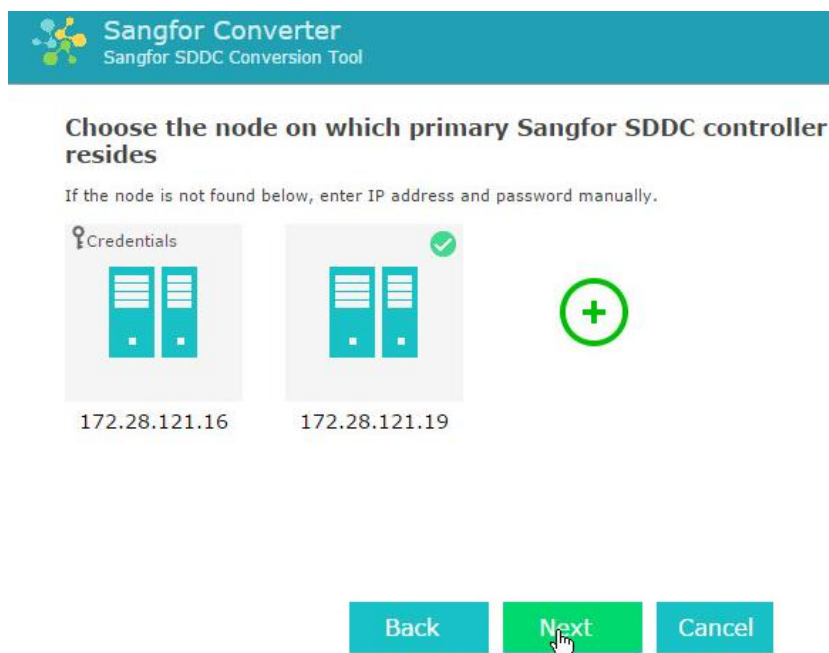
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The target node must be reachable from the physical server to be migrated. If there is a firewall appliance between them, access to that target node from that physical server must be allowed. Only the cluster controllers residing on a same subnet as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



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

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Sangfor Converter
Sangfor SDDC Conversion Tool

Virtual Machine

Name:

Datastore:

Run on Node:

Group:

Configuration

Low

Typical

High

☒ Custom

Advanced

Processor: [1 core\(s\)](#)

Memory: [4GB](#)

Disk: IDE0 40 GB

NIC: [NET0 bridged to ????](#)

Back
Next
Cancel



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.

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

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**Sangfor Converter**
Sangfor SDDC Conversion Tool

Confirm

Name:	Migrated_win7
Storage:	Datastore_2_copy
Working Location:	Node 1
Group:	Default Group
Processor:	8 core(s)
Memory:	8GB
Disk:	IDE0 200 GB
Disk:	IDE1 200 GB
NIC:	NET0 FastIO bridged to Demo
Enable High Availability:	Disabled
Default disk:	Disk: IDE0
Power on at host startup:	Disabled
High priority:	Disabled
Disk Write Caching:	Disabled

Back

Migrate

Cancel

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.

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Installation completed

Migration may start after reboot, and progress is available on the Sangfor SDDC web admin console.

Upon Migration Completion:

- ☒ Power off physical machine, power on virtual machine, the latter picks up the work
- ☐ Keep physical machine powered on, all later changes not synced to virtual machine
- ☐ Both physical machine and migrated VM are powered off

Note: Please unplug U disk and remove CD before reboot, not let the system boot from U disk or CD.

Restart and Migrate

Restart Later



-
- 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 lose of network connection during migration is allowed, but not supported if the corresponding program on client and server side is closed.
 - If migration fails due to uncertain factors(e.g., power outage, etc.), physical server being migrated can go back to its operating system by restarting it.
-

2.2.1.11.1.2 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 the system from that USB drive, and select **Migrate physical server to VM with P2V**.

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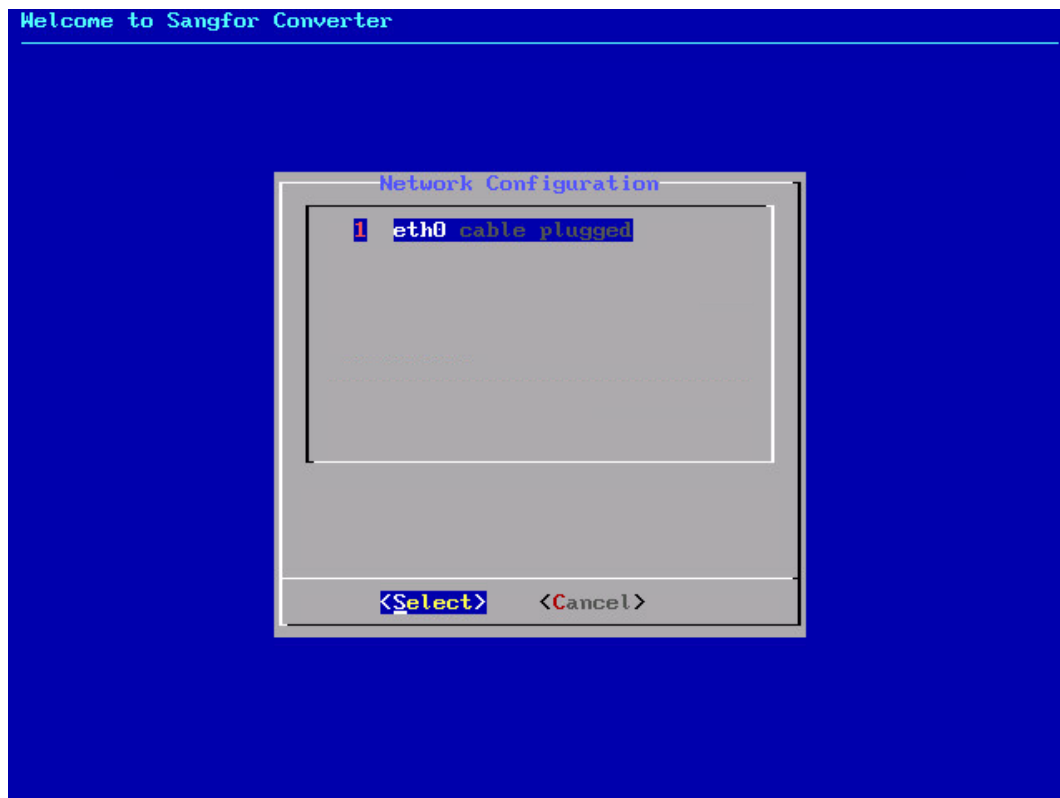


Network configuration is required before performing migration. Select a physical network adapter for the current node, for the purpose of communication with the destination node.

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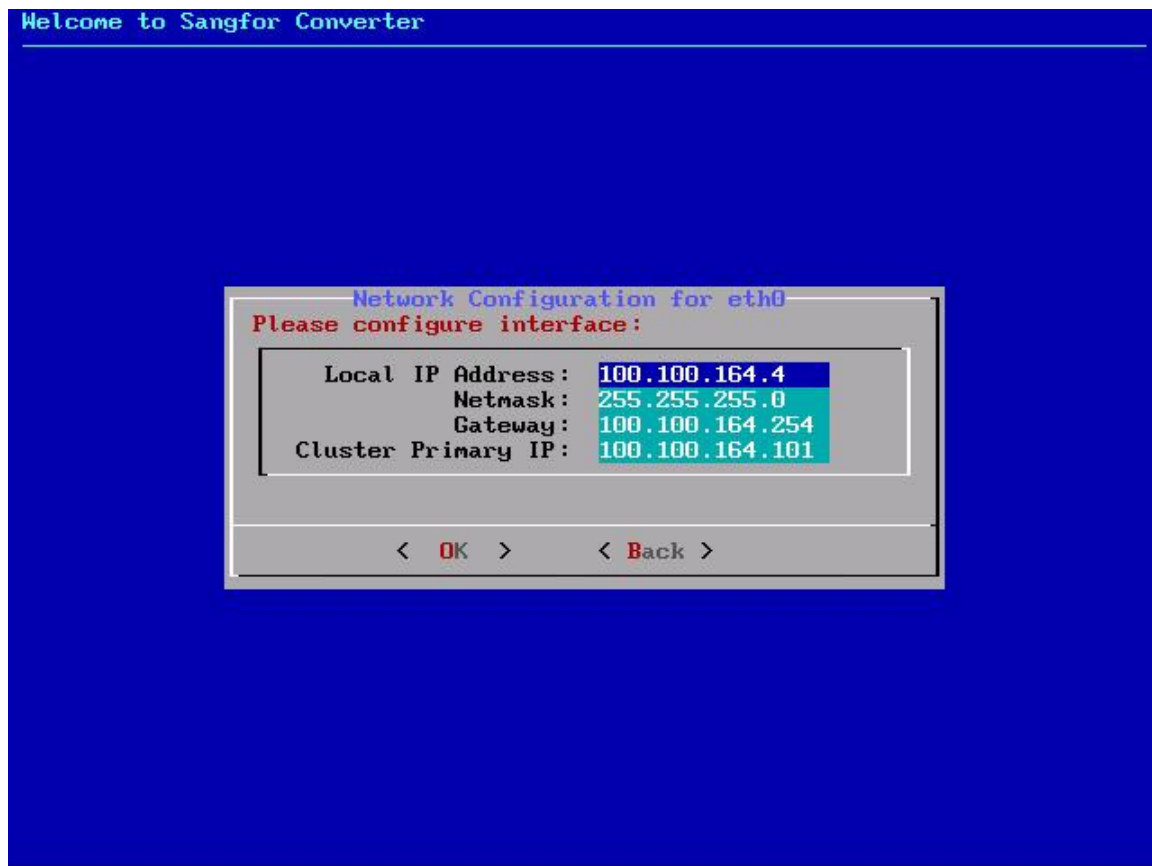


Configure an available local IP address, netmask and gateway for the physical network adapter, and enter IP address of the destination node. Make sure the server to be migrated can access that destination node.

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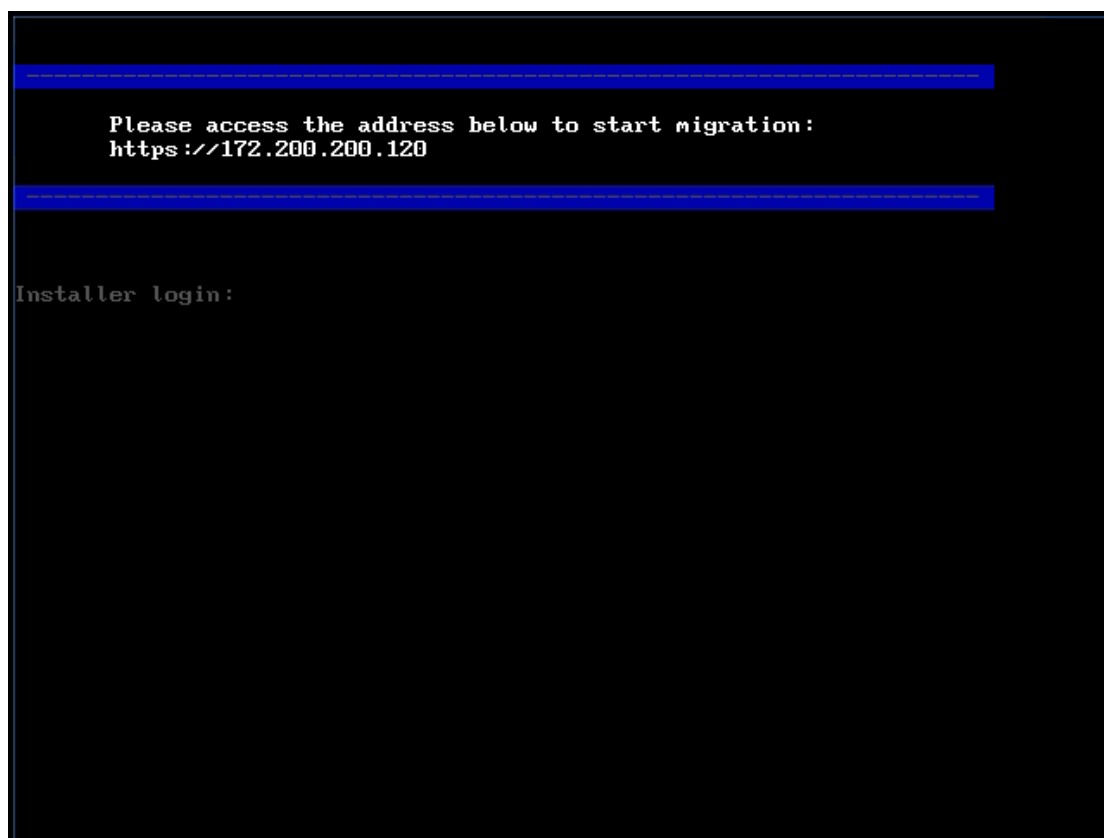
After specifying the above fields, the migration program will verify whether the current node and the destination node can communicate with each other. If not, it will be redirected to the network configuration page for you to make some changes, if so, click **OK** to proceed.

The following page will display if network communication succeeds, indicating that the node gets ready for migration. (The Installer login is for the purpose of debugging in case of migration failure)

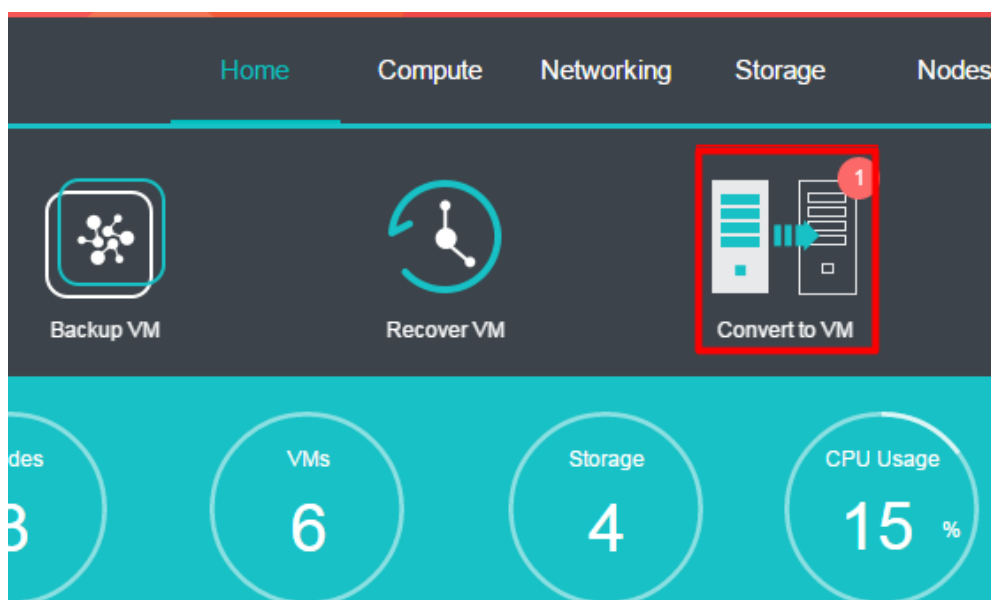
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To view migration tasks, log in to Web admin console of Sangfor HCI platform and click **Convert to VM** in **Home**.



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

Migrate Physical Machine with Sangfor Converter


Refresh

The following nodes are being migrated

Download Sangfor Converter([windows](#) , [linux](#))

Status	IP Address	Migrated VM Name	Operation
<div><div></div>Progress 0%, Estimating how long it will ... Details</div>	100.100.164.243	tao	Cancel

Make relevant configurations, including VM name, datastore, run on node, hardware configurations, etc, as shown below:



Name:

Group:

Default Group

Tag:

Select

HA:

☒ Migrate VM to another node if the node fails [HA Settings](#)

Datastore:

ISCSI

Run on Node:

<Auto>

Guest OS:

Select which type of OS to install...

High Priority:

☐ Guarantee resources for VM operation and recovery ⓘ

Configuration

Advanced

Standard:

Low

Typical

High

Processor

8 core(s)

Memory

16 GB

Disk 1

120 GB

CD/DVD 1

None

eth0

Connected To: Edge1

Cores: 8 core(s)

Virtual Sockets: 1

Cores Per Socket: 8

☒ Enable NUMA Scheduler ⓘ

OK

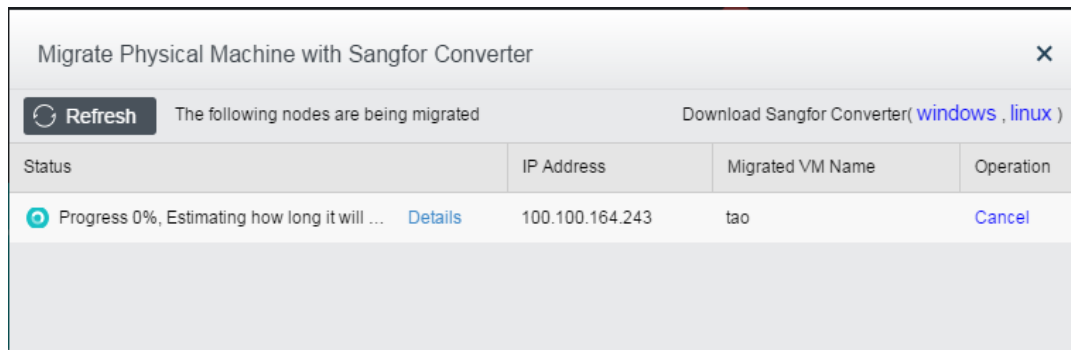
Cancel

After making the above configurations, start migration.

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- 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 ensure that 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.

2.2.1.11.2 Migrating VM to VMware vCenter

Powered-on virtual machines on Sangfor HCI platform can be migrated to VMware vCenter

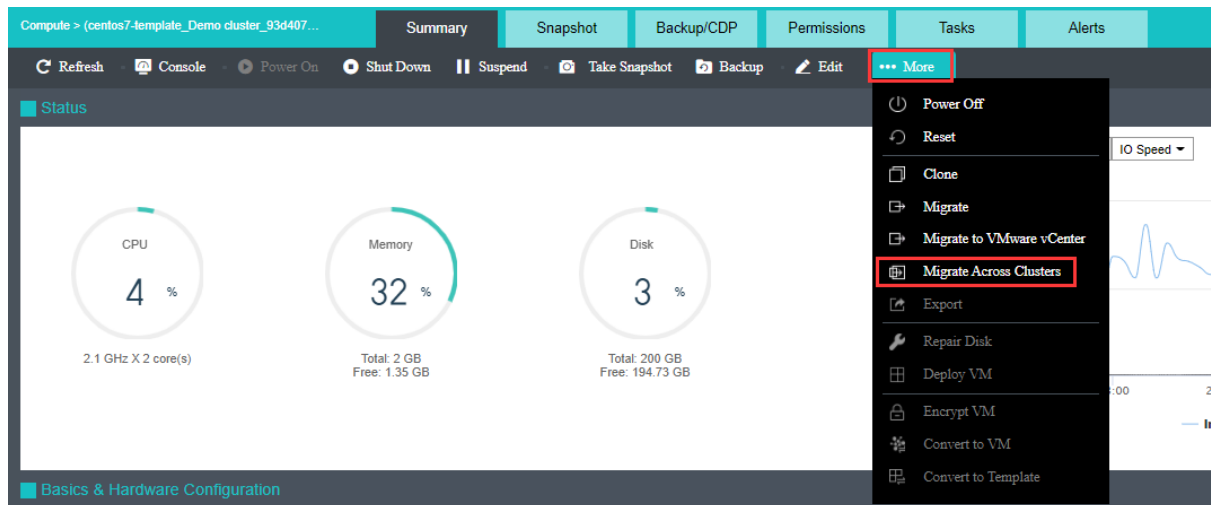
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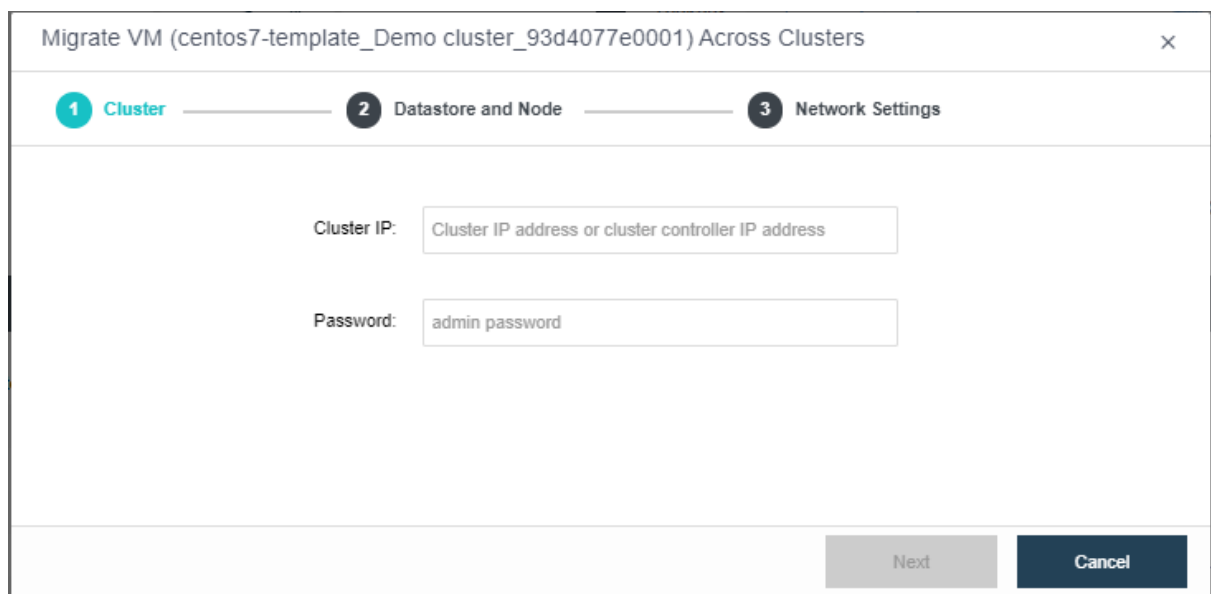
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This feature enables virtual machine to be migrated to a different cluster.

Live Migration



And then



Cluster IP: Specifies IP address of destination cluster.

Password: Specifies admin password.

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Migrate VM (centos7-template_Demo cluster_93d4077e0001) Across Clusters

1 Cluster
2 Datastore and Node
3 Network Settings

Current Cluster

Datastore: VirtualDatastore1
Storage Policy: 2_replica
Node: Node-3

Destination Cluster

Datastore: VirtualDatastore1
Storage Policy: 2_replica
Node:

☐ Power on virtual machine when migration is complete

☐ Max migration rate MB/s

The virtual machine will be powered off automatically

Prev
Next
Cancel

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.

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

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1 Cluster

2 Datastore and Node

3 Network Settings

eth0	Disconnected
eth1	Disconnected

☒ Enable

Connected To: ...
 Connected To: test

Advanced

Adapter Model:

MAC Address:

Prev

OK

Cancel

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. Options are **Realtek RTL8139** and **Intel E1000**.

MAC Address: MAC address can be automatically generated or manually specified. MAC address examples: 00-11-22-33-44-55, 00:11:22:33:44:55. MAC address will be changed after the migration operation completes and you may edit the MAC address if you do not want the MAC address to be changed.



The virtual machine will be powered off automatically and added into the default VM group.

Cold Migration

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Migrate VM (centos7-template_Demo cluster_93d4077e0006) Across Clusters

1 Cluster
2 Datastore and Node
3 Network Settings

Current Cluster

Datastore: VirtualDatastore1
Storage Policy: 2_replica
Node: Node-1

Destination Cluster

Datastore: VirtualDatastore1
Storage Policy: 2_replica
Node:

☐ Power on virtual machine when migration is complete
☐ Max migration rate MB/s

The virtual machine will be powered off automatically

Prev
Next
Cancel



Other configurations are the same with that of live migration. You may refer to the **Live Migration** section.

2.2.1.12 Deploying VM

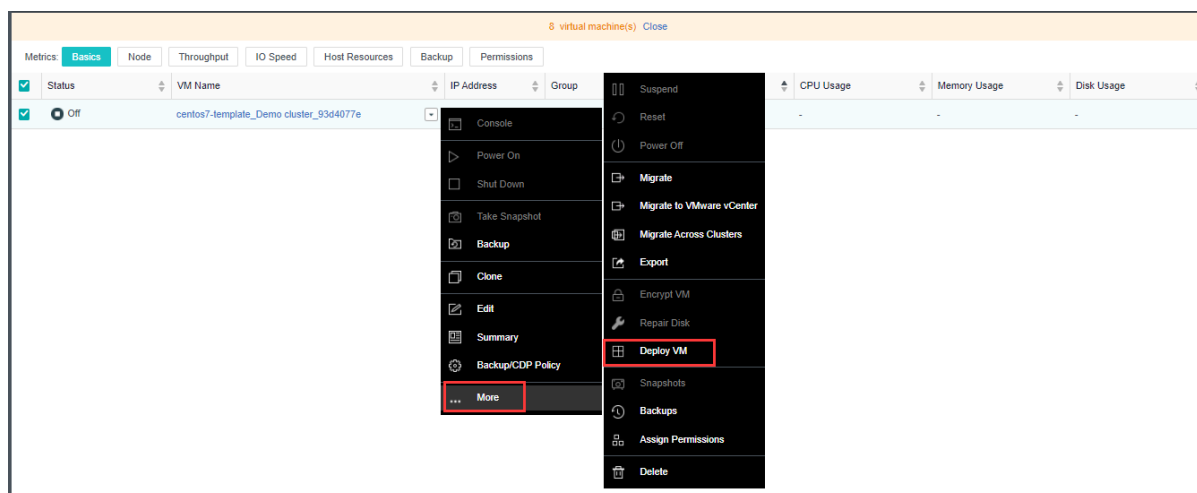
Generally speaking, a VM template is a virtual machine which has been configured, and can be used to deploy multiple virtual machines with the same configurations. The difference from cloning VM is that disk files will not be replicated when a virtual machine is deployed from a template. What's more, changes made to template will be saved to de virtual machine 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 may deploy new virtual machines when converting a virtual machine to template. Deployed virtual machines have the same configurations as that of its template.

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Deploy VM From Template (centos7-template_Demo cluster_93d4077e)

Based on this virtual machine, deploy new virtual machines from template. [Read More](#)

	Name:	<input type="text" value="centos7-template_Demo cluster_93d4077e"/>
	VMs:	<input type="text"/>
	Group:	<input type="text" value="template"/>
	HA:	<input checked="" type="checkbox"/> Migrate to another node if the node fails HA Settings
	Datastore:	<input type="text" value="VirtualDatastore1"/>
	Storage Policy:	<input type="text" value="2_replica"/>
	Run Location:	<input type="text" value="Node-1"/>

Private Disk

Configuration

Advanced

☐ Create private disk (to store data changes on the virtual machine since VM template deployment)

Size: GB

OK

Cancel

Name: Specifies name of the deployed virtual machine(s).

Name of the deployed VM depends on the **Name** and the number of virtual machines. For instance, name of VM is **name** and number of virtual machines is 2, then names of the two new virtual machines are **name_0001** and **name_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 the working node fails.

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

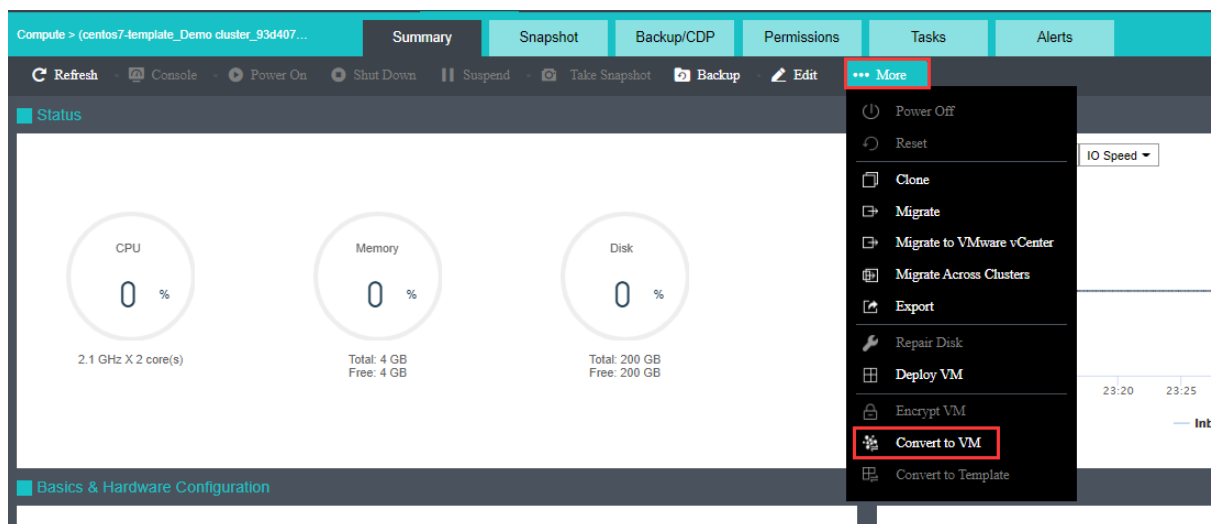
Working Location: Specifies a node where the deployed virtual machines resides.

Create Private Disk: You may 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.

2.2.1.13 Converting VM Template to VM

You may convert a VM template to an ordinary virtual machine. Before converting template to VM, template must be powered off first. To convert template to VM, make sure that template is powered off. If it is powered on, click **Power Off** or **Shut Down** and select **More > Convert to VM** on the **Summary** page, as shown below:



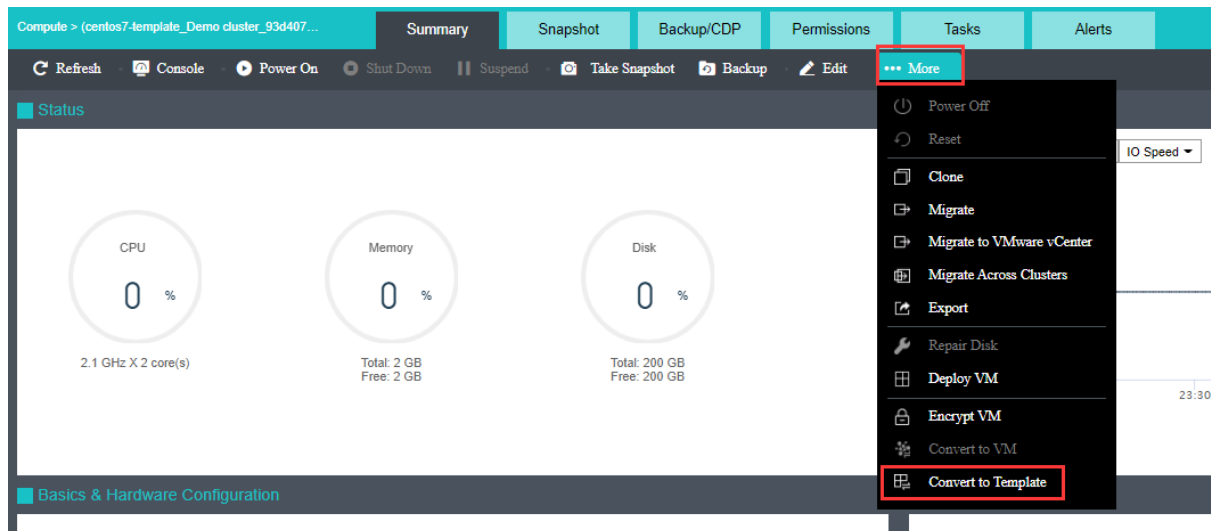
2.2.1.14 Converting VM to Template

A virtual machine can be converted into template so that it can be used as a template to create multiple virtual machines. Before converting virtual machine to template, make sure that VM is powered off; if it is powered on, click **Power Off** or **Shut Down** and then select **More > Convert to template** on the **Summary** page, as shown below:

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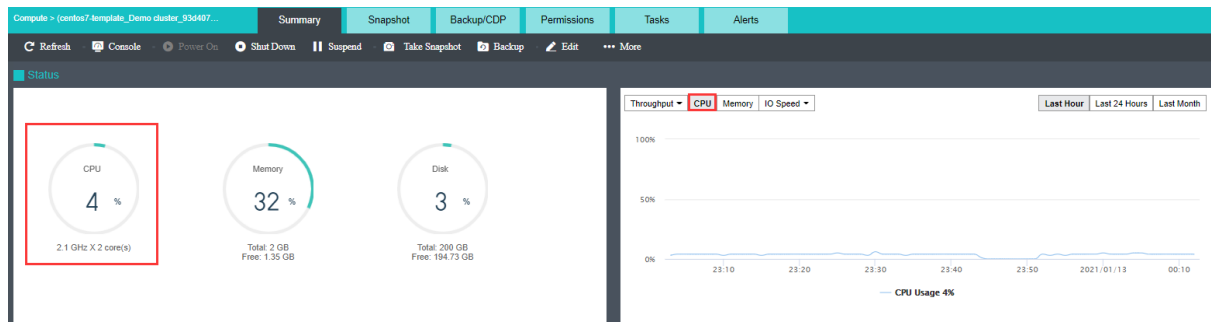
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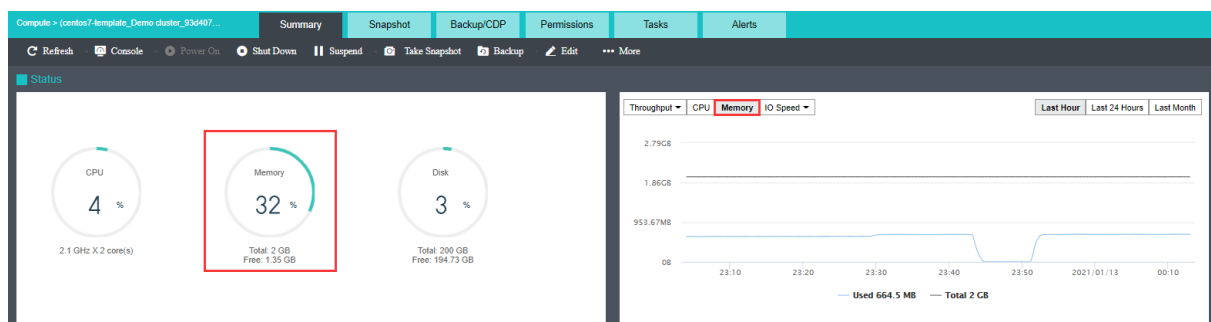


Status: Displays the following information about virtual machine: **CPU Usage, Memory Usage, Disk Usage, Throughput, CPU, Memory, IO Speed, IOPS.**

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



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

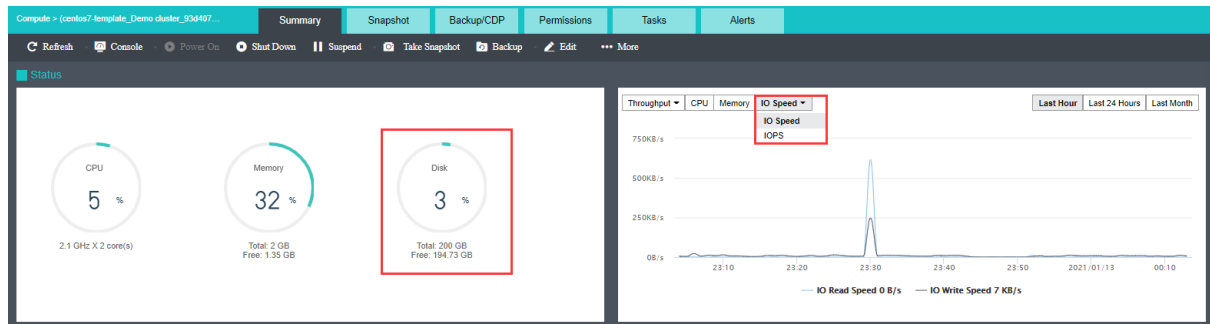


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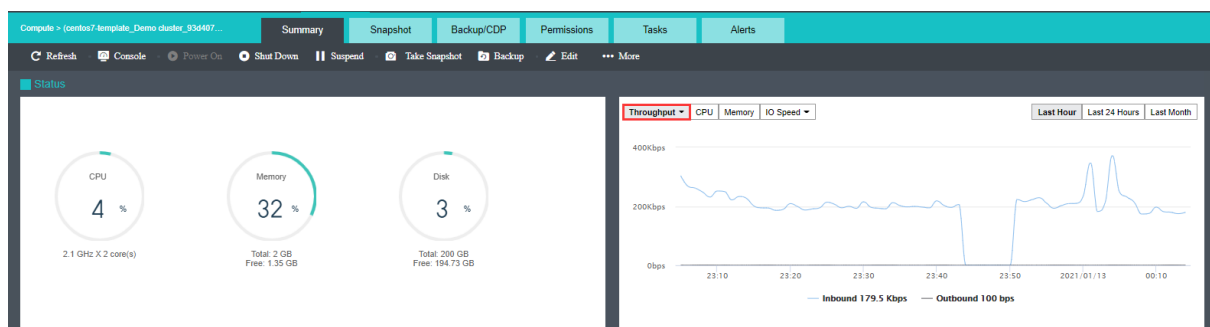
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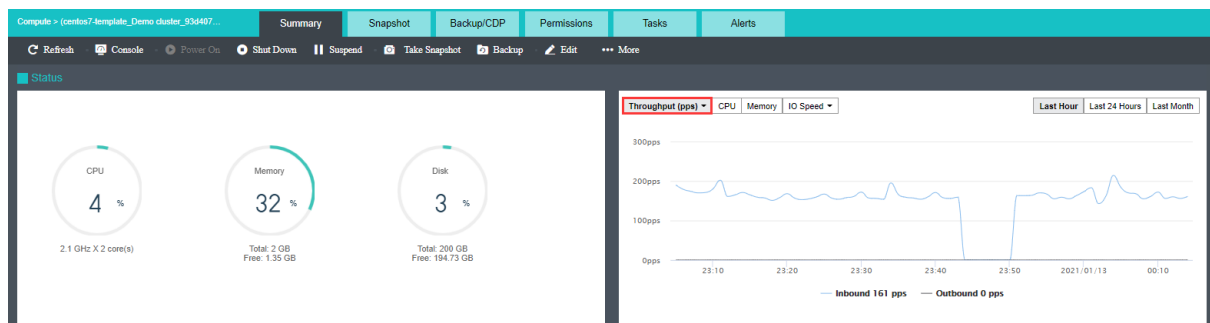
Disk Usage: Displays the total and free disk size respectively, as well as disk usage. On the right side, you may view disk IO speed and IOPS.



Throughput: Displays overall throughput.



Throughput(pps): Displays inbound and outbound packets per second.

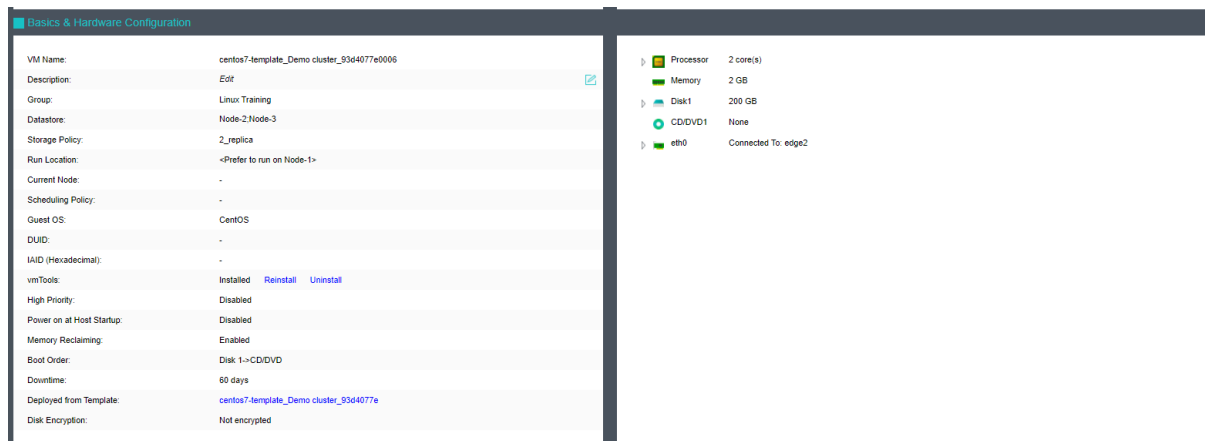


The **Basics & Hardware Configuration** section displays basic information and hardware configuration of virtual machine. Basic information includes **VM Name, Description, Group, Datastore, Storage Policy, Run Location, Current Node, Scheduling policy, Guest OS, DUID, IAID(Hexadecimal), vmTools, High Priority, Power on at host startup, memory reclaiming, Boot Order, Downtime, Deployed from Template and Disk Encryption.**

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2.2.1.15 Taking Snapshot

There are 2 types of snapshot starting from version 6.0.1.

a. Storage based snapshot

Description: Storage based snapshot with ROW mechanism. This is the default snapshot method for cluster starting from version 6.0.1 for 3 nodes and above environment.

The maximum number of storage based snapshot can be take is 128.

Up to 128 snapshot can be taken for storage based snapshot.

Features:

1. Reduce the impact to the performance after taking a snapshot.
2. Space occupied by the snapshot can be release after deleted the snapshot.

Requirement: To support storage based snapshot, the following requirement must be fulfill.

1. Version 6.0.1 and above.
2. 3 nodes and above cluster.
3. VM is running in virtual storage.

b. Virtual disk based snapshot

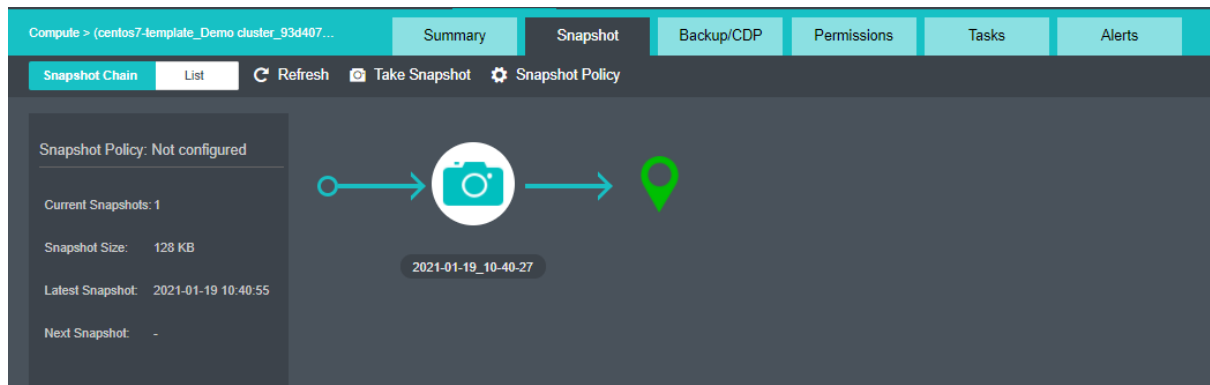
Description: Qemu based snapshot with COW mechanism. This snapshot will be use for 2 nodes cluster or VM that running on external storage.

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

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Take Snapshot

VM:

centos7-template_Demo cluster_93d4077e0006

Name:

Description:

OK

Cancel

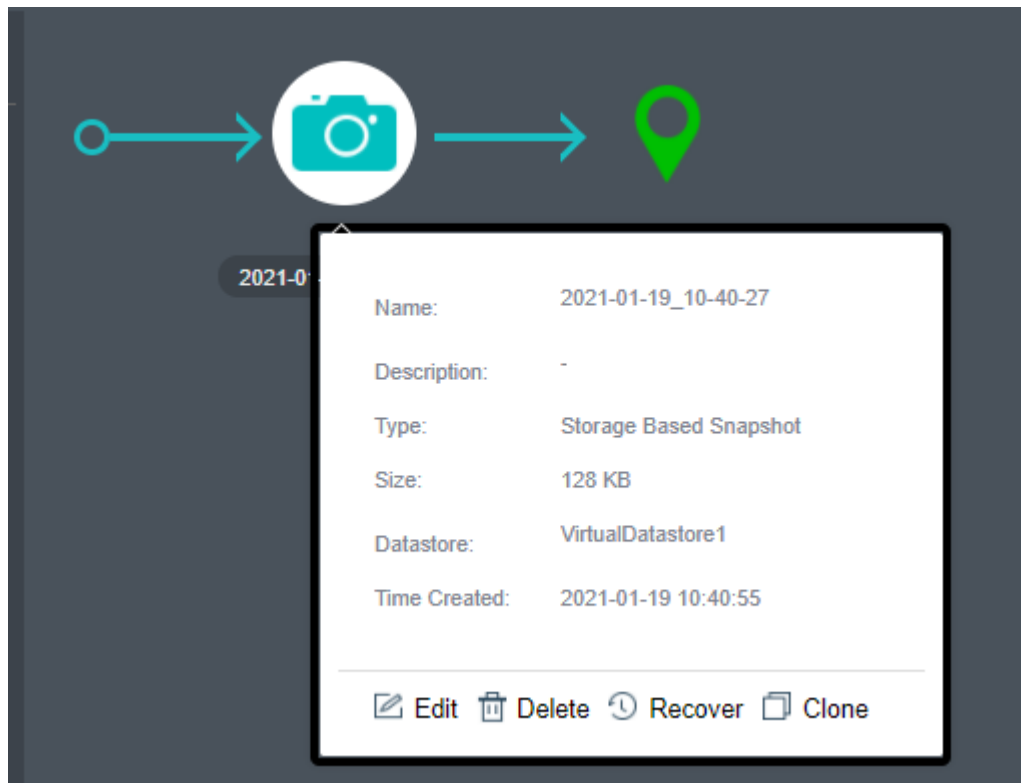
On the above page, specify **Name** and **Description**. Then, click **OK**.

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

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

To delete the snapshot, you may click **Delete**. Snapshots cannot be recovered once deleted. It requires admin password to confirm the operation.

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

To recover virtual machine from snapshot, you may click **Recover**. The virtual machine is running, but will be powered off before being recovered. Please power it on manually after recovery.

Take a snapshot prior to recovery: Once it is enabled, though the changes made since the previous snapshot will get lost, this snapshot is inevitable in case of recovery failure.

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Are you sure you want to recover it to the state at the time point (2021-01-19_10-40-27)?

- The virtual machine will be restored to the time point of the selected snapshot. Please make sure you have created snapshots or backups for data of the virtual machine, **otherwise unprotected data will get lost.**

☐ Power on virtual machine when recovery is complete

☒ Auto-take a snapshot before recovery

Enter password of **admin** to confirm this operation

Password

OK

Close

To make snapshot before recovery, you may tick the option **Auto-take a snapshot before recovery**.

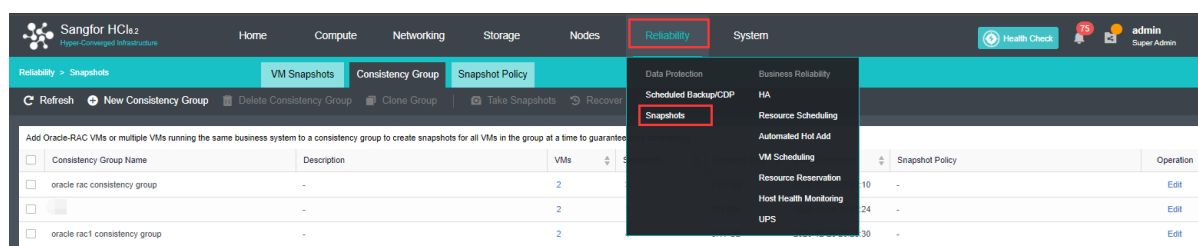
Consistency group snapshot

Consistency group snapshot is the feature which allow user to add multiple VM into a consistency group and take snapshot at the same time.

A single consistency group has restricted the number of vm disk which the maximum number of disk is 64.

Consistency group snapshot will only process for the virtual disk that running on virtual storage.

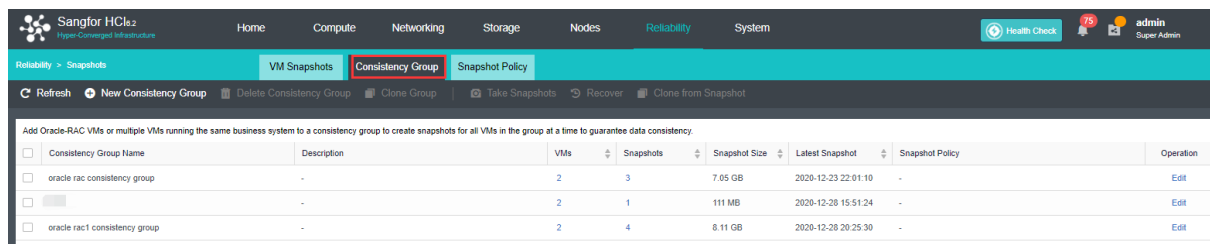
Navigate to consistency group snapshot setting under **Reliability > Snapshots > Consistency Group**.



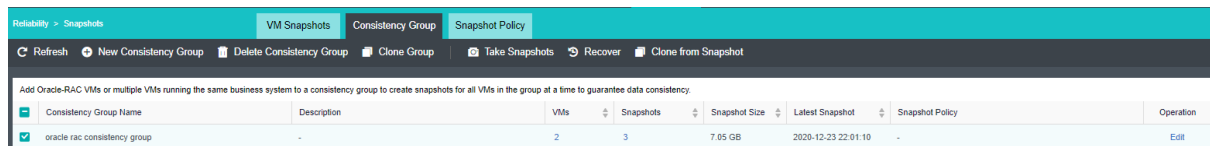
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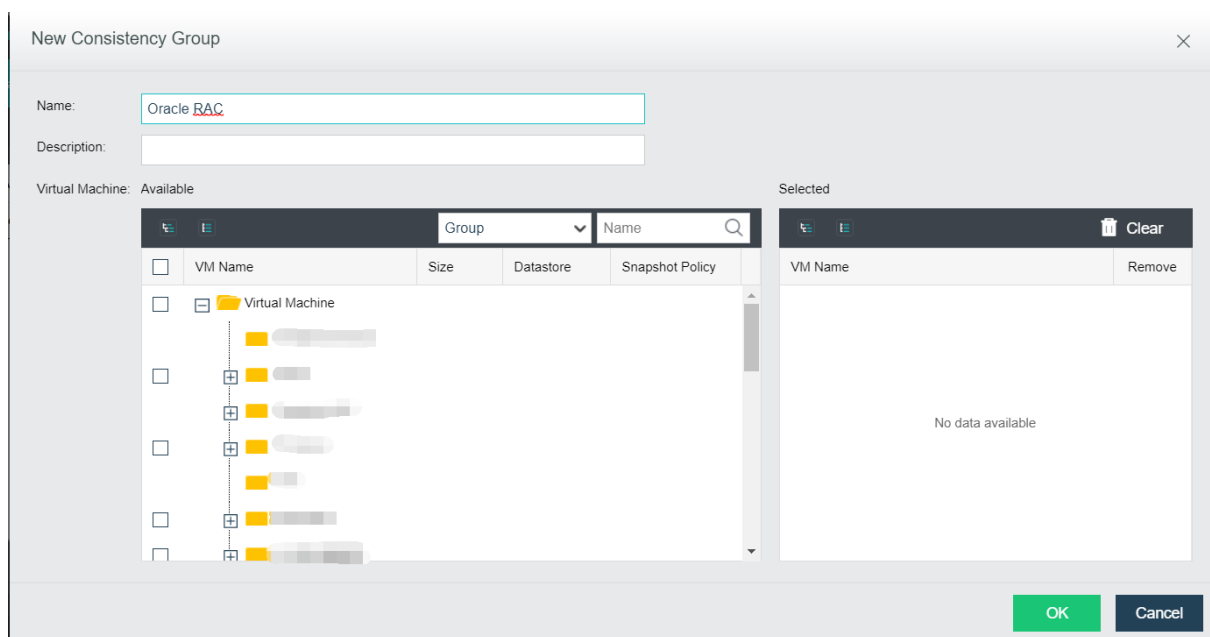
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In the Consistency Group tab, you can perform the following:



New Consistency Group: Create a new consistency group with selected VM



Delete Consistency Group: Delete the selected consistency group. Required to enter admin password to proceed.

Clone Group: Clone the VM inside the consistency group and create new consistency group with the cloned VM.

Take Snapshots: Take snapshot for the selected consistency group.

Recover: Recover snapshot for the selected consistency group.

Clone From Snapshot: Clone VM from the selected snapshot.

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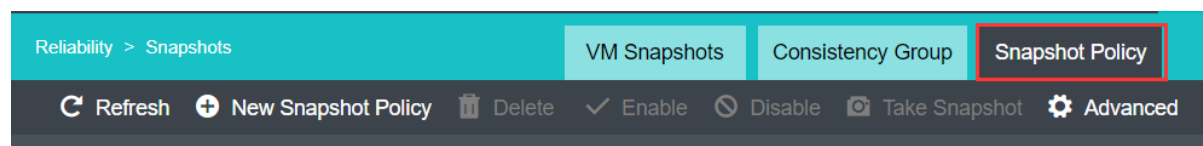
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Schedule Snapshot policy

Schedule snapshot policy allow user to take a snapshot and cleaning up the snapshot periodically for security purposes as well as saving the storage space.

User can configure schedule snapshot policy to take snapshot for the VM periodically under **Reliability > Snapshots > Snapshot Policy**.



In snapshot policy tab, you can perform the following action.

New Snapshot Policy: Create new snapshot policy by selecting VM/Consistency Group, Schedule, Retention Options and specify the policy name.

New Snapshot Policy ×

1 Select Object — 2 Schedule Snapshot — 3 Policy Name — 4 Finish

① If a snapshot policy has associated with the selected VM or consistency group, it will be replaced with this new policy.

Applicable Object: ☒ Virtual machine ☐ Consistency group (applicable to Oracle RAC)

Available

	VM Name	Size	Snapshot Policy
<input type="checkbox"/>	Virtual Machine		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		
<input type="checkbox"/>	...		

Selected

VM Name	Remove
No data available	

Next Cancel

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New Snapshot Policy

×

✓ Select Object

2 Schedule Snapshot

3 Policy Name

4 Finish

Schedule: ☐ Weekly ☒ Daily ☐ Hourly

Time: Every day 00:00

Merge earlier snapshots as follows to free up storage space

- Retain all snapshots taken in recent 7 day(s).
- Retain 5-7 recent snapshots, and merge earlier snapshots.

Retention Options

Prev

Next

Cancel

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Select Object



Schedule Snapshot



Policy Name



4 Finish

Name: Schedule Snapshot

Description: -

Snapshot Interval: Daily (Every day, 00:00)

Consistency Group Snapshot Policy: No

Prev

OK

Cancel

Delete: Delete the selected snapshot policy.

Enable: Enable the selected snapshot policy.

Disable: Disable the selected snapshot policy.

Take Snapshot: Take snapshot for the VM in the snapshot policy.

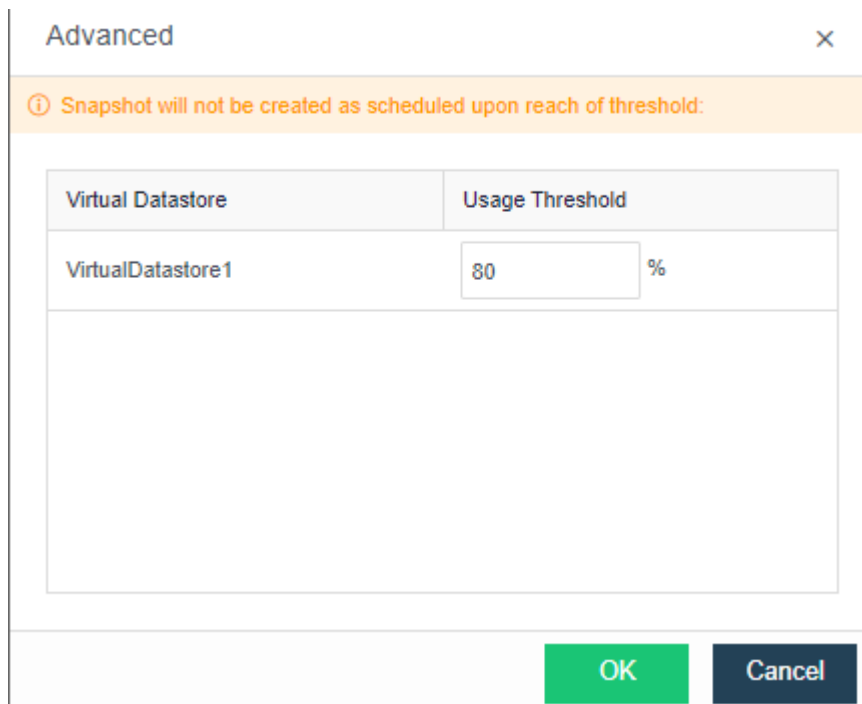
Advanced: Configure the **Threshold** for the storage which will stop the schedule snapshot.

Reliability > Snapshots						
VM Snapshots		Consistency Group		Snapshot Policy		
Refresh	New Snapshot Policy	Delete	Enable	Disable	Take Snapshot	Advanced
Policy Name	Description	Object	VMs	Snapshot Schedule	Status	Operation
✓ Schedule Snapshot	-	Virtual Machine	1	Daily (one snapshot every day <start at 00:00>)	✓	Edit

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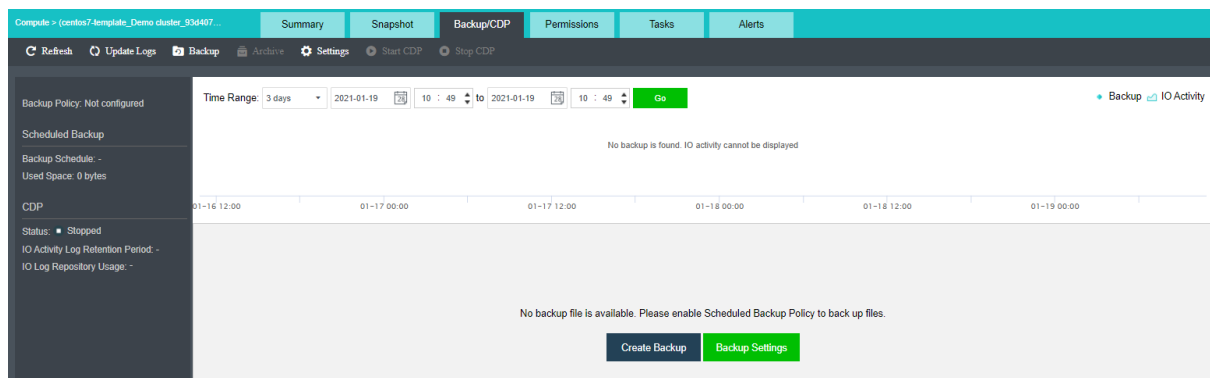
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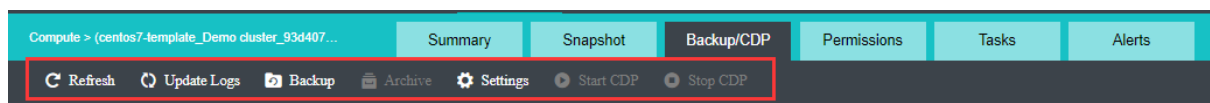


2.2.1.16 Configuring Backup/CDP

Continuous data protection(CDP) is real-time backup which can log every disk IO activity of a virtual machine. It enables administrators to restore virtual machine to any point in time and view or download file created at any point in time, which helps a lot in case that virtual machine encounters file deletion by mistake, virus infection, system crash, data damage, etc.



On the toolbar, there are **Refresh**, **Scan New Backups**, **Backup**, **Settings** and **Start CDP**, as shown below:



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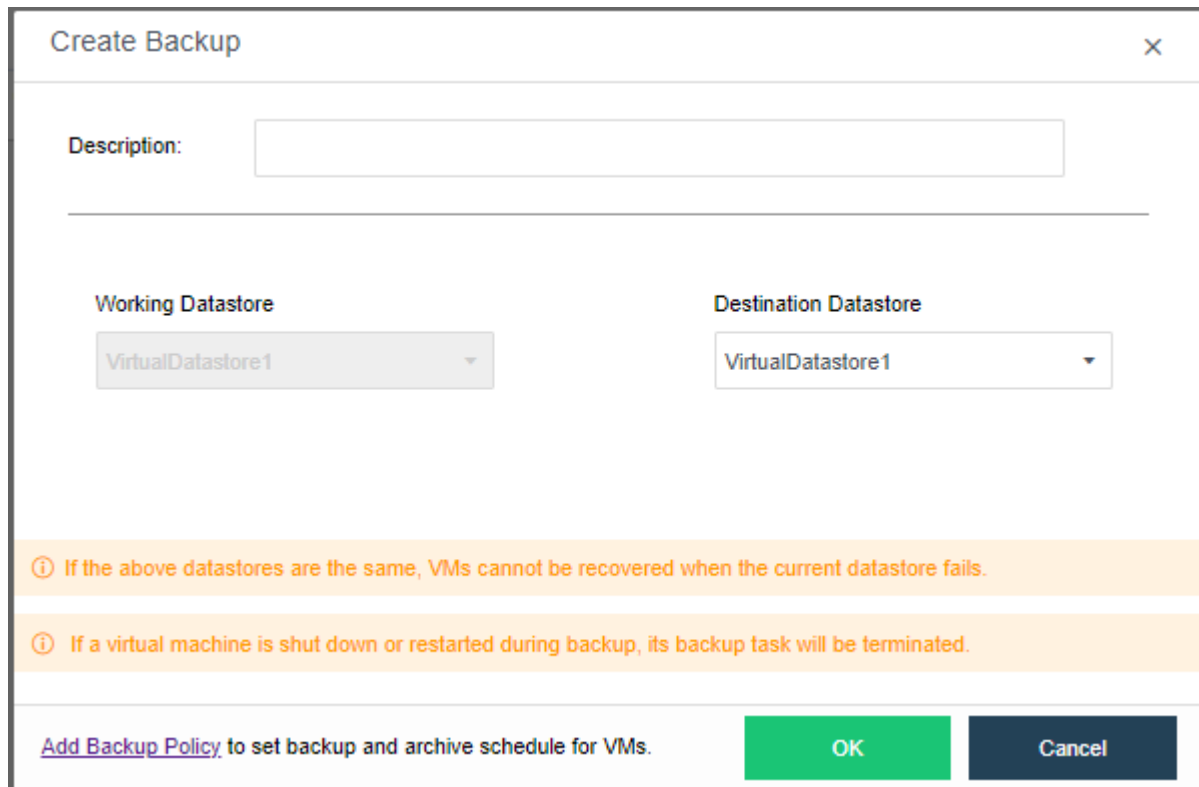
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To refresh the page, you may click **Refresh**.

To check whether there are new backups, you may click **Update Logs**.

To create backup for the virtual machine, you may click **Backup**.



Create Backup

Description:

Working Datastore: VirtualDatastore1

Destination Datastore: VirtualDatastore1

❗ If the above datastores are the same, VMs cannot be recovered when the current datastore fails.

❗ If a virtual machine is shut down or restarted during backup, its backup task will be terminated.

[Add Backup Policy](#) to set backup and archive schedule for VMs. **OK** **Cancel**



- If CDP is enabled, the destination datastore is that you have specified in CDP policy and cannot be specified manually.
- If the above datastores are the same, VM cannot recover when the current datastore fails.

To specify backup method and backup policy, click **Settings**. As for backup method, options are **Scheduled** and **Continuous(CDP)**. For details, refer to **2.6.12.1 Sangfor Backup Policy** section.

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Backup Settings

Type:
☒ Scheduled
☐ Continuous (CDP)

Backup Policy:

_backup_acmp-bacb

▼

Add New Policy

① VMs without any backup policy configured will be associated with default backup policy. You can disable the backup policy to not back up VMs automatically. If a virtual machine is shut down or restarted during backup, its backup task will be terminated.

OK

Cancel

Backup Settings

Type:
☐ Scheduled
☒ Continuous (CDP)

Backup Policy:

▼

New CDP Policy

IO Activity Log Repository:

dtest

▼

Max IO Activity Log Size:

800

GB

IO Log Cache Limit:

2

GB

① VMs without any backup policy configured will be associated with default backup policy. You can disable the backup policy to not back up VMs automatically. If a virtual machine is shut down or restarted during backup, its backup task will be terminated.

OK

Cancel



For VMs not associated with any backup policy, they will associate with default backup policy. To not back up a specific virtual machine, simply disable the corresponding backup policy.

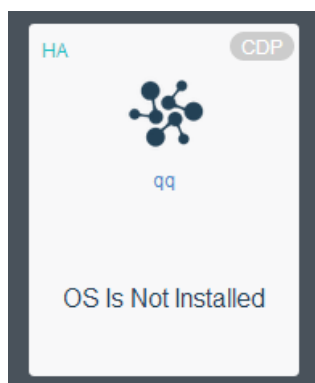
Start CDP: To start CDP, click **Start CDP**, only support when the backup method is **Continuous(CDP)**.

When CDP policy is enabled and CDP is started for virtual machine, the CDP icon is green on the VM panel. If the CDP policy is enabled yet CDP is not started, the CDP icon is gray, as shown in the following picture.

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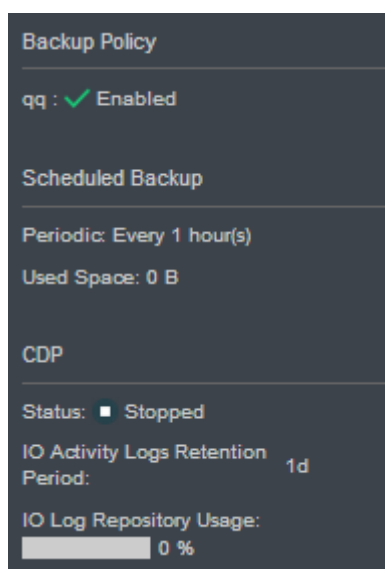
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CDP can be started only when virtual machine is powered on and associated with a CDP policy. Template and virtual machines deployed from template do not support CDP.

The left panel displays backup policy, backup method and CDP information, as shown below:



Backup Policy: It displays the backup policy that has been selected and its status.

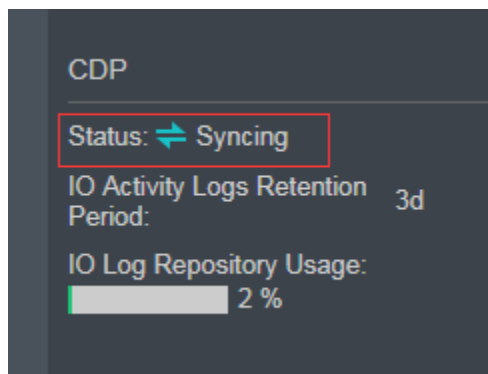
Scheduled Backup: It displays backup method and used space.

CDP: It displays status of CDP, IO Activity Logs Retention Period and IO Log Repository Usage. Status of CDP includes Not configured, Starting, Synchronizing, Started, and Stopped, etc.

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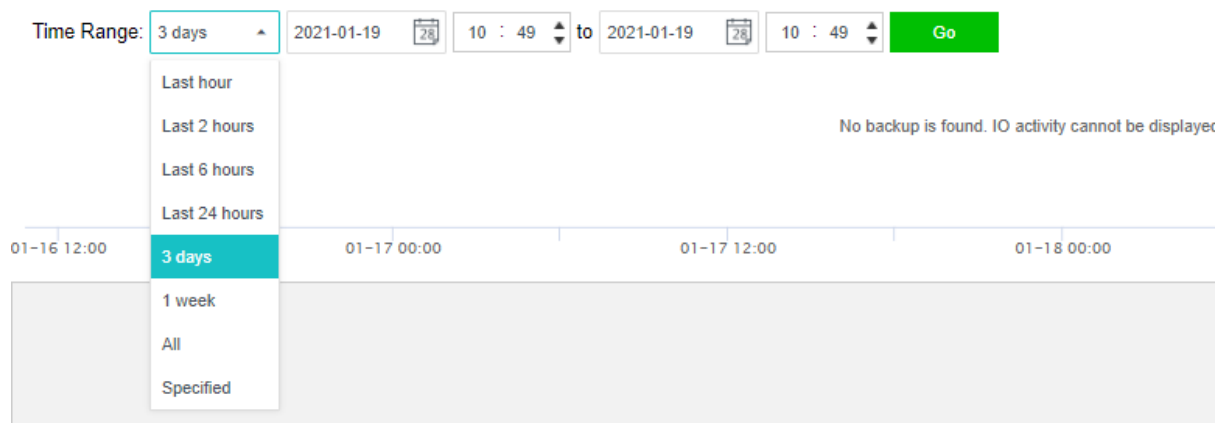
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2.2.1.16.1 Viewing IO Activities

As for **Period**, option can be **Last Hour**, **Last 2 Hours**, **Last 6 Hours**, **Last 24 Hours**, **Three days**, **One week**, **All** and **Specified**.



2.2.1.16.2 Viewing Backup Details

It displays backup details, including **Time**, **Type**, **Used Space**, **Datastore**, **Description**, **Backup Lock**, and **Operation**.

Expand All Collapse All Delete							Type: All
<input type="checkbox"/>	Time	Type	Used Space	Datastore	Description	Backup Lock	Operation
<input type="checkbox"/>	2020-12-25 17:27:43	Backup	1.3 GB	VirtualDatastore1	-	Off	Browse Files Recover Clone Details

Expand All: To display all the IO activity logs, click **Expand All**.

Collapse All: To hide IO activity logs, click **Collapse All**.

Delete: To delete one or more backups, select the backup(s) and click **Delete**. Once backup is deleted, corresponding IO activity logs will also be deleted for they are dependent on

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backup(s). Backups cannot be recovered once deleted. Enter password of the current username to confirm operation:

To display IO activity logs, click  . To hide IO activity logs, click  .


Time: Displays time that a backup or IO activity log is created.

Type: Displays backup type, Backup or IO activity log.

Used Space: Displays space used by backup or IO activity log.

Datastore: Displays datastore where backup or IO activity log is stored.

Description: Displays backup description. To edit description, click 

Backup Lock: To enable backup lock, click on  . To disable backup lock, click on 

Operation: For Backup, operations can be **Browse Files**, **Recover**, **Delete** and **Clone**. For IO activity log, operations can be **Browse Files** and **Recover**.



As for details of browsing files, see the **Browsing Files** section. For details on how to recover virtual machine, see the Recovering Virtual Machine section. For details on how to clone virtual machine, see the **Cloning Virtual Machine** section.

2.2.1.16.3 Browsing Files

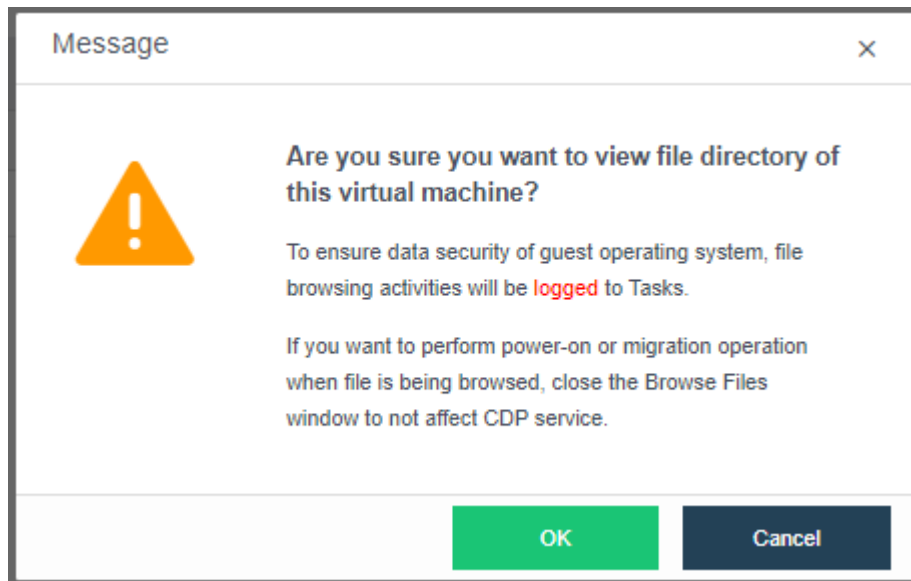
You may select a backup or IO activity log created at any time point and download the corresponding backup file. This operation will be logged so as to ensure data security.

Click **Browse Files** to enter the following page:

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To ensure data security of guest operating system, file browsing activities will be logged to **Tasks**.

If you want to perform power-on or migration operation when file is being browsed, close the Browse Files window to not to affect CDP service.



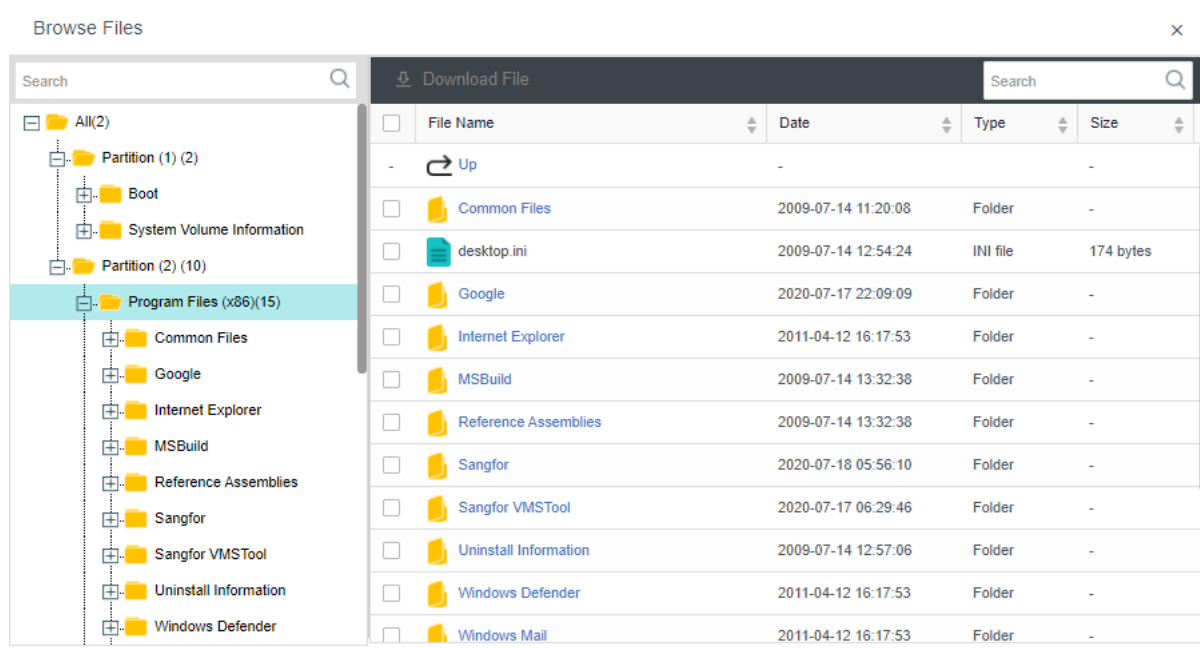
As for Linux-based virtual machines, backup files cannot be browsed or saved.

Click **OK** to enter the following page to select partition, select one or more files, click **Download File** to download file to local disk, as shown below:

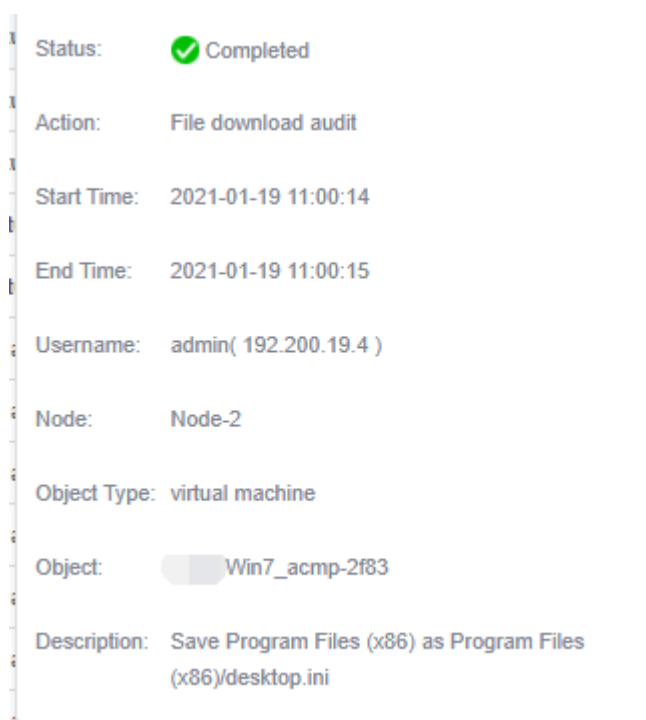
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You may go to **Tasks** to view relevant logs, as shown below:



2.2.1.17 Recovering Virtual Machine

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2.2.1.18 Disk Encryption

2.2.1.19 Viewing Permissions

The **Permissions** page shows the permissions of administrator against VM resources.

Compute > (centos7-template_Demo cluster_934407...					
Summary		Snapshot	Backup/CDP	Permissions	Tasks
Refresh New Delete					
<input type="checkbox"/>	Administrator	Group	Permissions	Creator	Edit
<input type="checkbox"/>	admin	Default Group	Super administrator	Yes	-
<input type="checkbox"/>	sangfor	Default Group	Admin	No	Edit



For details, refer to the **2.6.3 System Administrators and Permissions** section.

2.2.1.20 Viewing Tasks

On the **Tasks** page, you can view administrator logs about various operations performed by administrator, such as creating a virtual machine, etc. 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.

Compute > (centos7-template_Demo cluster_934407...

Summary

Snapshot

Backup/CDP

Permissions

Tasks

Alerts

Refresh

Action, node, object, description

Advanced

Status	Action	Start Time	End Time	Username	Node	Object Type	Object	Operation
Completed	Resume Virtual machine	2021-01-12 23:50:29	2021-01-12 23:52:20	admin(192.168.20.5)	Node-3	virtual machine	centos7-template_Demo cluster_9...	View
Completed	Suspend VM	2021-01-12 23:43:33	2021-01-12 23:44:22	admin(192.200.19.4)	Node-3	virtual machine	centos7-template_Demo cluster_9...	View
Completed	Power on VM	2021-01-12 22:50:28	2021-01-12 22:50:36	admin(192.200.19.4)	Node-3	Virtual machine	centos7-template_Demo cluster_9...	View
Completed	Power off VM	2020-12-28 17:07:17	2020-12-28 17:07:39	admin(192.200.19.4)	Node-3	Virtual machine	centos7-template_Demo cluster_9...	View
Completed	Power on VM	2020-12-28 17:00:55	2020-12-28 17:01:03	admin(192.200.19.4)	Node-3	Virtual machine	centos7-template_Demo cluster_9...	View
Completed	Shutdown VM	2020-11-20 22:06:16	2020-11-20 22:06:44	sangfor(111.119.183.44)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View
Completed	Edit VM	2020-11-20 10:05:47	2020-11-20 10:05:55	admin(192.200.19.4)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View
Completed	Edit VM	2020-11-20 10:04:56	2020-11-20 10:05:00	admin(192.200.19.4)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View
Completed	Edit VM	2020-11-20 10:01:32	2020-11-20 10:01:37	admin(192.200.19.4)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View
Completed	Power on VM	2020-11-20 09:59:12	2020-11-20 09:59:16	admin(192.200.19.4)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View
Completed	Shutdown VM	2020-11-06 15:08:34	2020-11-06 15:09:06	admin(192.200.19.4)	Node-1	Virtual Machine	centos7-template_Demo cluster_9...	View

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.

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Action, node, object, description

Advanced

Start Time:

2021-01-26

00:00

End Time:

2021-01-26

00:00

Status:

All

Search Term:

Action, node, object, description

OK

Clear All

2.2.1.21 Viewing Alerts

This section displays alert logs. For instance, an alert log records that VM CPU usage is above threshold, etc. When an alert-triggering threshold is reached, a corresponding alert will be triggered and an alarm log will be generated. An alert log includes the following information: **Severity, Timestamp, Object Type, Object, Event, Description, Status.**

Compute > (centos7-template_Demo cluster_93d4077e0001) Summary Snapshot Backup/CDP Permissions Tasks Alerts							
Refresh Filter Object, event, description							
Severity	Timestamp	Object Type	Object	Event	Description	Status	
Critical	2020-11-20 22:06:32	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	
Critical	2020-11-20 21:06:29	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	
Critical	2020-11-20 20:06:21	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	
Critical	2020-11-20 19:06:18	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	
Critical	2020-11-20 18:06:16	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	
Critical	2020-11-20 17:06:13	vm	centos7-template_Demo cluster_93d4077e0001	vm_net_conn	Virtual Machine (centos7-template_Demo cluster_93d4077e0001)'s edge (edge1) is not bridged to any physical interface on Virtual Machine's node (Node-1), which will disconnect the Virtual Machine (centos7-template_Demo cluster_93d4077e0001) from physical network.	Pending	

alert logs can be searched by action, node, object and description. By clicking **Filter**, you may also specify a period of time and search term to filter logs.

Compute > (centos7-template_Demo cluster_93d4077e0001) Summary Snapshot Backup/CDP Permissions Tasks Alerts

Refresh Filter

Severity

Period: All

Reset

Confirm

Cancel

Object, event, description

Object

Event

Description



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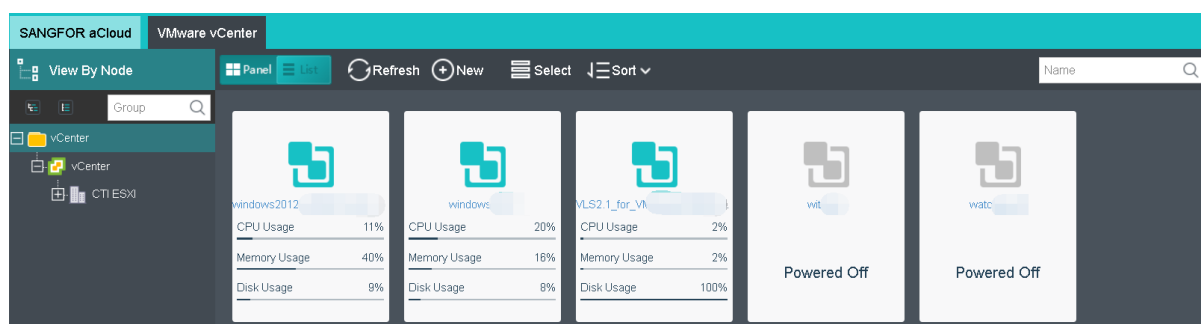
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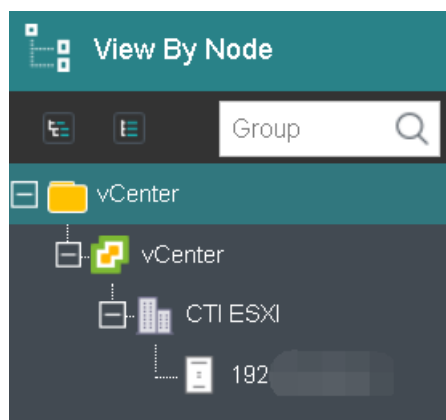
For details about alarm logs, refer to **2.6.4 Alarm** section.

2.2.2 Managing Virtual Machines in VMware vCenter

Navigate to **compute** and you will see a toolbar, as shown in the following figure. On the toolbar, there are the following items: **View By Group/Node/Datastore/Tag, Panel/List, Refresh, New, New Group, Select, Sort, Recycle Bin, Advanced**.



Virtual machines can be viewed by **Node**, as shown below:



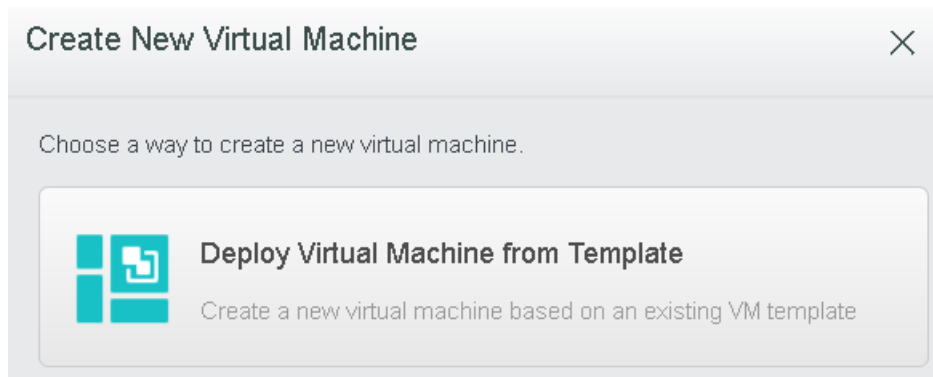
2.2.2.1 Viewing VMs by Panel or List

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:

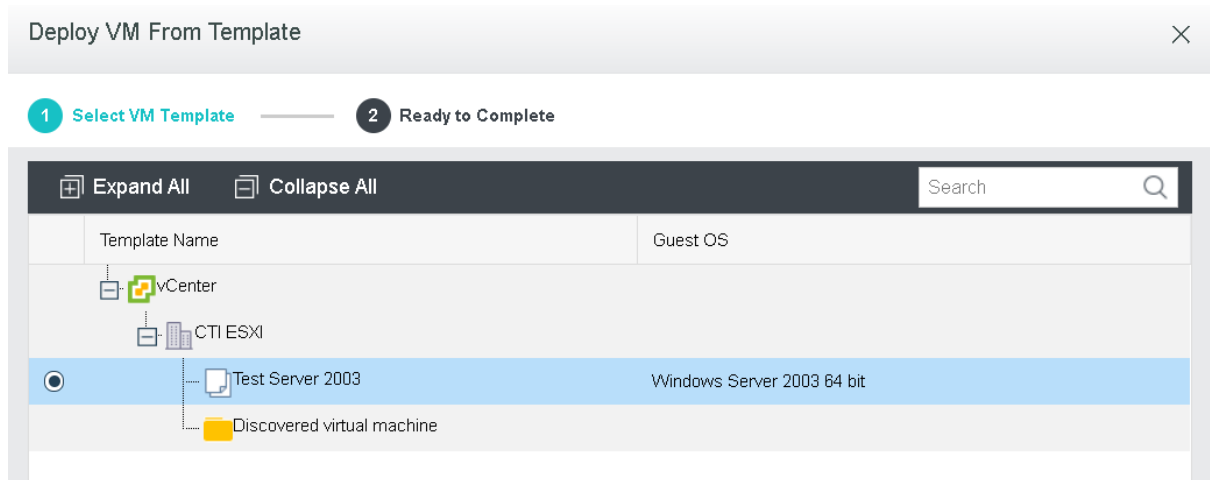
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Select a VM template and then configure relevant fields, as shown below:



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Click Next, after the template is selected.

Deploy VM From Template

1 Select VM Template — 2 Ready to Complete

Name: Yong-Server

Group: Select Group

Datastore: Select Datastore

Run on Node: Select a cluster, host, vApp or resource pool

Configuration

Processor	1 core
Memory	1 GB
Hard disk 1	8 GB
Network adapter	Select network

+ Add Hardware

Cores: 1 core

Virtual Sockets: 1

Cores Per Socket: 1

Back OK Cancel

Name: Specifies a distinguishable name for the virtual machine.

Group: Specifies a group to which this virtual machine belongs.

Run on Node: Specifies a node on which the virtual machine runs.

Datastore: Specifies a datastore where configuration files of deployed virtual machine is stored.

Configuration: It allows you to configure hardware resources, such as **Processor**, **Memory**, **Disk**, **CD/DVD** and **NIC**, etc.

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Configuration	
Processor	1 core
Memory	1011 GB
Hard disk 1	8 GB
Network ada...	Select network

Disk

NIC

Add Hardware ▼

Processor: Specifies the number of virtual sockets and cores per socket for the virtual machine respectively. Once the number of cores is configured, Virtual Sockets and Cores Per Socket will be automatically filled with optimum values so as to achieve best VM performance.

Configuration	
Processor	1 core
Memory	1011 GB
Hard disk 1	8 GB
Network ada...	Select network

Cores: core

Virtual Sockets:

Cores Per Socket:

Memory: Specifies the memory for the virtual machine. The minimum is 512 MB, and the maximum is 1TB.

Configuration	
Processor	1 core
Memory	1011 GB
Hard disk 1	8 GB
Network ada...	Select network

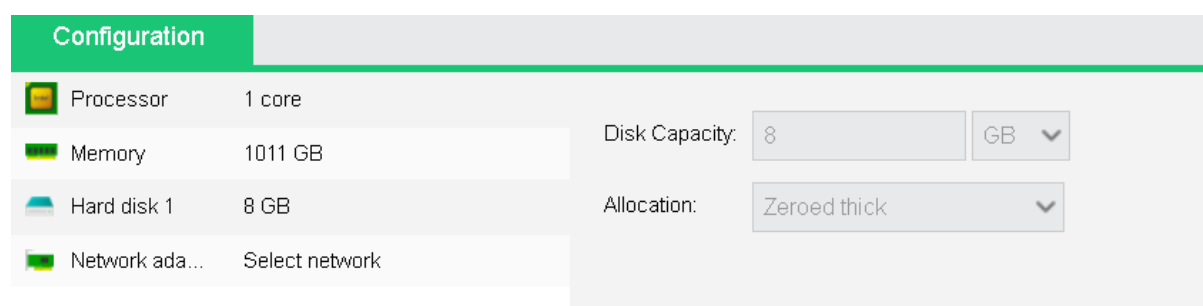
Memory Size:

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Disk: Specifies the disk for the virtual machine.

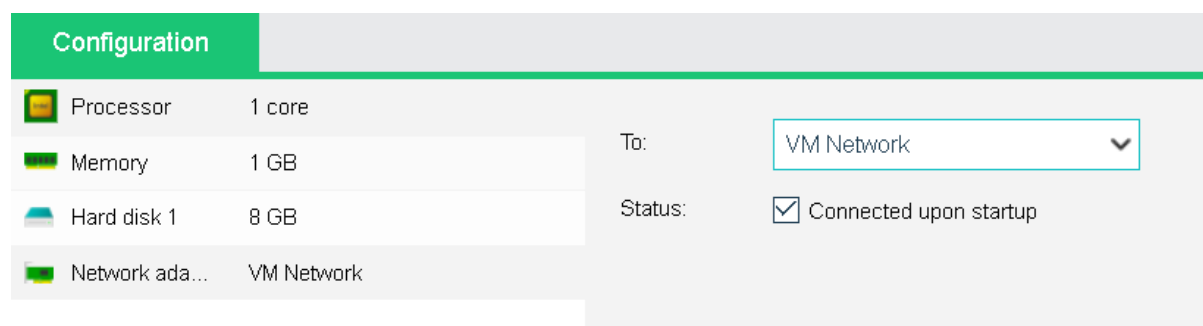


The screenshot shows the 'Configuration' tab of a virtual machine. On the left, a list of hardware components includes Processor (1 core), Memory (1011 GB), Hard disk 1 (8 GB), and Network adapter (Select network). On the right, the 'Disk Capacity' is set to 8 GB, and the 'Allocation' is set to Zeroed thick.

Disk Capacity: Specifies the capacity(GB) of the virtual disk.

Allocation: Options are **Thin Provisioning**, **Eager zeroed thick** and **Zeroed thick**.

Network adapter: Specifies what the virtual machine is connected to.

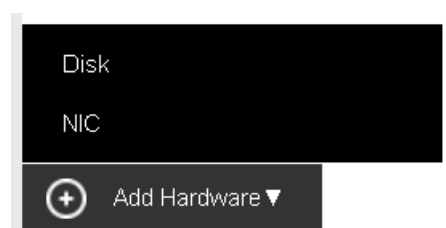


The screenshot shows the 'Configuration' tab of a virtual machine. On the left, the hardware list includes Processor (1 core), Memory (1 GB), Hard disk 1 (8 GB), and Network adapter (VM Network). On the right, the 'To:' dropdown is set to 'VM Network', and the 'Status:' checkbox 'Connected upon startup' is checked.

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

Status: If it is selected, the VM will auto connect to the edge upon startup.

Add Hardware: To add more hardwares, click **Add Hardware**. Then, you can add new Disk and NIC.



For example, click **Add Hardware** and select **Disk**. Then, a new disk will be added(as shown in following figure). To delete a disk, click on the  icon.

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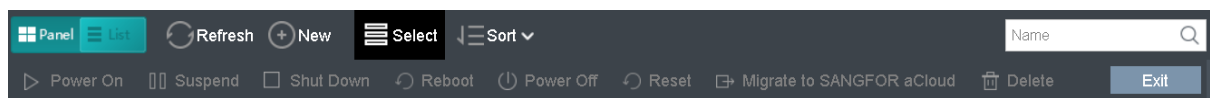
Configuration	
Processor	1 core
Memory	1 GB
Hard disk 1	8 GB
New disk	40 GB
Network adapter	VM Network

Disk Capacity: GB

 Allocation:

Batch Operation

Administrator can perform the following operations against multiple virtual machines: **Power On, Suspend, Shut Down, Reboot, Power Off, Reset, Migrate to SANGFOR HCI, and Delete.**



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

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

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

To start virtual machine(s), you may select one or more virtual machines and then click on **Reset**.

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

To restart virtual machine(s), you may select one or more virtual machines and then click on **Reboot**.

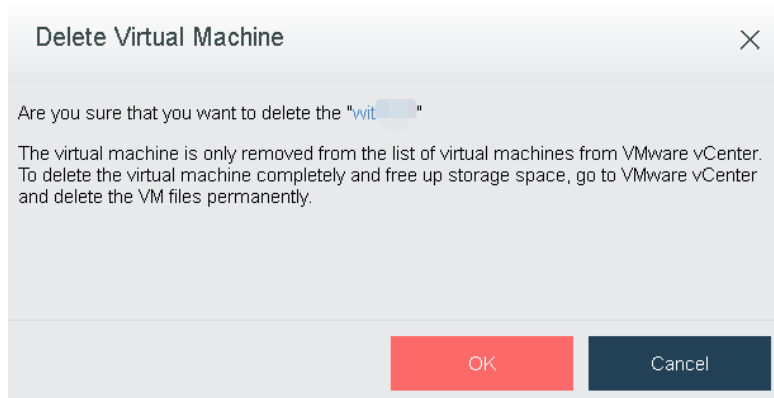
To migrate the virtual machine(s) to SANGFOR HCI, you may select one or more virtual machines and then click on **Migrate to SANGFOR HCI**.

To delete virtual machines, you may select the virtual machines and click **Delete**, then the virtual machine will be removed from the VMware vCenter yet the storage space occupied by the VM will not be freed up. You may go to VMware vCenter platform to clean up files of the virtual machine.

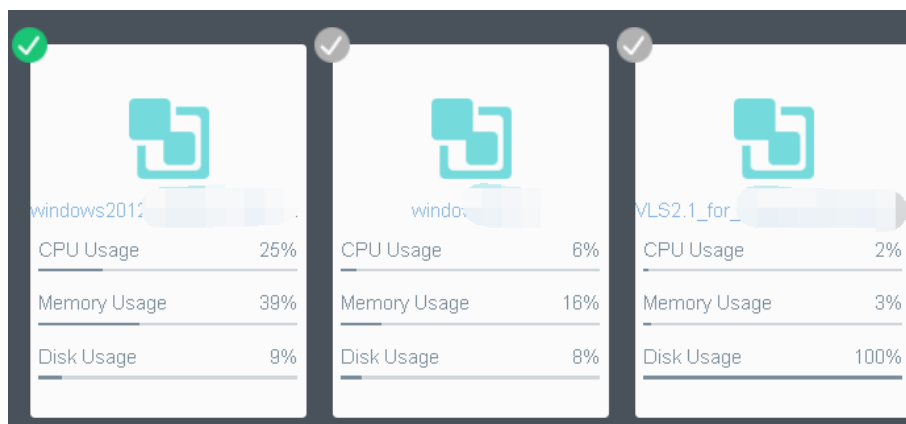
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If a virtual machine is selected, the color of the icon at the upper left corner of the corresponding card will turn to green from gray.

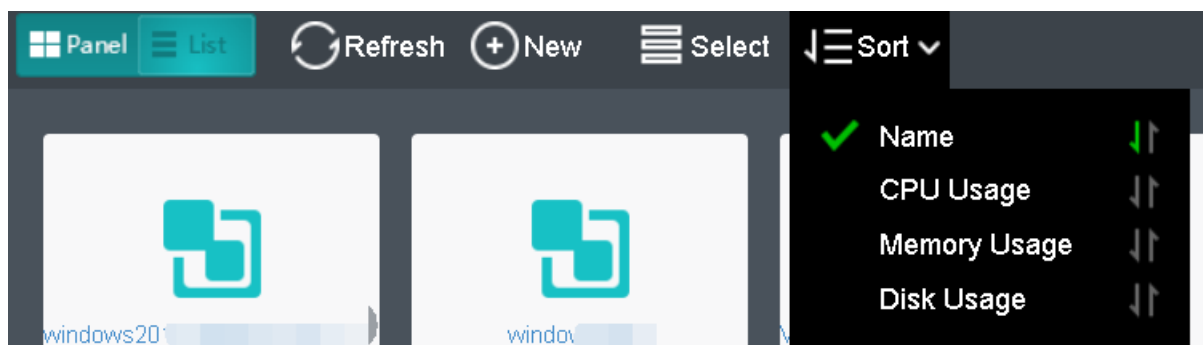


To exit from editing the virtual machines, click on the **Exit** button on the upper right corner.



2.2.2.4 Sorting Virtual Machines


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

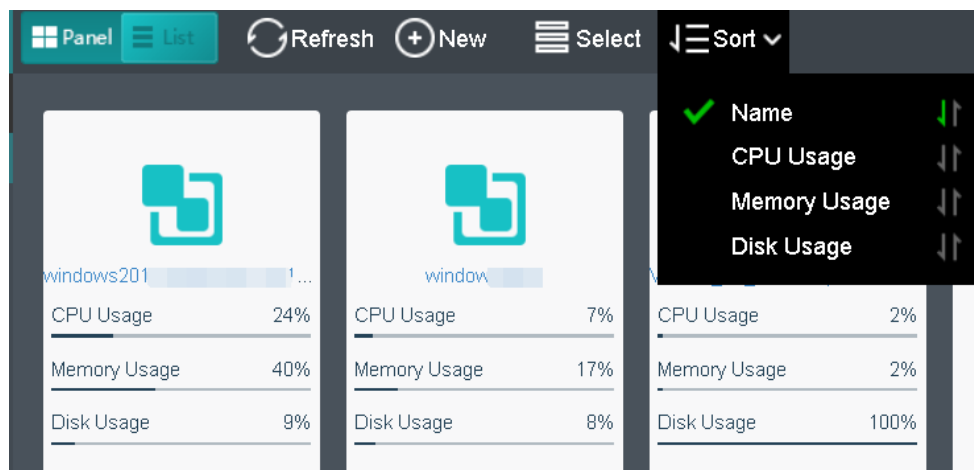


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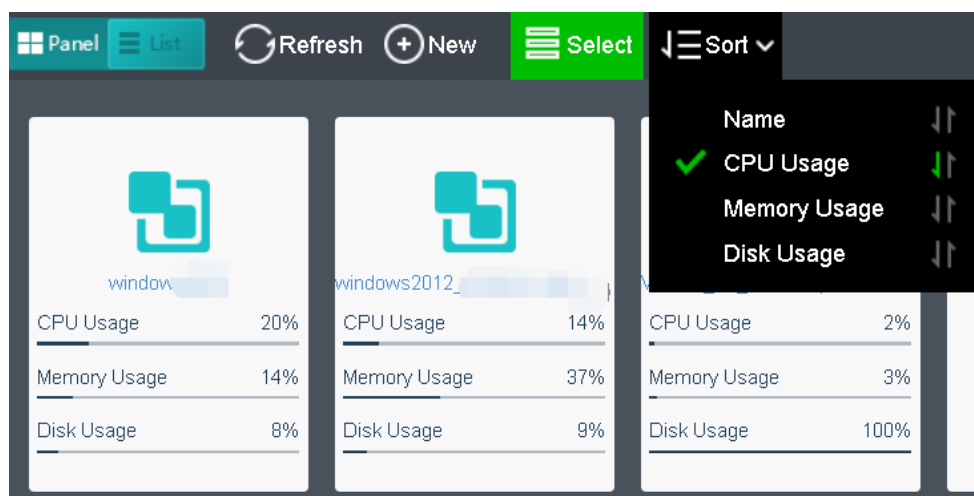
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To sort virtual machines by name, select **Sort > Name** in **Compute**. You may click on the arrow  to sort VMs in ascending or descending order.



To sort virtual machines by CPU usage, select **Sort > CPU Usage** in **Compute**. By clicking on that arrow, virtual machines can be sorted based on CPU usage in ascending order or descending order. The following figure shows that the virtual machines are sorted by CPU usage in a descending order.

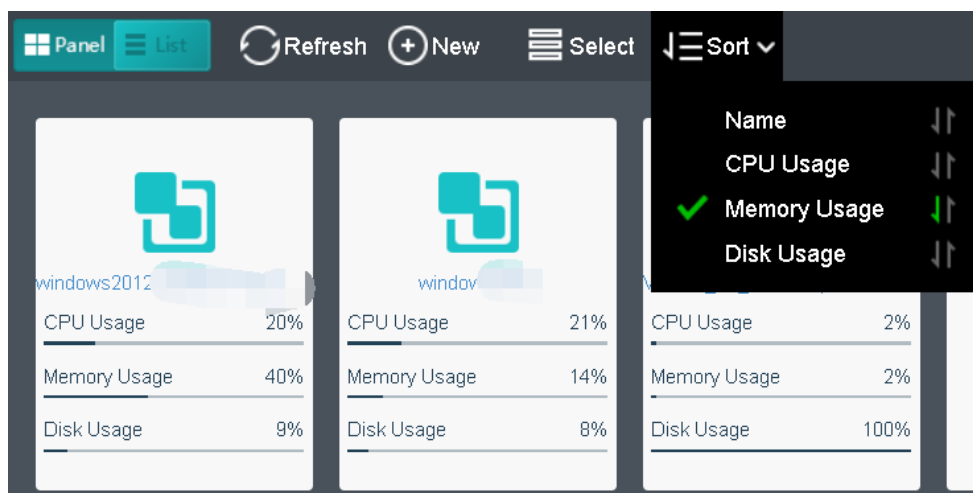


To sort nodes by memory usage, select **Sort > Memory Usage**. By clicking on that arrow, node can be sorted by memory usage in ascending order or descending order. The following figure shows that the virtual machines are sorted by memory usage in a descending order.

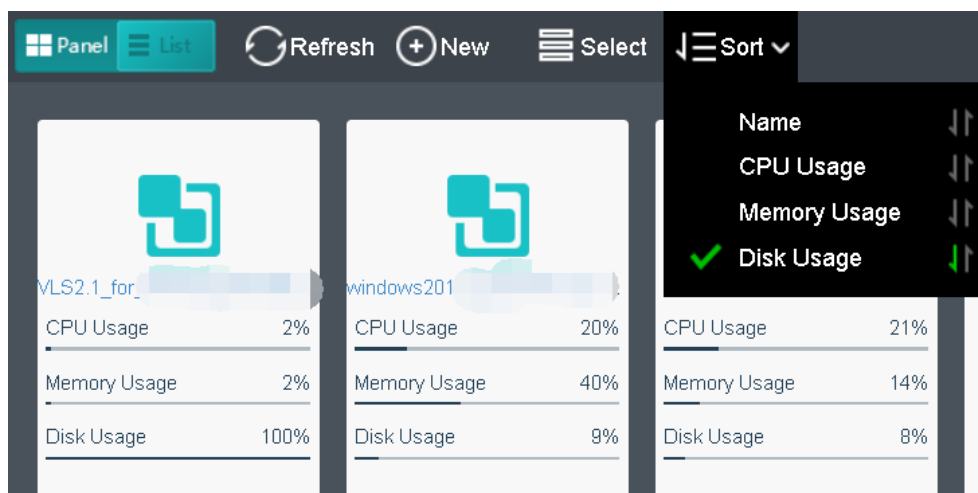
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To sort virtual machines by disk usage, select **Sort > Disk Usage** in **Compute**. By clicking on that arrow, virtual machines can be sorted by disk usage in ascending or descending order. The following figure shows that the virtual machines are sorted by disk usage in a descending order.



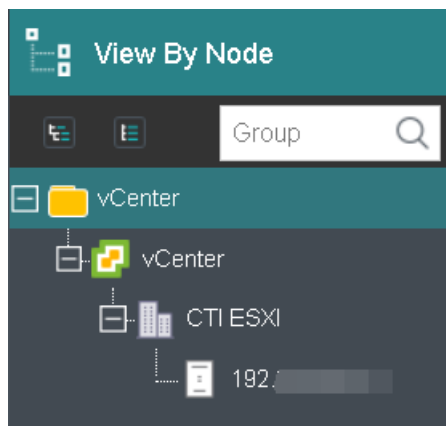
2.2.2.5 Viewing VM Status

In **Compute**, all VM groups can be expanded or collapsed by clicking on the  button. To expand or collapse a specific group, click on the  button next to that group.

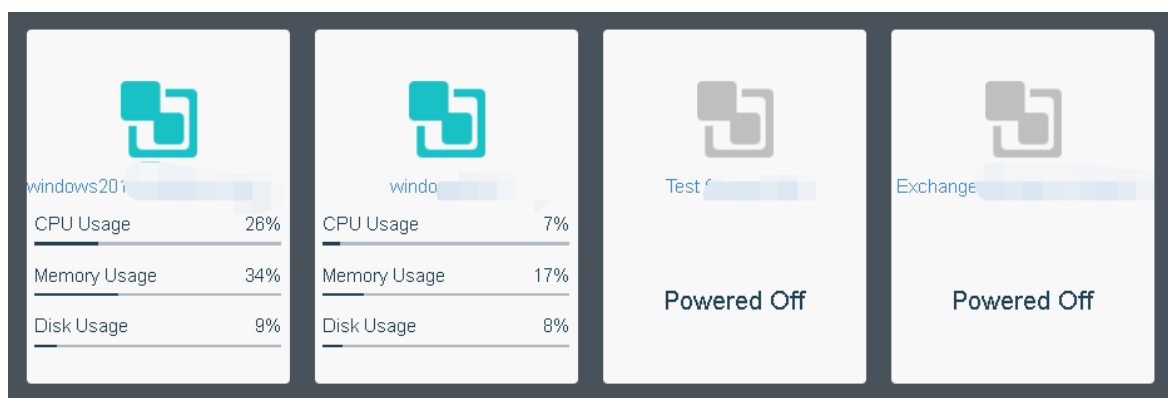
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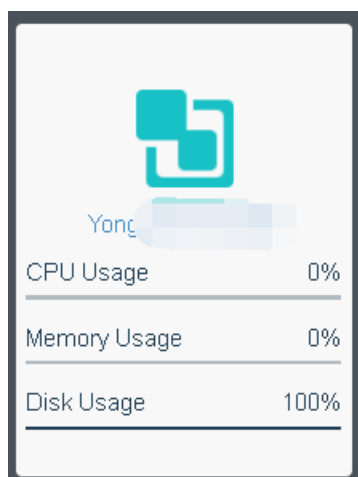
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You can get the following information on virtual machine panel: power status(powerd on or powered off), CPU, memory and disk usage. Blue VM icon indicates virtual machine is powered on, while gray VM icon indicates virtual machine is powered off.



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

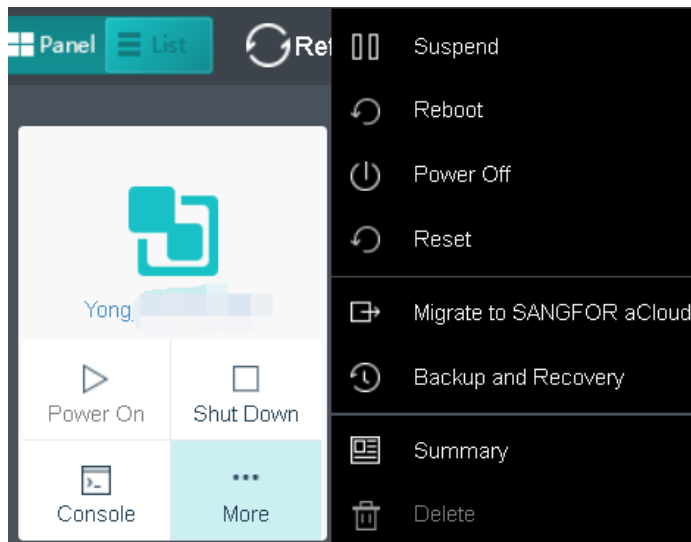


To perform more operation against virtual machine, click **More**, as shown below:

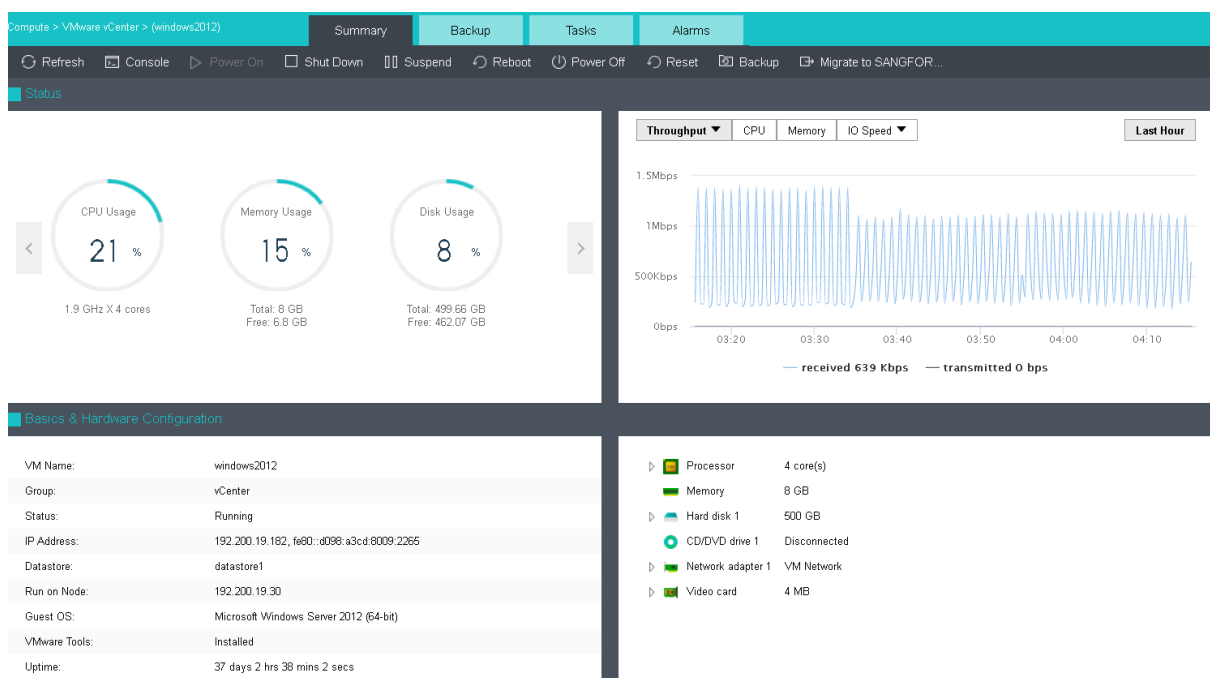
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For virtual machine details, you may click on VM name to redirect to the **Summary** page, as shown below:



2.2.2.6 Viewing VM Details

There are the following tabs: **Summary**, **Snapshot**, **Backup/CDP**, **Permissions**, **Tasks** and **Alarms**, as shown below.

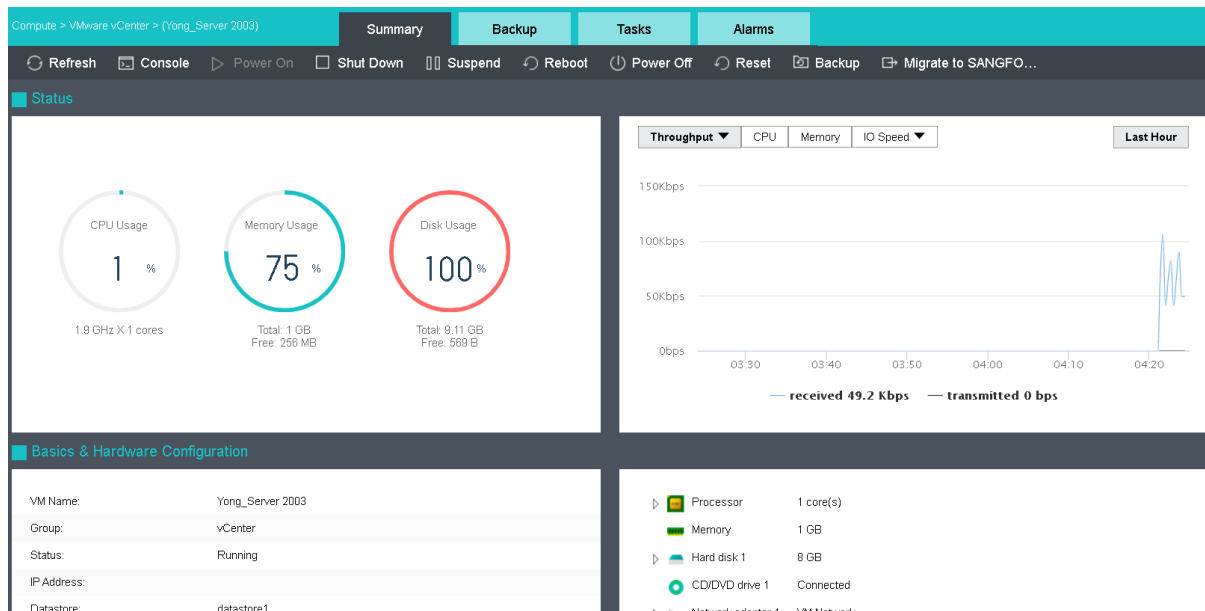
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On the **Summary** tab, you may perform such operations as **Power On**, **Shut Down**, etc., and view basic information and hardware configurations of virtual machine.



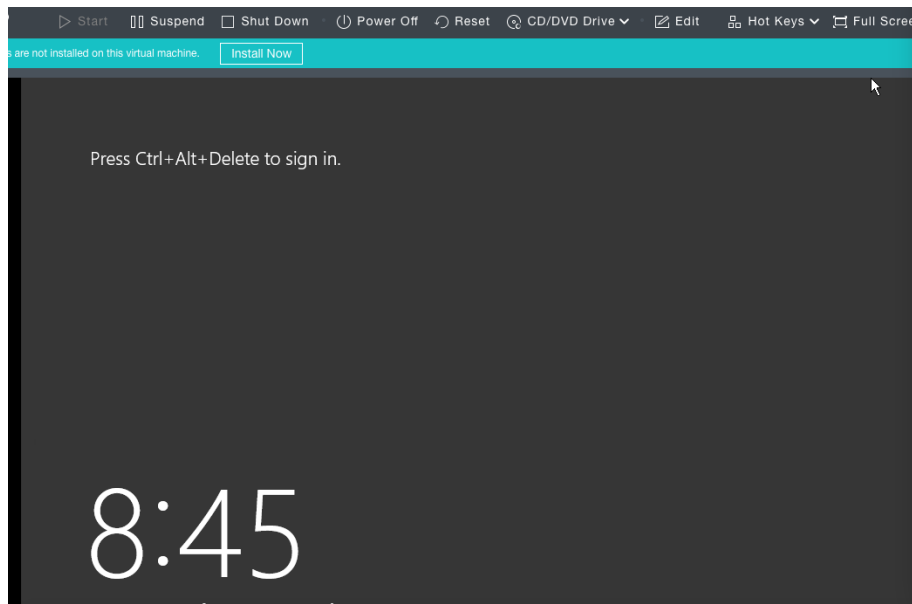
To refresh the **Summary** page, click on **Refresh** on the upper left corner.

To open virtual machine's console, click **Console** on the **Summary** page, or click on the **Console** button on the virtual machine panel to enter the following page. Before opening VMware vCenter administrator console, make sure the console plug-in has been installed, as shown below:

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Click  to send Ctrl+Alt+Delete command to guest OS.

Click  to enter full screen, and press Ctrl+Alt+Enter to exit from full screen.

To power on virtual machine, you may click **Power On**.

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

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

To restart a virtual machine, you may click **Reboot**.

When a virtual machine is in powered-on state, you can click **Power Off** to force it to be powered off.

To restart virtual machine, you may click **Reset**.

To back up virtual machine, you may click **Backup**.

To migrate the VM, you may click **Migrate to SANGFOR HCI**.

2.2.2.7 Migrating VM From Vmware vCenter to Sangfor HCI

Virtual machines running on VMware vCenter can be migrated to Sangfor HCI.

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Migrate VM from VMware vCenter to SANGFOR aCloud

1. VM tools will be automatically installed on virtual machines, which may take about 5 minutes. Windows virtual machines will restart automatically after first startup.
QXL graphics adapter will be used by default after migration of VMware virtual machine succeeded. Change the graphics adapter manually if display is abnormal after startup.

Current Location: VMware vCenter	Destination Location: SANGFOR aCloud
VM Name: Yong_Server 2003	VM Name: Yong_Server 2003
vCenter: vCenter	Group: Default Group
Group: vCenter/CTI ESXI	Datastore: VirtualDatastore1
Datastore: datastore1	Storage Policy: 2_replica
Run on Node: vCenter/CTI ESXI/192.200.19	Run on Node: <Auto>

☒ Auto power off the virtual machine in the VMware vCenter to complete migration
This will have the virtual machine power off automatically before migration completes to have the new changes synced to the destination location. If you do not want the virtual machine to power off at unexpected time and interrupt the services being offered via that virtual machine, do not select this option. You may power off the virtual machine manually when migration completes.

☒ Auto power on the migrated virtual machine in SANGFOR aCloud upon completion

Next Cancel

Specify the required fields under **Current Location** and **Destination Location**. Whether to select the options **Auto power off the virtual machine in the VMware vCenter to complete migration** and **Auto power on the migrated virtual machine in Sangfor HCI upon completion** depends on your own needs, and then start migrating virtual machine.

Auto power-off virtual machines in the VMware vCenter to complete migration: This will have the virtual machine powered off automatically before migration completes to have the new changes synced to the destination location. If you do not want the virtual machine to power off at unexpected time and interrupt the services being offered via that virtual machine, do not select this option. You may power off the virtual machine manually when migration completes.

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Migrate VM from VMware vCenter to SANGFOR aCloud
✕

✓ Datastore and Node
2 Hardware Configuration

eth0
Connected To: edge1

☒ Enabled

To:

Advanced
✕

Adapter Model:
Realtek RTL8139

MAC Address:
FE:FC:FE:45:8B:30
↻

IP Address:

Netmask:

Gateway:

Back
OK
Cancel

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. Options are **Realtek RTL8139** and **Intel E1000**.

MAC Address: MAC address can be automatically generated or manually specified. MAC address examples: 00-11-22-33-44-55, 00:11:22:33:44:55. MAC address will be changed after the migration operation completes and you may edit the MAC address if you do not want the MAC address to be changed.

After configuring relevant fields, click **OK** to start migrating virtual machine. To view migration progress, go to **Migration Process**, as shown below:

Migration Progress
✕

↻ Refresh

Status	Src VM	Run on No...	Working D...	VM Name	Run on Node	Datastore	Operation
0%	Details	Yong_Server ...	192.200.1...	datastore1	Yong_Server 2003	Auto	VirtualDatast... Cancel

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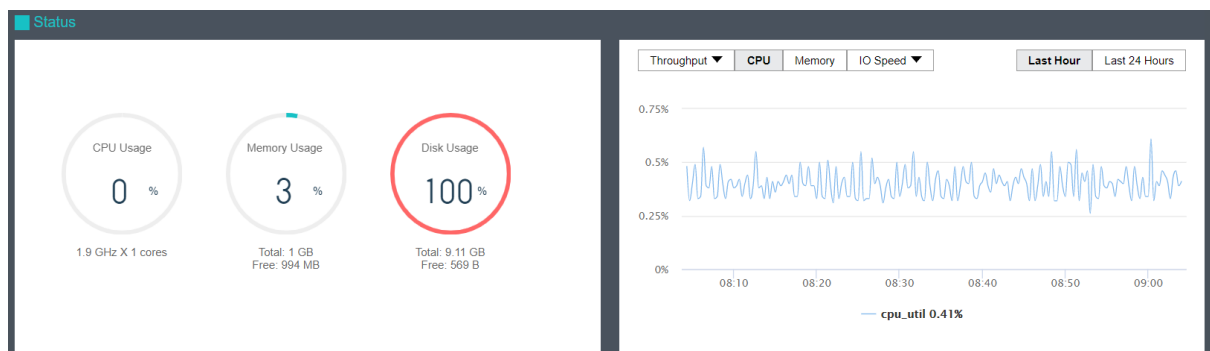
Tasks								
All		Migration (2)						
Status		Src VM	Run on Node	Working Da...	VM Name	Run on Node	Datastore	Operation
❗ Migration failed	Details	Yong_Server 20...	192.200.19.31	datastore1	Yong_Server 2003	Auto	VirtualDatastore1	-
⏸ Migration operat...		Yong_Server 20...	192.200.19.31	datastore1	Yong_Server 2003	Auto	VirtualDatastore1	-



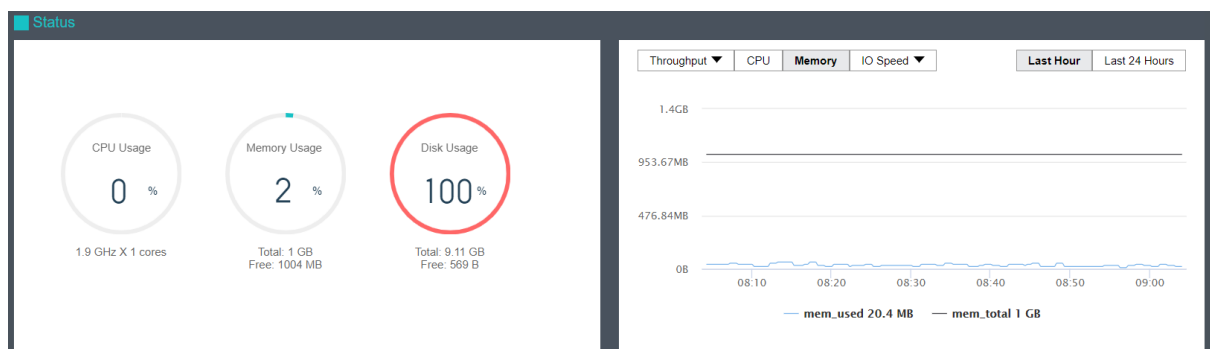
When migration is being performed on a virtual machine in VMware vCenter, do not power on the VM, expand disk capacity, or roll back snapshot of that virtual machine, or else migration may fail.

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 may view CPU usage in the last hour or last 24 hours.



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



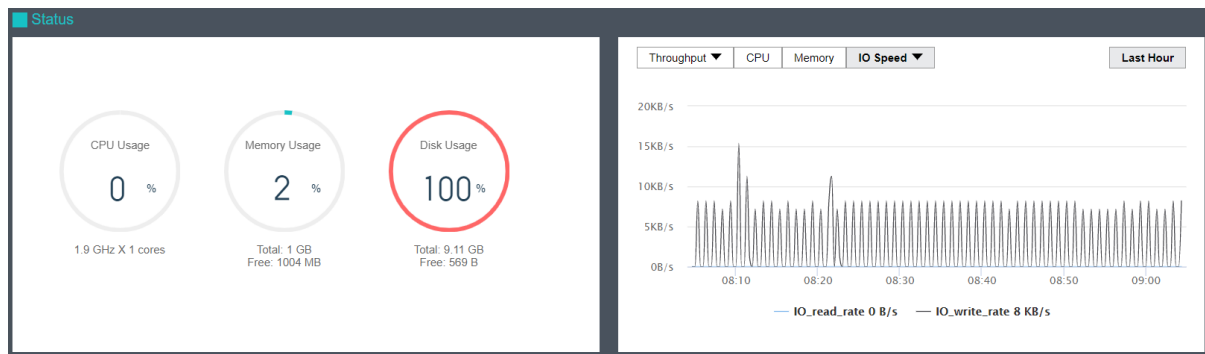
Disk Usage: Displays the total and free disk size respectively, as well as disk usage. On the

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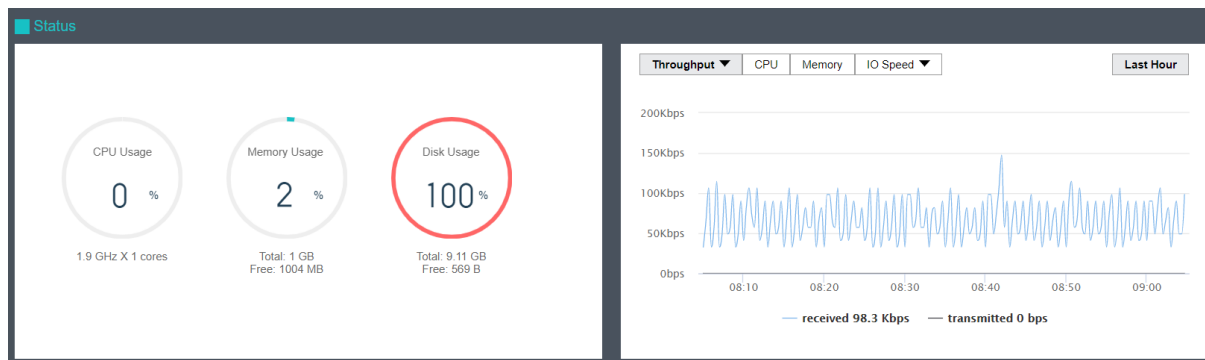
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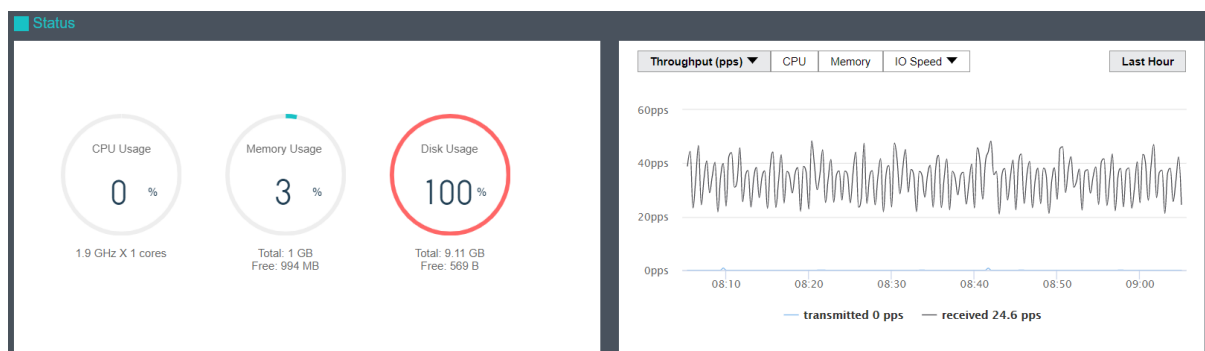
right side, you may view disk IO speed and IOPS.



Throughput: Displays overall throughput.



Throughput (pps): Displays inbound and outbound packets per second.



The **Basics & Hardware Configuration** section displays basic information and hardware configuration of virtual machine. Basic information includes **Name**, **Description**, **Group**, **Datastore**, **Run on Node**, **Guest OS**, **vmTools**, **High Priority**, **Power on at host startup**, **Enable memory reclaiming**, **Boot Order**, and **Uptime**.

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Basics & Hardware Configuration

VM Name:	Yong_Server 2003
Group:	vCenter
Status:	Running
IP Address:	
Datastore:	datastore1
Run on Node:	192.200.19.30
Guest OS:	Microsoft Windows Server 2003 (64-bit)
VMware Tools:	Not installed How to?
Uptime:	4 hrs 43 mins 46 secs

- Processor 1 core(s)
- Memory 1 GB
- Hard disk 1 8 GB
- CD/DVD drive 1 Connected
- Network adapter 1 VM Network
- Floppy drive 1 Disconnected
- Video card 4 MB

2.2.2.8 VM Backup

Virtual machines in VMware vCenter can be backed up to Sangfor HCI platform without installing any third-party software or plugin or purchasing any backup storage device. Additionally, virtual machines can be recovered on Sangfor HCI from backup or recovered to VMware vCenter.

Compute > VMware vCenter > (Yong_Server 2003)

Summary

Backup

Tasks

Alarms

Backup

Scheduled Backup

2.2.2.8.1 Manual Backup

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

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Create Backup

Backup Name: 2020-03-15_17-14-54

Description:

Working Datastore
datastore1

Destination Datastore
ISCSI-Secondary

☐ Enable VSS
File system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools be installed on the virtual machines running in VMware vCenter and recommended for those running applications like SQL Server and Exchange.

☐ Full Backup

[Add Backup Policy](#), to plan periodic backup.

OK Cancel

Specify **Backup Name**, **Description** and **Destination Datastore**. Then, click **OK**. You may select **Enable VSS** and **Full Backup** based on your own needs.



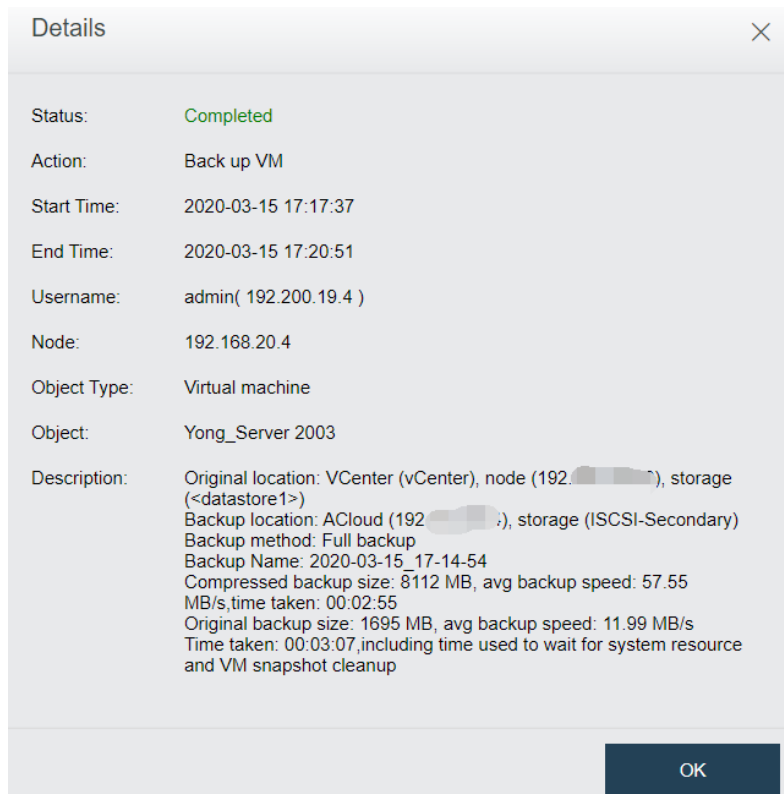
Enable VSS: File system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools to be installed on the virtual machines running in VMware vCenter and is recommended for those running applications like SQL Server and Exchange.

After specifying relevant fields, click **OK** to start backup operation. You may view backup status in **Tasks**, as shown below:

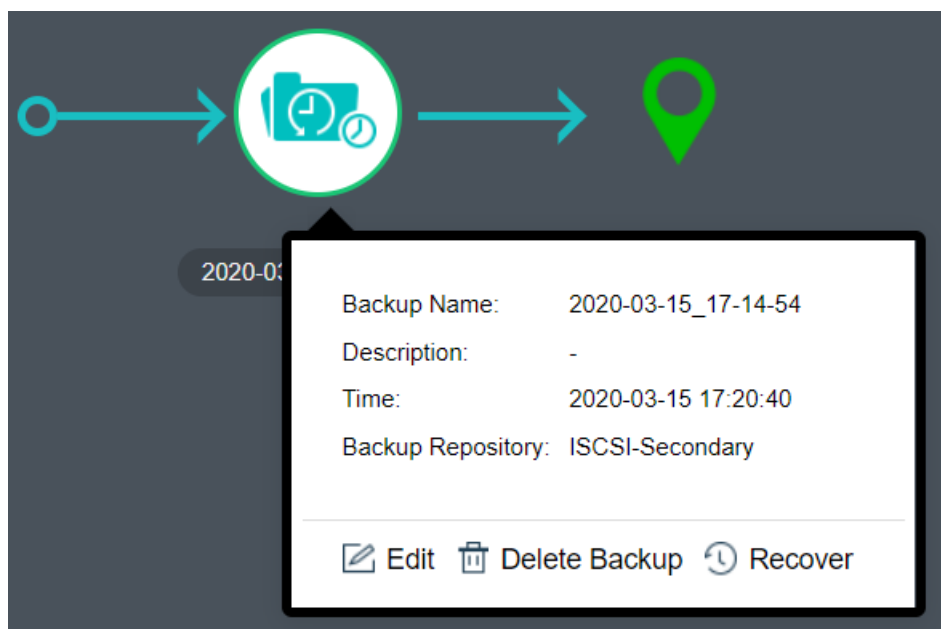
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After a backup is created, you may click on the backup name and then a dialog box pops up, as shown below:



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

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

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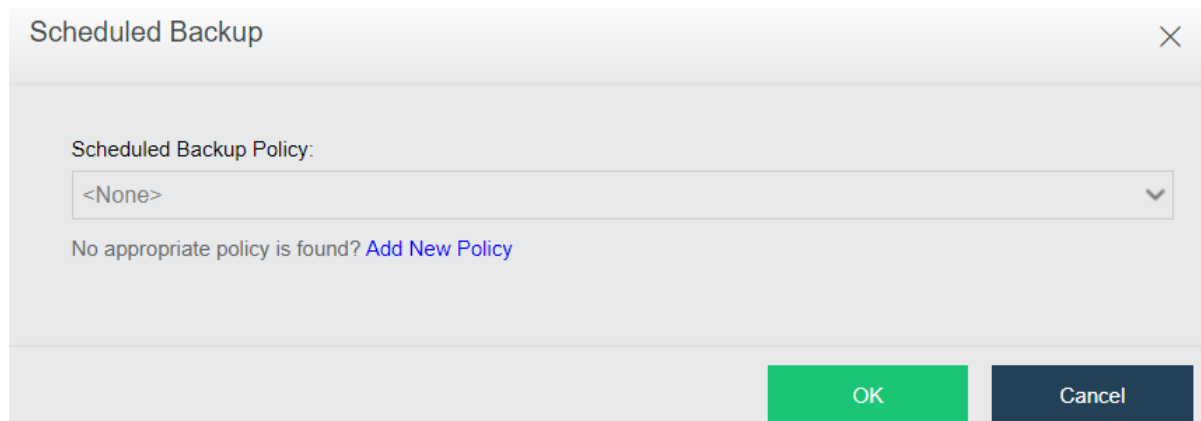
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To recover a virtual machine from its backup, you may click **Recover**.

2.2.2.8.2 Scheduled Backup

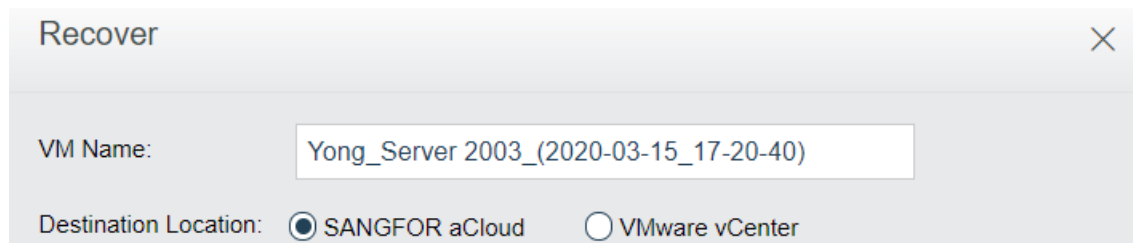
On the **Backup** page, you may also create a scheduled backup by clicking **Scheduled Backup** to enter the following page. On that page, select the option **Enable Scheduled Backup** and select a scheduled backup policy, then click **OK**. You may click **Add New Policy**, if there is no schedule backup policy.



For details about scheduled backup, refer to Error! Reference source not found. section.

2.2.2.9 VM Recovery

Virtual machines in VMware vCenter can be recovered on Sangfor HCI platform or recovered to VMware vCenter. Enter the name of the virtual machine and select destination location, as shown below:



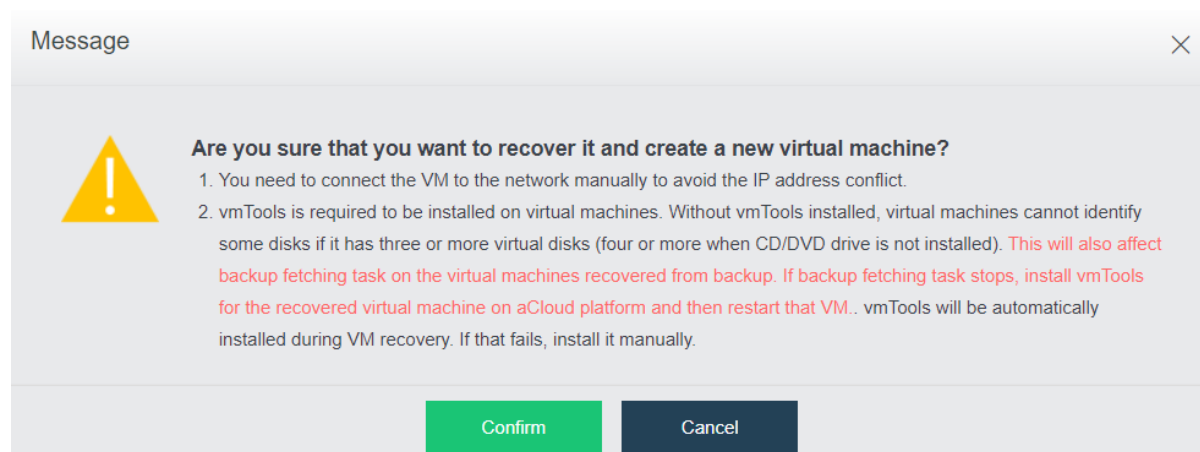
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To recover virtual machine to Sangfor HCI, select Sangfor HCI as **Destination Location**, as shown below:

Specify **Group**, **Run on Node** and **Datastore**, click **OK**, and then a new virtual machine will be created.



- You need to connect the VM to the network manually to avoid the IP address conflict.
- Install vmTools on the recovered virtual machine to support IP address restoration and improve performance of virtual machine, otherwise, some disks will not be identified if

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virtual machine has three or more virtual disks.

You may view recovery progress in **Tasks**.

Tasks							
All	VMware vCenter VM Recovery ①		Migration ②				
Status	Src VM	Recover to Bac...	New VM	Recover to ...	Recover to the ...	Recover to the ...	Operation
✔ Completed	Yong_Server 2003	2020-03-15_17-...	Yong_Server 2003...	Default Group	ISCSI-Secondary	192.168.20.3	View VM ...

Recover virtual machine to VMware vCenter, as shown below:

Recover

VM Name: Yong_Server 2003_(2020-03-15_17-20-40)

Destination Location: ☐ SANGFOR aCloud ☒ VMware vCenter

By default, the original location will be selected, including running and storage locations. You may specify new ones.

☒ Specified

vCenter: vCenter

Group: vCenter/CTI ESXI

Datastore: datastore1

Run on Node: vCenter/CTI ESXI/192.168.20.3

OK

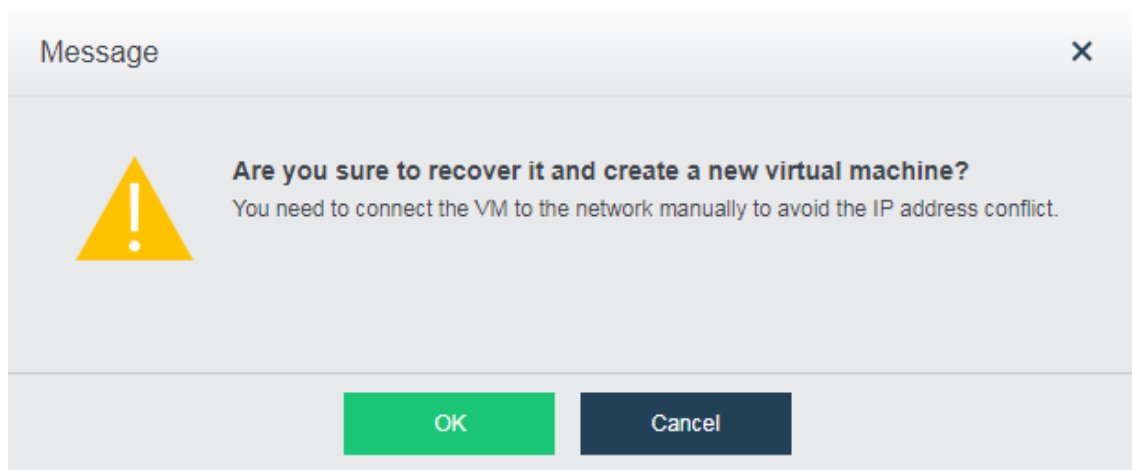
Cancel

Specify **vCenter**, **Group**, **Run on Node** and **Datastore**, click **OK**, and then a new virtual machine will be created. You may view recovery progress in **Tasks**.

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By default, the original location will be selected, including running and storage locations. You may specify new ones.



You need to connect the VM to the network manually to avoid the IP address conflict.

2.2.2.10 Viewing Tasks

The **Tasks** page displays administrator logs about various operations performed by administrator, such as creating a virtual machine, etc. 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.

Compute > VMware vCenter > (Yong_Server 2003)

Summary

Backup

Tasks

Alarms

Refresh

Action, node, object, descriptor

Advanced

Status	Action	Start Time	End Time	Username	Node	Object Type	Object	Operation
✔ Completed	Recover VM rapidly	2020-03-15 17:30:45	2020-03-15 17:33:01	admin(192.200.19.4)	192.168.20.3	Virtual ma...	Yong_Server 2003_(20...	View
✔ Completed	Back up VM	2020-03-15 17:17:37	2020-03-15 17:20:51	admin(192.200.19.4)	192.168.20.4	Virtual ma...	Yong_Server 2003	View
✘ Failed	Migrate across plat...	2020-03-15 17:01:43	2020-03-15 17:01:52	admin(192.168.20.3)	192.168.20.5	Virtual ma...	Yong_Server 2003	View
✘ Failed	Migrate across plat...	2020-03-15 17:01:03	2020-03-15 17:01:35	admin(192.168.20.3)	192.168.20.5	Virtual ma...	Yong_Server 2003	View
✔ Completed	Power on VM	2020-03-15 12:20:50	2020-03-15 12:20:53	admin(192.200.19.4)	192.168.20.3	virtual ma...	Yong_Server 2003	View
✔ Completed	Clone VMware virt...	2020-03-15 12:19:19	2020-03-15 12:20:16	admin(192.200.19.4)	192.168.20.3	virtual ma...	Yong_Server 2003	View

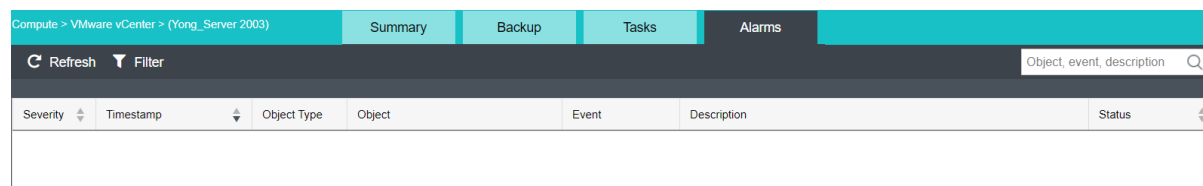
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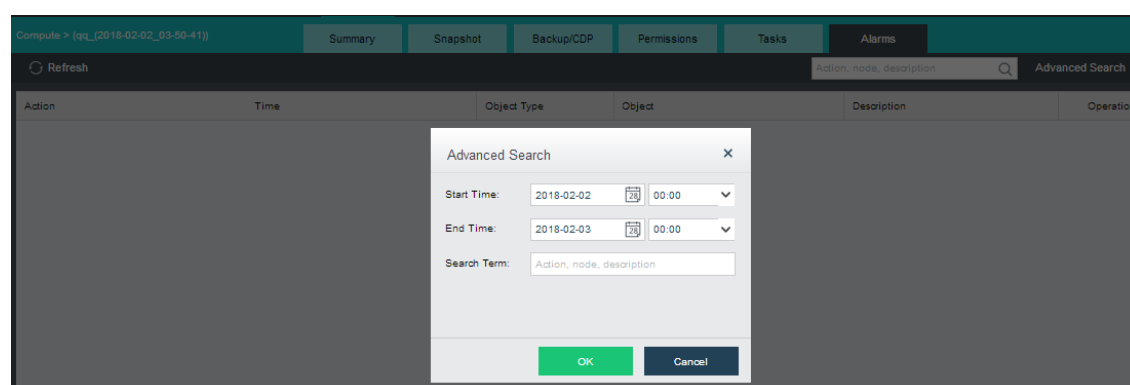
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2.2.2.11 Viewing Alerts

On the **Alarms** page, you can view alarm logs. For instance, an alarm log records that VM CPU usage is above threshold, etc. When an alarm-triggering threshold is reached, a corresponding alarm will be triggered and an alarm log will be generated. An alarm log includes the following information: **Action**, **Time**, **Object**, **Object Type**, **Description** and **Status**. To view details of an alarm log, click **View** in **Operation** column.



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



For how to configure alarm options, refer to **Alarms Options** section.

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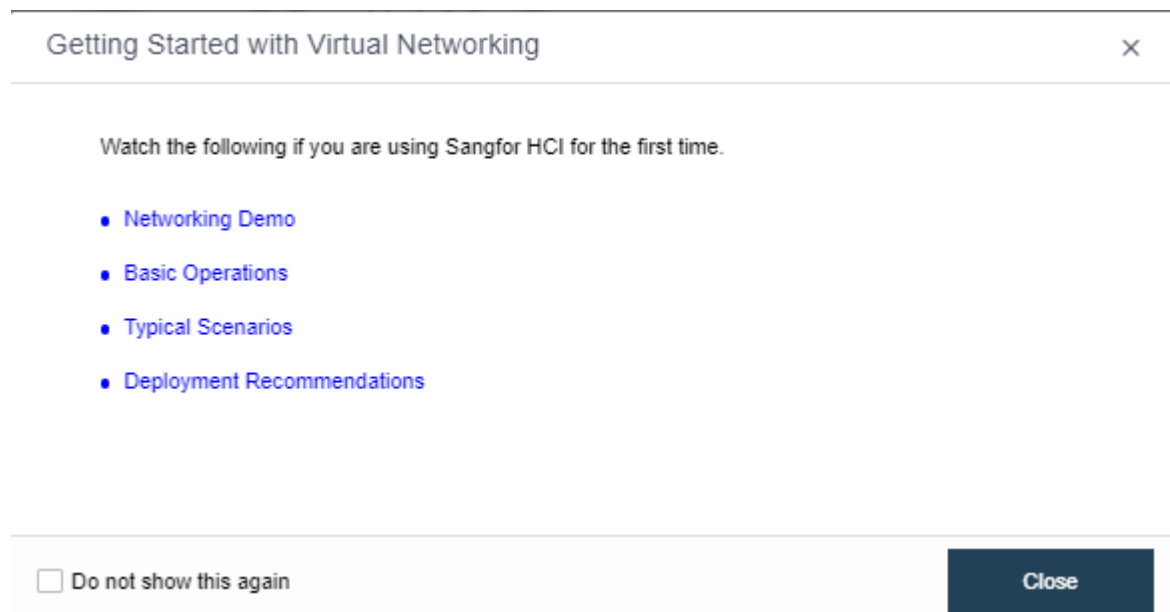
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2.3 Configuring Virtual Network

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: **Networking Demo**, **Basic Operations**, **Typical Scenarios** and **Deployment Recommendations**, as shown below:



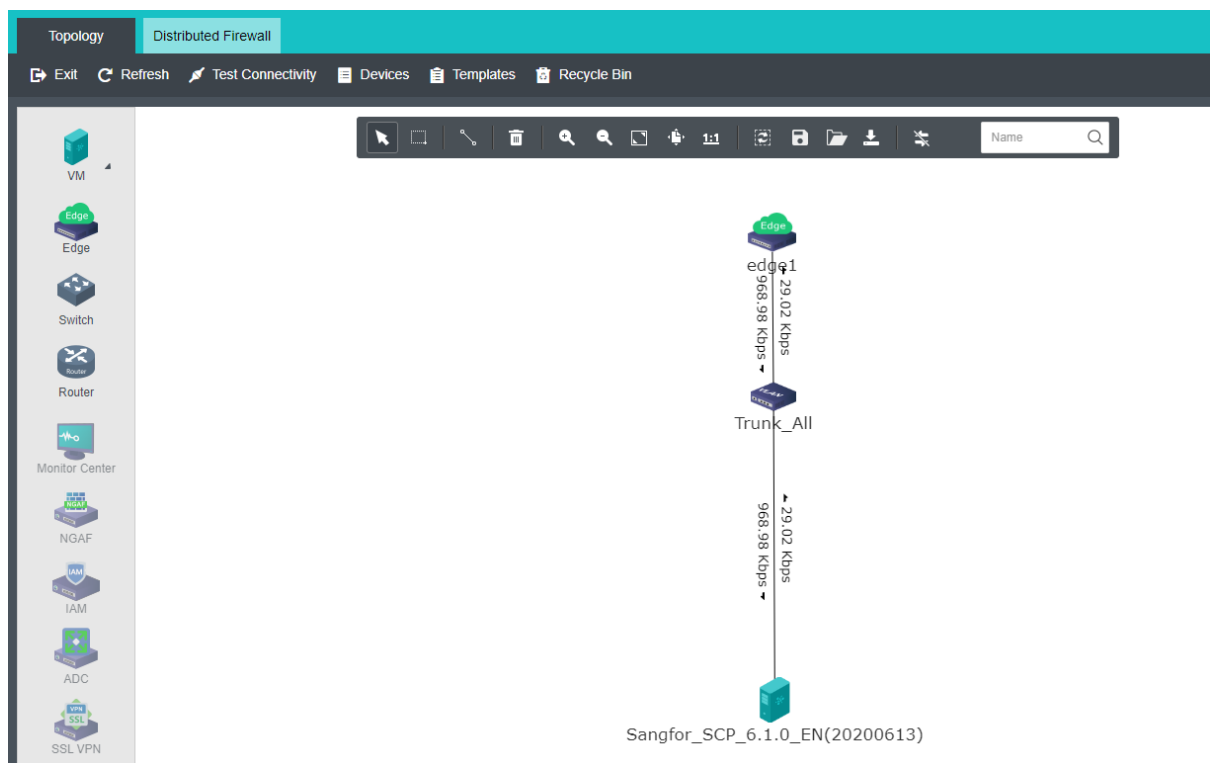
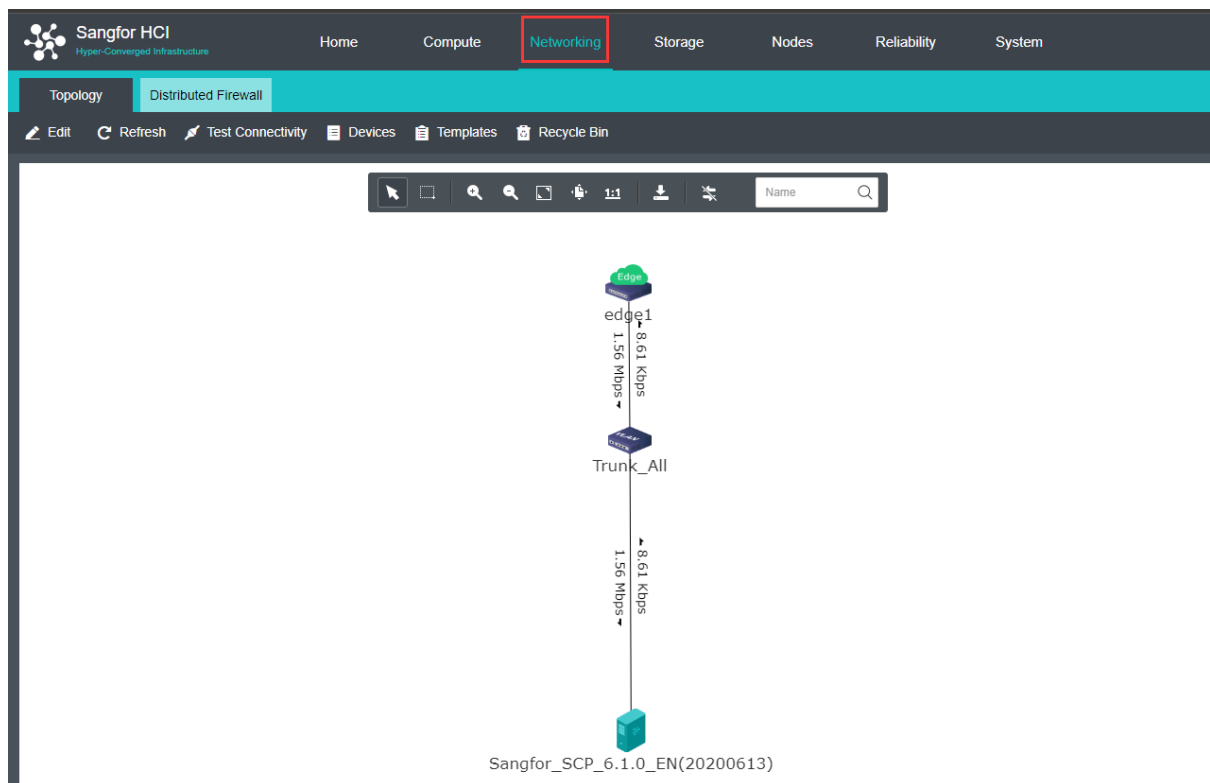
2.3.2 Deploying Network Topology

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:

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2.3.3 Configuring Edge

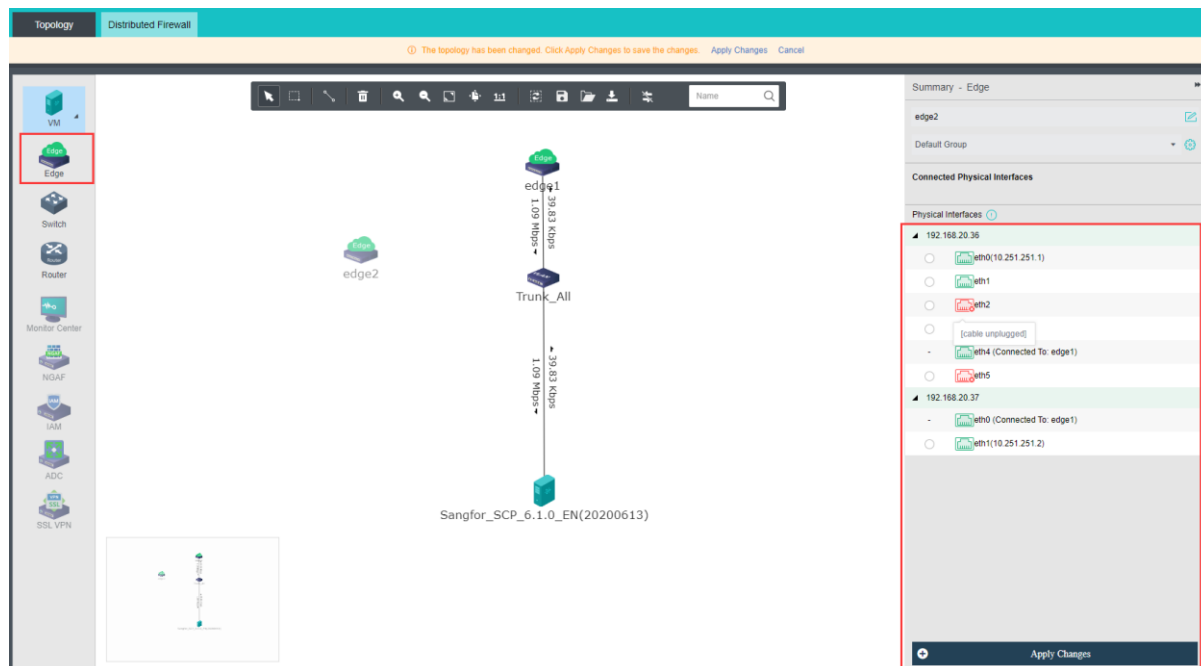
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An edge connects physical network and virtual network. It uses physical interface or aggregate interface to connect to physical network in **Trunk** mode. When configuring edge, you need to specify port group. A port group consists of more than one 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**.



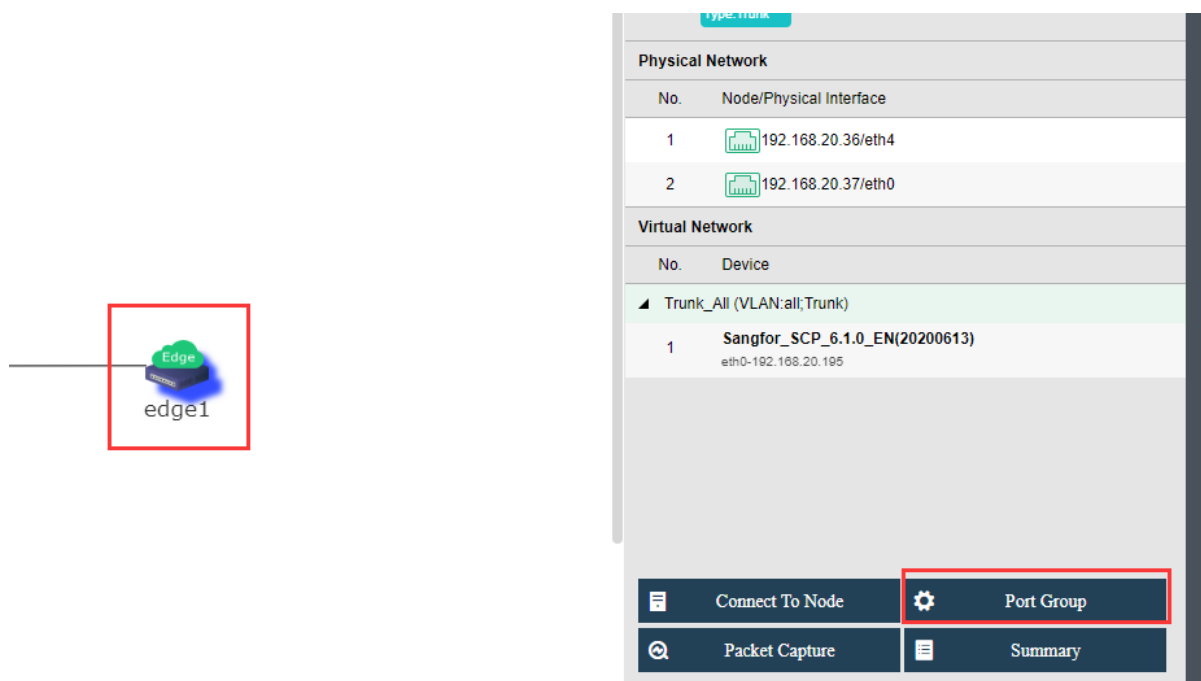
2.3.3.1 Viewing Edge Settings

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.

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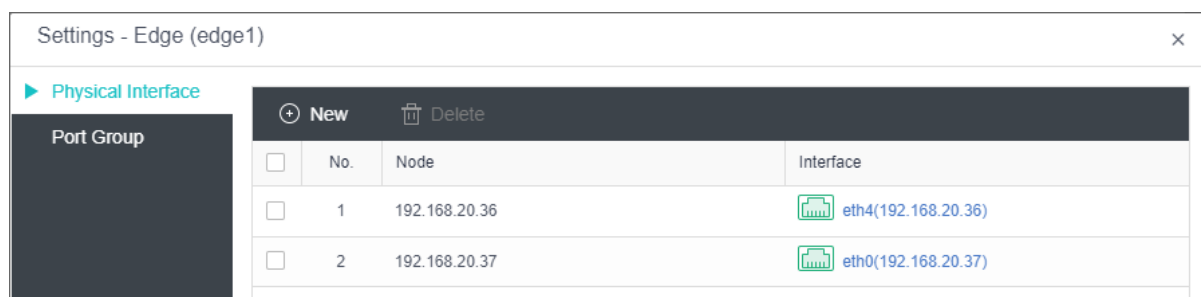
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2.3.3.1.1 Configuring Physical Interface

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. as shown below:



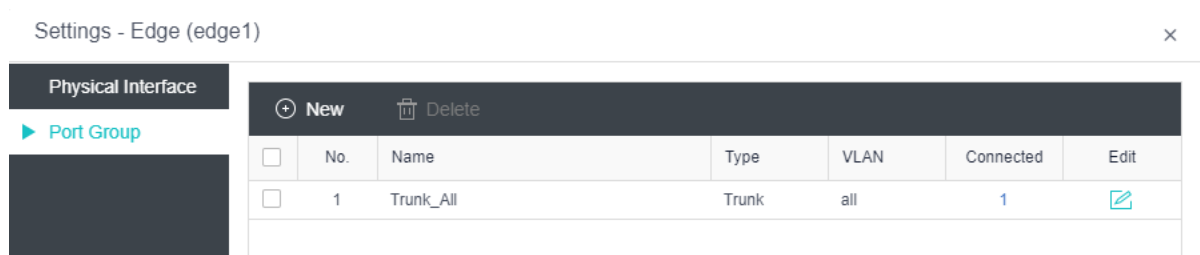
2.3.3.1.2 Configuring Port Group

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

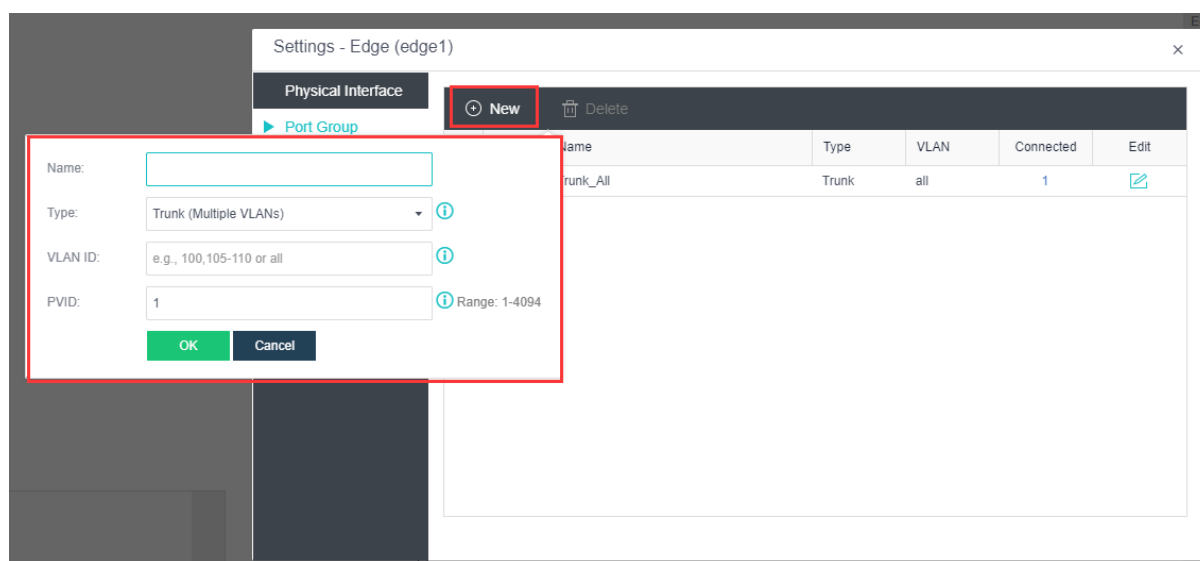
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To add a new port group, click **Add** to enter the following page and configure related fields.



[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. The packets without VLAN information are allowed to go through this port.

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**.

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[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 may 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),

The screenshot displays two windows from the Sangfor management interface. The top window, titled "Settings - Edge (edge1)", shows the "Port Group" tab. It contains a table with columns: "No.", "Name", "Type", "VLAN", "Connected", and "Edit". A single entry is shown with "No." 1, "Name" Trunk_All, "Type" Trunk, "VLAN" all, and "Connected" 1. The number "1" in the "Connected" column is highlighted with a red box. The bottom window, titled "Devices Connected to Port Group (Trunk_All)", shows a list of connected devices. It includes a search bar and a table with columns: "Connected To" and "Type". One device is listed: "eth0(192.168.20.195)" connected to "Virtual Machine".

No.	Name	Type	VLAN	Connected	Edit
1	Trunk_All	Trunk	all	1	Edit

Connected To	Type
eth0(192.168.20.195)	Virtual Machine

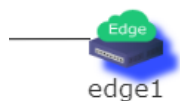
2.3.3.2 Viewing Edge Details

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

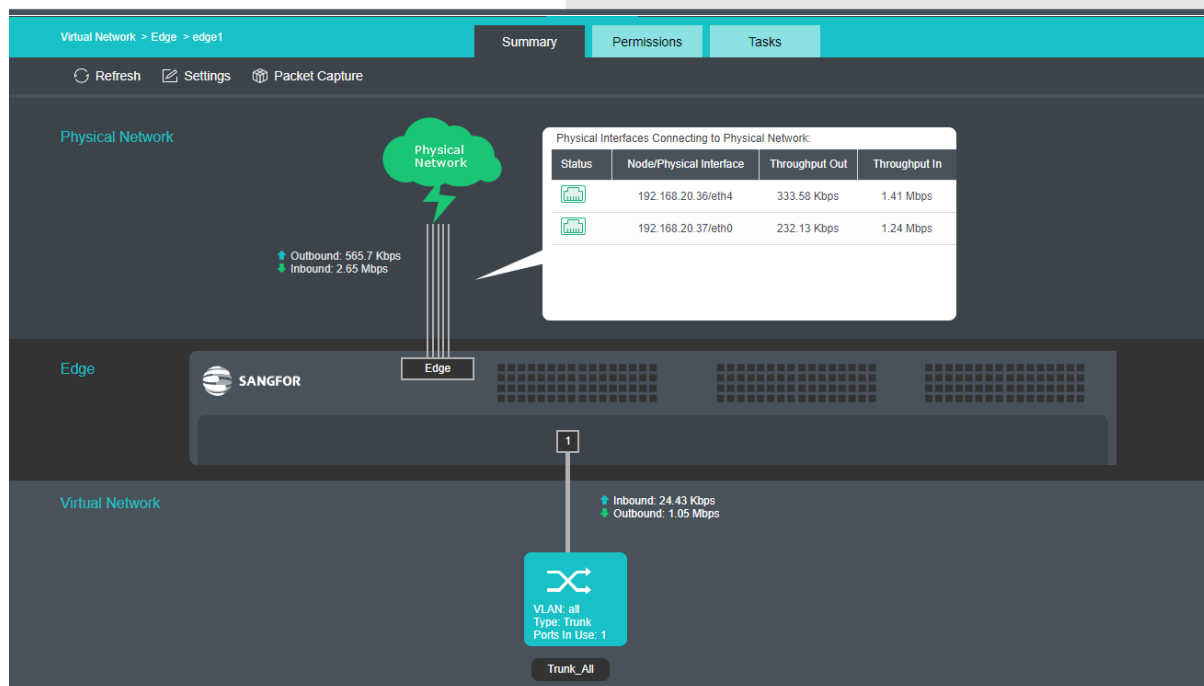
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Type: Trunk	
Physical Network	
No.	Node/Physical Interface
1	192.168.20.36/eth4
2	192.168.20.37/eth0
Virtual Network	
No.	Device
Trunk_All (VLAN:all;Trunk)	
1	Sangfor_SCP_6.1.0_EN(20200613) eth0-192.168.20.195
<div> <div>Connect To Node</div> <div>Port Group</div> <div>Packet Capture</div> <div>Summary</div> </div>	



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

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

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

The screenshot shows the Sangfor management interface. The top navigation bar includes 'Virtual Network > Edge > edge1', 'Summary', 'Permissions', and 'Tasks'. Below this, there are 'Refresh', 'Settings', and 'Packet Capture' buttons. The main area is divided into three sections: 'Physical Network', 'Edge', and 'Virtual Network'. The 'Physical Network' section shows a cloud icon and statistics: Outbound: 565.7 Kbps, Inbound: 2.65 Mbps. The 'Edge' section shows a SANGFOR device icon and a table of physical interfaces. The 'Virtual Network' section shows a switch icon and statistics: Inbound: 24.43 Kbps, Outbound: 1.05 Mbps. The bottom section is 'Packet Capture & Analysis', which includes a form for configuring packet capture. The form has fields for 'Interface', 'Expression' (with a TCPDUMP example), and 'Max File Size' (set to 10 MB). A 'Capture' button is at the bottom. To the right of the form is a help panel with 'Format', 'Protocols', 'Directions', 'Types', and 'Logical Operation' sections.

Status	Node/Physical Interface	Throughput Out	Throughput In
	192.168.20.36/eth4	333.58 Kbps	1.41 Mbps
	192.168.20.37/eth0	232.13 Kbps	1.24 Mbps

Packet Capture & Analysis

Interface:

Expression:

Max File Size: MB

Capture

Format: [Protocol] [Direction] [Type] <Address>

Protocols: ip, ip6, icmp, icmp6, arp, rarp, tcp, udp

Directions: src, dst, dst or src, dst and src

Types: host address, network address, port

Logical Operation: not, !, and, &&, or, ||

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.

Tasks: This section displays administrator logs, which record various operations performed **Sangfor Technologies**

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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.

Virtual Network > Edge > edge1					Summary	Permissions	Tasks
Refresh							
Status	Action	Start Time	End Time	Username			
Completed	Delete port group	2021-01-20 15:43:33	2021-01-20 15:43:33	admin(192.200.19.4)			
Completed	Edit port group	2021-01-20 15:41:11	2021-01-20 15:41:11	admin(192.200.19.4)			
Completed	Add port group	2021-01-20 15:36:05	2021-01-20 15:36:05	admin(192.200.19.4)			
Completed	Edit edge	2021-01-19 10:35:16	2021-01-19 10:35:18	admin(192.200.19.4)			
Completed	Add edge	2021-01-12 22:38:28	2021-01-12 22:38:29	admin(192.200.19.4)			

2.3.4 Configuring Virtual Switch

On a virtual switch, you can add connection, 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 **Communication Interface** and then click on the **Overlay Interface** tab to enter the following page:

Nodes

Physical Interfaces

Communication Interfaces

System Disks

Management Interface

Overlay Network Interface

Edge-connected Interface

Storage Network Interface




Flow Control

Refresh

Settings

Network Interface Planning Tips

An overlay network interface is used for business data transfer across nodes. VMs running on different nodes communicate with each other through this interface.

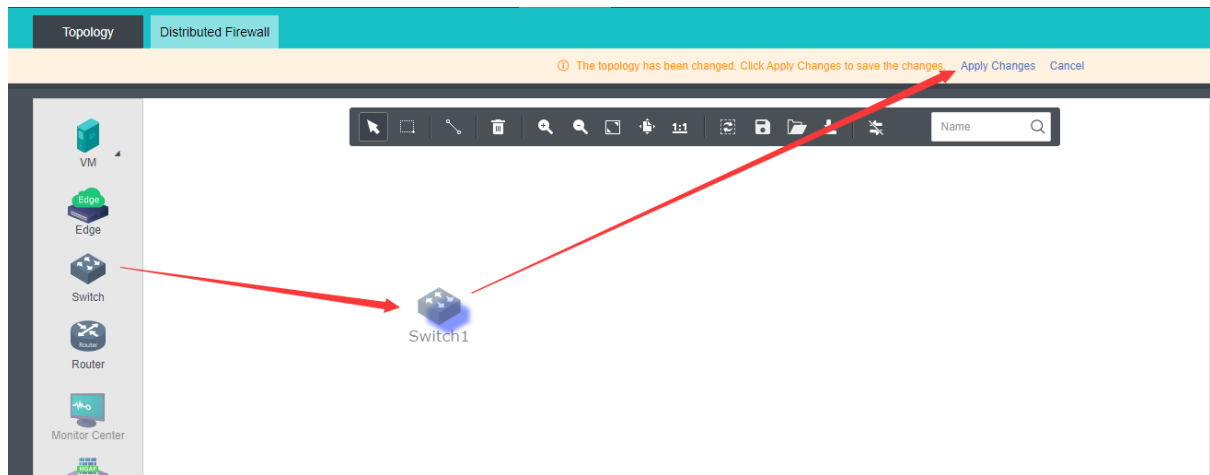
Node Name	Overlay Network Interface	Interface IP	Netmask	Driver Type	Link Mode	MTU	VLAN ID
192.168.20.3	 eth1	172.16.90.2	255.255.255.0	igb	Auto-negotiation (1000...	1600	-
192.168.20.4	 eth1	172.16.90.3	255.255.255.0	igb	Auto-negotiation (1000...	1600	-
192.168.20.5	 eth1	172.16.90.1	255.255.255.0	igb	Auto-negotiation (1000...	1600	-

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

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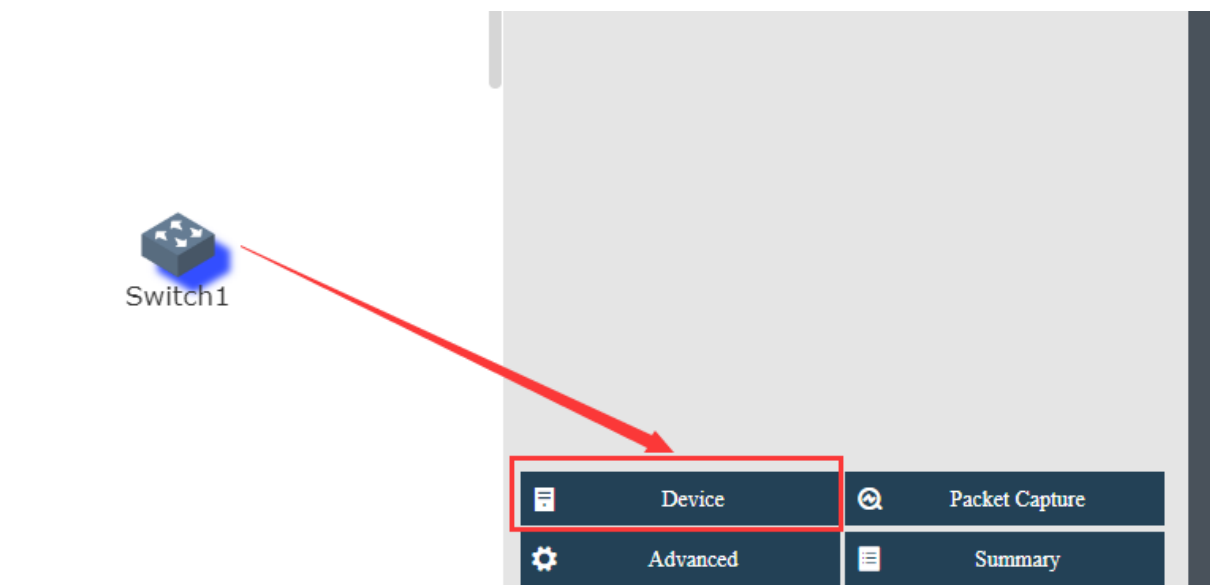


2.3.4.1 Viewing Switch Settings

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

2.3.4.1.1 Adding Connection

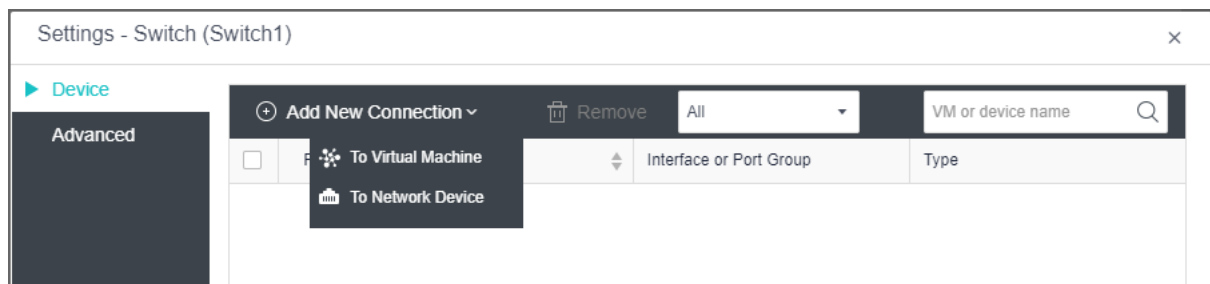
On the **Device** tab, you can add connection to virtual machines and network devices(such as router, NGAF, ADC, IAM, WOC, and SSL VPN), as shown below:



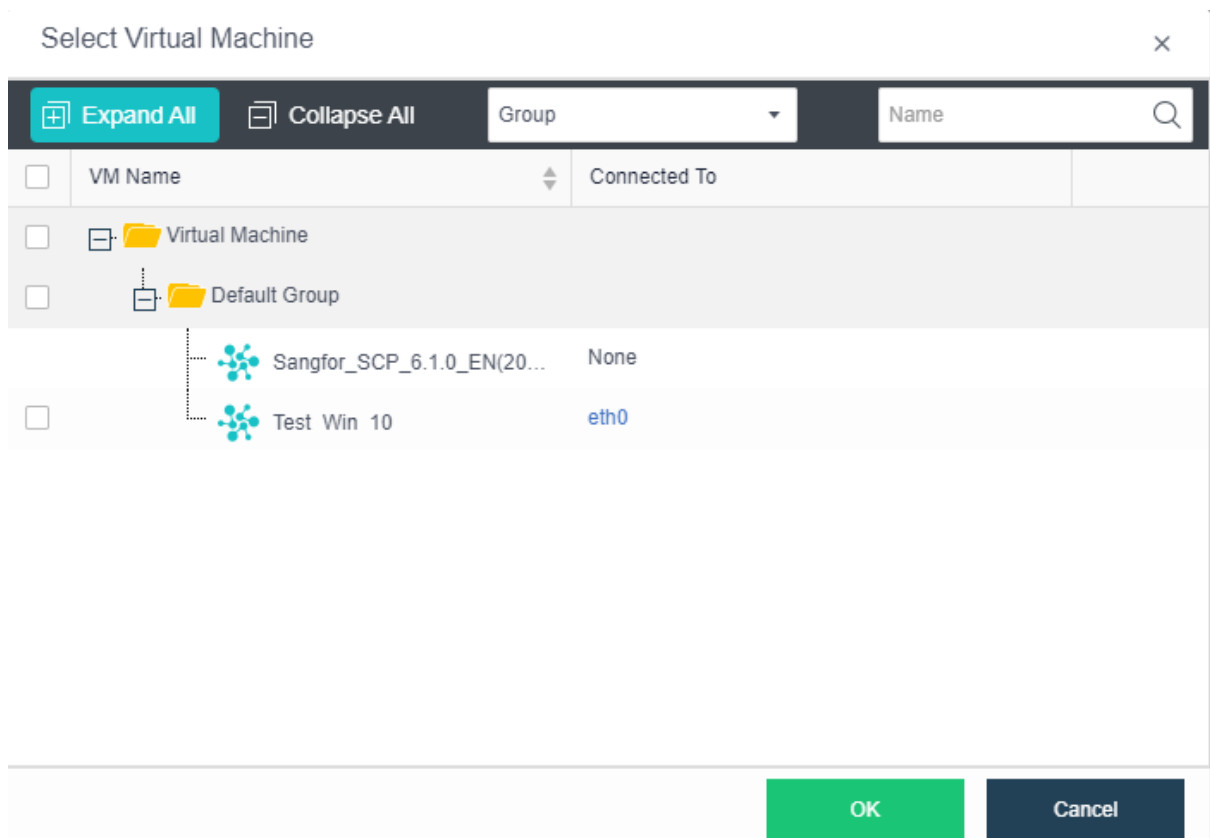
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To add connection to a virtual machine, select **Add Connection > To Virtual Machine**, then select the VM that you want to connect to the switch. Click **OK** to save the settings. as shown below:

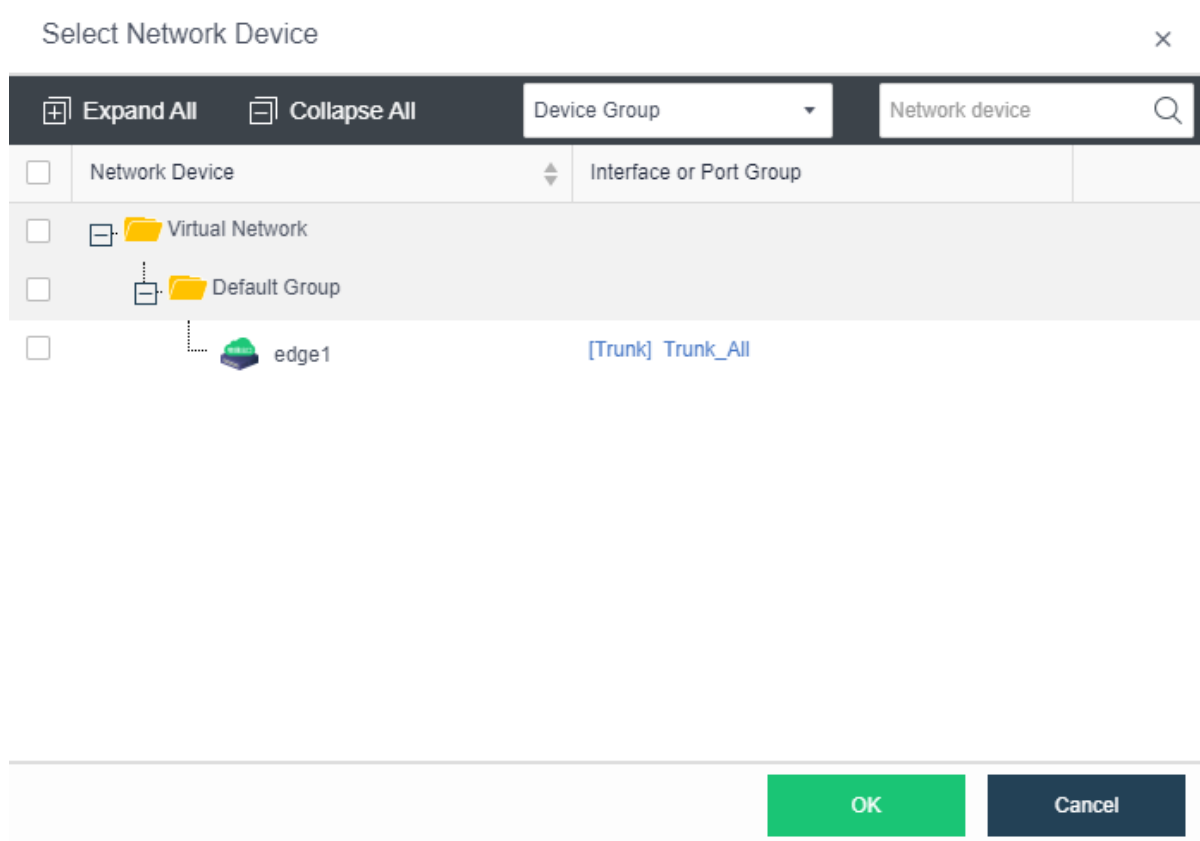


To add connection to a network device, select **Add Connection > To Network Device**, select the network device that you want to connect to the switch and then click **OK**, as shown below:

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2.3.4.1.2 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.

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Settings ×

Restrain data transfer rate if the threshold is reached:

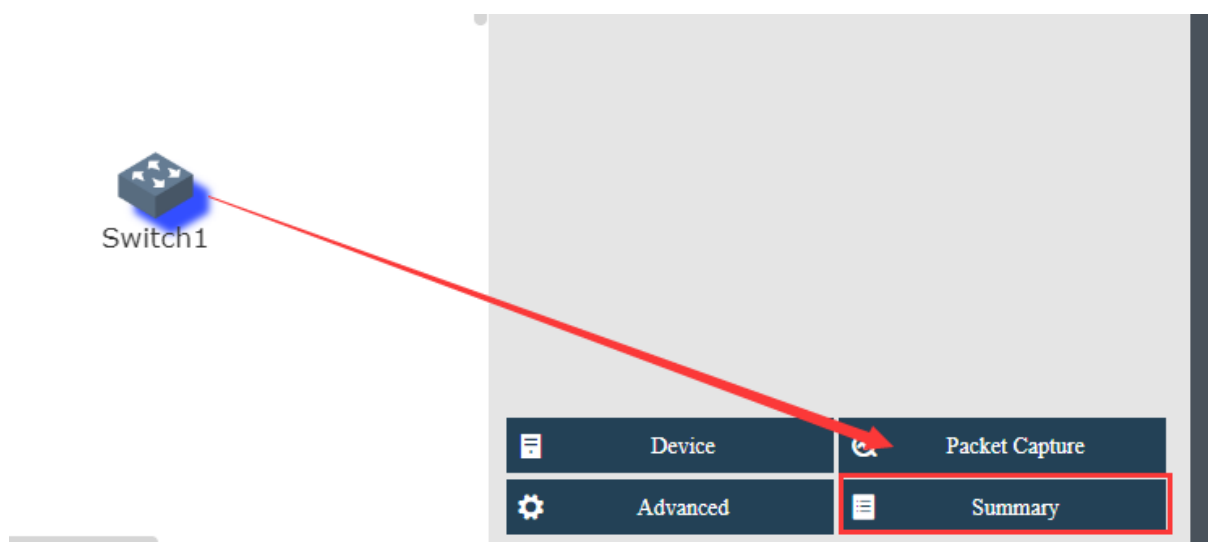
Threshold: Kbps

OK

Cancel

2.3.4.2 Viewing Switch Summary

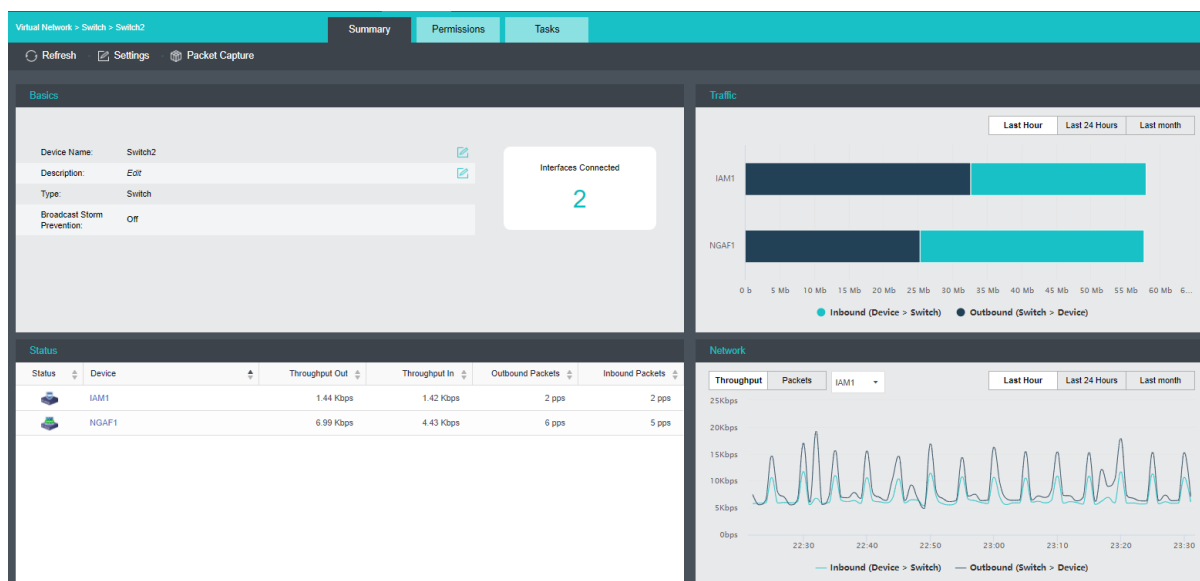
To view detailed settings of a switch, select the switch and click **Summary** button to enter switch summary page. Here you can view **Basics**, **Traffic**, **Status** and **Network**. You can also view admin logs on the **Admin Logs** tab.



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

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

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

The screenshot displays the 'Virtual Network > Switch > Switch2 > Packet Capture' page. The main content area is titled 'Packet Capture & Analysis'.

Interface: A dropdown menu shows 'Interface'.

Expression: A text box contains 'TCPDUMP expression' and 'Example: IP host 210.27.48.1 and ! 210.27.48.2'.

Max File Size: A text box contains '10' and a unit selector 'MB'.

Capture: A button labeled 'Capture'.

Format: A text box shows the format '[Protocol] [Direction] [Type] <Address>'.

Protocols: A list of protocols: ip, ip6, icmp, icmp6, arp, rarp, tcp, udp.

Example: IP host 210.27.48.1, indicates IP packets from node 210.27.48.1. If protocol is not specified, packets based on all protocols will be listened.

Directions: src, dst or src, dst and src.

Example: Src 210.27.48.2, indicates the source address is 210.27.48.2; Dst net 202.0.0.0, destination address is 202.0.0.0. If direction is not specified, default is Src or Dst.

Types: host address, network address, port.

Example: host 210.27.48.2, indicates that 210.27.48.2 is host IP address; net 202.0.0.0, indicates that 202.0.0.0 is an network address; port 23, indicates port number is 23. If type is not specified, default type is host.

Logical Operation: not, !, and, &&, or, |.

Example: ip host 210.27.48.1 and ! 210.27.48.2 indicates that 210.27.48.1 is included but 210.27.48.2 is not.

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.

Tasks: This section 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**

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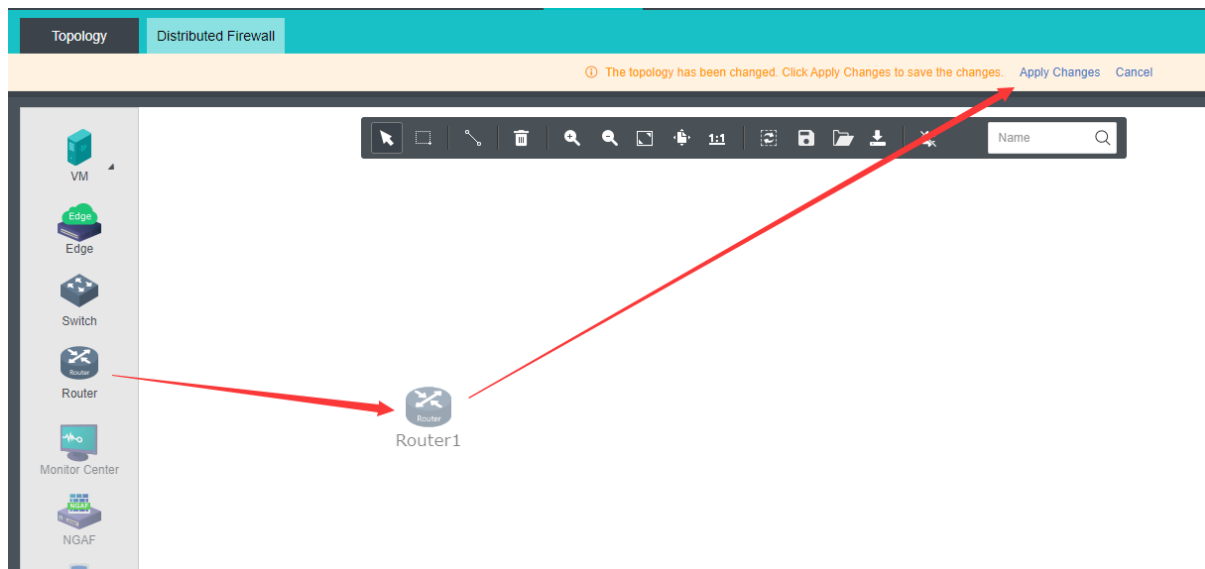
Type, Object and **Operation**. To view log details, click **View** in **Operation** column.

Virtual Network > Switch > Switch2						
Summary Permissions Tasks						
Refresh						
Status	Action	Start Time	End Time	Username	Node	Object Type
Completed	Add virtual switch	2020-12-22 20:52:57	2020-12-22 20:53:09	admin(192.200.19.4)	Node-2	virtual switch

2.3.5 Configuring Virtual Router

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

To deploy a virtual router, go to **Networking** page, 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.



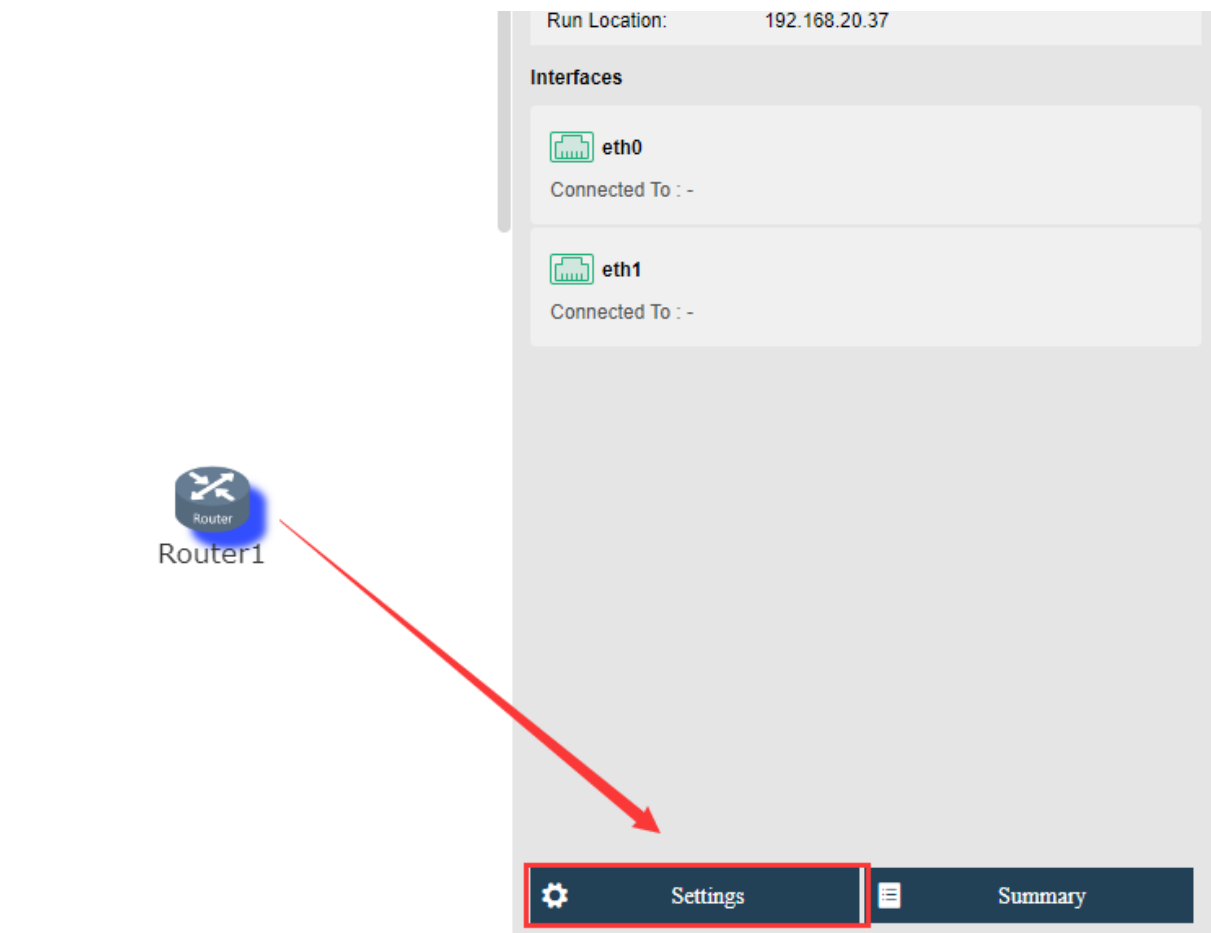
2.3.5.1 Viewing Router Settings

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).

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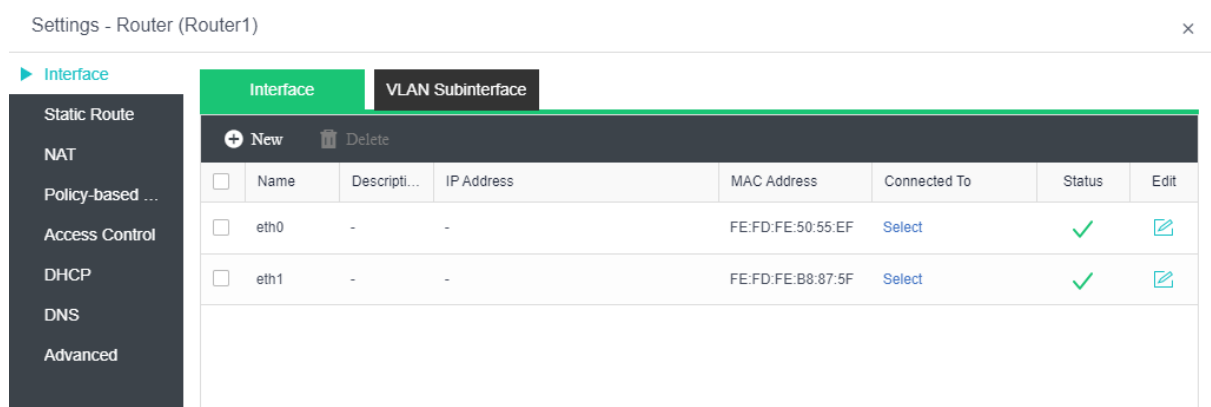
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2.3.5.1.1 Configuring Interface

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



To add interface(s), click **Add** and specify the number of interfaces that you want to add.

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Add New VLAN Subinterface

×

☒ Enable

Connected To:

Select

▼

VLAN ID

ⓘ

Description:

Optional

IP Address:

☒ Enable IPv4 address

IP Address:

Example: 192.168.1.1

ⓘ

Netmask:

Example: 255.255.255.0

☐ Enable IPv6 address

OK

Cancel

Support to enable IPv4 and IPv6 address.

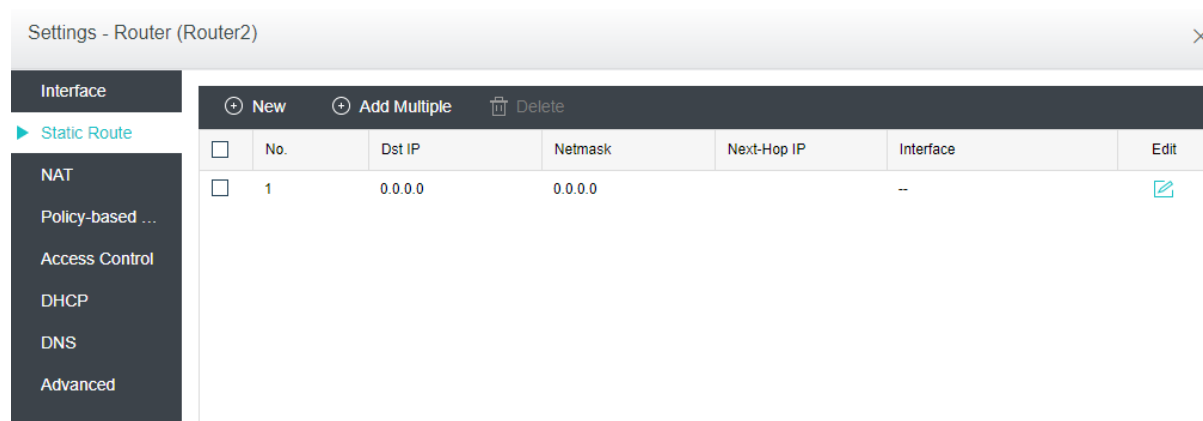
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2.3.5.1.2 Configuring Static Route

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. You may add one static route at a time or multiple static routes at a time.



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

Dst IP: Specifies the destination Ipv4 or Ipv6 address.

Netmask: Specifies netmask corresponding to the destination IP address.

Next-Hop IP: Specifies the next-hop Ipv4 or Ipv6 address.

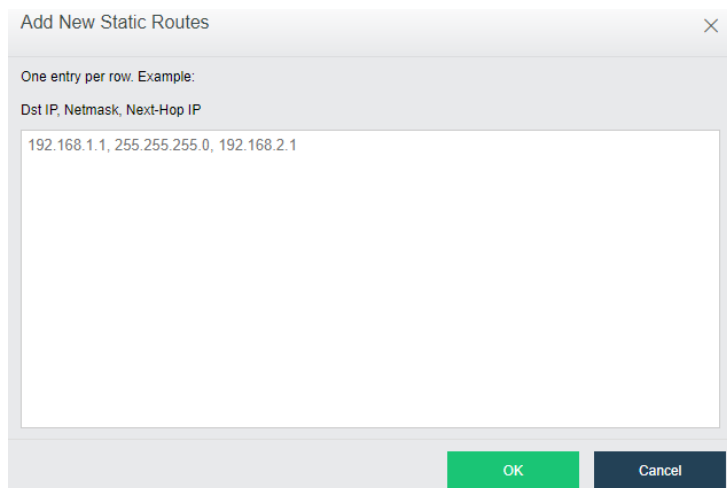
Interface: Specifies the interface through which data is forwarded.

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

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Add New Static Routes

One entry per row. Example:
Dst IP, Netmask, Next-Hop IP

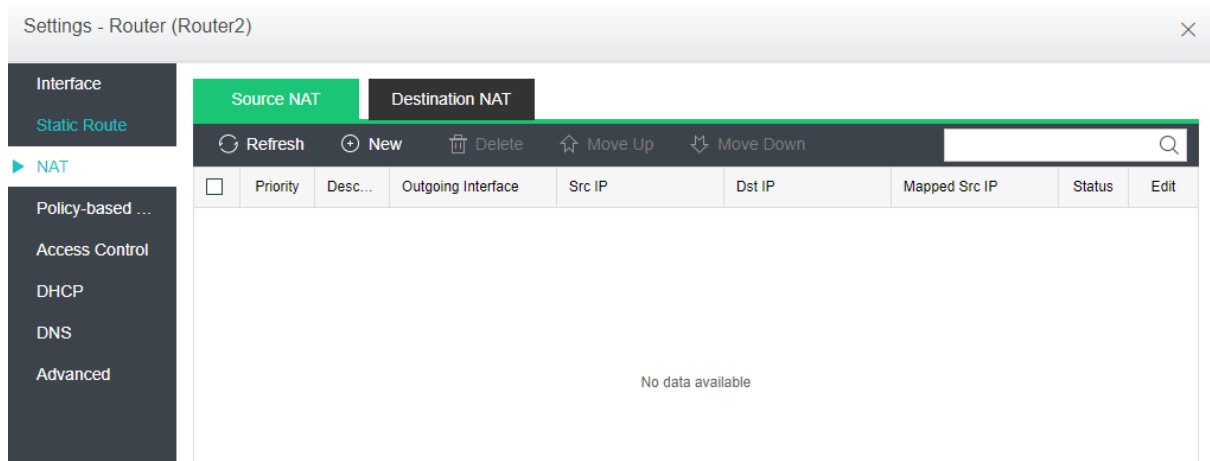
192.168.1.1, 255.255.255.0, 192.168.2.1

OK Cancel

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

2.3.5.1.3 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.



Settings - Router (Router2)

Interface Static Route

► NAT

Policy-based ...

Access Control

DHCP

DNS

Advanced

Source NAT Destination NAT

Refresh New Delete Move Up Move Down

	Priority	Desc...	Outgoing Interface	Src IP	Dst IP	Mapped Src IP	Status	Edit
No data available								

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

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Add New SNAT Rule
×

☒ Enable

Description:

Interface

Outgoing Interface:
Select

Source

Src IP:
☒ All
☐ Specified(support IPv4 address only)

Destination

Dst IP:
☒ All
☐ Specified(support IPv4 address only)

Address Translation

Mapped Src IP:
☒ Outgoing interface IP
☐ Specified(support IPv4 address only)

OK

Cancel

[**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:

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[**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.

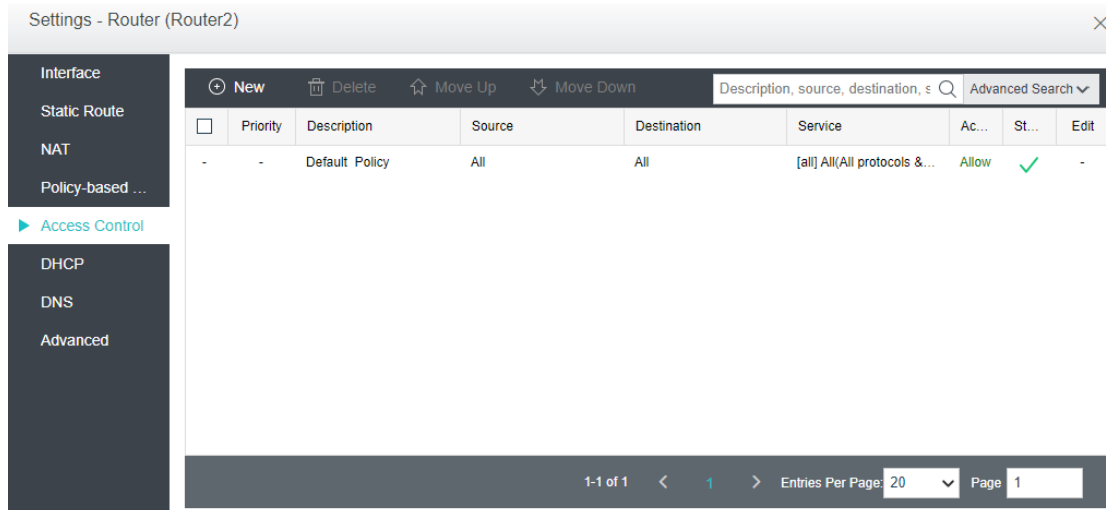
2.3.5.1.4 Configuring Access Control Policy

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.

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

Add New Access Control Policy

☒ Enable

Description:

Source

☒ All
☐ Interface

Select

☐ Specified(support IPv4 address only)

Example

Destination

☒ All
☐ Interface

Select

☐ Specified(support IPv4 address only)

Example

Service:

Select

- Action

Action:
☒ Allow
☐ Deny

OK

Cancel

Enabled: Select this option to enable the policy.

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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.

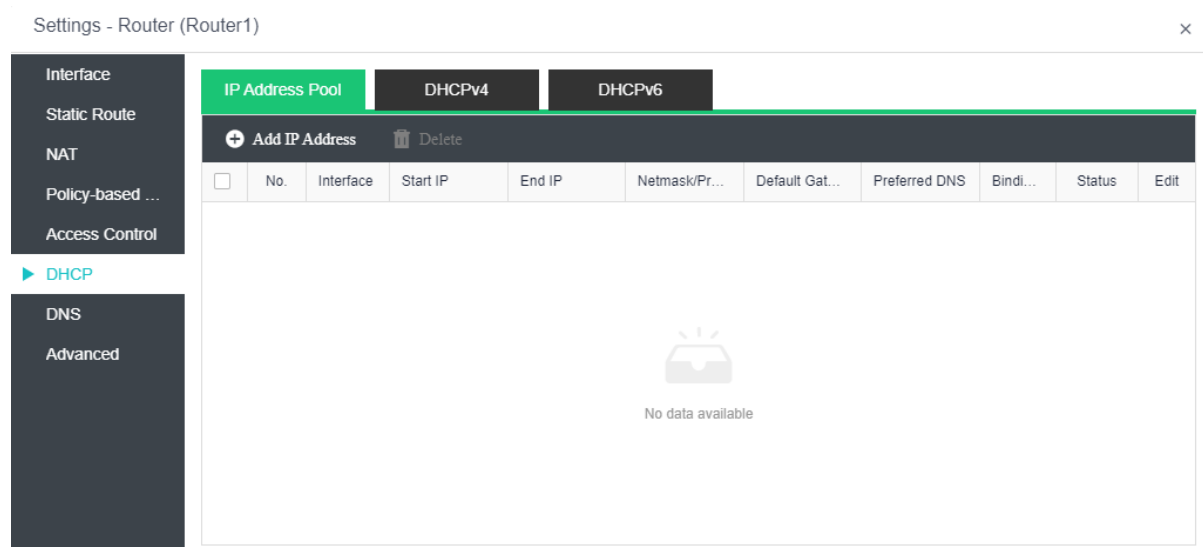
Specified: Specifies specific source or destination IP address.

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**.

2.3.5.1.5 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.

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Add IP Address
×

IP Address Type:
☒ IPv4
☐ IPv6

Interface:

Select

Start IP:

Example: 192.168.1.1

i

End IP:

Example: 192.168.1.1

i

Netmask:

Example: 255.255.255.0

Default Gateway:

Default gateway, example: 192.168.1.1

Preferred DNS:

Optional. Example: 8.8.8.8

Alternate DNS:

Optional. Example: 8.8.8.8

Advanced

⌵

OK

Cancel

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

Advanced: You can specify **Preferred WINS**, **Alternate WINS**, and **Lease**. As for **Lease**, it specifies the period that allocated IP addresses can be used, as shown below:

Advanced

⌵

Preferred WINS:

Optional

Alternate WINS:

Optional

Lease:

1

day

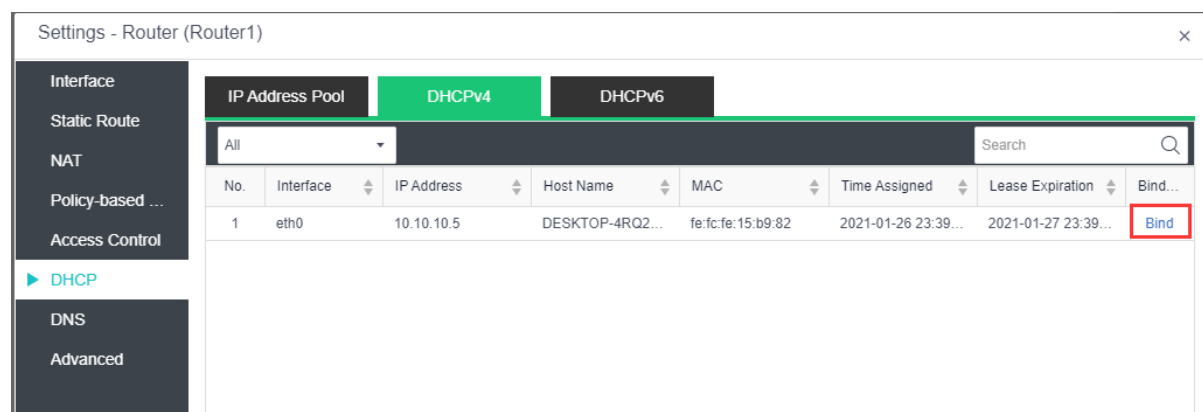
On the **DHCPv4/DHCPv6** tab, it displays the following information: **Interface**, **IP Address**,

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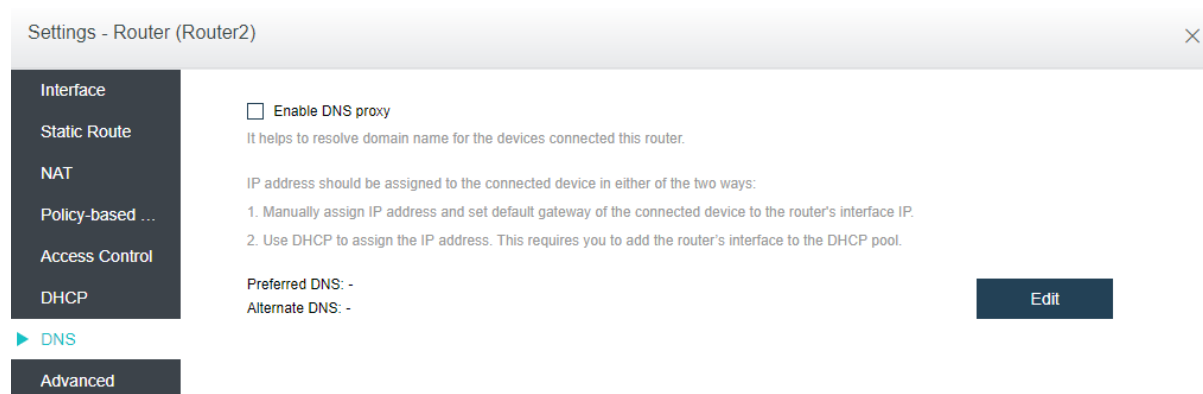
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Host Name, MAC, Time Assigned, Lease Expiration and Bindings. To bind IP address with a corresponding host, click **Bind** and specify MAC address. Thus, the IP address will be only assigned to the host with the specified MAC address.



2.3.5.1.6 Configuring DNS

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



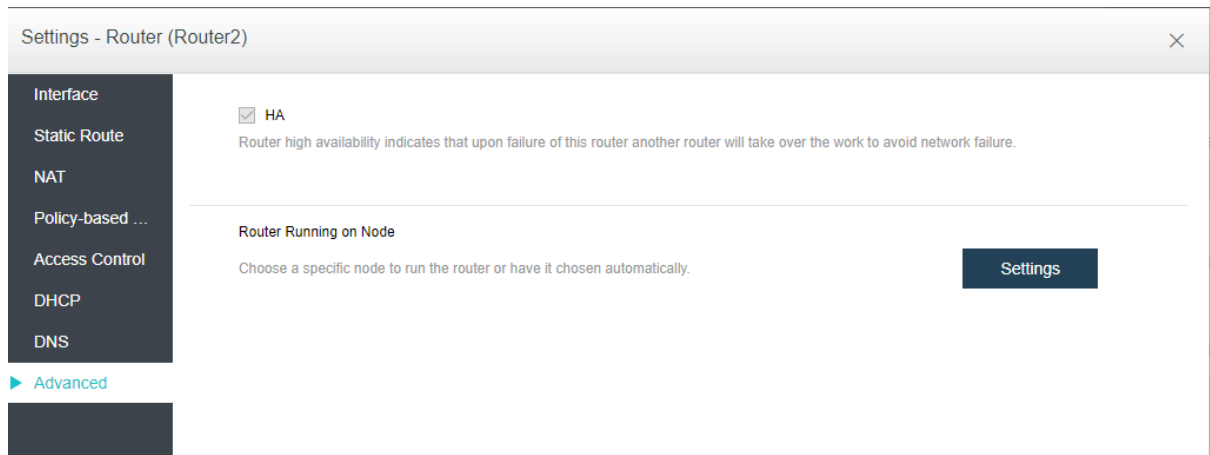
2.3.5.1.7 Configuring Advanced Settings

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

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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 high availability enabled, the router will still recover to a second node, but it will take longer to get up and running.

[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.

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Router Running on Node

Current Node

Node:

192.168.20.37

Change

Standby Node

It fails over to the selected node when the current node fails:

☒ Select node based on performance

☐ Select node based on priority

+

Add New Node

Remove

Move Up

Move Down

<input type="checkbox"/>	Priority	Node
<div><div></div><div>No data available</div></div>		

OK

Cancel

2.3.5.2 Viewing Router Summary

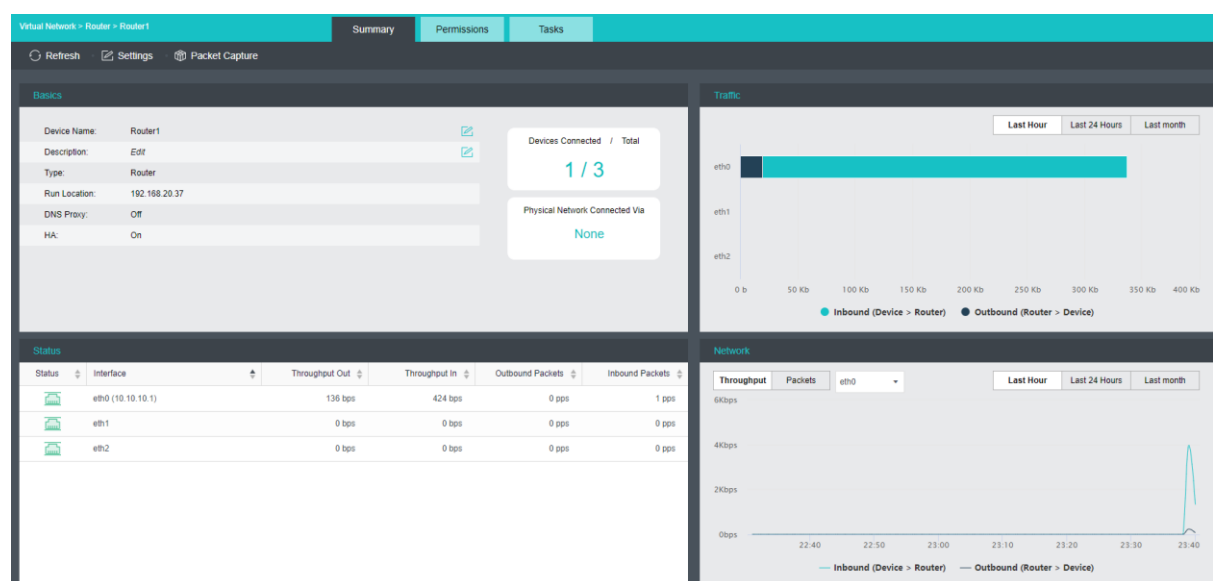
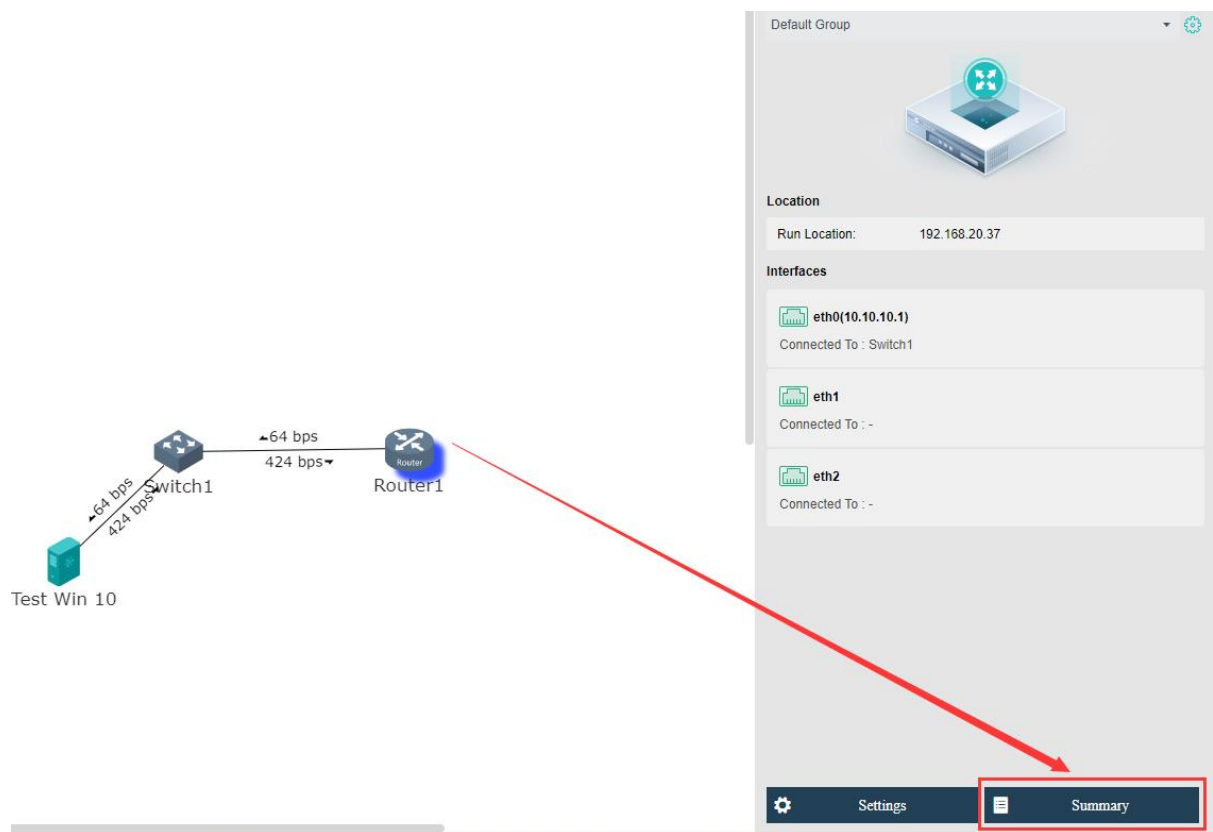
You can view detailed information of a virtual router by selecting the router and clicking **Summary** button. On the **Summary** page, it displays **Basics**, **Traffic**, **Status** and **Network**. On the **Admin Logs** page, it displays administrator logs.

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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:

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Virtual Network > Router > Router1 > Packet Capture

Packet Capture & Analysis

Interface: <Select>

Expression: TCPDUMP expression
Example: IP host 210.27.48.1 and ! 210.27.48.2

Max File Size: 10 MB

Capture

Format: [Protocol] [Direction] [Type] <Address>

Protocols: ip, ip6, icmp, icmp6, arp, rarp, tcp, udp

Example: IP host 210.27.48.1, indicates IP packets from node 210.27.48.1. If protocol is not specified, packets based on all protocols will be listened.

Directions: src, dst, dst or src, dst and src

Example: Src 210.27.48.2, indicates the source address is 210.27.48.2; Dst net 202.0.0.0, destination address is 202.0.0.0. If direction is not specified, default is Src or Dst.

Types: host address, network address, port

Example: host 210.27.48.2, indicates that 210.27.48.2 is host IP address; net 202.0.0.0, indicates that 202.0.0.0 is an network address; port 23, indicates port number is 23. If type is not specified, default type is host.

Logical Operation: not, !, and, &&, or, ||

Example: ip host 210.27.48.1 and ! 210.27.48.2 indicates that 210.27.48.1 is included but 210.27.48.2 is not.

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 **Packet 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.

Tasks: 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.

Virtual Network > Router > Router1								
Summary			Permissions		Tasks			
Refresh								
Action, node, object, description Q Advanced								
Status	Action	Start Time	End Time	Username	Node	Object Type	Object	Operation
Completed	Add IP address pool	2021-01-26 23:38:25	2021-01-26 23:38:25	admin(192.200.19.4)	192.168.20.36	vrouter	Router1	View
Completed	Edit router interface	2021-01-26 23:37:57	2021-01-26 23:37:57	admin(192.200.19.4)	192.168.20.36	vrouter	Router1	View
Completed	Add router interface	2021-01-26 23:34:08	2021-01-26 23:34:08	admin(192.200.19.4)	192.168.20.36	vrouter	Router1	View
Completed	Add router	2021-01-26 23:33:31	2021-01-26 23:33:32	admin(192.200.19.4)	192.168.20.36	Virtual router	Router1	View

2.3.6 Configuring Virtual Network Device

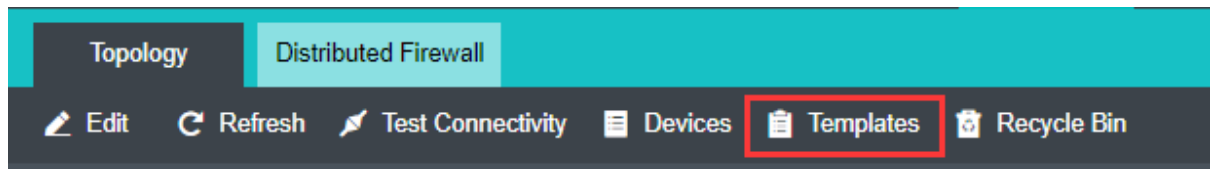
Currently, the virtual network devices(NGAF, ADC, IAM, SSL VPN and WOC) could be deployed into virtual network in **Networking**.

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

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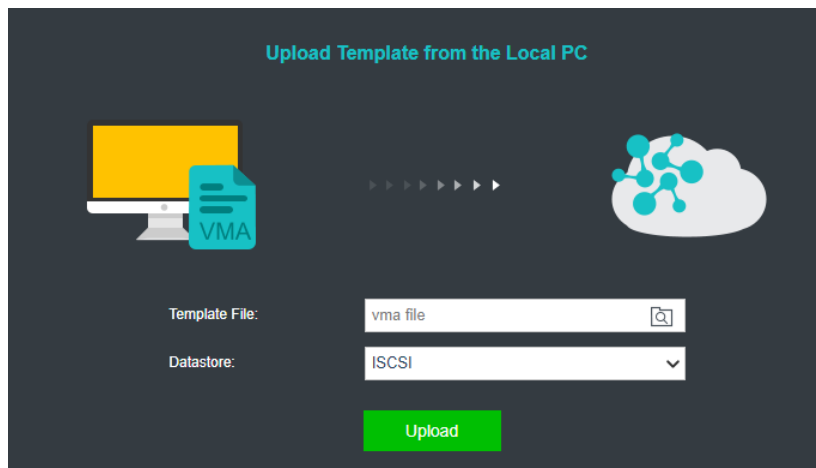
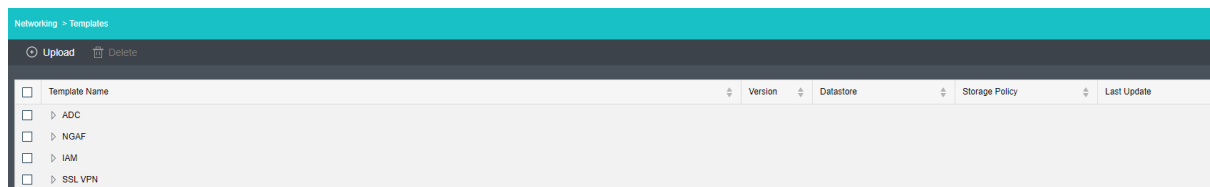
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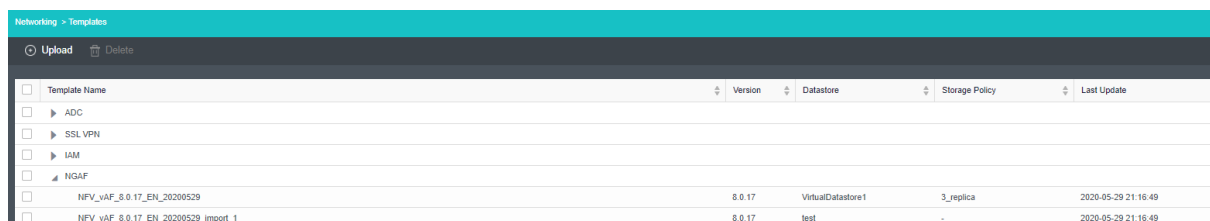


2.3.6.1 Uploading Template

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:

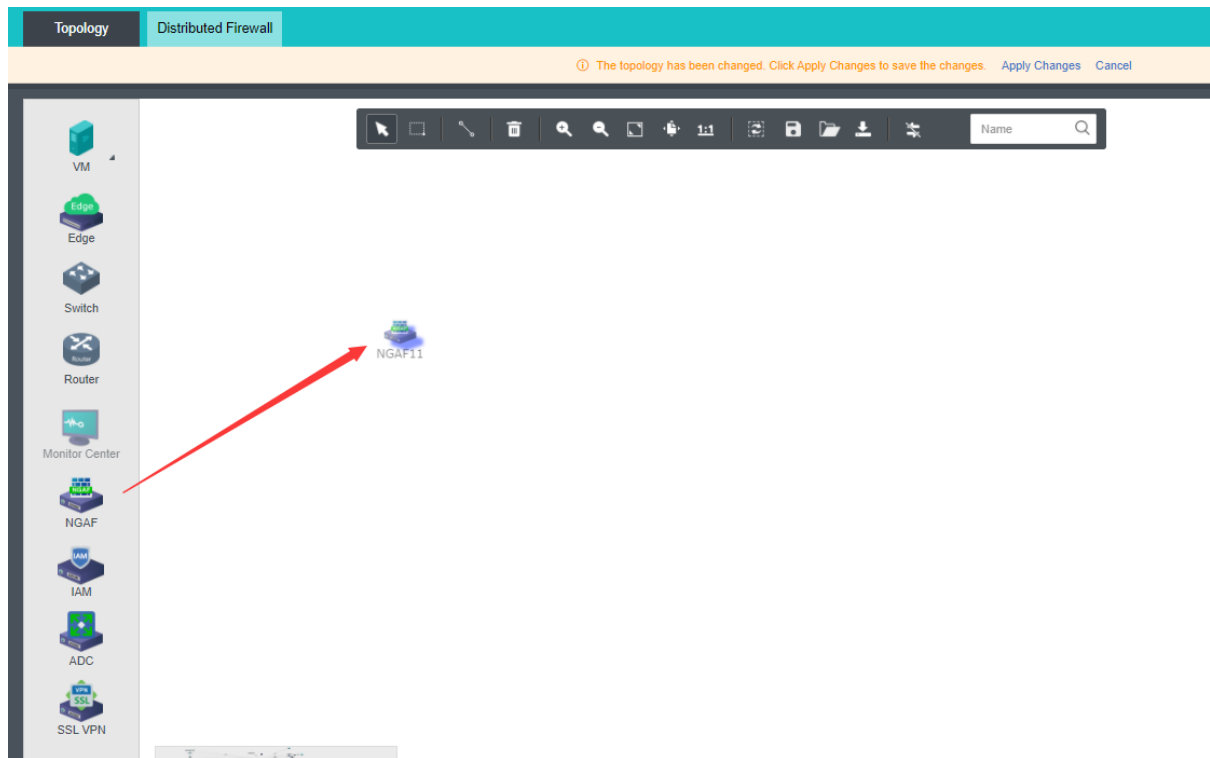


To create a virtual network device, drag the virtual network device onto the canvas and configure the basic information, then click **Apply Changes**.

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Summary - NGAF

NGAF11

Antiproxy



Settings

NICs:4

HA:☒ HA Settings ⓘ

Datastore:VirtualDatastore1

Storage Policy:3_replica

Run Location:<Auto>

NGAF Version:NFV_vAF_8.0.17_ ⓘ

Location

Run Location:

Datastore:

Interfaces

+

Apply Changes

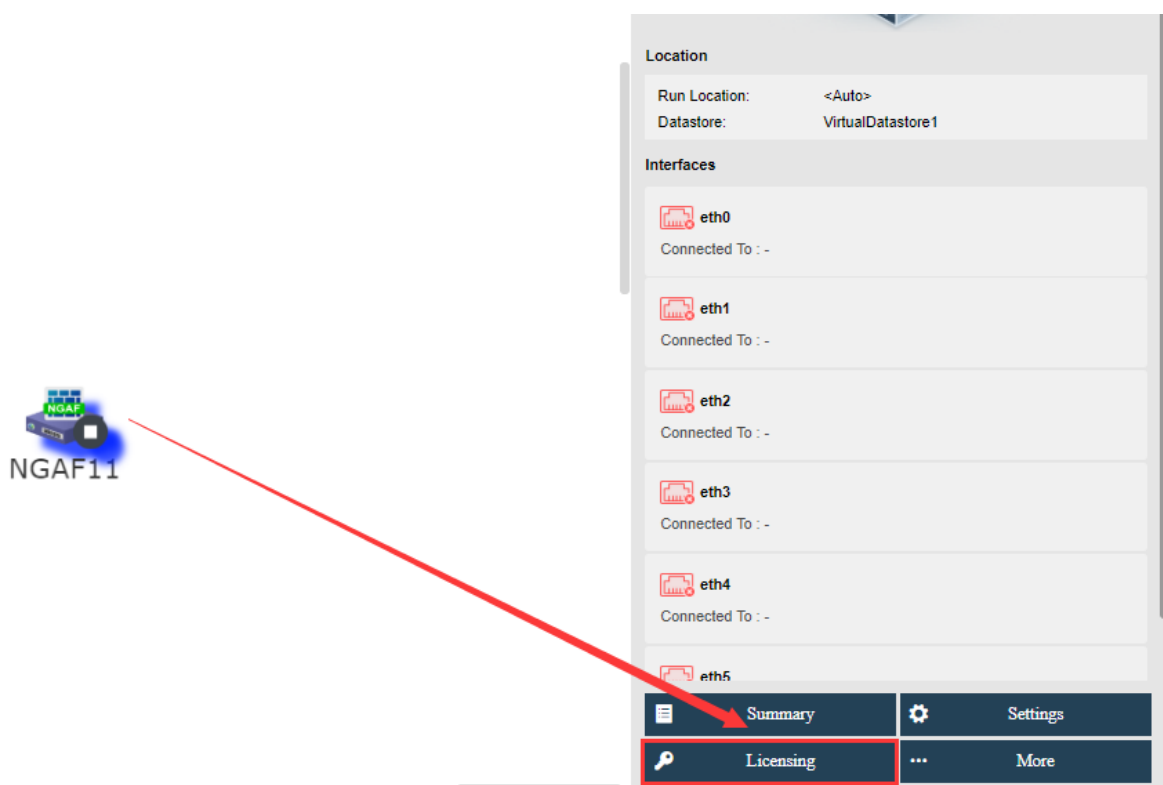
2.3.6.2 Licensing Virtual Network Device

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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:

NGAF Licensing

Device Name: NGAF11

Configuration Standard: 100 Mbps

Licensed Resources

Branch VPN Sites: 0

SSL VPN Users: 0

Server Access Verification: 0

Mobile VPN Users: 0

Licensed Features

Cross-ISP Access Optimization

IPSec VPN

IPS

Antivirus

Web App Protection

Bandwidth Management

Application Control

Licensed Hardware Usage

Type	Free	Licensed Number	Usage
100 Mbps	92	100	8%
200 Mbps	99	100	1%
400 Mbps	96	100	4%
800 Mbps	99	100	1%
1.6 Gbps	99	100	1%

Licensed Resource Usage

Type	Free	Licensed Number	Usage
Branch VP...	49	100	51%
SSL VPN ...	49	100	51%
Server Acc...	57	100	43%
Mobile VP...	51	100	49%

OK

Cancel

Device Name: Displays the name of the virtual network device.

Configuration Standard: Specifies bandwidth for the virtual network device.

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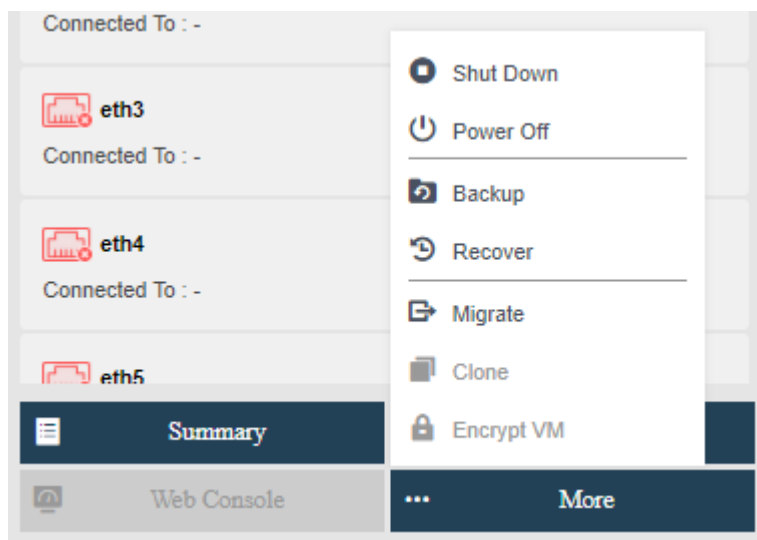
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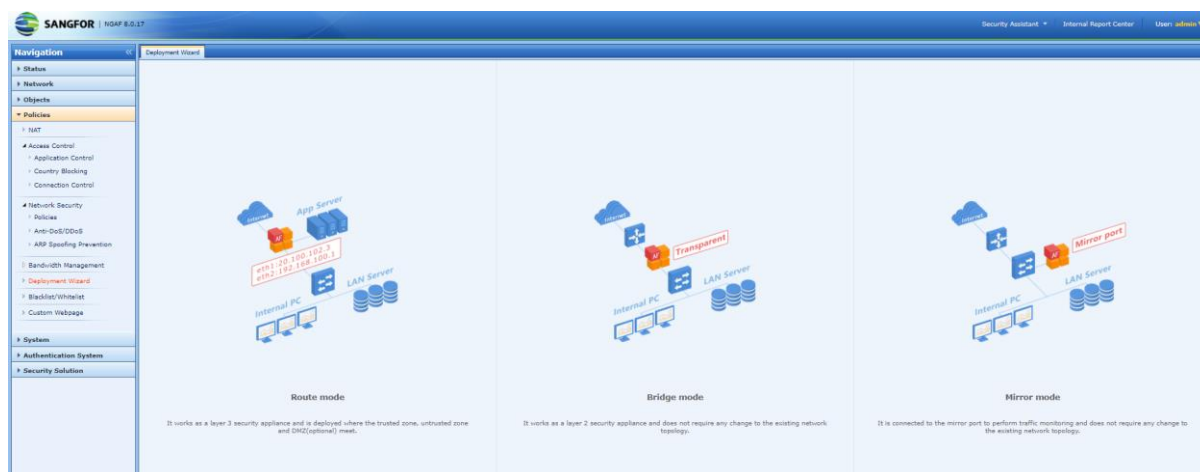
Licensed Resources: Specifies licensed resources of the virtual network device.

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**, **Clone**, and **Encrypt VM**.



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



2.3.6.3 Configuring Virtual Network Device

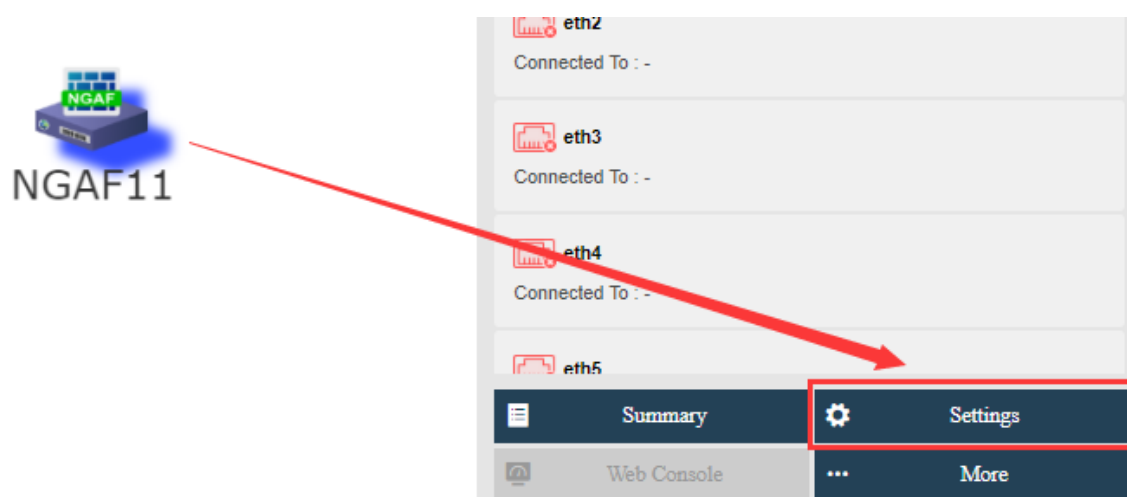
To configure a virtual network device, select it and click on **Settings** button to enter settings

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page, as shown below:



2.3.6.3.1 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**.

Settings - NGAF (NGAF9) ✕

▶ Interface

Configuration

Location

Advanced

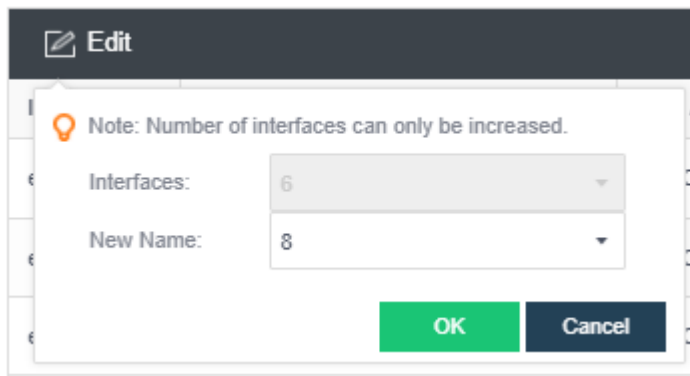
Edit



Interface	IP Address	MAC Address	Connected To	Status
eth0	10.251.251.251/255.255.255.0	FE:FC:FE:9B:65:4C	Select	✓
eth1	-	FE:FC:FE:16:87:B4	Select	✓
eth2	-	FE:FC:FE:81:9D:4C	Select	✓
eth3	192.168.20.65/255.255.255.0	FE:FC:FE:C9:C8:4A	test(Trunk_All)	✓
eth4	-	FE:FC:FE:D9:2A:77	Select	✓
eth5	192.168.1.1/255.255.255.0	FE:FC:FE:A6:4C:CE	switch16	✓

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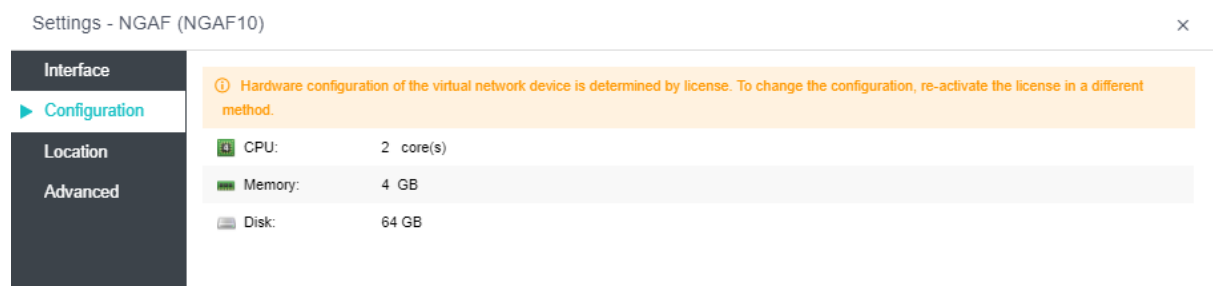
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To enable an **interface**, click on the  icon. To disable an interface, click on the  icon.

2.3.6.3.2 Modifying Configuration

Hardware configuration is displayed on the **Configuration** tab, including CPU, memory and disk. Re-licensing is required in order to change the hardware configuration of the Virtual Network Device.



On the above page, you can modify hardware configuration on the right.



Hardware configuration can only be set higher.

2.3.6.3.3 Changing Location

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

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Settings - NGAF (NGAF10)

Interface

Configuration

▶ Location

Advanced

Datastore: VirtualDatastore1

Run Location: <Auto>

Change

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

Change ×

1 Select Location Type

2 Specify Dst Location

Migration Type: ☐ Run location only

Migrate virtual machines to another node.

☒ Datastore and run location

Migrate virtual machines to another node and migrate their storage location to another virtual datastore or other storage.

Next

Cancel

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Change

×

1 Select Location Type

2 Specify Dst Location

Current Location

Destination Location

Datastore:

VirtualDatastore1

Storage Policy:

3_replica

Node:

<Auto>

Datastore:

VirtualDatastore1

Storage Policy:

<Use original storage policy>

Node:

<Auto>

☐ Power on virtual machine when migration is complete

Prev

OK

Cancel

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.

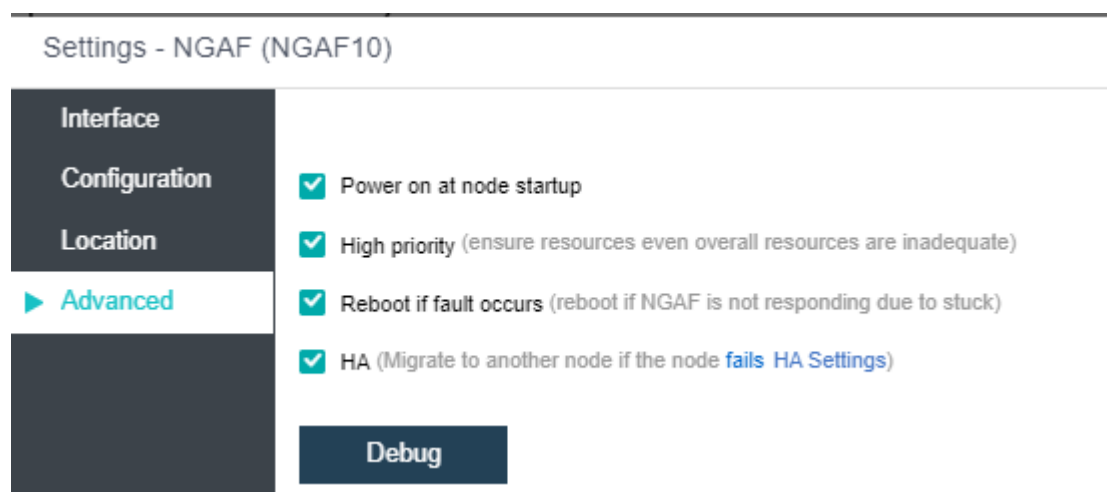
2.3.6.3.4 Configuring Advanced Options

To have the virtual network device power on upon node startup, select **Power on at node startup**. High priority can ensure that the virtual network device has enough resources even when overall resources are inadequate. **Reboot if error occurs** enables virtual device to restart automatically when it is not responding due to stuck. **HA** enables virtual network device to be migrated to another node when the working node fails.

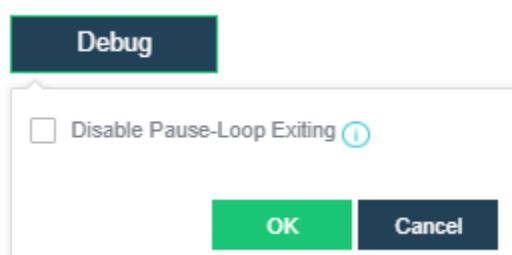
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To configure debugging options, click **Debug** to enter the following page. On that page, you may select **Disk write caching**, which enables files on disks to be loaded to memory so as to improve disk IO performance.



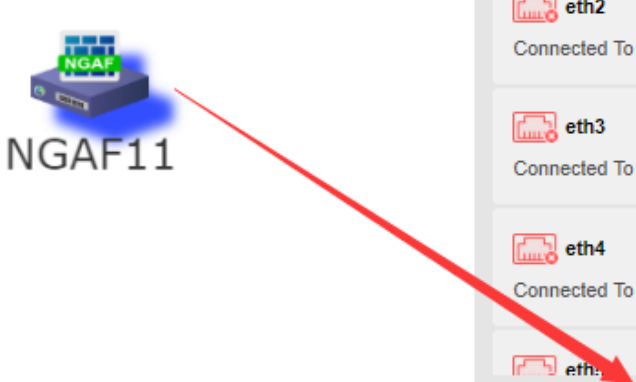
2.3.6.4 Viewing Virtual Network Device Summary

You may 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.

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NGAF11

eth2
Connected To : -

eth3
Connected To : -

eth4
Connected To : -

eth5
Connected To : -

Summary Settings

Web Console More

Networking > Devices > NGAF11 Summary

Summary Backup Permissions Tasks

Refresh Web-Based Console Power On Shut Down Backup Settings Licensing Revoke More

Status

Device Name: NGAF11

Description: Edit

Type: NGAF

Datastore: Node-2,Node-3,Node-1

Storage Policy: 3_replica

Run Location: Node-3

Deployed from Template: NFV_vAF_8.0.17_EN_20200529 (V 8.0.17)

Licensing: Licensed

Disk Encryption: Not encrypted

CPU: 19% (2.1 GHz X 2 core(s))

Memory: 99% (Total: 4 GB, Free: 21.27 MB)

Sessions

Last Hour Last 24 Hours Last month

0

22:50 22:55 23:00 23:05 23:10 23:15 23:20 23:25 23:30 23:35 23:40 23:45 23:50 23:55

Status

Status	Interface	Throughput Out	Throughput In	Outbound Packets	Inbound Packets
eth0(10.251.251.251)	eth0	0 bps	0 bps	0 pps	0 pps
eth1	eth1	0 bps	0 bps	0 pps	0 pps
eth2	eth2	0 bps	0 bps	0 pps	0 pps
eth3	eth3	0 bps	0 bps	0 pps	0 pps
eth4	eth4	0 bps	0 bps	0 pps	0 pps
eth5	eth5	0 bps	0 bps	0 pps	0 pps

Network

Throughput Packets eth0

Last Hour Last 24 Hours Last month

0 bps

23:00 23:05 23:10 23:15 23:20 23:25 23:30 23:35 23:40 23:45 23:50 23:55

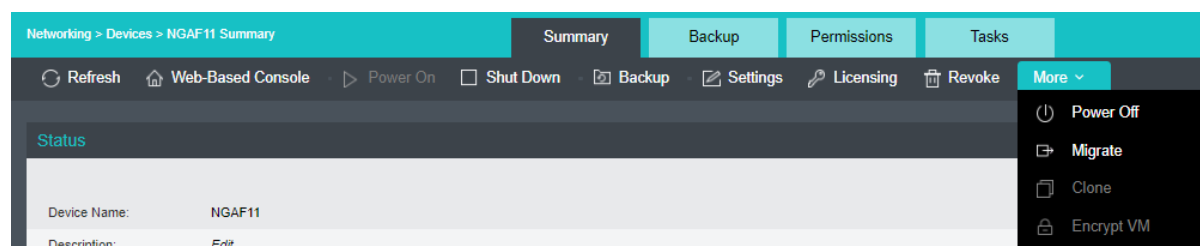
Inbound Outbound

On the above page, you can perform the following operations: **Refresh, Web-based Console, Power On, Shut Down, Backup, Settings, Licensing, and Revoke.** Click **More** to perform **Sangfor Technologies**

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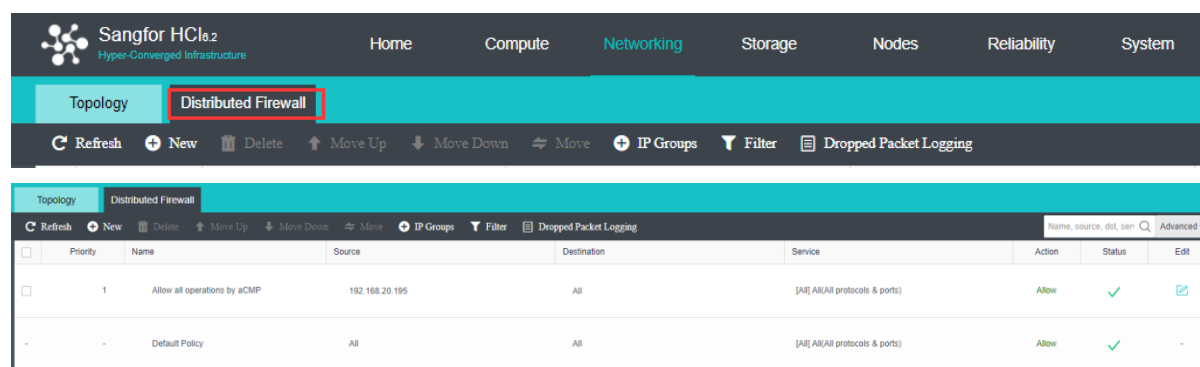
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more operations, such as **Power Off**, **Migrate**, **Clone**, and **Encrypt VM**.



2.3.7 Distributed Firewall

Distributed firewall is supported starting from Sangfor HCI 5.2 version, 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 **New** to enter the following page.

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Add New Rule
×

☒ Enable

Name:

- Match Clause

Source

☒ Any IP address
☐ Specified IP address

IP Groups
Select

☐ Specified VMs

Virtual Mach
Select

→

Destination

☒ Any IP address
☐ Specified IP address

IP Groups
Select

☐ Specified VMs

Virtual Mach
Select

Service:
Select

Action:
☒ Allow
☐ Deny

OK
Cancel

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

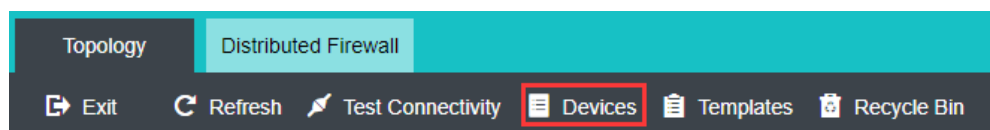
Name: Specifies a distinguishable name for the firewall rule.

Match Clause: For **Source** and **Destination**, options are **Any IP address**, **Specified IP address**, **Specified virtual machine**. If **Specified IP address** is selected, you may select **IP Groups** or **IP Addresses**. If **Specified virtual machine** is selected, you may 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 Virtual Network Devices



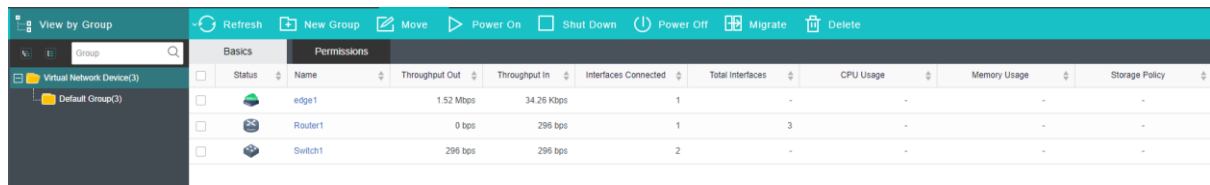
In **Networking > Devices**, there lists the following virtual network devices: virtual switches,

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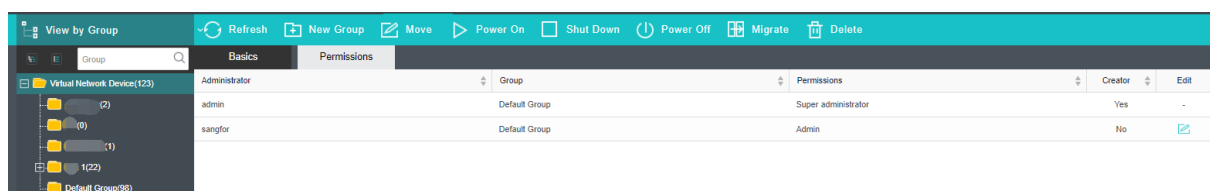
edge, virtual routers, NGAF, IAM, vADC. The **Basics** tab displays the following information: **Status, Name, Outbound, Inbound, Interfaces, Total Interfaces, CPU Usage, Memory Usage, Storage Policy.**



Status	Name	Throughput Out	Throughput In	Interfaces Connected	Total Interfaces	CPU Usage	Memory Usage	Storage Policy
	edge1	1.52 Mbps	34.26 Kbps	1	-	-	-	-
	Router1	0 bps	296 bps	1	3	-	-	-
	Switch1	296 bps	296 bps	2	-	-	-	-

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

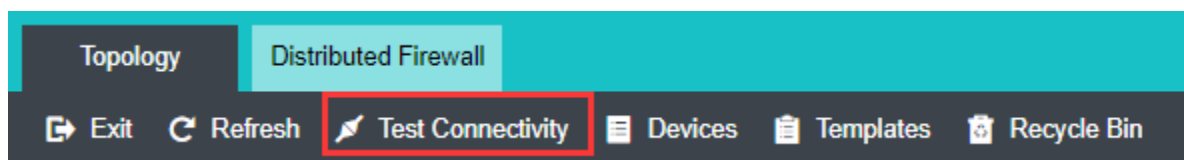
On the **Permissions** page, you can edit permissions of virtual network devices.



Administrator	Group	Permissions	Creator	Edit
admin	Default Group	Super administrator	Yes	-
sangfor	Default Group	Admin	No	

2.3.9 Testing Connectivity

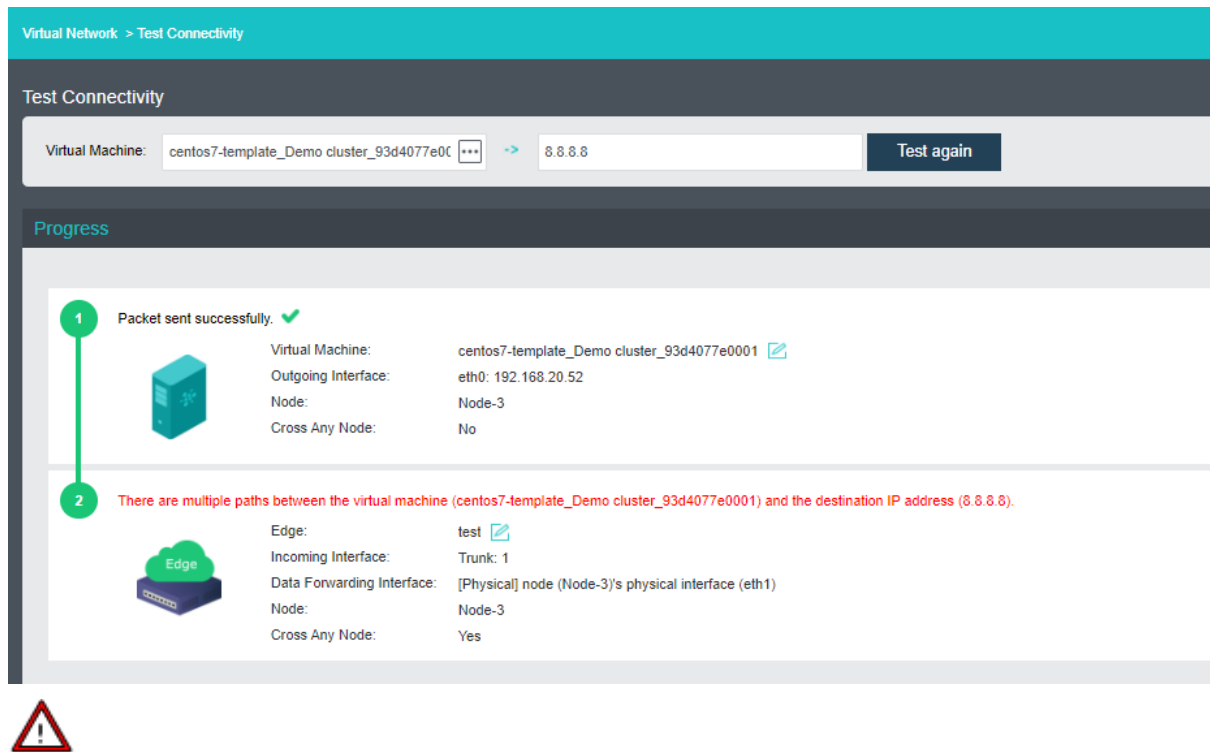
Test Connectivity tool helps administrator to quickly and easily troubleshoot network issues, which just requires administrator to specify source and destination addresses. To test connectivity, specify a source virtual machine and destination IP address, then click Start, as shown below:



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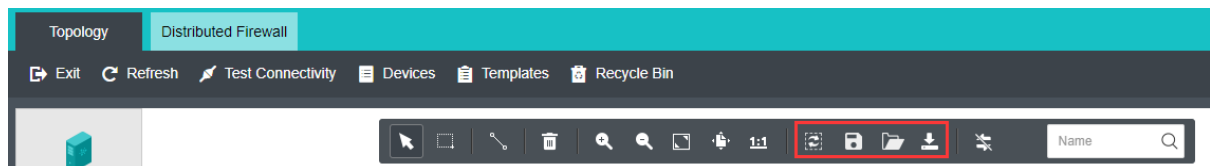
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To test connectivity from a virtual machine, that virtual machine must be powered on and installed vmTools.

2.3.10 Virtual Network Topology

In HCI6.2.0 version, it supports auto layout, saving layout changes, restoring and exporting topology, and selecting all pages.



: Auto layout enables objects on the topology to be displayed in an optimal way based on specific algorithms.

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Are you sure you want to apply auto layout to this topology?

Auto layout will automatically re-calculate position of objects on the topology and make the objects displayed in an optimal way based on a specific algorithm.

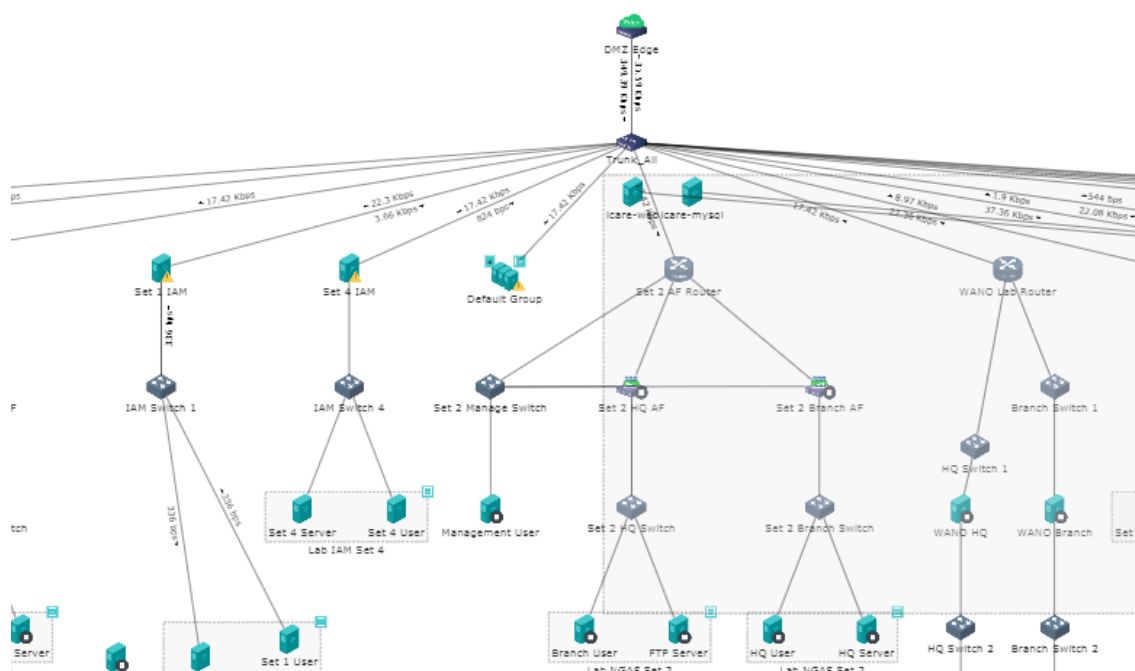
Note that the topology cannot be restored to the current one once auto layout is applied. Click the button below to save the current topology if necessary.

☒ Save the current topology

OK


Cancel

Before applying auto layout, you may save the current topology and then click **OK** to start applying auto layout.



Topology can be saved, restored and exported.




To save layout changes, you may click on .

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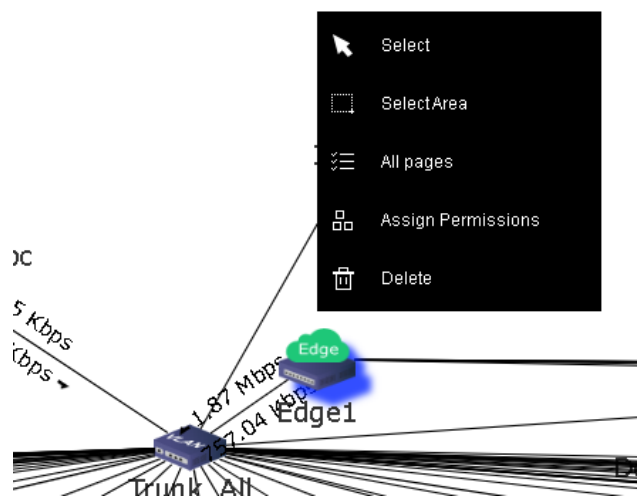
To view topologies, you may click on .

To export the current topology, you may click on .



Connections cannot be restored once deleted.

To select all object that are connected to edge, select **All pages**, as shown below.



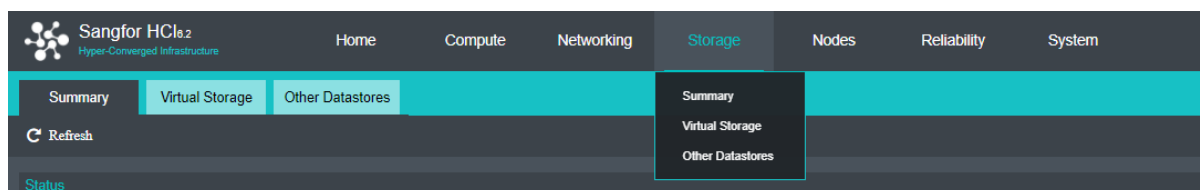
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2.4 Storage

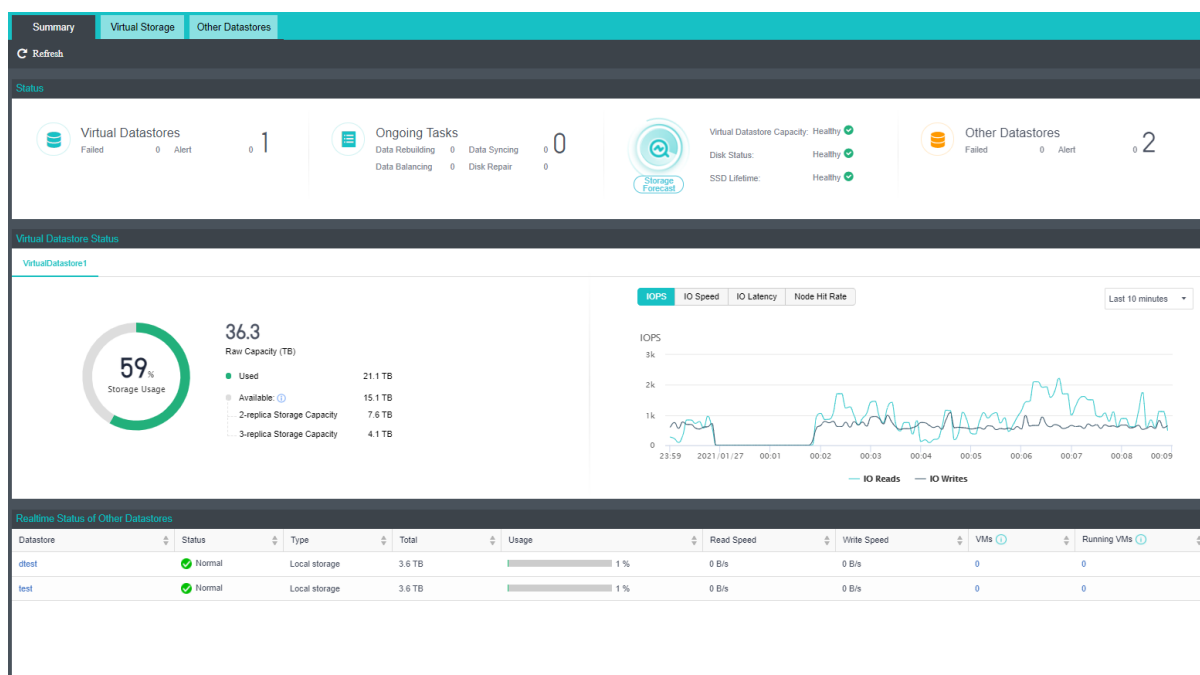
In **Storage**, there are three pages: **Summary**, **Virtual Storage** and **Other Datastore**.



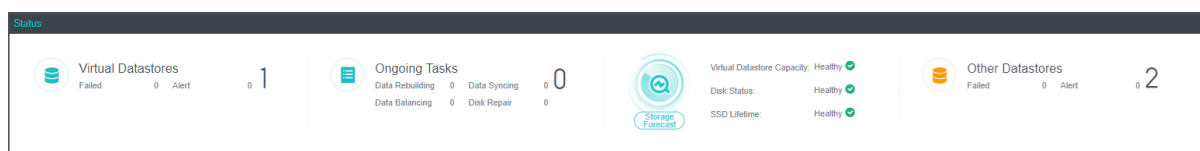
2.4.1 Storage Summary

2.4.1.1 Storage Status

On the **Summary** page, it displays the following sections, **Status**, **Storage Usage**, **Realtime Status**, **Performance of Virtual Storage**, **Unread Alarms** and **Task Status**.



Status: This section displays the number of virtual datastores and other datastores, the status of those datastores, the number of unread alarms, and the number of ongoing tasks, as shown below:



Virtual Storage Usage: This section displays the storage usage of the entire HCI, including

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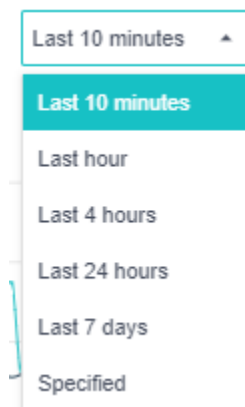
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the total number of storage, the quantity already used, and the unused quantity. as shown below:

This section also displays IOPS, IO speed, IO latency, storage usage, cache hit rate, and node hit rate of the specified virtual datastore in different period, as shown below. On the following graph, you may view **IOPS, IO Throughput, IO Latency, and Node Hit Rate**.



To specify **Period**, you can choose **Last 10 minutes**, **Last hour**, **Last 4 hours**, **Last 24 hours**, **Last 7 days**, or **Specified** to customize a new period, as shown below:



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

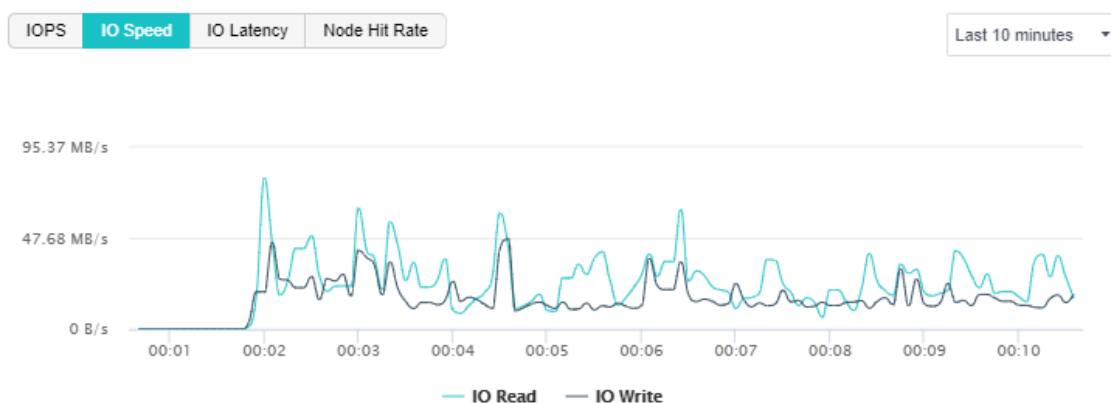
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IO Speed: Indicates bytes read or written by virtual storage per second, which represents IO throughput of virtual storage.

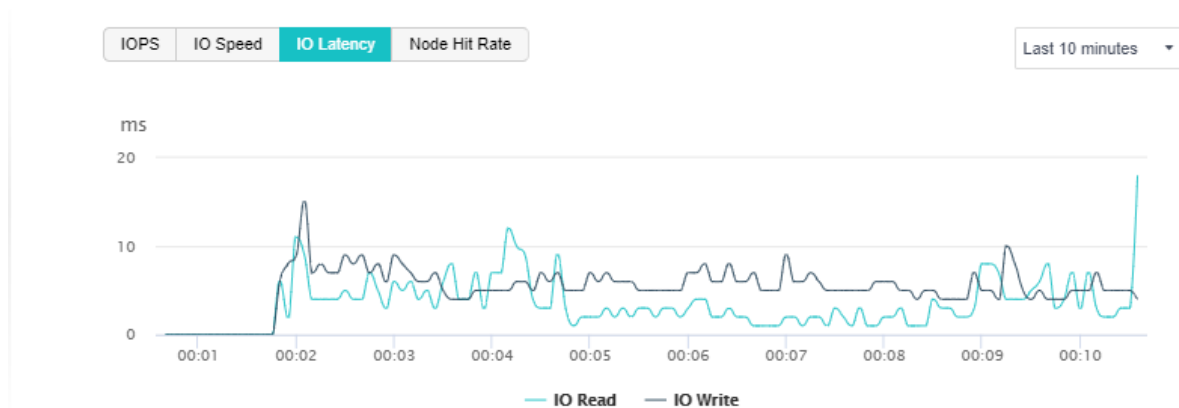


IO Latency: Indicates how long it takes for virtual storage to perform each write/read operation. Through IO latency trending graph, you may know storage IO load. If IO latency increases, it indicates that IO request is in queue and IO performance becomes poorer. Generally, it indicates that IO load 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.

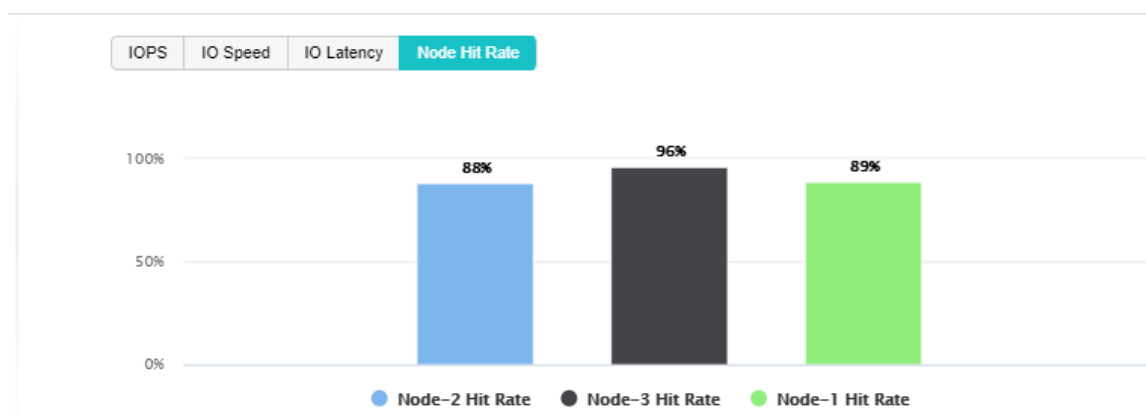
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Bar graph of **Node Hit Rate** shows the average hit rate of different nodes.



Realtime Status of Other Storage: This section displays the name of datastore, storage type, datastore capacity and usage, read and write speed, the number of virtual machines stored on the datastore, and the number of running virtual machines, as shown below:

Realtime Status of Other Datastores									
Datastore	Status	Type	Total	Usage	Read Speed	Write Speed	VMs	Running VMs	
Local-storage	Normal	Local storage	444 GB	3 %	0 B/s	0 B/s	0	0	
ISCSI	Normal	ISCSI	496 GB	84 %	0 B/s	13.3 KB/s	18	7	

Unread Alerts: This section displays unread alarms, and you can click [All Alarms](#) to view those alarms in details.

Task Status: This section displays the ongoing data sync and data balancing tasks, and you can click [All Tasks](#) to view details.

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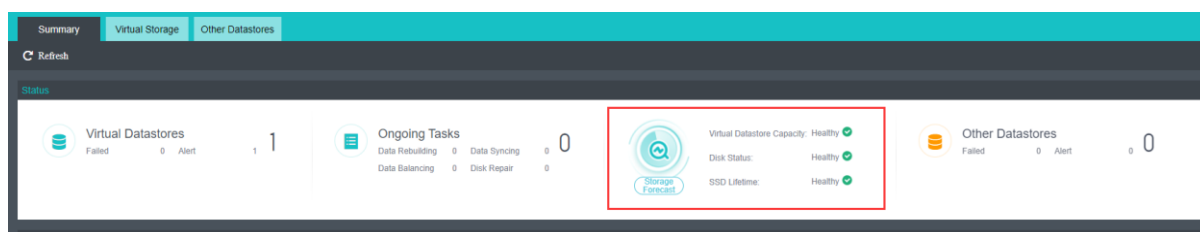
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Unread Alerts			Task Status			
Object	Timestamp	Description	Object	Status	Action	Virtual Datastore
dtest	2020-12-28 14:59:24	Node (Node-3)'s datastore (dtest) status anomaly. Please make sure ...	No data available			
dtest	2020-12-28 14:28:47	Node (Node-3)'s datastore (dtest) status anomaly. Please make sure ...				
VirtualDatastore1	2020-11-28 15:47:59	Node (Node-1)'s datastore (VirtualDatastore1) is disconnected. Pleas...				
VirtualDatastore1	2020-11-28 15:17:59	Node (Node-1)'s datastore (VirtualDatastore1) is disconnected. Pleas...				
VirtualDatastore1	2020-11-28 14:47:57	Node (Node-1)'s datastore (VirtualDatastore1) is disconnected. Pleas...				
All Alerts			All Tasks			

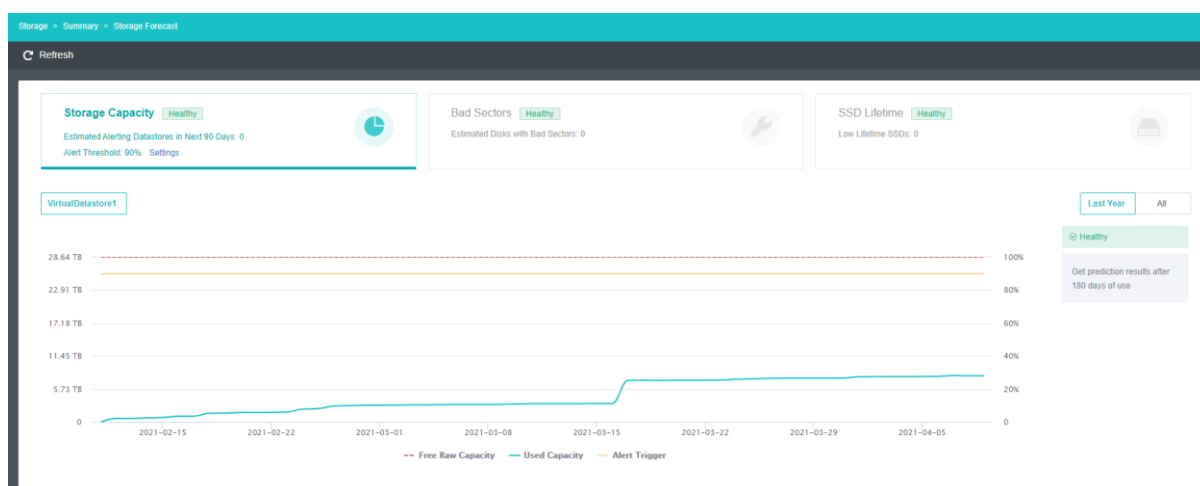
2.4.1.2 Storage Forecast

aSAN analyzes a large amount of real business scenario data, the underlying algorithm library integrates a variety of machine learning and deep learning algorithms, and independently developed the storage forecasting module, including bad sector prediction, capacity prediction and SSD life prediction functions.



1. Storage Capacity

aSAN can dynamically predict the capacity growth trend in the next 90 days based on the capacity usage of customer clusters. In the capacity forecast interface, users can switch to view the bare capacity of different storage volumes, the actual capacity used and the dynamic forecast curve, and the user is prompted in the section surface that the capacity used is expected to reach the capacity alarm threshold (90%) in xx days.



2. Bad Sectors

By collecting and analyzing the SMART data, performance parameters and hard disk log information of a large number of customers' real use scenarios, combined with advanced algorithm training models, Sangfor has independently developed a highly accurate bad sector forecasting function, and the aSAN bad sector forecasting

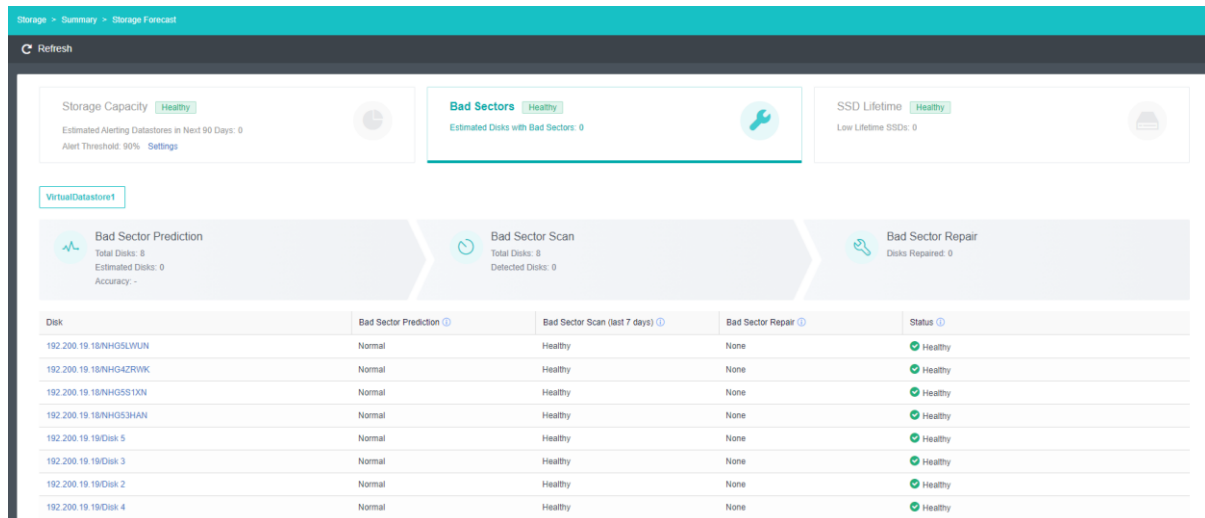
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accuracy rate is up to 95% or more through a large number of different business scenarios.

aSAN can dynamically sense which hard disks in the cluster are most likely to have bad sectors according to the upper business pressure and cluster hard disk usage, and prioritize them for bad sector scanning, which can shorten the actual window for hard disk bad sectors to be found from a week or even a month to a day, and combine aSAN bad sector scanning and repair to form a closed-loop processing of hard disk bad sectors, which greatly shortens the risk period of data being in "single copy" due to hard disk bad sectors.



In the **Bad Sectors** interface, users can see the hard disk bad sectors forecast results, actual scan results and bad sector repair, and at the same time will also be based on the number of hard disk bad sector risk assessment of the hard disk, for the history of a high number of bad sector hard disk alarm, prompting users to replace the hard disk as soon as possible to prevent data loss due to excessive number of bad channels resulting in hard disk damage.

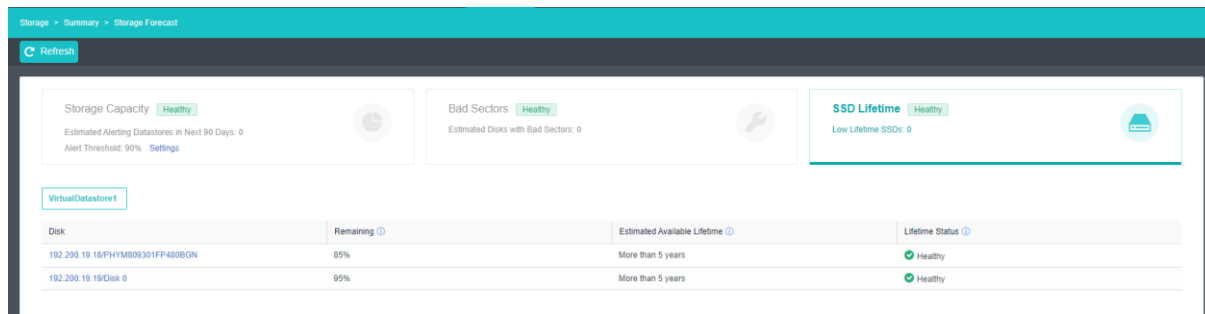
3. SSD Lifetime

aSAN collects and analyzes the SSD hard disk IO data in the cluster, calculates the remaining life of SSD hard disk, and displays the expected remaining available time of SSD in combination with the upper business pressure, and divides the three life levels of "healthy", "risk" and "high risk" according to the prediction result, prompting users to replace the SSD hard disk in the cluster with critical life in time.

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High Risk: Remaining life $\leq 10\%$

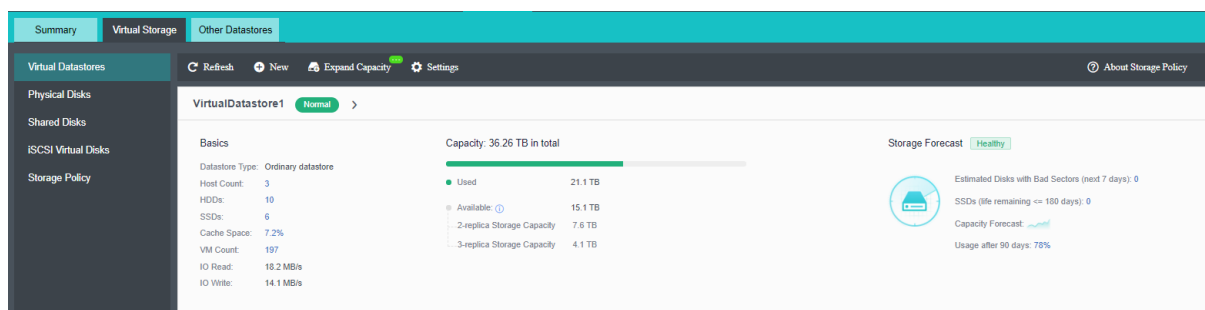
Medium Risk: Remaining life $\leq 15\%$

Healthy: Remaining life $> 15\%$

2.4.2 Virtual Storage

Sangfor virtual storage (later renamed Sangfor aSAN)) is storage virtualization software developed based on distributed file system, to adapt to the trend of storage virtualization. Currently, aSAN software is embedded into Virtualization Management Platform (VMP), through which all hard disks (except for system disk) on the physical machines in a cluster are managed together.

On the **Virtual Storage** page, there are five tabs: **Virtual Datastores**, **Physical Disks**, **Shared Disks**, **iSCSI Virtual Disks** and **Storage Policy**, as shown below.



2.4.3 Virtual Datastores

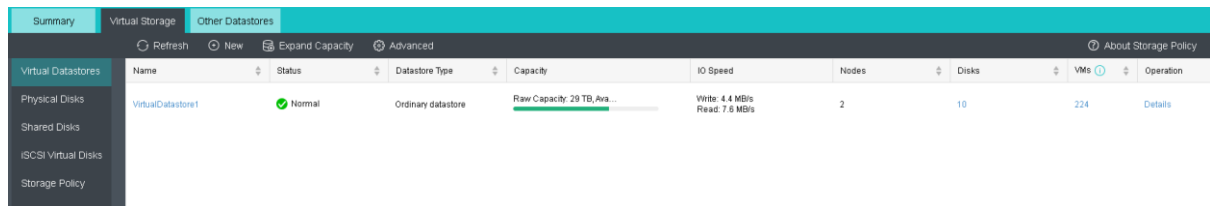
In 6.2.0, for cluster with 3 nodes and above can be divided into different virtual datastores, so as to meet requirements for IO data and performance segregation for different businesses. Each resource pool is a virtual datastore.

On the **Virtual Datastores** tab, it displays name, status, total capacity, usage, read and write speed, number of replicas, nodes, disks and virtual machines, as shown below:

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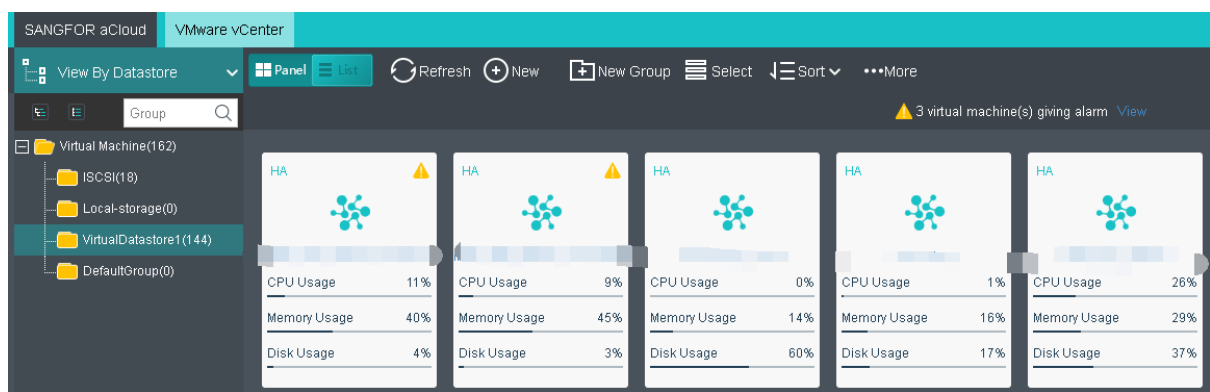
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To view detailed information of a virtual datastore, you may click on the name of the virtual datastore. For details, you may refer to the **Error! Reference source not found..**

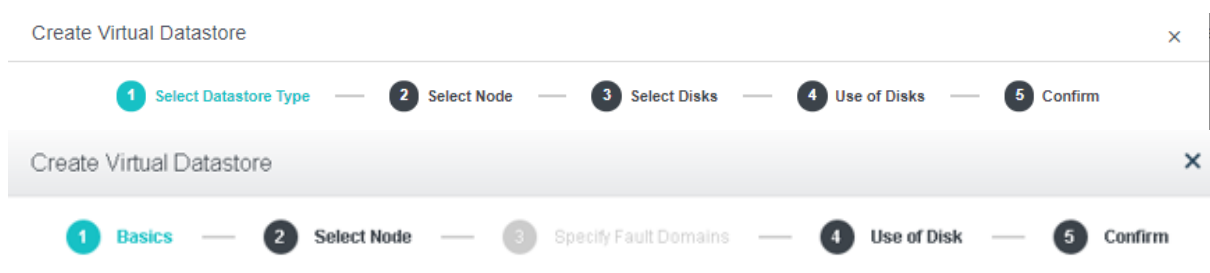
To view disks in detail and manage disks, you may click on the number under **Disks**. For details, you may refer to the **Error! Reference source not found.** section.

To view details of the virtual machines, you may click on the number under **VMs**, as shown below:



2.4.3.1 Creating Virtual Datastore

To create a second virtual datastore, there must be at least three nodes in the cluster. There are four steps to create a new virtual datastore: 1) Specify Datastore Type 2) Select node(s) 3) Specify use of disk 4) Confirm configurations. The following illustrates the creation process in details:



1. Specify basic information for the virtual datastore. You should specify virtual datastore **Name** and **Type** whether it is Ordinary Datastore or Stretched Datastore.

Ordinary datastore: Ordinary datastore use automated tiering to give full play to the

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advantages of SSDs and HDDs to achieve excellent performance. 2 datastores can be created using 3 nodes/hosts.

Stretched datastore: Stretched datastore used to build an active-active data center. Host comprising a stretched datastore are deployed in 2 server rooms which function as primary and secondary fault domain. Multiple replicas will be written into the 2 fault domains respectively to achieve zero RPO.

Create Virtual Datastore

1 Select Datastore Type

2 Select Node

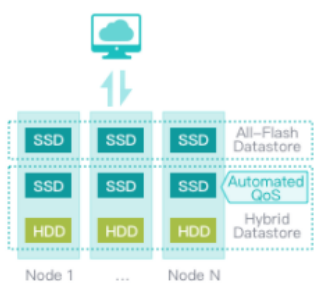
3 Select Disks

4 Use of Disks

5 Confirm

Virtual Datastore Name: VirtualDatastore2

Type: ☒ Ordinary datastore ☐ Stretched datastore



Introduction

Ordinary datastores use automated tiering to give full play to the advantages of SSDs and HDDs and achieve excellent performance. Based on specific disks, up to 2 datastores can be created using 3 hosts.

Configuration Requirement

For ordinary datastore, nodes can use SSD or HDD as data disk.

Features

Logical subvolume, auto tiering, aRaid2.0

Next

Cancel

2. Select node(s) that you want to add to the virtual datastore.

First, select the Method where it will be **Use disks on new hosts** or **Use unused disks added to existing datastores**.

Use disks on new hosts: Create virtual datastore based on nodes. Every first virtual datastore of the cluster must select this option.

Use unused disk added to existing datastores: Create new virtual datastore based on disk available on the nodes created with the "Use disks on new hosts".

Prerequisites of adding VS with [**Use unused disk added to existing datastores**]:

1. Version 6.2.0 and above
2. There are existing virtual datastore which created based on nodes.
3. Required at least 3 nodes in the cluster.

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Create Virtual Datastore

✓ Basics

✓ Select Node

3 Specify Fault Domains

4 Use of Disk

5 Confirm

Expand All

Collapse All

Restore Defaults

About Disk Grouping?

▼ Node: 192.168.20.192

Data disk: 2 Cache disk: 1

+ New Disk Group

Disk G...	Disk	Type	Disk Size	Use of Disk	Operation
	Disk 0	SSD	223.57 GB	Cache disk	
Group 1	Disk 2	HDD	1.82 TB	Data disk	Edit Delete
	Disk 1	HDD	1.82 TB	Data disk	

▼ Node: 192.168.20.191

Data disk: 2 Cache disk: 1

+ New Disk Group

Disk G...	Disk	Type	Disk Size	Use of Disk	Operation
	Disk 0	SSD	223.57 GB	Cache disk	
Group 1	Disk 1	HDD	1.82 TB	Data disk	Edit Delete

Back

Next

Cancel

5. Confirm configuration.

After configuring use of disk, you need to type admin password to confirm the operation of creating virtual datastore.

Create Virtual Datastore

✓ Basics

✓ Select Node

3 Specify Fault Domains

✓ Use of Disk

5 Confirm

Confirm Configuration of Virtual Datastore (VirtualDatastore1):

3.62 TB

Available Space

7.28 TB

Total Space

2

Nodes

2

Replicas

Virtual Datastore:

Node Name	Disk Groups	Cache Disks	Data Disks	Spare Disks	Free Disks	Total Space
192.168.20.192	1	1	2	0	0	3.64 TB
192.168.20.191	1	1	2	0	0	3.64 TB

Back

OK

Cancel

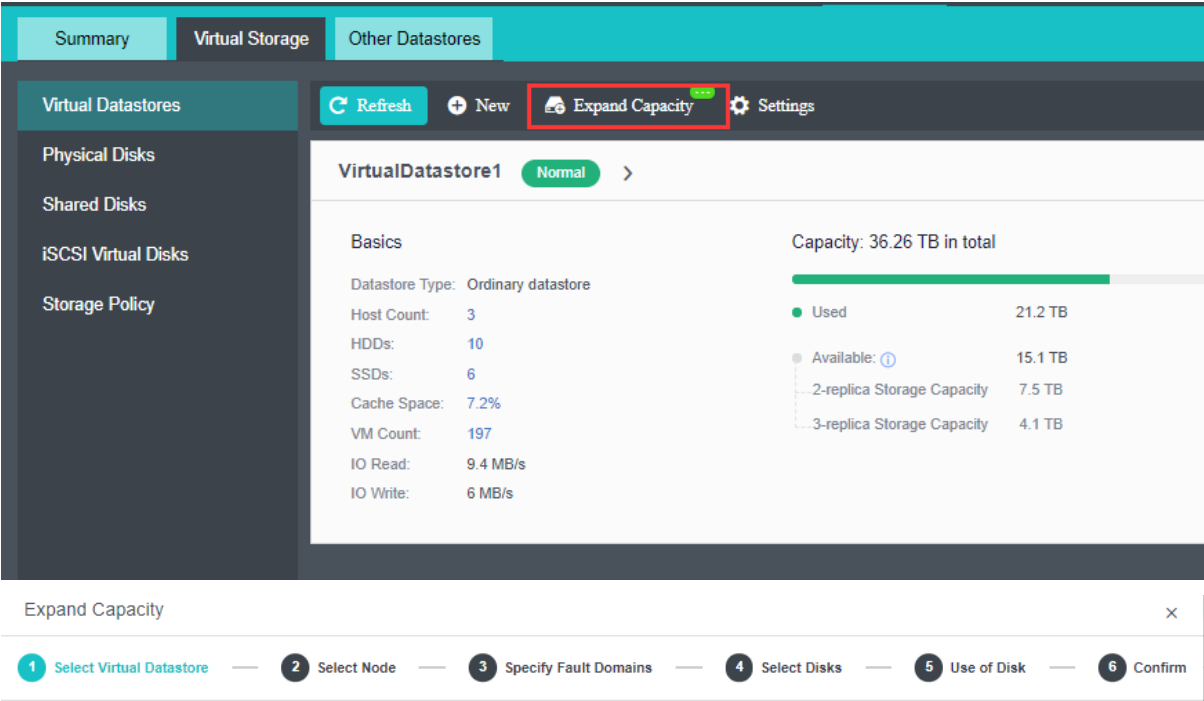
2.4.3.2 Expanding Capacity

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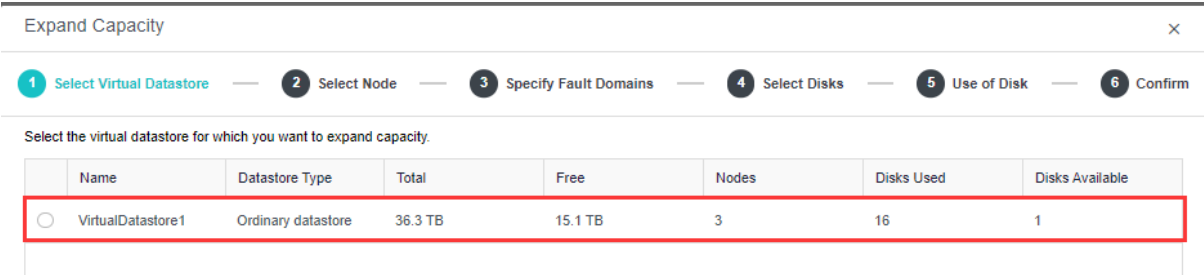
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Capacity of a virtual datastore can be expanded by adding more nodes or disks to it. Before expanding capacity via node, storage network interface of the new node should be specified. Steps of capacity expansion include the followings: 1) Select virtual datastore for which you want to expand capacity 2) Select a type to expand capacity 3) Specify use of disks 4) Confirm configurations.



1. Select virtual datastore.

There is a list displaying information of virtual datastore: datastore name, datastore type, total capacity, free space, the number of nodes, the number of disks that have been used and the number of free disks. From the list, select the datastore for which you want to expand capacity.



2. Select the to expand capacity. You may select **Expand capacity via node** or **Expand capacity via disk**. If **Expand capacity via node** is selected, the following page will be shown:

Edit Disk Group: Allow to edi the existing disk group by adding or removing disk from the disk group. When trying to expand the datastore with new disks, you may need to edit the disk group manually to add the disk normally.

If none of the above uses is selected for disk, it may not associate with virtual storage.
Edit Disk Group: Allow to edi the existing disk group by adding or removing disk from the disk group. When trying to expand the datastore with new disks, you may need to edit the disk group manually to add the disk normally.

If none of the above uses is selected for disk, it may not associate with virtual storage.

Expand Capacity

Select Virtual Datastore

Select Node

Select Disks

4

Use of Disk

5

Confirm

Expand All

Collapse All

Edit Disk Group

About Disk Grouping

▼ Node: Node-1

Data disk : 3 Cache disk : 2 Free : 1

Disk Group	Disk	Type	Disk Size	Use of Disk
Group 1	Disk 0	SSD	447.1 GB	Cache disk
	Disk 2	HDD	3.6 TB	Data disk
Group 2	Disk 1	SSD	447.1 GB	Cache disk
	Disk 3	HDD	3.6 TB	Data disk
	Disk 5	HDD	3.6 TB	Data disk
Free	Disk 7	SSD	447.1 GB	Free

Prev

Next

Cancel

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Expand Capacity

✓ Select Virtual Datastore

✓ Select Node

✓ Select Disks

4 Use of Disk

5 Confirm

Expand All

Collapse All

Restore Defaults

About Disk Grouping ?

▼ Node: Node-1

Data disk : 4 Cache disk : 2 + New Disk Group

Disk Gr...	Disk	Type	Disk Size	Use of Disk	Operation
Group 1	Disk 0	SSD	447.1 GB	Cache disk	Edit
	Disk 2	HDD	3.6 TB	Data disk	
	Disk 7	SSD	447.1 GB	Data disk	
Group 2	Disk 1	SSD	447.1 GB	Data disk	Edit
	Disk 3	HDD	3.6 TB	Cache disk	
	Disk 5	HDD	3.6 TB	Data disk	

Prev

Next

Cancel

5. Confirm configuration.

After configuring use of disk, type virtual datastore name and admin password to confirm capacity expansion operation.



Note that node or disk that has been added to virtual datastore cannot be removed, and disk will be formatted and emptied once the capacity expansion operation is confirmed.

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Expand Capacity
×

✓ Select Virtual Datastore

✓ Method

✓ Use of Disk

4 Confirm

Confirm Configuration of Virtual Datastore (vs_vol_rep2):

1.41 TB
Total

=

479.63 GB
Current

+

959.96 GB
Increased

0
New Nodes

Type	Disks	Total Capacity
Spare disk	0	0 B
Cache disk	3	360 GB
Data disk	8	2 TB
Free disk	0	-

Confirm Disk Expansion (once added, node or disk cannot be removed and disk will be formatted and emptied)

Virtual Datastore Name:

Type admin Password:

2.4.3.3 Configuring Advanced Settings

In **Storage > Virtual Storage > Virtual Datastore**, you may click **Advanced** to configure more. On the **Advanced** page, there are **Data Balancing**, **Data Rebuilding**, **Storage Area Network**, **VM Running Across Datastores** and **Intelligent Rate Restriction**, as shown below:

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Advanced

Reliability Settings

Data Balancing

Data Rebuilding

Bad Sector Scan

IO Timeout Handling

Linked Clone

Storage Area Network

VM Running Across Datastores

Intelligent Rate Restriction

In-memory Read Caching

File Storage Policy

When the system detects that disks are not evenly used, it will conduct data balancing to move data from the high-usage disk to the low-usage disk to make the best use of resources on each node. Select a Schedule time which is not normally busy to minimize system impact while data balancing is being performed.

Virtual Datastore	Status	Schedule (every day)	Edit All
VirtualDatastore1	Enabled	01:00 - 06:00	

OK Cancel

Data Balancing: You can create data balancing task for different virtual datastores. After the task is created, available storage space of each node will be restricted within a certain range. If the remaining storage space is below a certain range, the data balancing task will be executed automatically to have VM files stored on the node short of resources moved to another node. Data that have been migrated will be evenly written into each disk so as to keep disk usage balanced.

When the system detects that disks are not evenly used, it will conduct data balancing to move part of data from highly-used disk to lowly-used disk to make best use of resources on each node. Select a period that business is not busy for Schedule, and the system will conduct data balancing during that time period.

Virtual Datastore	Status	Schedule (Every day)	Edit All
VirtualDatastore1	Enabled	00:00	

21:00 - 06:00

OK Cancel



Since performance of virtual machine will be affected during data balancing, virtual machines of high priority will not chosen to perform data balancing. Virtual machines will not be migrated back immediately after migration.

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Data Rebuilding: Taking data with two-copy policy as the example, when components (disk or host) in storage volume suffer physical fault, the other copy of the data of faulted component is stored on other components to ensure normal reading and writing of virtual machine, but meanwhile the redundancy of storage volume is reduced, which will lead to data loss if the component storing the other copy also breaks down. With data reconstruction, when component breaks down, the other copy of the data on faulted component will be used as the recovery source to reconstruct a new copy on the target component in fragments to recover completeness of the copy and realize system self-recovery.

you can specify the time for confirming certain node or disk failure before data rebuilding. if the time is reached but the issue is still not fixed, data rebuilding will be executed automatically, as shown below:

Advanced

Reliability Settings ▼
Data Balancing
Data Rebuilding
Bad Sector Scanning
IO Timeout Handling
Linked Clone

ⓘ The following specify the time for confirming certain node and disk failure before data rebuilding. If the time is reached but the issue is still not fixed, data rebuilding will be executed automatically.

Host Fault Confirmation Time: hour(s) (for datastores involving more than 3 nodes)

Disk Fault Confirmation Time: minute(s) (for datastores involving more than 2 nodes)

Bad Sector Scanning: Hard disk will be periodically scanned for bad sectors. If any bad sector is detected, disk repairing will be conducted. To ensure scanning speed, it is better to perform scan during off-peak hours.

Advanced

Reliability Settings ▼
Data Balancing
Data Rebuilding
Bad Sector Scanning
IO Timeout Handling
Linked Clone

ⓘ Hard disks will be periodically scanned for bad sectors. If any bad sector is detected, disk repairing will be conducted. To ensure scanning speed, it is better to perform scan during off-peak hours.

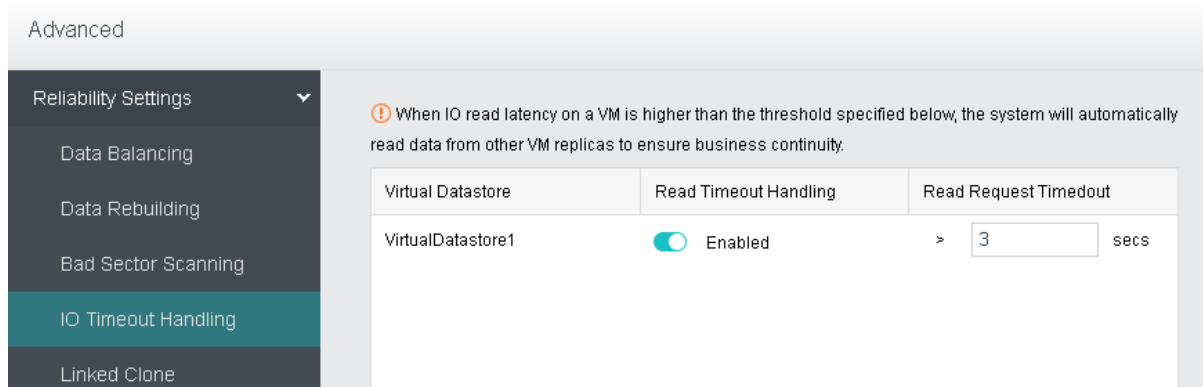
Virtual Datastore	Status	Schedule (Every day)	Edit All
VirtualDatastore1	<input checked="" type="checkbox"/> Enabled	01:00 - 06:00	

IO Timeout Handling: When IO read latency on a VM is higher than the threshold specified below, the system will automatically read data from other VM replicas to ensure business continuity.

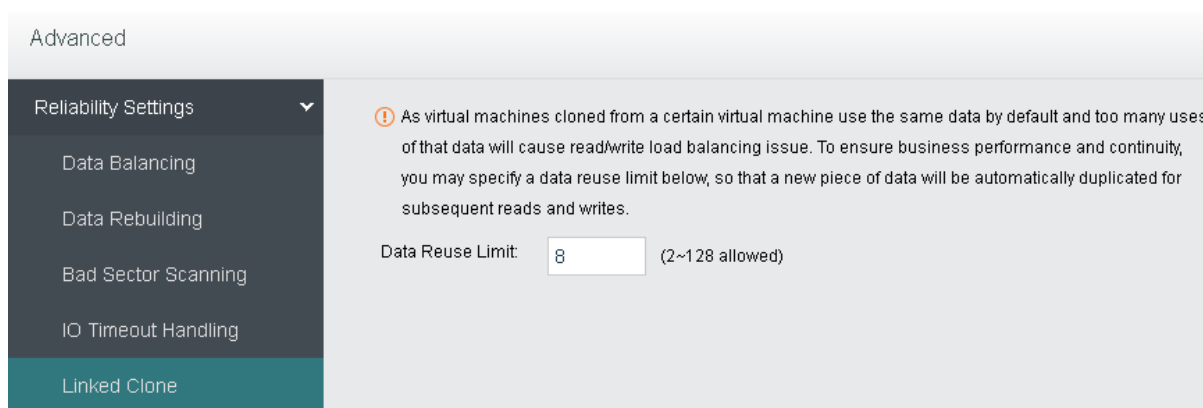
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Linked Clone: As virtual machines cloned from a certain virtual machine use the same data by default and too many uses of that data will cause read/write load balancing issue. To ensure business performance and continuity, you may specify a data reuse limit below, so that a new piece of data will be automatically duplicated for subsequent reads and writes.



Storage Area Network: You can change deployment mode(**Link aggregation disabled**, **Link aggregation with one switch**, **Link aggregation with two switches**) in **Settings**, as shown below:

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Advanced

Reliability Settings

Data Balancing
Data Rebuilding
Bad Sector Scanning
IO Timeout Handling
Linked Clone
Storage Area Network
VM Running Across Datastores
Intelligent Rate Restriction
In-memory Read Caching
File Storage Policy

! Independent storage area network is more efficient in data transmission and consistent in data sync. It requires each host to provide a separate interface as storage network interface.

Deployment Mode: Link aggregation with one switch Settings

Node Name	Physical Interface	Interface IP	Negotiated R...	MTU	Status
192.168.20.3	eth2, eth3	10.51.25.1	1000Mb/s	1500	✓ Normal
192.168.20.4	eth2, eth3	10.51.25.3	1000Mb/s	1500	✓ Normal
192.168.20.5	eth2, eth3	10.51.25.2	1000Mb/s	1500	✓ Normal

IP Address: 192.168.20.1 Test Connectivity

OK Cancel

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:

Settings ×

1 Deployment — 2 Select Storage Network Interface

Deployment Mode (for data communication among clustered nodes)
☐ Link aggregation disabled
☒ Link aggregation with one switch
☐ Link aggregation with two switches

Link aggregation with one switch

Benefits
It improves fault tolerance capabilities of storage area network, because failure of one link will not exert any impacts on the virtual storage.

Drawbacks
Once switch fails, the virtual storage would get offline.

Notes
Storage area network (SAN) is used for data transmission across nodes. Please connect the objects with cables according to the diagram.
The switch may be layer 2 switch, no change required.

1/2 Next Cancel

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

Settings ✕

1 Deployment

2 Select Storage Network Interface

Storage Network Interface [\(Deployment\)](#)

Node Name	Physical Interface	Aggregate Interface IP	Status
192.168.20.3	eth2(1000Mb/s),eth3(1000Mb/s) ▼	10.51.25.1 / 24	✓ Normal
192.168.20.4	eth2(1000Mb/s),eth3(1000Mb/s) ▼	10.51.25.3 / 24	✓ Normal
192.168.20.5	eth2(1000Mb/s),eth3(1000Mb/s) ▼	10.51.25.2 / 24	✓ Normal

2/2 Back OK Cancel



Independent storage area network is more efficient in data transmission and consistent in data sync. Furthermore, independent storage area network helps to reduce data sync risk caused by network connection error, since virtual storage contains crucial business data. The drawback is that additional interface must be provided on the node for the storage to communicate across nodes

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.

Test Connectivity ✕

This IP address is used to ping connectivity to the node to check whether it is isolated when there are only two nodes involved in virtual datastore. [Read More](#)
Better be a router IP address that is always connected.

IP Address:

OK Cancel



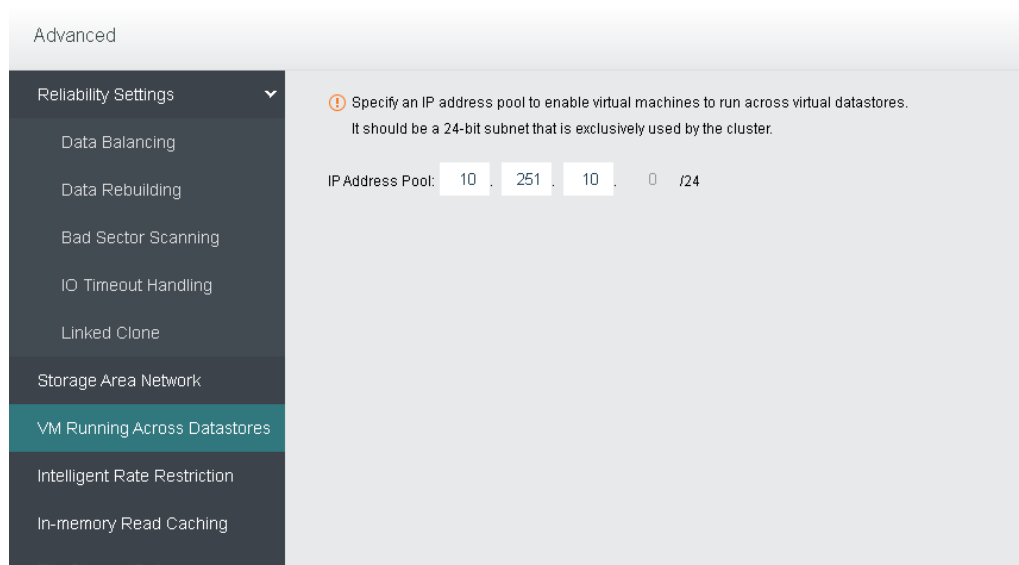
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In case that the working node gets offline, virtual machines running on it may be recovered on another clustered node, which may lead to two instances for one virtual machine when the failed virtual machine recovers and interrupts the service. For that reason, we need to stop the instance on the offline node to ensure business continuity.

VM Running Across Datastores: This enables virtual machines to run across virtual datastores. It should be configured only when the number of virtual datastores is greater than or equal to 2. IP addresses in the pool should be in a 24-bit subnet that is exclusively used by the cluster.

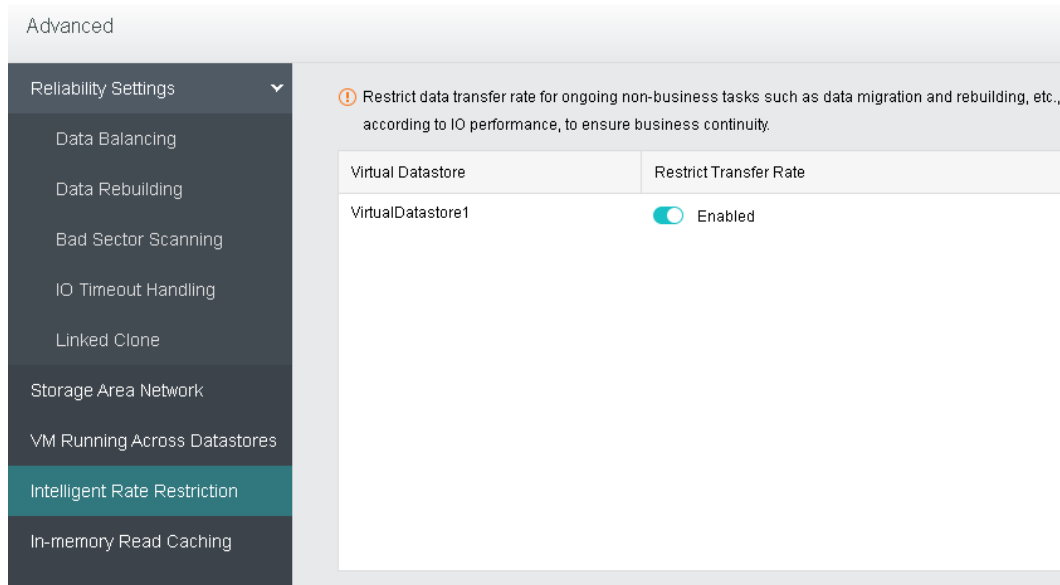


Intelligent Rate Restriction: Restrict data transfer rate for ongoing non-business tasks such as data migration and reconstruction, etc, according to IO performance, to ensure business continuity.

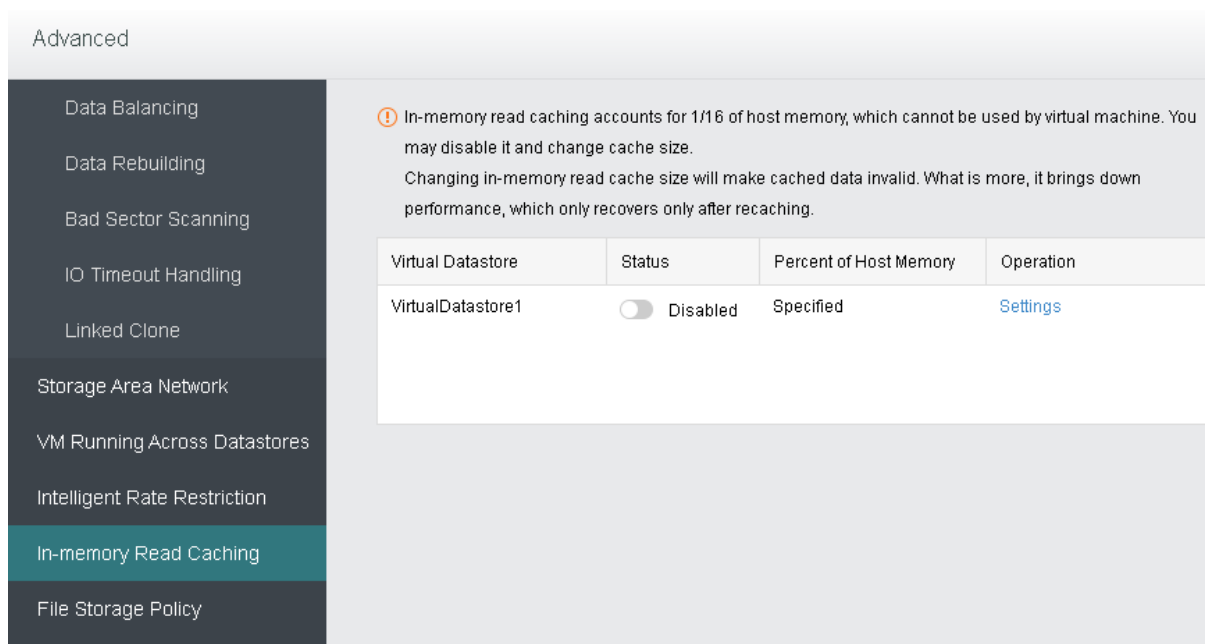
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In-memory Read Caching: In-memory read caching accounts for 1/16 of host memory, which cannot be used by virtual machine. You may disable it and change to cache size.

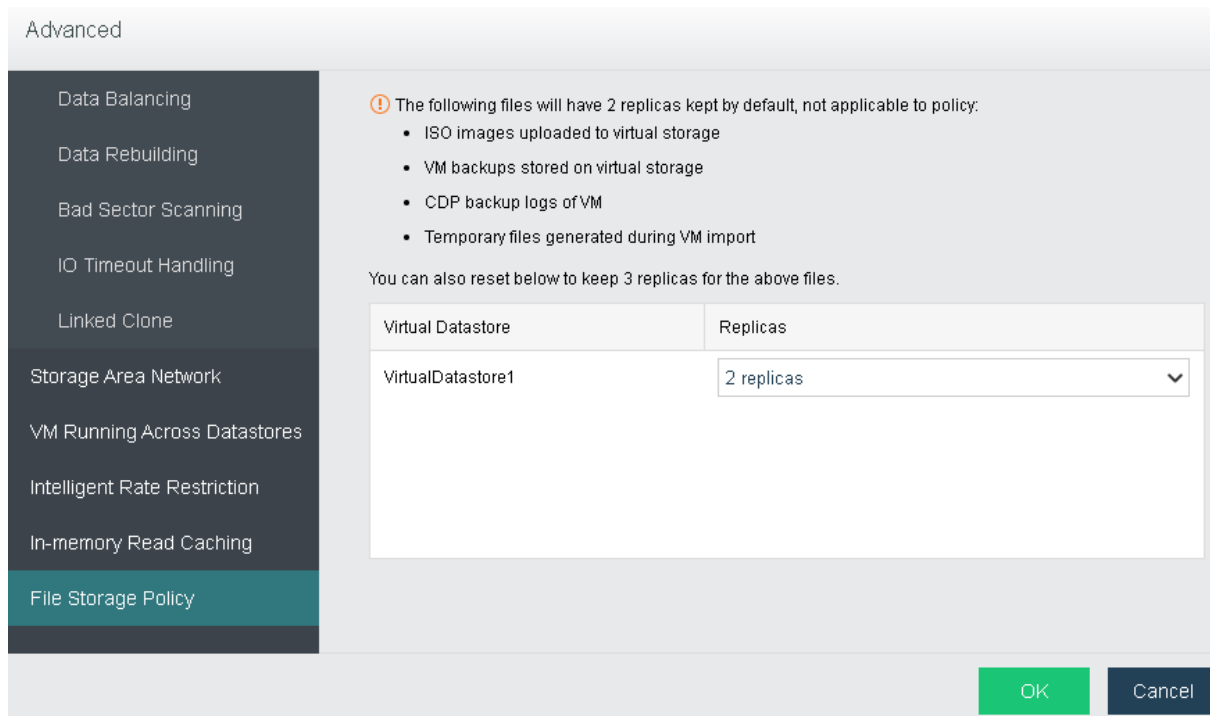


File storage Policy: To specifies number of replication which the ISO images, VM backups, CDP backup and the temporary file generated during import which stored in virtual storage.

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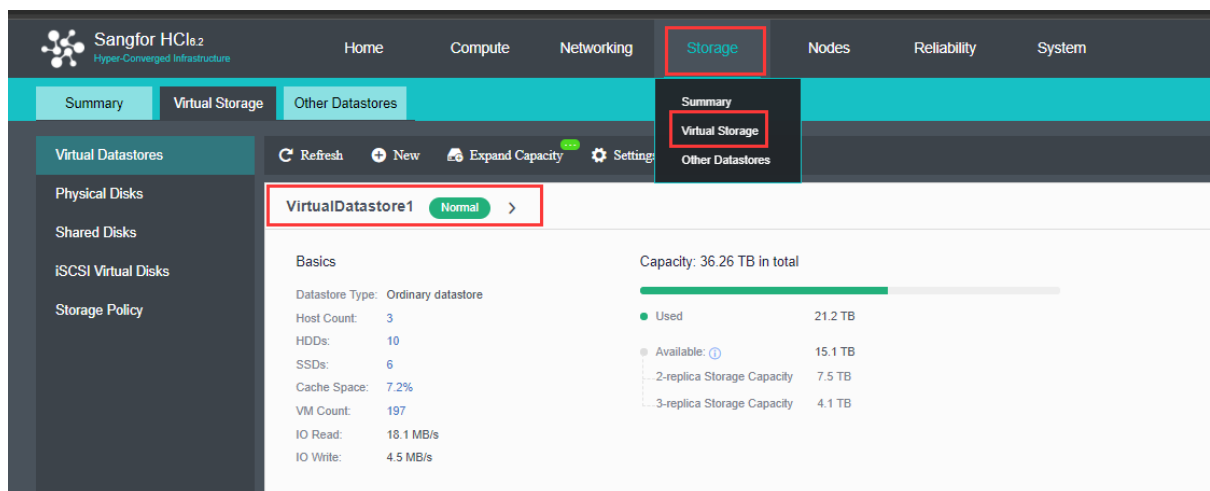
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2.4.3.4 Viewing Virtual Datastore Details

Navigate to **Storage > Virtual Storage > Virtual Datastores** and click on datastore's name to enter the following page. Here you may view detailed information about a virtual datastore. There are two tabs: **Summary** or **Permissions**.



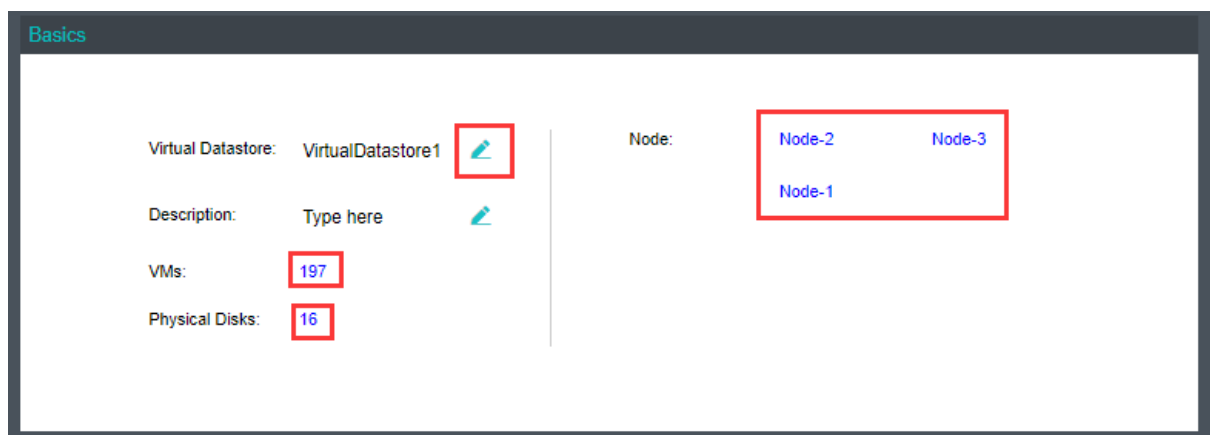
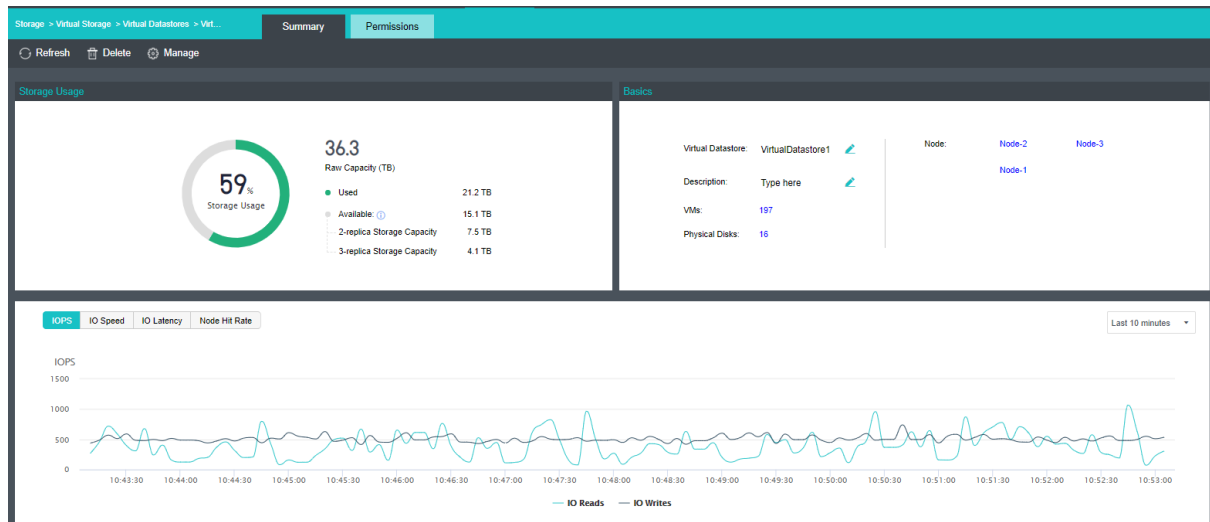
2.4.3.4.1 Viewing Virtual Datastore Summary


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On the **Summary** page, you may view virtual datastore capacity, basic information, status, etc.



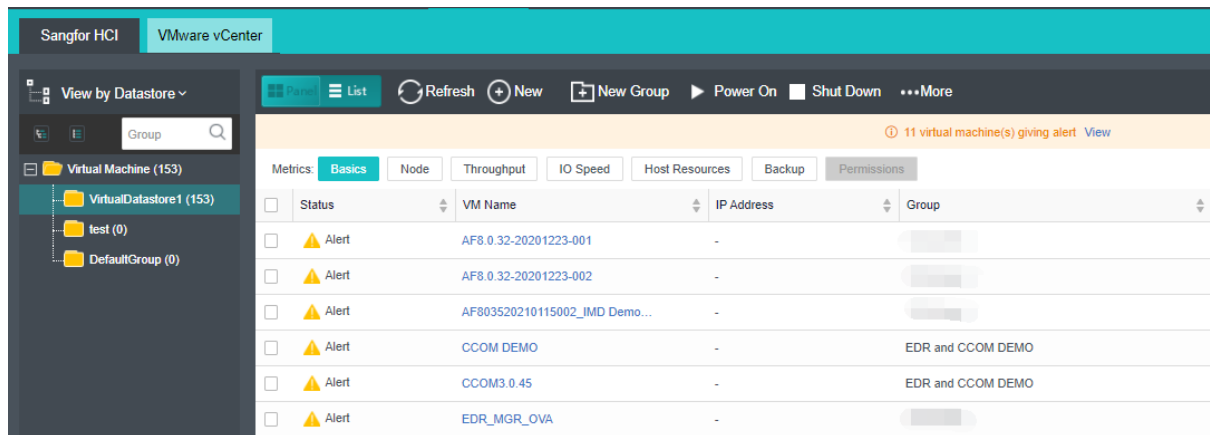
To change virtual datastore name and description, click .

To view virtual machines in the virtual datastore, click on the number beside **VMs**.

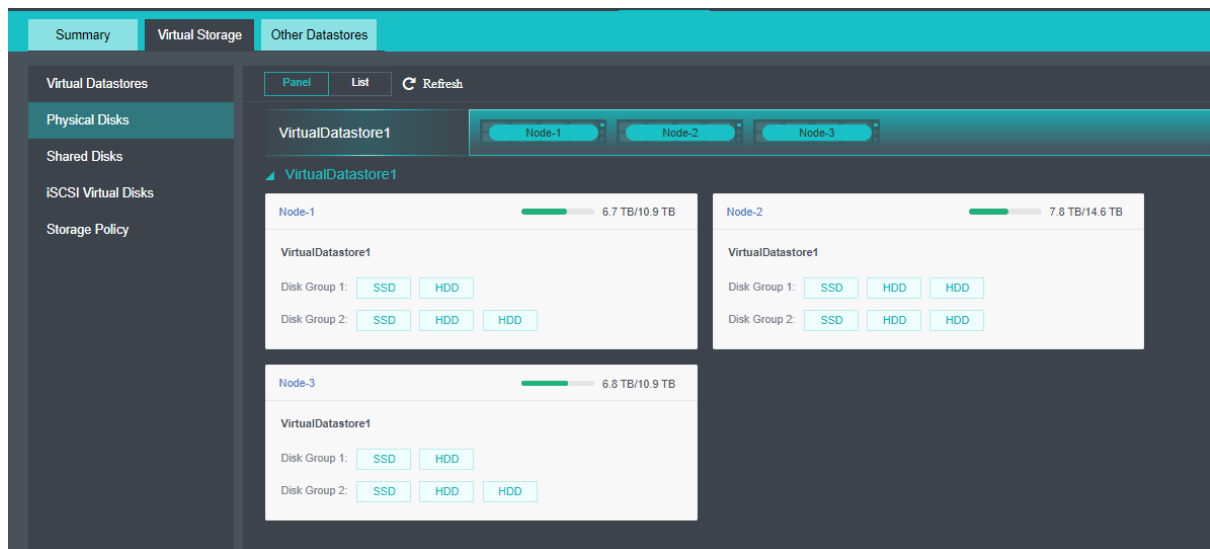
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To view disks in the virtual datastore, click on the number beside **Physical Disks**.



For storage operating details, you may refer to the **2.4.1 Storage Summary** section.

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2.4.3.4.2 Deleting Virtual Datastore

On the **Summary** page of a virtual datastore, click **Delete** to delete the datastore and the following dialog will pop up. Note that all the data will be deleted permanently and cannot be restored once the virtual datastore is deleted.




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Alert
×



Are you sure you want to delete the datastore (VirtualDatastore1)?

The datastore contains the following data:

Type	Count
Virtual Machine	153
Shared Disk	54
iSCSI Virtual Disk	1
Backup	26
ISO Image	60
VNF	0

You are recommended to replicate data to another datastore before deletion. After the datastore is deleted, **the data stored on it cannot be recovered**. Please operate with caution.

☐ I am sure that all data is safely migrated

OK
Cancel

Before performing deletion operation, do the following:

1. Make sure that all the virtual machines running in this virtual datastore are shut down.
2. Make sure that the virtual machines running in another virtual datastore but stored in this one are shut down.
3. If the iSCSI virtual disks provided by this virtual datastore are not to be used any more, end all the iSCSI connections to it.

Type admin password to confirm the deletion operation.

Once the virtual datastore is deleted, nodes added to the virtual datastore will be removed from the cluster.

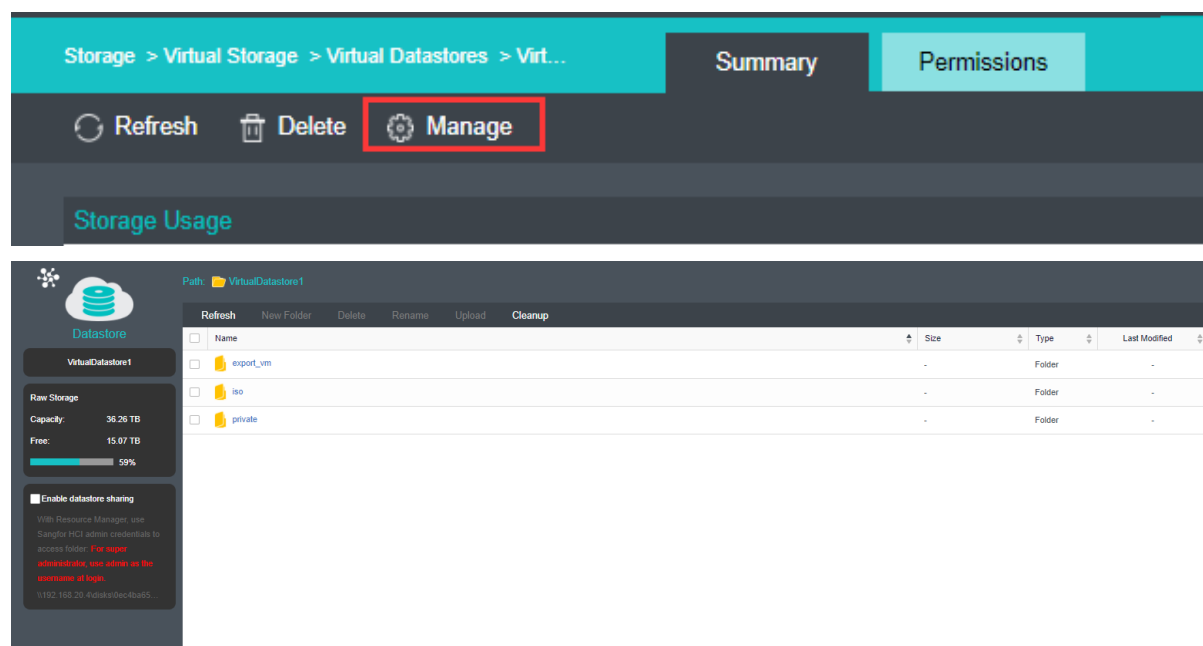
2.4.3.4.3 Managing Datastore

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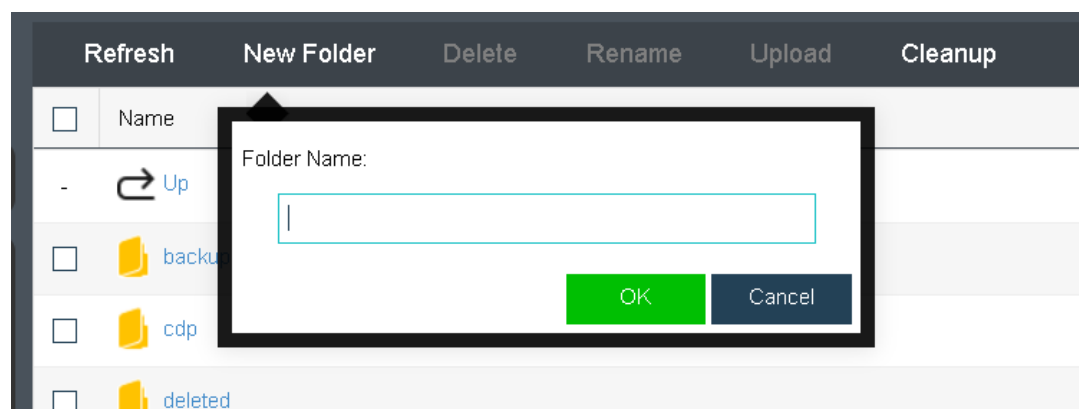
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On the **Summary** page of a virtual datastore, you may click **Manage** to enter the following page. Here you can manage the datastore and folders on it.



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

To add a new folder, click **New Folder** and then enter a folder name.



Delete: To delete a file or folder, select the file or folder that you want to delete and then click **Delete**.

Rename: To rename a file or folder, select the file or folder that you want to rename and click **Rename**.

Upload: To upload a file, select a folder and click **Upload** to upload a file to that folder. For **Sangfor Technologies**

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example, upload an ISO image file to ISO folder for the purpose of creating virtual machines.

2.4.3.4.4 Permissions

Permissions of virtual datastore is used to assign to sub-administrator to manage datastore. To add permission of virtual datastore on the **Permissions** page, you need to add the permission of accessing datastore in **System > System Administrators and Permissions** first.

Storage > Virtual Storage > Virtual Datastores > Virtual Datastore

Summary

Permissions

Refresh

New

Delete

<input type="checkbox"/>	Administrator	Group	Permissions
<input type="checkbox"/>	- admin	Default Group	Access datastore
<input type="checkbox"/>	demo_hci	Default Group	Access datastore
<input type="checkbox"/>	junwei	Default Group	Access datastore
<input type="checkbox"/>	sangfor	Default Group	Access datastore

2.4.4 Managing Physical Disks

2.4.5 Shared Disks

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)

On the **Shared Disks** tab shown below, it displays the following information: **Name**, **Status**, **Virtual Datastore**, **Disk Size**, **Write Speed**, **Read Speed**, and **Connected Virtual Machines**.

Summary

Virtual Storage

Other Datastores

Virtual Datastores

Physical Disks

Shared Disks

iSCSI Virtual Disks

Storage Policy

Refresh

New

Edit

Delete

Recycle Bin

<input type="checkbox"/>	Name	Status	Virtual Datastore	Storage Policy	Disk Size	Read Speed	Write Speed	Connected VMs
<input type="checkbox"/>	ORCLE-RAC_Data disk_1	Normal	VirtualDatastore1	2_replica_high_performance	100 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Data disk_2	Normal	VirtualDatastore1	2_replica_high_performance	100 GB	1016 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Data disk_3	Normal	VirtualDatastore1	2_replica_high_performance	100 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Log Disk_1	Normal	VirtualDatastore1	2_replica_high_performance	50 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Log Disk_2	Normal	VirtualDatastore1	2_replica_high_performance	50 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Log Disk_3	Normal	VirtualDatastore1	2_replica_high_performance	50 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Quorum Disk_1	Normal	VirtualDatastore1	2_replica_high_performance	10 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Quorum Disk_2	Normal	VirtualDatastore1	2_replica_high_performance	10 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	ORCLE-RAC_Quorum Disk_3	Normal	VirtualDatastore1	2_replica_high_performance	10 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	Oracle 1_Data disk_1	Normal	VirtualDatastore1	3_replica_high_performance	100 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	Oracle 1_Data disk_2	Normal	VirtualDatastore1	3_replica_high_performance	100 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	Oracle 1_Data disk_3	Normal	VirtualDatastore1	3_replica_high_performance	100 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	Oracle 1_Log Disk_1	Normal	VirtualDatastore1	3_replica_high_performance	50 GB	0 B/s	0 B/s	2
<input type="checkbox"/>	Oracle 1_Log Disk_2	Normal	VirtualDatastore1	3_replica_high_performance	50 GB	0 B/s	0 B/s	2

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2.4.5.1 Creating Shared Disk

To create a shared disk, you may click **New** in **Storage > Virtual Storage > Shared Disks** and configure the related fields on the pop-up page, as shown below:

Create Shared Disk

Virtual Datastore: VirtualDatastore1

Storage Policy: 3_replica_high_performance 
Please select the same storage policy as that of virtual machines that use this shared disk.

Name:


Size: GB

Disks:

Description:

Shared Among: All VMs in datastore

Advanced

 Virtual shared disk is used to provide sharing service for applications like Oracle RAC, so that different virtual machines can share the same virtual disk.

Virtual Datastore: Specifies where the shared disk is stored.

Name: Specifies a distinguishable name of the shared disk. It can only contain Chinese characters, digits, letters, space and the following special characters: ()[]{} () 【】 {} @|.- +

Storage Policy: Select the number of replication for the disk.

Disks: Specifies the number of shared disks.

Description: It is optional.

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Size: Specifies size of shared disk. The maximum is 1TB(1024GB).

Shared Among: You may select **Any virtual machine in this virtual datastore** or **Specified virtual machines**.

Any virtual machine in this virtual machine: If it is selected, it indicates that shared disk can be accessed by any virtual machine in the specified virtual datastore.

Specified virtual machines: If it is selected, you need to specify virtual machines. Only the selected virtual machines can access shared disk.

2.4.5.2 Allocating Shared Disk

To assign a shared disk to a virtual machine, first edit that virtual machine. Then, on the **Edit Virtual Machine** page, select **Add Hardware > Disk** and choose **Shared disk**, as shown below:

Configuration | Advanced

Standard: Low Typical High

Processor: 8 core(s)

Memory: 16 GB

Disk 1: 120 GB

CD/DVD 1: None

eth0: Connected To: edge2

Other Hardware

Add Hardware

Method: ☐ New disk ☐ Existing disk ☐ Physical disk ☒ Shared disk

Disk	LUN	Size	Storage Pol...	Details
Oracle ...	1	100 GB	3_replica_hi...	View
Oracle ...	21	100 GB	3_replica_hi...	View
Oracle ...	22	100 GB	3_replica_hi...	View
Oracle ...	23	50 GB	3_replica_hi...	View
Oracle ...	24	50 GB	3_replica_hi...	View
Oracle ...	25	50 GB	3_replica_hi...	View
Oracle ...	26	10 GB	3_replica_hi...	View

OK Cancel

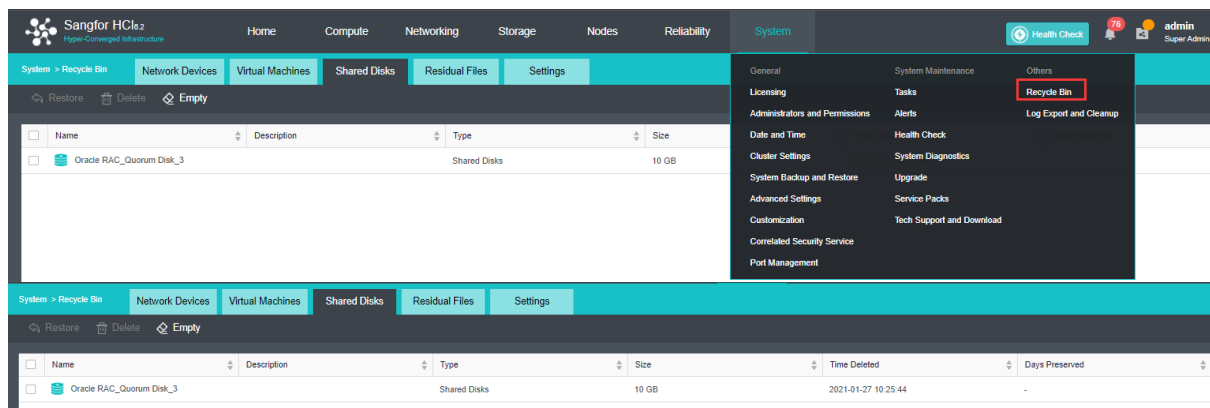
2.4.5.3 Restoring Shared Disk

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

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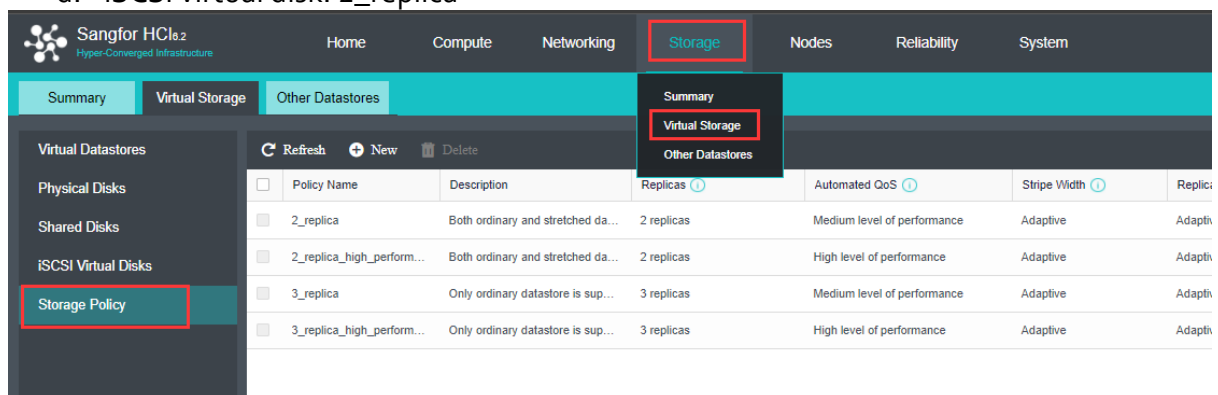
2.4.6 Storage Policy

In version 6.0.1, Storage Policy had been implemented for virtual machine and virtual disk. This allow user to separate the VM based on the priority of the business.

HCI will create the storage policy automatically after the virtual storage had been created. Navigate to **Storage > Virtual Storage > Storage Policy** to view the current available Storage Policy.

Below is the default storage policy for different scenario.

- Normal VM : 2_replica
- SQL Server/ Oracle Database: 3_replica_high_performance
- Shared disk: 3_replica_high_performance
- iSCSI virtual disk: 2_replica



Creating new storage policy allow to customize in terms of Replicas, Auto Tiering QoS, Stripe Width and Replica Defrag.

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Add New Storage Policy

Name:

Description:
This policy is applicable to all datastores

Data Placement

Replicas :
☒ 2 replicas (for all datastores)

2 replicas for each virtual machine to tolerate single host or disk failure; actual storage capacity is half of the total capacity

☐ 3 replicas (for ordinary datastores)

3 replicas for each virtual machine to tolerate single host (among 3-4 hosts) or dual host (among over 5 hosts) failure, or dual-disk failure; actual storage capacity is one third of the total capacity

☐ 3 replicas (for stretched datastores)

Replica Placement:

Stripe Width:
Adaptive

Automated QoS:
Medium level of performance

Replica Defrag:
☒ Adaptive
☐ Enabled
☐ Disabled

OK
Cancel

2.4.7 iSCSI Virtual Disks

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

Navigate to **Storage > Virtual Storage > iSCSI Virtual Disks** and you will see the following information: **Name, Status, Virtual Datastore, LUN ID, Disk Size, Write Speed, Read Speed, Target IP Address, and VMs.**

Summary	Virtual Storage	Other Datastores
Virtual Datastores	Refresh New iSCSI Server Edit Delete	
Physical Disks		
Shared Disks		
iSCSI Virtual Disks		
Storage Policy		

Name	Status	Virtual Datastore	Storage Policy	SCSI ID	LUN ID	Disk Size	Read Speed	Write Speed	Target IP	Connections
test	Normal	VirtualDatastore1	2_replica	93a03401-66db-43...	11	1000 GB	1016 B/s	0 B/s		2

To view connected iSCSI initiators, click on the number under the **Connected** column.

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Connected Initiators			✕	
Initiator Address	Initiator IQN	Server Address		
192.200.19.18	iqn.2005-03.org.open-iscsi:host-00e0e...	192.168.20.3		
192.200.19.19	iqn.2005-03.org.open-iscsi:host-6c92b...	192.168.20.3		

To edit an iSCSI virtual disk, you may select the disk that you want to edit and then click **Edit**

To delete an iSCSI virtual disk, you may select the disk that you want to delete and then click **Delete**

The screenshot shows the 'Virtual Storage' section with the 'Virtual Datastores' tab active. On the left, a sidebar lists 'Virtual Datastores', 'Physical Disks', 'Shared Disks', 'iSCSI Virtual Disks', and 'Storage Policy'. The main area displays a table of virtual datastores. The 'test' entry is selected, and the 'Edit' button in the top right is highlighted with a red box.

	Name	Status	Virtual Datastore	Storage Policy	SCSI ID
<input checked="" type="checkbox"/>	test	Normal	VirtualDatastore1	2_replica	93d0340

2.4.6.1 Configuring iSCSI Server

An iSCSI server should be configured before you create iSCSI virtual disk. You can configure iSCSI server for different virtual datastores. The configuration process involves configuring iSCSI authentication and target portal (only available for cluster with 3 nodes and above).

The screenshot shows the 'Virtual Storage' section with the 'Virtual Datastores' tab active. On the left, a sidebar lists 'Virtual Datastores', 'Physical Disks', 'Shared Disks', 'iSCSI Virtual Disks', and 'Storage Policy'. The main area displays a table of virtual datastores. The 'iSCSI Server' button in the top right is highlighted with a red box.

	Name	Status	Virtual Datastore	Storage Policy
<input checked="" type="checkbox"/>	test	Normal	VirtualDatastore1	2_replica

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iSCSI Server			
Refresh			
Virtual Datastore	Authentication	Target IP	Operation
VirtualDatastore1	iqn.2015-08.3ab48700.com.sangfor.asan	Not configured	Settings

2.4.6.1.1 Configuring iSCSI Server Authentication

Target Name Prefix, CHAP Username, CHAP Password, and Retype Password fields should be specified, as shown below:

Configure iSCSI Server (VirtualDatastore1)

Authentication | Target Portal

Target Name Prefix:

CHAP Username:

CHAP Password:

Confirm Password:

[Change Password](#)

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 the CHAP password.

Change Password: To change password, click **Change Password**.

2.4.6.1.2 Configuring Target Portal

On the **Target Portal** tab, configure the following fields: **Network Interface, Target IP Address, Netmask** and **Virtual IP Pool** :

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Configure iSCSI Server (VirtualDatastore1)

Authentication
Target Portal

Network Interface:
Storage network interface (Recommended) ⓘ

Target Address: ⓘ

Netmask:

Virtual IP Pool:

Each node will be assigned a virtual IP address from this pool, after connecting to the server via the target portal and scheduled to different nodes.

The virtual datastore has 3 node(s) involved. Please configure at least 3 IP addresses that reside in the same network segment as the target IP address.

Example

ⓘ iSCSI initiators can access iSCSI virtual disks via a target portal, to gain high availability and load balancing. [Learn More](#)

OK
Cancel

Network Interface: Specifies the interface for iSCSI initiator to access iSCSI server. Options are **Storage Network Interface** and **Management Interface**. Management interface cannot be used in the following situations: 1) It is reused as overlay network interface; 2) It is reused as the edge; 3) It applies link aggregation.

Target IP Address: Specifies target IP address. iSCSI initiator connects to iSCSI server through this IP address. Make sure that the target IP address is reachable for iSCSI initiators.

Netmask: Specifies the netmask of the target IP address.

Virtual IP Pool: Each clustered node will be assigned an IP address from virtual IP pool. Thus, initiators will be scheduled to to different nodes after connecting to iSCSI server.



iSCSI initiators can access virtual iSCSI disk via target IP address, to gain high availability

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and load balancing. Each clustered node will be assigned an IP address from virtual IP pool. Thus, initiator connections to a specified target IP address will be scheduled to different nodes. This has the following strengths:

Click **OK** to save the changes. Changes to target portal should also be made at iSCSI initiator side, and if there is any change made to network interface, the iSCSI network should be reconfigured correspondingly.

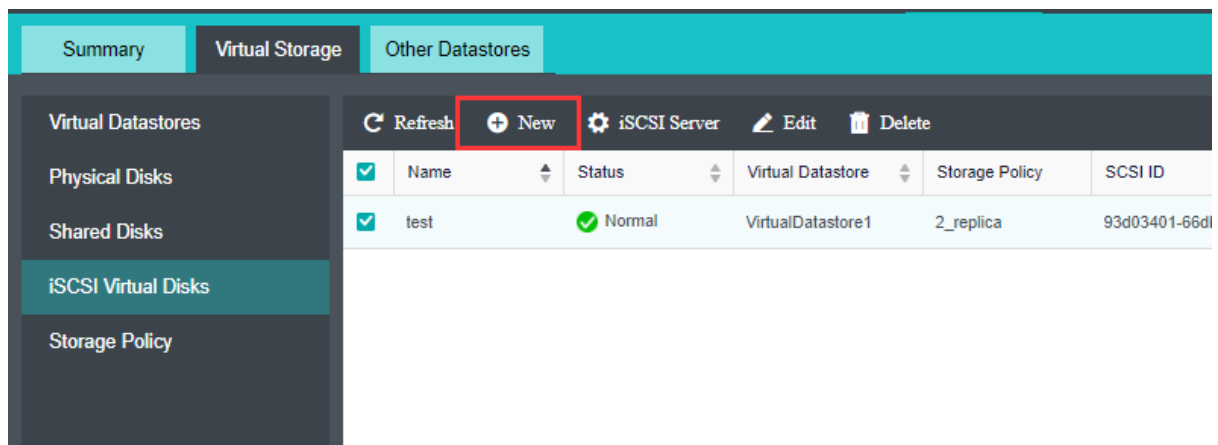
2.4.6.1.3 Load Balancing

If the iSCSI connections to nodes are not balanced, click **Perform Again** to re-schedule initiator connections to different nodes so as to ensure iSCSI connections evenly assigned to each clustered node. iSCSI connections will be preferentially scheduled to the node which has LUN replicas, which helps to enhance IO performance and reduce network load.

Rebalancing load will make some iSCSI connections disconnected and requires administrator to enter password of the username to confirm operation.

2.4.6.2 Creating iSCSI Virtual Disk

After iSCSI server has been configured, you can create iSCSI virtual disk by click **New** in **Storage > Virtual Storage > iSCSI Virtual Disks**, as shown below:



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Virtual Datastore: Specifies a datastore for creating iSCSI virtual disk.

Name: It can 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: Specifies description for the new virtual disk. It is optional.

Disk Size: Specifies size of the iSCSI disk. The maximum is 48TB(49152GB) and cannot exceed the available storage capacity.

Accessible To: You may 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 (o initiators)** button to configure iSCSI initiator. To add an iSCSI initiator, click **Add** on the **Initiator Settings** page to enter the following page.

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

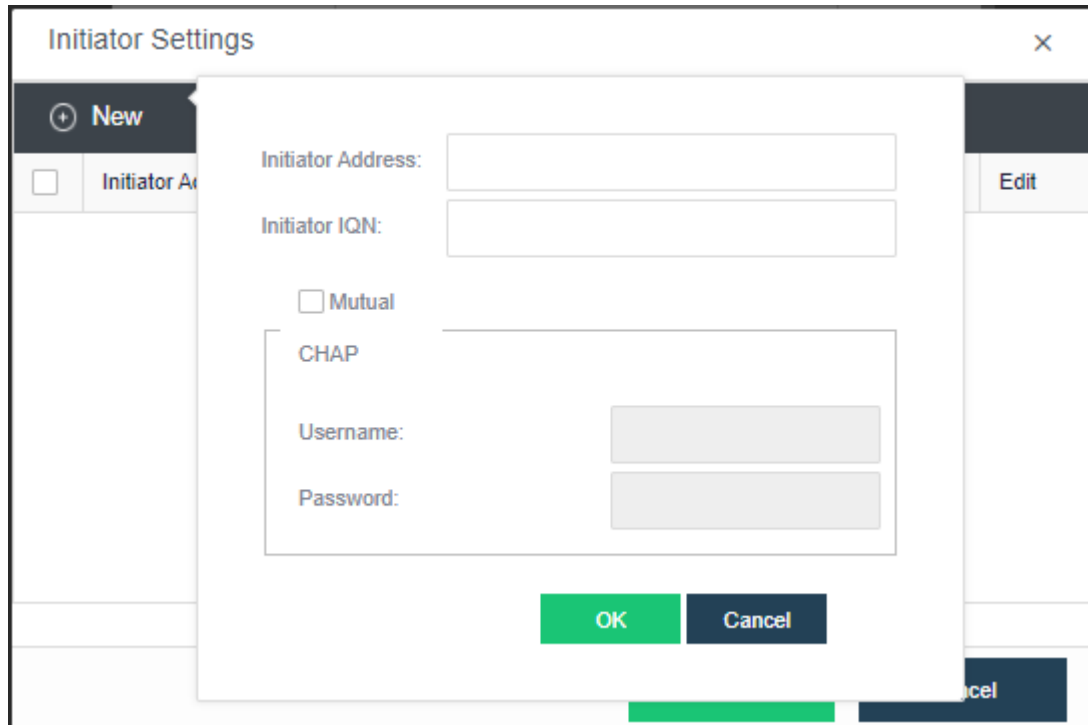
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deselected by default. Enable this to allow an entire cluster to access, for example, VMware vSphere cluster.

Pre-allocation: It will pre-allocate the iSCSI virtual disk for better performance. However, it will consume more storage space.



Initiator Address: Specifies management interface address of initiator or cluster IP address.

Initiator IQN: Indicates the device name of iSCSI initiator.

Mutual CHAP: If it is selected, **Username**, and **Password** fields are required. This option is optional. If mutual CHAP has not been configured on iSCSI initiator, keep this option deselected. iSCSI disk cannot be accessed by iSCSI initiator if the correct CHAP username and password are not provided in case that mutual CHAP has been configured on that iSCSI initiator and that initiator is required to be authenticated by iSCSI server,



One of the two fields is required at least.

2.4.8 Other Datastores

Storage falls into the following types: FC, iSCSI, NFS 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 physical disk of the host installed Sangfor HCI software and can only be

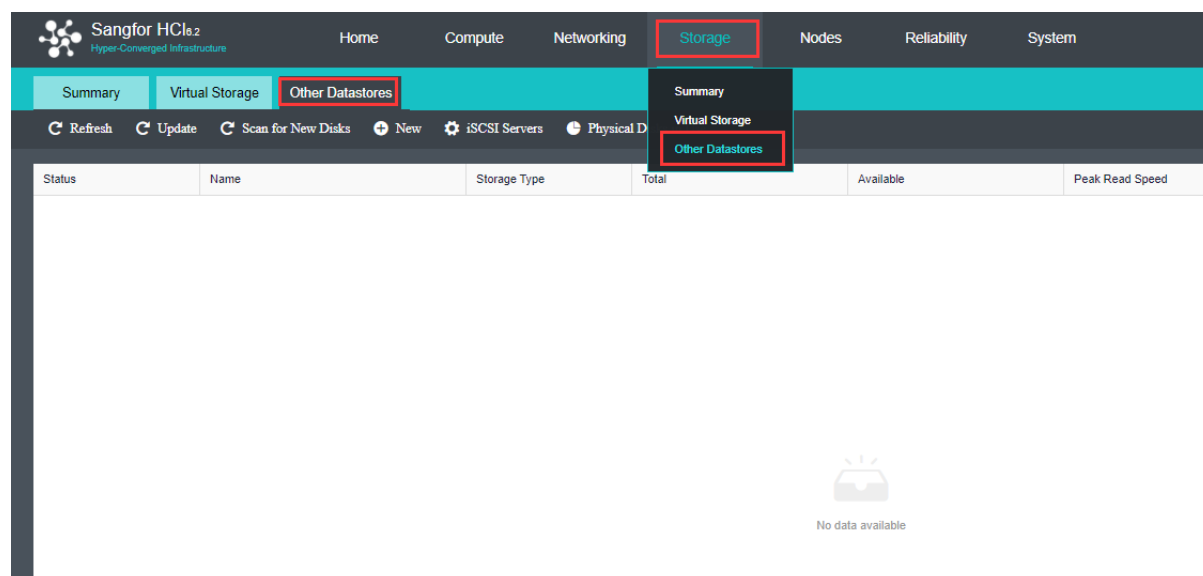
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accessed by the host where that storage resides but not accessed by other hosts.

On the **Other Datastore** page, status, name, storage type, total capacity, available space, peak read speed, peak write speed, and connected nodes are displayed as follows:

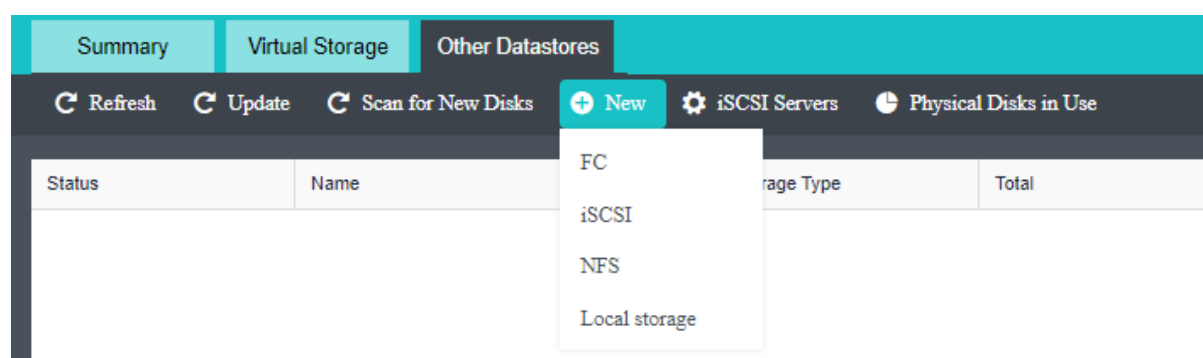


To view detailed information of virtual datastore, click on the name of the virtual datastore. For details, refer to the Error! Reference source not found.section.

To perform more operations, you may click on the icon  beside datastore name and will see the following operations: **Edit, Summary, Manage, Delete, Format** and **Cleanup**.

2.4.7.1 Adding New Datastore

You can add the following types of datastores: iSCSI, FC, NFS or local storage by clicking **New** in **Storage > Other Datastore**.



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2.4.7.1.1 Adding FC Type of Datastore

Fiber channel(FC) adopts Fiber Channel over IP (FCIP) to connect storage devices in TCP/IP network. FCIP transmits Fiber Channel data by establishing a tunnel between two peers. Generally, it builds storage area network through DWDM and dark fiber.

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

Add New Datastore

Storage Type:

☐ iSCSI ☒ FC ☐ Local storage

Status	Disk	LUN	Size	Details
No data available				

? [How to add a new FC disk?](#)

Disk is not reachable any more? [Scan for Disks](#)

1/2 Next Cancel

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

Add New Datastore

Storage Type:

☐ iSCSI ☒ FC ☐ Local storage

Status	Disk	LUN	Size	Details
No data available				

? [How to add a new FC disk?](#)

Disk is not reachable any more? [Scan for Disks](#)

1/2 Next Cancel

Datastore: Specifies a distinguishable name for the datastore. Datastore name should

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contain 2-16 characters consisting of digits, letters.

Connect To Node: Displays the node that the new local disk 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.

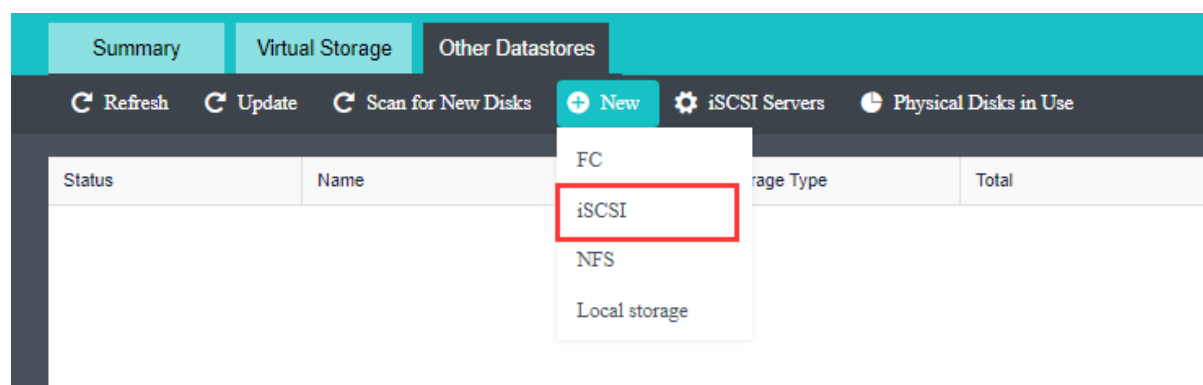


If there is virtual machine stored on the datastore, but the option Recover existing virtual machines on this datastore as well is not selected, the virtual machine will not be deleted. You should perform format operation so as to delete the virtual machine in the virtual datastore. If you'd like to recover virtual machine to HCI platform, you can add the datastore again and select the option Recover existing virtual machines on this datastore as well.

2.4.7.1.2 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, iSCSI commands and data should be encapsulated into TCP/IP packets before being forwarded.

To add iSCSI type of datastore, click **New** in **Storage > Other Datastore**, select **iSCSI** as **Storage Type** and then choose a disk.



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Add New Datastore

Storage Type:

☒ iSCSI ☐ FC ☐ Local storage

Status	Disk	LUN	Size	Details
<input checked="" type="radio"/>	VIRTUAL-IS-DISK_SANGFOR_1SANGF...	5	500 GB	View

Disk is not found or need more disks? [Add a New iSCSI Server](#)

Disk is not reachable any more? [Scan for Disks](#)

1/2

Next Cancel

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

Summary

Virtual Storage

Other Datastores

Refresh

Update

Scan for New Disks

New

iSCSI Servers

Physical Disks in Use

Status	Name	Storage Type	Total
--------	------	--------------	-------

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

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Add New Datastore

Storage Type:

☒ iSCSI ☐ FC ☐ Local storage

Status	Disk	LUN	Size	Details
	VIRTUAL-IS-DISK_SANGFOR_1SANGF...	5	500 GB	View

Disk is not found or need more disks? [Add a New iSCSI Server](#)

Disk is not reachable any more? [Scan for Disks](#)

1/2 Next Cancel

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

Add this datastore to VM backup repositories as well: Once this option is selected, datastore will be added to VM backup repositories.

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



If there are virtual machines on the datastore, and the option Recover existing virtual machines on this datastore as well is not selected, the existing virtual machines will not be cleaned up. You may try formatting the datastore if you want to clean up the existing virtual machines on that datastore. If you want to recover virtual machines on the datastore, you can delete the datastore and add it again and select that option.

2.4.7.1.3 Adding NFS Type of Datastore

NFS is network file system, one type of file system supported by FreeBSD. It enables computers to share resources across TCP/IP network. NFS client can have access to files on

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remote NFS server, just like accessing local files.

Due to performance restriction, NFS is recommended to store backups only, not to create or run VM.

Name:

Description:

Server:

Folder:

Connect To Node

<input checked="" type="checkbox"/>	Node	IP
<input checked="" type="checkbox"/>	192.200.19.18	192.200.19.18
<input checked="" type="checkbox"/>	192.200.19.19	192.200.19.19

OK Cancel

Name: Specifies name of the NFS type of datastore. Name can only contain 2 to 16 characters consisting of digits, letters, underscores, dots, and hyphens only, and should begin and end with letter or digit.

Description: Optional, specifies description for the NFS datastore.

Server: Specifies IP address of NFS server.

Folder: Specifies the shared folder on NFS server.

Connect to Node: Specifies node that can have access to NFS datastore.



Due to low performance of NFS datastore, it can only be used to store virtual machine backups only, not to create or run virtual machine, etc.

2.4.7.1.4 Adding Local 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.

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

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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 new local disk belongs to.

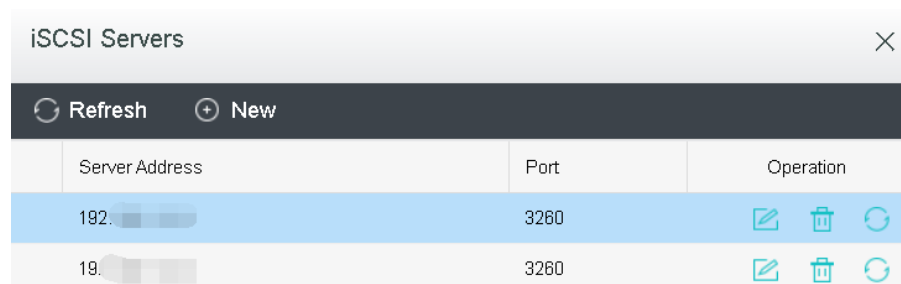
If any virtual machines is stored on the datastore, you can select the option **Recover existing virtual machines on this datastore as well** to recover existing virtual machines.







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

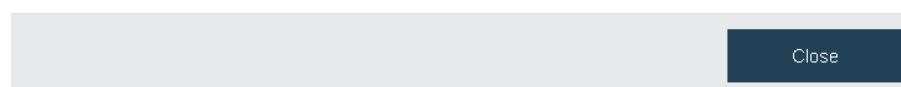
If the new disk being added has not been formatted, you will be prompted to format it when adding it into local storage. Note that formatted data cannot be restored any more.

2.4.7.2 Configuring iSCSI Server

You need to configure **iSCSI Servers** in **Storage > Other Datastore > iSCSI server** before adding iSCSI type of datastore. Then, click **New**. iSCSI disks will be automatically discovered when iSCSI server settings are saved.



Server Address	Port	Operation
192.	3260	  
19.	3260	  



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.

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Add a New iSCSI Server

iSCSI Server

Server:

Port:

Authentication

☐ One-way CHAP (server authenticates initiator)

Credentials for this machine to get authenticated against iSCSI server. Initiator simply needs to initiate connection.

Username:

Password:

☐ Mutual CHAP (server and initiator authenticate each other)

Credentials for iSCSI server to get authenticated against this machine.

Detect Target **Close**

After username and password are specified, click **Detect Target**. On the **iSCSI Targets** tab, 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**.

Edit iSCSI Server

iSCSI Server **iSCSI Targets**

iSCSI Target

By default, all disks from authenticated target are added onto SANGFOR aCloud.

No.	Target Name	Authentication
1	iqn.2015-08.3ab48700.com.sangfor.asan...	Authenticated
2	iqn.2015-08.3ab48700.com.sangfor.asan...	Start

Detect Target **Close**

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.

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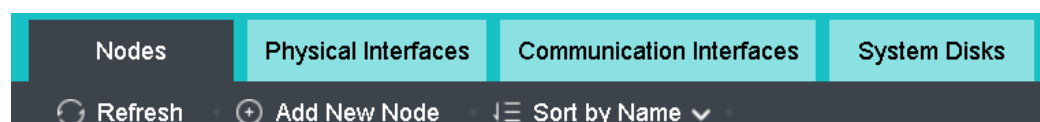
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Then iSCSI disks will be automatically discovered and listed on **Add Datastore** page so that you can add them to become a datastore.

2.5 Nodes

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



2.5.1 Managing Nodes

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

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

2.5.1.1 Adding Node

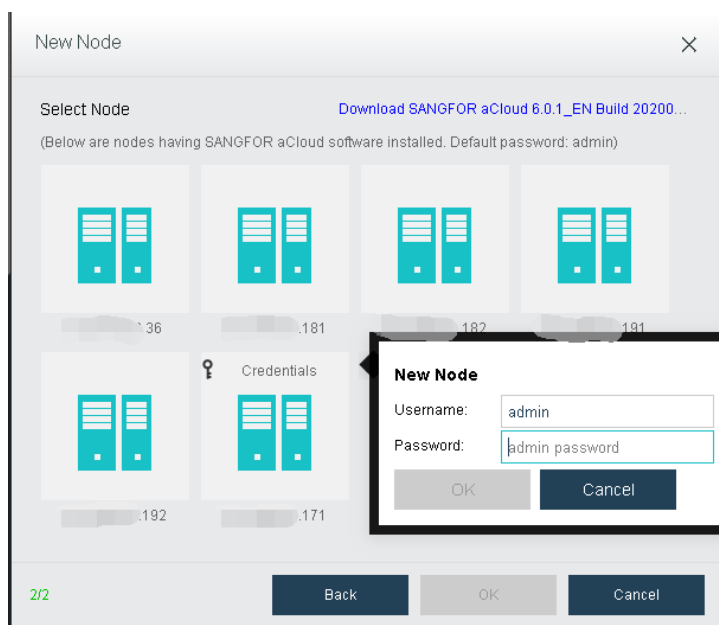
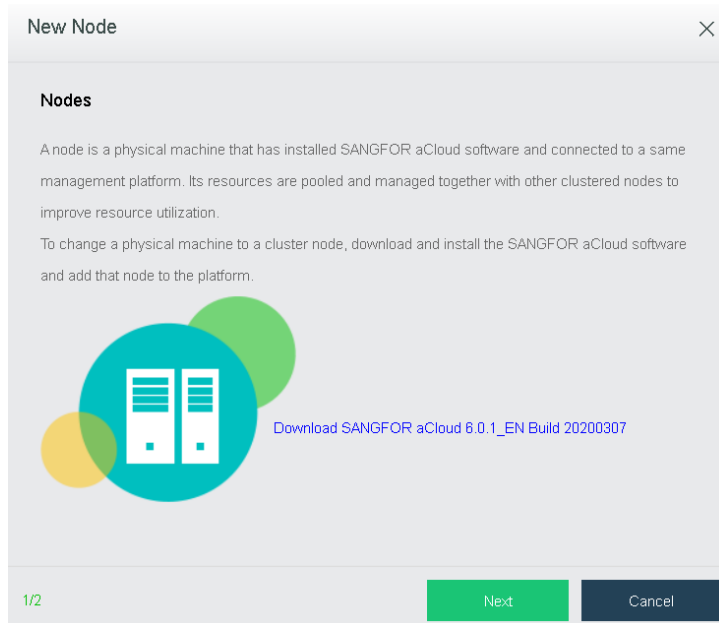
A node is a physical machine that has installed Sangfor HCI software and connected to Sangfor HCI platform. Its resources are pooled and managed together with other clustered nodes to improve resource utilization.

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

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

Username: Specifies administrator's username of that node.

Password: Specifies administrator's password of that node.

Finally, click **OK**.

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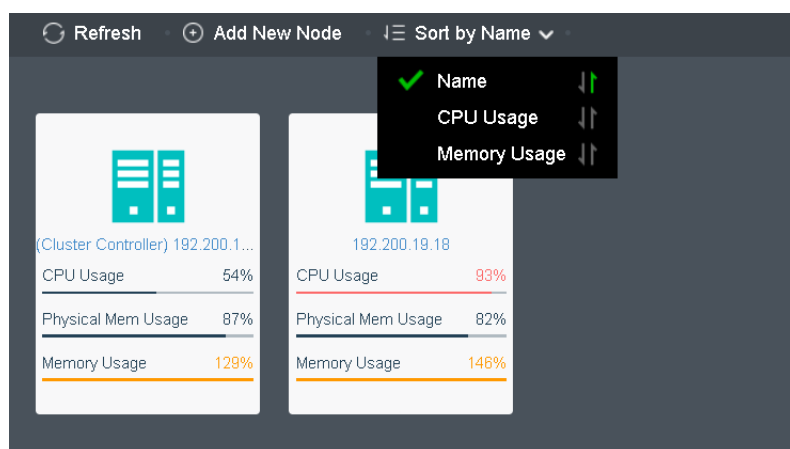
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- A node can be added to one cluster only. If a node has been added to a cluster and you want to add it to another cluster, it must be removed from that cluster first.
- Versions of Sangfor HCI software installed on the nodes to be added to a same 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 **New 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.

2.5.1.2 Sorting Nodes

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

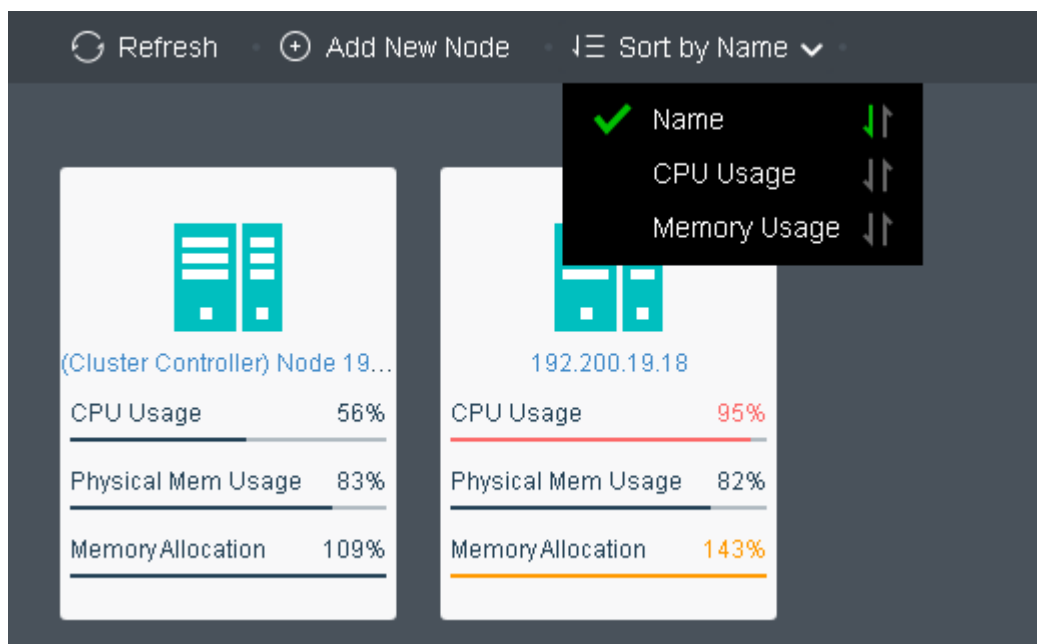


To sort nodes by name, select **Sort by Name**. Additionally, by clicking on the  arrow, nodes can be sorted in ascending order or descending order.

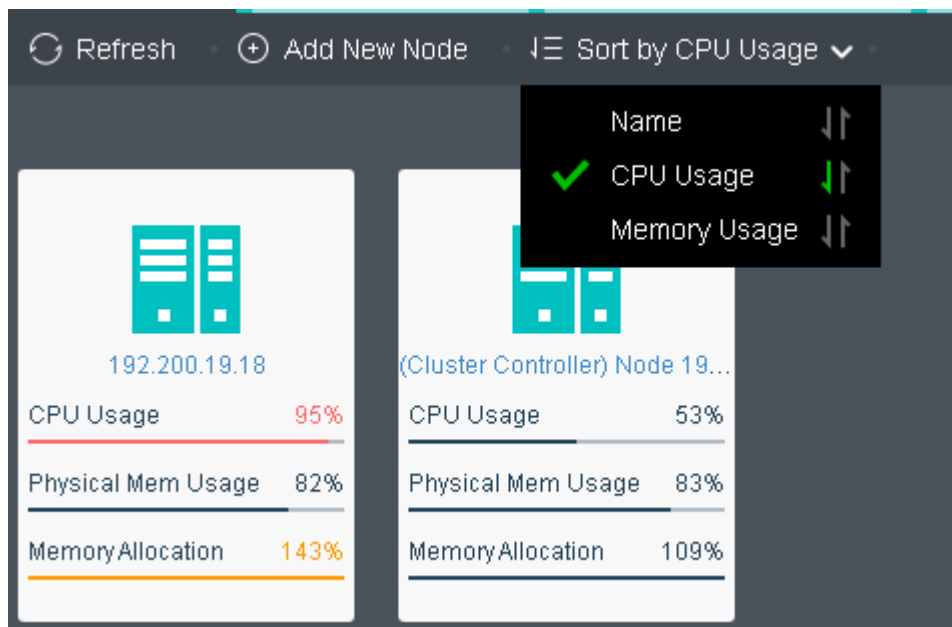
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To sort virtual machines by CPU usage, select **Sort > CPU Usage** in Nodes. By clicking on that arrow, virtual machines can be sorted based on CPU usage in ascending order or descending order. The following figure shows that the virtual machines are sorted by CPU usage in a descending order.

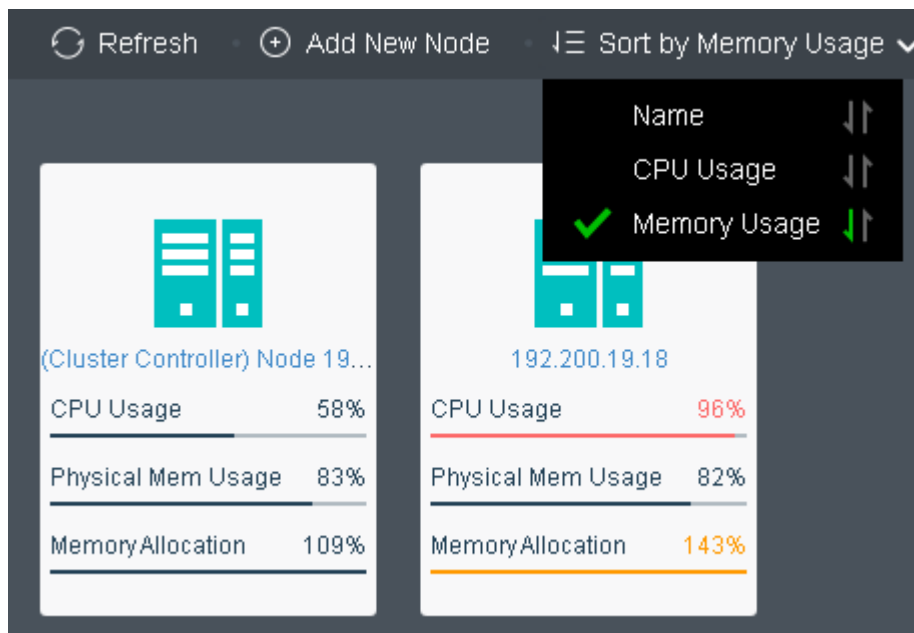


To sort nodes by memory usage, select **Sort > Memory Usage**. By clicking on that arrow, node can be sorted by memory usage in ascending order or descending order. The following figure shows that the virtual machines are sorted by memory usage in a descending order.

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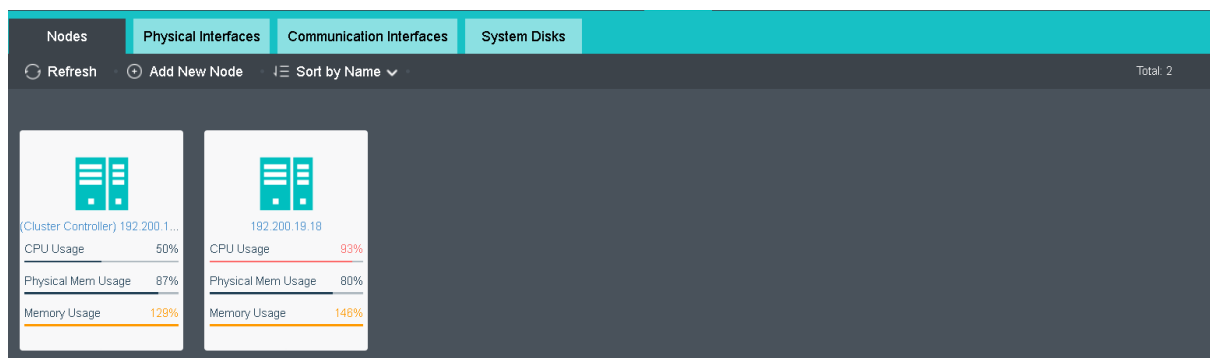
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2.5.2 Viewing Node Status

The **Nodes** page is shown below:



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

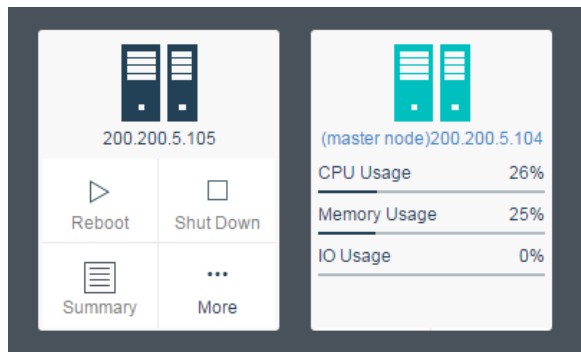
Total: 2

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

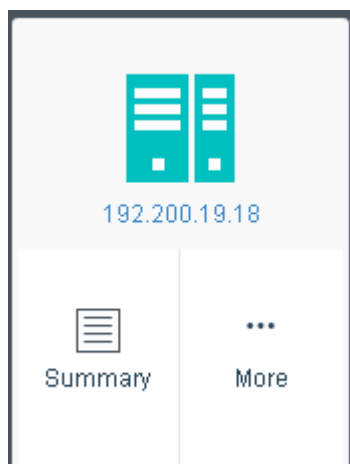
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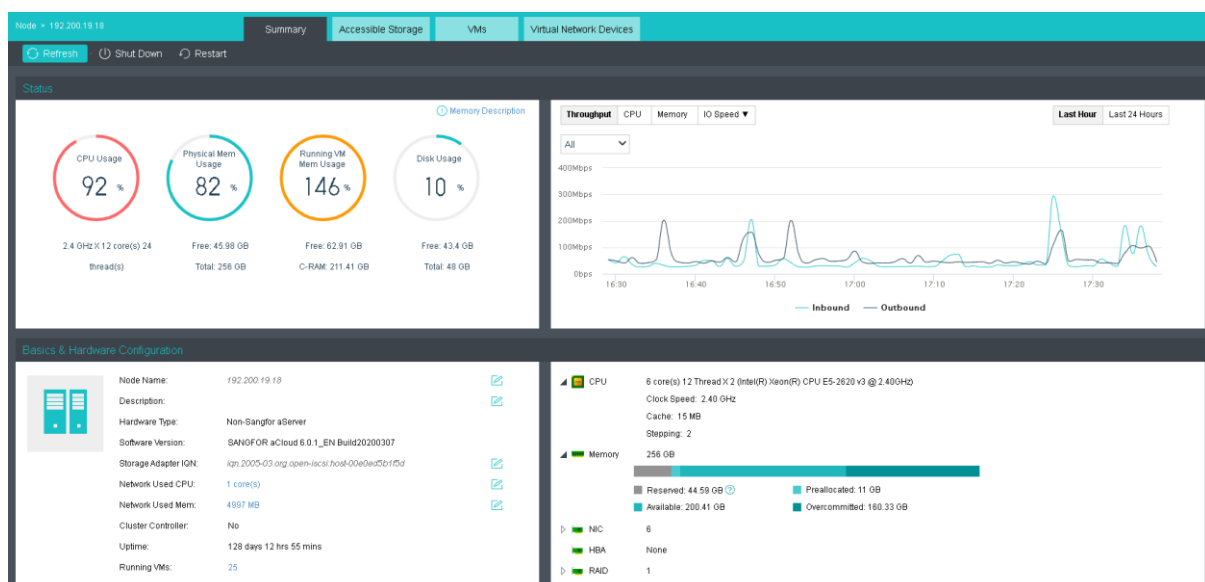
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Move your cursor on the node panel and you will see the following buttons: **Summary** and **More**, as shown below:



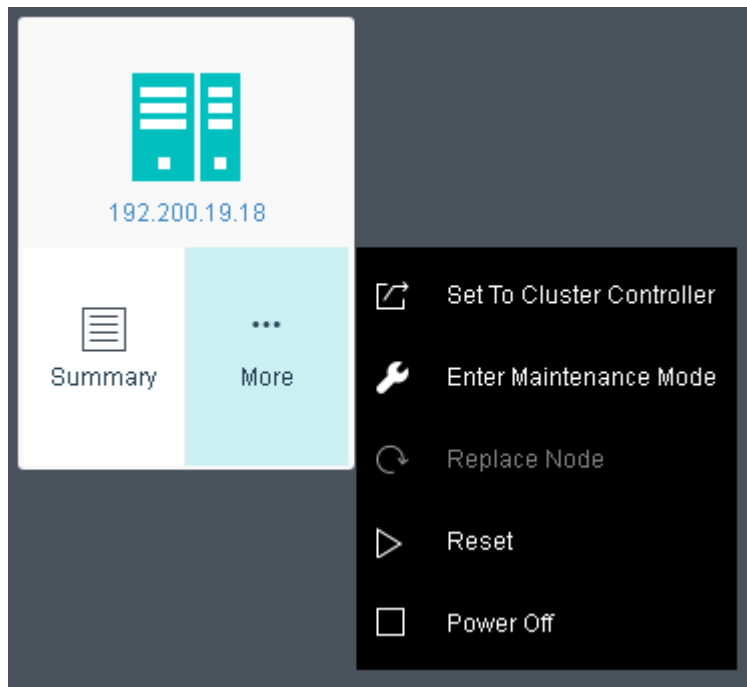
To enter node summary page, you may click on node name or **Nodes > Summary**.



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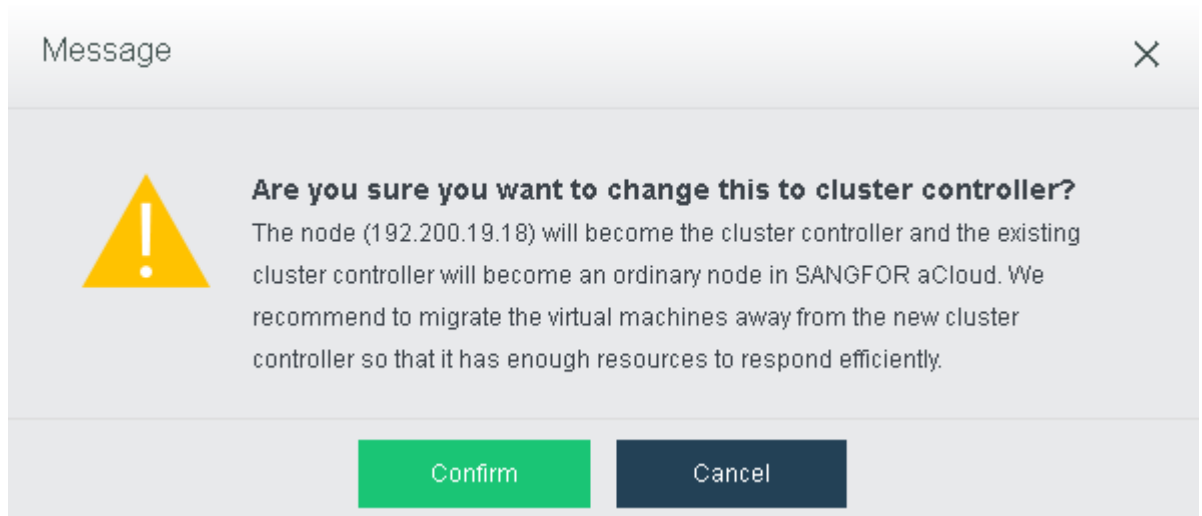
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There are few more options under More which are:

- a. **Set To Cluster Controller:** Set the selected node as the cluster controller node. This option is only available for non-controller node.

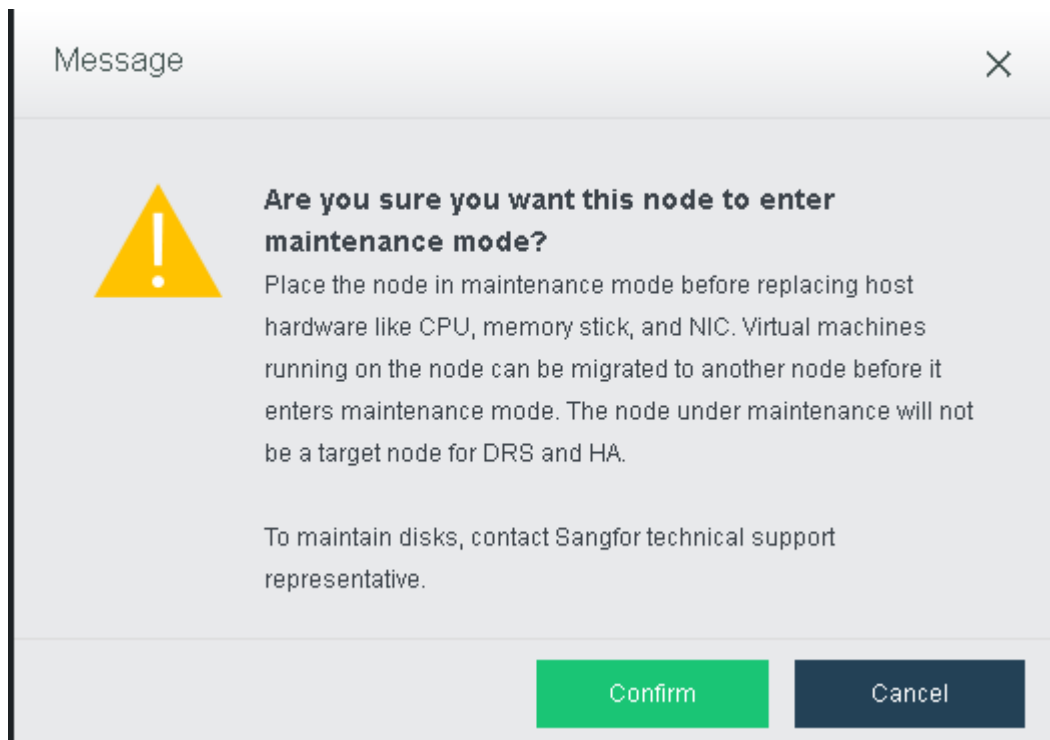


- b. **Enter Maintenance Mode:** Enable to allow the selected node to enter the maintenance node for hardware maintenance such as memory replacement.

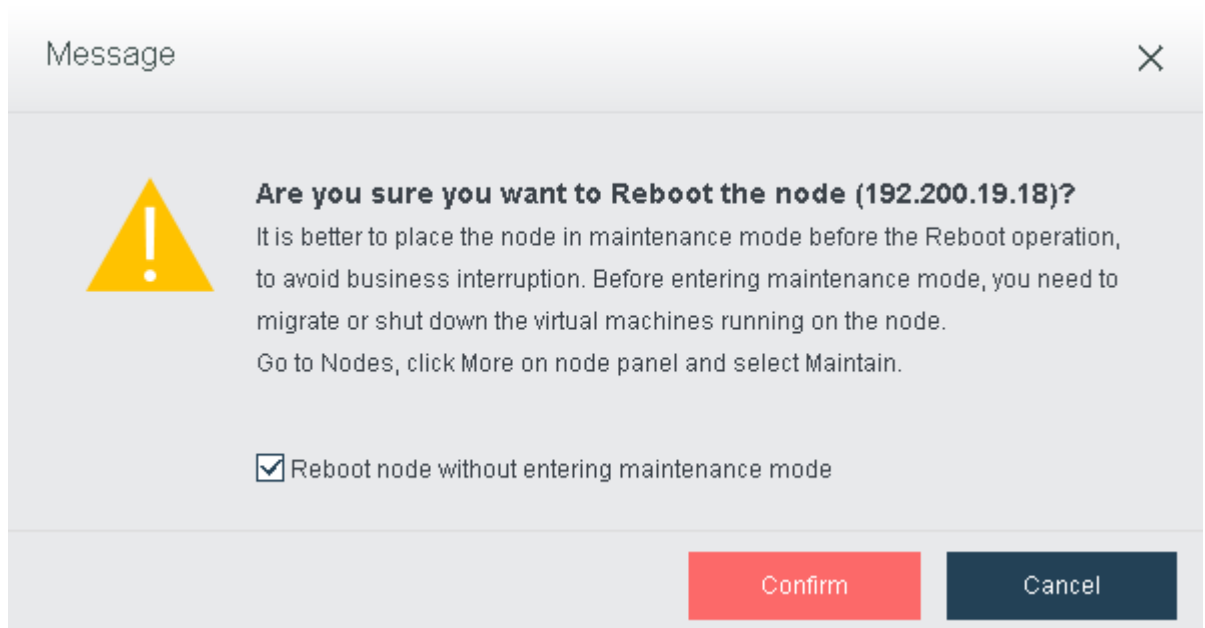
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- c. **Replace Node:** Allow to replace node when the node facing failure. Only available when the nodes is offline.
- d. **Reset:** Reboot the selectd node.



- e. **Power off:** Power off the node.

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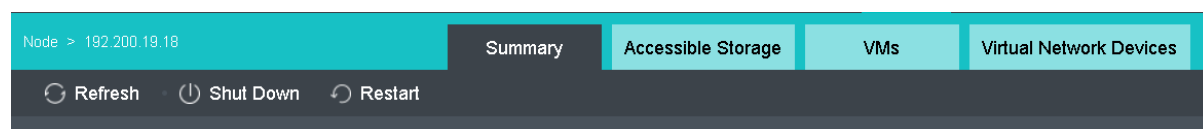
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Notes: Besides, A clustered node can be removed from cluster by clicking **Delete** if its disk is not added to virtual storage.

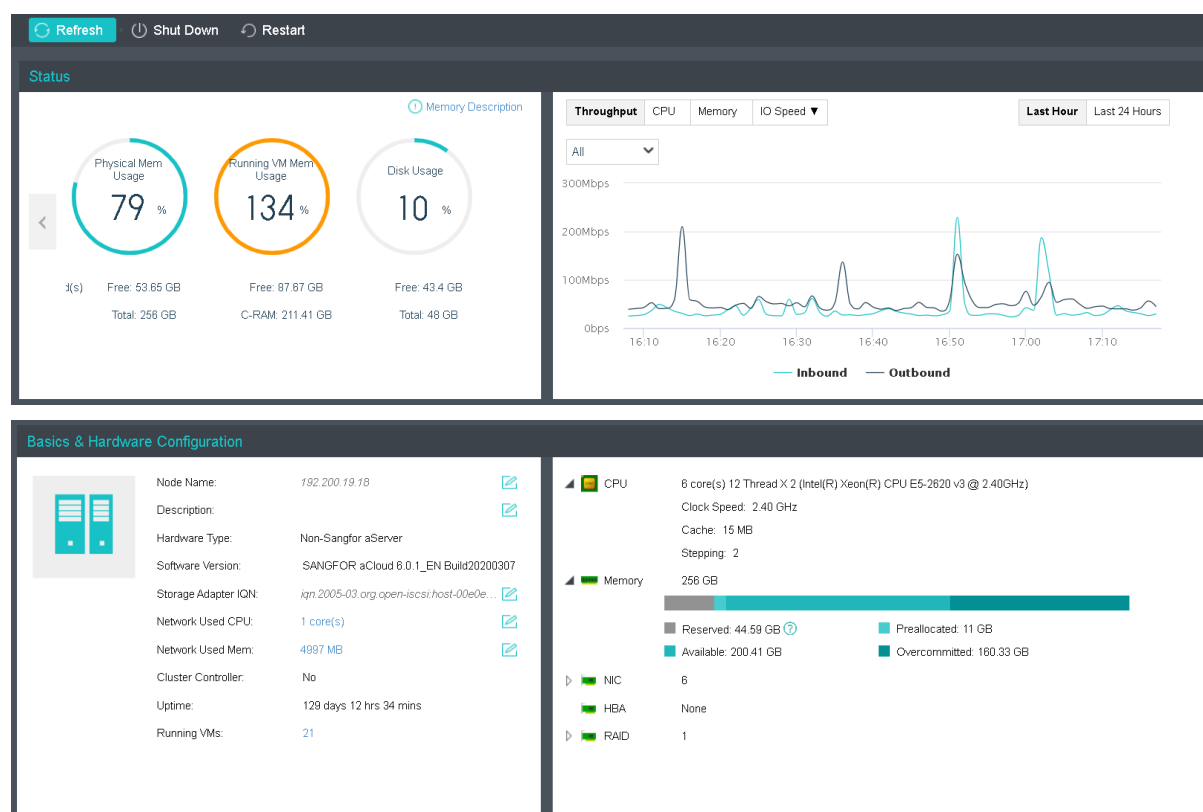
2.5.3 Viewing Node Details

There are the following parts: **Summary**, **Accessible Storage**, **Virtual Machine**, **Virtual Network Devices** as shown below:



2.5.3.1 Node Summary

On the **Summary** page, you may view node status, basics and hardware configurations.



To power off node, click **Shut Down**.

To reset node, click **Restart**.

Status: This section displays CPU usage, memory usage, disk usage, throughput, CPU usage trend, memory usage trend, IO speed, etc.

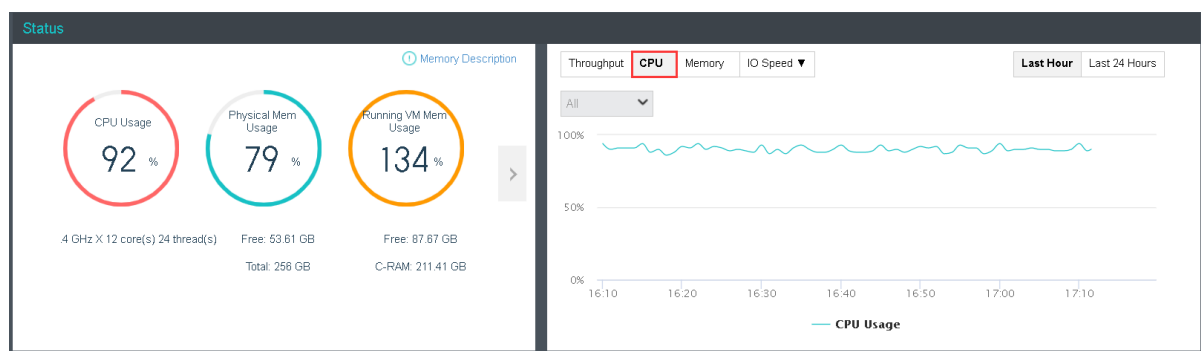
CPU Usage: Displays CPU usage of node. On the right side, you can view CPU usage in

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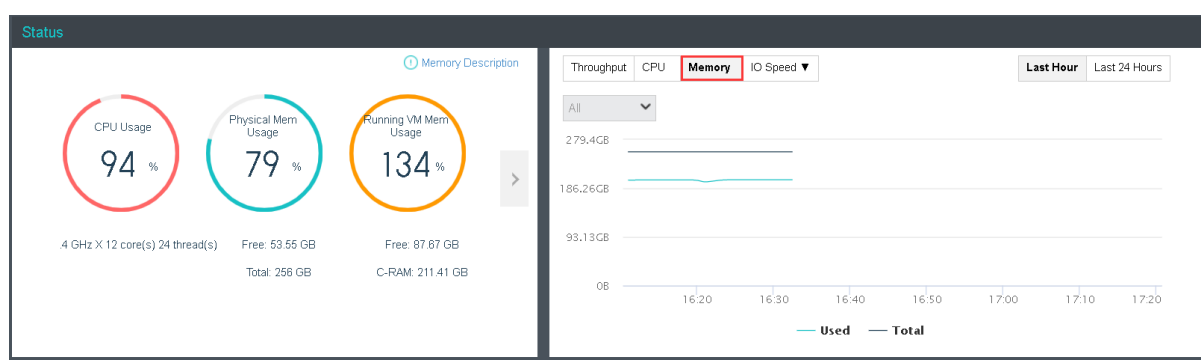
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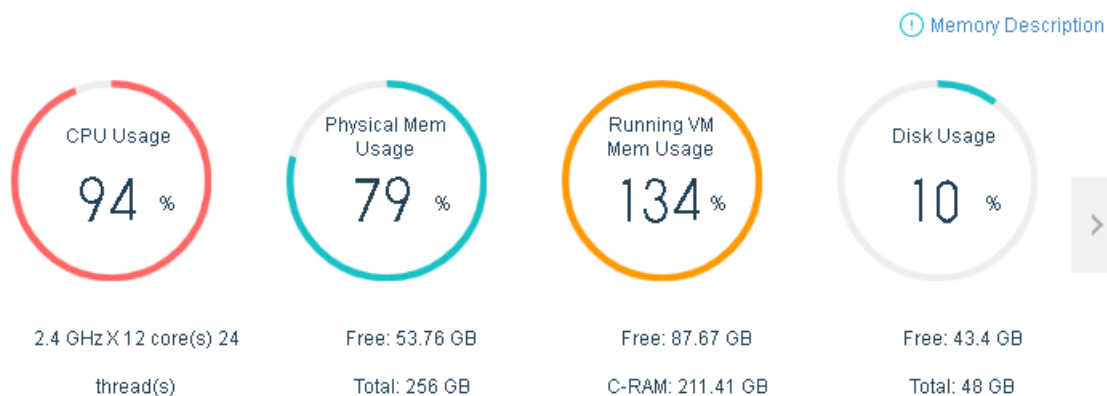
the last hour or 24 hours.



Memory Usage: Displays the total and free memory size respectively, 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.

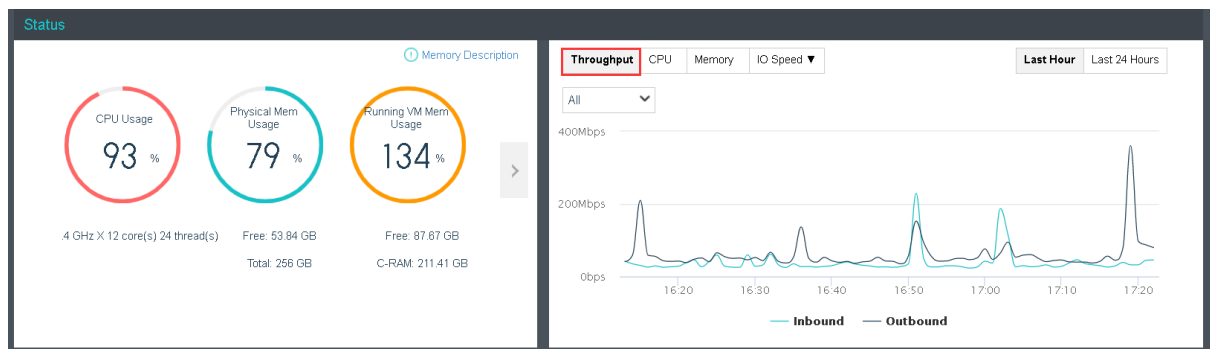


Throughput: Displays the trending of node throughput.

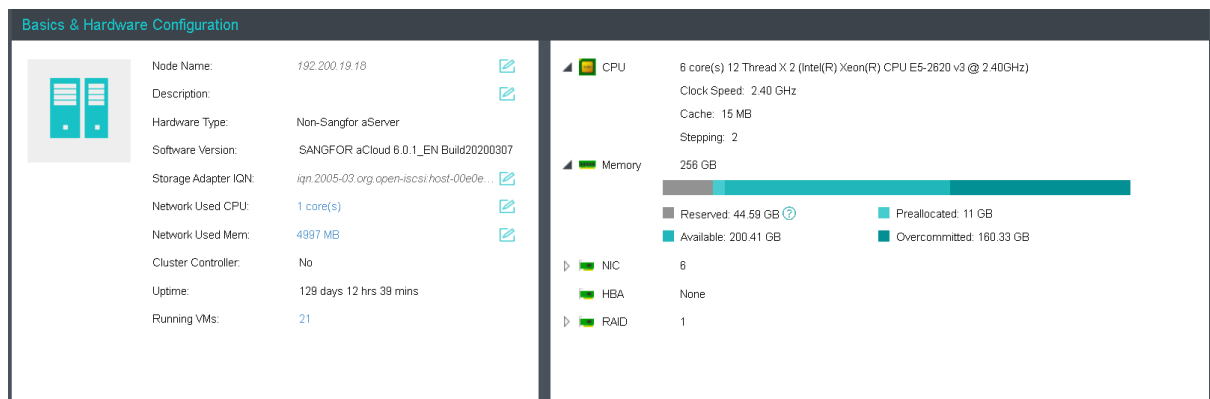
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Basics & Hardware Configuration: This section displays basic information and hardware configuration of node. Basic information includes **Node Name**, **Description**, **Software Version**, **Storage Adapter IQN**, **Network Used CPU**, **Network Used 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 Viewing Accessible Storage

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

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Node > 192.200.19.18								
Summary Accessible Storage VMs Virtual Network Devices								
Refresh Test Storage IO Speed								
Datastore	Type	Used	Free	Usage	Capacity	Peak Read Speed	Peak Write Speed	
ISCSI	ISCSI	459.5 GB	36.5 GB	92.64%	496 GB	118.15 MB/s	169.73 MB/s	
192.200.19.18/local	Local storage	4.6 GB	43.4 GB	9.57%	48 GB	489.52 MB/s	326.73 MB/s	
VirtualDatastore1	Virtual Storage	18.98 TB	10 TB	65.48%	28.98 TB	395.37 MB/s	184.57 MB/s	

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

Node > 192.200.19.18								
Summary Accessible Storage VMs Virtual Network Devices								
Refresh Test Storage IO Speed								

Test Storage IO Speed

Datastore:

ISCSI

Block Size:

64 KB

Test Now

Results

Peak Read Speed: -

Peak Write Speed: -

Read Rate Per Process: -

Write Rate Per Process: -

Close

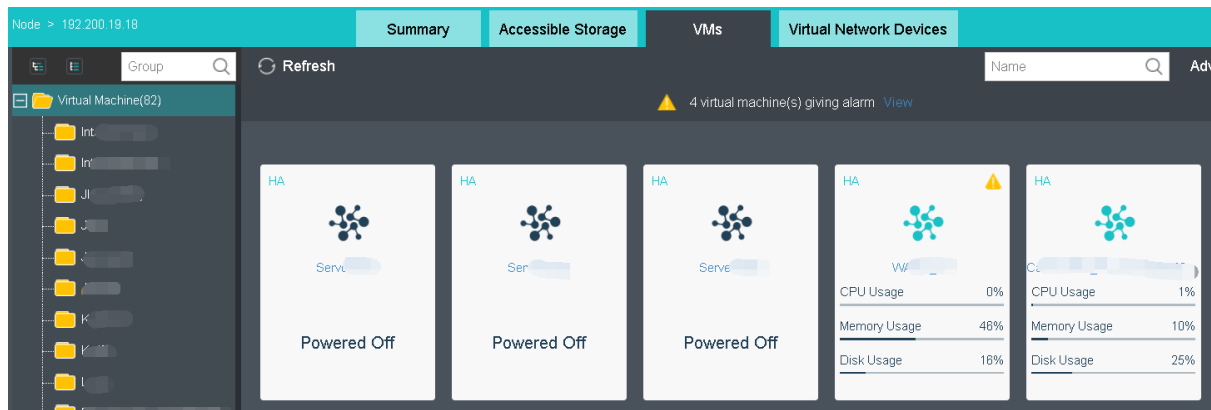
2.5.3.3 Viewing VMs

On the **VMs** page, you may 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).

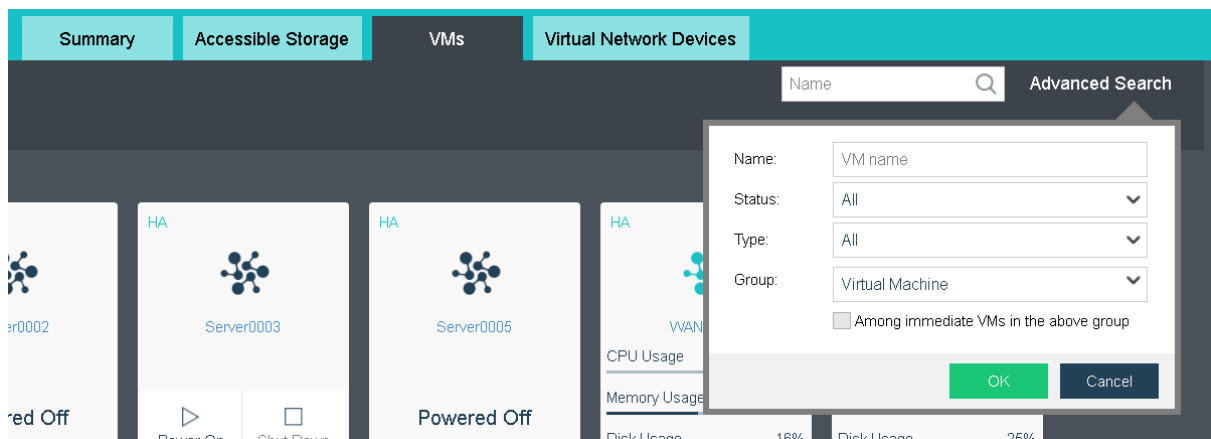
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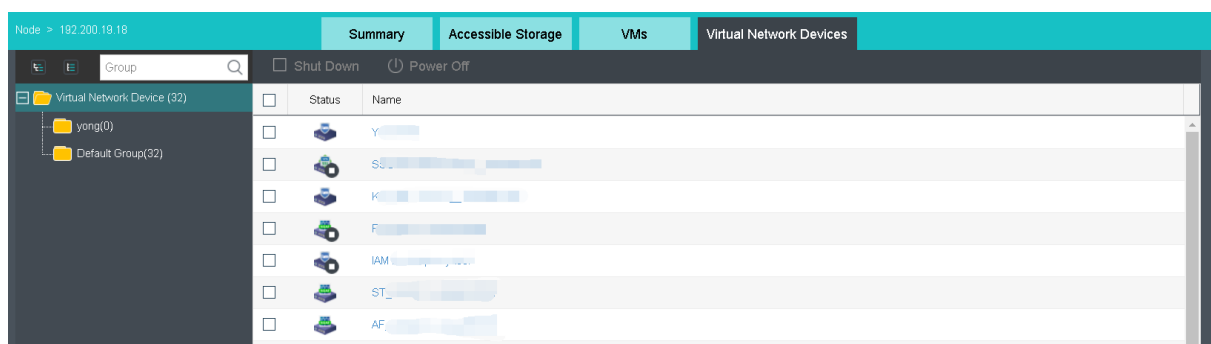
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Fuzzy match is supported. You may search for virtual machine by VM name or click **Advanced Search** to search for virtual machine by VM status, type and group.



On the Virtual Network Devices page, You may view the network device which running on the nodes. Those network devices are displayed by group(Network devices not running on that node will not be displayed).



2.5.4 Physical Interface







You may view the following information of physical interfaces on the **Physical Interface** tab: **Network, VLAN ID, Use of interface, IP address, Gateway, Driver, Link Mode, Status,**

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and Operation.

Nodes		Physical Interfaces		Communication Interfaces		System Disks				
Refresh Add Multiple Aggregate Interfaces Add Multiple VLAN Subinterfaces Edit Multiple Advanced										
Node	Name	VLAN ID	Use of Interface	Descripti...	IP Address/...	Gateway	Driver T...	Link Mode	Status	Operation
192.200.19.18	 eth0	-	Management Int...	-	192.200.19....	192.200.19.1	igb	Auto-negotiation ...	✓	Edit
192.200.19.19	 eth1	-	Edge-connected...	-	-	-	igb	Auto-negotiation	✓	Edit
	 eth2	-	Storage Network...	-	-	-	igb	Auto-negotiation ...	✓	-
	 eth3	-	Storage Network...	-	-	-	igb	Auto-negotiation ...	✓	-
	 eth4	-	Edge-connected...	-	192.168.19....	-	igb	Auto-negotiation ...	✓	Edit
	 eth5	-	Overlay Network...	-	172.17.19.3 ...	-	igb	Auto-negotiation ...	✓	Edit

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**.

Edit Interface (192.200.19.18)

Name:

eth0

Description:

VLAN ID:

Add a VLAN subinterface to specify VLAN ID

IP Address:

192.200.19.18

Netmask:

255.255.255.0

Gateway:

192.200.19.1

Advanced

Link Mode:

Auto-negotiation

MTU:

1500

MAC Address:

00:e0:ed:5b:1f:5c

OK

Cancel

2.5.4.1 Adding Aggregate Interface

Aggregate interface helps to improve performance of data communication, and supports data redundancy based on IP address and MAC address. When one of the interfaces is not available, data will be transmitted via other interfaces so that service continuity is ensured.

Nodes	Physical Interfaces	Communication Interfaces	System Disks
Refresh Add Multiple Aggregate Interfaces Add Multiple VLAN Subinterfaces Edit Multiple Advanced			

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Add Multiple Aggregate Interfaces

The connected physical switch must be configured accordingly based on specified load balancing mode.
IP address cannot be changed when adding new aggregate interface. You may change it after this operation. If any of the selected interfaces is a management interface or overlay network interface, the created aggregate interface will inherit its use and IP address.
If a member interface has been used for disaster recovery or iSCSI, aggregation operation will invalidate the original use of that interface. Please configure another interface for that feature after adding aggregate interface.

Edit Multiple

Node Name	Physical Interface	Load Balancing Mode	IP Address	Netmask	Gateway
192.200.19.18	eth0,eth5	Active/standby (Mode)	Use eth0 IP address (192.200.19.18)	255.255.255.0	192.200.19.1
192.200.19.19	eth0,eth5	Active/standby (Mode)	Use eth0 IP address (192.200.19.19)	255.255.255.0	192.200.19.1

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.

2.5.4.2 Configuring Advanced Settings

On the **Physical interface** page, you may configure **DNS Server**, **Static Route**, **Inter-Host Communication Interfaces** by clicking **Advanced > Other**, as shown on the following page.

Nodes
Physical Interfaces
Communication Interfaces
System Disks

Refresh
Add Multiple Aggregate Interfaces
Add Multiple VLAN Subinterfaces
Edit Multiple
Advanced

Node	Name	VLAN ID	Use of Int	IP Address
Node 192.200.19.19	eth0	-	Management Interface	192.200.19.18
192.200.19.18	eth1	-	Edge-connected Interface	-
	eth2	-	Storage Network Interface	-
	eth3	-	Storage Network Interface	-
	eth4	-	Edge-connected Interface	192.168.1.1
	eth5	-	Overlay Network Interface	172.17.1.1
	eth6	-	-	-
	eth7	-	-	-

Add Aggregate Interface
Add VLAN Subinterface
Others

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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, or sends alert email. Up to 3 DNS servers can be configured.

The screenshot shows a configuration window titled "Others (192.200.19.18)" with a close button (X) in the top right corner. The window has three tabs: "DNS" (highlighted in green), "Static Route", and "Inter-Host Communication Interfaces". Under the "DNS" tab, there are three input fields labeled "Preferred DNS:", "Alternate DNS 1:", and "Alternate DNS 2:". Below these fields is a "Save" button. At the bottom right of the window is a "Close" button.

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Inter-Host 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 network segment.

2.5.4.3 Adding Static Route

To add a static route for node, click **Static Routes** to enter the following page and specify the following fields: **Destination IP**, **Netmask** and **Next-Hop IP**.

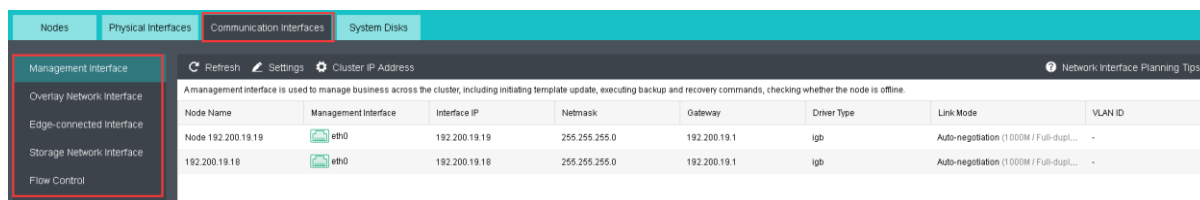
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2.5.5 Communication Interface

Under communication interface, you can view or change the configuration for each type of interfaces. Starting from version 6.0.0, flow control function has been added to control the traffic flow for the reused interfaces.



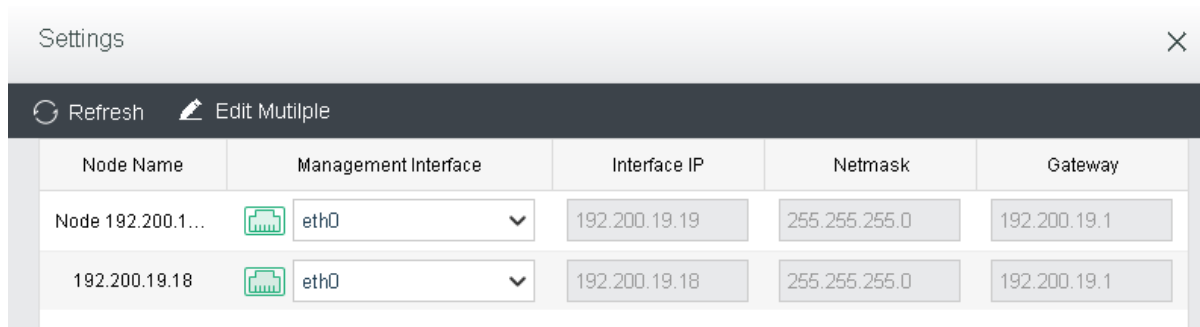
Nodes	Physical Interfaces	Communication Interfaces	System Disks
Management Interface			
Overlay Network Interface			
Edge-connected Interface			
Storage Network Interface			
Flow Control			

Node Name	Management Interface	Interface IP	Netmask	Gateway	Driver Type	Link Mode	VLAN ID
Node 192.200.19.19	eth0	192.200.19.19	255.255.255.0	192.200.19.1	igb	Auto-negotiation (1.000M / Full-dupl...	-
192.200.19.18	eth0	192.200.19.18	255.255.255.0	192.200.19.1	igb	Auto-negotiation (1.000M / Full-dupl...	-

2.5.5.1 Management Interface

Management interface in HCI will be used for several function such as managing the HCI, migrations, connecting external storage, template update, backup and more.

Settings: Allow to select specified physical interface as management interface with the IP address, netmask and gateway configuration.



Node Name	Management Interface	Interface IP	Netmask	Gateway
Node 192.200.1...	eth0	192.200.19.19	255.255.255.0	192.200.19.1
192.200.19.18	eth0	192.200.19.18	255.255.255.0	192.200.19.1

Cluster IP Address: Allow to change cluster settings which included cluster ip, netmask and Cluster name.

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Cluster IP Address

HCI platform supports web-based access on the cluster IP address, which makes VM management more stable.

Under normal circumstances, SANGFOR aCloud GUI is reachable through IP address of any managed node unless the node fails.

With cluster IP address, you will never lose control of the management even when one node fails unexpectedly.

SANGFOR aCloud management through cluster IP address improves system stability and reliability dramatically.

Cluster IP:

192.200.19.20

Netmask:

255.255.255.0

Cluster Name:

CTI HCI test

OK

Cancel

2.5.5.2 Overlay Network Interface

Overlay network interface will be used for inter-nodes communication for the virtual devices and virtual machines.

Management Interface

Overlay Network Interface

Edge-connected Interface

Storage Network Interface



Flow Control

Refresh

Settings

Network Interface Planning Tips

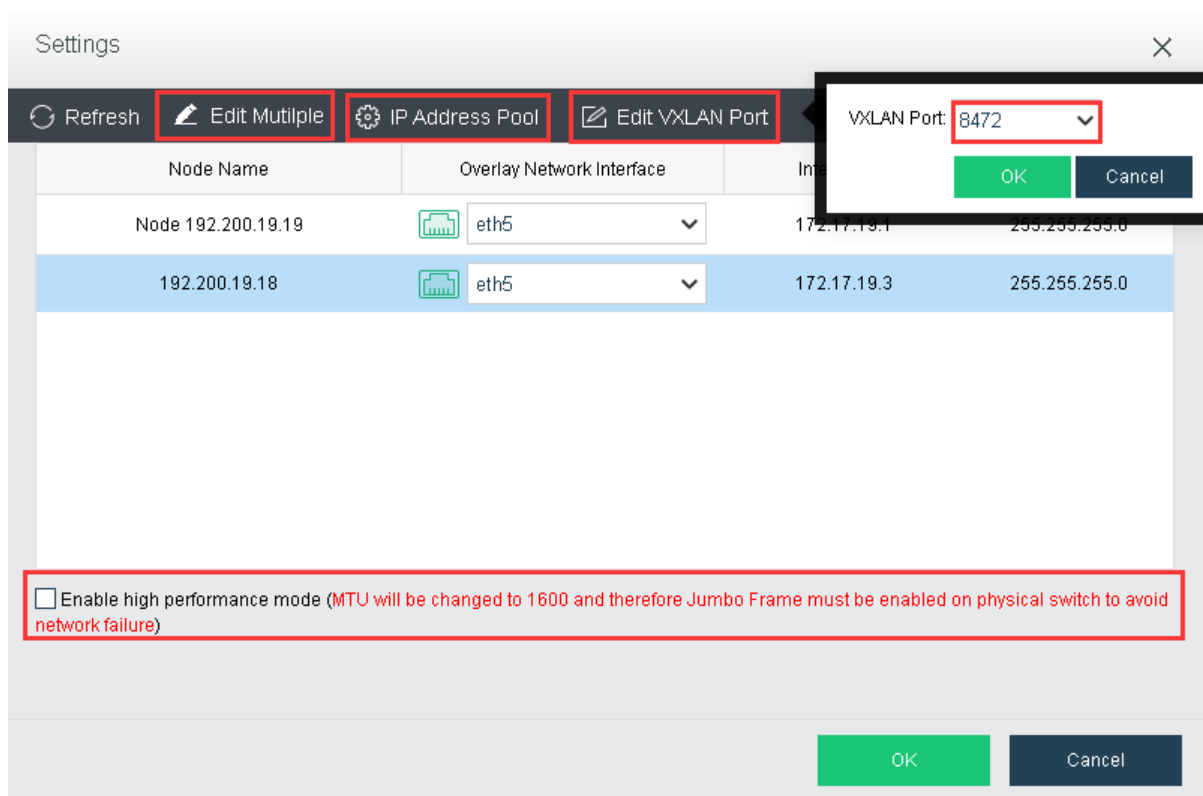
An overlay network interface is used for business data transfer across nodes. VMs running on different nodes communicate with each other through this interface.

Node Name	Overlay Network Interface	Interface IP	Netmask	Driver Type	Link Mode	MTU	VLAN ID
Node 192.200.19.19	 eth5	172.17.19.1	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl...	1500	-
192.200.19.18	 eth5	172.17.19.3	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl...	1500	-

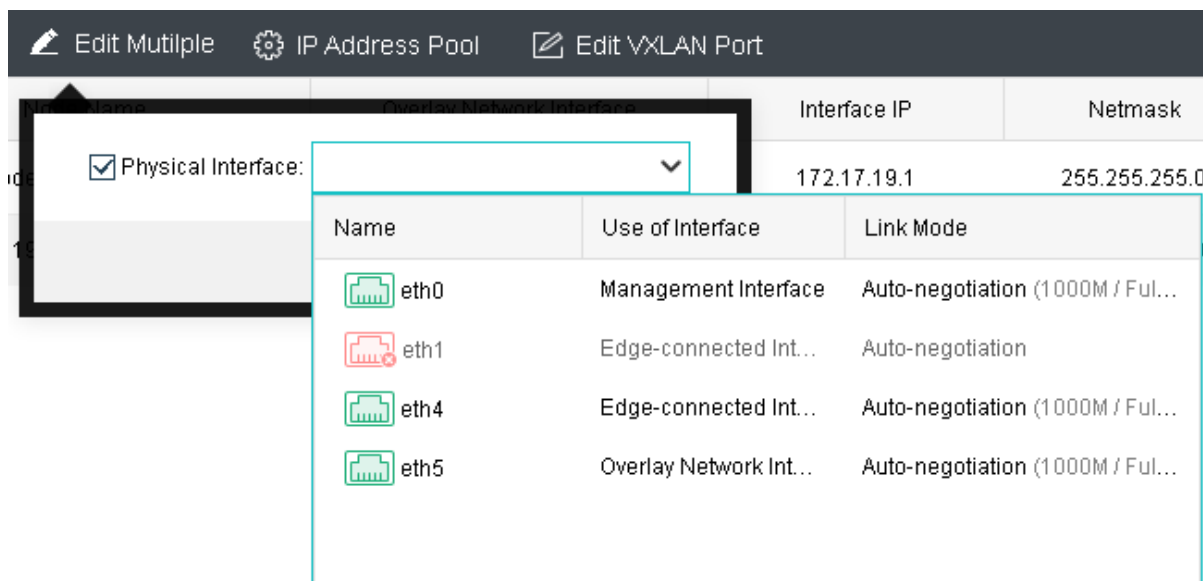
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Edit Multiple: Allow to edit the physical interfaces for all nodes.

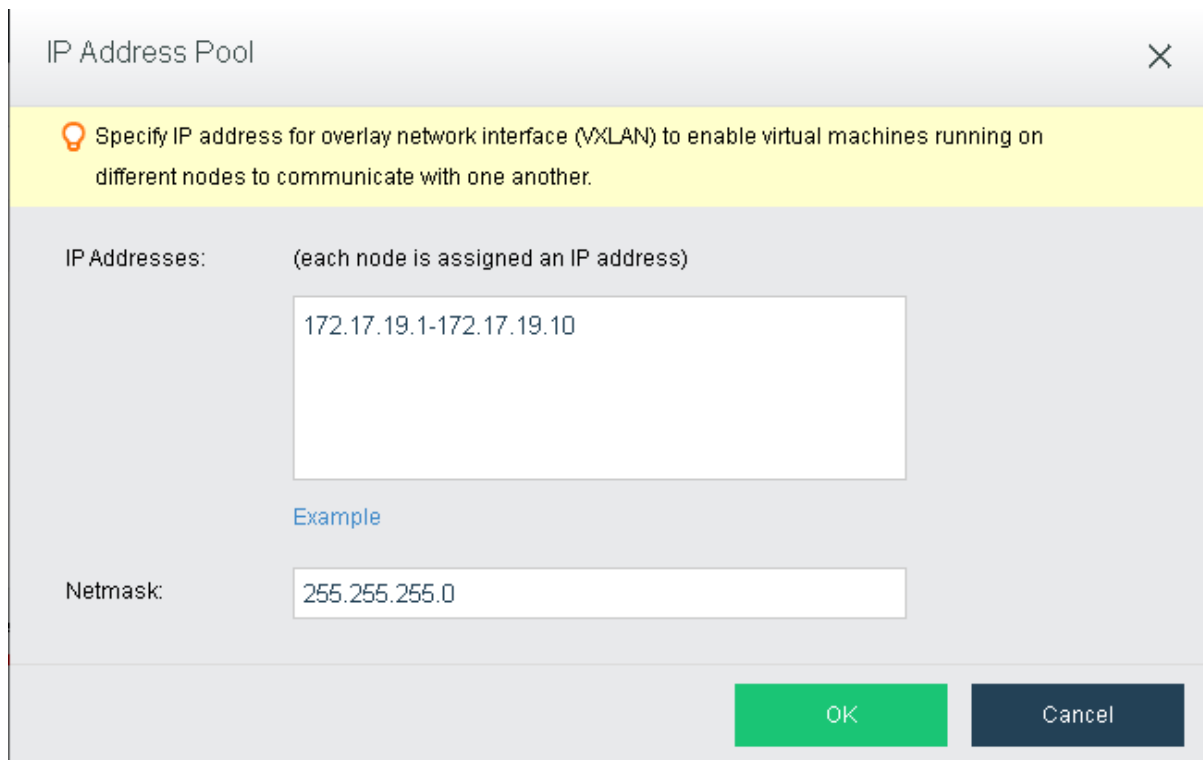


IP Address Pool: Configure the IP Pool for the overlay network.

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IP Address Pool

Specify IP address for overlay network interface (VXLAN) to enable virtual machines running on different nodes to communicate with one another.

IP Addresses: (each node is assigned an IP address)

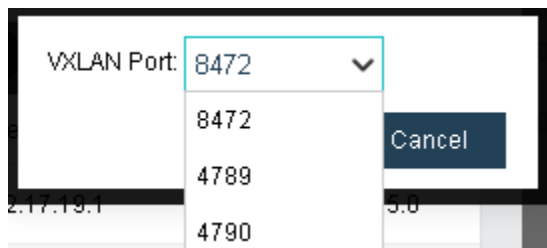
172.17.19.1-172.17.19.10

Example

Netmask: 255.255.255.0

OK Cancel

Edit VXLAN Port: Change the VXLAN port. By default it will be 8472.



VXLAN Port: 8472

8472

4789

4790

Cancel

Overlay Network interface: Change the physical interface for overlay network on corresponding nodes.

Enable high performance mode: MTU will be changed to 1600 to improve performance for overlay network. Connected switch are required to enabled Jumbo Frame if this option has been enabled.

2.5.5.3 Edge-connected interface

Edge-connected interface is the interface which forward the traffic from virtual machines and virtual devices to the connected physical switch.

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Nodes

Physical Interfaces

Communication Interfaces

System Disks

Management Interface

Overlay Network Interface

Edge-connected Interface

Storage Network Interface





Flow Control

Refresh

Edit Topology

Network Interface Planning Tips

An edge-connected interface is used for cluster to communicate with physical network. VMs are accessed from external network through this interface.

Node Name	Edge-connected Interface	IP Address	Netmask	Driver Type	Link Mode
▲ edge1					
Node 192.200.19.19	 eth1	-	-	igb	Auto-negotiation
192.200.19.18	 eth1	-	-	igb	Auto-negotiation
▲ Edge1					
Node 192.200.19.19	 eth4	192.168.19.171	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl...
192.200.19.18	 eth4	192.168.19.172	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl...

Edit Topology : It will redirect to the **Network** tab where you can edit the edge configuration.

2.5.5.4 Storage Network Interface

Storage network interface will be used to connect the SAN between 2 nodes. It will be used to sync the data and the storage resource across nodes will be access through this interface.

1. Navigate to **Nodes > Communication Interfaces > Storage Network Interface**, and select **Settings**.

Nodes

Physical Interfaces

Communication Interfaces

System Disks

Management Interface

Refresh

Settings

Test Connectivity

Network Interface Planning Tips

Overlay Network Interface

Edge-connected Interface

Storage Network Interface

Flow Control

A storage network interface is used for communication between different nodes in the cluster. VMs access storage resources across nodes through this interface.

Storage Network Deployment Mode: Link aggregation with two switches

Node Name	Physical Interface	Interface IP	Negotiated Rate	MTU	Status
Node 192.200.19.19	eth2, eth3	10.25.19.19	1000Mbps	1500	Normal
192.200.19.18	eth2, eth3	10.25.19.1	1000Mbps	1500	Normal

2. Specify Interface Mode:
 - a. Dedicated Mode : Use a separate physical NIC as storage network interface for better performance and stable bandwidth.
 - b. Shared Mode : Use one physical interface as storage network interface and logical interfaces of other functions when number of physical interfaces are insufficient.

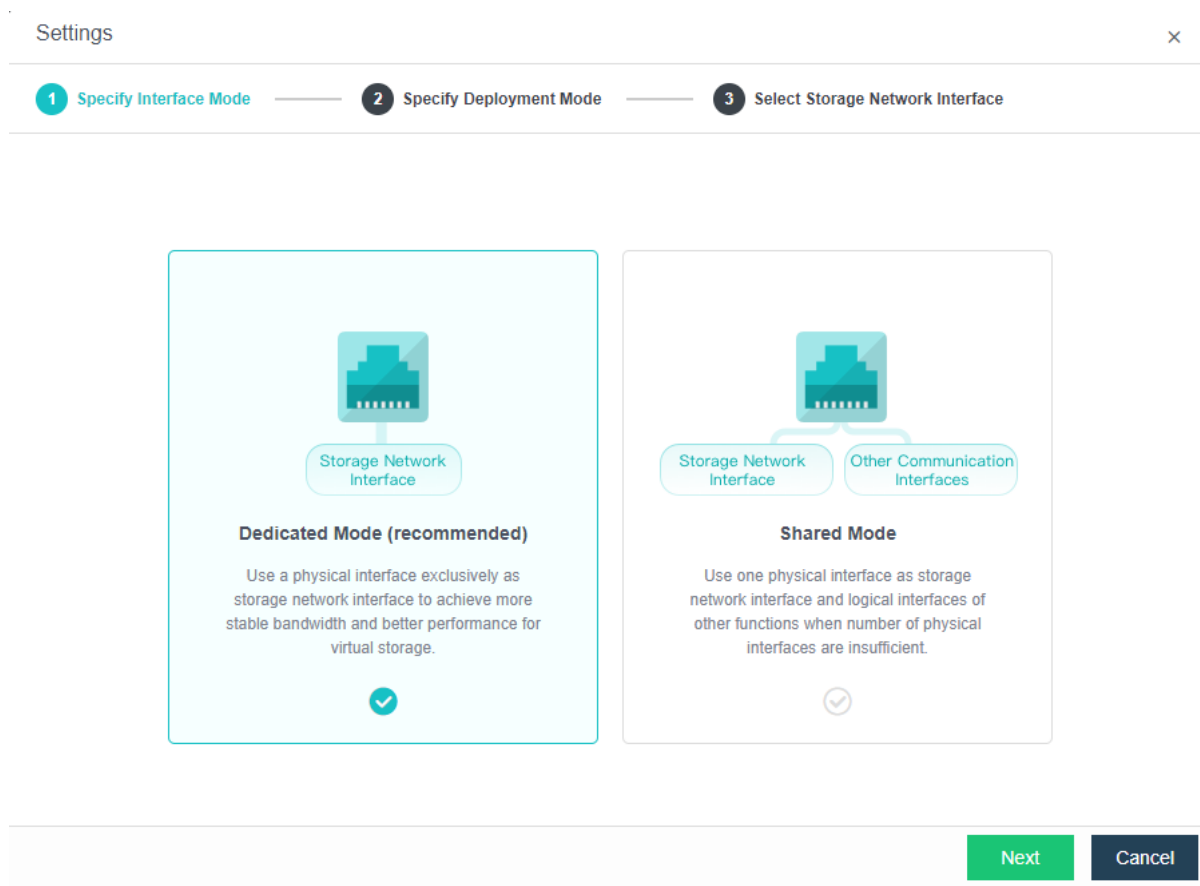
Precautions:

1. It is required to use aggregate interface for Shared Mode and the member interface must be 10G.
2. Currently only 2 types of NIC support Shared Mode storage network interface which are Mellanox CX4 and Intel X710.
3. Changing interface mode required to power off all VM before the operation.

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4. Specify Deployment Mode for the storage network interface.

a. Link aggregation disabled

- Select this option when only 1 physical NIC available for Storage Network Interface.
- If there are only two nodes, simply use a cable to connect one another, without using any switch.
- Drawbacks: Storage on the node will be inaccessible if one link fails.

b. Link aggregation with one switch

- Select this option when both physical NIC connected to one switch.
- Select this option when connecting to a stack switch.

c. Link aggregation with two switches

- Select this option when the physical NICs connected to different switch.
- If there are only two nodes, simply use a cable to connect one another, without using any switch.

Notes: Changing deployment mode for storage network interface required all

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VM/NFV to be powered.

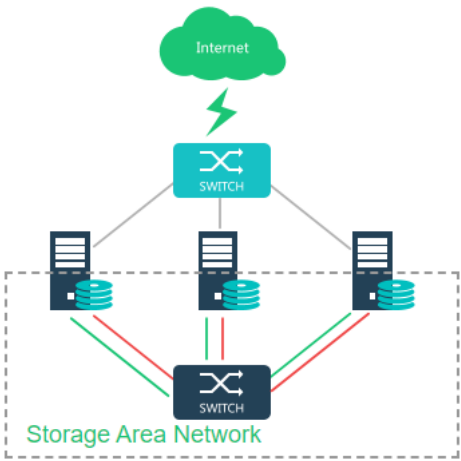
Settings

✓ Specify Interface Mode

2 Specify Deployment Mode

3 Select Storage Network Interface

Deployment Mode (for data communication among clustered nodes)
☐ Link aggregation disabled ☒ Link aggregation with one switch ☐ Link aggregation with two switches



Storage Area Network

Link Aggregation with One Switch

Benefits

Fault tolerance capability of storage area network is higher. A single link failure will not affect storage communication. Bandwidth of 2 links can be used when there are multiple virtual disks.

Drawbacks

Once switch fails, the virtual storage would get offline.

Notes

Storage area network (SAN) is used for data transmission across nodes. Please connect the nodes with cables according to the diagram.

Layer 2 switch can be used, no change required.

Prev

Next

Cancel

5. Lastly, specify the interface used for storage network and configure the corresponding IP address for communication.

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Settings ×

✓ Specify Interface Mode
✓ Specify Deployment Mode
3 Select Storage Network Interface

Node Name	Physical Interface	Interface IP	Status
192.168.20.36	eth0	10.251.251.1 / 24	✓ Normal
192.168.20.37	eth1	10.251.251.2 / 24	✓ Normal

Prev

OK

Cancel

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.

Test Connectivity: This allow to test whether the storage network has been isolated from other network.

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Test Connectivity

This IP address is used to ping connectivity to the node to check whether it is isolated [Read More](#)

Better be router IP address that is always connected.

IP Address:

OK

Cancel

2.5.5.5 Flow Control

Flow control is the function which restrict the peak traffic for each types of interface to ensure the performance for each interface for the network multiplexing port .

Network QoS can be applied to the traffics through the flow control.

Nodes

Physical Interfaces

Communication Interfaces

System Disks

Management Interface

Overlay Network Interface

Edge-connected Interface

Storage Network Interface

Flow Control

Refresh

Settings

Enable Flow Control

Disable Flow Control

Network Interface Planning Tips

It is recommended to enable flow control and set peak rates to ensure flow stability when a same interface is used as management interface, VLAN interface and edge-connected interface, and view throughput of these interfaces respectively on the node summary page.

<input checked="" type="checkbox"/>	Node Name	Reused Interface	Link Mode ①	Management interface Peak Rate	VLAN interface Peak Rate	Edge-connected interface Peak Rate ①	Flow Control
<input checked="" type="checkbox"/>	192.168.20.3	eth0	1 Gbps	-	-	-	
<input checked="" type="checkbox"/>	192.168.20.4	eth0	1 Gbps	-	-	-	
<input checked="" type="checkbox"/>	192.168.20.5	eth0	1 Gbps	-	-	-	

Settings: Configure the Peak Rate for each interface accordingly.

Settings							
<div>Refresh</div> <div>Edit Peak Rates</div>							
<input type="checkbox"/>	Node Name	Reused Interface	Link Mode	Management Interface Peak Rate	VLAN Interface Peak Rate	Edge-connected Interface Peak Rate	
<input checked="" type="checkbox"/>	192.168.20.3	eth0	1 Gbps	<input type="text"/> Mbps	<input type="text"/> Mbps	<input type="text"/> Mbps	
<input type="checkbox"/>	192.168.20.4	eth0	1 Gbps	<input type="text"/> Mbps	<input type="text"/> Mbps	<input type="text"/> Mbps	
<input type="checkbox"/>	192.168.20.5	eth0	1 Gbps	<input type="text"/> Mbps	<input type="text"/> Mbps	<input type="text"/> Mbps	

Enable Flow Control: Allow to enable the flow control for the selected nodes after peak rate has been configured.

Disable Flow Control: Allow to disable the flow control for the selected nodes after peak rate has been configured.

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2.5.6 System disk

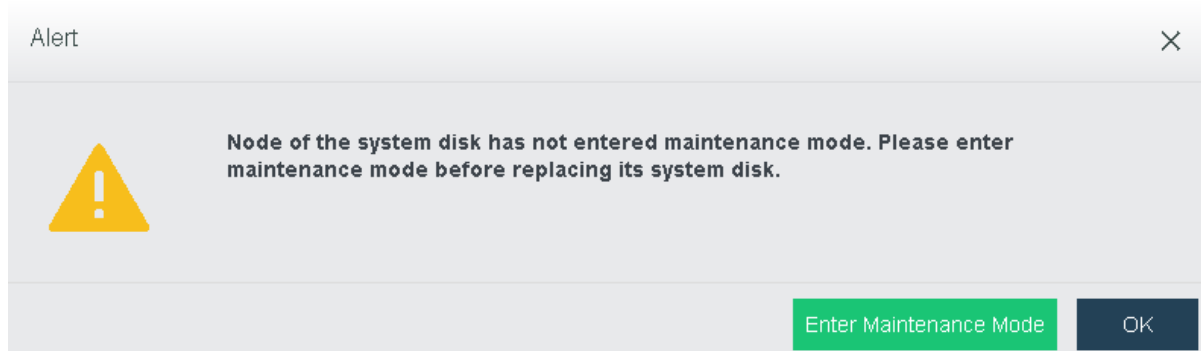
Starting from aCloud6.o.o., system disk can be replaced individually without replacing the whole node, including the storage disk.

The business integrity and availability can be ensured by replacing the system disk through the following steps:

- a. Migrate VMs
- b. Enter Host Maintenance Mode
- c. System config backup
- d. Rebooting and proceed with OS disk replacement
- e. ISO guided OS re-installation

Nodes							
Physical Interfaces							
Communication Interfaces							
System Disks							
Refresh Import Export							
<input type="checkbox"/>	Node	Disk Tag	Status	Type	SSD Lifetime Remaining	Operation	
<input type="checkbox"/>	192.168.20.3	1ATA_FORESEE_1280B_SSD_H34375R002848	Normal	SSD	92%	Replace System Disk	
<input type="checkbox"/>	192.168.20.4	1ATA_FORESEE_1280B_SSD_H34375R003390	Normal	SSD	92%	Replace System Disk	
<input type="checkbox"/>	192.168.20.5	1ATA_FORESEE_1280B_SSD_H34375R003391	Normal	SSD	92%	Replace System Disk	

1. You will be prompted to enter maintenance after clicking Replace System Disk.

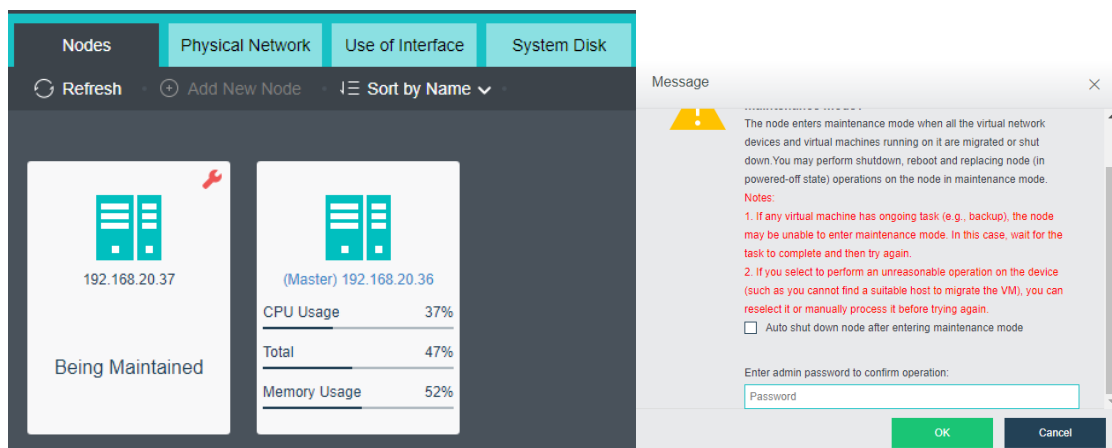
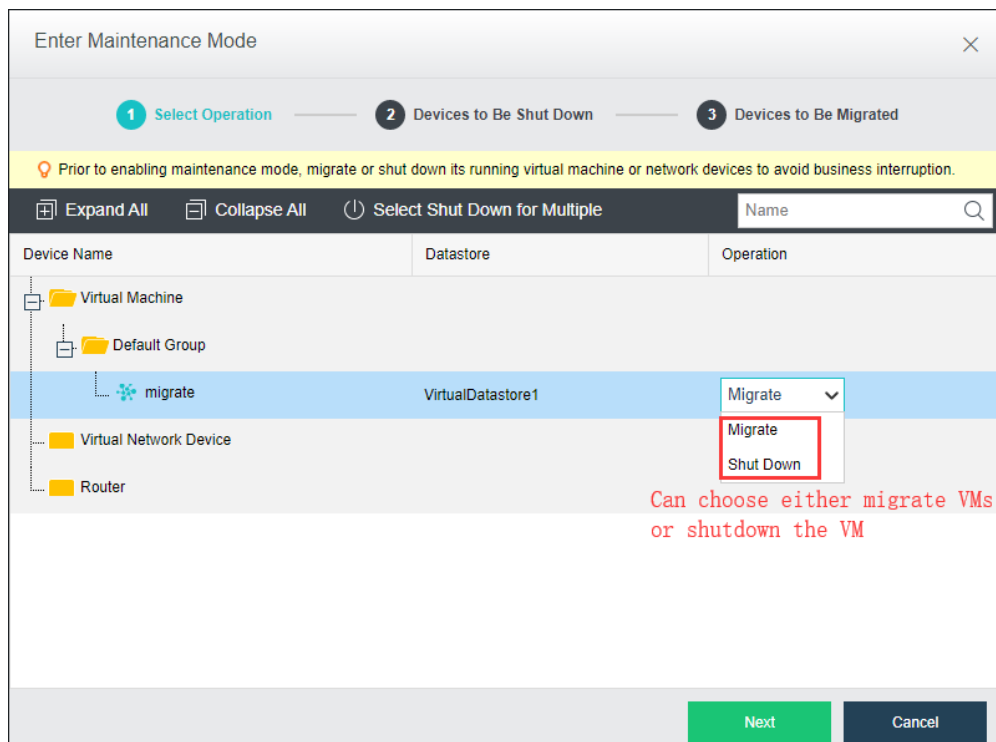


2. Before entering the maintenance mode, it provides the options to migrate VM to another host or shutdown the VM.

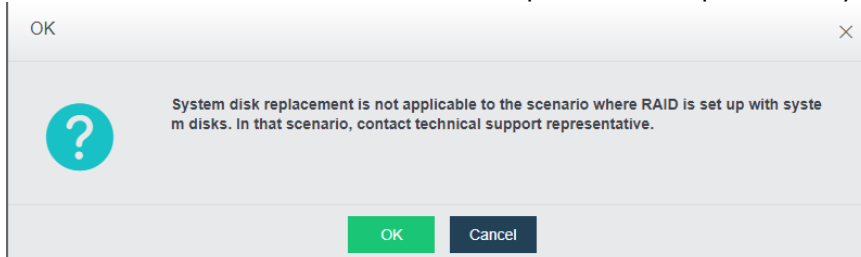
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- After host entered maintenance mode, proceed to replace the system disk.



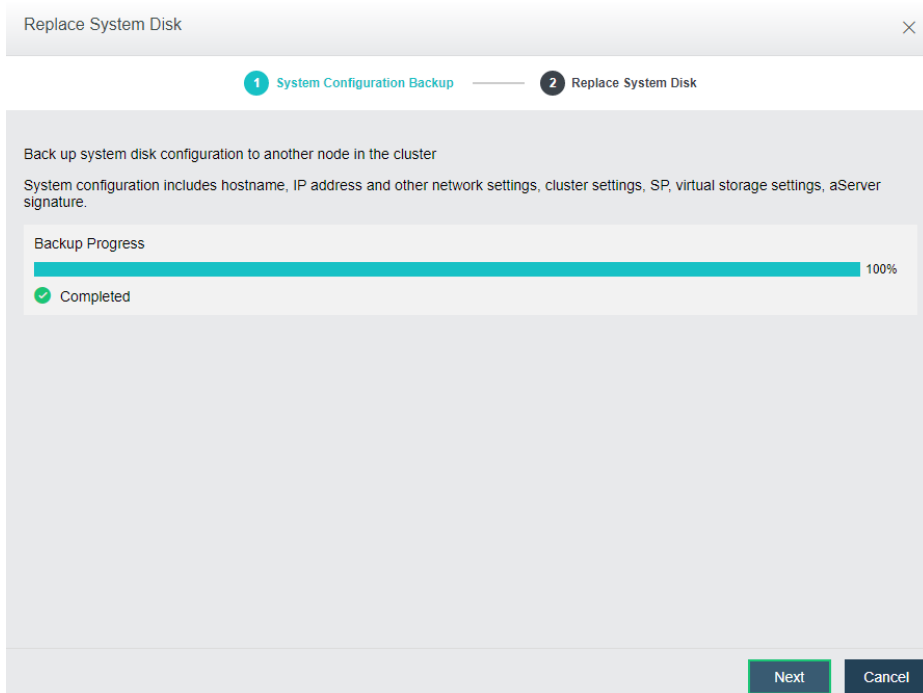
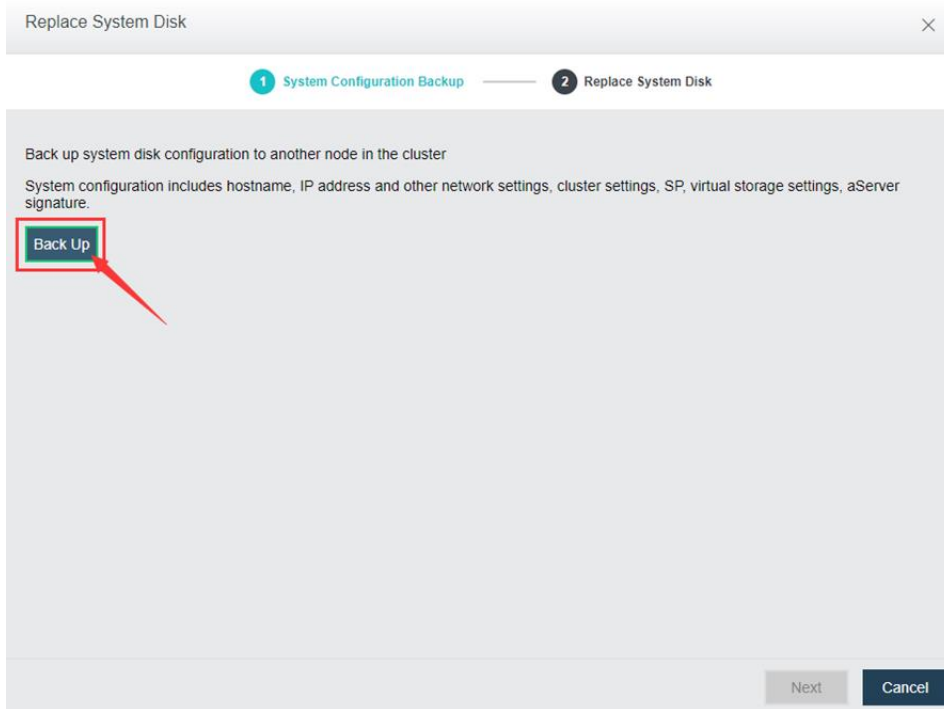
Note: If there have RAID configuration done on the OS disk, kindly contact technical support to assist you on your issue.

- Click on the backup to save a copy of config into available host.

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5. Click “finish” to complete the system disk replacement wizard.

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Replace System Disk

System Configuration Backup

Replace System Disk

Steps:

- Prepare a system disk

Disk Size: >=120GB

Disk Status: For SSD, its lifetime should have more than 80% remaining; For HDD, it should not have any bad sectors.
- Shut down the node, plug out the existing disk and insert a new one

Node: 192.168.20.37

Data Status: Unmigrated VM(s) or unbacked up data will remain on the old system disk.

Turn System Disk LED
- Start the node from the same version of CD/USB drive, select Replace System Disk, and then follow instructions to install the new system disk

aCloud Platform: aCloud6.0.0_EN_B (consistent with the original system disk)

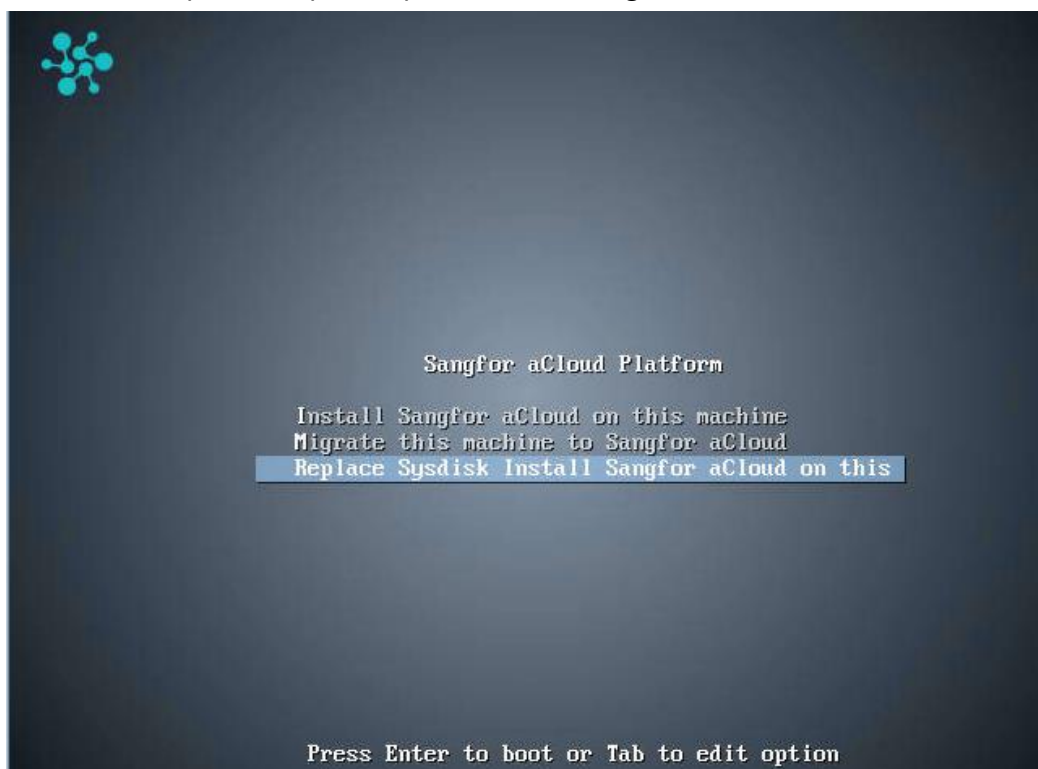
Node IP: 192.168.20.37 (consistent with the original management interface address)
- After successful installation, exit the CD/USB drive and restart the node
- After replacement is completed, go to Nodes and turn off maintenance mode for the node.

Back

Finish

Cancel

- Make a bootable USB with ISO file HCI 6.o.o EN or above, and restart the nodes. Select boot from USB.
- Select Third option "Replace Sysdisk Install Sangfor HCI on this"



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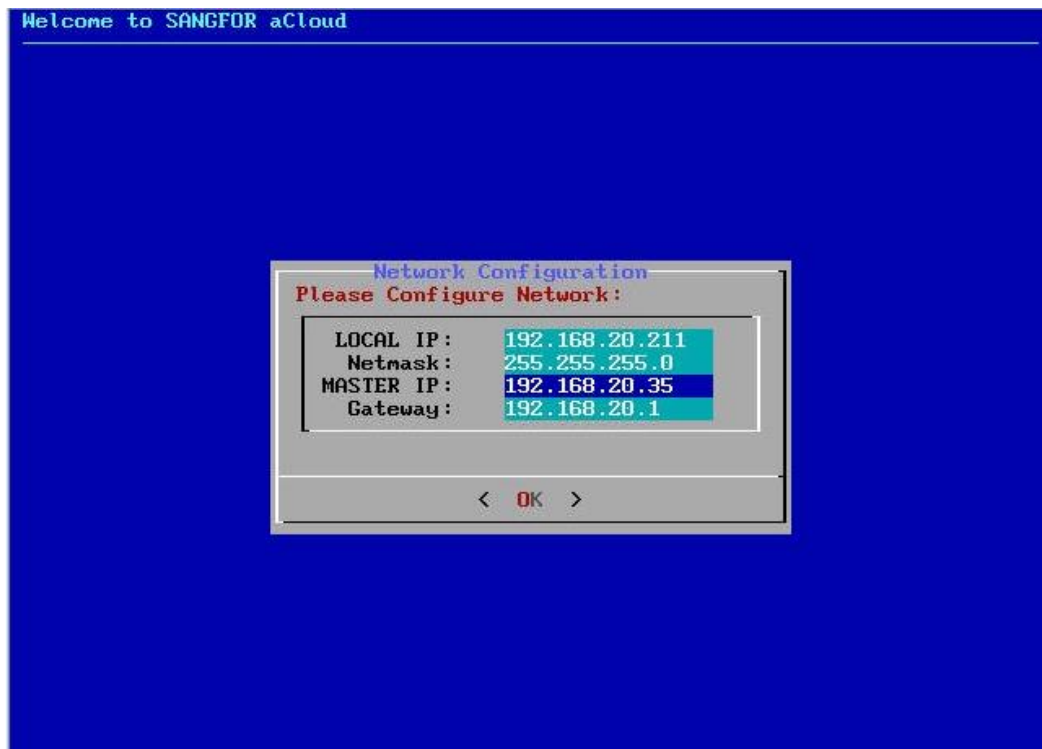
8. Configure network configuration for the booting ISO.

Local IP: Replacement node IP

Netmask: Network subnet mask

Master IP: Cluster IP address

Gateway: Default gateway for the IP



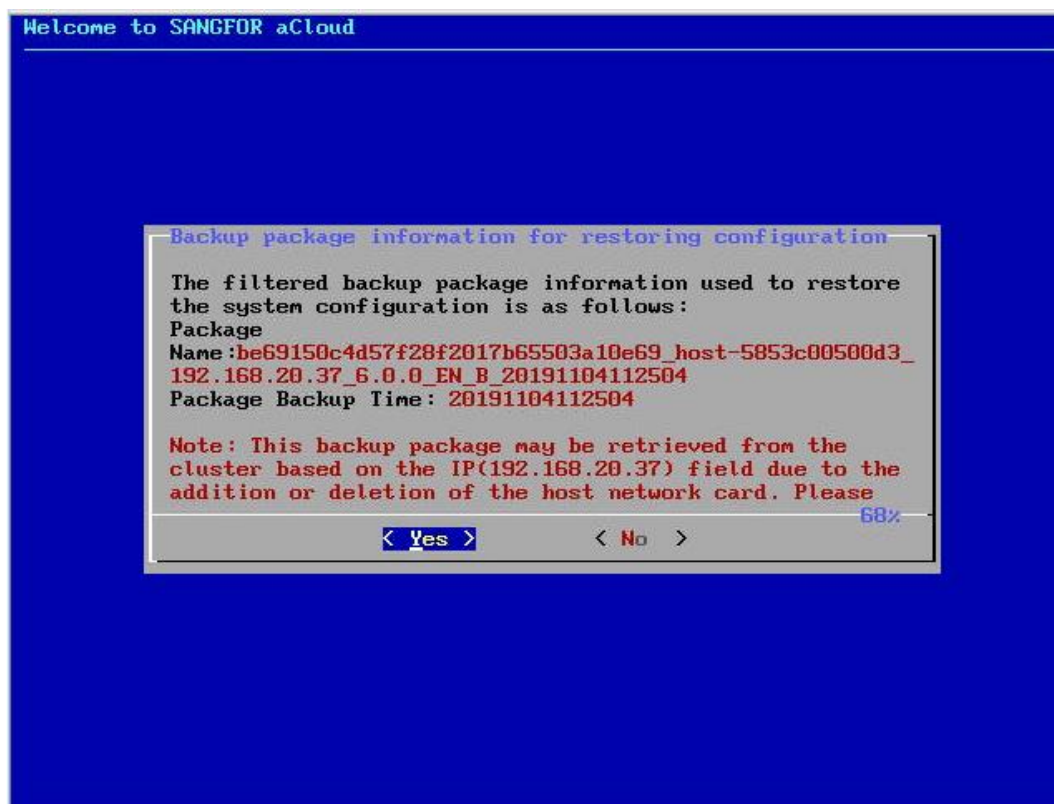
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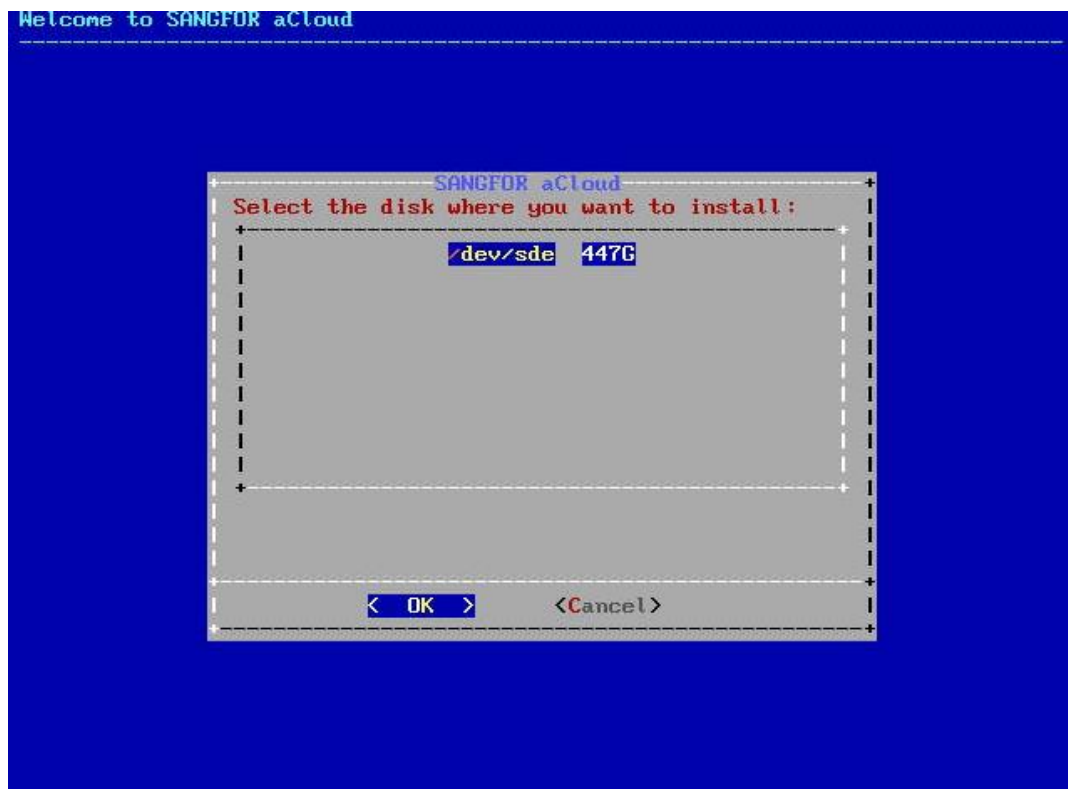
9. Select Yes to restoring backup configuration from the system.



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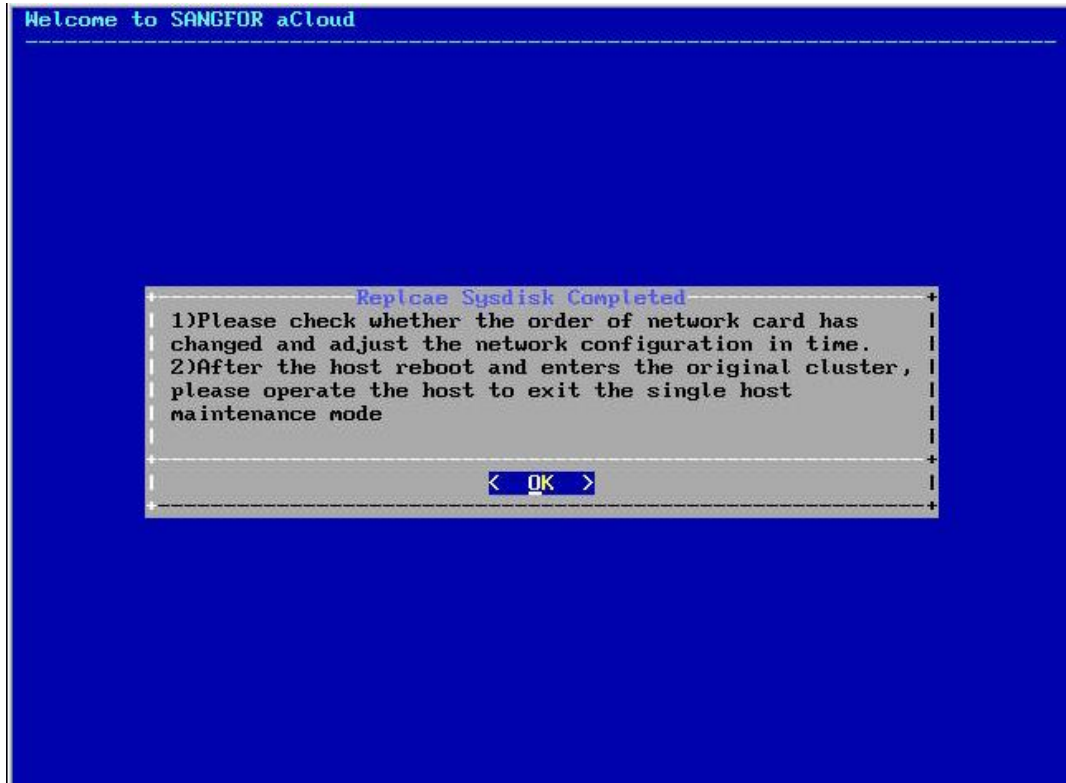
After click ok, it has to wait some time for HCI firmware installation on this new OS disk.

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10. After all, it has to quit the maintenance mode to verify the new OS disk is working fine.



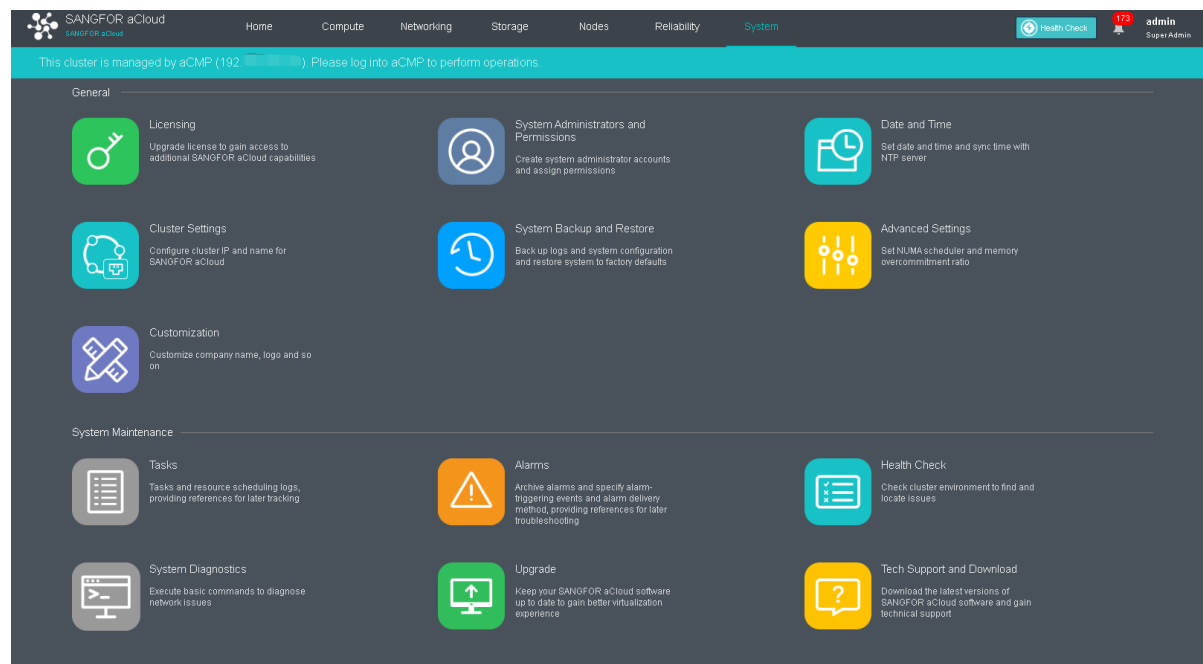
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2.6 System

System includes **General**, **System Maintenance** and **Others**. **General** includes **Licensing**, **Date and Time**, **System Administrators and Permissions**, **Alarm Options**, **Cluster Settings**, **System Backup and Restore**, and **VM Backup and Recovery**. **System Maintenance** includes **Tech Support & Download**, **Logs and Alarms**, **Upgrade**, **Health Check** and **Customization**. **Others** includes **Recycle Bin** and **HA & Resource Scheduling**.



2.6.1 Licensing

It includes **Basic Components**, **aSEC(Security)** and **Advanced License**. **Basic Components** includes aSV(Compute Virtualization), aNET(Network Virtualization), aSAN(Storage Virtualization), SCP(Sangfor Cloud Platform). aSEC(Security) includes vNGAF, vADC, vIAM, vSSL VPN, vWOC, etc. Advanced License includes CDP(Continuous), aHM(Heterogeneous Virtualization Mgmt), Security Integration (aSI), . aSC (Stretched Cluster) and aGPU (Graphics Card Management).

There are two editions, Trial Edition, and Enterprise Edition.

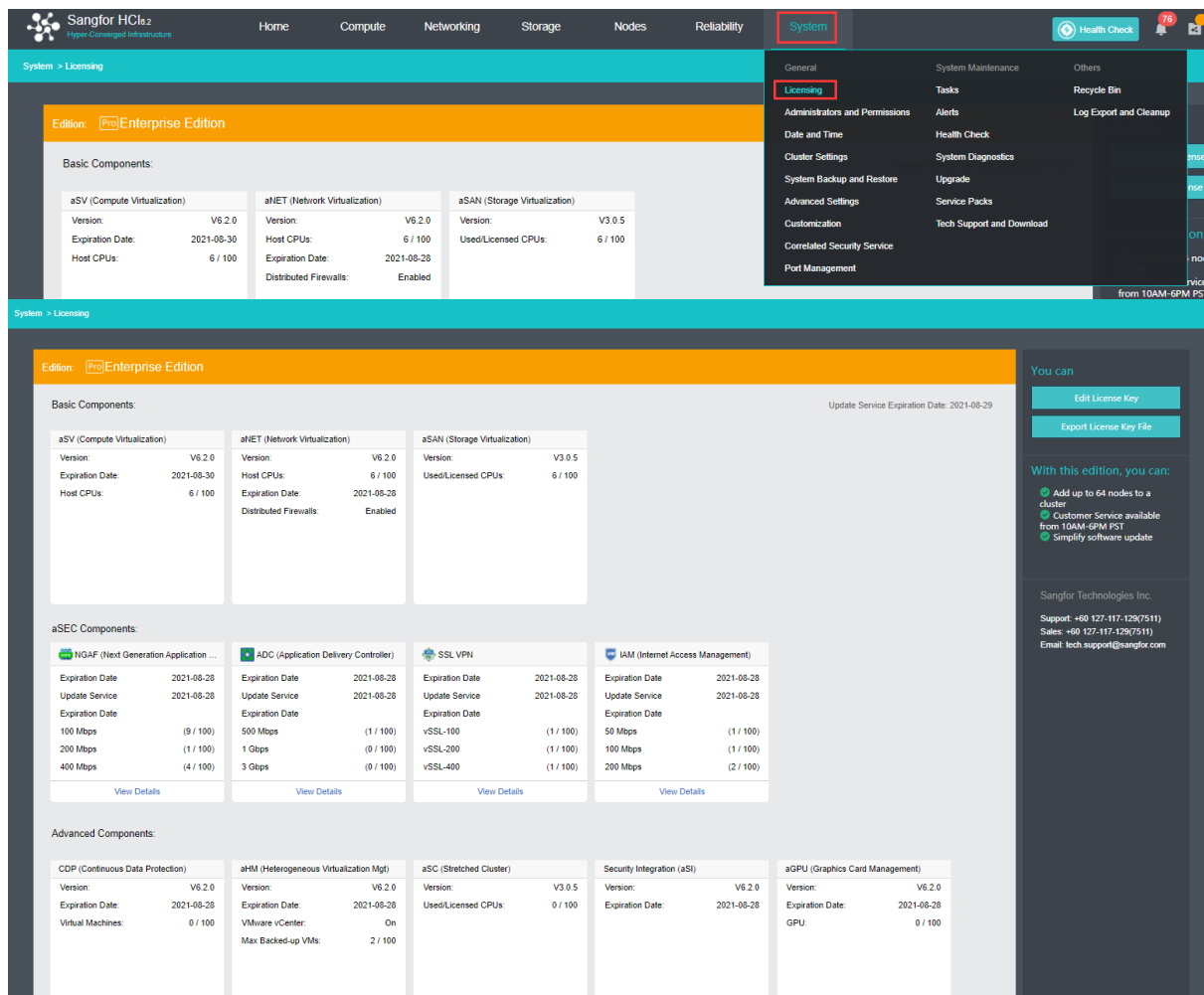
As for **Upgrade To Enterprise Edition**, a USB key is required to be plugged into one clustered node.

The **Enterprise Edition** is shown as follows:

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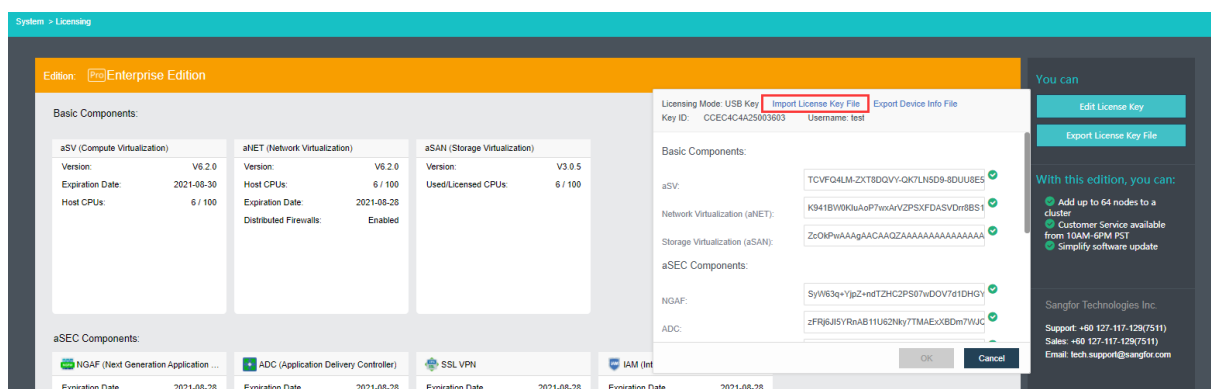
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Edit License Key: To edit license key, click **Edit License Key**.

Import License Key File: To import a license key file, click **Import License Key File**.

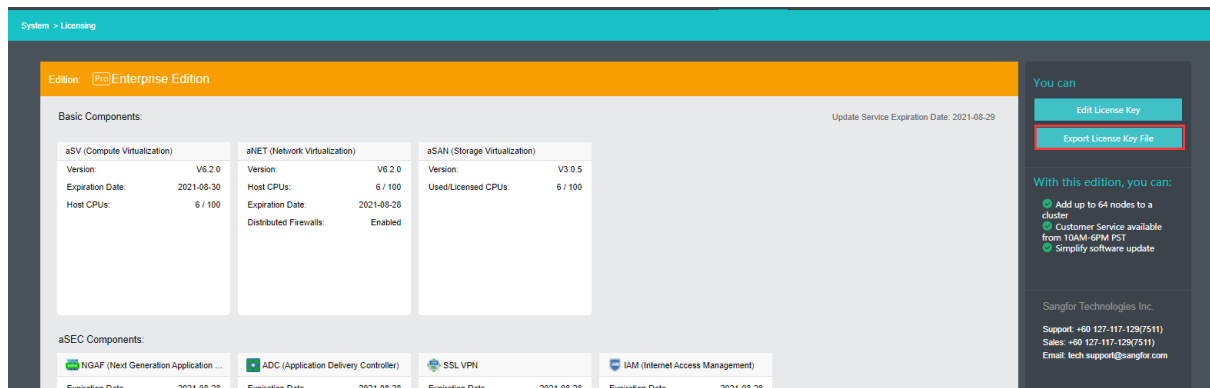


Export License Key File: To export license key file, click **Export License Key File**, as shown below:

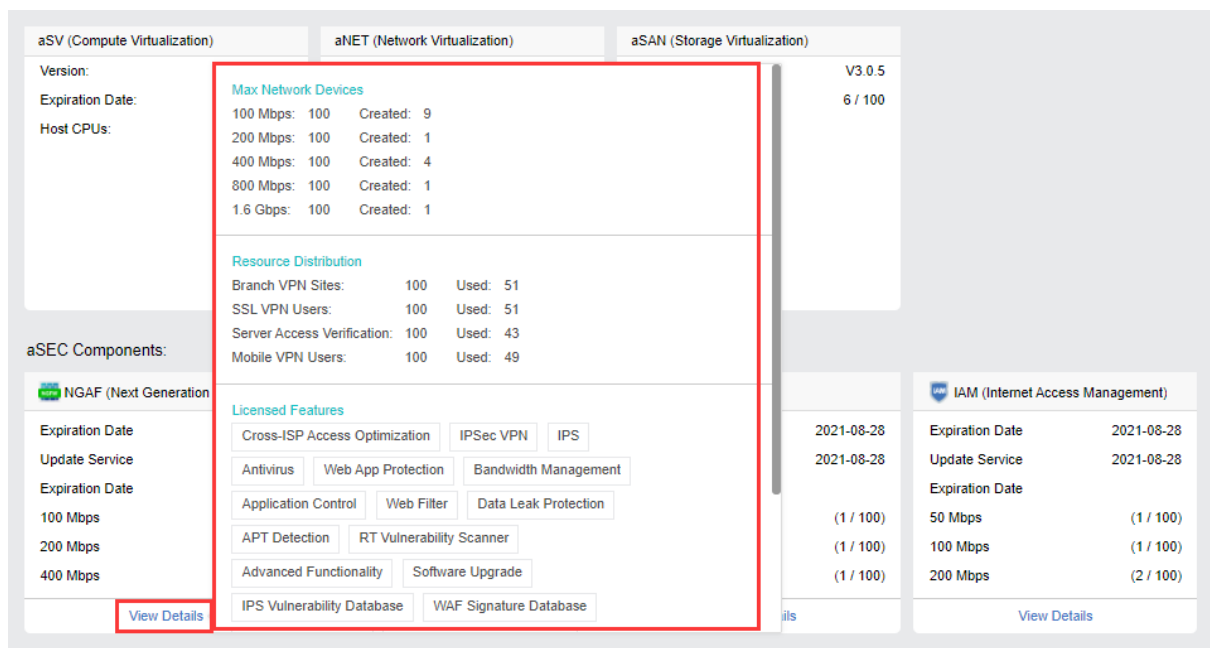
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Details: It displays detailed configurations, such as **Max Network Devices**, **Resource Distribution**, **Licensed Features**, etc.



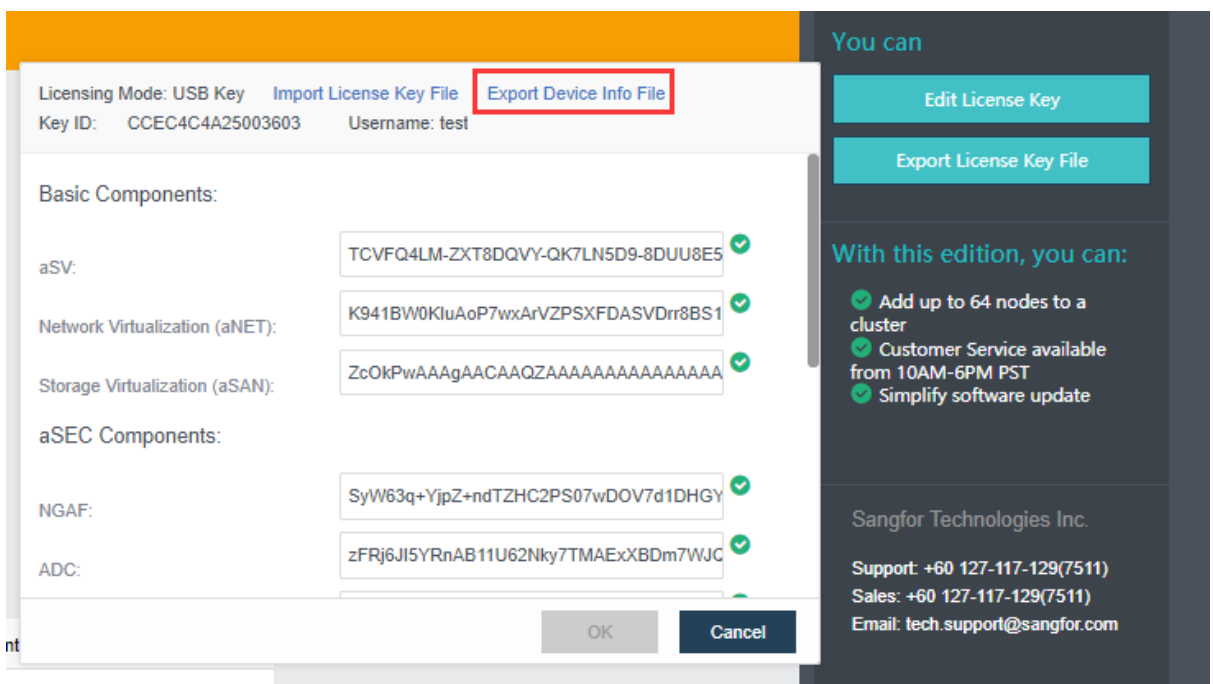
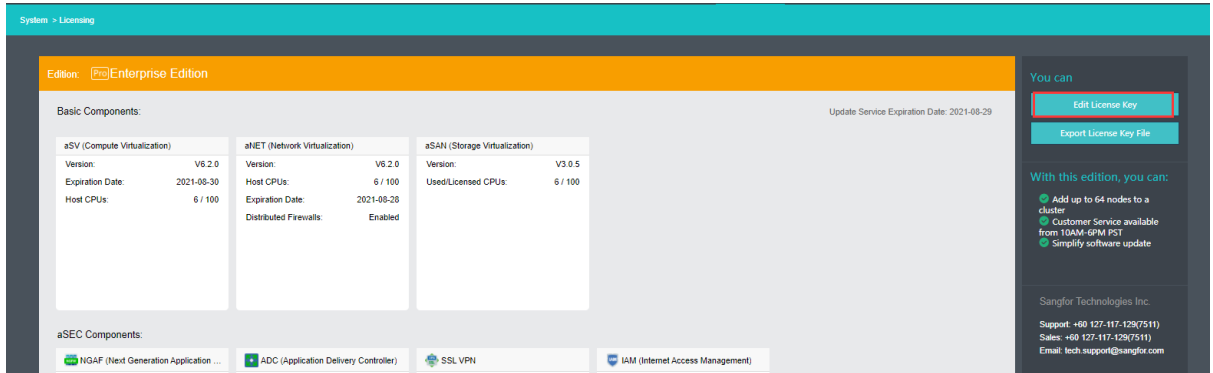
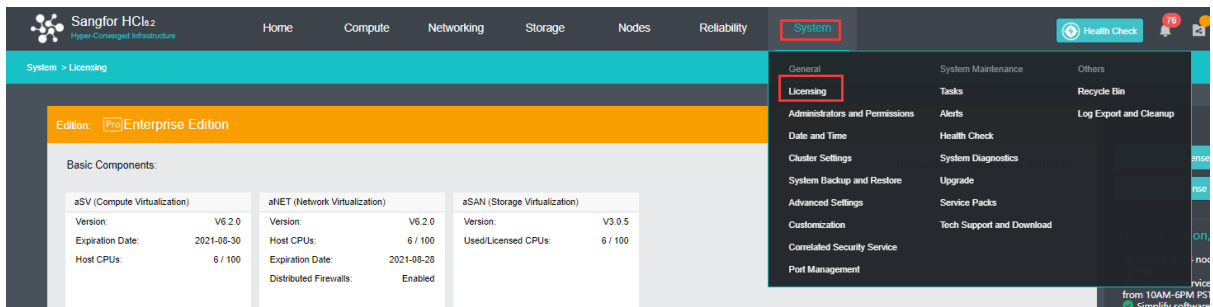
Virtual key function has been added to HCI since version 6.1.0. It allows HCI to be authorized without the physical USB key which might be damaged during the delivery progress.

1. The very first step for the virtual key licensing is to export the device information used to generate the license file. Under **System > Licensing**, select **Edit License Key** and select **Export Device Info File**.

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2. After that, provide this file to the corresponding Sangfor personnel for them to apply for the license file.
3. Once the application has been approved or processed, the license file will be generated.
4. Import the license file for the licensing.

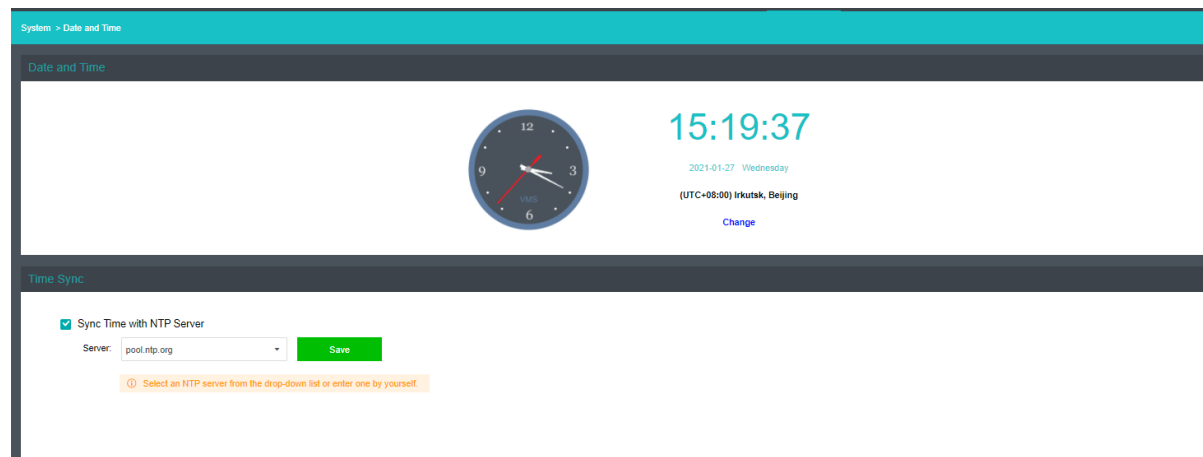
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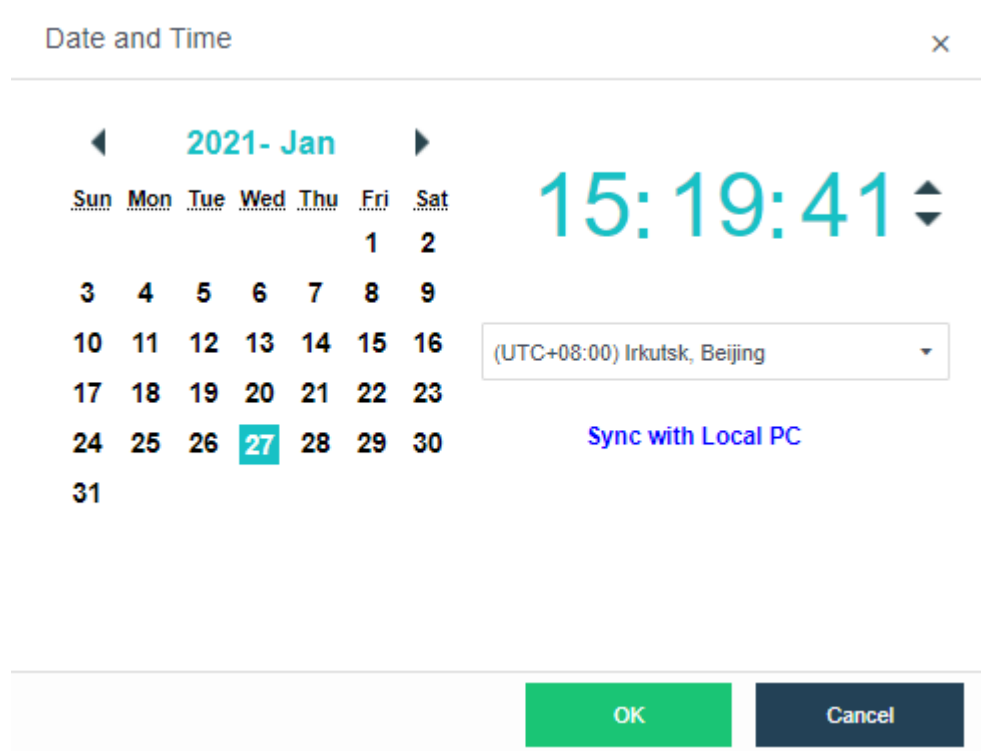
2.6.2 Date and Time

You can change date and time on Sangfor HCI platform and sync its time with NTP server.



2.6.2.1 Changing Date and Time

It displays date and time on SANGFOR HCI platform. To configure date and time, click **Change**.



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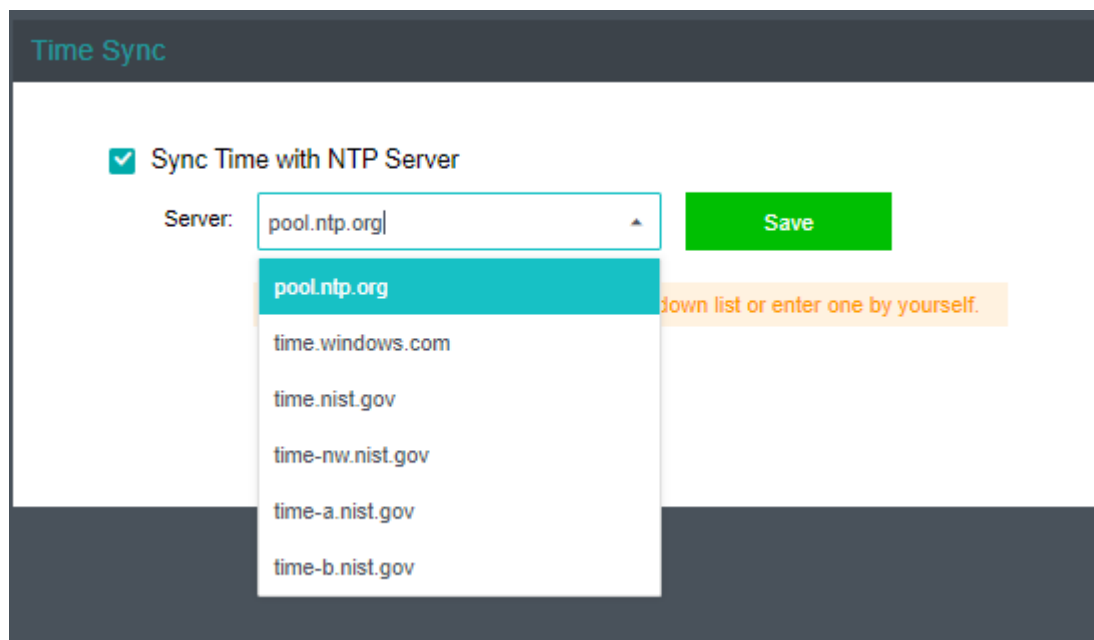
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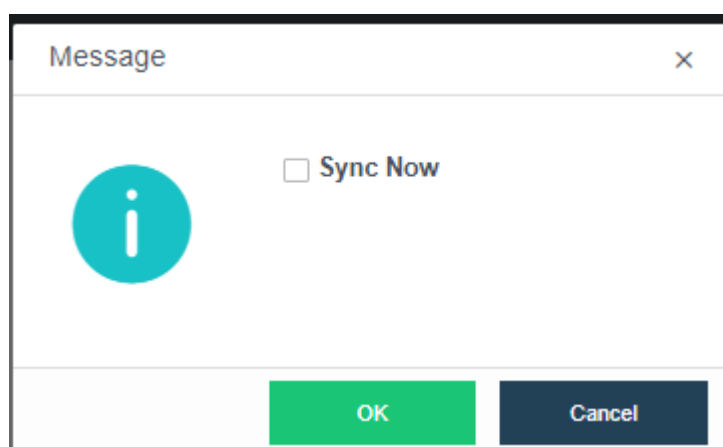
To sync time with local PC, click **Sync with Local PC**. Click **OK** to save the changes.
After saving changes to date and time, you need to log in again.

2.6.2.2 Time Synchronization

To sync time with NTP server, select one NTP server from the drop-down list, as shown below:



Click **Save** and a dialog box pops up asking whether to sync now, click **OK** to confirm. Synchronizing time with NTP server requires that the DNS server should be configured correctly and network connection is also required.



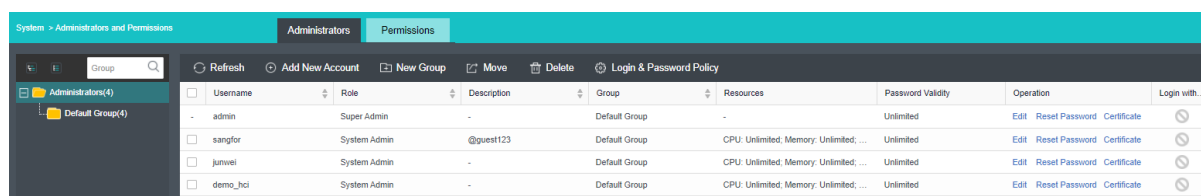
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2.6.3 System Administrators and Permissions

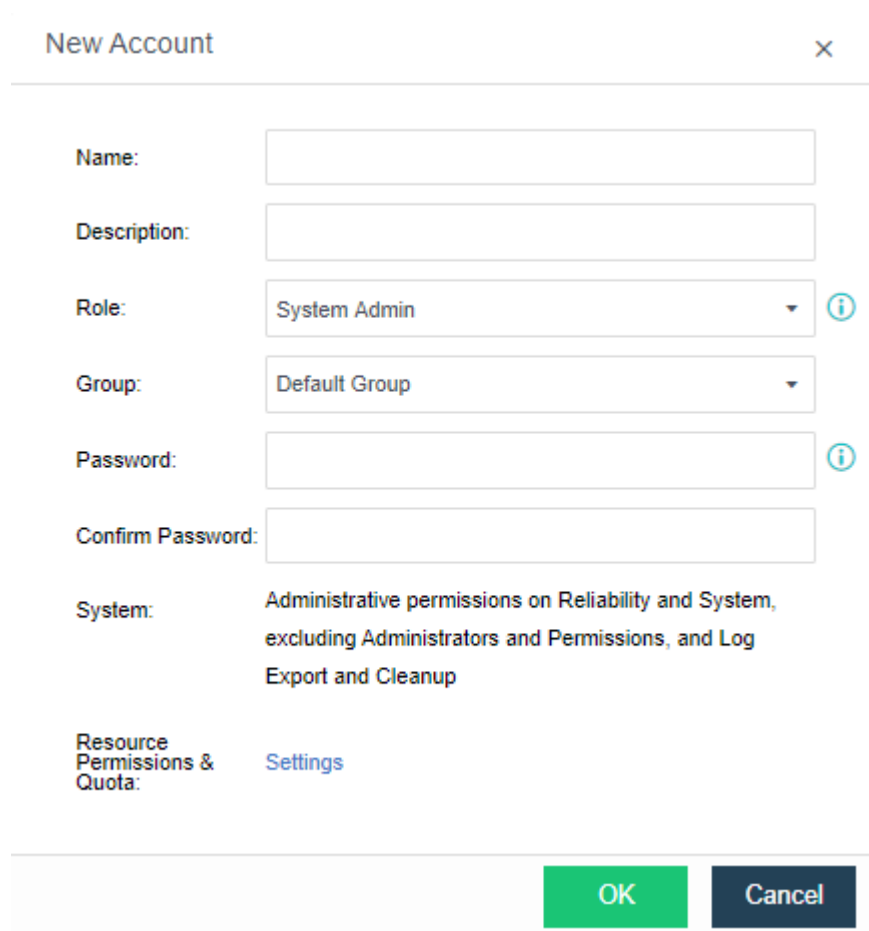
You can add multiple admin accounts and assign different privileges to those accounts.



Username	Role	Description	Group	Resources	Password Validity	Operation	Login with...
admin	Super Admin	-	Default Group	-	Unlimited	Edit Reset Password Certificate	
sangfor	System Admin	@guest123	Default Group	CPU: Unlimited, Memory: Unlimited, ...	Unlimited	Edit Reset Password Certificate	
junwei	System Admin	-	Default Group	CPU: Unlimited, Memory: Unlimited, ...	Unlimited	Edit Reset Password Certificate	
demo_hci	System Admin	-	Default Group	CPU: Unlimited, Memory: Unlimited, ...	Unlimited	Edit Reset Password Certificate	

2.6.3.1 Adding Administrator Account

To create an admin account to log into Sangfor HCI, click **System Administrators and Permissions** to enter the following page. To add an admin account, click **Add** to enter the **Add Account** page, as shown below:



New Account

Name:

Description:

Role: ⓘ

Group: ▼

Password: ⓘ

Confirm Password:

System: Administrative permissions on Reliability and System, excluding Administrators and Permissions, and Log Export and Cleanup

Resource Permissions & Quota: [Settings](#)

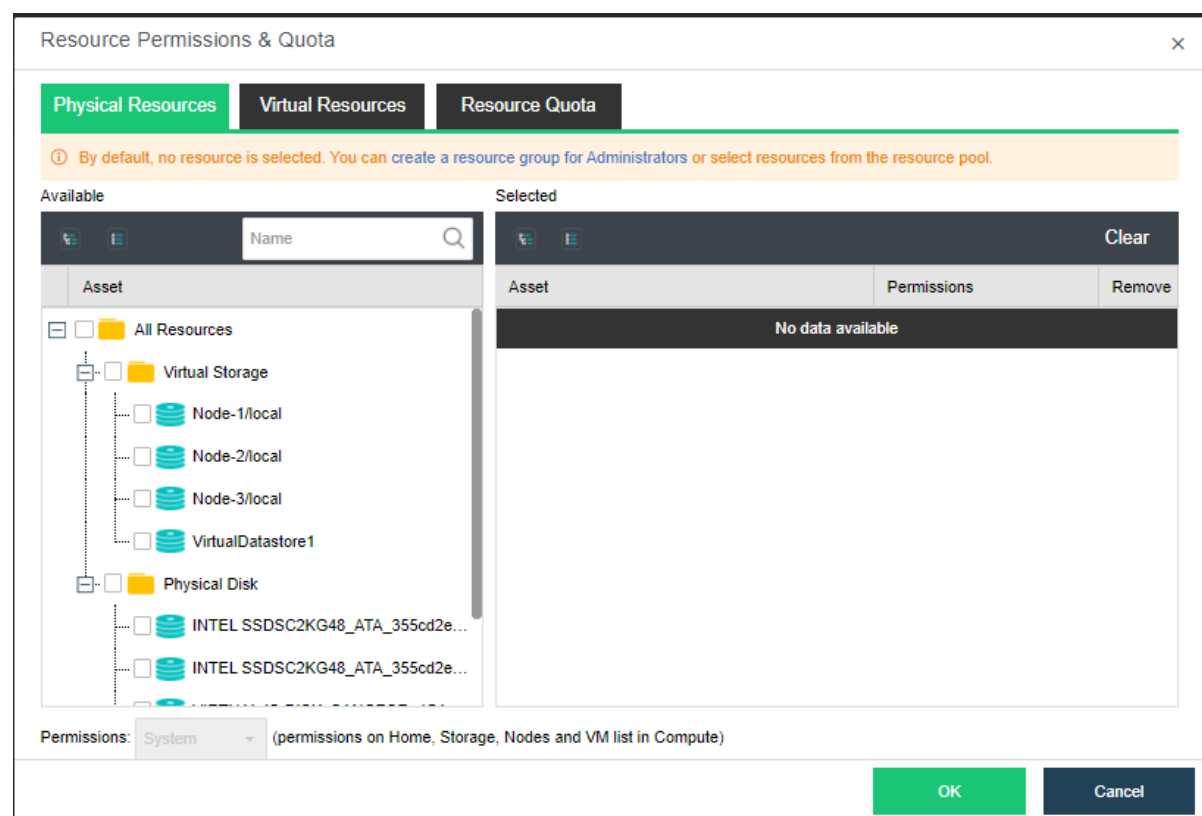
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Specify **Name**, **Description**, **Password** and **Retype Password** fields and a group. To avoid typing a wrong password, **Retype Password** field is required. To configure permissions, click **Settings**.

On the **Permissions** page, there are three tabs, **Permissions**, **Resources** and **System**. As for **Permissions**, it includes permissions on such resources as virtual machines, virtual network, virtual storage and physical disks.

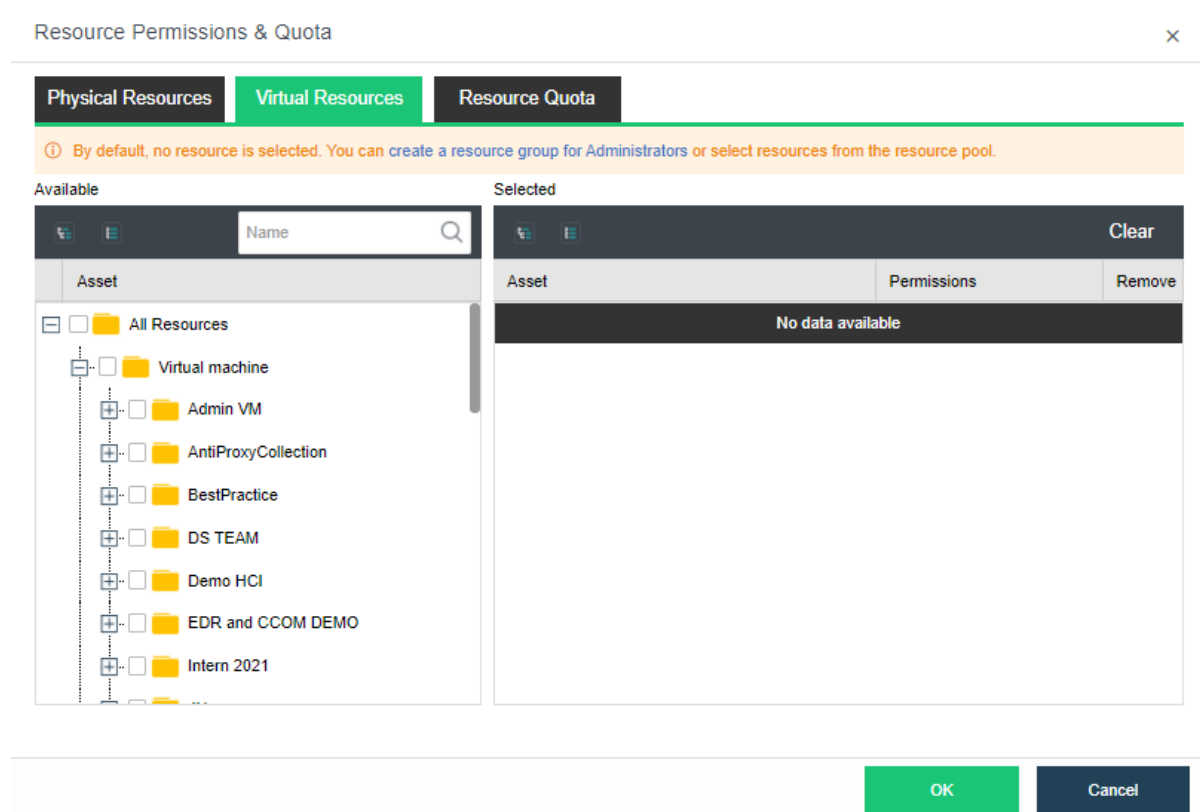


As for **Resources**, it includes CPU, memory and storage. The resources are allocated to the administrator to create virtual machines only, not taken up by virtual machines that are created by other administrators but are managed by this administrator.

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As for **System**, it includes **Physical resources**, **System configuration and maintenance** and **Service maintenance**.

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Resource Permissions & Quota

Physical Resources
Virtual Resources
Resource Quota

CPU:
☒ Unlimited
☐ Max cores for powered-on VM(s)
core(s)

Memory:
☒ Unlimited
☐ Max memory for powered-on VM(s)
GB

Storage:
☒ Unlimited
☐ Max disk size for all the VM(s)
GB

Note: The above resource quotas are applied only to virtual machines created by this Administrator but not applied to virtual machines created by any other Administrator which are managed by this Administrator.

OK
Cancel

As for **Physical resources**, it includes configuration of **Home**, **Storage** and **Nodes** and view all the virtual machines.

As for **System setting and maintenance**, it includes configuration of some **System General and Maintenance** settings, including Licensing, Data and Time, Alarm Options, Cluster, System Backup and Restore, Tech Support and Download, etc.

As for **Others**, it includes configuration of some System General and Maintenance settings, including VM Backup and Recovery, Recycle Bin, HA and Resource Scheduling.

2.6.3.2 Login & Password Policy

Login and password policy can be configured for all System Administrators account. This helps to improve the security by limiting the password minimum length, retry attempts, validity and timeout session.

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Login & Password Policy
×

Password Policy

Minimum Length:
i

Password Complexity:

Simple

i

Validity:

Unlimited

Max Password Retry Attempts:

5

i

Login Policy

Login Interval:

1 second

Session Timeout:

604800

i

☐ Disable multiple logins for same user *i*
The same account can only be used to log in from one IP address.

☐ Google Authenticator OTP *i*
Keep time difference between the cluster and your mobile phone within 30 seconds.
To send verification code by email, configure [SMTP Server](#)

[Restore Defaults](#)

OK

Cancel

2.6.3.3 Assigning Permissions

On the **Permissions** tab, accounts can be assigned with different permissions, as shown below:

After adding accounts and having assigned permissions to those accounts, you can edit permissions on the **Compute** and **Networking** page, as shown below.

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System - System Administrators and Permissions		
Administrators		Permissions
Refresh	New	Delete
Name	Description	Edit
- Admin	All permissions	-
- Deploy virtual machine	Deploy virtual machine	-
- Read-only permission	Read-only permission	-
- No permission	-	-
<input type="checkbox"/> VM administration	Use virtual machines	<input checked="" type="checkbox"/>
<input type="checkbox"/> Network administration	Use network functions	<input checked="" type="checkbox"/>

Edit Permissions

Name:

Network administration

Description:

Use network functions

Name

All permissions

+

Compute

+

Networking

OK

Cancel

System - System Administrators and Permissions		
Administrators		Permissions
Refresh	New	Delete
Name	Description	Edit
- Admin	All permissions	-
- Deploy virtual machine	Deploy virtual machine	-
- Read-only permission	Read-only permission	-
- No permission	-	-
<input type="checkbox"/> VM administration	Use virtual machines	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Network administration	Use network functions	<input checked="" type="checkbox"/>

Permission of editing virtual network is similar to that of editing VM

System - System Administrators and Permissions		
Administrators		Permissions
Refresh	New	Delete
Name	Description	Edit
- Admin	All permissions	-
- Deploy virtual machine	Deploy virtual machine	-
- Read-only permission	Read-only permission	-
- No permission	-	-
<input type="checkbox"/> VM administration	Use virtual machines	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Network administration	Use network functions	<input checked="" type="checkbox"/>

2.6.4 Alarm

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The **Alarm** page includes **Alarm**, **Alarm Option** and **Alarm Notification**.

2.6.4.1 Alarm Option

Thresholds for alarm events can be configured, including duration and severity. When thresholds are reached, alarms will be triggered and also alarm logs will be generated. as shown below:

Node

Host Alarm-Triggering Events

Storage

Virtual Machine

Virtual Network Device

License

Medium Alarms

- ☒ Host memory usage is above % for
- ☒ Host swap partition usage is above % for
- ☒ Host CPU usage is above % for
- ☒ Host CPU temperature is too high for

Critical Alarms

- ☒ Physical interface is disconnected
- ☒ Node is offline
- ☒ Overlay network interface (vniLAN) is down
- ☒ Node is disconnected from gateway
- ☐ Host packet loss rate is above % for
- ☒ Host NIC anomaly lasts for

Save

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Node
Storage
Virtual Machine
Virtual Network Device
License

Storage Alarm-Triggering Events

Medium Alarms

☒ Storage IO is busy for 30 minutes
☐ Backup repository IO is busy
☒ Storage IO latency is too high for 30 minutes

Critical Alarms

☒ Storage is disconnected from node
☒ Storage status anomaly
☒ RAID status anomaly
☒ Storage usage reaches 90 %
☒ Backup repository usage reaches 90 %

Save

Node
Storage
Virtual Machine
Virtual Network Device
License

VM Alarm-Triggering Events

Medium Alarms

☒ Memory usage is above 90 % for 10 minutes
☒ CPU usage is above 90 % for 10 minutes

Critical Alarms

☐ VM image file is damaged
☒ VM backup fails
☒ VM is disconnected from physical network
☒ Number of sessions on a VM NIC is above 10000 for 3 minutes

Save

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Node
Storage
Virtual Machine
Virtual Network Device
License

Networking Alarm-Triggering Events

Medium Alarms

☒ CPU usage is above % for

☐ Virtual network device encounters internal error

Critical Alarms

☐ Image file of virtual network device is damaged

☒ Router fails to run

☐ Packet loss rate on virtual interface is above % for

☒ ALG usage is above % for ⓘ

☒ Virtual network device is disconnected from physical network

Save

Node
Storage
Virtual Machine
Virtual Network Device
License

Licensing Alarm-Triggering Events

Critical Alarms

☒ License expiration

Save

The all **Triggering Event** specify threshold for **Node**, **Storage**, **Virtual Machine**, **Virtual Network** and **License**.

2.6.4.2 Configuring Alarm Notification

To send alarm email, you need check the option **Send alerts to specified email addresses** and then specify **Recipient Email Addresses**, and the recipient email addresses, and configure the SMTP server by clicking on **Settings**, as shown below:

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Alarm Notification

☒ Send Alarms to Recipient Address

☒ SMTP server is configured. [Settings](#)

Recipient Address:

tingfong

One entry per line, a maximum of 5 entries allowed.

[Send Test Email](#)

Notification:

☒ Critical Alarms

Periodic:

☐ Immediate ⓘ

☒ Every 15 minutes ▼ (one notification for alarms in a same category) ⓘ

☒ Medium Alarms

Periodic:

☐ Immediate ⓘ

☒ Every 6 hours ▼ (one notification for alarms in a same category) ⓘ

SMTP Server

✕

Sender Address:

ken

Server Address:

smtp.gmail.com

Port:

465

☒ Secure connections

Protocol:

SSL ▼

☒ Authentication required

Username:

ke

Password:

OK

Cancel

Sender Address: Specifies sender email address.

SMTP Server: Specifies IP address and domain name of SMTP server.

Port: Specifies port of SMTP server. Default port number is 25.

If the SMTP server requires authentication, select **Authentication required**, and enter username and password.

If For alarm-triggering events of critical alarms and medium alarm occurring within N minutes, send one alert email only (one for each node) is selected, only one alert email will be sent for alarm-triggering events of the same category within the specified period.

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Notification: ☒ Critical Alarms

Periodic: ☐ Immediate ⓘ

☒ Every 15 minutes ▼ (one notification for alarms in a same category) ⓘ

☒ Medium Alarms

Periodic: ☐ Immediate ⓘ

☒ Every 6 hours ▼ (one notification for alarms in a same category) ⓘ

2.6.5 Configuring Cluster

You can configure cluster, management interface and overlay network interface.

2.6.5.1 Cluster Settings

It supports web-based access, on the cluster IP address, which makes VM management more stable. Under normal circumstances, Sangfor HCI GUI is reachable with IP address of any managed node unless the node fails. With cluster IP address, you will never lose control of the management even when one node fails unexpectedly. Sangfor HCI management through cluster IP address improves system stability and reliability dramatically.

Cluster Settings

aCloud platform supports web-based access on the cluster IP address, which makes VM management more stable.

Under normal circumstances, SANGFOR aCloud GUI is reachable with IP address of any managed node unless the node fails. With cluster IP address, you will never lose control of the management even when one node fails unexpectedly.

SANGFOR aCloud management through cluster IP address improves system stability and reliability dramatically.

Cluster IP:

Netmask:

Cluster Name:

Save



Sangfor HCI can communicate with aCMP on the cluster IP address. To use relevant features of aCMP, the following should be configured, **Cluster IP**, **Netmask** and **Cluster Name**, and click **Save** to save the changes.

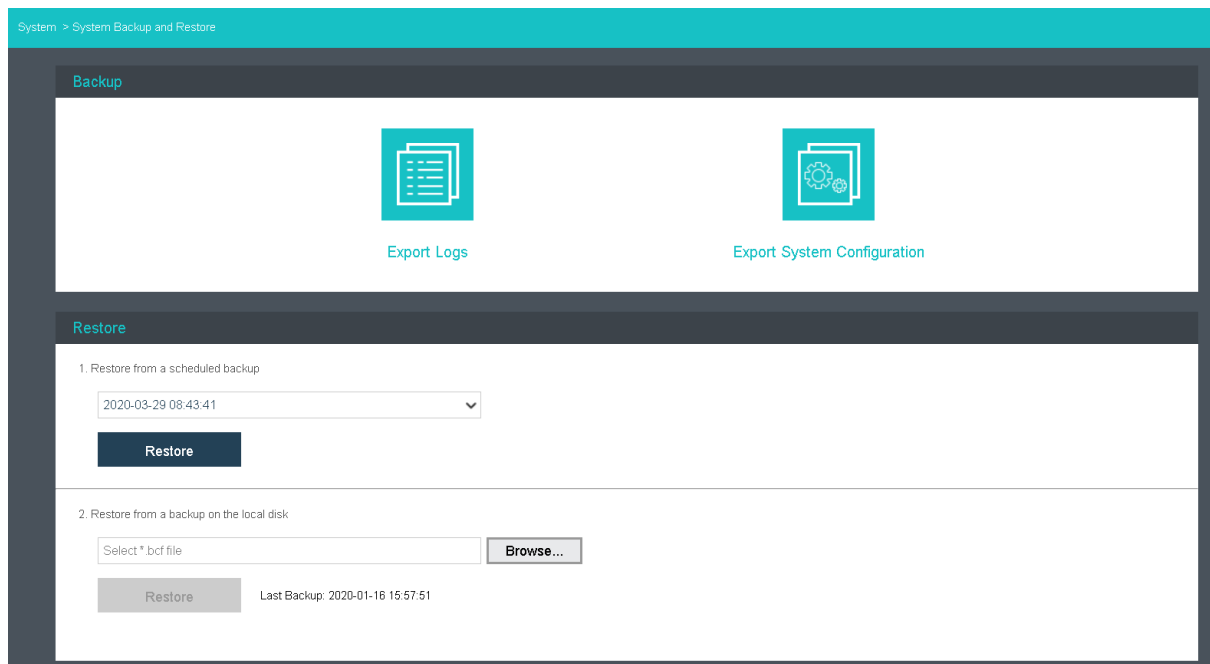
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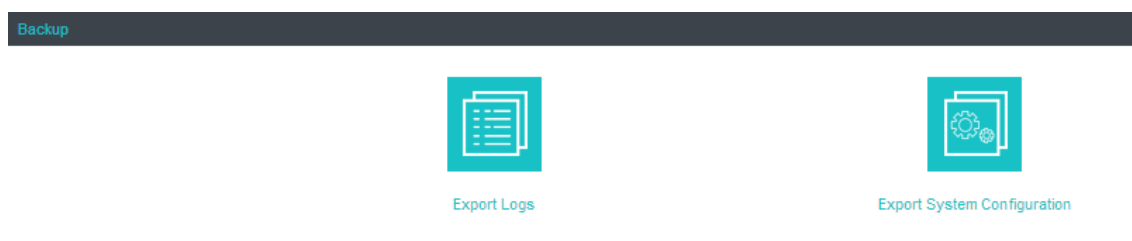
2.6.6 System Backup and Restore

It includes backing up and restoring configurations of system and virtual network devices, and also restoring to factory defaults.



2.6.6.1 System Backup

It includes **Export Logs** and **Export System Configuration**, as shown below:



Export Logs: Click to back up logs of specified period and specified nodes onto local disk.

Export System Configuration: Click to back up system configurations.

2.6.6.2 System Restore

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There are two options, including restoring system settings from a scheduled backup or restoring system settings from backup on the local disk.

Restore

1. Restore from a scheduled backup

2020-03-29 08:43:41

Restore

2. Restore from a backup on the local disk

Select *.bcf file

Browse...

Restore

Last Backup: 2020-03-29 16:10:55

2.6.6.3 Restoring System to Factory Defaults

You may click **Restore to Factory Defaults** to restore Sangfor HCI to its factory defaults. All nodes will be restored to factory defaults and removed from Sangfor HCI. You need to add them again. Sangfor HCI will also be restored to factory defaults, including Cluster Settings, System Administrators and Permissions, VM Backup and Recovery, User Experience Improvement Program, Date and Time, and Alarm Options.

Restore to Factory Defaults

All nodes will be restored to factory defaults and removed from SANGFOR aCloud.

SANGFOR aCloud will also be restored to factory defaults, including Cluster, System Administrators and Permissions, VM Backup and Recovery, Date and Time, Alarm Options, etc.

Please operate with caution!

Unreasonable Reasons:

1. Remove node(s) from the cluster

2. Fix system problems

3. Replace damaged node

Reasonable Reasons:

1. Return testing device

2. Reset settings of all clustered nodes

Neither of the reasons? call us at +60 127-117-129(7511)

The following are unreasonable reasons for restoration operation:

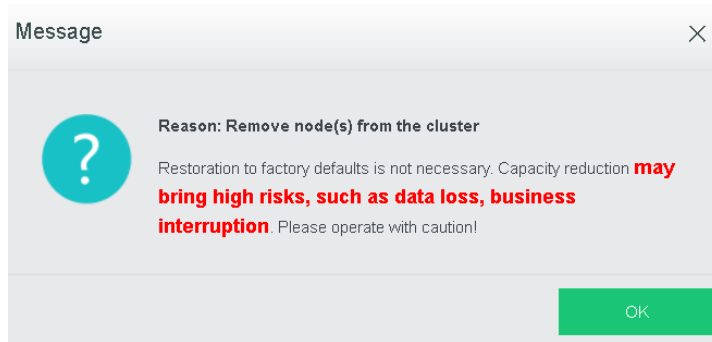
1. Remove node(s) from the cluster

Sangfor Technologies

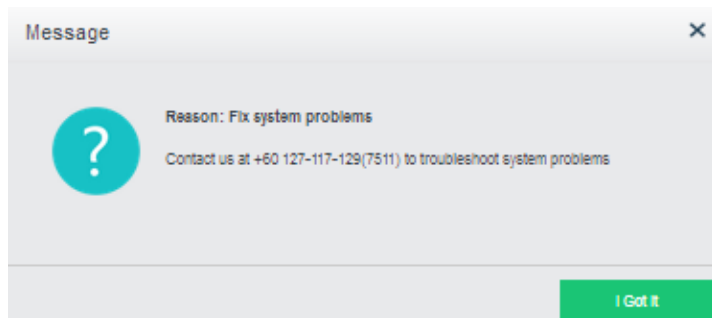
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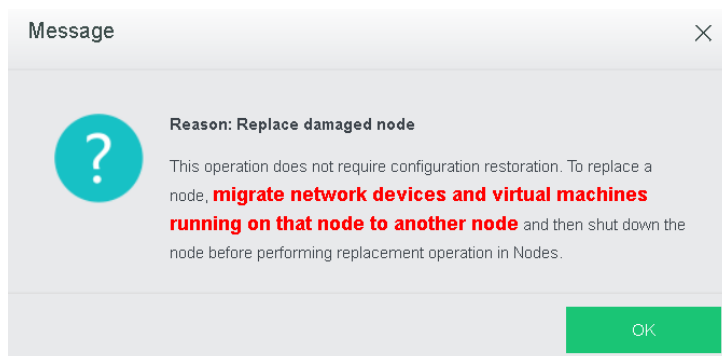
312



2. Fix system problems



3. Replace damage node



The following are reasonable reasons for restoration operation:

1. Return testing device

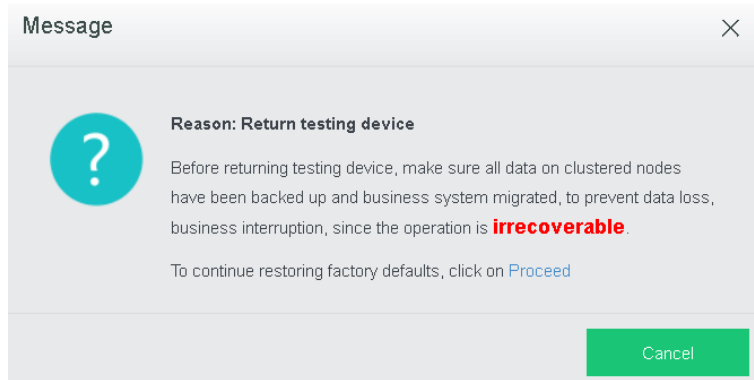
Before returning testing device, make sure all data on clustered nodes have been backed up and business system has been migrated, to prevent data loss, business interruption, since the operation is not irrevocable. Please operate with caution.

2. Click **Proceed** to restore settings to factory defaults.

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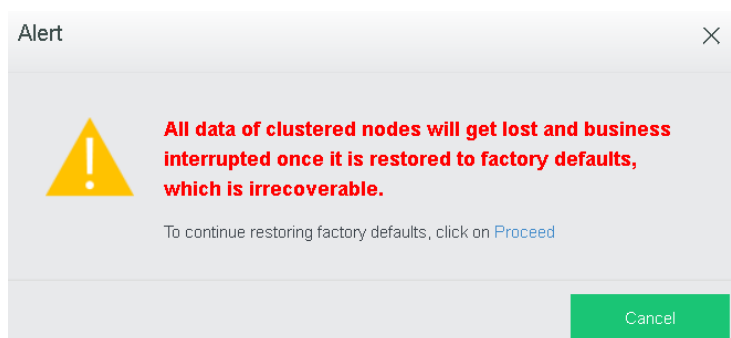
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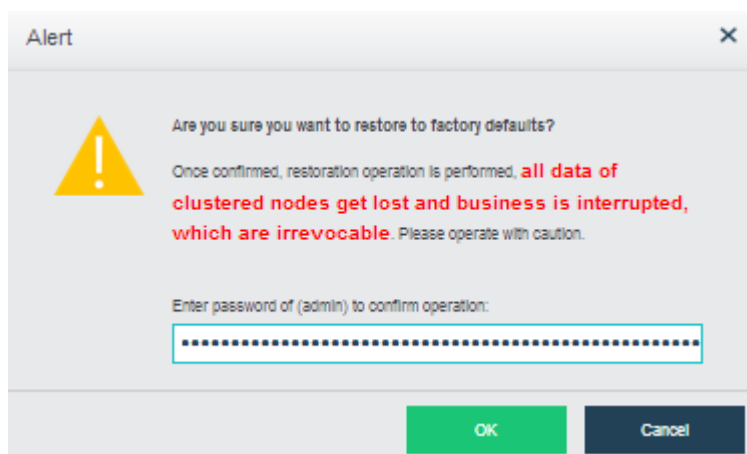


All data of clustered nodes will get lost and business interrupted after this operation which, is irrevocable. Please operate with caution.

3. Click **Proceed** to continue restoring factory defaults.



Click **OK** to start restoring factory defaults. All data of clustered nodes will get lost and business interrupted after this restoration operation, which is irrevocable. Enter password of the current username to confirm operation:



4. Reset cluster settings

Before resetting cluster settings, make sure all data on clustered nodes have been backed

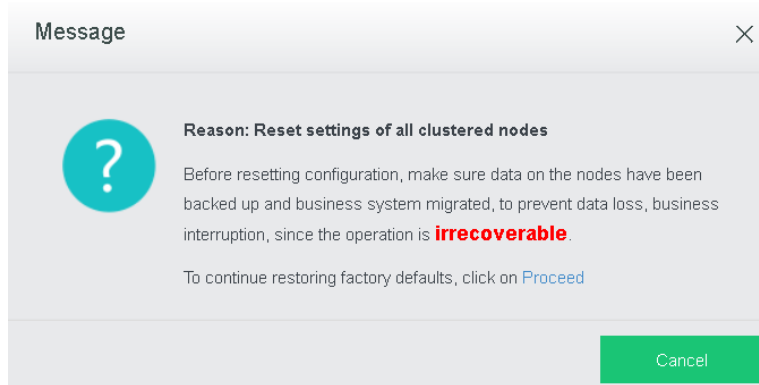
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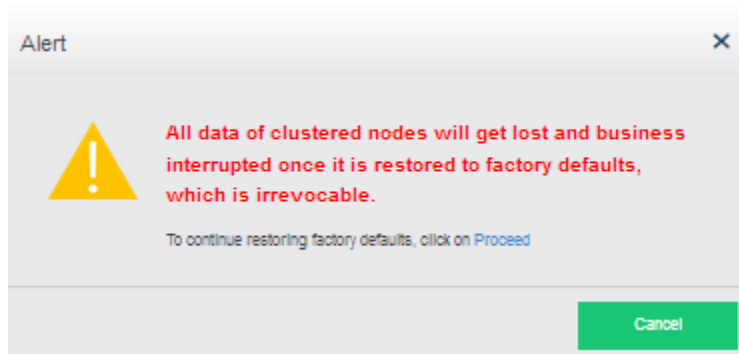
up and business system has been migrated. All data of clustered nodes will get lost and business interrupted after this restoration operation, which is irrevocable.

5. Click **Proceed** to continue restoring factory defaults.



All data of clustered nodes will get lost and business interrupted after this restoration operation, which is irrevocable.

6. To continue restoration operation, click **Proceed** again.

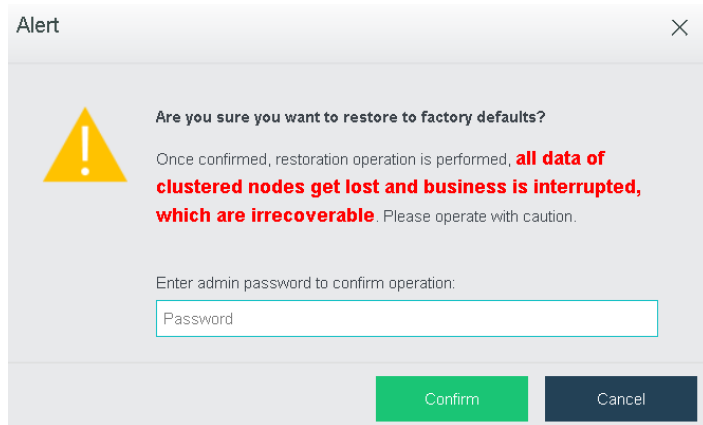


7. Click **OK** to start restoring factory defaults. All data of clustered nodes will get lost and business interrupted after this restoration operation, which is irrevocable. Enter password of the current username to confirm operation:

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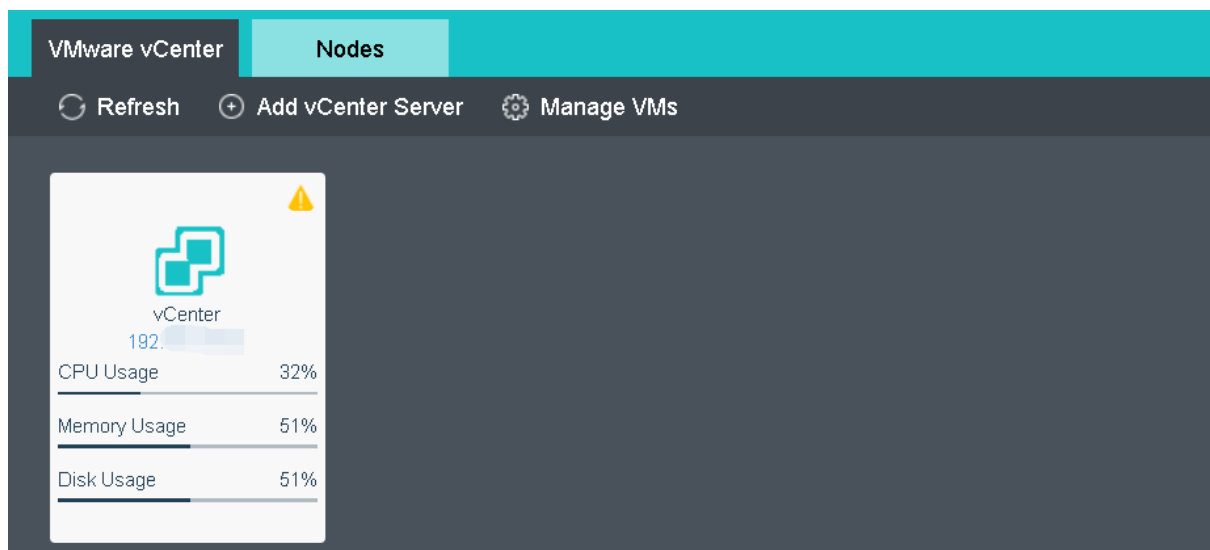
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2.6.7 VMware vCenter

In **Nodes**> **VMware vCenter**, there are two tabs, **VMware vCenter** and **Nodes**. vCenter servers can be added, monitored and deleted.



Currently only vCenter server 5.0, 5.1, 5.5, 6.0, 6.5 and 6.7 can be added.

To add a vCenter server, click **Add vCenter Server** to enter the following page and specify **Name, Address, Username, Password, Port and Description**, and then click **OK** to start adding vCenter server and check whether the vCenter server has been added successfully.

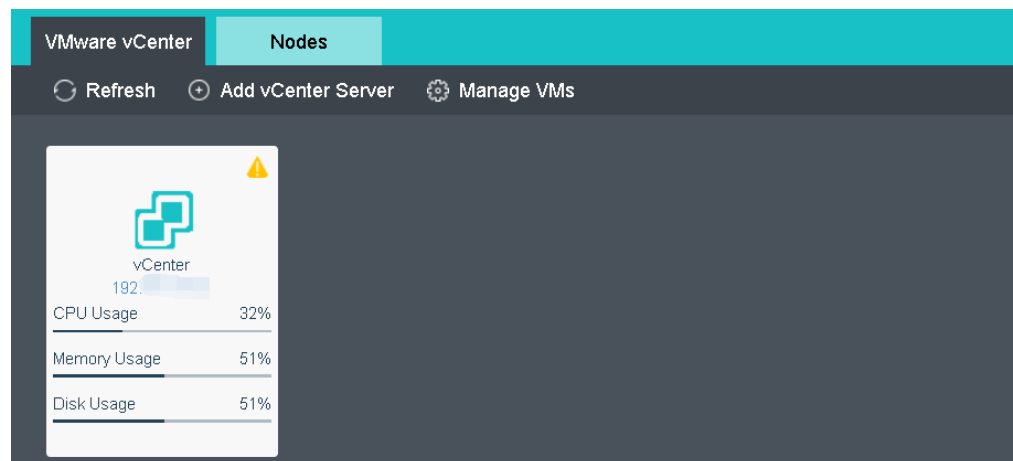
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2.6.7.1 Adding VMware vCenter

On the **VMware vCenter** tab, it displays the vCenter servers that have been added.



To add a vCenter server, click **Add vCenter Server** to enter the following page and specify **Name, Address, Username, Password, Port and Description**, and then click **OK** to start adding vCenter server and check whether the vCenter server has been added successfully.

Add vCenter Server

If there is ESXi hosts being managed by the VMware vCenter based on domain name or hostname, configure a DNS server to not affect VM migration and backup from/to VMware vCenter.
(In Nodes > Physical Interfaces > Advanced > Others)

Name:

Name displayed on SANGFOR aCloud

Address:

This field is required.

Username:

Password:

Port:

443

Description:

Optional

OK

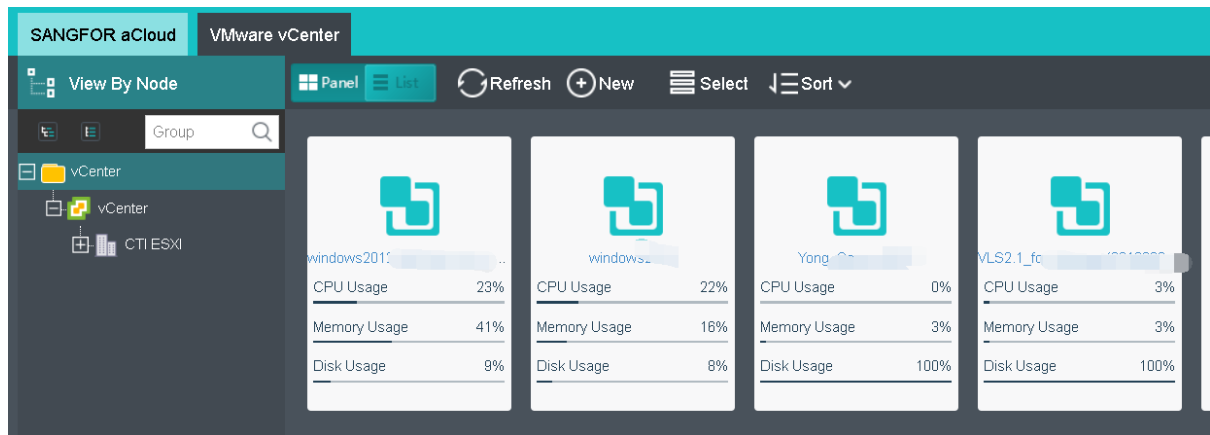
Cancel

To view VMs running on VMware vCenter server, click **Manage VMs**. For details about those virtual machines, refer to the

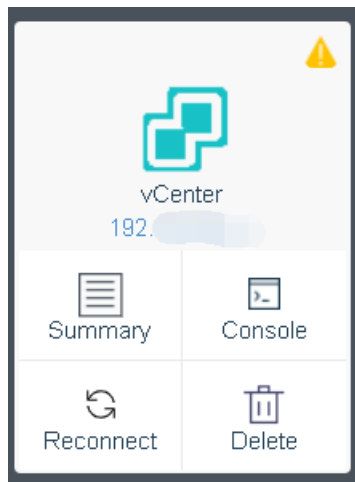
2.2.2 Managing Virtual Machines in VMware vCenter section

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On the **VMware vCenter** tab, you can view detailed information of vCenter servers, enter Web administrator console of VMware vCenter server, reconnect Sangfor HCI platform to vCenter server or delete vCenter server, as shown below:

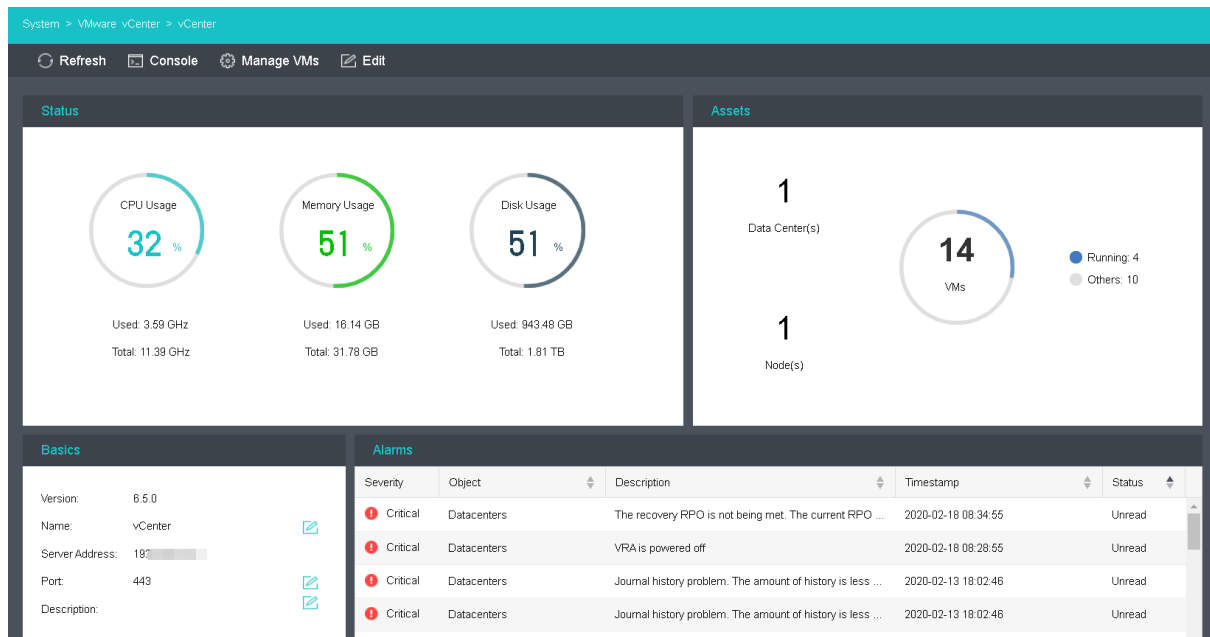


Click on the IP address of a vCenter server or click Summary to enter the **Summary** page, you will see the following information of that vCenter server: status, basics, alarms, etc, as shown below:

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To edit vCenter server's name, port or description, click **Edit**, as shown below:

The 'Edit' dialog box contains the following fields:

- Name:** vCenter
- Port:** 443
- Description:** Optional

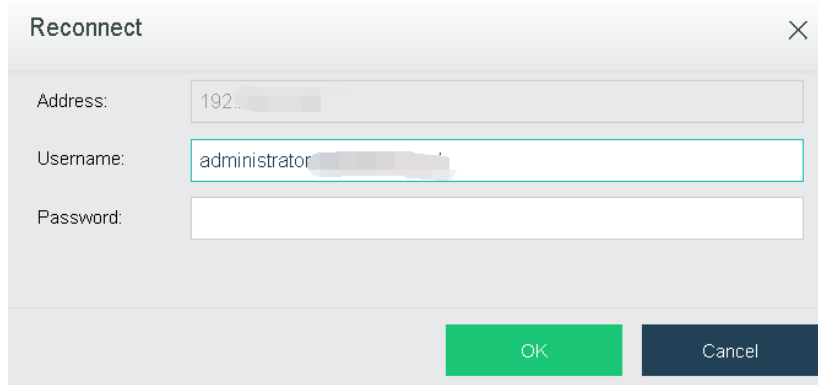
Buttons: OK, Cancel

To reconnect Sangfor HCI to vCenter server, click **Reconnect**, and enter password to start reconnection.

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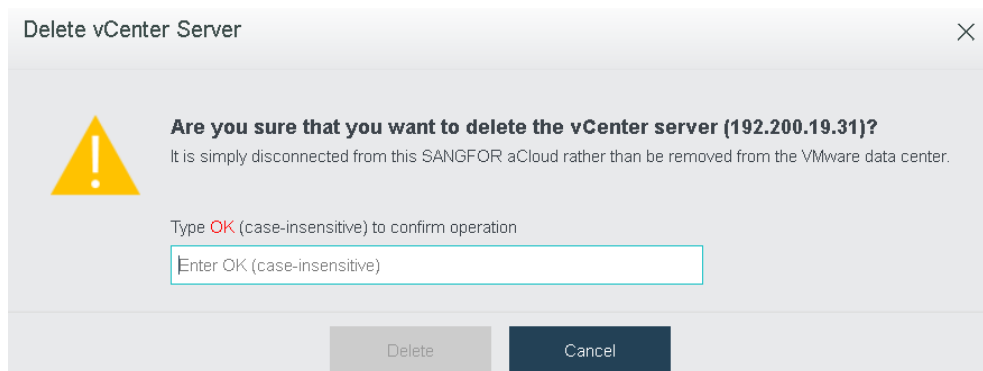
Reconnect [X]

Address:


Username:

Password:

To delete a vCenter server, click **Delete** to remove it from Sangfor HCI platform and disconnect Sangfor HCI from that vCenter server but it will not be removed from the VMware vCenter. Type **OK** to confirm operation.



Delete vCenter Server [X]

 **Are you sure that you want to delete the vCenter server (192.200.19.31)?**
It is simply disconnected from this SANGFOR aCloud rather than be removed from the VMware data center.

Type **OK** (case-insensitive) to confirm operation

2.6.8 Tech Support & Download

2.6.8.1 Services

Sangfor provides the following services, **Technical Support, Community, Upgrade**, etc, which are available to both Standard Edition and Enterprise Edition.

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Remote Technical Support

1. Call the following hotline and apply for an authorization code to ask for remote diagnostics, troubleshooting, recovery or system enhancement.
2. Hotline: **+60 127-117-129(7511)**

[Start Tech Support](#)
[Stop remote technical support](#)


Technical Support

1. Technical support staff guide you through setting up SANGFOR aCloud and getting the most out of your edition.
2. To reach our team, send us email or call customer service (**+60 127-117-129(7511)**) .
3. Standard edition provides technical support over phone only, while enterprise edition supports remote access and troubleshooting (service code is required by Sangfor)



Community

1. Search: Customer can search for technical information from Sangfor knowledge database (For example, solutions, techniques, etc).
2. Online Technical Support: Ask questions and share experience with Sangfor technical support online.
3. SP Download: Service patch can be downloaded to update the software.
4. Access Community (Community <http://community.sangfor.com>) .



Upgrade

Upgrade from standard edition is restrictive, while enterprise edition supports update to any software version.

☐ Turn off auto update



Open Ports

To ensure availability of necessary functionality, some ports are allowed on physical network. [View](#)

To help us improve product usability and user experience, you can take participate in **User Experience Improvement Program**.

User Experience Improvement Program



We invite you to join in User Experience Improvement Program to help us improve product usability, performance, design and user experience and provide more innovative services, by allowing Sangfor to gather and make statistics of each functionality. Information collected through this program does not contain personal information but the product only.

You have participated in User Experience Improvement Program. Thank you!

[Withdraw From Program](#)

2.6.8.2 Software Download

On the **Download** page, you can download Sangfor HCI software and Sangfor Converter.


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Download

SANGFOR aCloud Software




SANGFOR aCloud

Download ISO Image:

[Update Server in USA](#)
[Update Server outside USA](#)

SANGFOR Converter



SANGFOR Converter

For Windows-Based Server:

[Update Server in USA](#)
[Update Server outside USA](#)

For Linux-Based Server:

[Update Server in USA](#)
[Update Server outside USA](#)

2.6.9 Task

It includes **Tasks** and **Resource Scheduling Logs**.

System > Tasks

TasksResource Scheduling Logs

Refresh

Action, node, object, description

Advanced

Status	Action	Start Time	End Time	Username	Node	Object Type	Object	Operation
Completed	Log in	2020-03-29 16:33:40	2020-03-29 16:33:40	admin(192.200.19.4)	192.168.1.3	Administr...	ad...	View
Failed	Log in	2020-03-29 16:33:29	2020-03-29 16:33:29	admin(192.200.19.4)	192.168.1.3	Administr...	ad...	View
Completed	Delete edge	2020-03-29 11:11:21	2020-03-29 11:11:21	admin(192.168.20.3)	192.168.1.1	edge		View
Completed	Auto merge backups	2020-03-29 03:11:15	2020-03-29 03:11:15	admin(192.168.20.3)	192.168.1.1	Schedule...		View
Completed	Auto merge VM ba...	2020-03-29 01:15:34	2020-03-29 01:17:30	admin(192.168.20.4)	192.168.1.1	Virtual Ma...	...	View
Completed	Auto merge VM ba...	2020-03-29 01:14:45	2020-03-29 01:15:29	admin(192.168.20.3)	192.168.1.1	Virtual Ma...	...	View
Completed	Auto merge VM ba...	2020-03-29 01:13:14	2020-03-29 01:14:40	admin(192.168.20.5)	192.168.1.1	Virtual Ma...	...	View
Completed	Auto merge VM ba...	2020-03-29 01:12:12	2020-03-29 01:13:07	admin(192.168.20.4)	192.168.1.1	Virtual Ma...	...	View
Completed	Auto merge VM ba...	2020-03-29 01:11:15	2020-03-29 01:12:08	admin(192.168.20.3)	192.168.1.1	Virtual Ma...	...	View
Completed	Auto merge backups	2020-03-29 01:11:15	2020-03-29 01:17:37	admin(192.168.20.3)	192.168.1.1	Schedule...	...	View
Completed	Scan for bad sectors	2020-03-29 01:01:27	2020-03-29 06:01:55	admin(192.168.20.3)	192.168.1.1	Storage	...	View
Completed	Enable scheduled ...	2020-03-28 23:09:29	2020-03-28 23:10:34	admin(192.168.20.5)	192.168.1.1	Virtual Ma...	...	View

1-50 of 14873

1 2 3 4 5 6 ... 298

Entries Per Page 50

Page 1

Tasks: It records all kinds of operations, such as creating new VM, etc. 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.

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Status:	✔ Completed
Action:	Log in
Start Time:	2020-03-29 16:33:40
End Time:	2020-03-29 16:33:40
Username:	admin(192.200.19.4)
Node:	192.168.20.3
Object Type:	Administrators
Object:	admin
Description:	

System > Tasks

Tasks

Resource Scheduling Logs

Refresh

VM, node, reason, description

Advanced

Status	Virtual Machine	Current Node	Destination Node	Start Time	End Time	Operation
No data available						

0-0 of 0

Entries Per Page

50

Page

1

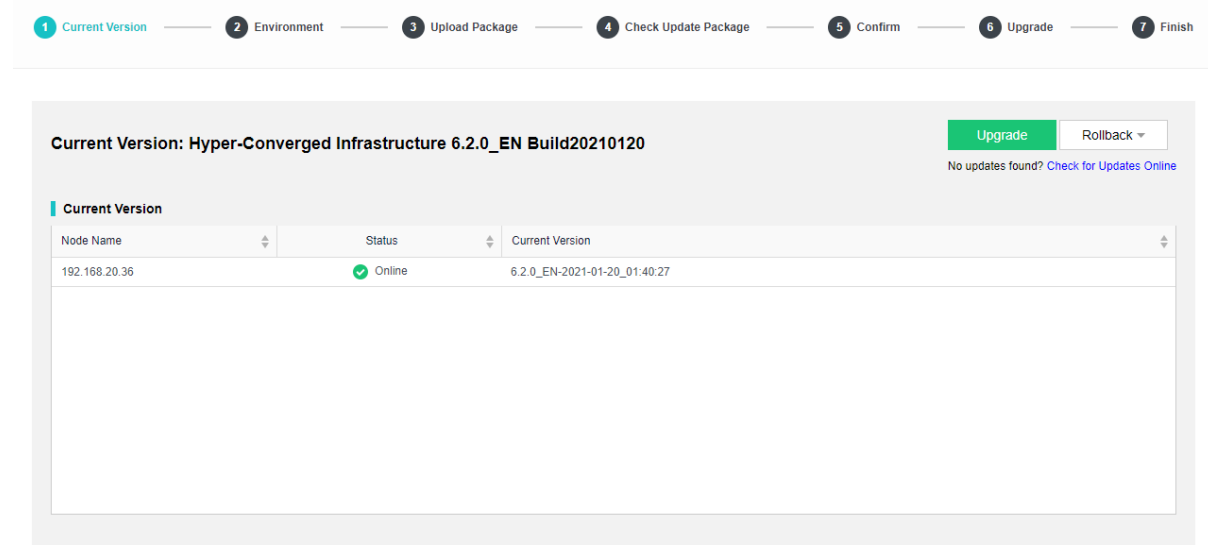
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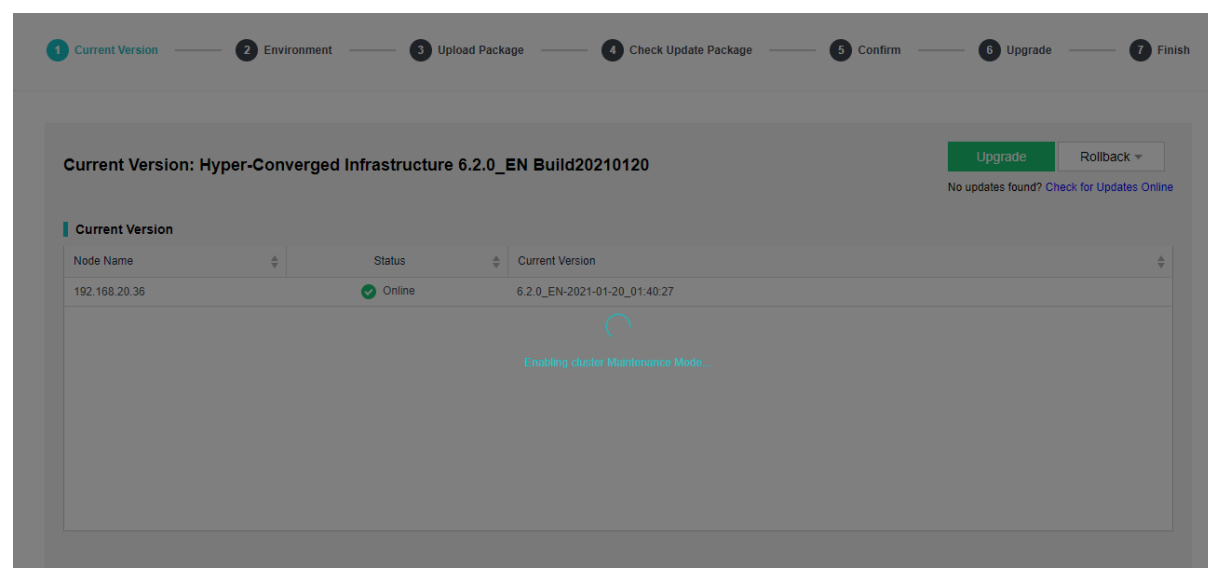
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2.6.10 System Upgrade

In **System > Upgrade**, you can see the upgrade page as below:



Click Upgrade and the device will enable the maintenance mode automatically as below:



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Then, the device will perform checking on the hardware status. If the device pass all the check, it will display message as below:

✓

Current Version

2

Environment

3

Upload Package

4

Check Update Package

5

Confirm

6

Upgrade

7

Finish

Results:

Check Again

Items	Results	Details
▶ Check expiration date of upgrade license	✓ Completed	-
▶ Check host status	✓ Completed	-
▶ Check host CPU	✓ Completed	-
▶ Check host disk	✓ Completed	-
▶ Check host memory	✓ Completed	-
▶ Check Boot partition	✓ Completed	-
▶ Check Local partition	✓ Completed	-
▶ Check host Log partition space	✓ Completed	-
▶ Check free space of host Tmp partition	✓ Completed	-
▶ Check witness link	✓ Completed	-
▶ Check VM status	✓ Completed	-
▶ Check virtual storage status	✓ Completed	-
▶ Check physical network	✓ Completed	-

Prev

NextExit

Click 'Next' and enter into the Upload Package page as below:

✓

Current Version

✓

Environment

3

Upload Package

4

Check Update Package

5

Confirm

6

Upgrade

7

Finish

Drag or click to open file

Prev

NextExit

In this step, we can either click on the 'Drag or click open file' to upload the upgrade package, or directly drag and drop the file into the provided space:

✓ Current Version

✓ Environment

3 Upload Package

4 Check Update Package

5 Confirm

6 Upgrade

7 Finish

Uploading, please wait...1%

Uploading: Sangfor_HCI6.2.30_EN(20210202).pkg, Total: 2.1 GB, Uploaded:1.4 MB, Upload Speed:1.03 MB/s, Remaining:34 mins 6 secs

Cancel

Prev

Next

Exit

After upload completed, click OK and proceed to next step.

Message



Upload completed

Please do not close or refresh this page; otherwise, the uploaded update package needs to be uploaded and checked again.

OK

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Click **Next** and then HCI will do initializing checking on the package.

✓ Current Version

✓ Environment

✓ Upload Package

4 Check Update Package

5 Confirm

6 Upgrade

7 Finish

Progress:

Initializing the environment before upgrade ... 5 %

Try Again

Step	Status	Start Time	End Time	Details
<div><div></div><div>Initializing the environment before upgrade ... No data available</div></div>				

Prev

Next

Exit

After the package done checking, the upgrade impact will be show.

✓ Current Version

✓ Environment

✓ Upload Package

✓ Check Update Package

5 Confirm

6 Upgrade

7 Finish

Version:6.2.70_EN build 2021-01-13 14:58:07

Update Method: Hot Upgrade

Phase 1 **takes about 20 mins**

Impacts:

- Node: Not require restart
- Virtual Machine: Not require reboot but you need to migrate some VMs to another node when upgrade is to complete
- Virtual Network: **No impacts**
- Virtual Storage: There may be no IO response for up to 5 seconds when upgrading from lower to higher version

Prev

Next

Exit

It will begin the upgrade and the page will display as below:

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Current Version

Environment

Upload Package

Check Update Package

Confirm

Upgrade

Finish

Progress:

Upgrade (11%)...

Try Again

Download Logs

Upgrade Procedure	Status	Start Time	End Time	Details
▶ Preparing for hot upgrade	Finish	2021-04-09 10:25:42	2021-04-09 10:26:25	
▶ Preparing for control plane upgrade	Finish	2021-04-09 10:26:25	2021-04-09 10:26:56	
▶ Upgrading control plane	Processing	2021-04-09 10:26:57	-	
▶ Control plane upgrade completes	Waiting	-	-	
▶ Upgrading virtual machine	Waiting	-	-	
▶ VM upgrade completes	Waiting	-	-	
▶ Preparing for upgrade of aSAN mgmt plane	Waiting	-	-	
▶ Upgrading aSAN mgmt plane	Waiting	-	-	
▶ aSAN mgmt plane upgrade completed	Waiting	-	-	
▶ Preparing for upgrade of aSAN protocol plane	Waiting	-	-	
▶ Upgrading aSAN protocol plane	Waiting	-	-	
▶ Upgrade of aSAN protocol plane completes	Waiting	-	-	
▶ Preparing for upgrade of aSAN data plane	Waiting	-	-	
▶ Upgrading aSAN data plane	Waiting	-	-	
▶ Upgrade of aSAN data plane completes	Waiting	-	-	
▶ Preparing for aNet upgrade	Waiting	-	-	
▶ Upgrading aNet	Waiting	-	-	
▶ aNet upgrade completes	Waiting	-	-	
▶ Hot upgrade completes	Waiting	-	-	

Next

It will take some times for the device to finish upgrade:

Current Version

Environment

Upload Package

Update Package

Confirm

Upgrade

Finish

Progress:

Completed

After upgrade completed, click Next.

Click Finish to quit from maintenance mode and upgrade.

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Current Version

Environment

Upload Package

Check Update Package

Confirm

Upgrade

7 Finish

Virtual Machines

Network Devices

Please migrate or restart the following virtual machines to complete upgrade.

Details

Reboot

<input type="checkbox"/>	Status	VM Name	IP Address	Group	Operation
No data available					

Finish

2.6.11 Cluster Health Check

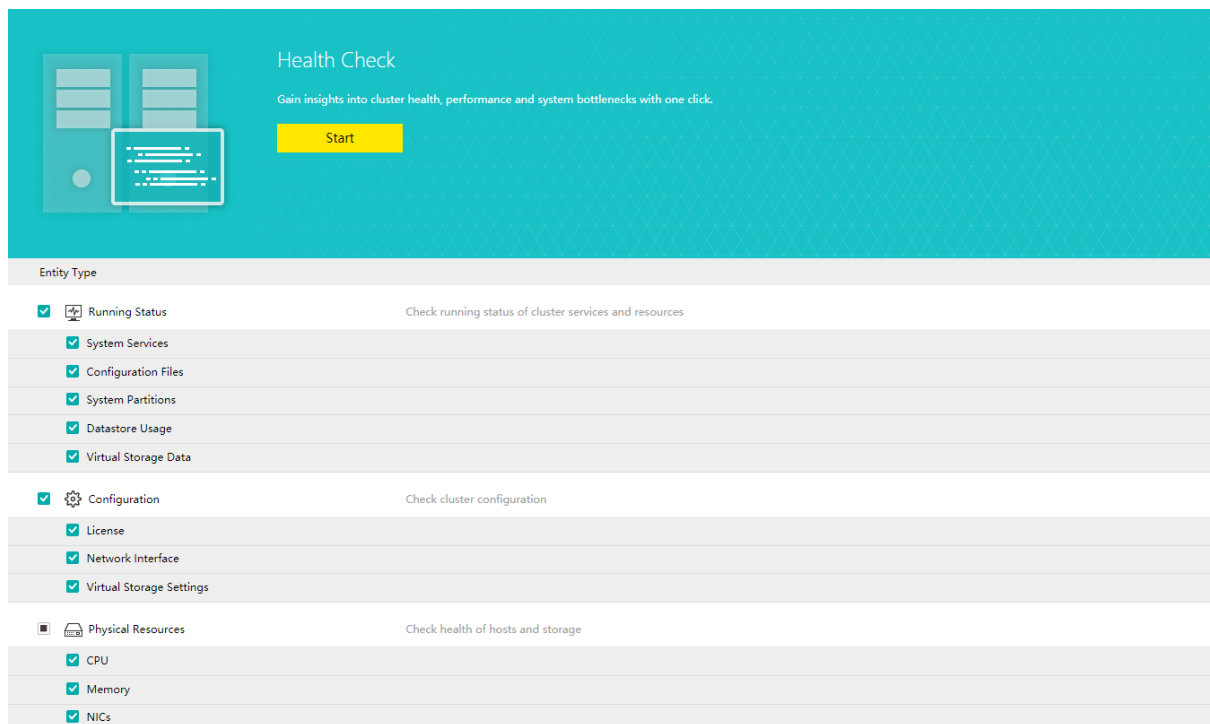
It enables you to gain insight into cluster health and operating status, and help you locate specific problems (related with hardware, platform or business), and offers solutions, so as to ensure that Sangfor HCI platform operates properly and to achieve easy maintenance.

Types of entities to be detected are **Running Status**, **Configuration** and **Physical Resources**.

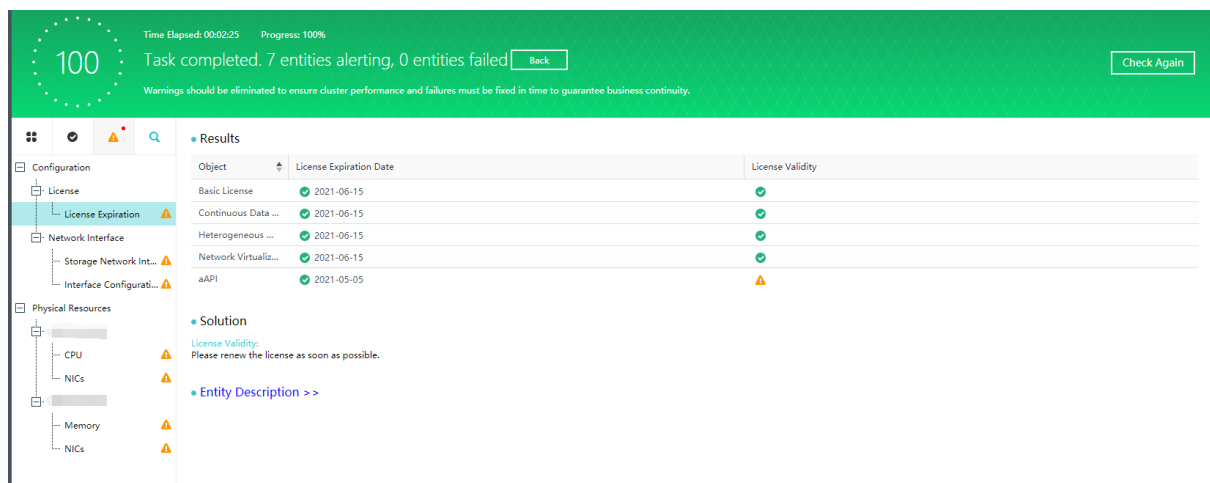
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After health check completes, you will see the score and results.



If there is something wrong with storage, the specific issue will be detected, and the corresponding solution will also be offered.

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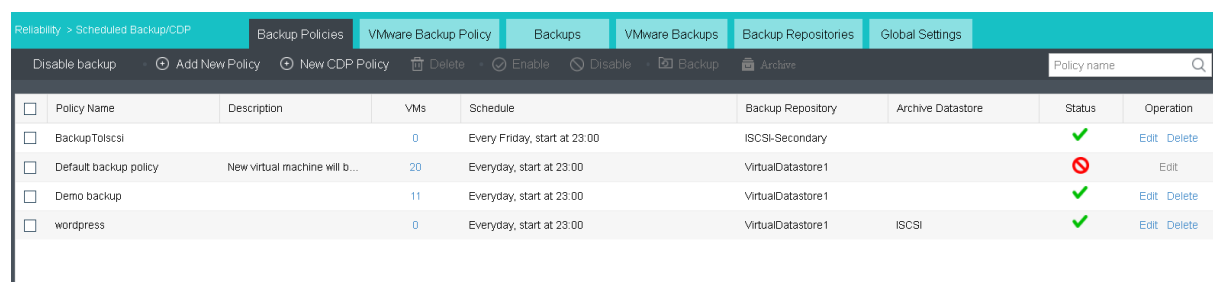
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2.6.12 VM Backup and Recovery

In this Internet era, data has become the first productivity and data security has gained more and more attention. Data loss or data damage, no matter due to human behaviors or natural disaster, will bring about immeasurable loss to enterprises. Therefore, restoring data from data replicas in the case of data loss becomes more important. On Sangfor HCI platform, the first backup is a full copy of data and the successive backups are incremental backups in which successive copies of the data contain only that portion that has changed since the preceding backup copy was made, which backs up less amount of data, occupies less space, and speeds up backup process as well. When a full recovery is needed, the restoration process needs the last full backup plus all the incremental backups until the point of restoration. Incremental backups are desirable as they reduce storage space usage, and are quicker to perform.

2.6.12.1 Sangfor Backup Policy

With scheduled backup policy, virtual machines can be automatically backed up during specified period of time.



<input type="checkbox"/>	Policy Name	Description	VMs	Schedule	Backup Repository	Archive Datastore	Status	Operation
<input type="checkbox"/>	BackupTolsci		0	Every Friday, start at 23:00	ISCSI-Secondary		✓	Edit Delete
<input type="checkbox"/>	Default backup policy	New virtual machine will b...	20	Everyday, start at 23:00	VirtualDatastore1		✗	Edit
<input type="checkbox"/>	Demo backup		11	Everyday, start at 23:00	VirtualDatastore1		✓	Edit Delete
<input type="checkbox"/>	wordpress		0	Everyday, start at 23:00	VirtualDatastore1	ISCSI	✓	Edit Delete

On the toolbar, there are **Enable/Disable backup**, **New Backup Policy**, **New CDP Policy**, **Delete**, **Enable**, **Disable** and **Backup**, as shown below:



Enable/Disable backup: To enable or disable backup, click **Enable backup** to enable backup or **Disable backup** to disable backup.

New Backup Policy: To add a new backup policy, click **New Backup Policy**. For details, refer to **2.6.12.1.1 Adding New Backup Policy** section.

To add a new CDP policy, click **New CDP Policy**. For details, refer to **2.6.12.1.2 Adding New CDP Policy** section.

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To delete backup policy, select the policy you want to delete and click **Delete**.

Enable: To enable a backup policy, click **Enable**, or click on the icon.



To disable a backup policy, click **Disable**, or click on the icon .

To manually execute a backup policy, select a policy and click **Backup**.

To archive the backup to another backup repository, select the policy and click on **Archive**.

To search for a backup policy, enter the policy name in the search box .

On the **Backup Policy** tab, it displays policy name, description, the number of virtual machines to be backed up, backup repository, backup period, status and operation, as shown below:

<input type="checkbox"/>	Policy Name	Description	VMs	Schedule	Backup Repository	Archive Datastore	Status	Operation
<input type="checkbox"/>	BackupTolscsi		0	Every Friday, start at 23:00	ISCSI-Secondary			Edit Delete
<input type="checkbox"/>	Default backup policy	New virtual machine will b...	20	Everyday, start at 23:00	VirtualDatastore1			Edit

Policy Name: Displays name of Sangfor backup policy.



Description: Displays descriptive information of Sangfor backup policy.

VM(s): Displays the number of virtual machines to be backed up. To view the virtual machines, click on the number under **VM(s)**.

Backup Repository: Displays backup repository.

Schedule: Displays backup period.

Archive Datastore: Display the datastore to store the archive backup.

Status: Displays status of the backup policy, enabled or disabled. To enable a backup policy, click on the  icon. To disable backup policy, click on the  icon.

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Operation: To edit or delete a backup policy, click **Edit** or **Delete** under **Operation**. The default scheduled backup policy cannot be deleted.

To edit a backup policy, click **Edit** and enter the following page:

Edit Scheduled Backup Policy

Name: BackupTolscsi

Description:

Applicable VM(s): 0 selected

Periodic | Backup Repository

Periodic: ☒ Weekly ☐ Daily ☐ Hourly ☐ Continuous (CDP)

Start Time: Friday 23:00

Max Duration: 48 hour(s)

☐ Cancel ongoing backup task upon timeout

☐ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM Backup Chain and improves IO performance of recovered VM in data fetching phase.

OK Cancel

2.6.12.1.1 Adding New Backup Policy

To add a new backup policy, click **New Backup Policy**, and then follow the wizard to specify backup periodic, select virtual machine, specify backup repository and policy name, as shown below:

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Add New Policy

1 Backup Periodic
2 Select Virtual Machine
3 Backup Repository
4 Policy Name
5 Finish

Periodic:
☒ Weekly
☐ Daily
☐ Hourly

Start Time:
Friday
23:00

Max Duration:
48
hour(s)

☐ Cancel ongoing backup task upon timeout

☐ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM Backup Chain and improves IO performance of recovered VM in data fetching phase.

Merge earlier backups to free up storage space

- Preserve all backups for the recent 1 months.
- By default, it retains the latest backups within the retention period, backups preserved for more than 1 months will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

Backup Retention Settings

Next
Cancel

1. Specify Backup Periodic.

Backup periodic can be on weekly basis, daily basis and hourly basis. **Automatic backup cleanup** can be selected to have backups deleted automatically.

Periodic:
☒ Weekly
☐ Daily
☐ Hourly

Start Time:
Friday
23:00

Weekly: Select **Weekly** and configure as follows:

Periodic:
☒ Weekly
☐ Daily
☐ Hourly

Start Time:
Friday
23:00

Max Duration:
48
hour(s)

☐ Cancel ongoing backup task upon timeout

☐ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM Backup Chain and improves IO performance of recovered VM in data fetching phase.

On weekly basis: Options are from **Sunday** to **Saturday**.

Start Time: It specifies time to start backup. Since backup may bring impacts to system service, select a period that service is not busy.

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Max Duration: It specifies the longest period that the backup operation can last. New backups only occur within this time range and will not stop once starts. However, the backup tasks having not started yet will resume when the time range arrives again. You may select **Cancel ongoing backup task upon timeout** based on your own needs.

Enable periodic full backup: Full backup will be created periodically on the specific time and date instead of only incremental backup created.

☒ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.

2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.

3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM [Backup Chain](#) and improves IO performance of recovered VM in data fetching phase.

Monthly Full Backup: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec

Start Date: the last Friday 22:00

Backup Retention Setting: It specifies the longest period that backups will be kept. The longest period is three months.

Merge earlier backups to free up storage space

• Preserve all backups for the recent 1 months.

• By default, it retains the latest backups within the retention period, backups preserved for more than 1 months will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

Backup Retention Settings

Daily: To have data backed up on daily basis, choose Daily for Periodic, as shown below:

Periodic: ☐ Weekly ☒ Daily ☐ Hourly

Backup Period: 23:00 to 08:00 (the following day since policy creation) ⓘ

☐ Cancel ongoing backup task upon timeout

☐ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.

2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.

3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM [Backup Chain](#) and improves IO performance of recovered VM in data fetching phase.

Backup Period: It specifies the longest period that the backup operation can last. New backups only occur within this time range and will not stop once starts. However, the backup tasks having not started yet will resume when the time range arrives again. You may select **Cancel ongoing backup task upon timeout** based on your own needs.

Enable periodic full backup: Full backup will be created periodically on the specific time and date instead of only incremental backup created.

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☒ **Enable periodic full backup**

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM [Backup Chain](#) and improves IO performance of recovered VM in data fetching phase.

Monthly Full Backup: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec ▼

Start Date: the last ▼ Friday ▼ 22:00 ▼

Backup Retention Setting: It specifies the longest period that backups will be kept. The longest period is three months.

Merge earlier backups to free up storage space

- Preserve all backups for the recent 1 months.
- By default, it retains the latest backups within the retention period, backups preserved for more than 1 months will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

[Backup Retention Settings](#)



You may enable Automatic backup cleanup to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

Hourly: To have data backed up on hourly basis, select **Hourly** as **Periodic**, as shown below:

Periodic: ☐ Weekly ☐ Daily ☒ Hourly

Interval: 1 hour ▼

☐ **Enable periodic full backup**

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM [Backup Chain](#) and improves IO performance of recovered VM in data fetching phase.

Merge earlier backups to free up storage space

- Preserve all backups for the recent 3 days.
- Retain one Every day preserved for over 3 days to 1 weeks (last backup in each of those days by default).
- By default, it retains the latest backups within the retention period, backups preserved for more than 1 weeks will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

[Backup Retention Settings](#)

Interval: The minimum interval is 1 hour.

Enable periodic full backup: Full backup will be created periodically on the specific time and

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date instead of only incremental backup created.

- ☒ **Enable periodic full backup**
1. Periodic full backup task takes priority over other backup tasks.
 2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
 3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM [Backup Chain](#) and improves IO performance of recovered VM in data fetching phase.

Monthly Full Backup: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec ▼

Start Date: the last ▼ Friday ▼ 22:00 ▼

Backup Retention Setting: It specifies the longest period that backups will be kept. The longest period is three months.

Merge earlier backups to free up storage space

- Preserve all backups for the recent 1 months.
- By default, it retains the latest backups within the retention period, backups preserved for more than 1 months will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

[Backup Retention Settings](#)



You may enable **Automatic backup cleanup** to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

2. Select virtual machine(s).

Select the virtual machine(s) you want to back up. You may view the virtual machines by **Group, Node, Datastore** or select **All** to view all the virtual machines, or you may enter the name of the virtual machine in the search box to search for a specific virtual machine. Select virtual machines under **Available** and then the selected virtual machines will be added to the **Selected** list on the right, as shown below:

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Add New Policy
✕

✓ Backup Periodic
2 Select Virtual Machine
3 Backup Repository
4 Policy Name
5 Finish

⚠ CDP and scheduled backup are invalid for VMs having disks mirrored directly from physical/shared disks (not via file system).

Available

Group
Name

<input type="checkbox"/>	VM Name	Type	VM Size	Backup Policy
<input type="checkbox"/>	Virtual Machine			
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				


Selected

Clear

VM Name	Remove
No data available	

Back
Next
Cancel

Clear: To clear the selected virtual machines, click '**Clear**'.

To remove a virtual machine from the selected list, click 



CDP or data protection is not applicable to virtual machines having disks mapped directly from physical or shared disks, rather than via file system.

One virtual machine cannot be associated with more than one backup policy. If the virtual machine is associated with a new policy, it will be removed from the previous policy.

- Specify backup repository to store virtual machine backups, as shown below:

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Add New Policy

Backup Periodic

Select Virtual Machine

3 Backup Repository

4 Policy Name

5 Finish

Backup Repository:
ISCSI-Secondary

Total: 496 GB
Free: 308.23 GB
First Backup Size: 15.88 GB

☒ Archive backups to other datastores
Merge backups and archive them to specified datastore, which cannot be a Windows shared folder or the backup repository specified above.

Archive Repository:
ISCSI

Total: 496 GB
Free: 36.49 GB
First Archive Size: 15.88 GB

Archives will be retained in the following ways:

- Archive backups on the last Saturday of Every month (start at 22)
- Preserve all the backups for the recent 12 months, one for each year in the earlier 12 to 36 months and delete all for even earlier 36 months.

Advanced

Back

Next

Cancel

Backup Repository: It specifies backup repository, you may select an existing datastore or choose to add a new Windows shared folder. Once the backup repository is specified, total capacity, available backup repository size and first backup size of the selected data store will be displayed.

Archive backup to other datastore: Specifies a repository to store the archive backup.



Note that next backup will have all data backed up if backup repository is changed, please operate with caution.

4. Specify a name for the new backup policy.

Add New Policy

Backup Periodic

Select Virtual Machine

Backup Repository

4 Policy Name

5 Finish

Name:

Description:

Name: Specifies name of the backup policy

Description: Specifies description of the new backup policy.

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5. Confirm the configurations and then click **OK** to save the settings.

It displays basic settings of the backup policy, such as **Name, Retention Period, Backup Repository and First Backup Size**, as shown below:

Add New Policy

Progress: Backup Periodic — Select Virtual Machine — Backup Repository — Policy Name — **5 Finish**

Backup Policy Summary

Name	te
Periodic	Every Friday, start at 23:00
Backup Repository	ISCSI-Secondary
First Backup Size	15.88 GB
Reserved Space of Backup Repository	23.88 GB Re-calculate
Archive Repository	ISCSI
First Archive Size	15.88 GB
Reserved Space of Archive Repository	222.25 GB (space is insufficient. Please expand capacity) How to Calculate

Buttons: Back OK Cancel

2.6.12.1.2 Adding New CDP Policy

To add a new CDP policy, click **New CDP Policy** to enter the following page and then follow the wizard to specify continuous backup period, select virtual machine(s) and backup repository, and specify policy name, as shown below:

New CDP Policy

Progress: **1 Continuous Backup** — 2 Select Virtual Machine — 3 Backup Repository — 4 Policy Name — 5 Finish

1. Configure **Continuous Backup**.

It involves the configurations of the following fields: **IO Activity Logs Retention Period, Backup Periodic, Backup Retention Period**. And **Automatic backup cleanup** is optional.

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New CDP Policy

1 Continuous Backup
2 Select Virtual Machine
3 Backup Repository
4 Policy Name
5 Finish

IO Activity Logs Retention Period:
24 hours
(earlier disk IO activity logs will be merged automatically)

IO Activity Logging Interval:
5 secs

Backup Periodic:
Every
1 hour

☐ Enable periodic full backup

1. Periodic full backup task takes priority over other backup tasks.
2. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
3. Periodic full backup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it shortens VM Backup Chain and improves IO performance of recovered VM in data fetching phase.

Merge earlier backups to free up storage space

- Preserve all backups for the recent 3 days.
- Retain one Every day preserved for over 3 days to 1 weeks (last backup in each of those days by default).
- Retain one Every week preserved for over 1 weeks to 2 weeks (Sunday's backup by default).
- By default, it retains the latest backups within the retention period, backups preserved for more than 2 weeks will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.

Backup Retention Settings

Next
Cancel

IO Activity Logs Retention Period: Specifies how long IO activity logs will be preserved. The longest period is 3 days. Earlier disk IO activity logs will be deleted automatically once the specified period is reached.

Backup Periodic: Specifies how often backup task is executed. The minimum backup periodic is one hour.

Retention Period: It specifies how long backups will be kept. The longest period is three months.



You may enable Automatic backup cleanup to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

2. Select the virtual machine(s) you want to back up. You may view the virtual machines by **Group, Node, Datastore** or select **All** to view all the virtual machines, or you may enter the name of the virtual machine in the search box to search for a specific virtual machine. Select virtual machines under **Available** and then the selected virtual machines will be added to **Selected** on the right, as shown below:

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New CDP Policy ✕

✓ Continuous Backup —
 2 **Select Virtual Machine** —
 3 Backup Repository —
 4 Policy Name —
 5 Finish

⚠ CDP and scheduled backup are invalid for VMs having disks mirrored directly from physical/shared disks (not via file system).

Available

	VM Name	Type	VM Size	Backup Policy
<input type="checkbox"/>	Virtual Machine			
<input type="checkbox"/>	├─ C			
<input type="checkbox"/>	├─ Te			
<input type="checkbox"/>	├─ .			
<input type="checkbox"/>	├─ D			
<input type="checkbox"/>	├─ z			
<input type="checkbox"/>	└─			

Selected

VM Name	Remove
No data available	

Clear

Back
Next
Cancel

Clear: To clear the selected virtual machines, click **Clear**.

To remove a virtual machine from Selected list, click



CDP or scheduled backup is not applicable to virtual machines having disks mapped directly from physical or shared disks, rather than via file system.

One virtual machine cannot be associated with more than one backup policy. If the virtual machine is associated with a new policy, it will be removed from the previous policy.

Template and virtual machines deployed from template do not support CDP.

3. Specify backup repository to store backups and configure IO activity log related options, as shown below:

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Backup/CDP tab. Max log size should be between 100GB and 10240GB, and should not be greater than the free space of the specified IO activity log repository.



If IO read and write speed is lower than 50MB/s, CDP service may stop due to low storage performance. Therefore, datastore with better performance is recommended.

4. Configure a distinguish name for the new CDP policy.

On this tab, you may fill in basic information for the new CDP policy such as policy name and description.

Name: Specifies name of the new backup policy.

Description: Specifies description of the new backup policy.

5. Confirm the configurations and then click **OK** to save the settings.

It displays the basic settings of the new CDP policy, such as **Name, Backup Retention Period, Backup Repository and First Backup Size, IO Activity Logs Retention Period, IO Activity Log Repository and Max Log Space**, as shown below:

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New CDP Policy

Continuous Backup

Select Virtual Machine

Backup Repository

Policy Name

5

Finish

Backup Policy Summary

Name	tes
Backup Periodic	Every 1 hour
Backup Repository	ISCSI-Secondary
First Backup Size	38.24 GB
Reserved Space of Backup Repository	47.74 GB Re-calculate

IO Activity Logs Retention Period	24 hours
IO Activity Log Repository	ISCSI-Secondary
Reserved Space	3 GB Re-calculate
Max Log Size	Size For Each VM: 300 GB

Back

OK

Cancel

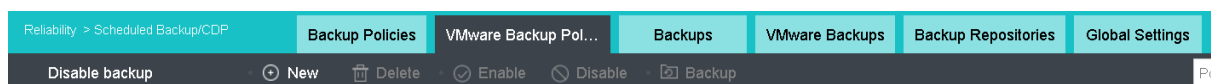


CDP can be started only for the virtual machine which is powered on and associated with a CDP policy. Template and virtual machines deployed from template do not support CDP.

2.6.12.2 VMware Backup Policy

Virtual machines in VMware vCenter can be backed up to Sangfor HCI platform without installing any third-party software or plugin and purchasing backup storage. Virtual machine can be recovered on HCI platform or recovered to VMware vCenter

On the toolbar, there are **Enable/Disable backup**, **New**, **Delete**, **Enable**, **Disable** and **Backup**, as shown below:



Enable: To enable or disable backup, click **Enable backup** to enable backup or **Disable backup** to disable backup.


To add a new VMware backup policy, you may click **New**.


To delete the selected backup policy, you may click **Delete**.

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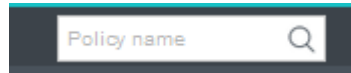
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To enable the backup policy, you may click **Enable** or click on the  icon.

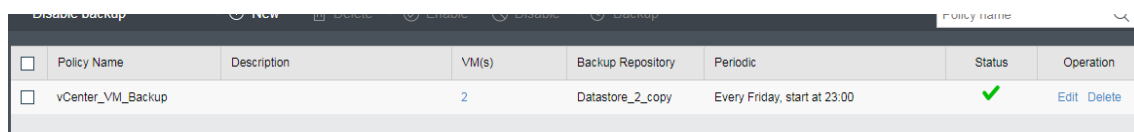
To disable the backup policy, you may click **Disable** or click the  icon.


To execute the selected backup policy, you may click **Backup**.

To search for a VMware backup policy, enter the policy name in the search box

A search box with the placeholder text "Policy name" and a magnifying glass icon on the right.

On the **VMware Backup Policy** tab, it displays policy name, description, the number of virtual machines, backup repository, backup periodic, status and operation, as shown below:

A screenshot of a VMware Backup Policy table. The table has columns: Policy Name, Description, VM(s), Backup Repository, Periodic, Status, and Operation. There is a search bar at the top right. The table contains one row for "vCenter_VM_Backup" with 2 VM(s), Datastore_2_copy repository, and a periodic backup every Friday starting at 23:00. The status is "Enabled" (green checkmark) and there are "Edit" and "Delete" links in the Operation column.

<input type="checkbox"/>	Policy Name	Description	VM(s)	Backup Repository	Periodic	Status	Operation
<input type="checkbox"/>	vCenter_VM_Backup		2	Datastore_2_copy	Every Friday, start at 23:00		Edit Delete



Policy Name: Displays name of the new VMware backup policy.

Description: Displays descriptive information of the new VMware backup policy.

VM(s): It displays the number of virtual machines to be backed up. To view virtual machines, click on the number under **VM(s)**

Backup Repository: It displays backup repository.

Periodic: It displays backup periodic.

Status: It displays status of the backup policy, enabled or disabled. To enable backup policy, click on the  icon. To disable backup policy, click on the  icon.

Operation: To edit or delete a backup policy, click **Edit** or **Delete** under **Operation**. The default scheduled backup policy cannot be deleted.

To edit a backup policy, click **Edit** and enter the following page:

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Edit Scheduled Backup Policy

Name: vCenter_VM_Backup

Description:

Applicable VM(s): 2 selected

Backup Repository: Datastore_2_copy

To save backup to Windows shared folder, [Add New Windows Shared Folder](#)

Periodic: ☒ Weekly ☐ Daily ☐ Hourly ☐ Minutely

Start Time: Friday 23:00

Max Duration: 48 hour(s)

☐ Cancel ongoing backup task upon timeout

Backup Retention Period: One month

☒ **Enable VSS**
 File system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools be installed on the virtual machines running in VMware vCenter and recommended for those running applications like SQL Server and Exchange.

OK Cancel

Adding VMware Backup Policy

To add a new VMware backup policy, do as follows:

1. Go to **System > VM Backup and Recovery > VMware Backup Policy**, click **New** to enter the following page.

Add New Policy

1 Select Virtual Machine 2 Backup Periodic 3 Backup Repository 4 Policy Name 5 Finish

2. Select the virtual machine(s) you want to back up. You may enter the name of the virtual machine in the search box to search for a specific virtual machine. Select virtual machines under **Available** and then the selected virtual machines will be added to **Selected** on the right, as shown below:

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On weekly basis: Options are from **Sunday** to **Saturday**.

Start Time: It specifies time to start backup. Since backup may bring impacts to system service, select a period that service is not busy.

Max Duration: It specifies the longest period that the backup operation can last. New backups only occur within this time range and will not stop once starts. However, the backup tasks having not started yet will resume when the time range arrives again. You may select **Cancel ongoing backup task upon timeout** based on your own needs.

Backup Retention Period: It specifies the longest period that backups will be kept. The longest period is three months.



You may select the option **Enable VSS** based on your own needs. Once that option is selected, file system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools to be installed on the virtual machines running in VMware vCenter and is recommended for those running applications like SQL Server and Exchange.

Daily: To have VM(s) backed up on daily basis, select Daily for Periodic and configure the related fields, as shown below:

The screenshot shows a configuration window for a backup task. At the top, under the 'Periodic:' section, the 'Daily' radio button is selected. Below this, the 'Backup Period:' is set from '23:00' to '08:00' (the following day since policy creation). The checkbox for 'Cancel ongoing backup task upon timeout' is unchecked. The 'Backup Retention Period:' is set to 'Two weeks'. A yellow information box contains two options: 'Merge earlier backups to free up storage space' (checked) and 'Enable VSS' (unchecked). The 'Enable VSS' option has a descriptive text below it: 'File system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools be installed on the virtual machines running in VMware vCenter and recommended for those running applications like SQL Server and Exchange.'

Backup Period: It specifies the longest period that the backup operation can last. New backups only occur within this time range and will not stop once starts. However, the backup tasks having not started yet will resume when the time range arrives again. You may select **Cancel ongoing backup task upon timeout** based on your own needs.

Backup Retention Period: It specifies the longest period that backups will be kept. The longest period is three months.



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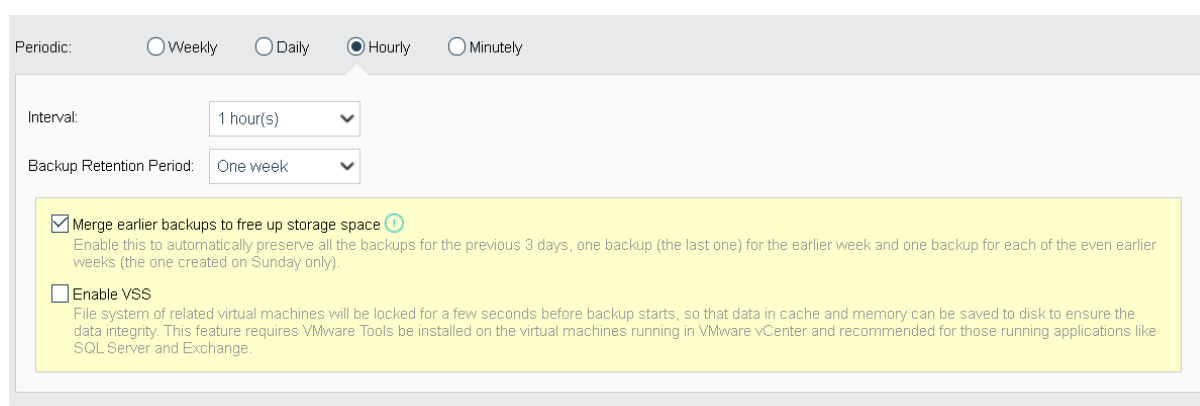
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You may select **Merge earlier backups to free up storage space** preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

You may select the option **Enable VSS** based on your own needs. Once that option is selected, file system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools to be installed on the virtual machines running in VMware vCenter and is recommended for those running applications like SQL Server and Exchange.

Hourly: To have VM(s) backed up on hourly basis, select Hourly for Periodic and configure the related fields, as shown below:



The screenshot shows a configuration window for backup settings. At the top, under the 'Periodic:' label, there are four radio buttons: 'Weekly', 'Daily', 'Hourly' (which is selected), and 'Minutely'. Below this, there are two dropdown menus: 'Interval:' set to '1 hour(s)' and 'Backup Retention Period:' set to 'One week'. A yellow highlighted box contains two options: 'Merge earlier backups to free up storage space' (checked) and 'Enable VSS' (unchecked). Each option has a small information icon (i) and a descriptive text block below it.

Interval: Specifies the interval of backup occurs. The minimum interval is 1 hour.

Backup Retention Period: It specifies the longest period that backups will be kept. The longest period is three months.



You may select **Merge earlier backups to free up storage space** to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

You may select the option **Enable VSS** based on your own needs. Once that is selected, file system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools to be installed on the virtual machines running in VMware vCenter and is recommended for those running applications like SQL Server and Exchange.

Minutely: To have VM(s) backed up on minutely basis, select Minutely for Periodic and configure the related fields, as shown below:

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Periodic: ☐ Weekly ☐ Daily ☐ Hourly ☒ Minutely

Interval:

Backup Retention Period:

☒ **Merge earlier backups to free up storage space** ⓘ
 Enable this to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

☐ **Enable VSS**
 File system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools be installed on the virtual machines running in VMware vCenter and recommended for those running applications like SQL Server and Exchange.

Interval: Specifies the interval of backup occurs. The minimum interval is 10 minutes.

Backup Retention Period: It specifies the longest period that backups will be kept. The longest period is three months.



You may select **Merge earlier backups to free up storage space** to automatically preserve all the backups for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier weeks (the one created on Sunday only).

You may select the option **Enable VSS** based on your own needs. Once that option is selected, file system of related virtual machines will be locked for a few seconds before backup starts, so that data in cache and memory can be saved to disk to ensure the data integrity. This feature requires VMware Tools to be installed on the virtual machines running in VMware vCenter and is recommended for those running applications like SQL Server and Exchange.

4. Specify backup repository to store VM backups, as shown below:

Add New Policy ×

☒ Select Virtual Machine
 ☒ Backup Periodic
 ☒ **3 Backup Repository**
☐ 4 Policy Name
 ☐ 5 Finish

Backup Repository:

Total:	43.51 TB
First Backup Size:	9.11 GB
Free:	8.45 TB

Backup Repository: It specifies backup repository, you may select an existing datastore. Once the backup repository is specified, total capacity, available backup repository size and first backup size of the selected datastore will be displayed.

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Note that next backup will have all data backed up if backup repository is changed, please operate with caution.

5. Specify name and description for the new policy on the following page:

Add New Policy

✓ Select Virtual Machine — ✓ Backup Periodic — ✓ Backup Repository — 4 Policy Name — 5 Finish

Name:

Description:

Name: Specifies name of the new backup policy.

Description: Specifies description of the new backup policy.

6. Confirm configurations and click **OK** to save the settings.

It displays the basic settings of the backup policy, such as **Name, Periodic Incremental Backup, Backup Repository and First Backup Size**. To have VM(s) backed up upon completion of backup policy creation, you may select **Back up now option**, as shown below:

Add New Policy

✓ Select Virtual Machine — ✓ Backup Periodic — ✓ Backup Repository — ✓ Policy Name — 5 Finish

Backup Policy Summary

Name:	test
Periodic Incremental Backup:	Everyday, start at 23:00
Backup Repository:	ISCSI-Secondary
First Backup Size:	9.11 GB

☐ Back up now (upon creation completion, backup is performed once to the applicable VMs)

2.6.12.3 Backups

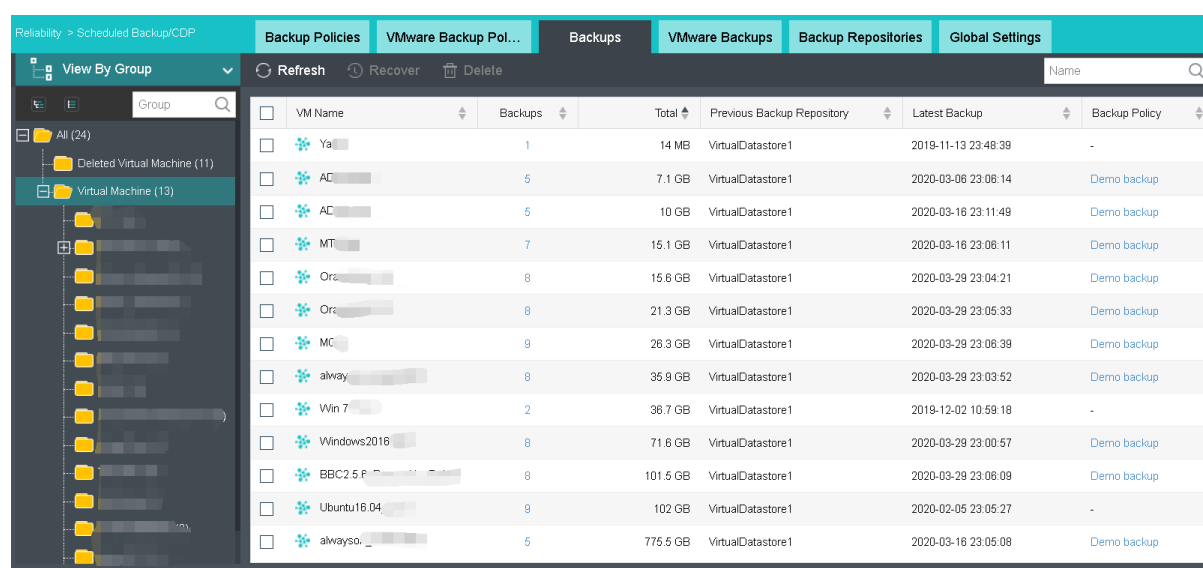
On the **Backups** tab, VM backups can be displayed by VM group, node, datastore and backup repository. Such information as VM name, number of backups, total size, previous backup

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repository, last backup and backup policy will be displayed.

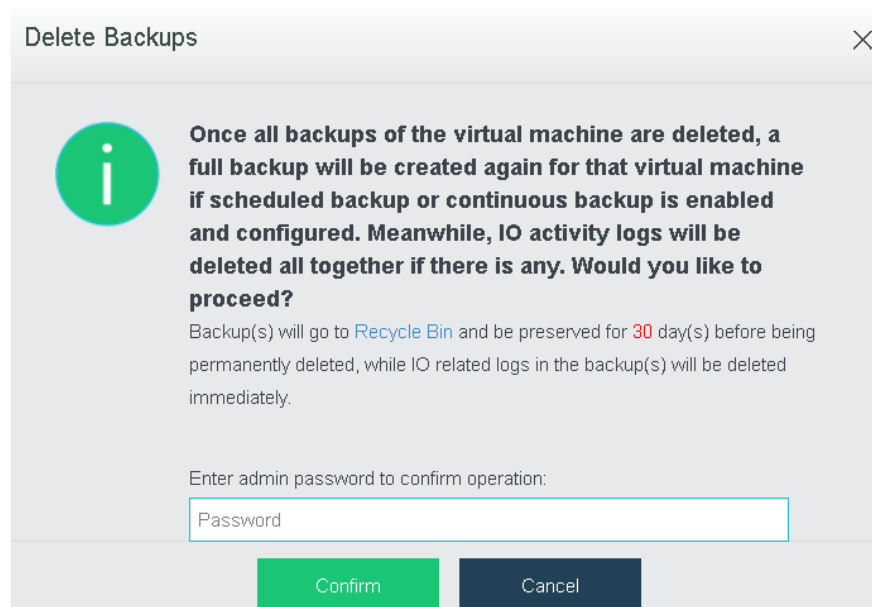


The screenshot shows the 'Backups' tab in the Sangfor Backup/CDP interface. On the left, there is a sidebar with a tree view showing 'All (24)', 'Deleted Virtual Machine (11)', and 'Virtual Machine (13)'. The main area displays a table of virtual machines with their backup details.

VM Name	Backups	Total	Previous Backup Repository	Latest Backup	Backup Policy
Yali	1	14 MB	VirtualDatastore1	2019-11-13 23:48:39	-
AD	5	7.1 GB	VirtualDatastore1	2020-03-06 23:06:14	Demo backup
AD	5	10 GB	VirtualDatastore1	2020-03-16 23:11:49	Demo backup
MT	7	15.1 GB	VirtualDatastore1	2020-03-16 23:06:11	Demo backup
Orz	8	15.6 GB	VirtualDatastore1	2020-03-29 23:04:21	Demo backup
Orz	8	21.3 GB	VirtualDatastore1	2020-03-29 23:05:33	Demo backup
MC	9	26.3 GB	VirtualDatastore1	2020-03-29 23:06:39	Demo backup
alway	8	35.9 GB	VirtualDatastore1	2020-03-29 23:03:52	Demo backup
Win 7	2	36.7 GB	VirtualDatastore1	2019-12-02 10:59:18	-
Windows2016	8	71.6 GB	VirtualDatastore1	2020-03-29 23:00:57	Demo backup
BBC2.5 P	8	101.5 GB	VirtualDatastore1	2020-03-29 23:06:09	Demo backup
Ubuntu16.04	9	102 GB	VirtualDatastore1	2020-02-05 23:05:27	-
alwayso	5	775.5 GB	VirtualDatastore1	2020-03-16 23:05:08	Demo backup

Recover: Select backed up virtual machines and restore them to their previous status and configuration. You may also go to Backup/CDP tab to perform recovery operation. For details, refer to Recovering Virtual Machine in Backup/CDP section.

Delete: To delete backups of virtual machine, select the virtual machine and click **Delete**. If scheduled backup or continuous backup policy is configured and enabled, a full backup will be created again for the virtual machine. IO activity logs will also be deleted if there is any. Backups will go to Recycle Bin and be preserved for 30 days, but IO activity logs will be deleted immediately and cannot be recovered any more. This operation requires you to enter password of the username to confirm.



The screenshot shows a 'Delete Backups' dialog box. It contains an information icon and a message explaining that once all backups are deleted, a full backup will be created again if scheduled or continuous backup is enabled. It also states that IO activity logs will be deleted. Below the message, there is a text input field for the admin password and two buttons: 'Confirm' and 'Cancel'.

Delete Backups

Once all backups of the virtual machine are deleted, a full backup will be created again for that virtual machine if scheduled backup or continuous backup is enabled and configured. Meanwhile, IO activity logs will be deleted all together if there is any. Would you like to proceed?

Backup(s) will go to [Recycle Bin](#) and be preserved for 30 day(s) before being permanently deleted, while IO related logs in the backup(s) will be deleted immediately.

Enter admin password to confirm operation:

Password

Confirm Cancel

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VM Name: It displays the name of the virtual machine that has been backed up.

Backups: It displays the number of backups. You may click on the number to view detailed information of backups of the virtual machine. For details, refer to the **2.2.1.16 Configuring Backup/CDP** section.

Total Size: It displays total size of the backup files of the virtual machine.

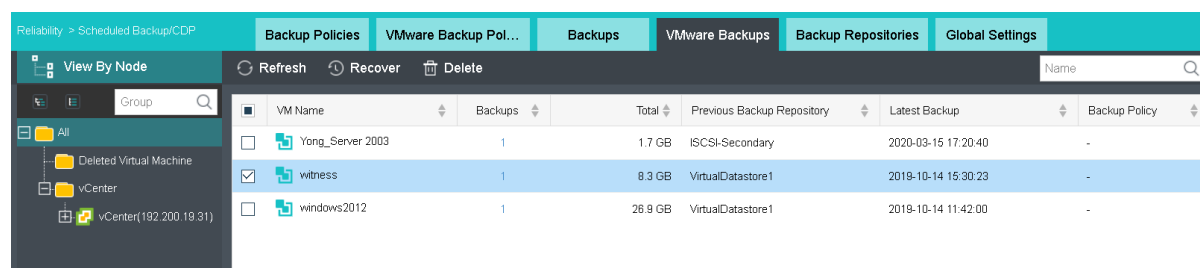
Previous Backup Repository: It displays the previous backup repository.

Lastest Backup: It displays time that the last backup happens.

Backup Policy: It displays the backup policy with which the virtual machine is associated. You may click on the backup policy to edit it.

2.6.12.4 VMware Backups

On the **VMware Backups** tab, VM backups can be displayed by node. Such information as VM name, number of backups, total size, previous backup repository, last backup and backup policy will be displayed.



The screenshot shows the 'VMware Backups' tab in a management console. On the left is a tree view with 'vCenter' selected. The main area contains a table with columns: VM Name, Backups, Total, Previous Backup Repository, Latest Backup, and Backup Policy. There are three rows of data, with the middle row 'witness' highlighted. Above the table are buttons for 'Refresh', 'Recover', and 'Delete', and a search bar.

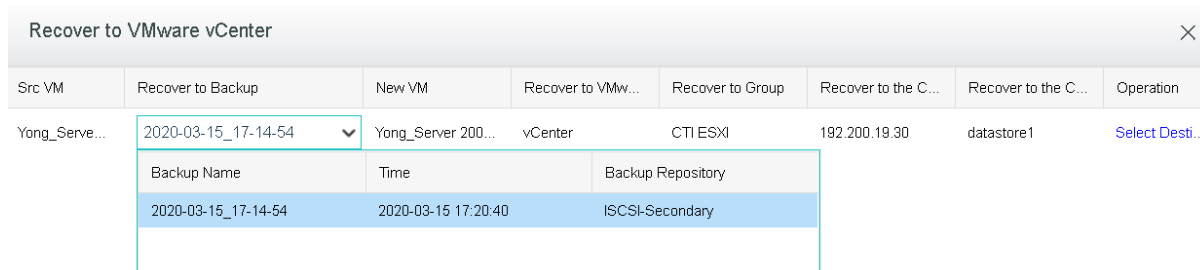
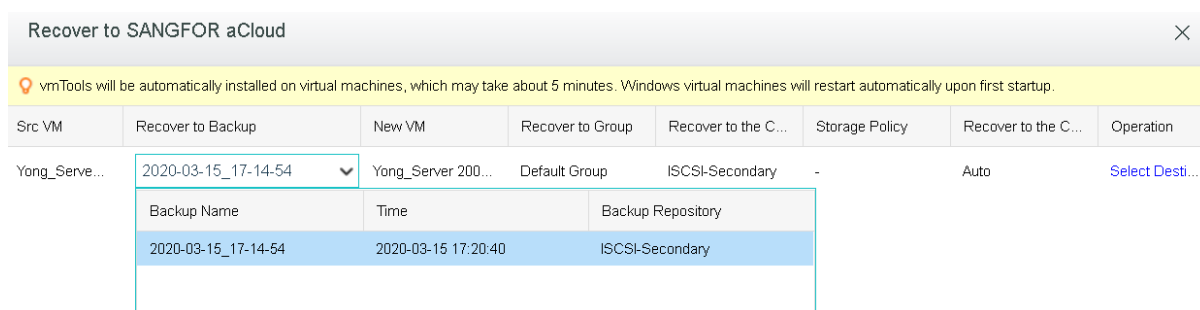
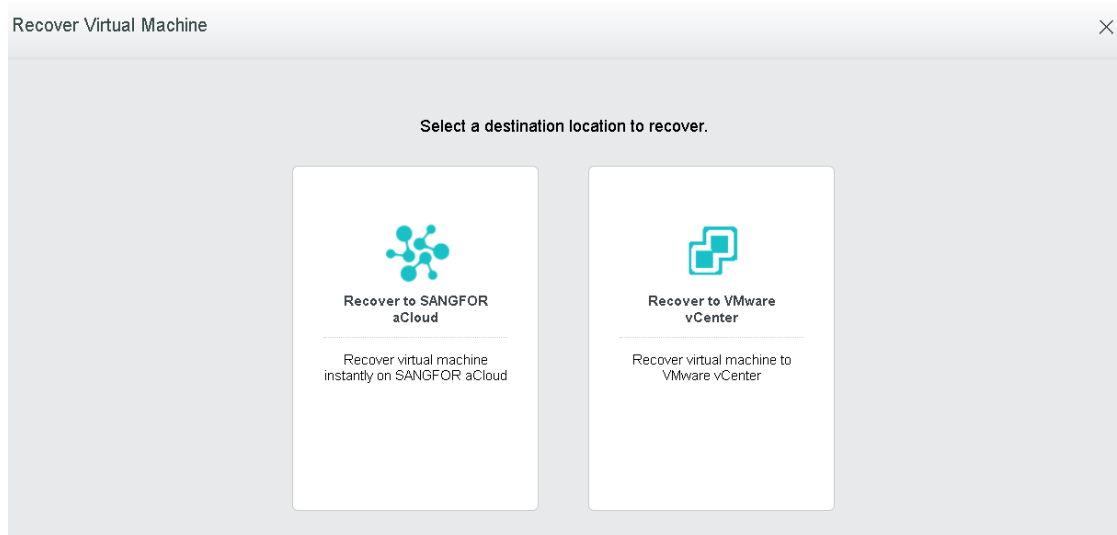
VM Name	Backups	Total	Previous Backup Repository	Latest Backup	Backup Policy
Yong_Server 2003	1	1.7 GB	iSCSI-Secondary	2020-03-15 17:20:40	-
witness	1	8.3 GB	VirtualDatastore1	2019-10-14 15:30:23	-
windows2012	1	26.9 GB	VirtualDatastore1	2019-10-14 11:42:00	-

Recover: Select backed up virtual machines and recover them to their previous status and configuration. Virtual machine can be recovered on Sangfor HCI platform or recovered to VMware vCenter, as shown below:

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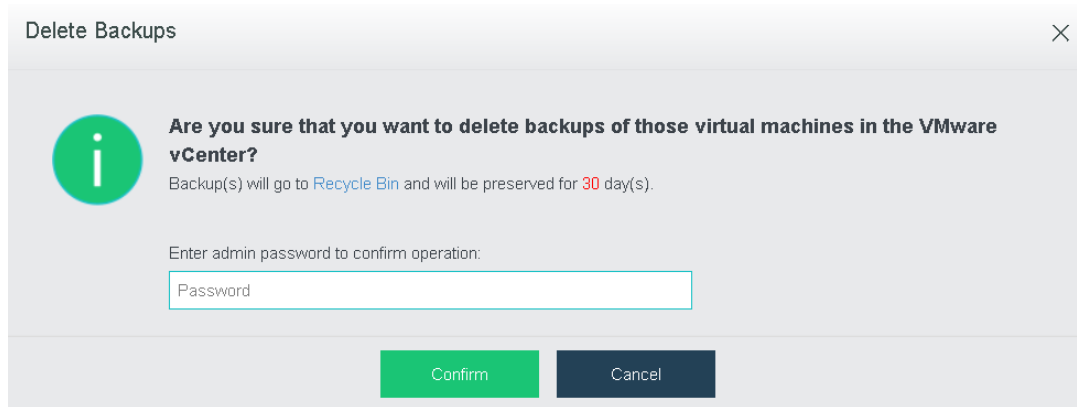
You may also recover virtual machine on **Backup** tab in VM summary. For details, refer to the **2.2.2.9 VM Recovery** section.

Delete: To delete backups of the virtual machine, select the virtual machine and click **Delete**. The backups will go to the **Recycle bin** and will be preserved for 30 days. This operation requires you to enter password of the username to confirm.

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VM Name: It displays the name of virtual machine that has been backed up.

Backups: It displays the number of backups. You may click on the number to view detailed information of backups of the virtual machine. For details, refer to the **2.2.2.8 VM Backup** section.

Total Size: It displays total size of the backup files of virtual machine.

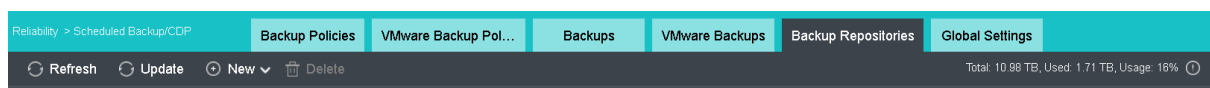
Previous Backup Repository: It displays the previous backup repository.

Last Backup: It displays time when the last backup happens.

Backup Policy: It displays the backup policy that virtual machine is associated with. You may click on the backup policy to edit it.

2.6.12.5 Backup Repositories

It displays available repositories for backups of virtual machines.



On the toolbar, there are **Refresh**, **Update**, **New**, **Delete** and **Advanced**, as shown below:

To refresh the page, you may click **Refresh**.

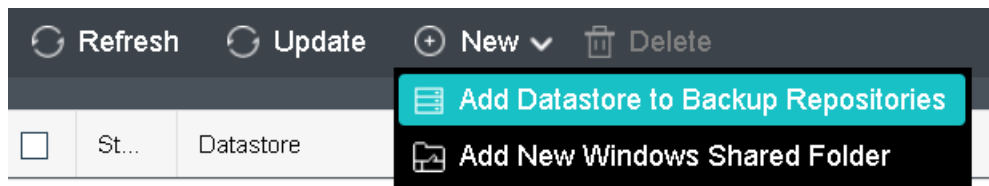
To update backups, you may click **Update**.

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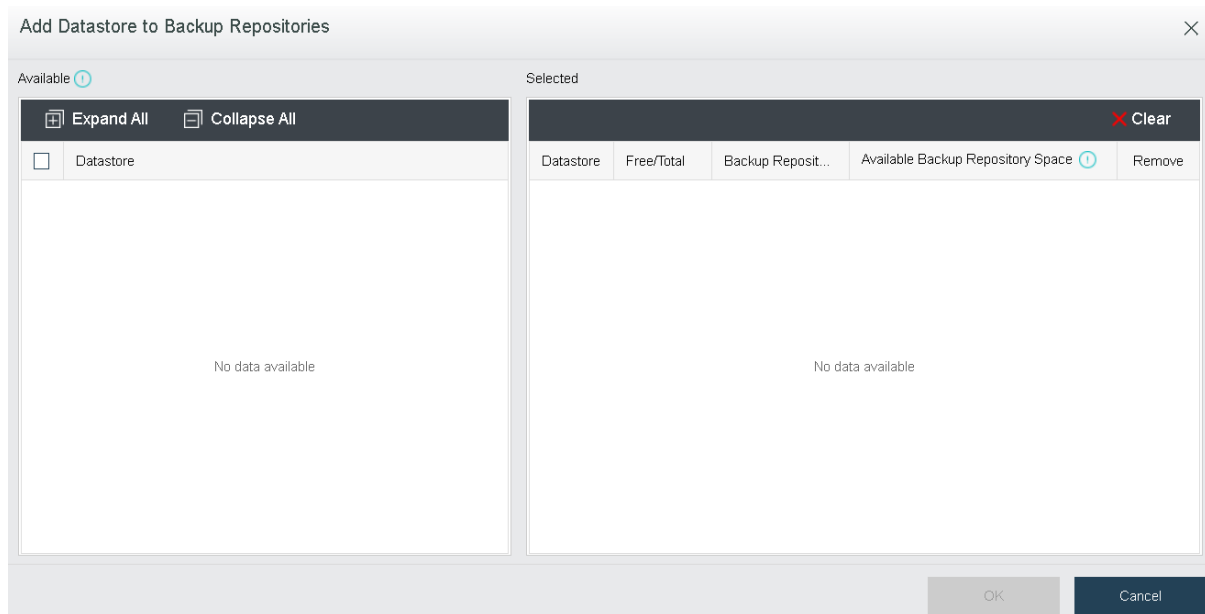
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To add backup repository, you may click **New**. You may choose **Add Datastore to Backup Repositories** or **Add New Windows Shared Folder**.



Add Datastore to Backup Repositories: Click it to enter the following page which displays available datastore and selected datastore list. The **Selected** list displays the free and total size of selected datastore, etc.



Add New Windows Shared Folder: To add a new Windows shared folder for storing backups, click **Add New Windows Shared Folder**.

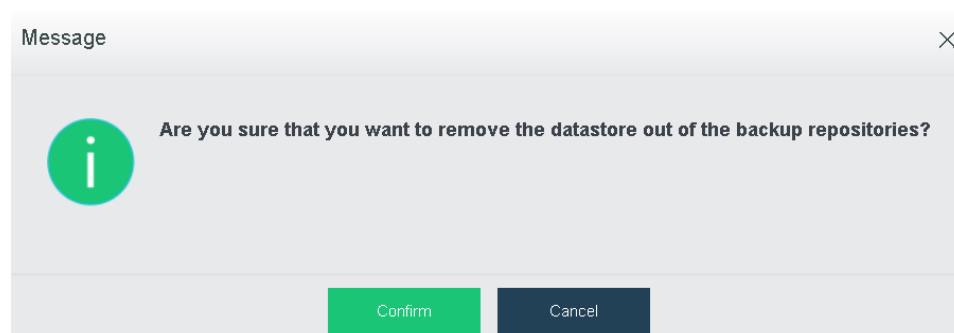
A screenshot of a dialog box for adding a new Windows shared folder. It contains the following fields: 'Shared Folder:' with a text input field and an example '\200.200.164.114\share' below it; a checkbox for 'Anonymous login'; 'Username:' with a text input field and a help icon; and 'Password:' with a text input field. At the bottom are 'OK' and 'Cancel' buttons.

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Delete: To move the datastore out of the backup repository, select the datastore(s) and click **Delete**.

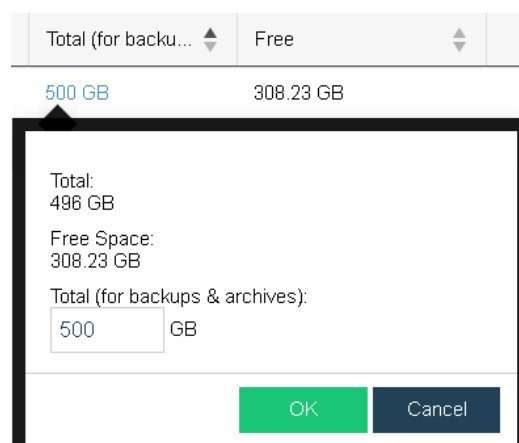


Virtual machines running on Sangfor HCI platform and VWware vCenter can be backed up to the same backup repository.

On the **Backup Repositories** tab, it displays status of backup repository, name of the datastore, type, total capacity, free space, total and free backup repository space, the number of virtual machines that have been backed up, max read speed, max write speed, and backup file, as shown below:

	St...	Datastore	Type	Capacity	Free	Total (for backu...	Free	VMs	Max Read S...	Max Write S...	Backup
<input checked="" type="checkbox"/>		ISCSI-Secondary	iSCSI	496 GB	308.23 GB	500 GB	308.23 GB	4	97.66 MB/s	92.09 MB/s	View

Total(For backup & archive): It displays size of backup repository. You may click on the number to edit it, as shown below:



Backup: To view and manage the backups, click **View** under the Backup column, as shown

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below:

Manage Backups								
Backups		VMware Backups						
Refresh		Delete		Recover		Name		
<input type="checkbox"/>	Virtual Machine	Backups	Total	Percent	Previous Backup ...	Latest Backup	Backup Policy	Backup Repository
<input type="checkbox"/>	Monitoring2	1	98.46 GB	20 %	ISCSI-Secondary	2020-02-14 23:00:59	-	-
<input type="checkbox"/>	MGR	1	11.62 GB	2 %	ISCSI-Secondary	2020-02-10 11:22:16	Demo backup	VirtualDatastore1
<input type="checkbox"/>	yong test0001	5	10.44 GB	2 %	ISCSI-Secondary	2020-02-21 23:00:47	-	-

Close

Manage Backups								
Backups		VMware Backups						
Refresh		Delete		Recover		Name		
<input type="checkbox"/>	Virtual Machine	Backups	Total	Percent	Previous Backup ...	Latest Backup	Backup Policy	Backup Repository
<input type="checkbox"/>	Yong_Server 2003	1	1.66 GB	0 %	ISCSI-Secondary	2020-03-15 17:20:40	-	-

Close

2.6.12.6 Global Settings

On the **Global Settings** tab, you can specify maximum concurrent backup tasks per storage and max concurrent recovery tasks per node and max recovery speed per VM, as shown below:

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Backup Tasks

Specify how many backup tasks can be implemented concurrently, according to the bandwidth and performance of the backup datastore.

Max Tasks Per Datastore: ⓘ

Max Backup Speed Per VM: MB/s

[Save](#) [Restore Defaults](#)

Backup Archiving

Specify how many backup archiving tasks can be implemented concurrently, according to the bandwidth and performance of the backup datastore.

Max Archiving Tasks Per Datastore:

[Save](#) [Restore Defaults](#)

Backup Recovery

Specify the maximum concurrent recovery tasks supported by a node according to system performance.

Max Tasks Per Node: ⓘ

Max Speed Per VM: MB/s ⓘ

[Save](#) [Restore Defaults](#)

Backup Merging

Max Merging Tasks Per Datastore: ⓘ

Max Merging Speed Per VM: MB/s ⓘ

[Save](#) [Restore Defaults](#)

Backup Tasks: Specify how many backup tasks can be implemented concurrently, according to the bandwidth and performance of the backup datastore.

Backup Archiving: Specify how many backup archiving tasks can be implemented concurrently, according to the bandwidth and performance of the backup datastore.

Backup Recovery: Specify the maximum concurrent recovery tasks supported by a node according to system performance.

Backup Merging: Specify how many merging task can be implemented concurrently, according to system performance.

2.6.13 Recycle Bin

2.6.14 Data Erasure

Function Description

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The HCI Data Erasure function enables users to choose to completely erase existing data during resource recovery. The user can choose to completely erase the existing data during resource recovery by customizing the number of overwrites according to the regulatory requirements or business needs.

Precaution

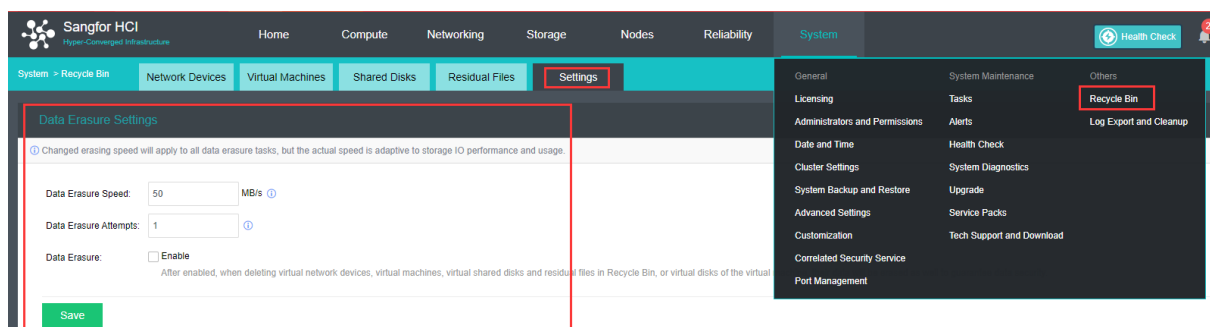
1. When using the data erasure function, it will occupy CPU and IO resources, and the erase process takes some time, so it is recommended to do it when the business is idle.
2. Data will not be recovered after erasing.
3. The actual rate will be dynamically adjusted according to the storage IO performance and busy level.

Prerequisites

The virtual machine has been deleted and placed to the recycle bin.

Operation steps

1. Navigate to **System > Recycle Bin** and click the **Settings** tab to configure the data erasure speed and attempt.
2. When **Data Erasure** is checked by default, the data will be erased when deleting virtual network devices, virtual machines, virtual shared disks, residual files in the Recycle Bin, as well as when deleting virtual disks of virtual machines to ensure data security.



3. Click the **Virtual Machines** tab. Select the virtual machine, click **Delete** or **Empty** to prompt for the "Erase business data of the virtual machine at the same time" option. Check this option and enter the HCI administrator password to completely wipe the business data of the virtual machine.

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System > Recycle Bin						
Network Devices Virtual Machines Shared Disks Residual Files Settings						
Restore Delete Empty						
<input checked="" type="checkbox"/>	Name	Description	Encryption Status	Storage	Type	Size
<input checked="" type="checkbox"/>	Sangfor_SCP_6.2.0EN(202...		Not encrypted	VirtualDatastore1	Medium	8.07 GB
<input type="checkbox"/>	test_server		Not encrypted	VirtualDatastore1	Medium	4 GB
<input type="checkbox"/>	s_test		Not encrypted	VirtualDatastore1	Medium	2 GB
<input type="checkbox"/>	Testing		Not encrypted	VirtualDatastore1	Medium	128 MB
<input type="checkbox"/>	test		Not encrypted	VirtualDatastore1	Medium	1.2 GB
<input type="checkbox"/>	zabbix_appliance-5.2.5		Not encrypted	VirtualDatastore1	Medium	1.5 GB

Alert



Are you sure you want to delete Sangfor SCP 6.2.0EN(2021... permanently?

This operation will delete virtual machines from disk permanently, which cannot be restored from Recycle Bin.

☐ Erase business data stored on the virtual machines
Once erased, the data cannot be restored. This will take some time and may affect storage performance. You are recommended to enable this during off-peak hours.

☐ Delete the backups of virtual machines
Backup(s) will go to Recycle Bin and will be preserved for 30 day(s).

Enter login password to confirm operation:

Password

OK

Cancel

2.6.15 High Availability & Resource Scheduling

2.6.15.1 High Availability

Migration upon node failure is applicable to shared storage only. HA will be triggered when node's hardware, storage or network fails for a period of time, and virtual machines(including virtual network devices) will be recovered seamlessly onto another node to ensure service continuity.

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Settings

The minute node's hardware, storage or network fails, virtual machines are recovered seamlessly onto another node to ensure service continuity.

Monitoring Sensitivity:

If node fails for **5 minutes**, shut down virtual machines and recover onto another clustered node.

Migration Triggers:

Management Interface	Edge Connected Directly or via a Switch	Storage	HA Enabled
✓	✓	✗	☑
✓	✗	✗	☑
✗	✓	✗	☑
✗	✗	✗	☑
✓	✗	✓	☐
✗	✗	✓	☐
✗	✓	✓	☐

✗ Failed

✓ Normal



Due to the fact that CPU and memory data of virtual machines are not synchronized among different nodes, data may be lost when virtual machines are migrated onto another node.

2.6.15.2 Resource Scheduling

Resource scheduling refers to migrating virtual machines to another node when running low on resources, so as to guarantee business stability and continuity. Resource scheduling will be triggered if CPU and/or memory usage of node exceed(s) the threshold that has been specified, and virtual machines will be migrated according to the automation level. Virtual machines will be migrated to nodes whose CPU and/or memory usage is low, so as to lowering resource usage of nodes to be within the threshold.

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Reliability > Resource Scheduling

Settings

☒ Enable resource scheduling
 Turn on this feature, so that virtual machines can be migrated to another node when running low on resources, to guarantee business stability and continuity.

Automation Level: ☒ Automated (virtual machines are automatically migrated to another node)
☐ Manual (migration recommendations will be given and need to be applied manually)

Resource: ☐ CPU ☐ Memory ☒ CPU or Memory

Trigger: Host CPU usage exceeds %
 Host memory usage exceeds %

Sensitivity Level: (migration will be triggered if CPU and/or memory usage exceed the above usage for 10 minutes)

Prefer The Node with VM Replica: (Once enabled, virtual machine stored on a virtual datastore can only be scheduled to the node where VM replica is stored, to ensure VM performance)

Individual VMs: (specify automation level for individual virtual machines)

You may specify threshold for CPU or memory(50%-90%), or for both. Migration recommendations will be given when threshold is reached.

You may specify sensitivity level, conservative(recommended) or aggressive. If conservative is selected, migration will be triggered if CPU and/or memory usage exceed the above usage for 10 minutes. If aggressive is selected, migration will be triggered if CPU and/or memory usage exceed the above usage for 3 minutes.

You may also specify automation level(manual and automated). If manual is selected, migration recommendations will be given when threshold is reached and virtual machines will be automatically migrated to another node.

2.6.15.3 Automated Hot Add

Automated hot add refers to adding CPU, memory, NIC and disks to virtual machines manually or automatically when virtual machines are running.

All the VM operating systems support automated disk and NIC hot add. Some VM operating systems do not support automated CPU and memory hot add. Refer to operation system list or contact relevant OS developers.

You may check resource usage regularly and add resources according to actual situations, so as to ensure proper operation of businesses. Configure automated hot add as follows:

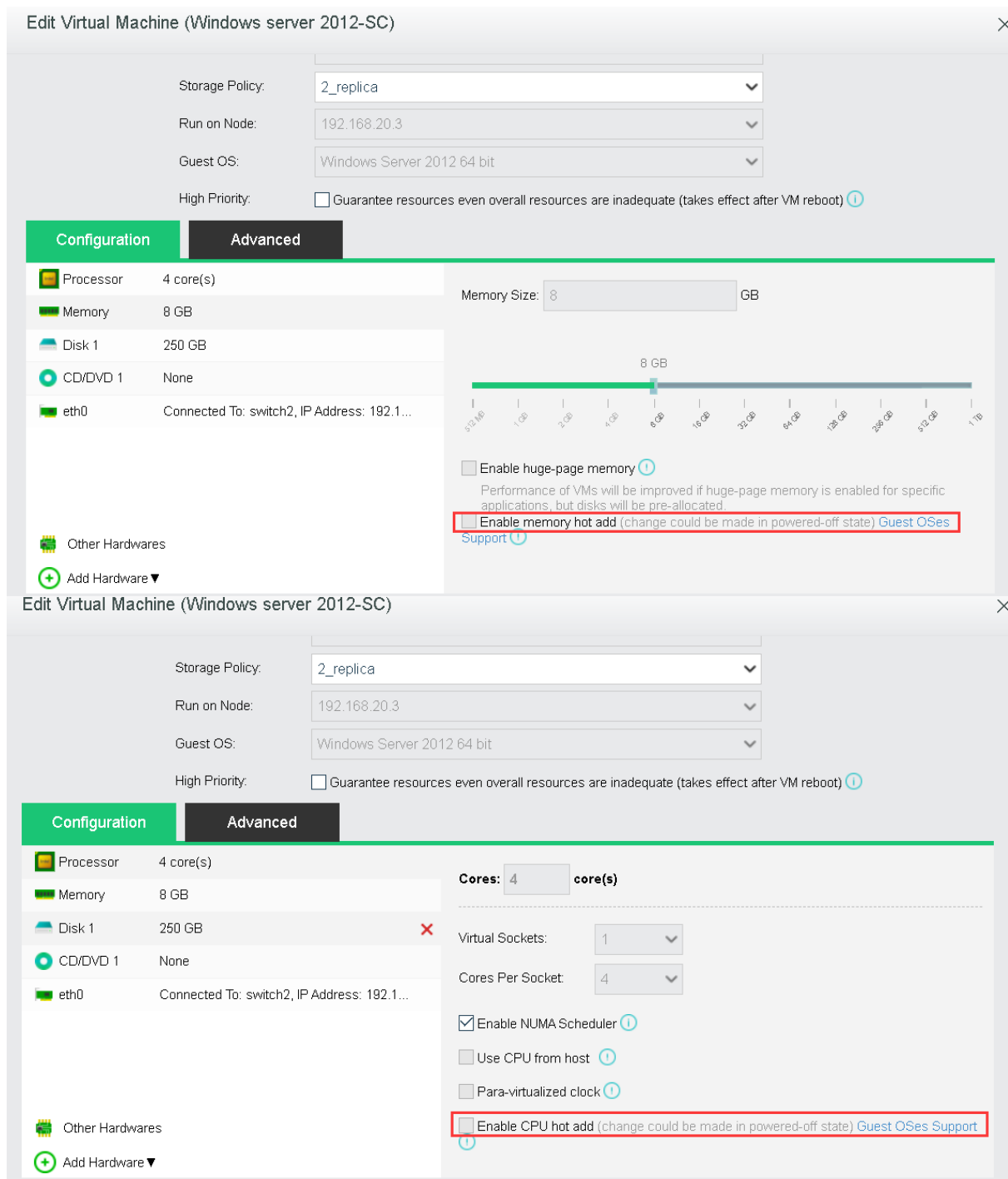
1. Enterprise edition is required.
2. Ensure that there are virtual machines in the cluster which support automated hot add.
3. Install vmTools.

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- Go to edit virtual machines to enable CPU hot add and memory hot add.



- Go to **System > HA & Resource Scheduling > Automated Hot Add**, select **Enable automated memory/CPU hot add**, and configure **Resource**, **Trigger** and **Sensitivity Level** fields.

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Settings

Prior to enabling hot-add for virtual machines, assess the impacts to business system, since hardware hot add may incur business system error (if application program running is subject to hardware status).

☒ Enable automated memory/CPU hot add

Performance of VMs will be evaluated and improved with automatically added resources when they are running out of CPU or memory, minimizing business downtime. [Guest OSes Support](#)

Virtual Machines:

Settings

 (specify virtual machines to support automated memory and/or CPU hot add, or remove them from the list)

Resource:
 ☐ CPU
 ☐ Memory
 ☒ CPU or Memory

Trigger:

Guest CPU usage exceeds % (one virtual socket will be added each time, but eventual number be less than doubles)

 Guest memory usage exceeds % (one eighth of the configured memory size will be added each time, but eventual number be less than doubles)

Sensitivity Level:

▼

 (more CPUs and/or memory will be added to virtual machines when any of the above thresholds has been reached for 10 minutes)

6. Add virtual machines to the VM list which support automated hot add.

Select Virtual Machine

Available

Expand All

Collapse All

Group

Name

<input type="checkbox"/>	VM Name	Current C...	Hot-Add Supp...
-	Virtual Machine		
-	Web Server Group		
-	Application Group		
-	Database Group		
-	Cheney		
-	Default Group		

Selected

Clear

VM Name	Delete
No data available	

OK

Cancel

7. Click **OK** to save changes.

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2.6.16 VM Scheduling

Function Description

In the VM scheduling page, you can add a new VM scheduling policy or select a policy to edit or delete. Through the scheduling policy, you can achieve precise control over the running location of VMs to meet the demand of dual-live.

Precaution

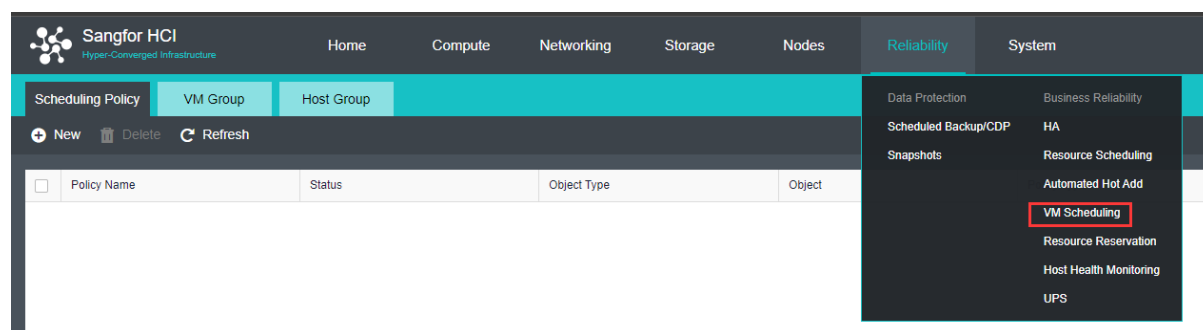
After a VM scheduling is added to a running VM, the VM must be restarted to take effect.

Prerequisites

None

Operation steps

1. Navigate to Reliability > VM Scheduling.



2. Add a scheduling policy, and select the policy type.
 - a. VM-VM Affinity – Scheduling based on selected VM to be running on same nodes..
 - b. VM-VM Anti Affinity – Scheduling based on selected VM to be running on different nodes.
 - c. VM Group Anti Affinity – Scheduling based on VM group to be running on different nodes while the VM in same VM group will be running on same node.
 - d. VM-Host Affinity – Scheduling based on VM group to be run on nodes in a Host Group.

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Create Scheduling Policy

① Run locations of virtual machines in one VM group must be set to the same fault domain or Auto. Editing run location of running virtual machines is not allowed. For changes to take effect, a running virtual machine needs to be powered off and restart.

Name:

Policy Type:

VM-VM Affinity

Automation Level:

Must

Run on the same node

VMs:

Expand

Collapse

Edit Run Location

Refresh

Group

Name

	VM/Virtual Network Device	Status	Datastore	Run Location
	<div>Virtual machine</div> <div> <div>Default Group</div> <div>Virtual network device</div> </div>			

Selected (0)

Clear

Name	Operation
<div>No data available</div>	

Status:

☒ Enabled
 ☐ Disabled

OK

Cancel

2.6.16 Advanced Settings

On the **Advanced Settings** tab, you can enable NUMA scheduler which can speed up memory access and improve VM performance. It takes effect after VM restart.

Besides, memory overcommitment ratio can also be configure or adjust under Advanced Settings tab.

NUMA Scheduler

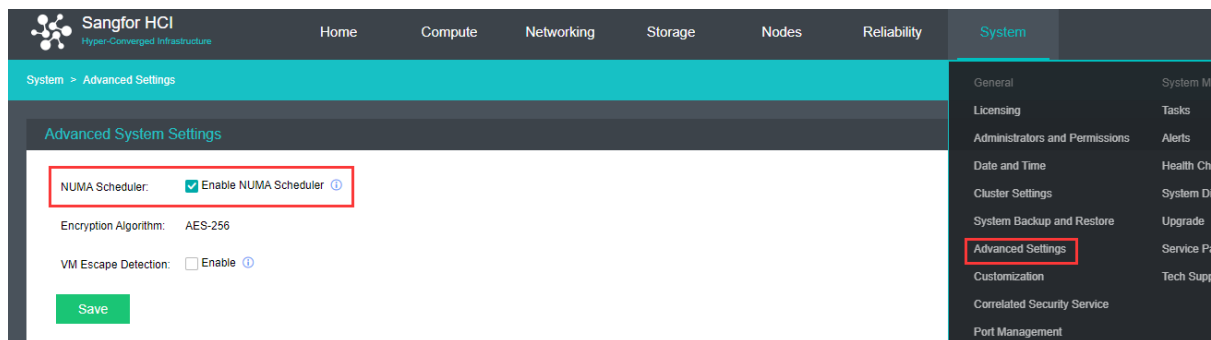
Once **NUMA scheduler** is enabled, it will be applied to all the virtual machines on the nodes in the cluster and it takes effect after VM reboot. Once disabled, it will be applied to all the virtual machines on the nodes in the cluster immediately. To enable NUMA scheduler for a virtual machine, do as follows:

1. Make sure the current version is Enterprise edition.
2. Make sure that the virtual machine has more than 8 cores and vmTools installed.
3. Go to **System > Advanced Settings**, select **Enable NUMA scheduler**.

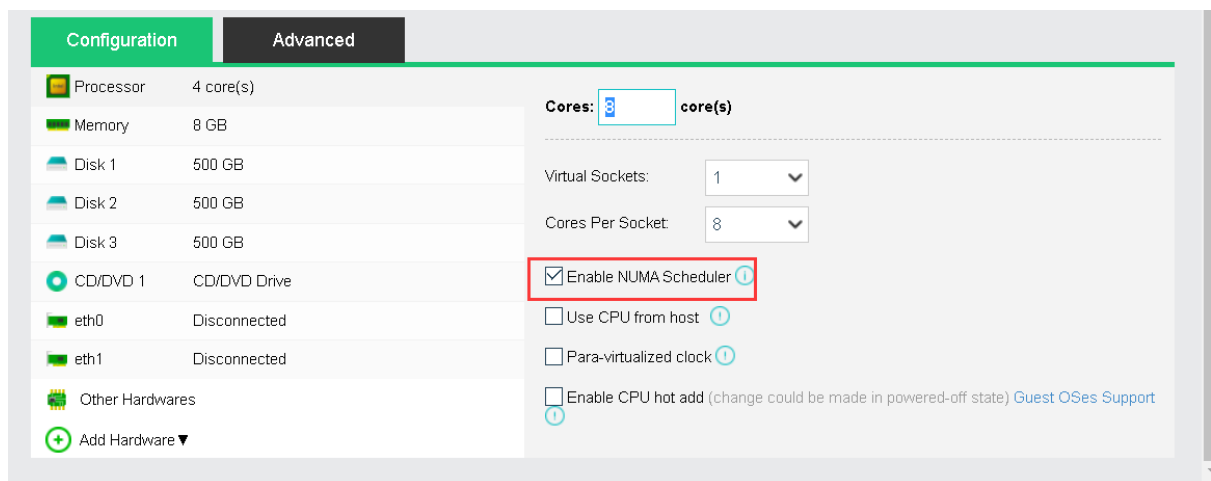
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4. Go to **Compute** and edit the virtual machine for which you want to enable NUMA scheduler, and then select **Enable NUMA Scheduler** option, as shown below:



5. Click **OK** to save the changes.



Once **Enable NUMA scheduler** is selected in **System > Advanced Settings**, you may also enable or disable NUMA scheduler on a specific virtual machine. Enabling NUMA scheduler takes effect after VM reboot while disabling NUMA scheduler takes effect immediately.

To project NUMA topology into a virtual machine, make sure that virtual machine has more than 8 cores and vmTools has been installed.

Memory overcommitment

Memory overcommitment is a concept in computing that covers the assignment of more memory to virtual computing devices (or processes) than the physical machine they are hosted, or running on, actually has.

You may configure the memory overcommitment ratio under **System > Advanced Settings**.

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System > Advanced Settings

Advanced System Settings

NUMA Scheduler: ☒ Enable NUMA Scheduler ⓘ

Encryption Algorithm: AES-256

VM Escape Detection: ☐ Enable ⓘ

Save

Memory Overcommitment Settings

Memory Allocation

Memory Overcommitment Ratio (100%)

Memory Overcommitment Ratio (>100%)

Reserved
Preallocated
Available

Reserved
Preallocated
Available
Overcommitted

Total
Committed-RAM
Allocatable

Reserved: Memory for system running
Preallocated: Memory reserved for page-memory enabled VMs
Available: Memory for dynamic provisioning
Overcommitted: Overcommitted = Allocatable - Preallocated - Available

Global Memory Overcommitment Ratio: 120%

Node Name	MEM Overcommitment Ratio	Total	Allocatable
192.200.19.19	100% (No risk)	256 GB	221.1 GB
192.200.19.18	100%	256 GB	223.5 GB

Save

Memory allocation: User can view the explanation of the memory allocation for better understanding.

Global Memory Overcommitment Ratio: Configure the memory overcommitment ratio for all nodes inside the cluster.

MEM Overcommitment Ratio: Change the memory overcommitment ratio for different nodes.

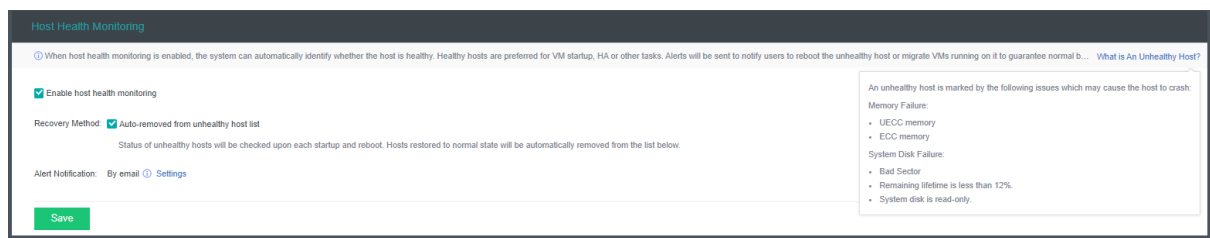
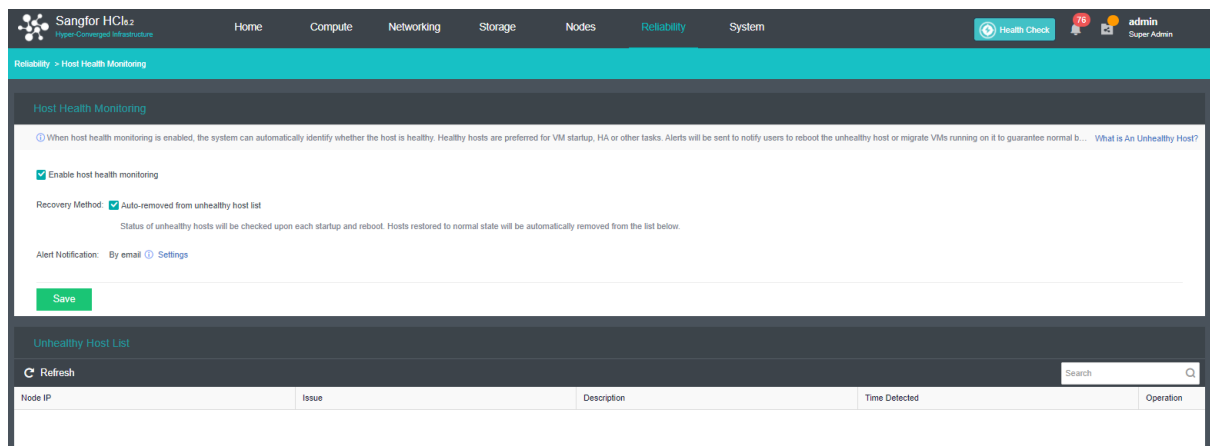
2.6.17 Host health monitoring

Host health monitoring monitors whether the system disks and memory of hosts in the cluster are in a healthy state. These features will automatically reduce the priority of unhealthy host in the process of VM startup, HA, and other tasks. Only support to detect the host memory ECC/UECC failure, HDD bad sector, SSD remaining lifetime, and system disk read-only issue.

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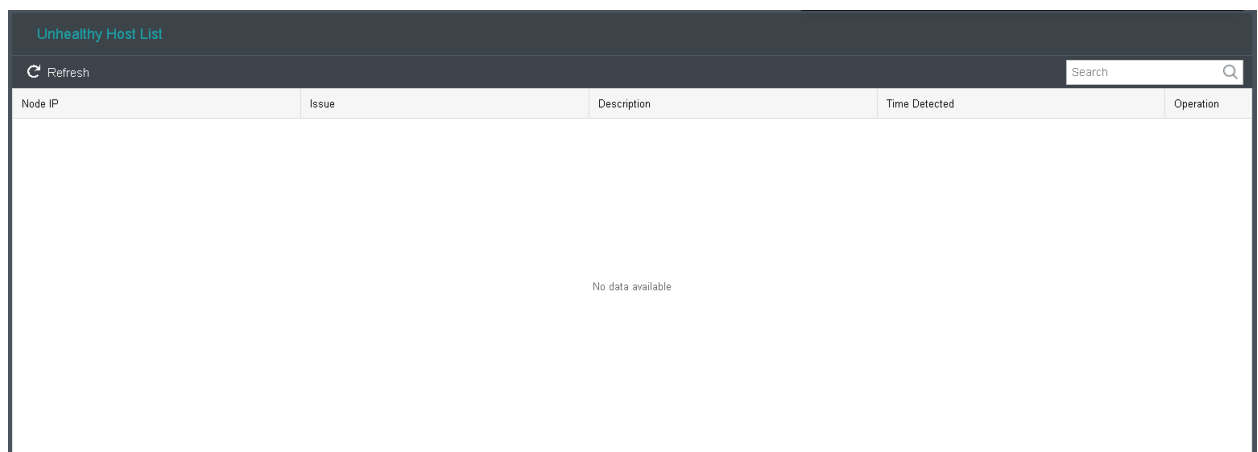
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To enable the host health monitoring, require to enable the option “Enable host health monitoring”.

To remove the unhealthy host automatically, select “Auto-removed from unhealthy host list”. The status of unhealthy hosts will be checked upon each startup and reboot. Hosts restored to the normal state will be automatically removed from the list below.

To notify the user, you can configure the alarm notification by email.



HCI automatically detects the unhealthy host and display in the unhealthy host list. The issue and solution will be also displayed in the list.

To remove the unhealthy host manually, you can click on the remove operation remove the host from the list after resolving the issue.

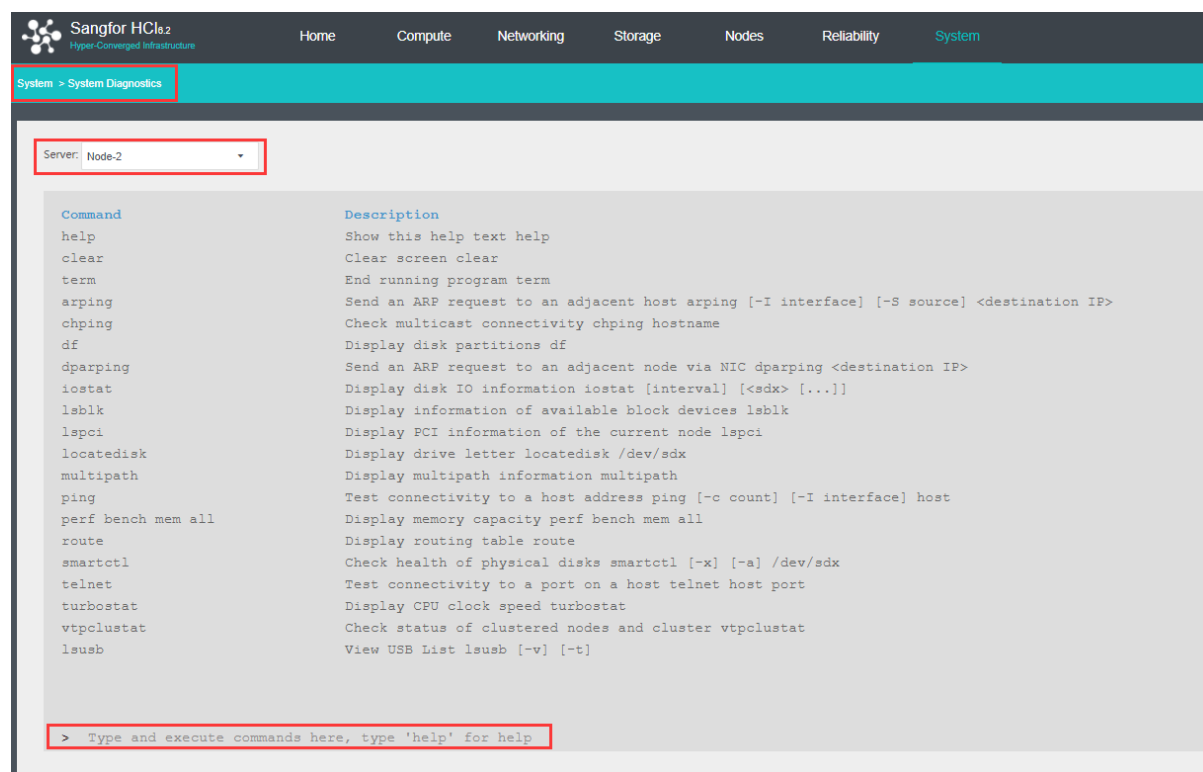
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2.6.18 System Diagnostics

Simple troubleshooting and information gathering can be carry out throughout the command available on **System > System Diagnostics**.



Server: Select the corresponding node to execute the command.

> : Enter the available command shown above to execute.

2.6.19 PaaS Correlated

Function Description

The KubeManager platform supports docking to virtual storage aSAN or file storage NFS for data persistence storage, so that users can store business data outside the application Pod and protect the application data from being affected when the application Pod fails. To interface KubeManager platform with aSAN storage, you need to use PAAS correlated function in Correlated Security Service.

Precaution

No

Prerequisites

1. aSI license is required for HCI platform.
2. The KubeManager platform and HCI platform can communicate normally.

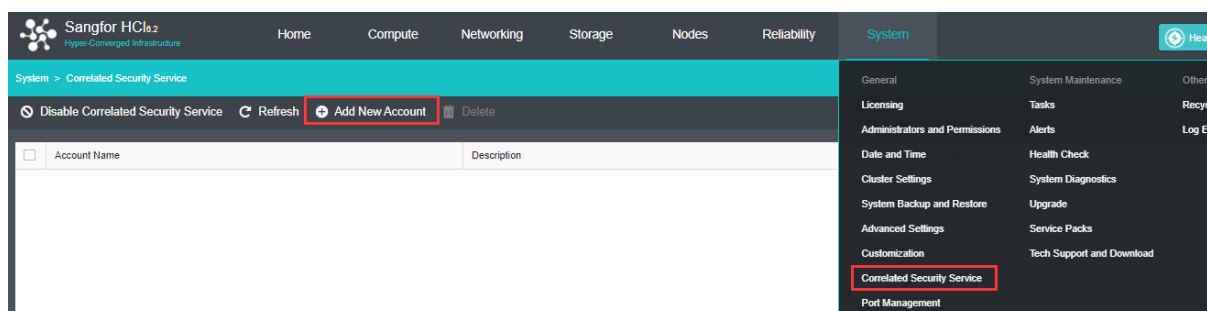
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Operation steps

1. Login to the HCI web console, navigate to **System > Correlated Security Services**, and click **Add New Account**.



2. Customize the account information.

Account name: Name of the account, for example: simon.

Description: Account description, for example: simon-paas.

Password: Password of the account.

Correlated Platform: PaaS.

Permission: Check Virtual Storage (checked by default).

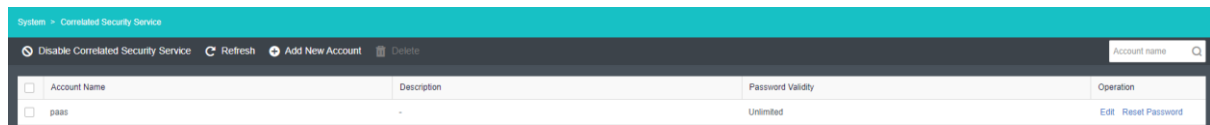
The image shows a modal dialog box titled 'Add New Account'. It contains several input fields: 'Account Name', 'Description', 'Password', and 'Confirm Password'. There is also a dropdown menu for 'Correlated Platform' currently set to 'Third-party security service'. Below these are checkboxes for 'Permissions', including 'All', 'Virtual machine', 'Cluster', 'Network', 'Disk', 'Recycle Bin', and 'Virtual Storage'. At the bottom right, there are two buttons: 'OK' (highlighted in green) and 'Cancel'.

3. Click <OK> and the service account is added.

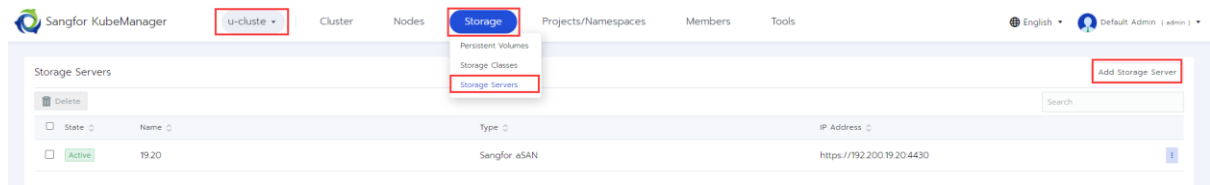
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4. Login to KubeManager platform, switch to the cluster where you want to add storage server, navigate to **Storage > Storage Servers**, and click **Add Storage Server**.



5. Enter the name of the storage server, select the corresponding storage type, and configure the basic information of the server.
 - a. Name: Customize the server name.
 - b. Type: Support Sangfor NFS and Sangfor aSAN storage servers; Sangfor aSAN is recommended, with high reliability and stable performance.
 - c. c. NFS server information.

Server address: the address of the NFS server.

Storage path: The path where the NFS server is stored.

Version: The version of the NFS server.
 - d. aSAN Server Information.

Gateway address: https:// HCI cluster IP:4433.

Authenticated Account: The name of the service account added in step 2.

Authenticated Password: The password of the service account added in step 2.
6. Click **Save** to finish adding the storage server.

2.6.20 Port Management

The listening port on HCI for different purposes can be view and manage on **System > Port Management** starting from version 6.1.0.

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System > Port Management					
<input checked="" type="checkbox"/> Enable <input type="checkbox"/> Disable <input checked="" type="button" value="Refresh"/>					
<input type="checkbox"/> Service	Port	Protocol	Description	Status	
<input type="checkbox"/> Host discovery	4099	udp	Port for new node discovery that aims to discover nodes with Sangfor HCI installed	✓	
<input type="checkbox"/> VM migration	7001-7019	tcp	Port for VM migration within a cluster or across clusters. It will be automatically enabled after being centrally managed by SCP	✓	
<input type="checkbox"/> P2V migration	4000-4010,10809-10900	tcp/udp	Port for processing migration requests and transmit data during executing P2V tasks	✓	
<input type="checkbox"/> Samba	139,445	tcp	Port for management of Samba shared directories	✗	
<input type="checkbox"/> Correlated security service	4433	tcp	Port providing an API gateway for correlated security services	✗	
<input type="checkbox"/> SNMP Service	161	udp	Administrator can know running physical resources via SNMP service, which requires a dedicated account and password. Set SNMP Service Password.	✗	
<input type="checkbox"/> Remote technical support	22	tcp	Port for remote technical support regarding remote diagnostics, troubleshooting and recovery to improve system performance. It will be automatically enabled after being centrally managed by SCP	✓	
<input type="checkbox"/> VMware VM console proxy	4481	tcp	Port for access to admin console of VMware vCenter virtual machine	✗	
- iSCSI	3260	tcp	Port for external access to storage based on iSCSI virtual disks and shared disks, iSCSI protocol parsing and data transmission	✓	
- Access to web admin console of the virtual network device	4480	tcp	Port for web access to admin console of virtual network device and protected by Sangfor-WAF	✓	
- Web access to HCI admin console	80,443	tcp	Port for web access to HCI admin console	✓	

2.6.21 UPS

By integrating UPS to HCI, VM is protected when the power grid is down. It protects the VM from immediately shutting down and allow the VM to shut down properly when a certain condition is met.

HCI integrates with UPS through SNMP (simple network management protocol) protocol. UPS vendor provides the OID (object identifier) library and through SNMP protocol, HCI is able to receive the battery usage of the UPS and take actions when the battery usage is below certain threshold.

Configure the UPS setting under **Reliability > UPS**

Add UPS: Add new UPS to the HCI.

- Name : Enter the name for the UPS.
- IP Address : IP Address of the UPS.
- Version : SNMP version with 3 options, version 1,2 and 3.
- Read Community : The read community in the SNMP setting.

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- v. **OID** : Select whether it is APC or Standard MIB. For other OID, please contact Sangfor Support teams for further assistance.

Add UPS

Name:

IP Address:

Version:

Read Community:

OID: ☒ APC ☐ Standard MIB

MIB OID (Remaining Power): iso.3.6.1.4.1.318.1.1.1.2.2.1.0

MIB OID (Output Status): iso.3.6.1.4.1.318.1.1.1.4.1.1.0

MIB OID (Remaining Runtime): iso.3.6.1.4.1.318.1.1.1.2.2.3.0

To change OID or use other OIDs, contact technical support representative at +60 127-117-129(7511)

OK Cancel

Attach To Nodes: Select the corresponding nodes to attach with the UPS.

- Attach UPS:** Select the UPS to be attach to the selected nodes.
- UPS Deployment Guide:** View the UPS deployment guide for different scenario with single UPS, 2 UPS and multiples UPS.

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Attach To Nodes

1. If a UPS runs out of power, it cannot provide power to the connected nodes, causing business interruption. To avoid this, follow [UPS Deployment Guide](#) to connect UPS and nodes.

2. The system can only detect connectivity between UPS and nodes. Please make sure nodes are connected to the attached UPS(s) and the physical switch connecting UPS and node is still connected to UPS.

Refresh

Attach UPS

UPS Deployment Guide

<input type="checkbox"/>	Node Name	Attached UPS	Operation
<input type="checkbox"/>	192.168.20.5	-	Attach
<input type="checkbox"/>	192.168.20.3	-	Attach
<input type="checkbox"/>	192.168.20.4	-	Attach

OK

Cancel

UPS Deployment Guide

Single UPS Deployment

Connect each node in the cluster to a UPS to have them protected by the same UPS.

Single Electricity Provider:

Dual Electricity Providers:

Network

Electricity Provider A

Node

UPS

Node

Network

Electricity Provider A

Electricity Provider B

Power Adapter

Node

UPS

Node

OK

UPS-Powered VM Shutdown : When the node is powered by UPS only, this function allow to shutdown VM follow by phases along with the battery percentage.

- i. Status: Do not enable this function when the node is powered by both UPS and eletricity provider.

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- ii. UPS Battery Remaining: Configure the battery percentage to shutdown the VM accordingly.
- iii. Critical VM: Select the important vm as critical VM for phase II.

UPS-Powered VM Shutdown

Notes:

- When a node is powered by electricity provider and UPS (as shown in the figure), do not enable UPS-powered VM shutdown, or else it will be triggered in case that UPS runs out of power.
- When a UPS on battery has remaining battery lower than specified threshold, sequentially shut down VMs running on the attached nodes.
- When a node is attached to multiple UPSs, UPS-powered VM shutdown is triggered only when all the attached UPSs provide power by battery and their battery remaining are lower than specified threshold.
- If resource scheduling is enabled, VMs will not be migrated to the nodes powered by UPS on battery.
- If UPS status shows it is offline, the system will not perform UPS-powered VM shutdown on the nodes attached to that UPS.

Disable UPS-Powered VM Shutdown

Status: ☒ Enabled

Shutdown Trigger:

As non-critical VMs will be shut down first, set virtual machines running important business as critical VMs.

	UPS Battery Remaining	Action
Phase I:	< 70 %	Shut down non-critical VMs
Phase II:	< 50 % (30%~100%)	Shut down critical VMs (1 selected)

OK

Cancel

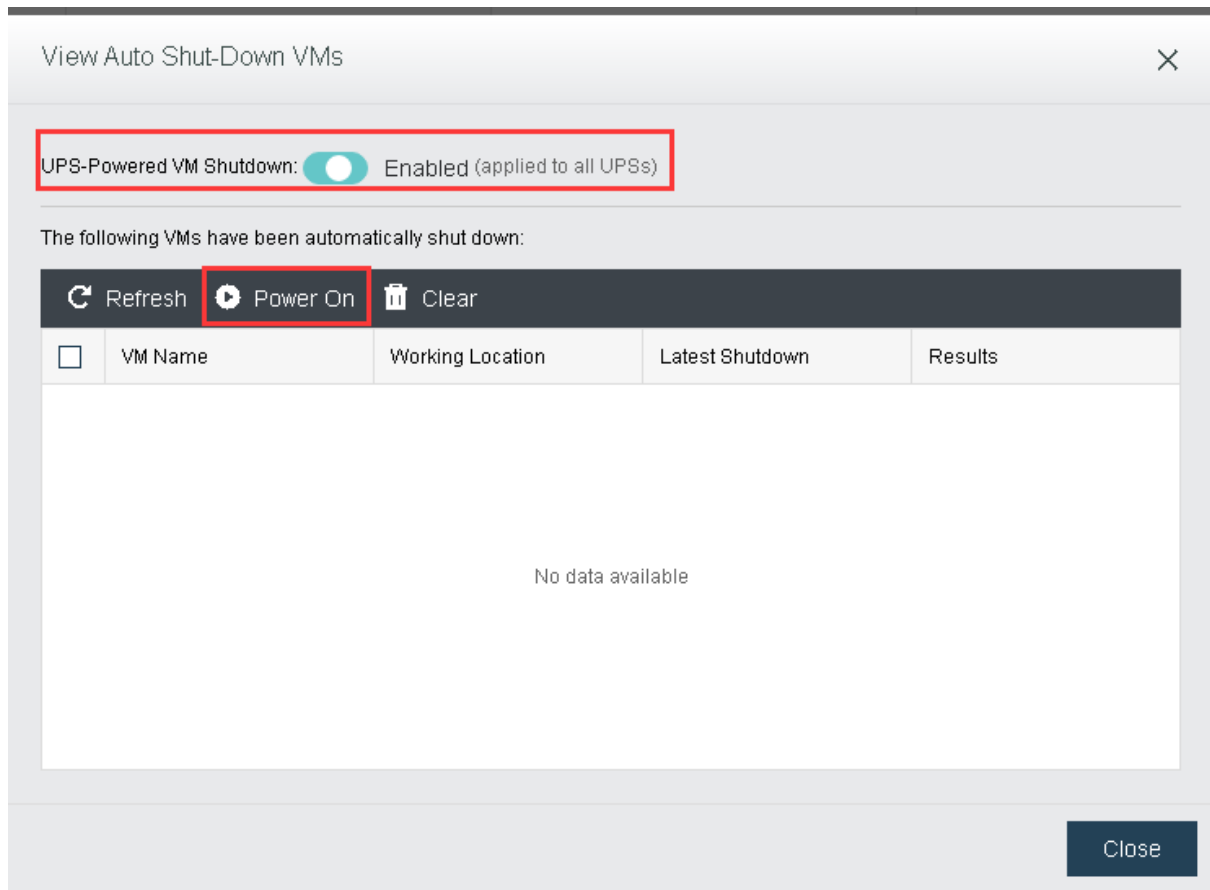
View Auto Shut-down VMs: The VM shutdown by the UPS-Powered VM Shutdown module can be view and select to power on.

- i. UPS-Powered VM Shutdown: Same configuration with the Status in UPS-Powered VM Shutdown.
- ii. Power On: Power on the selected powered off VM.

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2.6.22 Online SP package

2.6.21.1 Online SP settings

The online patch service can obtain the latest patch information from the online patch platform regularly to ensure the stability and security of the device.

The management network can connect to the HCI equipment of the Internet, and directly access the Sangfor online patch platform to update the latest patch information. For HCI devices in the internal network of the management network, if the virtual machine can access the Internet, you can use the Sangfor network proxy virtual machine to update the patch; if the virtual machine network cannot connect to the Internet, you can use a third-party network proxy to access the online patch platform; The SP patch server is deployed on the Internet for patch updates.

Precautions

1. After the patch service is configured, the connectivity must be tested to ensure that the platform can connect to the patch server.

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2. It is not recommended that the management network can directly access the online patch service platform, because directly exposing HCI to the public network is not conducive to the security of the platform.

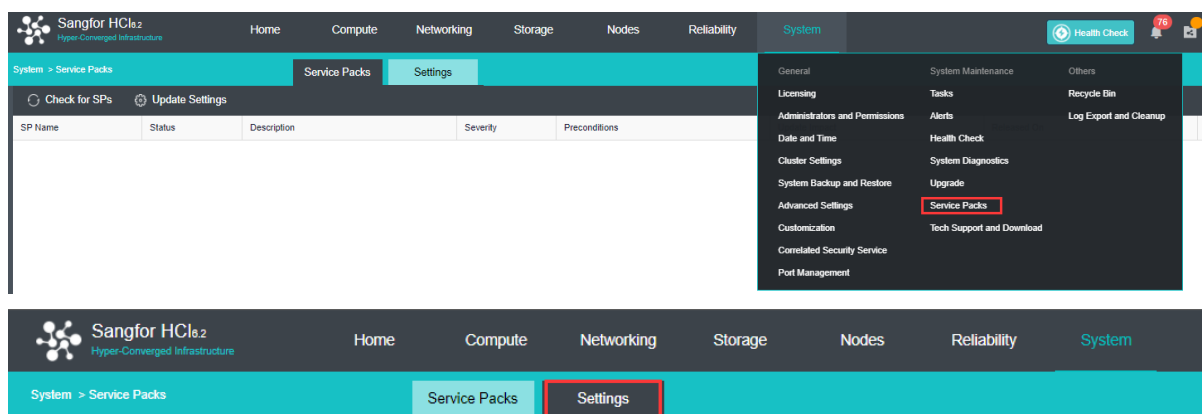
3. Use Sangfor network proxy virtual machine to access the online patch platform mode. After importing the network proxy virtual machine, do not modify the virtual machine name (the default name is: _SangforOperation_VM_WorkStation_), otherwise the proxy service will become invalid.

Precondition

The customer network needs to release the address update1.sangfor.net of Sangfor's patch server to ensure that the platform can access the patch server.

Operation Step

1. Enter the System > Service Packs interface, and click the Settings tab.



2. Click SP Center Addresses to ensure that the patch server has been allowed on the customer network. The requirements are shown in the table below.

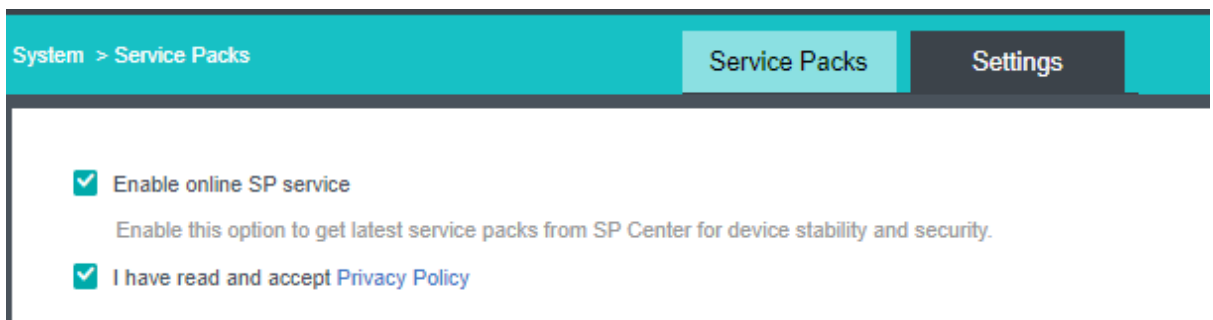
Server IP Address	Description	Requirement
https://cloudbgcop.sangfor.com	Cloud Service IP Address.	Must be allow.
http://update1.sangfor.net	Online Patch Platform IP Address.	Allow at least one of the IP, it is recommended to allow multiple.
http://update2.sangfor.net		
http://update3.sangfor.net		
http://121.46.26.221		

3. Check the "Enable online SP service" option.
4. Check the "I have read and accept Privacy Policy" option.

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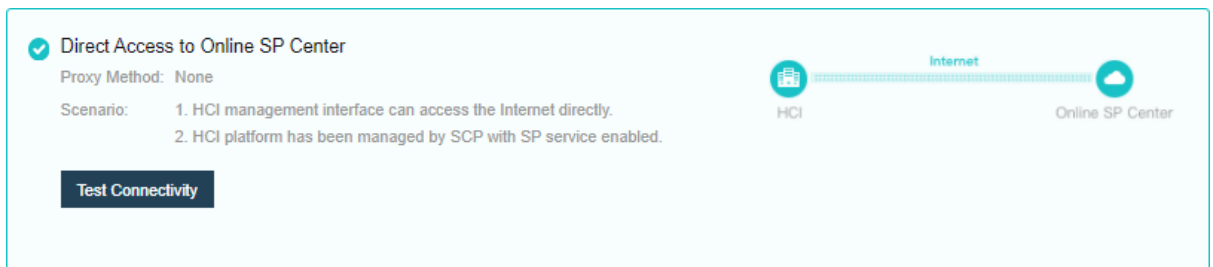
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5. According to the HCI deployment scenario and network conditions, select an appropriate online platform communication method for setting. (After selecting the corresponding scene and configuring, skip other scenes and go to step 6 for configuration).

Scenario 1: Directly access the online patch platform.



- Select [Direct Access to Online SP Center] for communication mode settings, test the connectivity and save the settings.



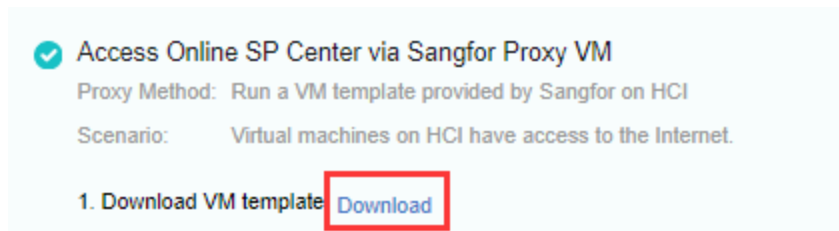
Scenario 2: The HCI platform cannot be connected to the Internet, but virtual machines that can be connected to the Internet can be deployed on the HCI.

- Download the virtual machine template.

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- Import the downloaded VM template into HCI. When importing the template, it is recommended to configure as following:
 - a. HA: Enable.
 - b. Datastore: Shared datastore for all nodes, for example virtual storage.
 - c. Run location: <Auto>.

- Edit the virtual machine, view the Advanced configuration, and confirm that HA is enabled as well as the "Power on at node startup".

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Edit Virtual Machine (_SangforOperation_VM_WorkStation_)

Name: _SangforOperation_VM_WorkStation_

Group: Default Group

Tag: Select

HA: ☒ Migrate VM to another node if the node fails HA Settings

Datastore: VirtualDatastore1

Storage Policy: 2_replica

Run Location: <Auto>

Guest OS: Linux 3.X/2.6 Kernel 64 bit

High Priority: ☒ Guarantee resources for VM operation and recovery (takes effect after VM reboot)

Configuration Advanced

Boot Order: 1 Disk 1 2 CD/DVD 3 None

Lifecycle: ☒ Immortal ☐ Expiration Date 2021-01-27

Hostname: Default hostname

Others: ☒ Power on at node startup

☐ Reboot if fault occurs (due to crash, blue screen, etc., requires vmTools installed)

☐ Enable UUID generator (auto generate UUID)

OK Cancel

- Configure the virtual machine eth0 to connect to the physical exit, and ensure that the physical exit can access the external network. Modify the IP settings on the page, configure the planned address to the virtual machine, and start the virtual machine.

Configuration Advanced

Processor 1 core(s)

Memory 1 GB

Disk 1 5 GB

Disk 2 10 GB

CD/DVD 1 None

eth0 Connected To: edge2

eth1 Disconnected

Other Hardware

Add Hardware

☒ Enable

Connected To: edge2

Advanced

Adapter Model: Virtio

MAC Address: FE:FC:FE:0E:03:94

IP Address: Takes effect after vmTools is installed

Guest OSes Supported

☒ IPv4 address

☐ IPv6 address

☒ Jumbo Frame (this can be edited only when VM is shut down)

If not enabled, jumbo TCP messages will be segmented while

OK Cancel

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Edit IP Configuration

☒ IPv4 address

IP Address: 192.

Netmask: 255.255.255.0

Gateway: 192.

Preferred DNS: 8.8.8.8

Alternate DNS: 8.8.4.4

☐ IPv6 address

OK Cancel

- As shown in the figure below, in the online patch platform communication mode settings, configure eth0's IP, subnet mask, gateway (optional), preferred DNS (optional), alternative DNS (optional), test connectivity, and ensure the IP Access to the online patch platform address. (Eth1 is the internal network port of the proxy virtual machine. If there is an NFV device, you need to configure the eth1 network port to connect to the NFV device. The configuration method refers to the configuration of the eth0 port to connect to the network where the NFV device is located).

Access Online SP Center via Sangfor Proxy VM

Proxy Method: Run a VM template provided by Sangfor on HCI

Scenario: Virtual machines on HCI have access to the Internet.

1. Download VM template. [Download](#)

2. Go to Compute to import the VM template and configure the IP address to access Online SP Center over the Internet.

After the proxy VM is successfully imported, do not change its name (default: _SangforOperation_VM_WorkStation_) to avoid proxy failure.

VM Status: **Powered On**

3. Configure interfaces (at least one) for the imported Sangfor proxy VM:

IP address (eth0):
Configure IP address for eth0 (WAN interface of the VM) to communicate with Online SP Center.

IP Address: 192.

Netmask: 255.255.255.0

Gateway: 192.

Preferred DNS: 8.8.8.8

Alternate DNS: 8.8.4.4

Test Connectivity

> Routing (Optional) ⓘ

> VM Internal Proxy Settings (Optional) ⓘ

Test Connectivity

IP address (eth0):
Configure IP address for eth0 (WAN interface of the VM) to connect to NFV

IP Address: 192.

Netmask: 255.255.255.0

Gateway: 192.

Test Connectivity

Connection successful.

OK

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Scenario 3: The HCI platform cannot be networked, but it can be networked through a third-party agent.

- The network deployment is shown in the figure above. In this scenario, a third-party proxy server is selected to access the online patch platform.

✓ Access Online SP Center via Third-Party Proxy Server

Proxy Method: HCI management interface connects to a third-party proxy server to access Online SP Center over the Internet.

Scenario: HCI platform is deployed in the Data Center, and both the HCI platform and VMs cannot access the Internet.

Proxy Settings

IP Address:

Username:

Password:

[Test Connectivity](#)

[Download Deployment Guide for Third-Party Proxy Server](#)

Diagram: HCI — Internet — Third-Party Proxy Server — Online SP Center

- Click <Download Deployment Guide for Third-Party Proxy Server>, the downloaded content is a compressed package named "Proxy_Squid_Deployment_Guidance.rar", which contains document descriptions and recommended agent installation packages and configuration files.
- Refer to the downloaded configuration guide, install and configure a third-party agent program on the proxy server, and confirm that the proxy server can access the Sangfor online patch server. Deploy 2 network ports as shown in the figure below, one can access the Internet to connect to the Sangfor patch server, and the other can access the hyper-converged platform of the intranet.

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```

[root@localhost ~]# ifconfig
eth0      Link encap:Ethernet  HWaddr FE:FC:FE:2F:1B:B6
          inet addr:192.200.244.33  Bcast:192.200.244.255  Mask:255.255.255.0
          inet6 addr: fe80::fcfc:feff:fe2f:1bb6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1533230 errors:0 dropped:43718 overruns:0 frame:0
          TX packets:58615 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:338489413 (322.8 MiB)  TX bytes:6926447 (6.6 MiB)

eth1      Link encap:Ethernet  HWaddr FE:FC:FE:B5:C0:EF
          inet addr:10.250.0.20  Bcast:10.250.0.255  Mask:255.255.255.0
          inet6 addr: fe80::fcfc:feff:feb5:c0ef/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:95080 errors:0 dropped:0 overruns:0 frame:0
          TX packets:230 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7877420 (7.5 MiB)  TX bytes:69578 (67.9 KiB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

[root@localhost ~]# ping update1.sangfor.net
PING update1.sangfor.net.cdn20.com (113.96.140.206) 56(84) bytes of data.
64 bytes from 113.96.140.206 (113.96.140.206): icmp_seq=1 ttl=54 time=8.04 ms
64 bytes from 113.96.140.206 (113.96.140.206): icmp_seq=2 ttl=54 time=8.44 ms
64 bytes from 113.96.140.206 (113.96.140.206): icmp_seq=3 ttl=54 time=7.52 ms
64 bytes from 113.96.140.206 (113.96.140.206): icmp_seq=4 ttl=54 time=8.19 ms
64 bytes from 113.96.140.206 (113.96.140.206): icmp_seq=5 ttl=54 time=8.55 ms
^C
--- update1.sangfor.net.cdn20.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4006ms
rtt min/avg/max/mdev = 7.521/8.150/8.552/0.361 ms
[root@localhost ~]# _

```

- Fill in the proxy address (IP+port, example: 10.250.0.20:3128) set in the second step on the HCI platform. And the proxy authentication user name and password set during the deployment of the proxy server.
- The IP address is the IP of the internal network port of the proxy server.
- The port is the publishing port of the proxy service, and the default is 3128.
- Click <Test Connectivity> to confirm that the network is connected.

Scenario 4: The HCI platform cannot be connected to the Internet, and the SP patch server has been set up in the local data center.

The customer uses multiple products of Sangfor and cannot connect to the Internet. At this time, only one Sangfor intranet SP patch server is deployed in the data center. Then, when updating the patch offline, the administrator only needs to upload the patch package to the intranet SP. It can be installed on the patch server, and each product obtains the patch package update by itself, without the administrator having to log in to multiple product platforms one by one to upgrade.

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Customers who use Sangfor multiple products only need to deploy one Sangfor intranet SP patch server, which can act as a unified agent of the online patch platform for networking, and download and cache patch packages to distribute to many products.

- In this scenario, select the "Use a locally built SP patch server" method.
- Contact Sangfor technical support to obtain the vma template of the offline patch server.
- Import the virtual machine of the offline patch server in [Virtual Machine\New\Import Virtual Machine].
- After importing, click <Go to Virtual Machine>. Click <Edit> virtual machine. Edit the network card and connect to the planned network.
- Open the console and enter the default username and password, admin/Sangforupdater. After successful login, the system will ask to change the default password, please configure a new password.

```
CentOS Linux 8 (Core)
Kernel 4.18.0-193.el8.x86_64 on an x86_64

Activate the web console with: systemctl enable --now cockpit.socket

localhost login: admin
Password:
===== Sangfor offline updater =====

No address in config file, use 'ip address' command to add addresses

'help'          to show command list and help
'config show'   to show current config

=====

CHANGING PASSWORD IS REQUIRED !!!

Changing password for user admin.
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: all authentication tokens updated successfully.
Shell>
```

- Use the initrv command to modify the IP address, mask, gateway, and DNS. Pressing Y to save the configuration will automatically restart the olu server to

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complete the configuration.

- Confirm the network card configuration and check the connectivity of the network.

```
Shell> ifconfig
ens18: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.250.0.10 netmask 255.255.255.0 broadcast 0.0.0.0
    inet6 fe80::fcfc:feff:fe2c:6a11 prefixlen 64 scopeid 0x20<link>
    ether fe:fc:fe:2c:6a:11 txqueuelen 1000 (Ethernet)
    RX packets 2792 bytes 171403 (167.3 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 54 bytes 2668 (2.6 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 66 bytes 6192 (6.0 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 66 bytes 6192 (6.0 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

Shell> ping 10.250.0.20
PING 10.250.0.20 (10.250.0.20) 56(84) bytes of data:
64 bytes from 10.250.0.20: icmp_seq=1 ttl=64 time=0.925 ms
64 bytes from 10.250.0.20: icmp_seq=2 ttl=64 time=1.38 ms
64 bytes from 10.250.0.20: icmp_seq=3 ttl=64 time=1.83 ms
```

- Enter the command moashell. Pop up the QR code, scan it with Sangfor Pocket Assistant (MOA), get the password in the Pocket Assistant "Little Assistant", and enter it into the command line. (Need Sangfor technical support processing).

```
Shell>
Shell>
Shell> moashell
```



- Create a user used by the olu server and set a password, and change the group of the olu user to root.

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```
[root@localhost ~]# useradd olu
[root@localhost ~]# passwd olu
Changing password for user olu.
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]#
[root@localhost ~]# usermod -g root olu
[root@localhost ~]#
```

- Use the newly added olu account to log in to the patch server, upload the patch package of HCI and NFV devices to the /var/wwwroot directory through the sftp tool, and view it in the HCI patch list after decompression.

```
[olu@localhost wwwroot]$
[olu@localhost wwwroot]$
[olu@localhost wwwroot]$ pwd
/var/wwwroot
[olu@localhost wwwroot]$
```

- After configuring the Olu server, test the connectivity of the SP patch server on the HCI interface, fill in the address of the SP patch server, and click <test connectivity>.

6. Set the security component (aSEC) patch service (optional), select "The communication mode of the patch service is consistent with HCI".

◆ SP Service for aSEC Components (Optional)

Method:

Use the same communication method as that configured on HCI ▼

7. Save the settings by clicking the Save button.

2.6.21.2 Patch information acquisition

Function Description

The patch information can be viewed in **Service Packs**, including:

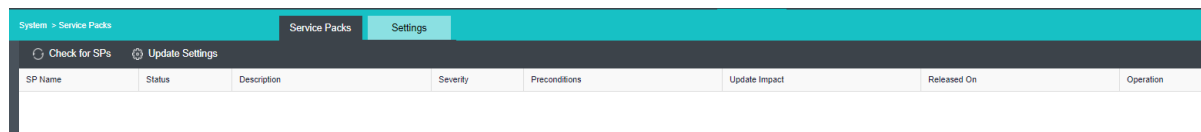
- The name of the patch package, such as sp-xxx-xxx.
- Patch package status, such as: not downloaded, downloading, downloaded, upgrading, upgraded, etc.
- The description of the patch package, such as: the patch solves the xxx problem.
- The severity of the patch package, such as high, medium, and low.
- Preconditions for the patch, such as: None, and the virtual machine needs to be shut down.

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- The impact of the patch upgrade, such as: none, the network will be interrupted for xx seconds.
- The patch release time, such as: 2020-10-20.
- Patch operations, such as upgrade, retry.



SP Name	Status	Description	Severity	Preconditions	Update Impact	Released On	Operation

Precautions

1. If the platform can be connected to the Internet or through the network proxy virtual machine/third-party proxy, the online patch platform address can be accessed, which can be automatically obtained regularly or the user clicks to immediately obtain the patch information required by the platform.
2. If the communication mode setting is "Use the SP patch server built by the local data center", it will be automatically obtained from the patch server or click to obtain it now.

Steps

1. Navigate to **System > Service Packs**.
2. Click the **Update Settings** button to set the patch upgrade method.

SP without Update Impact:

- When the patch is upgraded, it has no impact on platform services and virtual machines.
- Patch upgrade options: automatic upgrade, manual upgrade. After the automatic upgrade is selected, the patch will be automatically upgraded from 01:00AM-06:00AM daily.

SP with Update impact:

- When a patch is upgraded, it may affect platform services or virtual machines. Therefore, the administrator must confirm the impact of the patch and choose a suitable time for manual upgrade.
- Patch upgrade option: manual upgrade.

3. After configuring the patch upgrade options, click **<OK>**.
4. Click the **Check for SPs** button to immediately obtain the patch information required by the platform.

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Chapter 3 Case Study

Use Case: Sangfor HCI Storage

There are two types of storage: local storage and external storage. Disks that come with nodes having installed Sangfor HCI software are local storage, which cannot be accessed by other nodes. Only when external storage is added can clustered virtual machines be used. See Error! Reference source not found. section to add external storage.

Use Case: Virtual Machine

Creating VM

1. Go to **Compute**, click **New** and choose **Create New Virtual Machine** to create a new virtual machine running Windows Server 2008 OS. For details, refer to


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2. 2.2 Compute section.

Create New Virtual Machine



Name:

Group:

Tag:

HA: ☒ Migrate VM to another node if the node fails [HA Settings](#)

Datastore:

Storage Policy:

Run on Node:

Guest OS:

High Priority: ☐ Guarantee resources for VM operation and recovery

Configuration **Advanced**

Standard: ☐ Low ☒ Typical ☐ High

Cores: core(s)

Processor: 8 core(s)

Memory: 16 GB

Disk 1: 120 GB

Virtual Sockets:

Cores Per Socket:

Information of the virtual machine that has been created will be displayed as follows:

Sangfor HCI VMware vCenter

View by Group

Group

Virtual Machine (42)

2021 Intern (5)

Admin PC (1)

(1)

(3)

(4)

(1)

(4)

(2)

(4)

(2)

Template (0)

(1)

acmp_2021-02-17-21-09-11

Default Group (8)

Metrics: Basics Node Throughput IO Speed Host Resources Backup Permissions

2 virtual machine(s) giving alert View

Status	VM Name	IP Address	Group	CPU Usage	Memory Usage
Alert	WOC9_1R2EN-OVA	-	Default Group	5%	8
Alert	Ubuntu	-	Default Group	0%	2
On	_ADServer2012	192.168.19.115	Default Group	2%	1
On	test recover	-	Default Group	6%	8
Off	Email Server	-	Default Group	-	-
Off	_acmp-a646	-	Default Group	-	-
Off	SDW-R-X86-2020-12-29-128G	-	Default Group	-	-
Off	Sangfor_SCP_6.2.0EN(20210120)	-	Default Group	-	-

3. Install guest OS.

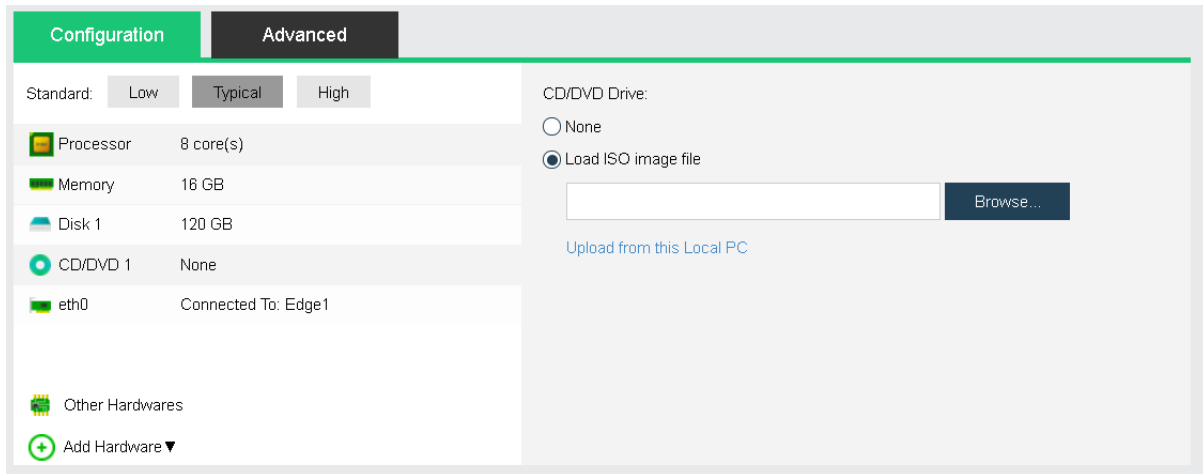
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- Upload ISO Image

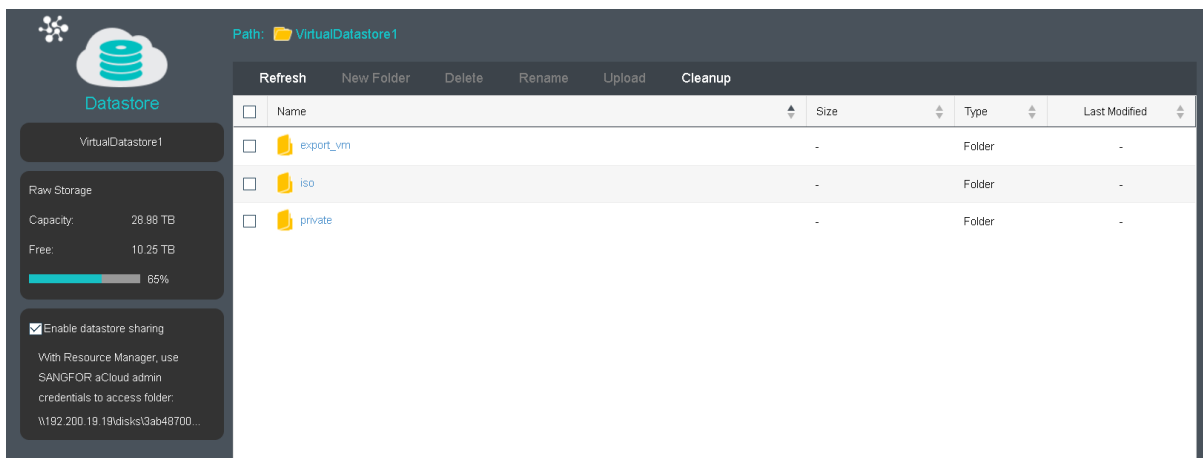
Method 1: Go to **Compute > New > Create New Virtual Machine**, click **Create New Virtual Machine**, and click **CD/DVD 1 > Upload from this Local Disk**, specify **Image File** and **Datastore** fields, and click **Upload from this Local PC** to start this operation.



The screenshot shows the 'Advanced' configuration tab for a new virtual machine. On the left, hardware specifications are listed: Processor (8 core(s)), Memory (16 GB), Disk 1 (120 GB), CD/DVD 1 (None), and eth0 (Connected To: Edge1). On the right, the 'CD/DVD Drive' section has two options: 'None' and 'Load ISO image file' (selected). Below this is a text input field for the ISO file path and a 'Browse...' button. At the bottom of this section is a blue link that says 'Upload from this Local PC'.

Method 2: Go to **Nodes > Storage > Storage used to run VM(it may be virtual datastore, local storage, iSCSI storage or FC storage) > More > Manage**,

Click **Upload** to upload ISO image files to datastore.



The screenshot shows the 'VirtualDatastore1' management interface. On the left, there's a sidebar with 'Datastore' and 'VirtualDatastore1' sections. The 'Raw Storage' section shows a capacity of 28.88 TB and 10.25 TB free (65%). Below that, there's a checkbox for 'Enable datastore sharing' which is checked. The main area has a toolbar with 'Refresh', 'New Folder', 'Delete', 'Rename', 'Upload', and 'Cleanup'. Below the toolbar is a table listing folders:

	Name	Size	Type	Last Modified
<input type="checkbox"/>	export_vm	-	Folder	-
<input type="checkbox"/>	iso	-	Folder	-
<input type="checkbox"/>	private	-	Folder	-

Method 3: Go to **Compute > New > Create New Virtual Machine**, click **CD/DVD 1**, and click **Browse** to enter the **Select ISO Image** page, and then click **Upload ISO Image** to enter the **Upload Image file from this local disk to datastore** page, click icon and enter **\\IP address of the host** in the address bar on the page that pops up and then you may be required to provide the admin account of that host. After entering the correct username and password, you get access to the files on that host, find the ISO image file and upload it to a specific datastore. Click **CD/DVD 1** to enter the ISO image file that has been uploaded in the **Load ISO image file** field.

Then go to edit VM configurations, click **CD/DVD 1** to enter the ISO image file that has

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been uploaded in the **Load ISO image file** field, save the changes and go back to the **Compute**.

Click **Power On** to power on the virtual machine, as shown below:

Status	VM Name	IP Address	Group	CPU Usage	Memory Usage
Off	Email Server		Default Group	-	-
Off	_acmp-a646		Default Group	-	-
Off	SDW-R-X86-2020-12-29-128G		Default Group	-	-
Off	Sangfor_SCP_6.2.0EN(20210120)		Default Group	-	-
Alert	WOC9.1R2EN-OVA		Default Group	4%	85%
On	_ADServer2012		Default Group	5%	13%
Alert	Ubuntu		Default Group	0%	24%
On	test recover		Default Group	5%	9%

After powering on the virtual machine, click **Console** to enter VM console and install operating system and applications.

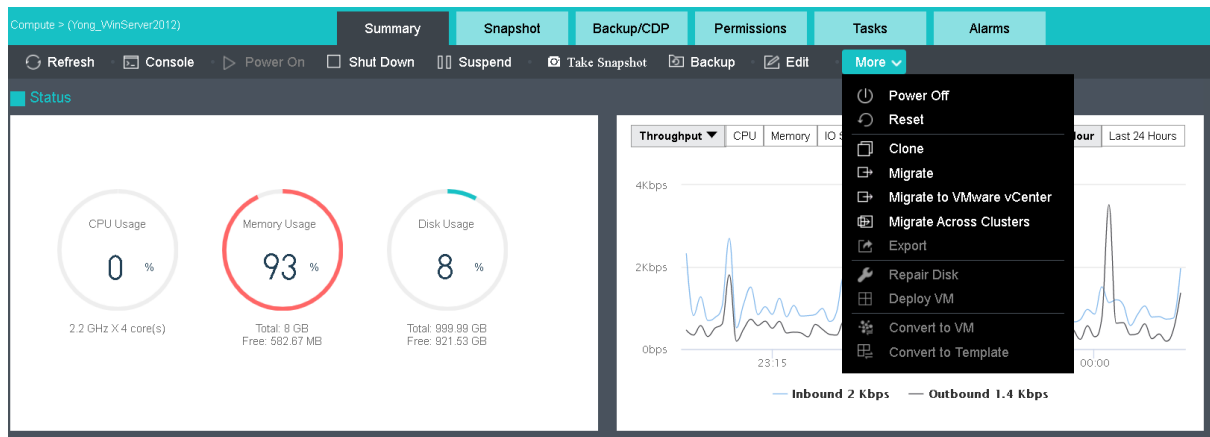
VM Migration

You may migrate the virtual machines to other nodes or other datastores.

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Click **Migrate**, specify destination datastore and node, and click **OK** to start migration

Migrate VM

1
Select Location Type

2
Specify Dst Location

Migration Type:

☐ Run location only
Migrate virtual machines to another node.

☒ Datastore and run location
Migrate virtual machines to another node and migrate their storage location to another virtual datastore or other storage.

Next
Cancel

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Migrate VM
×

1
Select Location Type

2
Specify Dst Location

Current Location

Datastore:
VirtualDatastore1

Storage Policy:
2_replica

Node:
<Auto>

Destination Location

Datastore:
VirtualDatastore1

Storage Policy:
<Use original storage policy>

Node:
<Auto>

☐ Power on virtual machine when migration is complete

Prev

OK

Cancel

Use Case: Admin Permissions

Administrators are assigned with different permissions to manage virtual machines, virtual network, storage, etc. Meanwhile, administrators can also manage resources available to sub administrators.

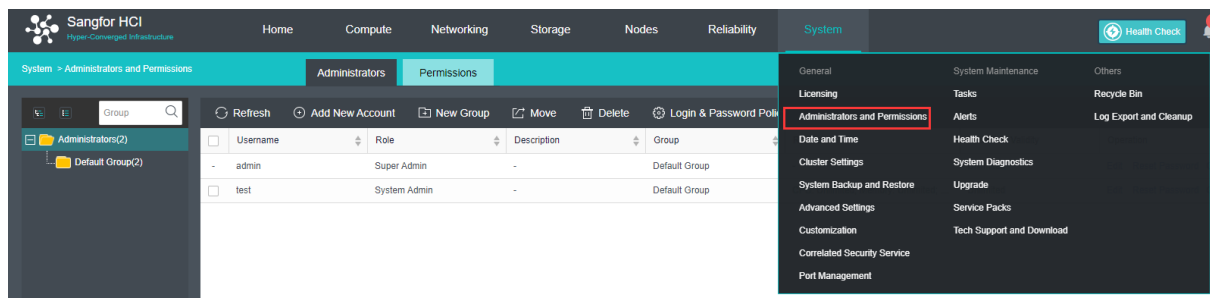
The following describes how to assign permissions:

Go to **System > Administrators and Permissions > Administrators**, click **Add New Account** to add an administrator account first, as shown below:

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New Account

Name:

Description:

Role:

System Admin

Group:

Default Group

Password:

Confirm Password:

System:

Administrative permissions on Reliability and System, excluding Administrators and Permissions, and Log Export and Cleanup

Resource Permissions & Quota:

Settings

OK

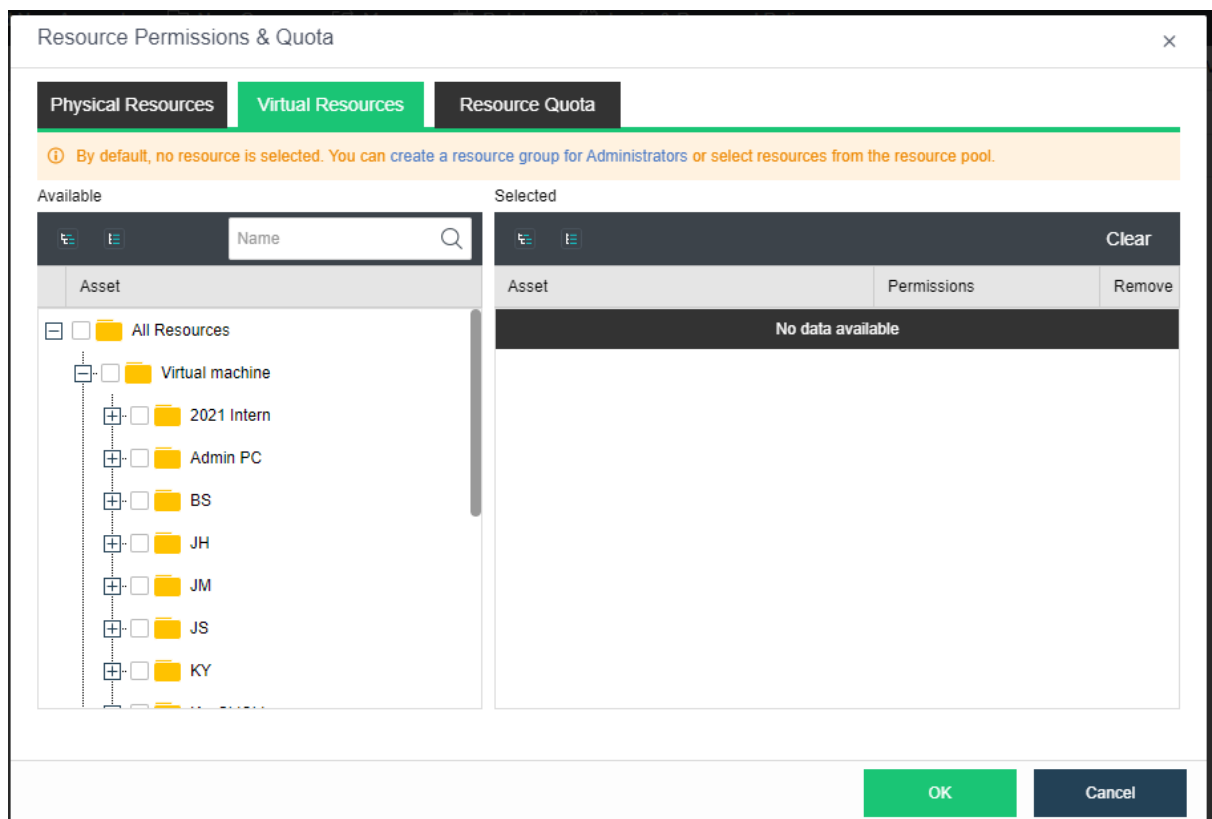
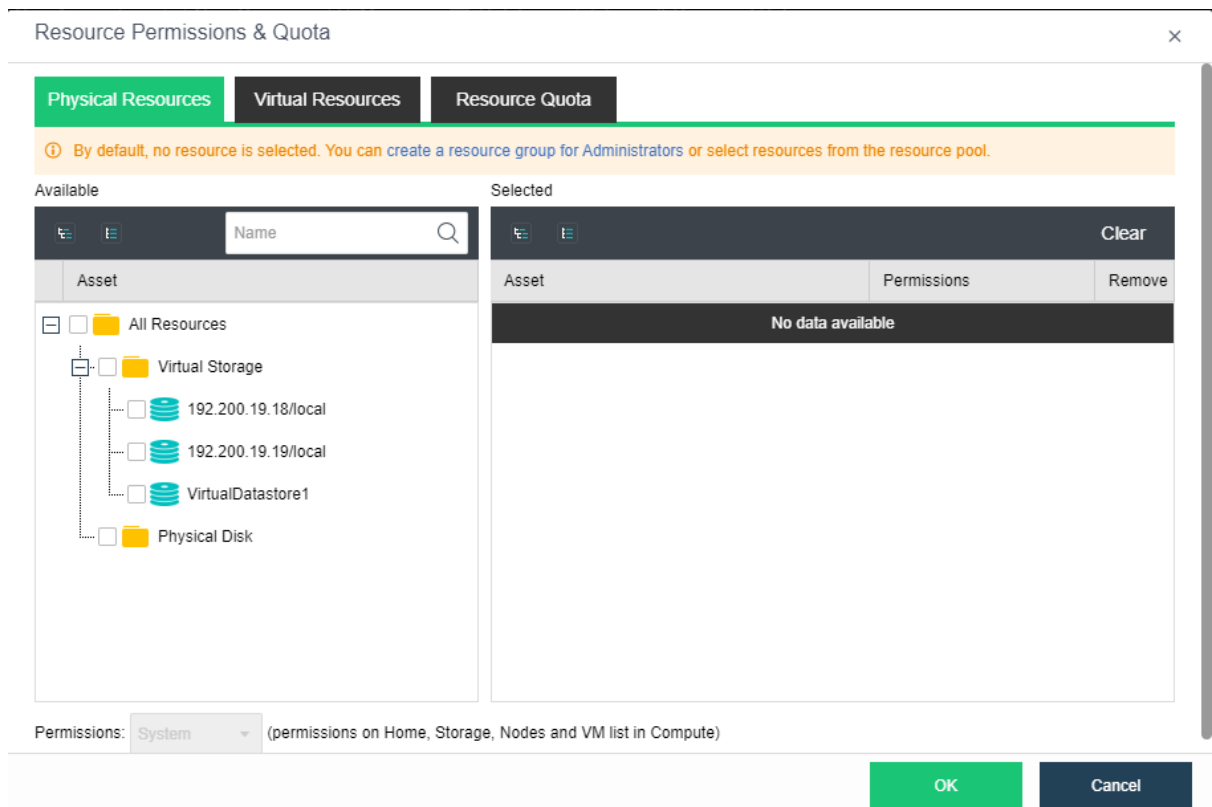
Cancel

Click **Settings** to enter the following page as shown below. On the **Permissions** page, you may view resources available in the default group of virtual machines, virtual network, and resources available in virtual storage, then choose desired resource(s) under Available and assign the corresponding permission on under Selected.

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Click **Resource Quota** to enter the following page, you may assign a maximum of 10 cores for powered-on VMs, allocate a maximum of 20GB memory for powered-on VMs, and specify 200GB as the maximum disk size for all the VMs.

Resource Permissions & Quota

Physical Resources

Virtual Resources

Resource Quota

CPU:

Unlimited

Max cores for powered-on VM(s)

core(s)

Memory:

Unlimited

Max memory for powered-on VM(s)

GB

Storage:

Unlimited

Max disk size for all the VM(s)

GB

Note: The above resource quotas are applied only to virtual machines created by this Administrator but not applied to virtual machines created by any other Administrator which are managed by this Administrator.

OK

Cancel

Accounts can be assigned with different permissions on virtual machines and virtual network.

System > System Administrators and Permissions

Administrators

Permissions

Refresh

New

Delete

<input type="checkbox"/>	Name	Description	Edit
<input type="checkbox"/>	Admin	All permissions	-
<input type="checkbox"/>	Deploy virtual machine	Deploy virtual machine	-
<input type="checkbox"/>	Read-only permission	Read-only permission	-
<input type="checkbox"/>	No permission	-	-
<input type="checkbox"/>	VM administration	Use virtual machines	Edit
<input type="checkbox"/>	Network administration	Use network functions	Edit

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