

HCI User Manual Version 6.1.0





Change Log

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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:

Conventio n	Meaning	Example
		Page/tab name example:
		Navigate to Storage to enter the Storage configuration page.
		Parameter example:
	Page title, parameter,	IP Address: Specifies the IP address that you want to reserve for certain computer.
boldfaco	button,	Button example:
DOIUTACE	key press,	Click the OK button to save the settings.
	other highlighted	Key press example:
	keyword or item	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.
W //	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			
Δ	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			
Ý	Note	Indicates helpful suggestion or supplementary information			

Technical Support

For technical support, please contact us through the following:

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Tel: 60 12711 7129 (7511)

Website: www.sangfor.com

Acknowledgments

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

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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 Sangor 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.

1.1Hardware 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 Intel <u>Virtualization Technology(VT)</u> or <u>AMD-V</u>. 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 UltralSO.
- 2. Select **File > Open** and load ISO file of Sangfor HCI software from local disk.

UltralSO	ions Help				0
New New Ctrl+O Reopen	1 3 7 3 3 0 0 0 7 × 1° 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total Size: OKB		0% of 650MB - 650MB free	
Dpen CD/DVD	Filename	Size Type	Date/Time LBA		
Save Ctrl+S					
Create Checksums Verify Checksums					
Open Project File Ctrl+Alt+O Save Project File As Ctrl+Alt+S					
Import IML Compile IML to ISO					
Properties	🄊 🔄 🗙 🗔 😯 🏟 😰 🛛 Path: C:	\Users\ctkeat\Documents\My ISO Files			
Exit Exit Exit Exit Exit Exit	Fienanie	Size Type 3,138,742 KB Uhra/SO File	Date/Time 2019:12:27 13:57		
	Copyright (c)2002	-2017 EZB Systems, Inc.		Image: 0 files, 0 KB	Local: 1 files, 3066 MB

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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	UltratSO - CAUserActik Actions Bootable Write Disk Image Message: Time PM 03:56:41 Uisk Drive: Image File: Write Method: Hide Boot Partition: Done: 0	Lupp Lupp Lupp Tools Options Help Event Windows 10 v10.0 Build 17763 (E:, 8 GB)SanDisk Cruzer Blade 1.26 (E:, 8 GB)SanDisk Cruzer Blade 1.26 C VU:ert/clk-al/Documents/My ISO Flack USB-HDD+ None None Mone	Venity Sangloc_aCloud_6.0.0_R3_EN(2019) Venity Sangloc_aCloud_6.0.0_R3 Xpress Boot Remain: Speed	tems, Inc. 225).iso Save EN(00:00:00 0KB/s	Date/Time 2013-11-28 14:30 2019-12:55 22:31 2019-12:55 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-12:27 13:57	LBA 34 37 39 35 40 41 41 42 19588	Image 1 files, 26 KB	Local 1 files, 3066 MB
	UltratSO - CAUserActik Actions Bootable Write Disk Image Message: Time PM 03:56:41 Uisk Drive: Image File: Write Method: Hide Boot Partition: Done: C	Logarian Constraints (My ISO Files/Sangfor_at Tools Options Help Event Windows 10 v10.0 Build 17763 (E:, 8 GB)SanDisk Cruzer Blade 1.26 (C-WJeers/Celear/Documents/My ISO Files/S USB-HDD+ ~ None ~ 3% Elapsed 00:000.00	Venify Sangfor_aCloud_6.0.0_R3_EN(2019) Xpress Boot Remain: Speed: Cloce	tems, Inc. 225).iso Save EN(00:00.00 0KB/s	Date/Time 2013-11-28 14:30 2019-12:55 22:30 2019-12:55 22:30 2019-12:25 22:33 2019-12:25 22:31 2019-12:25 22:31 2019-12:25 22:31 2019-10:23 20:57 ISO Files Date/Time 2019-12:27 13:57	LBA 34 37 39 35 40 41 41 42 195983	Image 1 files, 26 KB	Local 1 files, 3066 MB
	UltratSO - CAUserActik Actions Bootable Write Disk Image Message: Time PM 03:56:41 C Disk Drive: Image File: Write Method: Hide Boot Partition: Done: C	Logarian Contents My ISO Files (Sangfor, at Tools Options Help Event Windows 10 v10.0 Build 17763 (E., 8 GB)SanDisk Cruzer Blade 1.26 (E., 8 GB)SanDisk Cruzer Blade 1.26 C VUsers/ cities/VDocuments/My ISO Files (S USB-HDD+ None 12 Elapsed 00.00.00 nat Write Abo	Verify Sangfor_aCloud_6.0.0_R3_EN(2019) Xpress Boot Remain: Speed: Close	tems, Inc. 225).iso Save EN[00:00:00 0KB/s	Date/Time 2013-11-28 14:30 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-10-29 20:57 ISO Files Date/Time 2019-12-27 13:57	LBA 34 37 39 35 40 41 41 42 19598	Image 1 files, 26 KB 68% of 4.7GB - 1410MB free	Local 1 files, 3066 MB
	UltratSO - CAUserActik Actions Bootable Write Disk Image Message: Time PM 03:55:41 C Disk Drive: Image File: Write Method: Hide Boot Partilion: Done: C	Logarian Control of Co	Verity Sangfor_aCloud_6.0.0_R3_EN(2019) Xpress Boot Remain: Speed. Close	tems, Inc. 225).iso Save EN[00:00:00 0KB/s	Date/Time 2013-11-28 14:30 2019-12-25 22:31 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:31 2019-12-25 22:33 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-25 22:31 2019-12-27 13:57	LBA 34 37 39 35 40 41 41 42 19598	Image 1 files, 26 KB 68% of 4.7GB - 1410MB free	Local 1 files, 3066 MB
	UltratSO - CAUserActik Actions Bootable Write Disk Image Message: Time PM 03:55:41 C Disk Drive: Image File: Write Method: Hide Boot Partition: Done: C	Lupper Lu	Verity Cloud, 6.0.0, P3_EN(2019) Verity Sangfor_aCloud, 6.0.0, R3_EN(2019) Xpress Boot Remain: Speed. Cloce	tems, Inc. 225).iso Save EN[00:00:00 0KB/s	Date/Time 2013-11-28 14-30 2019-12-55 22:31 2019-12-55 22:33 2019-12-55 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:33 2019-12-25 22:35 2019-12-25 22:37 2019-12-25 22:37 2019-12-25 22:37 2019-12-25 22:37 2019-12-27 13:57	LBA 34 37 35 40 41 41 42 19598	Image 1 files, 26 KB 68% of 4.7GB - 1410MB free	Local 1 files, 3066 MB

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

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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 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 6oGB. If it is greater than 2TB, it is better to use UEFI mode for installation.

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Select the disk where you want to install: /dev/sda 2006
(OK) (Cancel)

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**.

Device start u is 200GB. Sang partition tabl	Warning with Legacy BIOS mode, and hard disk size gfor HCI software will be installed in MB Le.
Warning: all o Please input	lata on this disk will be erased "format" to continue.
[format_	
	Cancel>

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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.

Please choose an Ethernet interface:	
1 eth0 cable plugged 2 eth1 cable plugged 3 eth2 cable plugged 4 eth3 cable plugged	
(Refresh)	



If you skip the step of configuring Ethernet interface, etho 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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lcome to Sangfor HCI				
	etwork Conf	iguration for eth0		
Net	work Interf	ace eth0:		
IP	Address:	172.28.122.22		
	Netmask:	255.255.255.0		
	Gateway:	172.28.122.254_		
L				
			-	
	8	< <mark>O</mark> K >		
			1.0	

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.

Installation Completed
Congratulations! Sangfor HCI software has been successfully installed. Please remove the disk before reboot.
(Reboot)

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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(etho, 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 etho 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.

angfor HCI			×
nge default IP	address first.		
eth0			
10.250.0.7			
255.255.255	5.0		
10.250.0.1			
	ОК	Car	ncel
	angfor HCI nge default IP eth0 10.250.0.7 255.255.255 10.250.0.1	angfor HCI nge default IP address first. eth0 10.250.0.7 255.255.255.0 10.250.0.1 OK	angfor HCI nge default IP address first. eth0 10.250.0.7 255.255.255.0 10.250.0.1 OK Car

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1.3Initializing 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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To input license key, click **Edit** License **Key**.

Syster											
							_				You may
	Basic Components:						SUSB k (Key ID	ey status is OK.	sername: For	Import License Key File)	Edit License Key
	aSV (Compute Virtualiz	zation)	aNET (Network Virtualiza	ation)	aSAN (Storage Virtualizati	on)	Dark Or				Export License Key File
	Version:	V6.0.1	Version:	V6.0.1	Version:	V3.0.3	Basic Co	nponents:			
	Expiration Date:	2020-03-25	Host CPUs:	6/10	Used/Licensed CPUs:	6/10	Compute	virtualization (aSV):		1.UE 🥥	With this edition, you can:
	Host CPUs:	6/10	Expiration Date:	2020-03-23			Network	irtualization (aNET):		, LZQ 📀	Add up to 54 nodes to a
			Distributed Firewalls:	Enabled			Storage V	rtualization (aSAN):	2	.4 😒	cluster Get 10-6 PST customer service
											C
							aSEC (Se	curity):			 ampiny soleware optate
							NGAF:			1	
							ADC:		r		Sangfor Technologies Inc.
	aSEC (Security):						IAM:				Support: +60 127-117-129(7511)
	😇 NGAF		ADC .		- SSL VPN		😇 IAM			OK Cancel	Sales: +60 127-117-129(7511) Email: tech.support@sangfor.com
	Expiration Date	2020-03-23	Expiration Date	2020-03-23	Expiration Date	2020-03-23	Expiration Date	2020-03-23			4
	Update Service	2020-03-23	Update Service	2020-03-23	Update Service	2020-03-23	Update Service	2020-03-23			Sangfor (P.R.C)
	Expiration Date		Expiration Date		Expiration Date		Expiration Date				Tel: 0755-86627874
	100Mbps	(0/10)	10Mbps	(0 / 1 0)	vSSL-100	(0 / 10)	50Mbps	(0 / 10)			
	200Mbps	(1 / 10)	50Mbps	(0 / 1 0)	vSSL-200	(0 / 10)	100Mbps	(2/10)			Virtiant (U.S.A)

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:

Edition: Pro Enterp	rise Edition						
Pacia Componente:							
asy (Compute Virtuali	zation)	oNET (Network Virtualiza	tion)	aQANI (Storane Virtualizati	on)		
Version:	V6.0.1	Version:	V6.0.1	Version:	V3.0.3		
Expiration Date:	2020-03-25	Host CPUs:	6/10	Used/Licensed CPUs:	6/10		
Host CPUs:	6/10	Expiration Date:	2020-03-23		0110		
		Distributed Firewalls:	Enabled				
-950 (9-0015.)							
asec (security).		_					
ing NGAF		ADC ADC		😤 SSL VPN		IAM	
Expiration Date	2020-03-23	Expiration Date	2020-03-23	Expiration Date	2020-03-23	Expiration Date	2020-03
Update Service	2020-03-23	Update Service	2020-03-23	Update Service	2020-03-23	Update Service	2020-03
Expiration Date		Expiration Date		Expiration Date		Expiration Date	
100Mbps	(0 / 10)	10Mbps	(0 / 10)	vSSL-100	(0/10)	50Mbps	(0/
200Mbps	(1/10)	50Mbps	(0/10)	vSSL-200	(0/10)	100Mbps	(27
400Mbps	(0 / 10)	100Mbps	(0 / 10)	vSSL-400	(1/10)	200Mbps	(27

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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 > General > Cluster Settings**.

System	
	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
<u>/</u>	7

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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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.

New Node			×
Select Node (Below are nodes having	Dow SANGFOR aCloud softwa	mioad SANGFOR aClo are installed. Default p	oud 6.0.1_EN Build 20200 assword: admin)
		•	
`36	.181	182	191
	Credentials	New Node Username: Password: OK	admin admin password Cancel
2/2	Back	OK	Cancel

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1.3.2 Initializing Virtual Storage

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

Complete	d!		
Node Name	IP Address	Disk(s)	NICs
200.200.5.104	200.200.5.104	2	6
A REAL PROPERTY OF A REA			
200.200.5.105	200.200.5.105 ns: etwork to ensure storage stability	2	6
Additional Preparatio	200.200.5.105 ns: etwork to ensure storage stability york interface first.	2 Setting	6 IS
Additional Preparatio	200.200.5.105 ns: etwork to ensure storage stability york interface first. e, format physical disk and add to	2 Setting Initialize Virtua	s I Storage
Additional Preparatio Deploy storage area n Please set storage network. Initialize virtual storage Please set storage network Please set storage network Please set storage network Please set storage network Please set storage.	200.200.5.105 ns: etwork to ensure storage stability york interface first. e, format physical disk and add to york interface and then Initialize	2 Setting Initialize Virtua	6 I s I Storage

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

SANGFOR aCloud	aCloud 2		Compute	Networking	Storage						
Summary	tual Storage	Other Datastores									
			Expand Capacity	Advanced							
Virtual Datastores	Name	÷	Status	Datastore Type	Capacity		IO Sp	eed		Nodes	¢
Physical Disks	VirtualDatastor	e1	🕗 🔤 Advance	d							
Shared Disks			Reliability	/ Settings 🗸 🗸						Provide the second	
iSCSI Virtual Disks			Data F	Balancing	It requires each	orage area network is i i host to provide a sepa	more efficient in da arate interface as si	ta transmission and torage network interf	consistent ace.	in data sync.	
Storage Policy			Data F	Rebuilding	Deployment Mode:	Link aggregation wi	th one switch		<u> </u>	Settings	
			Bad S	ector Scal ning	Nodo Nomo	Physical Interface	Interfe	Negotiated P	MTU	Status	
			IO Tim	eout Hani ling	192.168.20.3	eth2, eth3	10.51.25.1	1000Mb/s	1500	Normal	
			Linker		192.168.20.4	eth2, eth3	10.51.25.3	1000Mb/s	1500	📀 Normal	
			Storage /		192.168.20.5	eth2, eth3	10.51.25.2	1000Mb/s	1500	📀 Normal	
			VAA Dupp	ing Across Datactores							
			Intelligent	t Data Destriction							
			in ite iniger it		IP Address: 192.16	8.20.1				iest Connectivity	
				y Reau Caching							
			- Lie Store						OK	Cancel	
			_	_	_	_	_	_			

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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.

Node Name	Physical Interface		Aggregate I	Interface IP		Status	
92.168.20.3	eth2(1000Mb/s),eth3(1000Mb/s)	~	10.51.25.1	/ 24	🕑 Normal		
92.168.20.4	eth2(1000Mb/s),eth3(1000Mb/s)	~	10.51.25.3	/ 24	🕑 Normal		
92.168.20.5	eth2(1000Mb/s),eth3(1000Mb/s)	~	10.51.25.2	/ 24	Normal		

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

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Configuring Data Copies and Disks

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

neale viituai Dalasi	010					
1 Basics —	2 Select Node	— 3 Specify Fault Doma	ains — 4	Use of Disk	—	5 Confirm
irtual Datastore Name:	VirtualDatastore1					
/pe:	Ordinary datastor	e				
	O Stretched datasto	pre				
	A stretched datas	tore is applicable to active-active data	a center scenario w	here nodes are	deployed	
	in two server roor	ms. Associate the nodes with the stre	etched datastore an	d add nodes in s	server	
	rooms to primary	and secondary fault domain respect	iively.			
ata Replicas:	2 replicas					
	All data has two r	eplicas stored on two nodes respect	ively. Total disk spa	ce should be do	ubled to	
	ensure certain ar	nount of space available.				
	 3 replicas (Not av 	vailable when the number of physical	nodes is less than	5.)		
	All data has three	e replicas stored on three nodes resp	ectively. Total disk s	space should be	three	
		al op acco.				
				Next		Cancel
Create Virtual Datast	ore			Next		Cancel
Create Virtual Datast	Ore 2 Select Node	3 Specify Fault Doma	ains — 4	Next	(Cancel 5 Confirm
Create Virtual Datast Basics elect and Add Node to Vir	Ore 2 Select Node tual Datastore :	(3) Specify Fault Doma	ains — 4	Next	2	Cancel 5 Confirm 2 node(s) sele
Preate Virtual Datast Basics Basics elect and Add Node to Vir Node Name	Ore 2 Select Node tual Datastore :	3 Specify Fault Doma	ains — 4 SSDs	Next	L L L L L L L L L L L L L L L L L L L	Cancel 5 Confirm 2 node(s) sele
Preate Virtual Datast Image: Basics Basics Belect and Add Node to Vir Image: Node Name Image: 192.168.20.191	Ore Select Node tual Datastore :	3 Specify Fault Doma Node IP 192.168.20.191	ains — 4 SSDs 1	Next		Cancel 5 Confirm 2 node(s) sele
reate Virtual Datast Basics Basics Rect and Add Node to Vir International Node Name International Node	Ore Select Node tual Datastore :	3 Specify Fault Doma Specify Fault Doma 192.168.20.191 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel Confirm Confirm
Create Virtual Datast Image: State of the st	Ore 2 Select Node tual Datastore :	3 Specify Fault Doma Node IP 192.168.20.191 192.168.20.192 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel 5 Confirm 2 node(s) sele
Create Virtual Datast Basics elect and Add Node to Vir Node Name 192.168.20.191 192.168.20.192	ore 2 Select Node tual Datastore :	3 Specify Fault Doma Node IP 192.168.20.191 192.168.20.192 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel Confirm Confirm
ireate Virtual Datast Image: Basics elect and Add Node to Vir Image: Node Name Image: 192.168.20.191 Image: 192.168.20.192	ore 2 Select Node tual Datastore :	3 Specify Fault Doma Node IP 192.168.20.191 192.168.20.192 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel 5 Confirm 2 node(s) sele
Create Virtual Datast Basics elect and Add Node to Vir Node Name 192.168.20.191 192.168.20.192	ore 2 Select Node tual Datastore :	3 Specify Fault Doma Node IP 192.168.20.191 192.168.20.192 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel Confirm Confirm
Create Virtual Datast Basics elect and Add Node to Vir Node Name 192.168.20.191 192.168.20.192	ore 2 Select Node tual Datastore :	Image: Specify Fault Domain Node IP 192.168.20.191 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel 5 Confirm 2 node(s) sele
Create Virtual Datast Image: Basics elect and Add Node to Vir Image: Node Name Image: 192.168.20.191 Image: 192.168.20.192	ore 2 Select Node tual Datastore :	(3) Specify Fault Doma Node IP 192.168.20.191 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel Confirm Confirm
est Practice: Associate a	ore Select Node tual Datastore :	Image: Specify Fault Doma Node IP 192.168.20.191 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel Confirm Confirm Conde(s) sele
reate Virtual Datast Basics Rect and Add Node to Vir Node Name 192.168.20.191 192.168.20.192 est Practice: Associate a Back	ore 2 Select Node tual Datastore :	Image: Specify Fault Doma Node IP 192.168.20.191 192.168.20.192	ains — 4 SSDs 1 1	Next	2 HDDs 2 2	Cancel

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Use of Disk: Specifies use of disk. A disk can be used for storing data, caching and used as spare disk. Generally, use SSD for caching to improve storage IO performance.

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

Create Vir	tual Datastore				×
🕑 ва	asics — 🧭 Select Node —	– 3 Specify F	ault Domains	— 4 Use of Disk –	5 Confirm
	All 🗐 Collapse All 🕥 Restore	e Defaults			About Disk Grouping ?
▼ Node: 192	.168.20.192			Data disk : 2 Cache disk : 1	+ New Disk Group
Disk G	Disk	Туре	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	Туре	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

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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 Data	store						×	
🗸 Basics —	– < Select N	lode — a	Specify Fault (Domains —	Vse of Disk	5	Confirm	
Confirm Configufation of	Confirm Configufation of Virtual Datastore (VirtualDatastore1):							
3.62 Available	TB Space	7.28 TB Total Space		2 Nodes	2 Repli	cas		
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					ок	(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.

Advanced					
Reliability Settings	() Independer	it storage area network is more efficient in data transr	nission and	consisten	t in data sync.
Data Balancing	It requires e	each host to provide a separate interface as storage n	etwork inter	face.	
Data Rebuilding	Test Connectivity	:	×		Settings
Bad Sector Scanning	💡 This IP address	is used to ping connectivity to the node to check	Î.R	MTU	Status
IO Timeout Handling	whether it is isol	lated when there are only two nodes involved in virtual		1500	🕑 Normal
Linked Clone	datastore. Read Better be a router IP a	More address that is always connected.		1500	🥑 Normal
Storage Area Network	IP Address:	10.25.19.1			
VM Running Across Datastore:			- *		
Intelligent Rate Restriction		OK Cancel			
	IP Address: 10.	25.19.1			Test Connectivity
Eilo Storago Doligy					
				ок	Cancel

1.3.2.2 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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Settings				×	<
🕝 Refresh 🛯 🖉 Edit Mutilple 🔅 I	P Address Pool	🖉 Edit VXLAN P	ort		
Node Name	Overlay Netwo	ork Interface	Interface IP	Netmask	
192.200.19.18	eth5	~	172.17.19.3	255.255.255.0	
192.200.19.19	eth5	~	172.17.19.1	255.255.255.0	
Enable high performance mode (MTU wi network failure)	l be changed to 1600	and therefore Jumbo	Frame must be enabled	on physical switch to avoid	1
			ок	Cancel	

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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1.3.3 Configuring Edge

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



1.3.4 System Upgrade

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

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

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

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

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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 <u>https://10.250.0.7</u> 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**.

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

Change Pas	sword	×
	Change Password Your password has never been changed. Pleas change it ASAP.	e
	Change Now Later	

- 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:

- 5	SANGFOR aCloud Hyper-converged infrastructure Platform	Home	Compute	Networking Stor	rage Nodes	System		Health Check
		Hete Unifie Pave	erogeneous Virtu ed management of Sa ways for informationi Add Now	ualization Mgt angfor HCI and VMware ad ization construction mana	Center,simplifying operations gement of the whole data center • • • • • • •			8
	Resource Scheduling Status: Balanced		VMs 69 Powered On: 26 Powered Off: 43	Nodes 2 Online: 2 Offline: 0	vCenter 1 vCenter Servers. 1 VMs: 9	CPU Usage 28 % Used: 46 48 GHz Total Capacity: 163 27 GHz	Memory Usage 54 % Used 278.5 GB Total Capacity: 512 GB	Storage Usage 14 % Used: 1.53 TB Total Capacity: 10.84 TB
	Nodes and Storage CPU Usage Memory Usa IO Usage 192200.19.1	44% age 48% 0%	CPU Usage Memory Usage IO Usage (master node)192.20	20% pe 60% 0% 00.19.19 Virtus	lastore Usage 15% ad Speed 2MB/s te Speed 3MB/s al/Datastore1			

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2.1 Home

2.1.1 Navigation Bar

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

SANGFOR aCloud	Home	Compute	Networking	Storage	Nodes	Reliability	Health Check	admin Super Admin

- ✓ 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.

	admin Super Admin		
	🖍 Change Password		
	🕛 Log Out		
Change Password			×
Current Password:			
New Password:			
Retype Password:			
		ок	Cancel

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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.



2.1.3 Viewing Resources

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



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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.

Nodes and Storage					
CPU Usage 46%	CPU Usage 29%	CPU Usage 19%	Datastore Usage 69%	Datastore Usage 38%	Datastore Usage 30%
Physical Mem Usage 45%	Physical Mem Usage 65%	Physical Mem Usage 22%	Read Speed OB/s	Read Speed 1KB/s	Read Speed 67KB/s
Memory Usage 45%	Memory Usage 87%	Memory Usage 14%	Write Speed 1KB/s	Write Speed 348B/s	Write Speed 4MB/s
(Cluster Controller) 192	192.	192.	ISCSI	ISCSI-Secondary	VirtualDatastore1

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.



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

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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: • Siva E-mail: • Subject: • Vm issue Message: • Cannot power on	
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.



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





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



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



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



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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:

Pa	👓 📃 List 🤅		sh 🕂 New	🕂 New Group	►	Power On 📃 Shut Do	wn•	••More							Nam	ne (Q Advar	nced 🗸
							4	5 virtual machine(s) givi	ing alarm View									
	Basics		Node	Throughput		IO Speed	Host	Resources	Backup	Perm	issions							
	Status	Å	VM Name		\$	IP Address	$\stackrel{\mathbb{A}}{\forall}$	Group		Å	CPU Usage	Å	Memory Usage)	÷	Disk Usage		\$
	🛕 Alarm		ChuaADServer			-		Intern2020			1.1	2%		100%		•	9%	^
	🛕 Alarm		Intern_BR_WAt	NO_acmp-35e9		-		Default Group				6%		90%			3%	- 11
	🛕 Alarm		Intern_HQ_WAI	NO_acmp-6947		-		Default Group				0%		77%		н. — — — — — — — — — — — — — — — — — — —	3%	- 1
	🛕 Alarm		S_NAS2			-		Siva				6%	-	35%			6%	
	🛕 Alarm		WANO_ST					Intern2020			1.00	3%		98%			16%	
	Powered On		ChuaDomainP	c		172.16.1.3		Default Group				11%	-	25%		-	17%	
	Powered On		EDR_AD_serve	er		192.168.11.3		JH_EDR			1 - C	6%	-	21%		-	27%	
	Powered On		EDR_SERVER	_acmp-072b0001		192.168.11.55		acmp_2019-07-05-10-	42-26			0%	-	18%		_	61%	
	Powered On		HQ_WANO					Intern2019			1.1	2%	-	37%		•	9%	
	Powered On		JM_AD			192.168.20.2		Intern2020				3%	-	15%		•	12%	
	Powered On		JM_Win7_Clon	e0001		192.168.20.50		Intern2020				0%	÷	11%		-	29%	
	Powered On		KY-Win7_Clone	0001		192.168.50.15		Yong			1.11	5%		51%			9%	

VM details are displayed, as shown below:

Basics: Displays basic information of virtual machines.

Basics		Node	Throughput		IO Speed	Host	Resources	Backup	Perm	iissions						
Status	÷	VM Name		$\frac{\mathbb{A}}{\mathbb{V}}$	IP Address	÷	Group		\$	CPU Usage	Å.	Memory Usag	e (Disk Usage		\$
🛕 Alarm		ChuaADServer					Intern2020			1	2%		100%		9%	
🛕 Alarm		Intern_BR_WAN	VO_acmp-35e9		-		Default Group				5%		90%		3%	
🛕 Alarm		Intern_HQ_VVA	NO_acmp-6947				Default Group				0%	_	77%	1.0	3%	

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

Basics		Node	Throughp	ut	IO Speed	Host Resources	Backu		Permissions				
] Status	*	VM Name	Å	IP Address	$\frac{\Delta}{\nabla}$	Group	*	Run on I	lode 4	Current Node	Å	VM Scheduling	Å
] 🔒 🔒 🔒		ChuaADServer		-		Intern2020		<prefer< th=""><th>o run on 192.200.19.18></th><th>192.200.19.18</th><th></th><th></th><th></th></prefer<>	o run on 192.200.19.18>	192.200.19.18			
] 🔥 Alarm		Intern_BR_WANO_	_acmp	-		Default Group		<auto></auto>		192.200.19.18		-	

Throughput: Displays outbound and inbound speed.

Basics	Node	Throughput	ю	Speed	Host Resources	Backup	Permissions					
Status	💠 🛛 VM Name		\$	IP Address	*	Group		*	Outbound Bps	Å	Inbound Bps	Å.
<u> </u> Alarm	ChuaADSer	ver		-		Intern2020			0 bps		1.73 Kbps	i i i
🛕 Alarm	Intern_BR_V	WANO_acmp-35e9		-		Default Group			18.47 Kbps		19.26 Kbps	

IO Speed: Displays IO speed.

Basics		Node	Throughput		IO Speed	Host Resources	Backup		Permissions						
Status	$\frac{\mathbb{A}}{\mathbb{V}}$	VM Name	\$	IP Address	\$	Group	\$	Read	Speed ÷	Write Speed	$\stackrel{\mathbb{A}}{=}$	IO Reads	\$	IO Writes	\$
🛕 Alarm		ChuaADServer		-		Intern2020		0 B/s		2.72 KB/s		0 IOPS		IOPS	
🛕 Alarm		Intern_BR_WANG	0_acmp-3	-		Default Group		0 B/s		22.22 KB/s		0 IOPS	:	IOPS	

Host Resources: Displays used resources and downtime.

Basics	Node		Throug	Ihput	IO Speed		Host Resources	Т	Backup		Permissions					
Status 🌐	VM Name	÷	IP Address	÷	Group	÷	Datastore	÷	Storage Policy	*	Actual Usage of Log‡	Actual Usage of Physical s \doteqdot	Used Memory	*	Downtime	÷
🛕 Alarm	ChuaADServer	٠	-		Intern2020		VirtualDatastore1		2_replica		10.63 GB	21.25 GB	16 GB			
🛕 Alarm	Intern_BR_WA				Default Group		VirtualDatastore1		2_replica		6.63 GB	13.25 GB	3.59 GB			

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

	Basics		Node	Throughput	IO Spea	ed	Host Resources	Backup		Permissions						
Γ	Status	*	VM Name	Å	IP Address	\$	Group		÷	Scheduled Bac\$	Backup Repository	*	Backup File Size	$\frac{\mathbb{A}}{\mathbb{V}}$	Latest Backup	*
I	🛕 Alarm		ChuaADServ	er	-		Intern2020			Not enabled	-					
	🛕 Alarm		Intern_BR_W	(ANO_acmp-35e9	-		Default Group			Not enabled			-			

Permissions: Displays admin permissions.

Basics	Node	Throughput	IO Speed	Host Resources	Backup	Permissions			
Administrator		\$	Group		\$	Permissions	≜	Creator 👙	Edit
admin			Default Group			Admin		Yes	•
calvin			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.

Create New Virtu	ial Machine						×
	Name:						
34	Group:	Default Group			~		
	Tag:	Select			•••		
	HA:	Migrate VM to anoth	ner node if the node fails	HA Settings			
	Datastore:	VirtualDatastore1			~		
	Storage Policy:	2_replica			~ (Ð	
	Run on Node:	<auto></auto>			~		
	Guest OS:	Select which type o	f OS to install		~		
	High Priority:	Guarantee resourc	es for VM operation and	recovery 🕕			
Configuration	Advanced						
Standard: Low	Typical High	1	Cores: 8 co	ire(s)			
🧧 Processor	8 core(s)						
Memory	16 GB		Virtual Sockets:	1 🗸			
isk 1	120 GB		Cores Per Socket:	8 🗸			
						ОК	Cancel

Name: Specifies a distinguishable name for the virtual machine.

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

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Create New Virtu	al Machine			
	Name:			
34	Group:	Default Group		~
	Tag:	E E	Group	Q
	HA:	2019		^
	Datastore:	020		
	Run on Node:	DR		
	Guest OS:			
	High Priority:	ie ie		
Configuration	Advanced			•

To add a new group, click "add new group"

\bigcirc Refresh \bigcirc New	🗜 New Group	🕨 Power On 📃 Shut Down	•••More
-----------------------------------	-------------	------------------------	---------

New Group			×
Location: Group Name:	Virtual Machine This field is required.		~
		ок	Cancel

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

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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.

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

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

Datastore:	Virtual	virtualDatastore1					~		
Storage Policy:	No.	St	Datas	Туре	Total	Free	Max Read Speed	Max Write Speed	
Run on Node:	1	9	ISCSI	iSCSI	496 GB	151.32 GB	118.15 MB/s	169.73 MB/s	
Guest OS:	2	8	Virtual	Virtual	28.98 TB	10.66 TB	395.37 MB/s	184.57 MB/s	
High Priority:	3	8	Local	Local	444 GB	433.45 GB	512.79 MB/s	451.91 MB/s	

Storage Policy: Specifies the number of replication and performances.

Storage Policy:	2_replica		~ ⊙			
Run on Node:	Policy Name	Replicas 🕕	Auto Tiering QoS 🕕	Stripe Width 🕕	Replica Defrag 🕕	
Guest OS:	2_replica	2 replicas	Medium level of perfo	Adaptive	Enabled	
High Priority:	2_replica_high_perfor	2 replicas	High level of perform	Adaptive	Enabled	
i iigii i iiciii,						

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

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owered On	ed On Run on Node:			<auto></auto>			
Node	IP Address	CPU Usage	Memory Size	Memory Usage	Free		
<auto></auto>		-	-	-	0 B		
192.200.19.18	192.200.19.18	86%	256 GB	78%	98.81 GB		
192.200.19.19	192.200.19.19	47%	256 GB	88%	90.62 GB		

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 operating system is mainly for software aCenter.

	Guest OS:	Select which type of OS to install	~
	High Priority:	Sangfor Technologies Inc.	
Configuration	Advopsed	Cloud Management Platform(aCMP)	
Configuration	Auvanceu	Windows	
Standard: Low	Typical High	Windows Server 2019 64 bit	
Processor	8 core(s)	Windows Server 2016 64 bit	-
	0.0010(0)	Windows Server 2012 64 bit	
Memory	16 GB	Windows Server 2008 32 bit	
🚍 Disk 1	120 GB	Windows Convert 2000 64 kit	
-		Windows Server 2008 64 bit	
		Windows Server 2003 32 bit	
		Windows Server 2003 64 bit	
NOD		M0	I

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

High Priority: Guarantee resources for VM operation and recovery ()

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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Configuration	Advanced			
Standard: Low	Typical High			
🧧 Processor	4 core(s)			
🚥 Memory	8 GB			
🚍 Disk 1	60 GB			
O CD/DVD 1	None			
	0			

- **Default Low Configuration**: 4 processor, 8 GB memory, 6o 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.

Standard: Low	Y Typical High	Cores: 4 core(s)
😑 Processor	4 core(s)	
Memory	8 GB	Virtual Sockets: 1
📥 Disk 1	60 GB	Cores Per Socket: 4
O CD/DVD 1	None	Enable NUMA Scheduler ()
🗯 eth0	Connected To: Edge1	Use CPU from host ()
		Para-virtualized clock ()
👹 Other Hardwa	ares e▼	Enable CPU hot add (change could be made in powered-off state) Guest OSes Support

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.

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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 512 MB, and the maximum is 1TB.

Configuration	Advanced	
Standard: Low	Typical High	Memory Size: 128 GB
🧧 Processor	4 core(s)	
🚥 Memory	8 GB	128 6 B
🚍 Disk 1	60 GB	
O CD/DVD 1	None	at ^e t ³
吨 eth0	Connected To: Edge1	Enable huge-page memory 🕕
		Performance of VMs will be improved if huge-page memory is enabled for specific applications, but disks will be pre-allocated.
🍓 🛛 Other Hardwa	res	Support ()
🕣 Add Hardware	Ŧ	

Enable memory hot add: Once memory hot-add is enabled, memory resources can be hotadded 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.

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Configuration	Advanced						
Standard: Low	Y Typical High	Disk Type: New disk Existing disk Physical disk Shared disk					
😑 Processor	4 core(s)	Disk Capacity: 60 GB					
Memory	128 GB	Allocation: Opnamic provisioning					
📥 Disk 1	60 GB	Allocate space based on pre-allocated space and actual demands, to enhance disk performance and utilization					
O CD/DVD 1	None	O Thin Provisioning					
🖮 eth0	Connected To: Edge1	Allocate space based on actual data size as needed, saving space. O Pre-allocating					
		Pre-allocate a fixed amount of space, enhancing disk performance but wasting more storage space.					
端 Other Hardwa	ares	Support Virtio					
Add Hardward	e▼	It helps to improve Disk IO performance, but some versions does not support this feature. Do not change the default unless necessary.					

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:



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.

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

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

Disk Type:	🔿 New disk	Existing disk	🔵 Physical disk	○ Shared disk			
Disk File: //irtualDatastore1/images/clust							
O Support mounting a vhd, vhdx or qcow2 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 Type: 🔿 New disk 🔿 Existing disk 💿 Physical disk 🔿 Shared disk									
Disk	÷		\$	Туре	*	Storage 🌲	De				
No data available											

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

Disk Typ	De: ONe	w disł	() Ex	isting disł	< O Phy	/sical	disk 💿 Share	d disk
	Disk	*	‡	*	Туре	*	Storage 🌲	De
	No data available							

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.

```
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```

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	
	Enter OK (case-insensitive)	
	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.

Configuration	Advanced	
Standard: Low	/ Typical High	CD/DVD Drive:
Processor	2 core(s)	O None
Memory	4 GB	Load ISO image file
💻 Disk 1	80 GB	Browse
CD/DVD 1	None	Upload from this Local PC
💼 eth0	Connected To: DefaultEdge	
🍓 Other Hardwa	ares	
🔶 Add Hardwa	ire V	

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.

Standard: Lo	w Typical High	CD/DVD Drive:	
Processor	2 core(s)	O None	
Memory	4 GB	Load ISO image file	
🦰 Disk 1	80 GB	Browse	
CD/DVD 1	None	Upload from this Local PC	
💼 eth0	Connected To: DefaultEdge		
👹 Other Hardw	ares		
🔶 Add Hardw	are 🔻		

etho: Specifies what the virtual machine is connected to.





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

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

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

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

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 Hardwares: Includes Graphics Adapter, Mouse Type and BIOS Option.

Standard: Low	Typical High	Built-in Graphics:	Standard VGA graphics adapte	er 🗸 🚺	-
😑 Processor	8 core(s)	Mauga Tupa:			
🚥 Memory	16 GB	wouse type.	0088 09820		
🚍 Disk 1	120 GB	Keyboard Type:	QWERTY(USA)	~	
CD/DVD 1	None				
💼 eth0	Connected To: Edge1	BIOS Option:	🖲 SeaBIOS 🛛 UEFI 🕕		
			 Specified 		
				Browse	
🍀 🛛 Other Hardwa	res		Upload BIOS File from Local PC		
🕒 Add Hardware	•		BIOS POST Time: 0		second(s)

Graphics Adapter: 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 hardwares, 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.

Standard: Low	y Typical High		Disk Type:
😑 Processor	8 core(s)		Disk Capacity: 120 GB
Memory	16 GB		Allocation: Dynamic provisioning
📥 Disk 1	120 GB		Allocate space based on pre-allocated space and actual demands, to enhance disk performance and utilization
a Disk 2 🦰	120 GB	×	
O CD/DVD 1	None		Allocate space based on actual data size as needed, saving space. O Pre-allocating
💼 eth0	Connected To: Edge1		Pre-allocate a fixed amount of space, enhancing disk performance but wasting more storage space.
👹 Other Hardwa	ares e ▼		Support Virtio It helps to improve Disk IO performance, but some versions does not support this feature. Do not change the default unless necessary.

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

Boot Order:	1 Disk 1 ✔ 2 CD/DVD ✔ 3 None	✓ ①	
Lifecycle:	Immortal O Expiration Date 2020-03-12		
Hostname:	Default hostname	Guest OSes Support ()	
Others:	 Power on at node startup Reboot if fault occurs (due to stuck, blue screen, etc., requiring vmTools installed) Enable UUID generator (auto generate UUID) () 		

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

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Boot Order:	1 Disk 1	🗸 2 CD/DVD 🗸 3 None	✓ ①	
Lifecycle:	💿 In Disk 1	O Expiration Date 2020-03-12	28	
Hostname:	D Disk 2	Specified	Guest OSes Support ()	
Others:		artup		
	Reboot if fault occurs (due to stuck, blue screen, etc., requiring vmTools installed)			
	Enable UVID generator (auto generate UVID) 🕕			

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.

Configuration	Advanced
Boot Order:	1 Disk 1 ✓ 2 CD/DVD ✓ 3 None ✓ ①
Lifecycle:	O Immortal ● Expiration Date 2020-03-12 □
Hostname:	Default hostname Specified
Others:	Power on at node startup
	Reboot if fault occurs (due to stuck, blue s Sun Mon Tue Wed Thu Fri Sat
	Enable UVID generator (auto generate U 1 2 3 4 5 6 7
Debugging	8 9 10 11 12 13 14
Condigania	15 16 17 18 19 20 21
	22 23 24 25 26 27 28
	29 30 31 OK Cancel

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 thhis 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

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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:

ጵ Debugging	
	Memory Reclaiming (detect and reclaim free memory of idle virtual machine for others)
	🗌 Support Virtio 🕕
	🗌 Filter page files (for Windows system only) 🕕
	🗌 Disable Pause-Loop Exiting 🕕
	Disable kvmclock 🕕

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 extend 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 affect source virtual machines.

To clone a virtual machine, click **New** in **Compute** and select **Clone VM** on the **Create New Sangfor Technologies**

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Virtual Machine page to enter the following page. On that page, select a virtual machine that you want to clone.





- A powered-off virtual machine cannot be cloned.
- A virtual machine being migrated or 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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Clone Virtual Machine				
Select Virtual Machine 2 Ready to Complete				
**	Name: VMs: Description: Group:	kaizhi_win7_Clone 1 Eventual Server Name(s): kaizhi_win7_Clone0001 KaiZhi	 	
	Clone Type:	Full Clone Power on virtual machine at creation Migrate to another node if the node fails HA Settings ()	~] ₩	
	Datastore: Storage Policy:	VirtualDatastore1 <use 2_replica="" original="" policy:="" storage=""></use>	~ ~	
	Run on Node: Hostname: Network Connection: NIC:	<auto> Optional Guest OSes Support ① Enable NIC of cloned VM ① eth0 To: •••• Network Setti</auto>	∽ ngs	
		Back OK Cance	I	

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

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b. Linked Clone

Description: Clone the virtual machine by linking the disk file to the original virtual machine. This method is recommended to be use 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 occuptation can be reduced.
- 3. Performance might be slightly affected after cloning 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

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	
💡 QXL graphics adapt	er will be used by default after VM is imported. If display issue occurs after startup, change the graphics adapter manually.	
File Type:	OVA or VMA 🗸 🗸	
	To use a vhd, vhdx or gcow2 image file, choose Existing disk and then select that image file when configuring disk for virtual machine.	
VM Image Files:	ova or vma file 🧧	
Group:	Default Group 🗸	
HA:	✓ Migrate to another node if the node fails HA Settings ①	
Datastore:	ISCSI 🗸	
Run on Node:	<auto></auto>	
OS:	Default 🗸 🗸	
	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**.

1	Import vma File
Uploading file centos_import_1.vma. Please do	not close this page.
Total Size: 486.3 MB.Progress: 59.8 MB, Upload	d Speed: 8.31 MB/s, Time Taken: 7 seconds, Time Remaining: 51 seconds
	Cancel
Δ	

• 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.

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- 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.

Pa														٢	Name	
								A 3								
	Bas	sics														
	Statu	IS	\$	VM Name	4	⇒ IP A	Address	\$ G	roup		\$	CPL	J Usage		Mem	ory Usa
		New (Grou	qu								×	3%		•	32%
													1%		•	14%
		Loo	catio	n:	Virtual Mach	ine					~		3%			40%
	C	Gro	oup N	lame:									0%		•	15%
	¢												1%		ı	10%
	¢												1%		•	13%
	C								ОК	Ca	ncel		1%		•	13%
	0	Powered				-		Ce	entos			-			-	

2.2.1.6 Sorting Virtual Machines

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

Panel 📃 List	⊖Refresh ⊖New	🕂 New Group 🚪	Select 🚽	Sort 🗸 🚥 More					Vame	Q Advanced 🗸
				/ Name	11 machine	(s) giving alarm. ∀iew				
НА	А	А на		CPU Usage Memory Usage	11 11	на	Ана	HA	НА	
- * *	 			Disk Usage	11	-\$*		 - **	-	fe

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.

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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.

■Panel E List OR	efresh 🕂 New 🕂 Ne	w Group 🗧 Select	J∃Sort~	•••More	
			Nam	e Usaqe	nachine
HA Sée	HA	на	Mem Disk	ory Usage Usage	1 1
Windows Server 2012 R2 E CPU Usage 100%	Windows Server 2019 SC CPU Usage 1009	kaizhi_win_s 6 CPU Usage	erver 77%	Sangfor_a CPU Usage	aCMP_6.0 47%
Memory Usage 45%	Memory Usage 459	6 Memory Usage	28%	Memory Usage	e 47%
Disk Usage 33%	Disk Usage 489	b Disk Usage	36%	Disk Usage -	2%

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.

🕂 Panel 📃 List		resh 🕂 New	+ New G	Group 📕 Select	J∃ Sort ∨	•••More	
					Nam	ie	11 nachin
НА	<u> </u>	НА	A	НА	CPU	l Usage hory Usage	11
	•				Disk	Usage	11
ChuaADS	erver	WANO_S	т	Yong_WinServe	er2012	Intern_BR_WAN	IO_acmp-35e9
CPU Usage	10%	CPU Usage	6%	CPU Usage	0%	CPU Usage	4%
Memory Usage	100%	Memory Usage	98%	Memory Usage	91%	Memory Usage	86%
Disk Usage	10%	Disk Usage	16%	Disk Usage	8%	Disk Usage -	3%

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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.

Panel 📃 List		resh 🕂 New 🖸	New (Group 📕 Select	1∃Sort ·	•••More	
					Nar	ne J Usage	^{nachine}
HA		НА		НА	Mei	nory Usage	11
		-350			🗸 Dis	< Usage	11
Yuan PC		Calvin_Win7		EDR_SERVER_acm	np-072b	win7-Jim	y_Clone
CPU Usage	0%	CPU Usage	0%	CPU Usage	1%	CPU Usage	0%
Memory Usage	37%	Memory Usage	14%	Memory Usage	16%	Memory Usage	9 12%
Disk Usage	79%	Disk Usage	64%	Disk Usage	61%	Disk Usage	60%

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 Cluesters, and Migrate to Vmware vCenter.



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

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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.

Move		×
Select group:	Finance	~
	ОК	Cancel
	OK	Ouncer

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

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Edit Virtual Machines		×
Edit		-
CPU		
Virtual Sockets:	1 ~	
Cores Per Socket:	2	
Memory		
Memory Size:		GB
Other Hardwares	00055572(412.0)	
кеурбаго туре.	QWERTY(USA)	
Add		
Disk		
Size:		GB
Allocation:	 Dynamic provisioning Dynamically allocate space based on pre-allocated space actual demands, which may enhance disk performance a utilization. Pre-allocation Pre-provision a fixed amount of space, which may enhance 	e and and ce disk
	r re provision a med arround of space, when may errian	co dian
Adapter Model:	Realtek RTL8139 🗸	
Connected to Switch:	•••	
Others		
Change VM icon		
Change reboot mode		
Power on VM at hos	t startup	
Change priority		
High priority Change lifecycle		
No limit Expiry da	te 2020-03-12	
		-
	ок	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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Take Snapshot – To take a snapshot according to the VM, choose one or more than one virtual machines and select Take Snapshot.

Take Snapsh	ot	×
Selected VM(s):	Yuan PC	
Name:	2020-03-12_11-32-55	
	This name will be applied to all snapshot files of th virtual machines.	ie selected
Description:		
		Consol
	OK	Cancel

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

Migrate VM	×
Select Location Type 2 Specify Dst Location	
Location Change: Working location only	
Migrate virtual machines to another node.	
O Datastore and working location	
Migrate virtual machines to another virtual datastore or other storage. Working location can also be changed so that VM can be migrated to another node.	S
Next Cancel	

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	Current Location		Destination Location
Datastore:	VirtualDatastore1	× ···>	Datastore: VirtualDatastore1 🗸
Storage Policy:	2_replica	\sim	Storage Policy: <use original="" polic="" storage="" td="" 🗸<=""></use>
Current Node:	192.200.19.18	\sim	Destination Node: 192.200.19.18

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

Migrate VM (S_NAS2) Acro	oss Clusters		×
1 Cluster	Datastore and Node	3 Network Set	tings
с	luster IP: Cluster IP address or clu	uster controller IP address	
Р	assword: admin password		
			Next Cancel

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Migrate VM (S_NA	S2) Across Clusters				×
1 Cluster	2 Datastore	and Node ——	3 N	letwork Settings	
Curre	ent Cluster (192.200.19.20)		Desti	nation Cluster (192.168.20.)	2)
Datastore:	VirtualDatastore1	~	Datastore:	ISCSI	~
Storage Policy:	2_replica	\sim	Node:	192.168.20.3	~
Node:	192.200.19.18	\sim			
Power on virtual ma	achine upon migration complet	tion			
Max migration rate O The virtual machine	e will be powered off automatic	ally			
		, any		_	
Back				Next	Cancel
Migrate VM (S_NA	S2) Across Clusters				×
1 Cluster	2 Datastore	and Node ——	3	Network Settings	
		*	🗹 Enabled		
吨 eth0 D	isconnected		Connecte	d To:	•••
			Connecte	d To: Edge1	
			Adapter M	odel: Intel E1000	~
			MAC Addr	ess: FE:EC:FE:27:66	3:88
		•			
_				_	
Back				ОК	Cancel

Migrate to VMware VCenter - To migrate the VM to VMware VCenter, choose one or more than one virtual machinese and select Migrate to Vmware VCenter.

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Current Location: SA	NGFOR aCloud		Destina	tion Location: VMware vC	≎enter
Selected	Status		vCenter:	vcenter	~
S_NAS2	🛕 Alarm		Group:	vcenter/CTI ESXI/Disc	overed v 🗸
Yong_WinServer2012	Powered On		Datastore:	datastore1	~
			Run on Node:	vcenter/CTI ESXI/192.2	200.19.3 🗸
to shut down the migrated vir is will have the virtual machin n location. If you do not want i I machine, do not select this to not we can the virtual machin	tual machine in SANGF te power off automatica the virtual machine to p option. You may power	OR aCloud to co Ily before migrat ower off at unexp off the virtual ma	mplete migration ion completes to h ected time and int chine manually wh	ave the new changes syr errupt the services being ren migration completes.	nced to the c offered via t

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



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

HA	Cheneyredhat
:	Suspending

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



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:	ISCSI	~
	Run on Node:	<auto></auto>	~
	Guest OS:	Select which type of OS to install	~
	Processor:	2 X 8 cores	
	Memory:	64 GB	
	Edit ∨M	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.

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```
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```

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 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.



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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.

Virtual Machine ⇒ Create VM				
🗸 Create VM 🛛 —	—— 🕑 Install Gu	est OS	3 Allocate Disk ———	4 Finish
Disk Planning				
	Disks	Size of Disk (GB)		
Log Disk:	3	50		
Data disk:	3	100		

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

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

5. 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:

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



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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 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.

	Checking dependencies in packages selected for installation		
Please select any additional repositories that	t you want to use for software installation.		
🗌 High Availability			6
Load Balancer			111
Red Hat Enterprise Linux			
C. Basiliant Channes			Y
	Modify repository		
You can further customize the software select management application.	ction now, or after install via the software		
0			
		en Back	I €xt

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.

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Creating SQL Server

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 etho ports on the two

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3. Create virtual machine

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

Virtual Machine > Create VM			
1 Create VM 2 Install Gue	st 0S	3 Clone VM 4 Allocate Disk 5 Configure	Scheduling Policy
	Name:	test1	
	Datastore:	ISCSI	~
	Run on Node:	<auto></auto>	~
	Guest OS:	Windows Server 2016 64 bit	~
	Processor:	2 X 8 cores	
	Memory:	2 GB	
	Edit ∨M	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.	×
	o JAGUAR7000-1.1.1-170522-1802.iso	Install Now
(150	 SangforVMSTool.iso 	Install Now
Install from ISO Image	o drbl-live-xfce-2.2.0-22-i686-pae.iso	Install Now
•	• OracleLinux-R7-U4-Server-x86_64-dvd.iso	Install Now
Ø	Windows server 2008 r2.iso	Install Now
Install from USB Device	o ubuntu-16.04.3-server-amd64.iso	Install Now
	o ubuntu-16.04.3-amd64.iso	Install Now

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- After guest OS is installed, firewall must be disabled.
- As for database, SQL Server 2012 Enterprise SP1 is recommended(SQL Server 2012 and 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	— VIII 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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DISK Plann	ling			
	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

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.

7. 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 —— 🧿 Finish
Congratulations
eongratulations.
You have completed configuration of SQL Server AlwaysOn Cluster hardware and operating system.
1. Download Deployment Guide
2. 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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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(powered 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 card and the following buttons will appear on that card, as shown in the following figure:





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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-1	*		- 4		00	Suspend
				_	(Power Off
CPU Usage	1%	CP	U Usage	9%		Migrate
Memory Usage	12%	Me	mory Usage	27%		Migrate to VMware vCenter
Disk Usage	17%	ŋ	Reset		₽	ائ ⁸ Migrate Across Clusters
		ō	Take Snapsho	ot	C*	Export
НА		ঌ	Backup		ىر	Repair Disk
	A	٥	Clone			Deploy VM
Yong_Wins	Server2016		Edit			Snapshots /
Dowor On	Shut Down		Summary			ەر Backups
	Shut DOWN	ప్ర	Backup/CDP	Policy		Assign Permissions
Console	More		More		団	Delete



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 Alarms, as shown below.

Compute > (Yong_WinServer2016) Summar	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
---------------------------------------	----------	------------	-------------	-------	--------	--

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.



Compute > (Yong_V			Summary	Snaps	hot	Backup/CDP	Permis	ssions	Tasks	Alarms
🕂 Refresh	🕞 🗔 Console		Shut Down]] Suspend	🖸 Take S	Snapshot [ව Backup	🖉 Edit	More 🗸	
Status										
						Throug	hput 🔻 CPU	J Memory	IO Speed 🔻	Las
	_					4Kbps				
CPL	J Usage	Memory Usage	Di	sk Usage						
	2 %	19 *	.) (13 »		2Kbps				7 A
2.4 GHz	X 8 core(s)	Total: 8 GB Free: 6 48 GB	Tot	al: 340 GB : 295 12 GB			16			
		1100.0.10.00	1100	. 200.12 00		0bps	09:45	1	0:00	10:15 10:30
								— Inbe	ound 751 bps -	— Outbound 246 bps
Basics & Ha	ardware Config	uration								
VM Name:		Yong_WinServer2016	ì			▶ 📼	Processor	8 core(s)		
Description:		Edit					Memory	8 GB		
Group:		Yong				▷ =	Disk1	100 GB		
Datactore:		102 200 10 18 102 2	10 10 10				D:-10	400.00		

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.



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

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⊳ Start	[]] Suspend	🗌 Shut Down	(I) Power Off	⊖ Reset	ତ୍ତ CD/DVD Drive 🗸	🛛 🗹 Edit	品 Hot Keys 🗸	[] Full Screen
品 Hot	Keys 🗸	Hot keys lis	ts combir	nations	ofcommonly	-used k	æys.	
品 Hot	Keys 🗸	며 Full Scre	e					
Ctrl	+ Alt +	Del						
Alt	+ F4							
Alt	+ Tab							
Ctrl	+ Space							
Ctrl	+ Shift							
Win	+ D							
Win	+ R							
Win	+ L							

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**.

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. **Sangfor Technologies** Block A1, Nanshan iPark, No.1001 Xueyuan Road, Nanshan District, Shenzhen, China T.: +60 12711 7129 (7511) | E.: tech.support@sangfor.com | W.: www.sangfor.com 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:



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.

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Migrate VM							×
Select Location Type	2 Spec	ify Dst L	ocation				
	Current Location			D	estination Location		
Datastore:	VirtualDatastore1	~	~~>	Datastore:	VirtualDatastore1	~	
Storage Policy:	2_replica	~		Storage Policy:	<use original="" storage<="" td=""><td>poli 🗸</td><td></td></use>	poli 🗸	
Current Node:	192.200.19.18	~		Destination Node:	192.200.19.18	~	
🤣 Virtual machine could ga	in optimum performance if o	destinatio	n node is in the	e virtual datastore (Vii	tualDatastore1).		
					_		
Back					ОК		Cancel

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.

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.

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Block A1, Nanshan iPark, No.1001 Xueyuan Road, Nanshan District, Shenzhen, China T.: +60 12711 7129 (7511) | E.: tech.support@sangfor.com | W.: www.sangfor.com 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.



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

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- *	SANGFOR aCloud	Home Comp	oute Networking \$	Storage 1	Nodes Reliability	System		Health Check	173	admin Super Admin
			Service and Tech	n Support	Download					
	Download						_			
	SANGFOR aCloud Softwa	are			SANGFOR Co	nverter				
	•	SANGFO	र aCloud				SANGFOR Converter			
	Download ISO Image:				For Windows-Bas	sed Server:	For Linux-Bas	ed Server:		
	Update Server in USA				Update Serve	er in USA	(1) Update S	erver in USA		
	Update Server outside US	A			Update Serve	er outside USA	(J) Update S	erver outside USA		

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.

Choose the node resides	e on which primar	y Sangfor SDDC controller
Credentials		(+)
172.28.121.16	172.28.121.19	

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

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Virtual Machine	El .	
	Name:	VM1
	Datastore:	FC-1.2T
	Run on Node:	172.28.121.19
~	Group:	Default Group
Configuration	Advanced	
Low	Processor:	<u>1 core(s)</u>
Typical	Memory:	<u>4GB</u>
High	Disk:	IDE0 40 GB
O Custom	NIC:	NETO bridged to ????1

⚠

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 Conve Sangfor SDDC Conve	rter rsion 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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Sangfor Converter

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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Welcome to Sangfor	Converter
	Medanak Carlinnadian
	1 eth0 cable plugged
	<pre></pre>

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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Network Configur Please configure interf	ation for eth0
Local IP Address: Netmask: Gateway: Cluster Primary IP:	100.100.164.4 255.255.255.0 100.100.164.254 100.100.164.101
< OK >	< Back >

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 **Sangfor Technologies**

Block A1, Nanshan iPark, No.1001 Xueyuan Road, Nanshan District, Shenzhen, China T.: +60 12711 7129 (7511) | E.: tech.support@sangfor.com | W.: www.sangfor.com 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					
Organization Converter() Converter()					
Status	IP Address	Migrated ∨M Name	Operation		
Progress 0%, Estimating how long it will Details	100.100.164.243	tao	Cancel		

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

	Name:						
34	Group:	Default Group			~		
	Tag:	Select	Select				
	HA:	Migrate VM to and	other node if the node	fails HA Se	ttings		
	Datastore:	ISCSI			~		
	Run on Node:	<auto></auto>			~		
	Guest OS:	Select which type o	f OS to install		~		
	High Priority:	Guarantee resour	ces for VM operation a	and recovery (D		
Configuration	Advanced						
Standard: Low	Typical High	1	Cores: 8	core(s)			
😑 Processor	8 core(s)						
Memory	16 GB		Virtual Sockets:	1	~		
🦰 Disk 1	120 GB		Cores Per Socket:	8	~		
CD/DVD 1	None		🗹 Enable NUMA So	heduler 🕕			
eth0	Connected To: Edge1						

After making the above configurations, start migration.

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Migrate Physical Machine with Sangfor Converter ×						
G Refresh The following nodes are being migrated	Do	wnload Sangfor Converter(wind	ows , linux)			
Status	IP Address	Migrated ∨M Name	Operation			
• Progress 0%, Estimating how long it will Details	100.100.164.243	tao	Cancel			



- Conversion of physical machine is supported by Sangfor HCI_{3.3} 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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VM Name:	Intern_HQ_WANO_acmp-694	7	VM Name:	Intern_HQ_WANO_a	cmp-6947_(
Group:	Default Group	~	vCenter:	vcenter	~
Datastore:	VirtualDatastore1	~ ~ >	Group:	vcenter/CTI ESXI/Dis	covered · 🗸
Storage Policy:	2_replica	~	Datastore:	datastore1	~
Run on Node:	192.200.19.18	~	Run on Node:	vcenter/CTI ESXI/192	2.200.19.9 🗸
o shut down the s will have the vi tion location. If y nat virtual machin	migrated virtual machine in SANG irtual machine power off automati- ou do not want the virtual machin ne, do not select this option. You	GFOR aCloud to cally before migr e to power off al may power off th	complete migration ation completes to unexpected time te virtual machine	on o have the new change and interrupt the servic manually when migrati	es synced to ces being off on complete

Before migration, you need to specify the fields under Current Location and Destination Location. Whether to select the options Auto shut down the migrated virtual machine in Sangfor HCI to complete migration and Auto power on the virtual machine in VMware vCenter upon migration completion depends on your own needs.

Auto shut down the migrated virtual machine in SANGFOR HCI 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.

After configuring relevant fields, click **OK** to start migrating virtual machine and you will see the migration process. You can also view migration progress and more details in tasks, as shown below:

Status		Src VM 🌲	Run on Node	Working Da	VM Name 🔶	Run on Node	Datastore	Ope
0 %	Details	WANO-WIN7	192.168.19	datastore1	WANO-WIN7-test	<auto></auto>	Datastore_2_c	Cancel

2.2.1.11.3 Migrating VM Across Clusters

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

Live Migration

Compute > (sangfortest)	Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
🕞 Refresh 🛛 🔄 Console 🔹 ▷ Power C	Dn 🗌 Shut Down 📲	Suspend · 🙆 Take s	snapshot 💿 B	ackup 🛛 🖄 Edit	More 🗸		
Status					() Power	Off	
		Т	hroughput 🔻 CP	U Memory IO Spee	d ▼ Reset		
			inoughput · Or		Clone		P
					D→ Migrate		
					➡ Migrate	to VMware vCenter	
CPU Usage Memory Usa	ge Disk Usage				Migrate	Across Clusters	
	10				Export		
	* 18 *	ОЬ	ips		Deploy	VM	
					😫 Conver		
2.4 GHz X 8 core(s) Total: 2 GE	Total: 30 GB				₽ Conver	t to template	
File. 2 GE	5 Fiee. 24.01 GB		10:3	0 10:45	11:00	11:15	

And then

Migrate VM (Yong-Centos) Across Clusters				
1 Cluster	2 Datastore and Node	3 Network Settings		
	Cluster IP: 192.			
	Password: •••••			
		Next	Cancel	

Cluster IP: Specifies IP address of destination cluster.

Password: Specifies admin password.

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Migrate VM (Yong	Migrate VM (Yong-Centos) Across Clusters					
1 Cluster	2 Datastore	and Node		3	Network Settings	
Curr	rent Cluster (192.200.19.20)			De	stination Cluster (192.168.2)	D.2)
Datastore:	VirtualDatastore1	\sim	····>	Datastore:	ISCSI	~
Storage Policy:	2_replica	\sim		Node:	192.168.20.3	~
Node:	<auto></auto>	\sim				
Power on virtual ma Max migration rate	chine upon migration completion	n				
O The virtual machine	e will be powered off automatical	lly				
Back					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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Migrate VM (Yong-	Centos) Across Clusters		×
1 Cluster	Datastore and Node	Network Settings	
eth0 D	hisconnected	Enabled Connected To: Connected To: Advanced Adapter Model: Intel E1000 MAC Address: FE:FC:FE:34:1A:DA	·· ·
Back		OK Can	cel

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.

ý

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

Cold Migration

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Migrate VM (Yong	-Centos) Across Clust	ers				×
1 Cluster	2 Datasto	re and Node		3	Network Settings	
Cur	rent Cluster (192.200.19.20)			Des	stination Cluster (192.168.2)	0.2)
Datastore:	VirtualDatastore1	~	····>	Datastore:	ISCSI	~
Storage Policy:	2_replica	~		Node:	192.168.20.3	~
Node:	<auto></auto>	~				
Power on virtual ma	chine upon migration complet	tion				
Max migration rate	MB/s					
Q The virtual machine	e will be powered off automatic	cally				
Back					Next	Cancel
Ý						

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 (windows	10-template_Primary cluster_3d884aa3_CTI Test_46407	7801)	×
Based on this virtual ma	achine, deploy new virtual	nachines from template. Read More		
	Name:	windows10-template_Primary cluster_3d884aa3_CTI Test_46407801		
	VMs:			
	Group:	template	~	
	HA:	Migrate to another node if the node fails HA Settings		
	Datastore:	VirtualDatastore1	~	
	Storage Policy:	2_replica	~	
	Run on Node:	<auto></auto>	~	
Private Disk	Configuration	Advanced		
Create Private	e Disk (to store data chani	es on the virtual machine since VM template deployment)		
Size:				
			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_ooo1** and **name_ooo2** 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 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.

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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:

Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
] Shut Down []]		ake Snapshot 🛛 🛚	🛛 Backup 🔹 🗹 E	dit More 🗸		
				() Pow	ver Off	
					et	
		Inroughp	ut CPU Memory		ie	
				⊡+ Migi	rate	
				⊡⇒ Migi	rate to VMware ∨Cer	nter
Disk Us	age			t ∰ Migi	ate Across Clusters	
7	0.6	Obpr		Exp	ort	
/ /	70	obps		🔑 Rep	air Disk	
				H Dep	loy VM	
Total: 25 Free: 232	0 GB 2.2 GB			🐴 Con	vert to VM	
			18:00 18	B:10 E Con	vert to Template	

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:

Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
]Shut Down [][Suspend 🔹 🖸	Take Snapshot 🛛 🖻	🛛 Backup 🛛 🗹 E	dit More 🗸		
				() Pow	er Off	
		Theresel			et	
		Inroughp	ut V CPU Memory		ie	Ir
				⊡→ Migi	ate	
				⊡→ Migi	ate to VMware ∨Cer	nter
Disk Us	sage			🕀 Migi	ate Across Clusters	
20				🗠 Exp	ort	
	5 %	Obps		🔑 Rep	air Disk	
				🖽 Dep	loy VM	
Total: 8: Fron: 65	5 GB			🛓 Con	vert to VM	
Fiee. 65.	13 00	_	18:00	18:10 🖳 🖳 Con	vert to Template	p

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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.

Status	
	Throughput CPU Memory IO Speed Last Hour Last 24 Hours
CPUUsage Memory Usage Disk Usage	100%
16 % 19 % 13 %	50%
2.4 GHz X 8 core(s) Total: 9.0B Total: 340 GB Free: 8.46 GB Free: 285.11 GB	0% 750 18:00 18:10 18:20 18:30 18:40 18:50
	— CPU Usage 4%

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.

Status	
CPU Usage 16 % 2.4 GHz X 8 core(s) Memory Usage 19 % Total: 8 GB Free: 8.46 GB Total: 340 GB Free: 295.11 GB	Throughput ▼ CPU Memory IO Speed ▼ Last Hour Last 24 Hours 9.31C8

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.



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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 VMName, Description, Group, Datastore, Storage Policy, Run on Node, Current Node, Scheduling policy, Guest OS, vmTools, High Priority, Power on at host startup, Enable memory reclaiming, Boot Order, Sangfor Technologies

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Uptime.

Basics & Hardware Confi			
VM Name:	Yong_WinServer2016	Processor	8 core(s)
Description:	Edit	Memory	8 GB
Group:	Yong	þ 👝 Disk1	100 GB
Datastore:	192.200.19.18;192.200.19.19	þ 📥 Disk2	120 GB
Storage Policy:	2_replica	þ 📥 Disk3	120 GB
Run on Node:	<prefer 192.200.19.18="" on="" run="" to=""></prefer>	CD/DVD1	CD/DVD Drive: /VirtualDatastore1/iso/en_windows_server_2016_x84_dvd_9718
Current Node:	192.200.19.18	þ 📻 ethO	Connected To: Switch0425, IP address: 10.123.123.10
Scheduling Policy:			
Guest OS:	Windows Server 2016 64 bit		
vmTools:	running Reinstall		
High Priority:	Disabled		
Power on at Host Startup:	Disabled		
Memory Reclaiming:	Enabled (5.63 GB reclaimed)		
Boot Order:	Disk 1->CD/DVD		
Uptime:	3 days 2 hrs 37 mins 5 secs		

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.o.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.

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

Compute > (Yong_WinServer2016)		Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms
Snapshot Chain List	C Refresh 🖸 Ta	ike Snapshot 🛛 🛱 S	Snapshot Policy				
Snapshot Policy: Not configured Current Snapshots: 1 Snapshot Size: - Latest Snapshot: 2020-03-14 19.07 Next Snapshot: -	d O	2020-03-14_18-06-	48				
Take Snapsho	ot				×		
VM:	Yong_WinSe	rver2016					
Name:	2020-03-14	4_19-14-01					
Description:							
				ок	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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		\rightarrow
2020-0:	Name:	2020-03-14 19-06-46
	Description:	
	Description.	
	Туре:	Virtual Disk Based Snapshot
	Size:	-
	Datastore:	VirtualDatastore1
	Time Created:	2020-03-14 19:07:07
	🗹 Edit 🖞 D	elete 🕚 Recover 🗇 Clone

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

To delete the snapshot, you may click **Delete Snapshot**. 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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Recover		×	
	Are you sure that you want to recover it to the state at the time point (2020- 03-14_19-06-46)?		•
	 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. 		
	 Virtual Machine(Yong_WinServer2016) is running. It will be shut down before recovery. 		
	Power on virtual machine upon recovery completion Auto-take a snapshot before recovery		
	Enter password of admin to confirm this operation:		
	Password		•
	ОК СК	ose	

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**.

- 5	SANGFOR aCloud	Home	Compute	Networking	Storage	Nodes	Reliability	System	Health C	heck
Reliabilit	y > Snapshots		VM Snapshots	Consistenc	y Group	Snapshot Policy	Data Prote			
C' F	Refresh 🕂 New Consistency Grou	i p 🛅 Delet	e Consistency G	roup 🔳 Clone		🖸 Take Sna	Scheduled	Backup/CDP	НА	
							Snapshots	7	Resource Scheduling	
Add Or	acle-RAC VMs or multiple VMs running the	e same busines	s system to a consis	stency group to cre	ate snapshots	s for all VMs in the g	roup at a time to	guarantee data	Automated Hot Add	
	Consistency Group Name D	escription		VMs 🌲	Snapshot	s 🌲 Snap	shot Size 👙		VM Scheduling	
	test -			2	2	94.64	GB		Resource Reservation	
									UPS	

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

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Reliabi	lity > Snapshots	VM Snapshots	Cons	istency (Group S	napshot	Policy			
G	Refresh How Consistency G	roup 👖 Delete Consistency G	iroup 🗐	Clone C	Group	🖸 Tak	e Snapshots 🔞	Recover 📄 Clone fro	m Snapshot	
Add	Oracle-RAC VMs or multiple VMs running	the same business system to a consi	stency group	to create	e snapshots fo	r all VMs	in the group at a time t	o guarantee data consisten	zy.	
	Consistency Group Name	Description	VMs	*	Snapshots	*	Snapshot Size 🔺	Latest Snapshot	Snapshot Policy	Operation
	test	-	2		2		94.64 GB	2020-05-04 14:00:21		Edit

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

New Consiste	ency Group			×
Name: Description:	Oracle <u>RAC</u>			
Virtual Machine:	Available	Group V	Selected	🗂 Clear
	VW Name	Size Datastore	Shapshot Poicy	No data available
				OK Cancel

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.

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**.

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Reliability > Snapshots		VM Snapshots	Consistency Group	Snapshot Policy
C Refresh New Snapshot Policy	👖 Delete	🗸 Enable 🛇	Disable 🖸 Take Snaj	pshot 🍄 Advanced

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	Operation Policy Name	e — 4 Finish	
O If a snapshet policy has associated with the so	acted VM or consis	tongu group, it will be rea	placed with this new policy	
Applicable Object: Virtual machine Cons	istency group (app	licable to Oracle RAC)	praced with this new policy.	
Available			Selected	
E Group	✓ National Nation	me Q	EE	Clear
VM Name	Size	Snapshot Policy	VM Name	Remove
Virtual Machine		Â	Virtual Machine	
		_		
		•		
			Next	Cancel
New Snapshot Policy				×
Select Object 2 Schedule	Snapshot	- 3 Policy Nam	e — 4 Finish	
Schedule: OWeekly ODaily OHourly				
Time: Every day 00:00	~			
Merge earlier snapshots as follows to free up st	orage space			
Retain all snapshots taken in recent 7 day(s) Retain 5 7 recent snapshots and marga and	er snanshoto			
Retention Options	er snapsnots.			

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Ne	w Snapshot Policy					×
<	Select Object 🛛 😽 So	hedule Snapshot	Policy Name	4 Finish		
	Name:	Schedule Snapshot				
	Description:	-				
	Snapshot Interval:	Daily(Every day, 00:00)				
	Consistency Group Snapshot Policy:	No				
E	Back				ОК	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.

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Advanced		×
Snapshot will not be created as schedule	d upon reach of thres	hold:
Virtual Datastore	Usage Threshold	
VirtualDatastore1	80	%
	ОК	Cancel

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.

Compute > (Yong_WinServer2016)		Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
🕝 Refresh 🛛 Update Logs 🛛	ව Backup 🧧	Archive 🛞 Se	ettings ⊳ Start (
Backup Policy. Not configured	Time Range:	Three days 🗸 202	20-03-14 🔀 21	: 04 🗘 to 2020-03	-14 28 21 : 04	€ Go	٠	Backup 🗹 IO Activities
Scheduled Backup Periodic: - Used Space: 0 bytes				No backup is found.	IO activities cannot be di	splayed		
CDP	03-12 00:00		03-12 16:00	03-	-13 08:00	03-14 00	:00	03-14 16:00
Status: II Stopped IO Activity Logs Retention Period - IO Log Repository Usage: -								
			No backup fil	le is available. Please Backup	e enable the Schedu	led Backup Policy fo	r it.	

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

🕞 Refresh \ominus Update Logs 🙆 Backup 💼 Archive 👶 Settings ⊳ Start CDP 🗌 Stop CDP

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 Destination Datastore	
VirtualDatastore1	~
• If the above datastores are the same. VM cannot recover when the current datastore fails	
If virtual machine is shut down or restarted during backup, its backup task will be terminated.	
Add Backup Policy, to set periodic backup and archive for VMs.	Cancel

- ý
- 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: Backup Policy:	Scheduled testzxbackup_a	○ Continuous (CDP) cmp-0f53 ✓	Add New Policy
For VMs not associately policy. To not back backup policy. If vitask will be termin	ciated with any ba cup a specific virtu rtual machine is s ated.	ckup policy, they will associate Jal machine, simply disable the hut down or restarted during ba	with default backup corresponding ackup, its backup
		OK	Cancel
Backup Settings			×
Type: Backup Policy:	○ Scheduled SC backup test	● Continuous (CDP)	New CDP Policy
IO Activity Log Repository: Max IO Activity Log	ISCSI 800	GB	
For VMs not assorpolicy. To not back backup policy. If vi task will be termin	ciated with any ba (up a specific virtu rtual machine is s ated.	ckup policy, they will associate Jal machine, simply disable the hut down or restarted during ba	with default backup corresponding ackup, its backup
		ОК	Cancel

ý

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 **Sangfor Technologies**

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shown in the following picture.





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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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**.

Time Range:	Three days 🐱	2020-03-14 🔀	21 : 26 🌲 to	2020-03-14 🛃	21 : 26 🛟	Go	🔹 Backup 🖂 IO Activities
	Last Hour						
	Last 2 Hours		No backu	in is found IO activities	cannot be displayed		
	Last 6 Hours		No bacha	p is round, to activites	carrier se aispiayea		
	Last 24 Hours						
03-12 00:00	Three days	03-12 16:00		03-13 08:00		03-14 00:00	03-14 16:00
	One week						
	All						
	Specified						
	•						

2.2.1.16.2 Viewing Backup Details

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

Ш в	xpand All 🗮 Collapse All	imes Delete		Type: All 🗸			
	Time	Туре	Used Space	Datastore	Description	Backup Lock	Operation
	2020-03-01 16:15:33	Backup	20.38 GB	VirtualDatastore1	-	Enabled	Browse Files Recover More

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 $\,{}^{\triangleright}\,$. To hide IO activity logs, click $\,{}^{\checkmark}\,$

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 te following page:

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Message		>								
	Are you sure that you want to view file directory of this virtual machine?									
To ensure data security of guest operating system, file brows 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 affect CDP service.									
	Confirm Cancel									

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:

View File								×
Search	Q	Ŷ	Download File			Search		Q
All(2)			File Name	\$ Date	÷	Туре 🔶	Size	\$
Partition(1) (2)	_	-	⊖ Up	-			-	^
⊕Boot(24)			BCD	2018-03-03 11:13:00		file	24 KB	
Partition(2)			BCD.LOG	2018-03-03 11:13:00		LOG file	21 KB	
			BCD.LOG1	2018-03-02 09:06:16		LOG1 file	-	
			BCD.LOG2	2018-03-02 09:06:16		LOG2 file	-	
			BOOTSTAT.DAT	2018-03-02 09:06:16		DAT file	64 KB	
			s-CZ	2018-03-02 09:06:16		Folder	-	
			🥑 da-DK	2018-03-02 09:06:16		Folder	-	
			🥑 de-DE	2018-03-02 09:06:16		Folder	-	
			el-GR	2018-03-02 09:06:16		Folder	-	
			en-US	2018-03-02 09:06:16		Folder	-	
				2040 02 02 02 00 00 40		E-14-5		-

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Browse Files								×
Search Q	<u> </u>	Download File			Search			Q
🖃 🧰 All(16)		File Name	\$ Date	Å	Туре	÷	Size	*
		€Up	-				-	
Boot		tracking.log	2019-08-27 02:40:11		LOG file		20 KB	
System Volume Information								
Partition (2)								
Partition (3) (Not supported file system								
Partition (4) (Not supported file system								
Partition (5) (Not supported file system								
Partition (6) (Not supported file system								
Partition (7) (Not supported file system								
Partition (8) (Not supported file system								
Partition (9) (Not supported file system								
Partition (10) (Not supported file syste								
Partition (11) (Not supported file system								

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

Details		×
Status:	Completed	
Action:	File download audit	
Start Time:	2020-03-14 23:38:53	
End Time:	2020-03-14 23:38:53	
Username:	admin(192.200.19.4)	
Node:	192.200.19.19	
Object Type:	virtual machine	
Object:	Ky_server2012	
Description:	Save System Volume Information as System Volume Information/tracking.log	
		ок

2.2.1.17 Recovering Virtual Machine

You may recover virtual machine from any backup or any IO activity log. Virtual machine can Sangfor Technologies Block A1, Nanshan iPark, No.1001 Xueyuan Road, Nanshan District, Shenzhen, China

be recovered and powered on within 3 minutes and VM performance will be recovered to normal status within 15 minutes so as to well ensure business continuity. (Recovery Time Objective(RTO) \leq 15 minutes). Validity of a backup can be verified by recovering a new virtual machine from that backup.

To recover virtual machine from a backup, you should select recovery method and then specify destination location. There are two ways to recover virtual machine: **Create a new one** or **Overwrite the existing one**.



2.2.1.17.1 Creating a New Virtual Machine

- 1 Create a new virtual machine from a specified backup and the original virtual machine will not be affected.
- 2 Upon completion of VM recovery and data verification, you may manually make the new virtual machine run business services.

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You need to connect the VM to the network manually to avoid the IP address conflict. Since new virtual machine will have a new hardware ID. you need to reauthorize the virtual machine if guest OS or software reauthorization is bound with hardware ID. To not perform reauthorization, choose the other way.

After recovery method is chosen, you need to specify destination location, including VM Name, Group, Datastore and Run on Node fields.

Recover VM							
Choose Meth	od 2 Destination Location						
VM Name:	Yong_Server2012_(2020-03-01_16-15-33)						
Destination Location:							
Group:	Yong						
Datastore:	VirtualDatastore1						
Storage Policy:	<use 2_replica="" original="" policy:="" storage=""></use>						
Run on Node:	<auto></auto>						
	Restore Defaults 🕕						
Back	ок с	ancel					

VM Name: Specifies a name for the recovered virtual machine.

Group: Specifies a group to which the virtual machine is recovered.

Datastore: Specifies a datastore for the recovered virtual machine.

Storage Policy: Specifies the number of replication.

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

Restore Defaults: VM group is not changed after recovery. It prefers the destination datastore that has access to a node and to backup repository at the same time, to achieve rapid recovery. It prefers the original datastore, to keep business network unchanged.

Then click **OK** to enter the following page. To confirm the recovery operation, enter password of the current username

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Message		×
	 Are you sure that you want to recover it and create a new virtual machine? 1. Connect the VM to the network manually to avoid IP address conflict. 2. Change to overwrite the existing one if guest OS or software authorization for recovered virtual machine fails. 3. Check status of the recovered virtual machine in Compute and ensure the backup repository is always online before rapid recovery completes (lightning icon disappears). 4. Virtual machine deployed from template will become ordinary virtual machine after recovery. 	
	Enter admin password to confirm operation: Password	
	Confirm Cancel	

After recovery operation, you ,may, go to **Compute** to view the VM that has been successfully recovered, as shown below:

НА	0	HA		НА					
Backup Test_(2018-03-01) Please make sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure that the backup storage is online before the please the sure the									
D Power On	Shut Down	Memory Usage	8%						
>_		Disk Usage	2%	Powered Off					
Console	More								



- You need to connect the VM to the network manually to avoid the IP address conflict.
- If guest OS or software is failed to be reauthorized after recovery, you can recover the VM in the other way **Overwrite the existing one**.
- Go to Compute to check status of the recovered VM and ensure the backup repository is always online before rapid recovery completes (lightning icon disappears).
- Backup files will be merged after the virtual machine has been recovered successfully and therefore no operation is allowed except for powering on, shutting down, entering VM console, editing network settings and VM deletion operations. Make sure the backup repository is always online before rapid recovery completes (lightning icon disappears), or else the recovered virtual machine may not run properly.

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2.2.1.17.2 Overwriting Original VM

- 1 Original virtual machine will be powered off and be deleted but can be restored by Sangfor technical support representative within 30 days before being permanently deleted.
- 2 This will not change hardware ID, and there is no need to get guest OS or software reauthorized.
- 3 Network will not be changed.
- 4 Then destination location should be specified, including VM Name, Group, Datastore and Run on Node fields.



- As for configuring destination location, it is similar to that of creating a new virtual machine. For details, refer to the **2.2.1.2** Creating Virtual Machine section.
- Since the recovery method is **Overwrite the existing one**, there is no need to configure VM name and group. Datastore and Run on Node fields should be configured.

Recover VM		×
Choose Meth	od 2 Destination Location	
VM Name:	Ky_server2012	
Destination Location:		
Group:	Yong 🗸	
Datastore:	VirtualDatastore1	
Storage Policy:	<use 2_replica="" original="" policy:="" storage=""></use>	
Run on Node:	<auto></auto>	
	Restore Defaults ()	
Back	OK Cance	I

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Then click OK to enter the following page. To confirm the recovery operation, enter password of the current account

Message		×
	30 days before being permanently deleted. 2. VM hardware configuration keeps unchanged. Therefore, guest OS or software does not need to be reauthorized. 3. Network will not be changed after virtual machine is recovered.	•
	 Check status of the recovered virtual machine in Compute and ensure the backup repository is always online before rapid recovery completes (lightning icon disappears). Virtual machine deployed from template will become ordinary virtual machine after recovery. For virtual machine associated with any VM scheduling policy, it is necessary to check the scheduling policy whether 	
	the destination working location is different from the existing location after VM recovery from backup. If they are the same, change recovered VM's working location.	
	Enter admin password to confirm operation: Password	•
	Confirm Cancel	

After virtual machine is recovered, go to **Compute** to view the new VM, as shown below:

			····· • _ ····							
⚠ 6 virtual machine(s) giving alarm(s) View										
на		НА	0	НА		НА				
Test_TapVM01_(2018	3-03-02	Backup Test_(2	Coll8-03-01_	e virtual machine has bee being merged and theref vering on, shutting down, ings and VM deletion ope ase make sure that the b	n recovered fore no opera entering VM erations. ackup storag	successfully. Backup files ation is allowed except for console, editing network le is online before the				
CPU Usage	2%	\triangleright		tening icon disappears, o cted.	or else prope	r operation of VM may be				
Memory Usage	50%	Power On	Shut Down	Memory Usage	8%					
Disk Usage	23%	>_		Disk Usage	2%	Powered Off				
		Console	More							

Δ

- Original virtual machine will be powered off and be deleted but can be restored by Sangfor technical support representative within 30 days before being permanently deleted.
- This will not change hardware ID, and there is no need to get guest OS or software reauthorized.
- Network will not be changed after virtual machine is recovered.

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- Go to Compute to view the new VM after recovery and ensure the backup repository is always online before rapid recovery completes(lightning icon disappears).
- Backup files will be merged after the virtual machine has been recovered successfully and therefore no operation is allowed except for powering on, shutting down, entering VM console, editing network settings and VM deletion operations. Make sure the backup datastore is online before rapid recovery completes(lightning icon disappears).

2.2.1.18 Viewing Permissions

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

Compute > (Ky_server2012)		S	Summary Snapshot Backup		Backup/CDP	1	Permissions Tasks		Alarms			
Θ	Refresh 🕣 New 🛅 Delete											
	Administrator	*	Group			-	Permissions		*	Creator	*	Edit
-	admin		Default Group				Admin			Yes		-
	calvin		Default Group				Admin			No		Z
	sengyuan		Default Group				Admin			No		
	ť		Default Group				Admin			No		Z



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

2.2.1.19 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.

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Compute > (Yong_Wi	nServer2018)		Su	immary	Snap	shot	Backup/CDP	F	Permissions	Та	sks	Alarms		
C Refresh											Actio	on, node, object, descr	iptioı Q	Advanced 🗡
Status	Action	Start Time		End Time		Usernam	e		Node		Object Type	e Object		Operation
Completed 🗸	Take disk-based sn	2020-03-14 19:0	7:07	2020-03-14 1	9:07:18	admin(19	12.200.19.4)		192.200.19.18		virtual ma	Yong_WinServer2	D16	View
🗸 Completed	Power on VM	2020-03-11 16:2	5:22	2020-03-11 1	6:25:27	admin(19	12.200.19.92)		192.200.19.18		Virtual Ma	Yong_WinServer2	D16	View
🗸 Completed	Edit VM	2020-03-11 16:2	5:15	2020-03-11 1	6:25:17	admin(19	12.200.19.92)		192.200.19.19		Virtual Ma	Yong_WinServer2	D16	View
🗸 Completed	Power off VM	2020-03-11 18:23	3:57	2020-03-11 1	8:24:23	admin(19	12.200.19.92)		192.200.19.18		Virtual Ma	Yong_WinServer2	D16	View
🗸 Completed	Power on VM	2020-03-10 10:2	8:18	2020-03-10 1	0:23:23	admin(19	12.200.19.44)		192.200.19.18		Virtual Ma	Yong_WinServer2	D16	View
🗸 Completed	Edit VM	2020-03-10 10:2	2:49	2020-03-10 1	0:22:50	admin(19	12.200.19.44)		192.200.19.19		Virtual Ma	Yong_WinServer2	D16	View
🗸 Completed	Shutdown VM	2020-03-10 10:1	3:43	2020-03-10 1	0:20:21	admin(19	12.200.19.44)		192.200.19.18		Virtual Ma	Yong_WinServer2	D16	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.

Acti	ion, node, object	, descriptiol Q	Advanced 🗡
Start Time:	2020-03-15	00:00	~
End Time:	2020-03-15	00:00	~
Status:	All		~
Search Term:	Action, node, o	bject, description	
		Confirm	Clear All

2.2.1.20 Viewing Alarms

This section displays 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: **Severity, Timestamp, Object Type, Object, Event, Description, Status**.

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Compute > (Yong	g_WinServer2016)			Summary	Snapshot	Backup/CDP	Permissions	Tasks	Alarms	
C Refresh	n 👅 Filter								Object, eve	nt, description Q
Severity 👙	Timestamp	$\frac{A}{\Psi}$	Object Type	Object		Event	Description			Status 🍦
e Medium	2020-01-22 13:43:07		vm	Yong_WinServer2018		vm_cpu	The CPU usage of VM (You certain period of time.	ng_WinServer2016) has	s been above 90.0% for a	Pending
Critical	2019-11-20 04:48:17		vm	Yong_WinServer2016		vm_ha	It is the 9 time that Virtual M recovered onto another no because there is offline no	fachine (Yong_WinServ de. Error: The virtual ma de in the virtual datastor	er2016) failed to be achine cannot be powered on e. Please check whether	🤣 Marked as fixed
Critical	2019-11-20 04:47:58		vm	Yong_WinServer2016		vm_ha	It is the 8 time that Virtual N recovered onto another no because there is offline no	Machine (Yong_WinServ de. Error: The virtual ma de in the virtual datastor	er2016) failed to be achine cannot be powered on e. Please check whether	🤣 Marked as fixed

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.

C Refresh	▼ Filter			
Severity 🜲 -	Period:	All		~
e Medium 1	Reset		Confirm	Cancel



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**.

SANGFOR aCloud VMware v0	Center							
View By Node	🕂 Panel 📃 List	⊖Refresh ↔New	E Selec	t J⊒Sort~			Name	Q
E Group Q			_					
Center	windows2012	windows		VLS2.1_for_VN	ł	vit	watc	
	CPU Usage	11% CPU Usage	20%	CPU Usage	2%			
	Memory Usage	40% Memory Usage	16%	Memory Usage	2%	Powered Off	Powered Off	
	Disk Usage	9% Disk Usage	8%	Disk Usage	100%			

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

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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:

Pa	nel 🗏 List	Refresh 🕂 New	►	Power On	Shu	t Down ••••More				Nam	ne		Q
	Basics	Throughput		IO Speed									
	Status 🜲	VM Name	$\frac{\mathbb{A}}{\mathbb{V}}$	IP Address	*	Group	*	CPU Usage	*	Memory Usage	≜ ▼	Disk Usage	*
	Powered On	VLS		-		vCenter		I 3%		I 3%		100%	
	Powered On	windc		192.200.19.182		vCenter		21%		16%		I 8%	
	Powered On	windov		192.200.19.94		vCenter		20%		43%		I 9%	
	O powered off	EVE		-		vCenter		-		-		-	

VM details are displayed, as shown below:

Basics: Displays basic information of virtual machines.

Basics	Throughput		IO Speed										
Status 🌲	VM Name	$\frac{\mathbb{A}}{\mathbb{V}}$	IP Address	*	Group	*	CPU Usage	*	Mem	ory Usage	*	Disk Usage	*
Powered On	VLS2.1_f		-		vCenter		3%		1	3%		100%	
Powered On	windows		192.200.19.182		vCenter		21%		•	16%		8%	
Powered On	windows?		192.200.19.94		vCenter		20%		•	43%		I 9%	

Throughput: Displays outbound and inbound speed.

Basics		Throughput	I	os	peed							
Status	*	VM Name		*	IP Address	*	Group	*	Outbound Bps	*	Inbound Bps	Å.
Powered On		VLS2.1_f			-		vCenter		0 B/s		0 B/s	
Powered On		windc			192.200.19.182		vCenter		0 B/s		60 KB/s	
Powered On		window			192.200.19.94		vCenter		3 KB/s		53 KB/s	

IO Speed: Displays IO speed.

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Basics	Throughput	IO Speed					
Status 🌲	VM Name 🌲	IP Address 🛛 🌲	Group 🌲	Read Speed 🌲	Write Speed 🌲	IO Reads 🛛 🌲	IO Writes 🛛 👙
Powered On	VLS2.	-	vCenter	0 B/s	7 KB/s	0 IOPS	1 IOPS
Powered On	windows	192.200.19.182	vCenter	0 B/s	3 KB/s	0 IOPS	0 IOPS
Powered On	windov	192.200.19.94	vCenter	0 B/s	163 KB/s	0 IOPS	12 IOPS

Creating New Virtual Machine

Click to deploy a new virtual machine from an existing VM template, as shown below:



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

Deplo	by VM From Template			×
1 s	Select VM Template 2 Ready to Complete			
Ē	Expand All 📄 Collapse All		Search	Q
	Template Name	Guest OS		
۲	🖵 Test Server 2003	Windows Server 2003 64 bit		
	Discovered virtual machine			

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Click Next, after the template is selected.

Deploy VM From Tem	plate		×
Select VM Template	2 I	Ready to Complete	
5	Name: Group: Datastore: Run on Node:	Yong-Server Select Group Select Datastore Select a cluster, host, vApp or resource pool	
Configuration			
 Processor Memory Hard disk 1 Network ada 	1 core 1 GB 8 GB Select network	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	
e Hard disk 1	8 GB	
💻 Network ada	Select network	
Disk		
NIC		
Add Hardware	7	

Processor: Specifies the number of virtual sockets and cores per socket for the virtual machine respectively. Once the numbe 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	Cores: 1 col	7 0	
Memory	1011 GB			
름 Hard disk 1	8 GB	Virtual Sockets:	1	~
💻 Network ada	Select network			
		Cores Per Socket:	1	~

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	Mem	ory Size	101	1	GB	~			
🦰 Hard disk 1	8 GB								1011	GB
💻 Network ada	Select network	1 5 ^{2 M⁰}	- 2 ³	l ⊾ô°	୍ଷ	 । ॐ	- **	- **	- *	10 ¹⁰

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Disk: Specifies the disk for the virtual machine.

Configuration				
📃 Processor	1 core			
Memory	1011 GB	Disk Capacity:	8	GB 🗸
e Hard disk 1	8 GB	Allocation:	Zeroed thick	~
📕 Network ada	Select network			

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.

Configuration				
🧧 Processor	1 core			
Memory	1 GB	To:	VM Network	~
🚍 Hard disk 1	8 GB	Status:	Connected upon startup	
💼 Network ada	VM Network			

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			1	
Memory	1 GB	Disk Capacity:	40	GB	~
📥 Hard disk 1	8 GB	Allocation:	Thin Provisioning		~
🦰 New disk	40 GB				
📕 Network ada	VM Network				

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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Delete Virtual Machine		×
Are you sure that you want to delete the "wit The virtual machine is only removed from the To delete the virtual machine completely and f and delete the VM files permanently.	list of virtual machines ree up storage space, g	from VMware vCenter. go to VMware vCenter
	ок	Cancel

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.

°					
windows2011		windox		VLS2.1_for_	
CPU Usage	25%	CPU Usage	6%	CPU Usage	2%
Memory Usage	39%	Memory Usage	16%	Memory Usage	3%
Disk Usage	9%	Disk Usage	8%	Disk Usage	100%

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

Exit

2.2.2.4 Sorting Virtual Machines

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



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



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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Panel 📃 List		esh 🕂 New	Select	J⊒Sort ~		
windows2012		windov		Name CPU L Memor Disk U	Jsage ry Usage Isage	$\begin{array}{c} \leftarrow \end{array} \begin{array}{c} \leftarrow \end{array} \begin{array}{c} \leftarrow \end{array} \begin{array}{c} \leftarrow \end{array} \end{array}$
CPU Usage	20%	CPU Usage	21%	CPU Usage	2%	
Memory Usage	40%	Memory Usage	14%	- Memory Usage	2%	
Disk Usage	9%	Disk Usage	8%	Disk Usage	100%	

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.

Hennel Elist		esh 🕂 New	Select	1≡sort∨		
VLS2.1 for		windows201		Name CPU Memo	e Usage ory Usage Jsage	$\stackrel{\leftarrow}{=} \stackrel{\leftarrow}{=} \stackrel{\leftarrow}{=} \stackrel{\leftarrow}{=}$
CPU Usage	2%	CPU Usage	20%	CPU Usage	21%	
Memory Usage	2%	Memory Usage	40%	Memory Usage	14%	
Disk Usage	100%	Disk Usage	9%	Disk Usage	8%	

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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You can get the following information on virtual machine panel: power status(powered 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.

windows201		windo		Test	Exchange
CPU Usage	26%	CPU Usage	7%		
Memory Usage	34%	Memory Usage	17%	Deward Off	Devices of Off
Disk Usage	9%	Disk Usage	8%	Powered Off	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: **Sangfor Technologies**

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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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Summary Backup	Tasks	Alarms
----------------	-------	--------

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.

			Summary	Backup	Tasks	Alarms					
💮 Refresh	🕞 Console		Shut Down [] Si	uspend 🥥 Reboot	() Power Off	Reset	Backup	🕞 Migrate	e to SANGFO		
Status											
					Through	out 🔻 CPU	Memory IC) Speed 🔻			Last Hour
	-				150Kbps						
CPI	U Usage	Memory Usa	ge Disk Us	age	100Kbps						1.1
	%	/5			50Kbps						
1.9 GH	iz X 1 cores	Total: 1 GE Free: 256 M	B Total: 9.1 B Free: 56	1 GB 39 B	Obps	00.00	00.40	00 50			
							received 49.2	2 Kbps —	transmitted 0	bps	04.20
Bacias & Ha	ardwara Confi	auration									
Dasies & Ha	aruware conn <u>ç</u>	guration									
VM Name:		Yong_Server 2003			Þ 🧧 F	rocessor	1 core(s)				
Group:		vCenter			une M	lemory	1 GB				
Status:		Running			Þ 📥 H	lard disk 1	8 GB				
IP Address:					0	D/DVD drive 1	Connected				
Datastore:		datastore1			N 🖬 N	letwork adapter 1	VM Network				I

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 **Reeboot**.

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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Curre	ent Location: VMware vCenter		Destination	Location: SANGFOR aClou	d
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>	~

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 Cor	figuration							
eth0 Connected To: edge1	C Enabled To: edge1 Advanced Adapter Model: Rea MAC Address: FE:F	altek RTL8139 V FC:FE:45:8B:30	0					
	IP Address: IP a Netmask: Netr Gateway: Gate	iddress mask eway address						
Back		ок	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 Progr	ess									×
🕞 Refresh										
Status		Src VM	*	Run on No	Working D	VM Name	*	Run on Node	Datastore	Operation
O %	Details	Yong_Server .		192.200.1	datastore1	Yong_Server 20	003	Auto	VirtualDatast	Cancel

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Tasks										×
All	Migra	ation 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	-

Δ

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 **Sangfor Technologies**

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Throughput V CPU Memory IO Speed V Last Hour 20KB/ CPU Usage Disk Usage Memory Usage 15KB/s 0 2 100% 10KB/s 5KB/s 1.9 GHz X 1 cores Total: 9.11 GB Free: 569 B Total: 1 GB Free: 1004 MB OB/s IO_read_rate 0 B/s — IO_write_rate 8 KB/s

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

Throughput: Displays overall throughput.

Status	
CPU Usage 0 % 1.9 GHz X 1 cores 1.9 GHz X 1 cores Memory Usage 2 % Total: 1 GB Free: 1004 MB Total: 9 11 GB Free: 569 B	Throughput CPU Memory IO Speed Last Hour 200kbps

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

CPU Usage 0 % 1.9 GHz X 1 cores Total: 1 GB Free: 994 MB Total: 9 11 GB Free: 569 B 0	Throughput (pps) CPU Memory IO Speed Last Hour 60pps
--	--

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 Confi			
VM Name:	Yong_Server 2003	Processor	1 core(s)
Group:	vCenter	Memory	1 GB
Status:	Running	Hard disk 1	8 GB
IP Address:		O CD/DVD drive 1	Connected
Datastore:	datastore1	Network adapter 1	VM Network
Run on Node:	192.200.19.30	Eloppy drive 1	Disconnected
Guest OS:	Microsoft Windows Server 2003 (64-bit)	Video card	4 MB
VMware Tools:	Not installed How to?		
Uptime:	4 hrs 43 mins 46 secs		

2.2.2.8 VM Backup

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

Compute > VMware vCenter > (Yong_Server 2003)	Summary	Backup	Tasks	Alarms	
💿 Backup 💮 Scheduled Backup					
$\longrightarrow \mathbf{Q}$					

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: Description:	2020-03-15_17-14-54								
Working Datast	ore		estination Datastore SCSI-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	o plan periodic backup.		ОК	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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Details	×
Status:	Completed
Action:	Back up VM
Start Time:	2020-03-15 17:17:37
End Time:	2020-03-15 17:20:51
Username:	admin(192.200.19.4)
Node:	192.168.20.4
Object Type:	Virtual machine
Object:	Yong_Server 2003
Description:	Original location: VCenter (vCenter), node (192), storage (<datastore1>) Backup location: ACloud (192), storage (ISCSI-Secondary) Backup method: Full backup Backup Name: 2020-03-15_17-14-54 Compressed backup size: 8112 MB, avg backup speed: 57.55 MB/s,time taken: 00:02:55 Original backup size: 1695 MB, avg backup speed: 11.99 MB/s Time taken: 00:03:07,including time used to wait for system resource and VM snapshot cleanup</datastore1>
	ок

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

		> \
2020 00	Backup Name:	2020-03-15_17-14-54
	Description:	
	Time:	2020-03-15 17:20:40
	Backup Repository:	ISCSI-Secondary
	🖾 Edit 🛅 Dele	ete Backup 🕚 Recover

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

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

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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.

So	heduled Backup		×
	Scheduled Backup Policy: <none> No appropriate policy is found? Add New Policy</none>		~
		ОК	Cancel



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:

Recover		×
VM Name:	Yong_Server 2003_(2020-03-15_17-20-40)	
Destination Location: (SANGFOR aCloud OVMware vCenter	

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

Destination Location:	SANGFOR aCloud	◯ VMware vCenter	
Group:	Default Group	~]
Datastore:	ISCSI-Secondary	~]
Run on Node:	192.	~]
	Use MAC address of o	riginal VM	
VmTools will be minutes. Wind	e automatically installed on v ows virtual machines will re	virtual machines, which may take start automatically upon first star	e about 5 tup.

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

Message	>	×
	 Are you sure that you want to recover it and create a new virtual machine? 1. You need to connect the VM to the network manually to avoid the IP address conflict. 2. vmTools is required to be installed on virtual machines. Without vmTools installed, virtual machines cannot identify some disks if it has three or more virtual disks (four or more when CD/DVD drive is not installed). This will also affect backup fetching task on the virtual machines recovered from backup. If backup fetching task stops, install vmTools for the recovered virtual machine on aCloud platform and then restart that VM vmTools will be automatically installed during VM recovery. If that fails, install it manually. 	
	Confirm Cancel	
\triangle		

- 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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Tasks										×
All	VM	ware vCenter	VM R	ecovery 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 200	3	Default Group	ISCSI-Secondary	192.168.20.3	View VM

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

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
By default, the origina specify new ones.	I location will be selected, including running and storage locations. You may
vCenter:	vCenter 🗸
Group:	vCenter/CTI ESXI
Datastore:	datastore1
Run on Node:	vCenter/CTI ESXI/192.
	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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Message	×	
	Are you sure to recover it and create a new virtual machine? You need to connect the VM to the network manually to avoid the IP address conflict.	
	OK Cancel	



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 2	003)	Summary	Backup	Tasks	Alarms	ms			
C Refresh								Action,	node, object, descriptic Q	Advanced ¥
Status	Action	Start Time	End Time	Userna	me	Node		Object Type	Object	Operation
Completed	Recover VM rapidly	2020-03-15 17:30:4	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 17:01:4	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 17:01:0	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 12:20:5	50 2020-03-15	12:20:53 admin(192.200.19.4)	192.168.20	.3 1	virtual ma	Yong_Server 2003	View
Completed	Clone VMware virt	2020-03-15 12:19:1	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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2.2.2.11 Viewing Alarms

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.

Compute > VMware vCenter > (Yong_Server 2003)			Summary	Backup	Tasks	Alarms					
C Refresh	T Filter							C	Object, even	t, description	Q
Severity 🌲	Timestamp	÷	Object Type	Object		Event	Description			Status	*

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.



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

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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:

Getting Started with Virtual Networking	×
Watch the following if you are using Virtiant HCI for the first time.	
Networking Demo	
Basic Operations	
Typical Scenarios	
Deployment Recommendations	
Do not show this again	Close

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

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**.



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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.

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:

Settings - Edge (Edge1)									
Physical Interface	⊕ Add	O Add [⊕] Delete							
Port Group	No.	Node	Interface						
	1	200.200.5.104	eth3(10.250.3.7)						
	2	200.200.5.105	eth3(10.250.3.7)						

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.

Settings - Edge (Edge1)									
Physical Interface	\odot	O Add [™] Delete							
Port Group		No.	Name	Туре	VLAN	Connected	Edit		
		1	Trunk_All	Trunk	all	0	-		
		2	vlan10	Access	10	1			
		3	vlan20	Access	1	0			

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



Settings - Edge (Edge	91)				×
Physical Interface Port Group	Add	년 Delete	Tune MLAN	Connected	Edit
	Name:			0	-
	Туре:	Access (One VLAN)	~ 0	1	
	[VLAN ID:	1 OK Cancel	Range: 1-4094	0	

[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.

[**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),

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Devices Connected to Port Group (Trunk_All)								
+	Add New Connection 🗸	ਜ਼ਿ Remove	All	~	VM or device name	Q		
	• To Virtual Machine	Å	Connected to		Туре			
	im To Network Device	_(2020-03-1	eth0		Virtual Machine			

2.3.3.2Viewing 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.

Virtual Network > Edge	> edge3			Summary				
🕞 Refresh 🛛 🖉	Settings	Packet Capture						
Physical Network		 Outbound: 0 bps Inbound: 0 bps 	Physical Network	Physic	al Interfaces Connecting s Node/Physical In) to Physical Network: Interface Outbound Bps No data available	Inbound Bps	
Edge	•	ANGFOR	Edge					
Virtual Network				VLAN all Type: Trunk Ports in Use	Inbound: 0 bps Outbound: 0 bps Outbound: 0 bps			

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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Interface: Interface Format: [Protocol] [Direction] [Type] <Address> TCPDUMP expression Example: IP host 210.27.48.1 and I 210.27.48.2 Expression: Protocols: IP. ARP. RARP. TCP. UDP. etc. Example: IP host 210.27.48.1, indicates IP packets from node 210.27.48.1. If protocol is not specified, packets sed on all protocols will be listened Directions: src, dst, dst or src, dst and src Max File Size 10 MR 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, indicates that 202.0.0 Capture is an network address; port 23, indicates port number is 23. If type is not specified, default type is host. Logical Operation: not, I, 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.

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

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

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

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

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

Virtual Network > Edge > edge3				mary	Permissions	Tasks				
C Refresh								Action,	node, object, descriptic Q	Advanced
Status	Action	Start Time	End Time	Use	ername	Node		Object Type	Object	Operatio
Completed	Add edge	2020-03-15 17:56:49	2020-03-15 17:56:5	0 adn	nin(192.200.19.4)	192.168.20.	3	edge	edge3	View

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:

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Nodes Physical Interfaces Communication Interfaces System Disks								
Management Interface	C Refresh	∠ Settings				(Network Interfa	ce Planning Tips
Overlay Network Interface	An overlay network	k interface is used for business data trar	isfer across nodes. V	Ms running on differe	nt nodes communica	te with each other through this	interface.	
	Node Name	Overlay Network Interface	Interface IP	Netmask	Driver Type	Link Mode	MTU	VLAN ID
Edge-connected intenace	192.168.20.3	eth1	172.16.90.2	255.255.255.0	igb	Auto-negotiation (1000	1600	-
Storage Network Interface	192.168.20.4	eth1	172.16.90.3	255.255.255.0	igb	Auto-negotiation (1000	1600	
Flow Control	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.

	① The topology has been changed. Click Apply Changes to save the changes. Apply Changes Cancel	
		Summary - Switch
VM 4		switch8
Edge		Default Group 🗸 💮
Edge	edge3	
Router	Truc Al witchs Yong_Server 2003_(2020-03-15_17-20-40)	
Monitor Center		

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.

Settings - Switch (se	witch8)					×
Device		ection 🗸 🖞 Ren	nove All	~	VM or device name	Q
Advanced	Port VM/D	evice Name	Interface or Port	rt Group	Туре	

2.3.4.1.1 Adding Connection

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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:

Settings - Switch (s	witch8)		×
Device		🗓 Remove 🛛 All 🗸 🗸	VM or device name Q
Advanced	To Virtual Machine	▲ Interface or Port Group	Туре
	To Network Device	Trunk_All	Network Device

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:

Select Virtual Machine							
Ð	Expand All	Collapse All	Group		~	yong	Q
	VM Name		Å.	Connected to			
	Carlor Cirtual	Machine Pefault Group					
		Yong_Server 2003		None			
		Yong_Server 2003_(2	020	None			

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: as shown below:

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Select Network Device									
Ð	Expand All 📄 Collapse All	D	evice Type	~	Network device	Q			
	Network Device	*	Interface or Port Group						
	😑 🔚 edge					4			
	📣 edge1		[Trunk] Trunk_All						
	edge1 _{∋3}		[Trunk] Trunk_All						
	😂 edge2		[Trunk] Trunk_All						
	Edge1		[Trunk] Trunk_All						

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.

witch8)		×
Broadcast Storm Prevention		
It helps to restrain outgoing packets or block some interface if multicast or broadcast storm occurs on the switch.	Settings	
	witch8) Broadcast Storm Prevention It helps to restrain outgoing packets or block some interface if multicast or broadcast storm occurs on the switch.	witch8) Broadcast Storm Prevention It helps to restrain outgoing packets or block some interface if multicast or broadcast Settings

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

Settings					×
Restrain da Threshold:	ta transfer r 40960	rate if the thre	shold is	reached:	Kbps
				or.	
				OK	Cancel

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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.

		Connect	tion Details	
		Port	Connected To	
	Edge	1	edge3 Trunk_All	
ig_Server 2003_(2020-03-1훗 ^씨 환원8-40) ^{Trunk_All}	edge3	2	Yong_Server 20 eth0	003_(2020-03-15_17-20-40)
		R	Device	Packet Capture
		÷	Advanced	🗉 Summary

Virtual Network > Switch > switch8	Summary Perm	hissions Tasks			
🔿 Refresh 🛛 🖻 Settings 🚽 🍿 Packet Capture					
Basics				Traffic	
					Last Hour Last 24 Hours
Device Name: switch8		2 Interface	s Connected		
Description: Edit			Connected		
Type: Switch			1	Yong Server 20	Yong_Server 20 Inbound: 0 b
Broadcast Storm Enabled Prevention:					Outbound: 0 b
					0 b
				Inbound (De	vice > Switch) • Outbound (Switch > Device)
Status				Inbound (De Network	Outbound (Switch > Device)
Status Status ‡ Device ‡ Outbour	id Bps ⊕ Inbound Bpr	s ≑ Outbound Packets ≑	Inbound Packets ‡	Inbound (De Network Throughput Packets Yong Se	vice > Switch) Outbound (Switch > Device) Last Hour Last 24 Hours
Status Device Outbour Status 0 Device Outbour Image: Server 2003_0526-03-15_17-20-40) 0 Device Device	id Bps ≑ inbound Bp 0 bps 0 bp	i ⇔ Outbound Packets ⇔ IS 0 pps	Inbound Packets 0 pps	Inbound (De Network Throughput Paciets Yong St +	vice > Switch) Outbound (Switch > Device) Last Hour Last 24 Hours
Status Device Outbour	nd Bps 👙 Inbound Bp 0 bps 0 bp	0 pps	Inbound Packets 0 pps	● Inbound (De Network Throughput Packets Yong_Se ✓	vice > Switch) Outbound (Switch > Device) Last Hour Last 24 Hours
Status Cence Outbour	d Bps ‡ Inbound Bp 0 bps 0 bg	t ⇔ Outbound Packets ⇔ bs 0 pps	Inbound Packets \$ 0 pps	● Inbound (De Network Throughput Paciets Yong_Se ❤	vice > Switch) Outbound (Switch > Device) Last Hour Last 24 Hours
Status Status Device Outboun	d Bps ‡ Inbound Bp 0 bps 0 bg	 Outbound Paciets \$ 0 pps 	Inbound Packets \$ 0 pps	Inbound (De Network Throughput Paciets Yong_Se Obes	vice > Switch)
Status Status Device Outbour Vang_Server 2003_(2020-03-15_17-20-40)	d Bps () Inbound Bp O bps O bg	Cuthound Packets © Is 0 pps	Inbound Packets ≑ 0 pps	● Inbound (De Network Throughput Paciets Yong_Se ~ Obps	vice > Switch)
Status Status Oexice Outbour	nd Bps - Inbound Bp 0 teps 0 te	Dutbound Packets 0 Is 0 pps	inbound Packets ≎ 0 pps	Inbound (De Network Throughput Paciets Yong_Se Obes	vice > Switch)
Status Status Device Outbour Vrag_Server 2003_(2020-03-15_17-20-40)	d Bps () Inbound Bp O bps O by	0 Outbound Paciets () s 0 pps	Inbound Packets © 0 pps	Inbound (De Network Tarouphput Paciets Yong_St 06ps 22:50 21	vice > Switch)
Status Status Device Outbour Vong_Server 2003_(2020-03-15_17-20-40)	d Bps © Inbound Bp O bps O by	t () Outbound Packets () Is O pps	Inbound Packets ‡ 0 pps	Inbound (De Network Throughput Paciets Yong_S4 0bps 22:50 23	vice > Switch) Outbound (Switch > Device) Last Hour Last 24 Hours Outbound (Switch > Device) Outbound (Switch > Device)

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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:

Virtual Network > Switch > switch8 > Packet Capture									
Packet Capture & /									
Interface:	Interface	Format: [Protocol] [Direction] [Type] <address></address>							
Expression:	TCPDUMP expression	Protocols: IP, ARP, RARP, TCP, UDP, etc.							
	Example. IP host 210.27.46.1 and 1210.27.46.2	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. If direction is not specified, default is Src or Dst.							
Max File Size:	10 MB ()	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							
	Capture	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 1210.27.48.2 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 Type, Object** and **Operation**. To view log details, click **View** in **Operation** column.

Virtual Network > Switch > switch8			Summary	Permissions	Tasks			
C Refresh						Action	, node, object, descriptic ${\sf Q}$	Advanced ¥
Status	Action	Start Time	End Time	Username	Node	Object Type	Object	Operation
Completed	Enable broadcast	2020-03-15 23:27:36	2020-03-15 23:27:37	admin(192.200.19.4)	192.168.20	3 vsw	switch8	View
Completed	Remove connecte	2020-03-15 22:21:03	2020-03-15 22:21:03	admin(192.200.19.4)	192.168.20.	3 dvsw	switch8	View
Completed	Remove connected r	network device 21:02	2020-03-15 22:21:03	admin(192.200.19.4)	192.168.20.	3 dvsw	switch8	View
Completed	Remove connecte	2020-03-15 22:21:02	2020-03-15 22:21:02	admin(192.200.19.4)	192.168.20.	3 dvsw	switch8	View
Completed	Remove connecte	2020-03-15 22:21:02	2020-03-15 22:21:02	admin(192.200.19.4)	192.168.20.	3 dvsw	switch8	View
Completed	Delete Network de	2020-03-15 22:21:01	2020-03-15 22:21:02	admin(192.200.19.4)	192.168.20	3 dvsw	switch8	View

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 **Sangfor Technologies**

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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).

2.3.5.1.1 Configuring Interface

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

Settings - Router (R	louter2	2)							×
Interface		Interface	VLAN	Subinterface					
Static Route	€	New	📅 Delete						
Policy based		Name	Descripti	IP Address	Netmask	MAC Address	Connected To	Status	Edit
Folicy-based		eth0	-	-	-	FE:FD:FE:F1:C7:FF	Select	\checkmark	
Access Control		eth1	-	-	-	FE:FD:FE:91:63:1D	Select	\checkmark	
DHCP									
DNS									
Advanced									

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



Edit Interfac	Edit Interface							
🗹 Enable								
Name:	ethO							
Description:	Optional							
IP Address:	🗹 Enable IPv4 addre	BSS						
	IP Address:	IP Address: Example: 192.168.1.1						
	Netmask:	Netmask: Example: 255.255.255.0						
	Enable IPv6 address							
		ок	Cancel					

Support to enable Ipv4 and Ipv6 address in the interface.

Settings - Router	(Router2)						×
Interface Static Route	Interface	VLAN Subir	iterface				
NAT	O New ⊡	Delete	IR Address	Notmask	MAC Address	Status	Edit
Policy-based		Description	IF AUGIESS	Neuriask	MAC Address	Status	Eun
Access Control							
DNS							
Advanced				No data available			
Add New VLA	N Subinterface			×			
🗹 Enable							
Connected To:	Select		VLAN ID	0			
Description:	Optional						
IP Address:	Enable IPv4 address Enable IPv6 address						
		Ok	Can	cel			

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.

Settings - Router (I	Router2	?)							×
Interface	÷	New	• A	dd Multiple	🗄 Del	lete			
Static Route		No.		Dst IP		Netmask	Next-Hop IP	Interface	Edit
NAT		1		0.0.0.0		0.0.0.0			
Policy-based									
Access Control									
DHCP									
DNS									
Advanced									

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

New			×
Dst IP:	IPv4/IPv6 address		0
Netmask/Prefix:	Netmask/Prefix length		0
Next-Hop IP:	IPv4/IPv6 address		0
Interface:	Auto		~
		ОК	Cancel

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		
	ок	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 (R	louter2)								×
Interface	Sour	rce NAT		Destination NAT					
Static Route	⊖ Re	efresh	⊕ Ne	w 📅 Delete	☆ Move Up 🛛 找	Move Down			Q
Policy-based	D P	Priority	Desc	Outgoing Interface	Src IP	Dst IP	Mapped Src IP	Status	Edit
Access Control									
DHCP									
DNS									
Advanced					No data ava	ilable			

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



Add New SNAT	Add New SNAT Rule								
🗹 Enable									
Description:									
Interface									
Outgoing Interface:	Select			~					
Source									
Src IP:	All	O Specified(support IPv4 address only)							
Destination									
Dst IP:	All	O Specified(support IPv4 address only)							
Address Translati	on								
Mapped Src IP:	Outgoing interface IP	O Specified(support IPv4 address only)							
			ОК	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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Add New Destination NAT Rule								
Description:						*		
Interface Incoming Interface:	Select				~			
Source Src IP:	() All		○ Specified					
Destination								
Dst IP:	Incoming interface I	P	O Specified					
Dst Port:	TCP	~	Port number only, e.g., 80					
	Bypass ACL and all	ow ac	cess via incoming interface					
Address Translati	on							
Mapped Dst IP:								
Mapped Port:	Port number only, e.	g., 80						
						Ŧ		
				ОК	Cancel			

[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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Settings - Router (I	Router2	2)							×
Interface	÷	New	튭 Delete 🗘 Mo	ove Up 👌 Move [Down	Description, source, destination, s	ک Adva	nced Sea	irch 🗸
Static Route		Priority	Description	Source	Destination	Service	Ac	St	Edit
NAT	-	-	Default Policy	All	All	[all] All(All protocols &	Allow	\checkmark	-
Policy-based									
Access Control									
DHCP									
DNS									
Advanced									
				1-1	of 1 < 1	> Entries Per Page: 20	Page	1	

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

Add New Access Co	ntrol Policy				×
Enabled Description:					
- Match Clause					
Source		- Destination			
All		All			
O Interface		 Interface 			
Select	~	Select		\sim	
 Specified 		 Specified 			
Example		Example			
Service: Select				•••	
- Action					
Action: Allow 	O Reject				
			ОК	Cano	el

Enabled: Select this option to enable the policy.

Description: Descriptive information of the policy.

Filter: Specifies Source and Destination.

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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.

Settings - Router (F	Settings - Router (Router2) ×									
Interface	IP Address Pool		Status							
Static Route	⊕ Add IF	P Address	🗇 Delete							
NAI Policy-based	No.	Interface	Start IP	End IP	Netmask	Default Gat	Preferred D	Bindi	Status	Edit
Access Control										
► DHCP										
DNS										
Advanced					No data availab	le				

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

Add IP Address	>	<
Interface:	Select	•
Start IP:		
End IP:		
Netmask:	255.255.255.0	
Default Gateway:		
Preferred DNS:	Optional	
Alternate DNS:	Optional	
Advanced 🕇 —		
	OK Cancel	

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

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

Advanced 💝 —			-
Preferred WINS:	Optional		
Alternate WINS:	Optional		
Lease:	24	hour(s)	~

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

Settings - Router (R	outer2)												×
Interface	IP Ac	Idress Pool		Status	;								
Static Route				~							Se	arch term	Q
NAI	No.	Interface	÷	IP Address	÷	Host Name	\$	MAC	÷	Time Assigned	÷	Lease Expiration 👙	Bind
Policy-based													
Access Control													
► DHCP													
DNS													
Advanced							No da	ata available					

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**.

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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.



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 -	192.168.20.3	7		Change	1
Standby Node	selected node v based on perform based on priority	when the current node nance	e fails:		
↔ Add	New Node	面 Remove	分 Move Up	🕂 Move Down	
Prio	rity N	lode No d	ata available		
				ОК	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 & A	nalysis	
Interface:	<select></select>	Format: [Protocol] [Direction] [Type] <address></address>
Expression:	TCPDUMP expression	Protocols: IP, ARP, RARP, TCP, UDP, etc.
	Example: IP nost 210.27.46.1 and 1210.27.46.2	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. If direction is not specified, default is Src or Dst.
Max File Size:	10 MB ()	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
	Capture	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 I 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.

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

Virtual Network > Router > R			Summary	Permissions	Tasks					
C Refresh									Action, node, object, descriptic C	Advanced 🕶
Status	Action	Start Time	End	Time	Username		Node	Object Type	Object	Operation
Completed	Add router	2020-03-13 14:25:0	05 2020	-03-13 14:25:08	admin(192.200	. 19.88)	192.168.20.36	Status:	Completed	View
S Failed	Add router	2020-02-20 11:26:1	13 2020	-02-20 11:26:15	admin(192.200	. 19. 122)	192.168.20.36	Action:	Add router	View
								Start Time:	2020-03-13 14:25:05	
								End Time:	2020-03-13 14:25:08	
								Username:	admin(192.200.19.88)	
								Node:	192.168.20.36	
								Object Type	e: Virtual router	
								Object:	Router1	
								Description		

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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Topology		Distribut	ted F	Firewall				
🖍 Edit	C	Refresh	ø	Test Connectivity	Devices	🔋 Templates	Recycle Bin	

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.

Networking > Templates							
⊙ Upload 茴 Delete							
Template Name		÷	Version	÷ 0	Datastore 👙	Storage Policy	Last Update
□ ▷ ADC							
□ ▷ NGAF							
I DIAM							
□ ▷ SSL VPN							
Upload Te	mplate from the Local PC						
	$\vdash \vdash \vdash \vdash \vdash \vdash \vdash \vdash$						
Template File:	vma file	പ്ര					
· · · · ·							
Datastore:	ISCSI	~					
	Upload						

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

Virtual Network > Templates			
🕑 Upload 👘 Delete			
Template Name	Version	Datastore 🌲	Last Update
🗌 🖌 NGAF			
AF6.9R1_20160912	6.9R1	Datastore_2_copy	2016-09-12 11:07:11

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

2.3.6.2 Licensing Virtual Network Device

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

	\backslash	Default	Cor	nnected Io : -		
NGAFI Default Group	Cheneyredhat	- 2.98 KBP	Cor	eth2 nnected To : -		
		Default Gr	Cor	eth3 nnected To : -		
				Summary	۲	Settings
			Þ	Licensing		More

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

NGAF Licensing										×
Device Name:	NGAF1	I			Licensed Hardware Usage					
Configuration Standard:	100M	bps			~	Туре	Free	Licensed Numb	ber Usage	
						100Mbps	10	10	0%	
Licensed Resources						200Mbps	9	10	10 %	
						400Mbps	10	10	0%	
						800Mbps	10	10	0%	
Branch VPN Sites:		0				1.6Gbps	10	10	0%	
SSL VPN Users:		0								
Server Access Verit	fication:	0	0			Licensed Res	source	Usage		
Mobile VPN Users:		0				Туре	Free	Licensed Numb	oer Usage	
Licensed Features						Branch VP	98	100	2%	
Electional Catalog						SSL VPN	90	100	10%	
					-	Server Acc	90	100	10%	
Cross-ISP Access Optin	nization		IPSec VPN	IPS		Mobile VP	90	100	1 0%	
Antivirus W	Veb App F	Protection								
Bandwidth Management	t		Application Contr	ol						
									ОК	Cancel

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

Config Standard: Specifies bandwidth for the virtual network device.

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

Licensed Features: Displays licensed functions.

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

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

	1		User: admin [Internal Report Center]
Navigation «	Configuration Wizard		
Status System Security Status RT Vulnerability Analysis Security Events Traffic Ranking Abnormal Traffic Top Sessions Affiliated Source Lockout	App Server App Server (1) 120,100,102,3 (1) 120,100,100,102,3 (1) 120,100,100,100,100,100,100,100,100,100,	Transparent LAN Server	Internal PC
 Network Security Databases 			
→ VPN	Route mode	Bridge mode	Mirror mode
Objects Users	It works as a layer 3 security appliance and is deployed where the trusted zone, untrusted zone and DMZ(optional) meet.	It works as a layer 2 security appliance and does not require any change to the existing network topology.	It is connected to the mirror port to perfor monitoring and does not require any chan; existing network topology.
• Firewall	<		>

2.3.6.3 Configuring Virtual Network Device

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

Settings - NGAF (N	NGAF1)						×
Interface	🖄 Edit						
Configuration	Interface 🌲	IP Address 👙	Netmask 🌲	MAC Address	Connected To	🜲 Statu	is 🌲
Location	eth0	-	-	FE:FC:FE:91:B5:25	Select	~	/
Advanced	eth1	-	-	FE:FC:FE:7D:6A:AF	Select	~	1
	eth2	-	-	FE:FC:FE:BE:80:55	Select	~	/
	eth3	-	-	FE:FC:FE:FC:F9:6E	Select	~	1
	eth4	-	-	FE:FC:FE:59:A8:E5	Select	~	/
	eth5	-	-	FE:FC:FE:33:0E:80	Select	~	/

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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.



2.3.6.3.2 Modifying Configuration

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



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.

Settings - NGAF (N	IGAF1)	
Interface	Datastore:	VirtualDatastore1
Configuration	Run on Node:	<auto></auto>
Location		
Advanced	Change	

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

Change						×
Select Location Typ	oe 2 Spe	cify Dst l	Location			
	Current Location			C.	Destination Location	
Datastore:	VirtualDatastore1	~		Datastore:	VirtualDatastore1	•
Storage Policy:	2_replica	~		Storage Policy:	<use original="" polic<="" storage="" td=""><td>1</td></use>	1
Node:	<auto></auto>	~		Node:	<auto></auto>	/
Power on virtual machin	ne upon migration completio	n				
Back					ок	Cancel

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



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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.

Settings - NGAF (NGAF1)
Interface	
Configuration	Power on at node startup
Location	High priority (ensure resources even overall resources are inadequate)
Advanced	Reboot if fault occurs (reboot if NGAF is not responding due to stuck)
	HA (Migrate to another node if the node fails HA Settings)
	Debug

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 th**e Admin Logs** page, you can view detailed operation logs.

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Networking > Devices > NG		Summary Bac	kup Permissions	Tasks		
🔆 Refresh 🛆 W	Veb-Based Console 🔹 ⊳ Power On	Shut Down 🛛 🖸 Backup 🛛 🖉	🖞 Settings 🖉 Licensing More			
Status						
Device Name:	NGAF06					
Description:	Edit				CPU Usaç	ge Memory Usage
Datastore:	192.200.19.18:192.200.19.19				24	« /
Storage Policy:	2_replica_high_performance					
Run on Node:	192.200.19.19				2.2 GHz X 2 ct	ore(s) Total: 4 GB Free: 1.88 GB
Deployed from Template	e: AF7.1R3_20170830 (V 7.1R3)					
Licensing:	View					
Sessions						
						Last Hour Last 24 Hours
300						
						\frown
200						
100						
0						
2	22:35 22:4	40 22:45 22:51	0 22:55 23:0	23:05 23:10	23:15 23:20 23:25	23:30 23:35
Status						
Status	atus	\$	Outbound Bps 👙	Inbound Bps 👙	Outbound Packets ≑	Inbound Packets ≑
Status Sta	atus 💠 Interface eth0 (10 251.2	\$ 251.251)	Outbound Bps ≑ 0 bps	Inbound Bps \$ 0 bps	Outbound Packets ≑ 0 pps	Inbound Packets ¢ 0 pps
Status Sta	atus	¢ 251.251) 123.1)	Outbound Bps ¢ 0 bps 2.78 Kbps	Inbound Bps \$ 0 bps 3.69 Kbps	Outbound Packets 0 pps 2 pps	Inbound Packets ‡ Opps 3 pps
Status Sta Constant Status	atus	¢ 251 251) 123 1) 19 115)	Outbound Bps 0 bps 2.78 Kbps 6.03 Kbps	Inbound Bps 0 bps 3.69 Kbps 13.13 Kbps	Outbound Packets © 0 pps 2 pps 10 pps	Inbound Packets \$ 0 pps 3 pps 18 pps
Status Status	atus	¢ 251 251) 123 1) 18 115) 124 1)	Outbound Bys 0 0 bps 2.78 Köps 8.03 Köps 0 bps	Intound Bes () 0 bes 3 69 Kps 13,13 Kbes 0 bes	Outbound Packets 0 pps 2 pps 10 pps 0 pps	Inbound Packets \$ 0 pes 3 pes 18 pes 0 pps
Status Sta Control State	atus	¢ 151 251) 19.115) 19.115)	Outbound Bps () 0 Aps 2.78 Kaps 8.83 Kaps 0 Aps	Inteound Bps () 0 bps 3.69 Kpps 13.19 Kpps 0 bps	Outbound Packets () 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps
Status Sta Control Sta Control State	atus	¢ 251 251) 123 1) 19 115) 224 1)	Outbound Bps () 0 teps 2.78 Köps 8.83 Köps 0 teps	Intound Bps () 0 bos 3 809 Kbps 13 13 Kbps 0 bps	Outbound Packets © 0 pee 2 pee 10 pes 0 pps	Inbound Packets © O pes 3 pes 18 pes O pos
Status Sta Constant Status Status Status Status	atua 🗘 Interface etho (10 251 2 eth 1 (10 123 1 etho 2 (10 2 160. etho 3 (10 124 1	¢ 251 251) 1223 1) 19 115) 224 1)	Outbound Bps () 0 tops 2.78 Kops 8.03 Kops 0 bps	Intound Eps (0 bos 3.69 Kbos 13.13 Kbos 0 bos	Outbound Packets © 0 pper 2 pper 10 pper 0 pper	Inbound Packets © 0 pps 3 pps 18 pps 0 pps
Status Sta Sta Sta Status Stat	atus 0 Interface emb (10 251.2 emb (10 251.2 emb (10 123.1 emb (10 124.1 emb (10 124.1	¢ 251 251) 122 3 1) 19 115) 124 1)	Outbound Bips © 0 teps 2.78 Kops 8.03 Kops 0 bips	Intound Bps () 9 bos 3 89 Ktos 13 13 Ktos 0 bos	Outbound Packets 0 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps
Status Sta Sta Sta Status Status Notwork	atus 0 Interface emb (10 25 1 2 emb (10 25 1 2 emb (10 25 1 2 emb (10 25 1 2 emb (10 2 1 6). emb (10 1 24 1	¢ 1251 251) 1223 1) 19 115) 1224 1)	Outbound Bips © 0 teps 2.78 Köps 8.03 Köps 0 bips	Intound Bps () 9 bos 3 69 Ktop 13 13 Ktop 0 bos	Outbound Packetb 0 0 pps 2 pps 10 pps 0 pps	Inbound Paciets © 0 pps 3 pps 18 pps 0 pps
Status 94 20 20 20 20 20 20 20 20 20 20 20 20 20	atus	¢ (22.1) 19.115) 124.1)	Outbound Bps () 0 teps 2.78 Kops 8.03 Kops 0 teps	Inbound Bps () Oper 3.89 Ktops 13.13 Ktops 0 bos	Outbound Packetb () 9 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps
Status Sta Control State	atus	¢ 251 251) 123 1) 19 115) 124 1)	Outbound Bpt () 0 teps 2.78 Kops 8.03 Kops 0 teps	Intound Bps () Ope 3.09 Ktps 13.13 Ktps 0 bps	Outbound Packets 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps User Hour Last 24 Hours
Status Sta Co Co Co Co Co Co Co Co Co Co Co Co Co	etus () Interface emb (10 251 2 eth (10 123 1 eth (10 123 1 eth 2 (192 16) eth 3 (10 124 1	¢ 251 251) 19 115) 224 1)	Outbound Bips () 0 hps 2.7% Kips 8.83 Kips 0 hps	Interrund Bas () Orbos 3.69 Ktps 13.13 Ktps Orbos	Outbound Packets () 0 pps 2 pps 10 pps 0 pps	Incound Packets © 0 pps 3 pps 18 pps 0 pps Last Hour Last 24 Hours
Status Sta Co Co Co Co Co Co Co Co Co Co Co Co Co	etus	¢ 151 251) 123 1) 19 115) 124 1) 4-2020 22 49 41 ntbound: 0 pps	Outbound Bps () 0 Aps 2.78 Kips 8.83 Kips 0 Aps	Interrund Bas () O bas 3.69 Kops 13.13 Kops O bas	Outbound Packets () 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pel 3 pes 18 pos 0 pos
Status Sta Control State Status Statu	etus	• 1251 251) 1223 1) 19.115) 1224 1)	Outbound Bips (0 hps 2.78 Kaps 8.83 Hzps 0 hps	Interrund Res () 0 bes 3.69 Kbps 13.19 Kbps 0 bps	Outbound Packets () 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps Last Hour Last 24 Hours
Status Sa Control Cops Cops	etus	¢ 251 25 1) 19:115) 224 1) 4-5050 23 45 41 arbound: 0 bps	Outbound Bips () 0 tops 2.278 Köps 8.03 Köps 0 tops	Interrund Res (Diser 3.69 Kbps 13.13 Kbps 0 Bps	Outbound Packets () 0 pps 2 pps 10 pps 0 pps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps Last Hour Last 24 Hours
Status Sta Contemport Throughput Pack Cops	ettu	251 251) 123 1) 19 115) 124 1) 4-3020 22 49 41 abound 0 bps	Outbound Bps () 0 teps 2.78 Köps 8.83 Köps 0 teps	Intound Bps (Dises 3.89 Kbps 13.13 Kbps 9 Bps	Outbound Packets © 0 pps 2 pps 10 pps 0 pps	Intound Packets © 0 pps 18 pps 0 pps Last Hour Last 24 Hours
Status Status Status Status Cops	atus	• 251 251) 122 1) 19 115) 124 1) 4-2020 22 49 41 at-2020 22 49 41	Outbound Bps () 0 tps 2.78 Kops 8.83 Kops 0 bps	Inteound Bps ¢ 0 bps 3.69 Kbps 13.13 Kbps 0 bps	Outbound Packets \$ 0 ppg 2 ppg 10 ppg 0 ppg 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Inbound Packets : 0 pps 3 pps 18 pps 0 pps 0 pps Last Hour Last 24 Hours
Status 94 20 20 20 20 20 20 20 20 20 20 20 20 20	atus	• 251 251) 122 1) 18 115) 124 1) 4-2020 22 48 41 at-2020 22 48 41 22.50 22.55	Outbound Bps © 0 tps 2.78 Kops 8.03 Kops 0 tps 0 tps 2.00 2105 - Infocum -	Inteaund Eps () 0 tops 3.09 Kops 3.09 Kops 13.13 Kbps 0 tops 0 bps 0 tops	Outbound Packets () 0 gps 2 gps 0 gps 0 gps	Inbound Packets © 0 pps 3 pps 18 pps 0 pps 0 pps Last Hour Last 24 Hours

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

2.3.7 Distributed Firewall

Distributed firewall is supported starting from Sangor HCl 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.

Topology		Distribut	ed Firewall				
🖍 Edit	G	Refresh	💉 Test Co	nnectivity	Devices	Templates	🔋 Recycle Bin

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

Add New Rule	×
Enabled Name: - Match Clause	
Source Any IP address Specified IP address IP Groups V Select ····	Destination Any IP address Specified IP address IP Groups V Select ····
O Specified VMs Virtual Macl ✓ Select ····	O Specified VMs Virtual Macl ✓ Select ····
Service: Select Action: Allow Reject	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, VMGroup, 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, 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**.

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Basics	Permissions									
Sta \$	Name	÷	Outbou \$	Inboun \$	Interfaces 👙	Total Interf 👙	CPU Usage 👙	Memory Usage 👙	Storage Policy 👙	
۲.	Lab_Switch3		0 bps	0 bps	2	-	-	-	-	^
۲	VPC_tflest_WAN Subnetb4190d5137		0 bps	0 bps	2	-	-	-	-	
۹	Switch-3603d02b390		0 bps	0 bps	2	-	-	-	-	
۹	switch6		0 bps	0 bps	2	-	-		-	
۲	test247b13df282		0 bps	0 bps	1					

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

L	Yiew By Group	~	🕜 Refresh	🕂 New Group	🖄 Move	Power On	Shut Down	Ú		🕂 Migra	te 👖 Dele				
C	Group	Q	Basics	Permissions											
31	Virtual Network Device(163)	٠	□ Stat ≑	Name				\$	Outbou \$	Inboun 👙	Interfaces 👙	Total Interf 👙	CPU Usage 👙	Memory Usage 👙	Storage Policy 👙
	🦲 yong(0)														
	Default Group(163)														

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

Uiew By Group	~	💮 Refresh	🕂 New Group	🖄 Move	▷ Po		Shut Down	D Power Off	Migrate	e 🔟 Delete			
C Group	Q	Basics	Permissions										
🖃 🧰 Virtual Network Device(163)		Administrator			$\stackrel{\wedge}{\nabla}$	Group			Å	Permissions	Å	Creator 👙	Edit
yong(0)		admin				Default (Group			Admin		Yes	
Default Group(163)		calvin				Default (Broup			Admin		No	
		sengyuan				Default (Group			Admin		No	Z
		tf				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:

Fest Connectivity	1				
Virtual Machine:	Yong_WinServer2016		8.8.8.8	Test again	
Progress					
1 The vir	tual machine (Yong_WinServer201	6) failed to ping de	estination IP address (8.8.8.8). PI	ease check the network connection.	
	Virtual Machine:	Yong	_WinServer2016 Z		
	Node:	192.3	200.19.18		
	Cross Any Node:	No			
\wedge					

To test connectivity from a virtual machine, that virtual machine must be powered on and **Sangfor Technologies**

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2.3.10 Virtual Network Topology

In HCI6.0.1 version, it supports auto layout, saving layout changes, restoring and exporting topology, and selecting all pages.



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



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

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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

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



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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:

Status					
Virtual Datastores	Other Datastores	Unread Alarms		Ongoing Tasks	
1	2	1698		0	
					_
 All is normal 	 All is normal 	Virtual Datastores	0	Data Rebuilding	0
		Other Datastores	1698	Data Sync	0
				Data Balancing	0
				Disk Data Repairing	0

Storage Usage: This section displays the storage usage of the entire HCI, including the total number of storage, the quantity already used, and the unused quantity. as shown below:



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 Datastor														
Datastore 4	Status	$\frac{A}{\Psi}$	Туре	\$ Total	÷	Usage	Å	F	Read Speed	\$ Write Speed	÷	VMs 🕕 🙏	Running VMs 🕕	÷
Local-storage	🤣 Normal		Local storage	444 GB		3 %	6	0	0 B/s	0 B/s		0	0	
ISCSI	🤣 Normal		ISCSI	496 GB		84	%	0	0 B/s	13.3 KB/s		18	7	

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

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Performance of Virtual Storage	
VirtualDatastore1 VIIrtualDatastore1 VIrtualDatastore1 VIrtualData	Period: Last 10 minutes
IOPS	
2020-09-17 10.98:50 500 • 10 Reads 521 10PS • 10 Wines: 361 10PS	Anth
	10:45:00 10:45:30 10:46:00 10:46:30
— IO Reads — IO Writes	

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:

Period:	Last 10 min	utes		~						
	Last 10 min	Last 10 minutes								
	Last hour									
	Last 4 hours	;								
	Last 24 hour	rs								
	Last 7 days									
\sum	Specified									
Time Rar	ige			×						
Start Time:	2020-03-16	28	00 : 00	÷						
End Time:	2020-03-17	28	00 : 00	\$						
	ОК	Т	Cancel							

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



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.



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

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VirtualDa	tastore1 🔹	~	IOPS	IO Speed	IO Latency	Storage Usage	Cache Hit Rate	Node Hit Rate				
2019	-08-10 02:05:53											
36.3 • Fre	21.27 TB											
 Inva 	lid Capacity: 0 B											
18.19 TB -											_	
0 B												
	2019/08			201	9/09	2	019/10	2	:019/11	2019/12	2020,	/01
								•	Free 🔵 Used	Invalid Capacity		

Cache Hit Rate: A cache hit occurs when the requested data is found in SSD, while a cache miss occurs when the requested data is not in SSD and should be returned from data disk. Cache hits to read operations means cache hit rate. **Cluster Hit Rate** graph shows the overall cache hit rate in the cluster in the last 7 days.

Perfor												
Vir	iualDatastore1	~	IOPS	IO Speed	IO Latency	Storage Usage	Cache Hit Rate	Node Hit Rate				
100%												
75%					<u> </u>		/	<u> </u>				
25%		Norman and a second second						~	~~~~~			
2.376	12:00	2020/03	/11	12:00	2020,	03/12	12:00 20	020/03/13	12:00 — C	2020/03/14 ache Hit Rate	12:00	2020/03/15

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



Unread Alarms: 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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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 four tabs, Virtual Datastores, Shared Disks, iSCSI Virtual Disks and Physical Disks, as shown below:

Summary		Other Datas	tores	5										
	🔾 Refrest		6	Expand Capacity	۲								⑦ About S	
Virtual Datastores	Name		\$	Status	¢	Datastore Type	÷	Capacity	IO Speed	Nodes \Leftrightarrow	Disks 🍦	VM	As 🕕 💠	Operation
Physical Disks	VirtualDatasto	ore1		🕑 Normal		Ordinary datastore		Raw Capacity: 29 TB, Ava	Write: 4.4 MB/s Read: 7.6 MB/s	2	10	220	4	Details
Shared Disks														
ISCSI Virtual Disks	5													
Storage Policy														

2.4.3 Virtual Datastores

Storage of a cluster with 6 or more than 6 nodes 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:

Summary	√irtu	al Storage	Other Datast	ores										
		🔆 Refresh											⑦ About St	
Virtual Datastores	5	Name		¢	Status	¢	Datastore Type	÷	Capacity	IO Speed	Nodes 👙	Disks 🍦	VMs 🕕 🎄	Operation
Physical Disks		VirtualDatastor	e1		🥑 Normal		Ordinary datastore		Raw Capacity: 29 TB, Ava	Write: 4.4 MB/s Read: 7.6 MB/s	2	10	224	Details
Shared Disks														
iSCSI Virtual Disks	s													
Storage Policy														

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:

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SANGFOR aCloud VMware vC	enter									
uew By Datastore ✓	Panel 📃 List		esh 🕂 New 🛛	+ New G	roup 📃 Select	J∃Sort	✓ •••More			
🖼 🗉 Group Q							<u> (</u> 3 virtual	machine	(s) giving alarm View	
🖃 🧰 Virtual Machine(162)					_		_		_	
 ISCSI(18)	HA	-	HA	-	HA		НА		НА	
 Local-storage(0)				_	-35-					
				- 1	•••	. 1				- J
DefaultGroup(0)	CPU Usage	11%	CPU Usage	9%	CPU Usage	0%	CPU Usage	1%	CPU Usage	26%
	Memory Usage	40%	Memory Usage	45%	Memory Usage	14%	Memory Usage	16%	Memory Usage	29%
	Disk Usage	4%	Disk Usage	3%	Disk Usage	60%	Disk Usage	17%	Disk Usage	37%

2.4.3.1 Creating Virtual Datastore

To create a new virtual datastore, there must be at least three nodes. There are four steps to create a new virtual datastore: 1) Specify basic information 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 number of data replicas, **2 replicas** or **3 replicas**.

2 replicas (recommended): Indicates that all data has two replicas stored on two nodes respectively. Total disk space should be doubled to ensure certain amount of space available. Featuring rapid data reconstruction, rapid backup and continuous data backup (CDP), this solution caters to majority of the scenarios and offers a balance on costs and data safety.

3 replicas: All data has three replicas stored on three nodes respectively. Total disk space should be three times to the actual space.

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Create Virtual Datast	iore >	<
1 Basics —	2 Select Node — 3 Specify Fault Domains — 4 Use of Disk — 5 Confirm	
Virtual Datastore Name: Type:	VirtualDatastore1	
	 Stretched datastore A stretched datastore is applicable to active-active data center scenario where nodes are deployed in two server rooms. Associate the nodes with the stretched datastore and add nodes in server rooms to primary and secondary fault domain respectively. 	
Data Replicas:	 2 replicas All data has two replicas stored on two nodes respectively. Total disk space should be doubled to ensure certain amount of space available. 3 replicas (Not available when the number of physical nodes is less than 5.) All data has three replicas stored on three nodes respectively. Total disk space should be three times to the actual space. 	
	Next Cancel	

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

There is a list displaying node information such as node name, node IP address, number of SSDs and HDDs. You should select the node(s) from that list that you want to add to virtual datastore. Note that at least three nodes are required to create a virtual datastore.

Creat	te Virtual Datastore			×
	Basics — 2 Select Node	— (3) Specify Fault Domains	— 4 Use of Disk	— 5 Confirm
Select	and Add Node to Virtual Datastore :			2 node(s) selected
	Node Name	Node IP	SSDs	HDDs
	192.168.20.191	192.168.20.191	1	2
	192.168.20.192	192.168.20.192	1	2
Best P	ractice: Associate a maximum of 12 nodes	with a datastore.		
_				
	Back		Next	Cancel

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3. Specify use of disk.

In this step, you will see the following information of discovered disks(system disk is not listed): disk name, disk type, disk size and use of disk. Then, you should specify use of those disks. Disks that are added to virtual storage can be used as data disk, cache disk or spare disk.

Data disk: It is used to store disk data files of virtual machine and create virtual disk. Its capacity should be greater than or equal to 200GB.

Cache disk: It is used for caching, to improve performance of virtual storage. SSD is often used as cache disk. Its capacity should be greater than or equal to 100GB. Since version HCI5.3, SSD cannot be used as cache disk to add to virtual datastore if it is not an SSD for data center, and storage performance may be affected without cache disk.

Spare disk: It acts as backup of data disk on virtual storage, and is always ready to replace the data disk when it fails. Once the failed disk recovers, it returns to spare disk. Its capacity should be greater than or equal to 200GB.

Create Vir	tual Datastore				×
Sa Ba	asics — 🕑 Select Node —	– 3 Specify F	ault Domains 🗕	— 👍 Use of Disk –	— 5 Confirm
⊞ Expand.	All 🗐 Collapse All - 今 Restore	Defaults			About Disk Grouping 🥐
▼ Node: 192.	.168.20.192		D)ata disk:2 Cache disk:1	+ New Disk Group
Disk G	Disk	Туре	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		D	0ata disk∶2_Cache disk∶1	+ New Disk Group
Disk G	Disk	Туре	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

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

4. Confirm configuration.

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

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Create Virtual Datas	tore					×
Basics —	Select N	lode — 3	Specify Fault (Domains —	Vise of Disk	— 5 Confirm
Confirm Configuration of V	′irtual Datastore (Vi	rtualDatastore1):				
3.62 T Available S	B Bpace	7.28 TB		2 Nodes	2 Replie	cas
Virtual Datastore:	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					ок	Cancel

2.4.3.2 Expanding Capacity

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.

Expand Capacity		×
Select Virtual Datastore	2 Expand Type 3 Use of Disk	- 4 Confirm

1. Select virtual datastore.

There is a list displaying information of virtual datastore: datastore name, 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.

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Expa	Expand Capacity ×							
1 Select Virtual Datastore 2 Expand Type 3 Use of Disk 4 Confirm								
Select	the virtual datastore for	r which you want to exp	oand capacity.					
	Name Total Capacity		Free Space Nodes		Disks Used	Disks Available		
0	VirtualDatastore1	18.11 TB	15.72 TB	3	17	1		

 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:

Expand Capacity		×
Select Virtual Datastore 2 Expand Type	3 Use of Disk –	Confirm
Expand Type: Add new nodes Add new disks		
Select any of the following nodes to add to the virtual datastore (VirtualDatastore1).		0 node(s) selected
Select any of the following nodes to add to the virtual datastore	SSDs	HDDs
No data available		
Best practice: 8-12 nodes corresponding to one virtual datastore.		
Back	Next	Cancel

If **Expand capacity via disk** is selected, the following page will be shown:

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Expand Capacity		100 07		×			
Select Virtual Datastore — 2 Expand Type — 3 Use of Disk — 4 Confirm							
Expand Type: O Add new nodes Add new disks							
Select any of the following nodes with	n free disk to add to the virtual da	atastore :					
Node Name	IP Address	Disk Groups	Free SSDs	Free HDDs			
192.168.20.4	192.168.20.4	2	0	1			
Back			Next	Cancel			

3. Configure use of disk.

In this step, you will see the following information of available disks(system disk is not listed): disk name, disk type, disk size and use of disk. Then, you should specify use of those disks. Disks that are added to virtual storage can be used as data disk, cache disk or spare disk.

Data disk: It is used to store disk data files of virtual machine and create virtual disk. Its capacity should be greater than or equal to 200GB. The number of data disks should be multiple of the data replicas, or else some data disks cannot be added to virtual datastore.

Cache disk: It is used for caching, to improve performance of virtual storage. SSD is often used as cache disk. Its capacity should be greater than or equal to 100GB. Since version HCI_{5.3}, SSD cannot be used as cache disk to add to virtual datastore if the SSD is not an SSD for data center, and storage performance may be affected without the cache disk.

Spare disk: It acts as backup of data disk on virtual storage, and is always ready to replace the data disk when it fails. Once the failed disk recovers, it returns to spare disk. Its capacity should be greater than or equal to 200GB.

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

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Expand Ca	pacity				×
🥑 s	elect Virtual Datastore	📀	Expand Type —	3 Use of Dis	sk — 4 Confirm
Expand A	II 🗐 Collapse All	🖉 Edit			About Disk Group ?
✓ Node: 192.16	68.20.4				Data disk : 4 Cache disk : 2
Disk Group	Disk		Туре	Disk Size	Use of Disk
	Disk 1		SSD	447.13 GB	Cache disk
Disk Gro	Disk 4		HDD	3.64 TB	Data disk
	Nev Disk 2		HDD	3.64 TB	Data disk
	Disk 0		SSD	447.13 GB	Cache disk
Disk Gro	Disk 5		HDD	3.64 TB	Data disk
	Disk 3		HDD	3.64 TB	Data disk
Back				N	lext Cancel

4. 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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Exp	and Capacity						×
⊘	Select Virtual Datastore	(Method —	— 🗸 Use	e of Disk ——	- 4	Confirm
C	Confirm Configufation of Virtual	Datastore (v	s_vol_rep2):				
	1.41 TB =	479.63 Current	GB +	959.96 GB Increased		0 New Nodes	
	Туре		Disks		Total Capacity		
	Spare disk		0		0 B		
	Cache disk		3		360 GB		
	Data disk		8		2 TB		
	Free disk		0		-		
C	Confirm Disk Expansion (once a	added, node	or disk cannot be re	moved and disk wi	ill be formatted a	nd emptied)	
۷	'irtual Datastore Name:	Virtual Data	astore Name				
Ţ	ype admin Password:	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 🛛 🗸	() When the system detects th	at disks are not even!	y used, it will conduct data balancing to n	nove part of			
Data Balancing	data from highly-used disk t Select a period that busines	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.					
Data Rebuilding	during that time period.						
Bad Sector Scanning	Virtual Datastore	Status	Schedule (Every day)	EditAll			
IO Timeout Handling	VirtualDatastore1	C Enabled	00:00 🖌 - 06:00 🗸				
Linked Clone							
Storage Area Network							
VM Running Across Datastores							
Intelligent Rate Restriction							
In-memory Read Caching							
File Storage Delicy							
			ОК	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)	EditAll			
VirtualDatastore1	C Enabled	00:00 21:00 V - 06:00 OK Can	cel			

Δ

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 specifie 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 🛛 🗸	The following specify the time is reached but the issue is still	ne for confirming ce not fixed, data rebu	ertain node and disk failure before data rebuilding. If the time uilding will be executed automatically.
Data Balancing Data Rebuilding	Host Fault Confirmation Time:	4	hour(s) (for datastores involving more than 3 nodes)
Bad Sector Scanning	Disk Fault Confirmation Time:	30	minute(s) (for datastores involving more than 2 nodes)
IO Timeout Handling			
Linked Clone			

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 🔹 🗸	() Hard disks will be periodical	lly scanned for bad sec	tors. If any bad sector is detected, disk repa	iring will be			
Data Balancing	conducted. To ensure scann	conducted. To ensure scanning speed, it is better to perform scan during off-peak hours.					
Data Rehuilding	Virtual Datastore	Status	Schedule (Every day)	EditAll			
	VirtualDatastore1	C Enabled	01:00 🗸 - 06:00 🗸				
Bad Sector Scanning							
IO Timeout Handling							
Linked Clone							

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.



Advanced					
Reliability Settings 🛛 🗸 🗸	() When IO read latency on a VM is	s higher than the threshold specified	l below, the system will automatically		
Data Balancing	ancing read data from other VM replicas to ensure business continuity.				
Data Rebuilding	Virtual Datastore Read Timeout Handling		Read Request Timedout		
Bad Sector Scanning	VirtualDatastore1	C Enabled	> 3 secs		
IO Timeout Handling					
Linked Clone					

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.

Advanced	
Reliability Settings 🛛 🗸	() As virtual machines cloned from a certain virtual machine use the same data by default and too many uses
Data Balancing	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
Data Rebuilding	subsequent reads and writes.
Bad Sector Scanning	Data Reuse Limit: 8 (2~128 allowed)
IO Timeout Handling	
Linked Clone	

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 🛛 🗸	() Independent sto	consistent	t in data sync.			
Data Balancing	It requires each host to provide a separate interface as storage network interface.					
Data Rebuilding	Deployment Mode: Link aggregation with one switch					Settings
Bad Sector Scanning	Node Name	Physical Interface	Interface IP	Negotiated R	MTU	Status
IO Timeout Handling	192.168.20.3	eth2, eth3	10.51.25.1	1000Mb/s	1500	🤣 Normal
Linked Clane	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
Storage Area Network						
VM Running Across Datastores						
Intelligent Rate Restriction						
In-memory Read Caching	IP Address: 192.168	Test Connectivity				
Eilo Storago Doligy						
					ок	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:



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

Settings						×							
1 Deployment —	- 2 Select Storage Network Interface												
torage Network Interface (Deployment)													
Node Name	Physical Interface		Aggregate In	terface 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			Ba	ck	ок	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.





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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.

Advanced								
Reliability Settings 🛛 🗸 🗸	() Specify an IP address pool to enable virtual machines to run across virtual datastores.							
Data Balancing	It should be a 24-bit subnet that is exclusively used by the cluster.							
Data Rebuilding	IP Address Pool: 10 . 251 . 10 . 0 /24							
Bad Sector Scanning								
IO Timeout Handling								
Linked Clone								
Storage Area Network								
VM Running Across Datastores								
Intelligent Rate Restriction								
In-memory Read Caching								
E D								

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

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Advanced							
Reliability Settings 🔹 🗸	() Restrict data transfer rate for ongoing r	on-business tasks such as data migration and rebuilding, etc.,					
Data Balancing	according to IO performance, to ensure business continuity.						
Data Rebuilding	Virtual Datastore	Restrict Transfer Rate					
- Bad Sector Scanning	VirtualDatastore1	Enabled					
IO Timeout Handling							
Linked Clone							
Storage Area Network							
VM Running Across Datastores							
Intelligent Rate Restriction							
In-memory Read Caching							

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.

Advanced											
Data Balancing	() In-memory read caching a	ccounts for 1/16 of h	ost memory, which cannot be	used by virtual machine. You							
Data Rebuilding	Data Rebuilding may disable it and change cache size. Changing in-memory read cache size will make cached data invalid. What is more, it brings down										
Bad Sector Scanning	performance, which only re	ecovers only after rec	aching.								
IO Timeout Handling	Virtual Datastore	Status	Percent of Host Memory	Operation							
Linked Clone	VirtualDatastore1	Disabled	Specified	Settings							
Storage Area Network											
VM Running Across Datastores											
Intelligent Rate Restriction											
In-memory Read Caching											
File Storage Policy											

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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Advanced		
Data Balancing Data Rebuilding Bad Sector Scanning IO Timeout Handling	 The following files will have 2 replicas ke ISO images uploaded to virtual stora VM backups stored on virtual storage CDP backup logs of VM Temporary files generated during VM You can also reset below to keep 3 replicas 	pt by default, not applicable to policy: ge import for the above files.
Linked Clone	Virtual Datastore	Replicas
Storage Area Network	VirtualDatastore1	2 replicas 🗸
VM Running Across Datastores		
Intelligent Rate Restriction		
In-memory Read Caching		
File Storage Policy		
		OK Cancel

2.4.3.4 Viewing Virtual Datastore Details

Navigate to **Storage > Virtual Storage > Virtual Datastores a**nd 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**.

Storage > Virtual Storage > Virtual Datastores > Virt	Summary	Permissions	

2.4.3.4.1 Viewing Virtual Datastore Summary

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

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Storage Usage	
Storage Usage 31 x Analogie 31 x Raw Capacity 43.5 TB • Used: 13.2 TB (31%) • Available: 30.3 TB (85%) 2-teptica Storage Capacity 15.2 TB 3-replica Storage Capacity 9.9 TB	Virtual Datastore: VirtualDatasto Description: Click here to edit VMB: 65 Physical Disks; 18
Status	
IOPS ID Speed ID Laterny Storage Usage Cache HIt Rate Node HIt Rate	Period Last 10 minutes 🗸 🗸
400 200	0 11:30:30 11:31:30 11:32:30 11:32:30 11:32:30 11:32:30 11:34:30 11:34:30 11:34:30
— 10 Reads	— IO Writes

To change virtual datastore name and description, click 🚄 .

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



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

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Summary	/irtual Storage Other Datastores			
Virtual Datastores Physical Disks	VirtualDatastore1	0.19.18		
Shared Disks iSCSI Virtual Disks	▲ VirtualDatastore1			
Storage Policy	192.200.19.18 Disk Group 1: SSD HDD	9.7 TB/14.6 TB	192.200.19.19 Disk Group 2: SSD HDD H	9.7 TB/14.6 TB

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

vs_vol_rep2	~	IOPS	IO Speed	IO Latency	Storage Usage	Cache Hit Rate	Node Hit Rate		Pe	riod: Last 10 minutes	~
IOPS			_								
0.75	2018-03	-15 01:44:1 ds: 0 IOPS	5								
0.5	IO Write	es: 0 IOPS									
0.25											
0	01:44	01-45		1.46	01-47	01-48	01-40	01:50	01-51	01-52	01-52
	01.44	01.45	0	1.40	01.47	01.46	01.45	01.50	01.51	01.52	01.55

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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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.

Nodes									
⊖ Refresh 💿 Add New Node 🛛 ↓∃ Sort by Name 🗸 🖉 Communication Interface									
(master node)192.1	68.20.5	192.168.20.4	4	192.10	68.20.3				
CPU Usage	21%	CPU Usage	17%	\triangleright					
Memory Usage	21%	Memory Usage	42%	Reboot	Shut Down				
IO Usage	0%	IO Usage	0%	Summary	••• More	Ľ	Set To Cluster Controller		
						G	Replace Node		

2.4.3.4.3 Managing Datastore

On the **Summay** page of a virtual datastore, you may click **Manage** to enter the following page. Here you can manage the datastore and folders on it.

*		🧀 Virtua										
	F	Refresh			Cleanup							
		Name				*	Size	$\frac{A}{\Psi}$	Туре	*	Last Modified	÷
VirtualDatastore1		🤳 export	t_vm				-		Folder		-	
Raw Storage		🤳 iso					-		Folder		-	
Capacity: 28.98 TB		🗾 private	e				-		Folder		-	
Free: 10.2 TB												
65%												
Enable datastore sharing												
With Resource Manager, use												
SANGFOR aCloud admin credentials to access folder:												
\\192.200.19.19\disks\3ab48700												

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

F	Refresh	New Folder	Delete	Rename	Upload	Cleanup
	Name	^				
-	⇔ ∩Þ	Folder Name:				
	📙 backu	0		01/		
	📙 cdp			OK	Cancel	
	📙 delete	d				

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 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.

Storag	e > Virtual Storage > Virtu	ial Datastores ≻vs_v	Summary		Permissions				
⊖ Refresh ⊙ New 📅 Delete									
	Administrators		\$	Group			\$ Permissions		
-	admin		Default Group				Access datastore		

2.4.4 Managing Physical Disks

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In **Storage > Virtual Storage > Physical Disks**, such information as disk name, status, virtual datastore, disk type, disk usage, read and write speed, IO reads and writes, IO latency are displayed, as shown below:

Panel style show as below:

	Summary	/irtual Storage Other Datastores								
		Panel List 📿 Refresh	 Normal Alarm Critician 	cal						
	Virtual Datastores									
	Physical Disks									
I	Shared Disks	Shared Disks								
	iSCSI Virtual Disks	• 192. 9.5 TB/14.6 TB	9.5 TB/14.6 TB							
	Storage Policy	Disk Group 1: SSD HDD HDD HDD HDD HDD	Disk Group 2: SSD HDD HDD HDD HDD HDD							

List style show as below:

Summary	Virtual St	orage Oth	er Data	stores													
	Pa	nel List	6	Refresh	Q Tu	'n On Disk LED	7	'Virtual Data	astore:,	All ∨ Q	Advanced	l Search	Cache	disks: 2 Data d	isks: 8	Spare disks: 0	Free disks:
Virtual Datastores		Node	Å	Disk	*	Status	$\stackrel{\pm}{\Psi}$	Туре	$\frac{\mathbb{A}}{\mathbb{V}}$	Usage		Read Speed	$\frac{\mathbb{A}}{\mathbb{V}}$	Write Speed	$\stackrel{\mathbb{A}}{=}$	IO Latency	\$ 6
Physical Disks		192.20		Disk 1		🔗 Normal		SSD			95 %	282 KB/s		3.8 MB/s		0.07 ms	
Shared Disks		192.20		Disk 5		🕑 Normal		HDD			69 %	0 B/s		0 B/s		0 ms	
iSCSI Virtual Disks		192.20		Disk 4		🔗 Normal		HDD			47 %	0 B/s		0 B/s		0 ms	
Storage Policy		192.2		Disk 3		🔗 Normal		HDD			66 %	0 B/s		0 B/s		0 ms	
		192.20		Disk 2		🕑 Normal		HDD			78 %	0 B/s		0 B/s		0 ms	
		192.2		PHYM80930	1FP4	🕑 Normal		SSD			95 %	718 KB/s		3.5 MB/s		0.17 ms	
		192.20		NHG5S1XN		🕑 Normal		HDD			67 %	2 KB/s		84 KB/s		19.69 ms	
		192.200		NHG5LWUN		🔗 Normal		HDD			60 %	0 B/s		78 KB/s		1.56 ms	
		192.26.		NHG53HAN		🔗 Normal		HDD			67 %	0 B/s		50 KB/s		6.67 ms	
		192.2		NHG4ZRWP		📀 Normal		HDD		-	65 %	10 KB/s		2 KB/s		9.33 ms	

By clicking on a disk name, you may enter the summary page of that disk to view the disk details, such as disk IO throughput, IOPS, disk tag, disk status, etc.



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Basics									
	Disk :	K7HN393L	Ľ	Virtual I	al Datastore : VirtualDatastore1				
l	Description :			Node:	e: 192.200.19.19				
l	Type :	HDD		Group :	ıp : Group 2				
l	Disk Capacity :	Used (2.5 TB)/Total (3.6 TB)		Disk Sta	Status : Healthy				
l	Disk Tag :	K7HN393L		Use of [of Disk : Data disk				
l	Slot:	Disk 5							
L									

To turn on disk LED, you may select one or more disks, and click **Turn On Disk LED** so as to easily locate disks, and disk LED will be automatically turned off in one minute after it is turned on.

Summary	Virtual Storage Other	Datastores								
	Panel List	🕝 Refresh 🛛 📿 Turn On Disk LE	ED 🛛 🖓 Virtual Datastore: All	✓ Q Advanced Se	arch		Cache Disl			
Virtual Datastores	Node	Disk	Status	🗢 Туре	Usage	Read Speed	Write Speed			
Physical Disks	192.168.20.5	Disk 1	📀 Normal	SSD	95 %	0 B/s	614 KB/s			
Shared Disks	192.168.20.5	Disk 0	🕑 Normal	SSD	95 %	8 KB/s	200 KB/s			
iSCSI Virtual Disk	192.168.20.5	Disk 5	📀 Normal	HDD	16 %	0 B/s	24 KB/s			
	192.168.20.5	Disk 4	📀 Normal	HDD	11 %	0 B/s	8 KB/s			
	192.168.20.5	Disk 3	📀 Normal	HDD	16 %	0 B/s	36 KB/s			
	192.168.20.5	Disk 2	🕑 Normal	HDD	14 %	0 B/s	40 KB/s			
	192.168.20.4	Disk 1	📀 Normal	SSD	38 %	4.18 MB/s	268 KB/s			
Turn On Disk LED X Image: Comparison of the text of the text of the text of the text of text o										
					l Got It					
	All 🗸									

To display disks by datastore, click on the icon

. You may also

go to Advanced Search to filter disks by specifying certain conditions such as Node, Status(All, Normal, Error, Having ongoing task), Use of Disk(All, spare disk, data disk, cache disk), and Type(All, HDD, SSD).

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) 5	🖓 Virtual Data	astore: All 🗸		Search	Cache Disks: 2	Data disks: 4
÷	Virtual 🌲	Type 🕐		Re	Wr	IO Reads
lorma	Datastore	Data disk(HDI	Node:	All		~
lorma	Datastore	Data disk(HDI	Status:	All		~
	Datastas	O a tradición	Disk:	All		~
Iorma	Datastore	Cache disk(St	Type:	All		~
lorma	Datastore	Data disk(HDI			ОК	Cancel
lorma	Datastore	Data disk(HDI),	12 /0 00		01010

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	Summary Virtual Storage Other Datastores												
	🕂 Refresh 💿 New		🗄 Delete	Recycle	Bin								
Virtual Datastores	Name Name	÷	Status	\$ Vir	rtual Datastore	\$	Disk Size	¢	Read Speed	\$ Write Speed	¢	Connected Virtual Machines	¢
Physical Disks	Oracle RAC_Data disk_1		🕑 Normal	Vir	rtualDatastore1		60 GB		0 B/s	0 B/s		2	
Shared Disks	Oracle RAC_Data disk_2		🕑 Normal	Vir	rtualDatastore1		60 GB		0 B/s	0 B/s		2	
iSCSI Virtual Dieke	Oracle RAC_Data disk_3		🕑 Normal	Vir	rtualDatastore1		60 GB		4 KB/s	0 B/s		2	
ISCSI VIItuai Diaka	Oracle RAC_Log Disk_1		📀 Normal	Vir	rtualDatastore1		30 GB		0 B/s	0 B/s		2	
	Oracle RAC_Log Disk_2		📀 Normal	Vir	rtualDatastore1		30 GB		8 KB/s	0 B/s		2	
	Oracle RAC_Log Disk_3		🕑 Normal	Vir	rtualDatastore1		30 GB		0 B/s	0 B/s		2	
	Oracle RAC_Quorum Disk_	,1	📀 Normal	Vir	rtualDatastore1		10 GB		0 B/s	0 B/s		2	
	Oracle RAC_Quorum Disk_	2	🕑 Normal	Vir	rtualDatastore1		10 GB		0 B/s	0 B/s		2	
	Oracle RAC_Quorum Disk_	3	Normal	Vir	rtualDatastore1		10 GB		0 B/s	0 B/s		2	

2.4.5.1Creating 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:

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Create Shared Disk		×
Virtual Datastore:	VirtualDatastore1	-
Storage Policy:	2_replica_high_performance	× 🕂
	The storage policy should be the same as applied for the VM using this shared disk.	
Name:		
Size:	GB	
Disks:	1	
Description:		
Shared Among:	All in datastore O VM(s) Selected	
Virtual shared disk is u different virtual maching	used to provide sharing service for applications like Oracle RAC, s nes can share the same virtual disk.	o that
	OK Car	cel

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.

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

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Configuratio	n Advanced						
📃 Processor	8 core(s)	Disk Ty	/pe: ONew disk (O Existing d	isk OP	hysical disk 💿 Sh:	ared disk
📟 Memory	8 GB			-			
🦰 Disk 1	100 GB		Disk	LUN	Size	Storage Policy	Detail
e Disk 2	120 GB	-	🝧 Yong-test	8	200 GB	2_replica_high_p	View
🦰 Disk 3	120 GB						
🦰 Disk 4	120 GB						
CD/DVD 1	CD/DVD Drive						
吨 eth0	Connected To: Switch0425						

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

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.

-34	SANGFOR aCloud	aCloud	Home	Compute	e Ne	tworking	Storage	No	odes	Reliability	System	I I I I I I I I I I I I I I I I I I I	ealth Check
Syster		Network Devices	Virtual Ma	chines	Share	d Disks	Junk File	s					
Ş		lete \land Empty											
	Name	÷	Description		÷	Туре		Å	Size	÷	Time Deleted	Å	Days Preserved
	Set					Shared Dis	sks		10 GB		2020-03-05 12:02:58		-
	Share-demo					Shared Dis	sks		10 GB		2019-06-21 01:53:37		-
	😂 Test					Shared Dis	sks		100 GB		2019-07-17 09:05:59		-

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.

- a. Normal VM : 2_replica
- b. SQL Server/ Oracle Database: 3_replica_high_performance
- c. Shared disk: <u>3_replica_high_performance</u>
- d. iSCSI virtual disk: 2_replica

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Summary	Virtu	ual Sto	orage Other Data	astores		Summary					
		Θ	Refresh 🕣 Add I	New Storage Policy		Virtual Storage	2				
Virtual Datastores			Policy Name	Description	Replicas (Other Datasto	res oS 🕕	Stripe Width	Replica Defrag	Associated Objects	Operation
Physical Disks			2_replica	Both ordinary and str	2 replicas	Mediu	um level of perfor	Adaptive	Enabled	254	Edit Delete
Shared Disks			2_replica_high_per	Both ordinary and str	2 replicas	High	level of performar	nce Adaptive	Enabled	29	Edit Delete
iSCSI Virtual Disk	s		3_replica	Only ordinary datasto	3 replicas	Mediu	um level of perfor	Adaptive	Enabled	1	Edit Delete
Storage Policy			3_replica_high_per	Only ordinary datasto	3 replicas	High	level of performar	nce Adaptive	Enabled	0	Edit Delete

Creating new storage policy allow to customize in terms of Replicas, Auto Tiering QoS, Stripe Width and Replica Defrag.

ad New Stora	ge 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
	O 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, o dual-disk failure; actual storage capacity is one third of the total capacity
	O 3 replicas (for stretched datastores)
	Replica V Placement:
Stripe Width:	Adaptive 🗸 🕕
Auto Tiering QoS	Medium level of performance 🗸 🕕

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.

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Summary	Virt	ual St	torage	Oth	er Datast	ores												
		0	Refresh	⊙	New	٢	iSCSI Server											
Virtual Datastores			Name	+	Status	$\frac{\mathbb{A}}{\mathbb{V}}$	Virtual Dat 🌲	Storage Po	SCSHD 🗧	7	LUN ID	$\frac{A}{\Psi}$	Disk Size 🏻 🌲	Read Speed 🌲	Write Speed 🚔	Target IP	÷	Conne 🌲
Physical Disks			iscsi-test	ting	🕑 Norn	nal	VirtualDatast	2_replica	97684313-6a		4		500 GB	3 KB/s	514.5 KB/s			5
Shared Disks			test		🕑 Norn	nal	VirtualDatast	2_replica	ec109ba2-3c		5		500 GB	31.5 KB/s	64 KB/s			3
iSCSI Virtual Disk	s																	
Storage Policy																		

To view connected iSCSI initiators, click on the number under the **Connected** column.

				SCSI Server] Delete										
Name		Status	*	Virtual Dat	Stora	age Po	SCSHD	÷	LUN ID	*	Disk Size	÷	Read Speed	Write Speed 🌲	Target IP	*	Conne 🜲
iscsi-testi	ing	🕑 No	Con	nected Initiat	ors								×	289 KB/s			5
test		🚫 No											_	0 B/s			5
			Initiator	Address		Initiator IG	N			Ser	ver Address						
			192.			iqn.2005-0	13.org.open-is	csi:ho	st-6c92bf	192	.200.19.19						
			192.			iqn.2005-0	13.org.open-is	csi:ho	st-6c92bf	192	.200.19.19						
			192.			iqn.2005-0	13.org.open-is	csi:ho:	st-6c92bf	192	.200.19.19						
			19:			iqn.2005-0	13.org.open-is	csi:ho:	st-00e0ed	192	.200.19.19						
			192			iqn.2005-0	13.org.open-is	csi:ho	st-8c92bf	192	.200.19.19						

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**

2.4.6.1Configuring iSCSI Server

An iSCSI server should be configured before you create iSCSI virtual disk. You con configure iSCSI server for different virtual datastores. The configuration process involves configuring iSCSI authentication and target portal.

iSCSI Server			×
🕝 Refresh			
Virtual Datastore	Authentication	Target IP	Operation
VirtualDatastore1	iqn.2015-08.3ab48700.com.sangfor.asan	🛞 Not configured	Settings

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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:	iqn.2015-08.3ab48700.com.sangfor.asan								
CHAP Username:	sangfor	0							
CHAP Password:	****	0							
Retype 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 :

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.

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iSCSI initiators can access virtual iSCSI disk via target IP address, to gain high availability 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:

No single-point of failure: Once a node fails, iSCSI connections to the node will be scheduled to another node.

Load balancing: Initiator connections to a specified target IP address will be evenly scheduled to different nodes to access virtualized iSCSI disks in virtual storage, so as to realize load balancing.

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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Create iSCSI \	/irtual Disk	×
Virtual Datastores:	VirtualDatastore1	
Storage Policy:	2_replica	
Name:		
Description:		
Disk Size (GB):		0
Accessible To:	Any initiator 🔹 Settings (0 initiators)	
S Advanced	Allow initiators to connect concurrently 🕚	
Particular State of Control of	nodes in the cluster. iSCSI virtual disks should better a management interface IP address (192.200.19.19, 18).	be •
	ОК	Cancel

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 deselected by default. Enable this to allow an entire cluster to access, for example, VMware vSphere cluster.

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Initiator Setting	IS		×
New Initiator Addr	Initiator Address:		Edit
	СНАР		
	Username: Password:		
		OK Cancel	

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**, **Password** and **Retype 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.

More Options

Optimum disk performance: Once this is selected, SSD cache disk will be occupied preferentially to improve disk performance.

2.4.8 Other Datastores

Storage falls into the following tyeps: 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 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:

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Summary	Virtual S	Storage Other Datastores						
🖯 Refresh	🖯 Update	🕞 Scan for New Disks 💿 New (🄅	SCSI Servers 🕒 Physic	al Disks in Use				
Status		Name	Storage Type	Total Capacity	Available Space	Peak Read Speed	Peak Write Speed	Connected Nodes
				No data	available			

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 or local storage by clicking **New** in **Storage > Other Datastore.**

Summary	Virtual Storage	Other Datastores			
🔾 Refresh	🖁 Update 🛛 G Sc	an for New Disks	• New	iSCSI Servers	🕒 Physical Disks in Use
Status	Name	Stora	FC		Available
🥑 Normal	Local-storage	Local	ISCSI	3	433.4 GB
🛕 Alarm	ISCSI	iSCSI	Local stor	age	36.8 GB

2.4.7.1.1 Adding FCType 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.

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Ac	d New Datas	store							×
St	orage Type:								
_	Oiscel	●FC	OLocal storage						
Г	Status	Disk	\$	LUN	Å	Size	×	Details	
			No data availa	ble					
	How to add a	new FC disk?							
	Disk is not rea	achable any more?	Scan for Disks						
1/2					Nex	t		Cancel	

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

Add I	New Datas	tore						×
Stora	ge Type:							
(Discel	OFC	OLocal storage					
	Status	Disk		LUN	*	Size	$\frac{\mathbb{A}}{\mathbb{V}}$	Details
			No data available					
2	How to add a r	new FC disk?						
	Disk is not rea	chable any more? So	can 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.

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.

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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.

erresh e update e scan for New Disks e New e Isosi Servers e Physical Disks in Ose	
Status Name Stora FC Available F	Peak Read
Normal Local-storage Local Local 3 433.4 GB 5	512.8 MB/s
Alarm ISCSI iSCSI Local storage 3 36.8 GB 1	118.1 MB/s
Add Now Datastoro	
Storage Type:	
iSCSI OFC OLocal storage	
Status Disk ILUN I 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	

Before adding iSCSI type of datastore, you need to add iSCSI server in **Storage > Other Sangfor Technologies**

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Datastore> **iSCSI Server**. iSCSI disks will be automatically discovered when iSCSI server settings are saved.

Summary	Virtual Storage Other Data	astores					
🖸 Refresh	Update 🕤 Scan for New D	isks 🕀 New	💮 iSCSI Servers 🕐 I	Physical Disks in Use			
Status	Name	Storage Type	Total	Available	Peak Read Speed	Peak Write Speed	Connected Nodes
📀 Normal	Local-storage	Local storage	444 GB	433.4 GB	512.8 MB/s	451.9 MB/s	1
🛕 Alarm	ISCSI	iSCSI	496 GB	36.8 GB	118.1 MB/s	169.7 MB/s	2
1							

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

Add New Datas	tore					×
Storage Type:						
Oiscsi	OFC	OLocal storage				
Status	Disk	*	LUN	*	Size 🛔	Details
0	VIRTUAL-IS-DIS	SK_SANGFOR_1SANGF	5		500 GB	View
Disk is not fou Disk is not rea	nd or need more d achable any more?	isks? Add a New iSCSI Server 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.

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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 formating 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 remote NFS server, just like accessing local files.

Add N	NFS			×
💡 Due	to peri	ormance restriction, NFS is recommended t	o store backups only, not t	o create or run VM.
Name	e:			
Desci	ription:			
Serve	er:			
Folde	er:			\sim
Cor	nnect [·]	To Node		
		lode	IP	
	1	92.200.19.18	192.200.19.18	
	1	92.200.19.19	192.200.19.19	
			ОК	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.

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```



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.

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.

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iSCSI Servers		×
🕞 Refresh 🛛 🕙 New		
Server Address	Port	Operation
192.	3260	200
19.	3260	🖻 🖻 G

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.

dd a Nev	v iSCSI Server		>	~
iSCSI	Server			
Server:	IP address			
Port:	3260			
Authent	cation			
Crei	lentials for this machine to tor simply needs to initiate	get authenticated against connection.	iSCSI server.	
Use	name:			
Pas	sword:			
Mutu	al CHAP (server and initiat	or authenticate each other)	
Cre	Id a New iSCSI Server ISCSI Server Server: IP address Port: 3280 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: Ontual CHAP (server and initiator authenticate each other) Credentials for iSCSI server to get authenticated against this machine			

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**.

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```

Edit iSCSI Server					
iSCSI S	Server iSCSI Targets				
ISCSI Ta By default,	rget all disks from authenticated target are added ont	o 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.

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**.

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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**.



- 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.



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

🕝 Refresh 🛛 🕀 Add New	Node 1 = Sort by Name 🗸
	Name CPU Usage Memory Usage
(Cluster Controller) Node 19 CPU Usage 56%	192.200.19.18 CPU Usage 95%
Physical Mem Usage 83%	Physical Mem Usage 82%
Memory Allocation 109%	Memory Allocation 143%

To sort virtual machines by CPU usage, select **Sort > CPU Usage** inNodes. 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.

\bigcirc Refresh \odot Add New Node $\exists \exists$ Sort by CPU Usage $ullet$					
	Name				
	CPU Usage 🛛 🚺				
	Memory Usage				
192.200.19.18	(Cluster Controller) Node 19				
CPU Usage 95%	CPU Usage 53%				
Physical Mem Usage 82%	Physical Mem Usage 83%				
Memory Allocation 143%	Memory Allocation 109%				

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 **Sangfor Technologies**

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🕝 Refresh 🔹 🕀 Add Nei	w Node $1 \equiv$ Sort by Memory Us	age 🗸
	Name	11
	CPU Usage	11
	🗸 Memory Usage	11
(Cluster Controller) Node 19	192.200.19.18	
CPU Usage 58%	CPU Usage 96%	
Physical Mem Usage 83%	Physical Mem Usage 82%	
Memory Allocation 109%	Memory Allocation 143%	

figure shows that the virtual machines are sorted by memory usage in a descending order.

2.5.2 Viewing Node Status

The **Nodes** page is shown below:

Nodes	Physical	Interfaces	Communication Inte	rfaces Syst	em Disks
· ⊖ Refresh 🚽 ⊙ Add New Node 🚽 🗄 Sort by Name 🗸 🐇					
(Cluster Controller) 19	12 200 1	192.2	00 19 18		
CPU Usage	50%	CPU Usage	93%		
Physical Mem Usage	87%	Physical Mem	Usage 80%		
Memory Usage	129%	Memory Usag	e 146%		
	_				

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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Move your cursor on the node panel and you will see the following buttons: **Summary** and **More**, as shown below:

192.20	0.19.18
Summary	••• More

To enter node summary page, you may click on node name or **Nodes > Summary**.

	Summary	Accessible Storage	VMs	Virtual Network Device	s		
🕜 Refresh 🕒 🕕 Shut Down							
CPU Usage 92 % 2.4.0HzX12.com(0).24 mread(s)	Previation Mann Usage 82 % Free: 4598 08 Total: 256 08 C-Ref	ир ум Usage 46 % 1 1 1 1 1 1 1 1 1 1 1 1 1	Memory Description	Throughput C Ail 400Mbps 300Mbps 200Mbps 00Mbps 00bbps 00bps 00bps	PU Memory 10 Speed •	1659 1200 1210 — Inbound — Outbound	Last Hours Last 24 Hours
Basics & Hardware Configura	tion						
Node Name	192.200.19.18		e	🔺 🧮 CPU	6 core(s) 12 Thread × 2 (Intel	(R) Xeon(R) CPU E5-2620 v3 @ 2.40GHz)	
Description:					Clock Speed: 2.40 GHz		
Hardware T	pe: Non-Sangfor aServer				Cache: 15 MB Stepping: 2		
Software Ve	rsion: SANGFOR aCloud 6.0.1	_EN Build20200307	-	🖌 🚥 Memory	256 GB		
Storage Ada	pter IGN: iqn.2005-03.org.open-iso	si:hosl-00e0ed5b1f5d					
Network Us	ad Marx: 4007 MD				Reserved: 44.59 GB 🕐	Preallocated: 11 GB	
Cluster Cor	troller No		2		Available: 200.41 GB	Overcommitted: 160.33 GB	
Uptime:	128 days 12 hrs 55 mins				5		
Running VM	s: 25	-		D RAID	1		

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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.

Message		×
	Are you sure you want to change this to cluster controller? The node (192.200.19.18) will become the cluster controller and the existing cluster controller will become an ordinary node in SANGFOR aCloud. We recommend to migrate the virtual machines away from the new cluster controller so that it has enough resources to respond efficiently.	
	Confirm Cancel	

b. **Enter Maintenance Mode**: Enable to allow the selected node to enter the maintenance node for hardware maintenance such as memory replacement.





- 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.

Message		×
	Are you sure you want to Reboot the node (192.200.19.18)? It is better to place the node in maintenance mode before the Reboot operation, to avoid business interruption. Before entering maintenance mode, you need to migrate or shut down the virtual machines running on the node. Go to Nodes, click More on node panel and select Maintain.	
	Reboot node without entering maintenance mode	
	Confirm Cancel	

e. **Power off**: Power off the node.

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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:

Node > 192.200.18.18	Summary	Accessible Storage	VMs	Virtual Network Devices
🕝 Refresh 👘 🕛 Shut Down 🗳 Restart				
-				

2.5.3.1 Node Summary

On the **Summary** page, you may view node status, basics and hardware configurations.

<mark>⊖ Refresh</mark> (¹) Shut Down → Restart						
		() Memory Des	cription	Throughput C	PU Memory IO Speed ▼	Last Hour Last 24 Hours
Physical Mem Usage 79 % 3(s) Free: 53.85.68 Free: 87.87.68 Free: 43.4.6B Total: 256.68 C-RAM: 211.41.68 Total: 48.68				All 300Mbps	16/20 16/30	1640 1650 17.00 17.10
					— Inbound	— Outbound
Basics & Hardwa	re Configuration					
	Node Name:	192.200.19.18		🔺 📴 CPU	6 core(s) 12 Thread X 2 (Intel(R) Xe	eon(R) CPU E5-2620 v3 @ 2.40GHz)
	Description:				Clock Speed: 2.40 GHz	
	Hardware Type:				Clock Opecu. 2.40 Off2	
	,,	Non-Sangtor aServer			Cache: 15 MB	
	Software Version:	Non-Sangtor aServer SANGFOR aCloud 6.0.1_EN Build2020	00307		Cache: 15 MB Stepping: 2	
	Software Version: Storage Adapter IQN:	Non-Sangtor aServer SANGFOR aCloud 6.0.1_EN Build2020 iqn.2005-03.org.open-iscsi:host-00e0e:	00307	🔺 📟 Memory	Cache: 15 MB Stepping: 2 256 GB	
	Software Version: Storage Adapter IQN: Network Used CPU:	Non-Sangtor aServer SANGFOR aCloud 6.0.1_EN Build2020 iqn.2005-03.org.open-iscsi.host-00e0e. 1 core(s)	00307 🖄	🖌 💳 Memory	Cache: 15 MB Stepping: 2 256 GB	Preallocated: 11 GB
	Software Version: Storage Adapter IGN: Network Used CPU: Network Used Mem:	Non-Sangtor aServer SANGFOR aCloud 6.0.1_EN Build202/ kgn 2005-03.org.open-iscsi:host-00e0e. 1 core(s) 4997 MB	00307 🕑	🔺 💳 Memory	Cache: 15 MB Stepping: 2 258 GB Reserved: 44.59 GB (?) Available: 200.41 GB	Preallocated: 11 GB Overcommitted: 180 33 GB
	Software Version: Storage Adapter IQN: Network Used CPU: Network Used Mem: Cluster Controller:	Non-Sangtor aberver SANGFOR aCloud 6.0.1_EN Build202(ign 2005-03.org.open-iscsi:host-00e0e. 1.core(s) 4997 MB Na	00307	Memory	Cache: 15 MB Stepping: 2 256 GB Reserved: 44.59 GB (?) Available: 200.41 GB	Presilocated: 11 GB Overcommitted: 180.33 GB
	Software Version: Storage Adapter ION: Network Used CPU: Network Used Mem: Cluster Controller: Uptime:	Non-Sangtor aServer SANGFOR aCloud 6 0.1_EN Build202(iqn 2005-03 org open-iscsi host-00e0e 1 core(s) 4997 MB No 129 days 12 hrs 34 mins	00307	Memory Memory NIC HBA	Cache: 15 MB Stepping: 2 256 GB Reserved: 44 59 GB (?) Available: 200.41 GB 8 None	Preallocated: 11 GB Overcommitted: 160.33 GB
	Software Version: Storage Adapter IQN: Network Used CPU: Network Used Mem: Cluster Controller: Uptime: Running VMs:	Non-Sangtor aServer SANGFOR aCloud 6 0.1_EN Build202(km 2005-03.org.open-liscsi host-00e0e. 1.core(s) 4997 MB No 129 days 12 hrs 34 mins 21	00307 🗹 🔽	 Memory NIC HBA RAID 	Cache: 15 MB Stepping: 2 266 GB Reserved: 44 59 GB (?) Available: 200.41 GB 8 None 1	Preallocated: 11 GB Overcommitted: 180.33 GB
	Software Version: Storage Adapter IQN: Network Used CPU: Network Used Mem: Cluster Controller: Uptime: Running VMs:	Non-Sangtor aServer SANGFOR aCloud 6 0.1_EN Build202(km 2005-03.org.open-iscsi host-00e0e. 1.core(s) 4997 MB No 128 days 12 hrs 34 mins 21	00307 🕜	Memory Memory MiC HBA RAID	Cache: 15 MB Stepping: 2 256 GB Reserved: 44.59 GB ? Available: 200.41 GB 6 None 1	Preallocated: 11 GB Overcommitted: 180.33 GB
	Software Version: Storage Adapter IQN: Network Used CPU: Network Used Mem: Cluster Controller: Uptime: Running VMs:	Non-Sangtor aServer SANGFOR aCloud 6 0.1_EN Build202(ign 2005-03 org open-iscei host-00e0e. 1 core(s) 4997 MB No 129 days 12 hrs 34 mins 21	00307 🕑	 Memary NIC HBA RAID 	Cache: 15 MB Stepping: 2 256 GB Reserved: 44.59 GB ^(*) Available: 200.41 GB 8 None 1	Preallocated: 11 GB Overcommitted: 160.33 GB

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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the last hour or 24 hours.

Status	
Memory Description	Throughput CPU Memory IO Speed V Last Hour Last 24 Hours
CPU Usage Physical Mem Usage Usage 92 % 79 % 134 %	All • 100% •••••••••••••••••••••••••••••••••••
4 GHz X 12 core(s) 24 thread(s) Free: 53 81 GB Free: 87 87 GB Total: 258 GB C-RAM: 211.41 GB	0% 16:10 16:20 16:30 16:40 16:50 17:00 17:10 — CPU Usage

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.

Status	
Memory Description	Throughput CPU Memory IO Speed ▼ Last 24 Hours
CPU Usage 94 % Physical Mem Usage 79 % 134 %	All 279.4GB 186.26GB
.4 GHz X 12 core(s) 24 thread(s) Free: 53.55 GB Free: 87.67 GB	93.13CB
Total: 256 GB C-RAM: 211 41 GB	0816:20 16:30 16:40 16:50 17:00 17:10 17:20
	— Used — Total

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



Throughput: Displays the trending of node throughput.





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

Basics & Hardwar	re Configuration					
Basics & Hardwar	re Configuration Node Name: Description: Hardware Type: Software Version: Storage Adapter IQN Network Used CPU: Network Used Mem: Cluster Controller: Uptime: Running VMs:	192.200.19.18 Non-Sangfor aServer SANGFOR aCloud 6.0.1_EN Build20 iqn 2005-03.org open-iscs: host-00e0 1.core(s) 4997 MB No 129 days 12 hrs 39 mins 21	200307 e 2	CPU Memory Memory NIC HBA RAID	6 core(s) 12 Thread × 2 (Intel(R) Clock Speed: 2.40 GHz Cache: 15 MB Stepping: 2 256 GB Reserved: 44.59 GB (?) Available: 200.41 GB 6 None 1	Xeon(R) CPU E5-2620 v3 @ 2.40GHz) Preallocated: 11 GB Vercommitted: 160.33 GB
	Running VMs:	21		D 🖿 RAID	1	

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	Sum	mary Accessible Storage	VMs	Virtual Network Device	s		
⊖ Refresh Test Storage IC) Speed						
Datastore 🗘 Typ	e Å	Used 💂	Free 荣	Usage 븆	Capacity 荣	Peak Read Speed 🏺	Peak Write Speed 荣
SCSI iSC	SI	459.5 GB	36.5 GB	92.64%	496 GB	118.15 MB/s	169.73 MB/s
📒 192.200.19.18/local Loc	al storage	4.6 GB	43.4 GB	9.57%	48 GB	489.52 MB/s	326.73 MB/s
PirtualDatastore1 Virt	ual Storage	18.98 TB	10 TB	85.48%	28.98 TB	395.37 ME/s	184.57 ME/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
G 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				
			Close	1

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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	Summar	ry Accessible Storag	e VMs	Virtual Network Devices			
🖼 🗉 Group Q	🔆 Refresh				Nam	e	Q Ad
🖃 🧰 Virtual Machine(82)			🛕 4 virtual machir	ne(s) giving alarm View			
- Int							
- In	НА	НА	HA	НА	4	HA	
	3%	3%	3%	3%		3%	
	Servi	Ser	Serve	CPU Usage	0%	Ci CPU Usage	1%
 K				Memory Usage	48%	·	10%
	Powered Off	Powered Off	Powered Off	Disk Usage	16%	Disk Usage	25%

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.

Summar	у	Access	sible Storage	VMs	Virtual Network D	evices			
							Nar	ne (Advanced Search
_						Nan	ne:	VM name	
_						Stat	tus:	All	~
. e	HA	•	,	HA	HA	Тур	e:	All	~
*			?			Gro	up:	Virtual Machine	~
er0002		Server	0003	Server0005		AN		Among immediate	VMs in the above group
					CPU Usage	-			OK Cancel
red Off				Powered Of	f Memory Usa	ige			Cancer
cu on	Pov	war On	Shut Down	i owered Of	Nisk Hsane		16%	Nisk Hsane	25%

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).

Node > 192.200.19.18		SI	ummary	Accessible Storage	VMs	Virtual Network Devices
🖼 🗉 Group 🖸	\gtrsim					
Virtual Network Device (32)		Status	Name			
 yong(0)		\$	Y			
Default Group(32)		4	s.			
		-	K			
		4	F			
		-	IAM			
		الله الله	ST_			
		الله الله	AF			
		-				

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 Interfa	aces Communication Interfac	es Syste	m Disks							
C Refresh 🕂 Add Multiple Ag	gregate Interfaces 🕀 Add Mu	ıltiple VLAN Sı	ubinterfaces 🖉 E	dit Multiple	🌣 Advan	iced 🗸				
Node	Name	VLAN ID	Use of Interface	Descripti	IP Address/	Gateway	Driver T	Link Mode	Status	Operation
192.200.19.18	th0	-	Management Int	-	192.200.19	192.200.19.1	igb	Auto-negotiation	~	Edit
192.200.19.19	th1	-	Edge-connected	-	-	-	igb	Auto-negotiation	~	Edit
	th2	-	Storage Network	-	-	-	igb	Auto-negotiation	\checkmark	
	eth3	-	Storage Network	-	-	-	igb	Auto-negotiation	\checkmark	
	eth4	-	Edge-connected	-	192.168.19		igb	Auto-negotiation	~	Edit
	eth5		Overlay Network	-	172.17.19.3	-	igb	Auto-negotiation	× .	Edit
	l									

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 (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	0								
MAC Address:	00:e0:ed:5b:1f:5c									
	ок	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	Communic	ation Interfaces	System Disks		
C Refresh	+ Add Multiple Aggregat	e Interfaces	🕂 Add Multiple	VLAN Subinterface	s 🛯 🖍 Edit Multiple	🛛 🛱 Advanced 🗸

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Add Multiple Agg	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 Mutilple										
Node Name	Physical Interface (i)	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					



⚠

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 Interf	aces Communication Interfaces	System Disks		
C Refresh 🕂 Add Multiple Ag	gregate Interfaces 🛛 🕂 Add Multiple	VLAN Subinterfaces 🛛 🖉 Edit	Multiple 🗘 Advanced 🗸	
Node	Name	VLAN ID	Add Aggregate Inte Use of Int Add VLAN Subinter	rface IP Addre
Node 192.200.19.19	th0	-	Managerr Others	192.200
192.200.19.18	English eth1	-	Edge-connected Intenace	
	th2	-	Storage Network Interface	
	th3	-	Storage Network Interface	
	th4	-	Edge-connected Interface	- 192.168
	th5	-	Overlay Network Interface	- 172.17.1
	🔜 eth6	-		
	🔜 eth7			

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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.

Others (192.200.1	19.18)		×
DNS	Static Route	Inter-Host Communication Interfaces	
Preferred DNS:			
Alternate DNS 1:			
Alternate DNS 2:			
	Save		
			Close

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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

Others (192.200.19	.18)					\times
DNS	Static	Route	Inter-Host Communication Interfaces			
Management Interface:		eth0		~		
		Save				
Overlay Network Interface	(VXLAN):	eth5		~		
		Save				
					Clos	e

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**.

Others (192.200.	19.18)					×
DNS	Sta	tic Route	Inter-Host Comr	nunication Interfac	es	
Add New Static	Route 🚺	Delete				
No.	Dst IP		Netmask		Next-Hon IP	Operation
		Add New S	Static Route		×	
		IP Address:				
		Netmask				
		Next-Hop IP:				
				ОК	Cancel	
						Close

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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 Interfa	ces Communication Inter	faces System Disks						
	C Refresh 🖉 Setting:	s 🔅 Cluster IP Address					? Network	ork Interface Planning Tips
Overlav Network Interface	Amanagement interface is use	ed to manage business across th	e cluster, including initiating temp	late update, executing backup an	d recovery commands, checking	whether the node is offline.		
	Node Name	Management Interface	Interface IP	Netmask	Gateway	Driver Type	Link Mode	VLAN ID
Edge-connected interrace	Node 192.200.19.19	eth0	192.200.19.19	255.255.255.0	192.200.19.1	igb	Auto-negotiation (1000M / Full-dupl	-
Storage Network Interface	192.200.19.18	ith0	192.200.19.18	255.255.255.0	192.200.19.1	igb	Auto-negotiation (1000M / 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.

	Settings							
🕝 Refresh 🛛 🖍 Edit Mutilple								
	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	ethD 🗸	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 circum unless the node fails.	Under normal circumstances, SANGFOR aCloud GUI is reachable through IP address of any managed node unless the node fails.								
With cluster IP addres	ss, you will never lose control of the management even when one node fails unexpectedly.								
SANGFOR aCloud ma	anagement 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	nterface C Refresh Settings							ork Interface Planning Tips
Overlay Network Interface	An overlay network interface is	s used for business data transfer acros	is nodes. VMs running on differe	nt nodes communicate with eac	h other through this interface.			
	Node Name	Overlay Network Interface	Interface IP	Netmask	Driver Type	Link Mode	MTU	VLAN ID
Euge-connected internace	Node 192.200.19.19	eth5	172.17.19.1	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl	1500	-
Storage Network Interface	192.200.19.18	ith5	172.17.19.3	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl	1500	
Flow Control								

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	Settings			_	×
ķ	🕞 Refresh 🛛 🖍 Edit Mutilple	IP Address Pool	🗹 Edit VXLAN Port	VXLAN Port	8472 🗸
	Node Name	Overlay Netwo	ork Interface	Inte	OK Cancel
	Node 192.200.19.19	eth5	~	17 <mark>2.17.19.1</mark>	255.255.255.0
	192.200.19.18	eth5	~	172.17.19.3	255.255.255.0
[Enable high performance mode (MTU v network failure)	will be changed to 1600	and therefore Jumbo Frar	me must be enabled	d on physical switch to avoid
				ОК	Cancel

Edit Multiple: Allow to edit the physical interfaces for all nodes.

Ľ	Edit Mutilple 🎲 IF	PAddress Pool 🛛 🖉	了Edit VXLAN Port			
	lame	Overlay Network I	nterface	Inter	face IP	Netmask
ide	Physical Interface:		~	172.1	17.19.1	255.255.255.0
		Name	Use of Interface		Link Mode	
L		eth0	Management Int	erface	Auto-negotiati	on (1000M / Ful
		Eth1	Edge-connected	I Int	Auto-negotiati	on
		eth4	Edge-connected	I Int	Auto-negotiati	on (1000M / Ful
		eth5	Overlay Network	Int	Auto-negotiati	on (1000M / Ful

IP Address Pool: Configure the IP Pool for the overlay network.

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IP Address Pool		×
Specify IP address different nodes to d	for overlay network interface (VXLAN) to enable virtual machines running on 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.



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 Interfa	ces Communication Interfaces	System Disks				
Management Interface	C Refresh 🗶 Edit Topology				6	Network Interface Planning Tips
Overlay Network Interface	An edge-connected interface is used for clu	ster to communicate with physical network. VMs	are accessed from external network through t	his interface.		
Color and and interdered	Node Name	Edge-connected interface	IP Address	Netmask	Driver Type	Link Mode
Edge-connected interface	∡ edge1					
Storage Network Interface	Node 192.200.19.19	th1			igb	Auto-negotiation
	192.200.19.18	th1			igb	Auto-negotiation
	⊿ Edge1					
	Node 192.200.19.19	initial eth4	192.168.19.171	255.255.255.0	igb	Auto-negotiation (1000M / Full-dupl
	192.200.19.18	initial 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.

Nodes	Physical Interfac	es Communication Interfaces S	lystem Disks				
Management Int		C Refresh 🖍 Settings 🗘 Test	Connectivity				? Network Interface Planning Tips
Overlay Network	Interface	A storage network interface is used for comm	unication between different nodes in the cluster. VMs ac	cess storage resources across nodes through th	is interface. Sto	orage Network Deploymer	t Mode: Link aggregation with two switches
Edaa connected	Listerface	Node Name	Physical Interface	Interface IP	Negotiated Rate	MTU	Status
Euge-connected	interrace	Node 192.200.19.19	eth2, eth3	10.25.19.19	1000Mb/s	1500	🥑 Normal
Storage Network	< Interface	192.200.19.18	eth2, eth3	10.25.19.1	1000Mb/s	1500	🕑 Normal
Flow Control							

Settings: It will prompt the Storage Area Network which allow to select Link Aggregate mode, physical interface, IP address and netmask.



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Test Connectivity: This allow to test whether the storage network has been isolated from other network.

Test Connectivity		×
O This IP address is used whether it is isolated Re	to ping connectivity to the node to check ad More	Î
Better be router IP address th	at is always connected.	
IP Address:		
		*
	OK Cancel	

2.5.5.5 Flow Control

ı.

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 Interfa	aces	Communication Interfaces	System Disks					
ſ	Management Int	erface	C	Refresh 🗶 Settings 🗸 En:	able Flow Control 🔕 Disable F	low Control			? Network	Interface Planning Tips
	Overlay Network	Interface	Itisr	ecommended to enable flow control a	nd set peak rates to ensure flow stabil	ity when a same interface is used as r	nanagement interface, VXLAN interfac	e and edge-connected interface, and vi	ew throughput of these interfaces respectivel	y on the node summary page.
	Edao econostor	l intorfaca		Node Name	Reused Interface	Link Mode 🕕	Management Interface Peak Rate	VXLAN Interface Peak Rate	Edge-connected Interface Peak Rate 🕕	Flow Control
	Euge-connected	i interrace		192.168.20.3	eth0	1 Obps	-		•	
١.	Storage Network	< Interface		192.168.20.4	eth0	1 Gbps				
				192.168.20.5	eth0	1 Gbps				

r Se	ettings					×
G	Refresh 🙋 E	Edit Peak Rates				
	Node Name	Reused Interface	Link Mode 🕕	Management Interface Peak Rate	VXLAN Interface Peak Rate	Edge-connected Interface Peak Rate 🕕
	192.168.20.3	eth0	1 Gbps	Mbps	Mbps	Mbps
	192.168.20.4	eth0	1 Gbps	Mbps	Mbps	Mbps
	192.168.20.5	eth0	1 Gbps	Mbps	Mbps	Mbps
	192.168.20.4 192.168.20.5	eth0 eth0	1 Gbps 1 Gbps	Mbps Mbps	Mbps Mbps	Mbps Mbps

Settings: Configure the Peak Rate for each interface accordingly.

Enable Flow Control: Allow to enable the flow control for the selected nodes after peak rate has been configured.

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Disable Flow Control: Allow to disable the flow control for the selected nodes after peak rate has been configured.

2.5.6 System disk

Starting from aCloud6.o.o., system disk can be replace individually without replacing the whole node, including the storage disk.

The business integrity and availability can be ensure 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	Co	mmunication Interfaces System Disks								
G, I	Refresh 💼 I											
	Node		÷	Disk Tag	¢	Status 🔅	þ	Type	¢	SSD Lifetime Remaining	¢	Operation
	192.168.20.3			1ATA_FORESEE_12808_SSD_H34375R002848		Normal		SSD		92%		Replace System Disk
	192.168.20.4			1ATA_FORESEE_128GB_SSD_H34375R003390		Normal		SSD		92%		Replace System Disk
	192.168.20.5			1ATA_FORESEE_128GB_SSD_H34375R003391		Normal		SSD		92%		Replace System Disk

1. You will be prompted to enter maintenance after clicking Repalce System Disk.



2. Before enter the maintenance mode, it provides the options to migrate VM to another host or shutdown the VM.

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	ode				×
1 Select Op	eration ——	Devices to Be Shut Down	3	Devices to Be Migrate	d
Prior to enabling mainten	iance mode, migrate or sł	ut down its running virtual machine	e or network devic	ces to avoid business in	terruption.
Expand All	Collapse All 🛛 🕕 Se	elect Shut Down for Multiple		Name	Q
Device Name		Datastore	0	peration	
- Virtual Machine					
📙 🧰 Default Group					
👯 migrate		VirtualDatastore1	١	Aigrate 🗸	
🗾 Virtual Network Devic	e		N	/ligrate	
Router			Can sho	Shut Down	grato VMs
			or shut	down the VM	grate VMS
				Next	Cancel
Nodes Physi	cal Network Use o	f Interface System Disk			
Nodes Physi	cal Network Use o	f Interface System Disk	Message		
Nodes Physi Refresh • • Add	cal Network Use o New Node · JE Sou	f Interface System Disk t by Name V	Message	The node enters maintenance devices and virtual machines in down. You may perform shutdo powered-off state) operations or Notes: 1. If any virtual machine has or may be unable to enter mainten task to complete and then try a 2. If you seek to perform an up	mode when all the virtual network unning on it are migrated or shut wn, reboot and replacing node (in on the node in maintenance mode, regoing task (e.g., backup), the nod nance mode. In this case, wait for ti gain.
Nodes Physi Refresh Add	Cal Network Use o New Node · J E So (Master) 192.168 CPU Usage	f Interface System Disk t by Name	Message	The node enters maintenance devices and virtual machines ri down You may perform shutdo powered-off state) operations of Notes: 1. If any virtual machine has or may be unable to enter mainten task to complete and then try a 2. If you select to perform an u (such as you cannot find a suit reselect it or manually process	mode when all the virtual network unning on it are migrated or shut wn, reboot and replacing node (in n the node in maintenance mode, hagoing task (e.g., backup), the nod nance mode. In this case, wait for t gain. measonable operation on the devia able host to migrate the VMJ, you c it before trying again.
Nodes Physi Refresh • • Add	Cal Network Use o New Node • J = So (Master) 192.168 CPU Usage Total	f Interface System Disk tt by Name V	Message	The node enters maintenance devices and virtual machines in down. You may perform shutdo powered-off state) operations or Notes: 1. If any virtual machine has or may be unable to enter mainten task to complete and then try as 2. If you select to perform an u (such as you cannot find a suit reselect it or manually process Auto shut down node after	mode when all the virtual network unning on it are migrated or shut wn, reboot and replacing node (in on the node in maintenance mode, nance mode, in this case, wait for ti gain. measonable operation on the devia able host to migrate the VM), you of it before trying again.
Nodes Physi Refresh Add 192.168.20.37 Being Maintained	Cal Network Use o New Node I E So (Master) 192.168 CPU Usage Total Memory Usage	f Interface System Disk t by Name Source State Stress System Disk t by Name Source System Disk t by Name Source System Disk t by Name Source System Disk Source Source So	Message	The node enters maintenance devices and virtual machines n down. You may perform shuldo powred-off state) operationos of Notes: 1. If any virtual machine has or may be unable to enter mainten task to complete and then try a 2. If you select to perform an ur (such as you cannot find a suit reselect it or manually process Auto shut down node after Enter admin password to conflit Password	mode when all the virtual network unning on it are migrated or shut wn, reboot and replacing node (in no the node in maintenance mode. nance mode. In this case, wait for t gain. nreasonable operation on the device able host to migrate the VM), you or it before trying egain. entering maintenance mode rm operation:

3. After host entered maintenance mode, proceed to replace the system disk.

ОК		×
?	System disk replacement is not applicable to the scenario where RAID is set up with syste m disks. In that scenario, contact technical support representative.	
	OK Cancel	

Note: If there have RAID configuration done on the OS disk, kindly contact technical support to assist you on your issue.

4. Click on the backup to save a copy of config into available host.

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Replace System Disk	×
3 System Configuration Backup 2 Replace System Disk	
Back up system disk configuration to another node in the cluster System configuration includes hostname, IP address and other network settings, cluster settings, SP, virtual storage settings, aServer signature. Back Up	
Next: Car	ncel
Replace System Disk	×
System Configuration Backup Replace System Disk	
Back up system disk configuration to another node in the cluster System configuration includes hostname, IP address and other network settings, cluster settings, SP, virtual storage settings, aServer signature.	
Backup Progress 100% Completed	
Next Cance	el

5. Click "finish" to complete the system disk replacement wizard.

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Replace System E	Disk	×
	System Configuration Backup 2 Replace System Disk	
Steps:		
Prepare a syste	em 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 r	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 fi system disk	rom the same version of CD/USB drive, select Replace System Disk, and then follow instructions to install the new	
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	
6 After replaceme	ent is completed, go to Nodes and turn off maintenance mode for the node.	
Back	Finish Can	cel

- 6. Make a bootable USB with ISO file HCI 6.0.0 EN or above, and restart the nodes. Select boot from USB.
- 7. Select Third option "Replace Sysdisk Install Sangfor HCI on this"



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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

Network Configuration Please Configure Network:	
LOCAL IP: 192 158 20 211	
Netmask: 255.255.25.0	
Gateway: 192.168.20.1	
< ок >	

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9. Select Yes to restoring backup configuration from the system.

Backup p	ackage information	for restoring	configuration
The filt	ered backup packag	e information	used to restore
The systeme	em configuration i	s as follows:	
Name :be6	9150c4d57f28f2017b	65503a10e69_ho	st-5853c00500d3_
192.168. Package	20.37_6.0.0_EN_B_2 Backup Time: 20191	0191104112504 104112504	
Note: Th	in hackun nackage	mau he retrieve	ad from the
cluster addition	based on the IP(19 or deletion of th	2.168.20.37) f e host network	ield due to the card. Please
	K Yes >	< No >	68×
-			

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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.



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.

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2.6.1 Authorization

It includes **Basic Components, aSEC(Security)** and **Advanced License**. **Basic Components** includes aSV(Compute Virtualization), aNET(Network Virtualization), aSAN(Storage Virtualization), aCMP(Cloud Management Platform). aSEC(Security) includes vNGAF, vADC, vIAM, vSSL VPN, vWOC, DAS, etc. Advanced License includes CDP(Continuous) and aHM(Heterogeneous Virtualization Mgmt).

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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Systen								
_								
		e Edition						You may
	Basic Components:				L	lpdate Service	Expiration Date: 2020-05-03	Edit License Key
	aSV (Compute Virtualization	n)	aNET (Network Virtualization	n)	aSAN (Storage Virtualization)			
	Version:	V6.0.1	Version:	V6.0.1	Version:	V3.0.3		With this edition, you can:
	Expiration Date:	2020-05-03	Host CPUs:	4/4	Used/Licensed CPUs:	4/4		Add up to 64 nodes to a
	Host CPUs:	4/4	Expiration Date:	2020-05-03				Get 10-6 PST customer service
			Distributed Firewalls:	Enabled				 Simplify software update
								Sangfor Technologies Inc.
	aSEC (Security):							Support: +60 127-117-129(7511)
	📇 NGAF		ADC		n SSL VPN			Sales: +60 127-117-129(7511) Email: tech.support@sangfor.com
	A		A		A			Sangfor (P.R.C)
								Tel: 0755-86627874
								Virtiant (U.S.A)
	Unknow		Unknow		Unknown			46721 Fremont Boulevard Fremont, CA 94538, USA
	Ш. 16М							Tel: 510 573 0715 Email: info@virtiant.com

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.

System) > Licensing									
										. You may
	Basic Components:							Licensing Mode: USB Key Impo Key ID: CCEC4C4A25003603	Usemame: fest	Edit License Key
	aSV (Compute Virtualis	zation)	aNET (Network Virtualiza	tion)	aSAN (Storage Virtualization	n)		Basic Components:		Export License Key File
	Version:	V6.1.0	Version:	V6.1.0	Version:	V3.0.4		baat, companients.		
	Expiration Date:	2020-10-16	Hast CPUs:	6/100	Used/Licensed CPUs:	6/100		aSV:	TCVFQ4LM-ZXT8WWEJ-24UYKAJ5-RBCFN 🤗	With this edition, you can:
	Host CPUs:	6/100	Expiration Date:	2020-09-23				Network Virtualization (aNET):	WHV9BKXJyl4hdZwzXqVP0WphU5hGxarNz 🤗	Add up to 64 nodes to a
			Distributed Firewalls:	Enabled				Storage Virtualization (aSAN):	ZcOkPwAAAgAACAAQZAAAAAAAAAAAA	cluster Get 10-6 PST customer service
								aSEC Components:		 Simplify software update
								NGAF:	iHmXe2xgzA9K0Pvp3rh5qqygpOvImJBb3ZE 🤗	
								ADC:	SyW63q+YjpZ+ndTZHC2PS07wDOV7d1DH 🥏	Sangfor Technologies Inc.
	aSEC Components:							IAM:	OOiNFt6Bqc6HT2LE9W3₀UZ8THjgQ9FK5N ♥	Support +60 127-117-129(7511)
	📇 NGAF (Next Gener	ration Application	ADC (Application De	livery Controller)	SSL VPN		iam (i		0K Cancel	Sales: +60 127-117-129(7511) Email: tech.support@sangfor.com
	Expiration Date	2020-09-23	Expiration Date	2020-09-23	Expiration Date	2020-09-23	Expiration	Date 2020-09-23		

Export License Key File: To export license key file, click **Export License Key File**, as shown below:

f	idition: Pro Enterpr	rise Edition						You may
	Basic Components:						Update Service Expiration Date: 2019-01-07	Edit License Key
	aSV (Compute Virtualiz	aNET (Network Virtualiza	ition)	aSAN (Storage Virtualization	1)		Export License Key File	
	Version:	V5.8.6	Version:	V5.8.6	Version:	V3.0.0		
	Expiration Date:	2019-01-31	Host CPUs:	6/8	Used/Licensed CPUs:	6/8		With this edition, you can:
I	Host CPUs:	6/8	Expiration Date: Distributed Firewalls:	2019-01-06 Enabled				Add up to 64 nodes to a charter Get 10 6 PST customer service Simplify software update Sangfor Technologies Inc.

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Details: It displays detailed configurations, such as **Max Network Devices**, **Resource Distribution**, **Licensed Features**, etc.

Version:		V2.8.0
Expiration Date: 2	Max Network Devices	2 / 10
Host CPUs:	100Mbps: 10 Created: 0	
	200Mbps: 10 Created: 0	
	400Mbps: 10 Created: 0	
	800Mbps: 10 Created: 0	
	1.6Gbps: 10 Created: 0	
	Resource Distribution	
	Branch VPN Sites: 100 Used: 0	
	SSL VPN Users: 100 Used: 0	
SEC (Security):	Server Access Verification: 100 Used: 0	
NGAF	Mobile VPN Users: 100 Used: 0	
Expiration Date 2	Licensed Features	2018-07-09
Undate Expiration	Cross-ISP Access Optimization IPSec VPN IPS	2018-07-09
100Mbps	Antivirus Web App Protection Bandwidth Management	(0 / 10)
200Mbps	Application Control Web Filter Data Leak Protection	(0 / 10)
400Mbps	APT Detection RT Vulnerability Scanner	(0 / 10)
800Mbps	Software Upgrade IPS Vulnerability Database	(0 / 10)
View Details	WAE Signature Database Anti-Virus Database	

Virtual key function has been added to HCI version 6.1.0. It allows HCI to be authorized without the physical USB key which might be damaged during the delivery progress.

 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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Sangfor HCI	Home Compute Ne	tworking Storage No	ides Reliability	System		Health Check 49 admin Super Admin
Bystern > Licensing Eattoon: Pro Enterprise Edition				General Licensing Administrators and Permissions Date and Time	System Maintenance Tasks Alarms Health Check	Others Recycle Bin Log Export and Cleanup
Basic Components: aSV (Compute Virtualization) Version: V61.0 Expiration Date: 2020-16-16 Heat CPUs: 8 / 100	aNET (Network Virtualization) Version: V6.10 Host CPUs: 6-100 Expiration Date: 2020-08-23 Distributed Pirewalls: Enabled	aSAN (Storage Virbualization) Version: V3.0.4 Used/Licensed CPUs: 6/100		Cluster Settings System Backup and Restore Wrkanced Settings Customization Correlated Security Service Port Management	System Diagnostics Upgrade Tech Support and Download	 Key File Key File J, YOU Can: bdes to a stormer service Simplify software update
ASEC Components: Work (Ved Generation Application Expiration Date 2020-09-23 Update Service 2020-09-23 Expiration Date 2020-09-23 Exp	ADC (Application Delivery Controller) Expiration Date 2020-09-23 Update Serice 2020-09-23 Expiration Date S00Mbps (0/1100) 10bps (0/1100) 36bps (0/1100) View Details	SRL VPN Expiration Date 2020-09-23 Update Service 2020-09-23 Expiration Date v/s02-09-23 Service 00/1000 vSSL-100 (0/100) View Details View Details	AM (IntermetAccess Manager Expiration Date 2021 Update Service 2022 Expiration Date 2022 SOMops (200Mops (200Mops (View Details	nee0 0-09-23 24 / 100 1 / / 100		Sangfor Technologies Inc. Support +60 127-117-128(7511) Bales - 60 127-117-128(7511) Email tech support Bangfor (P.R.C) Tet 0765-88827874 Virtiant (U.S.A) 48721 Fremont Boulerand Fremort, CA94530, USA Tel 510 673 0715
Bystem - Likensing Eathorn Proceedings Edition Basic Components: SSV (Compute Virtualization) Version: V6.1.0 Expiration Date: 2020-10-16 Host CPUS: 6/100	aNET (Veltwork Voltualization) Version: V5.10 Host CPU: 6/100 Expiration Date: 2020-09-23 Distributed Freevalls: Enabled	aSAN (Storage Virtualization) Version: V3.0.4 Used/Licensed CPUs: 6/100		Update Ber	vice Expiration Date: 2020-09-24	You may Edit License Key Expant License Key File With this edition, you can: Add up to 64 nodes to a duster duster Get Lice ST customer service Simplify software update
aSEC Components: Expiration Date 2020-09-23 Update Service 2020-09-23 Expiration Date Expiration Date (3/100) 200Mops (3/100)	ADC (Application Delivery Controller) Explination Date Explination Date SolWebps 0/100 1Geox 0/100	SSL VPN Expiration Date 2020-09-23 Update Service 2020-09-23 Expiration Date VSL-100 VSL-100 (0 / 100) VSSL-200 (1 / 100)	VM Onternet Access Manageme Expiration Date 2020- Uodate Service 2020- Expiration Date SoMtipp (41, 100Mbes (11,	ent) 09-23 08-23 /100) /100)		Sangfor Technologies Inc. Support +00127-117-120/511) Bales +60127-117-120/511) Email tech supportgeangforcom Sangfor (P.R.C) Tei: 0755-66627874 Virtiant (U.S.A)
Licensing Mode: USB Ke Key ID:	y Import License Ke Usernar	y File Export Device	Info File		Edit Licen: Export Licens	se Key e Key File
Basic Components: aSV: Network Virtualization (aN Storage Virtualization (aS aSEC Components: NGAF:	IET): WHV9BI AN): ZcOkPw iHmXe2»	LM-ZXT8WWEJ-24U KXJyl4hdZwzXqVP0V AAAgAACAAQZAAA gzA9KOPvp3rh5qqy(YKAJ5-RBCFN /phU5hGxarNz AAAAAAAAA gpOvImJBb3ZE 오	vvitt	h this edition Add up to 64 n cluster Get 10-6 PST cu Simplify softwar	n, you can: odes to a istomer service re update
ADC: IAM: n	SyW63q OOiNFt8	+YjpZ+ndTZHC2PS0 :Bqc6HT2LB9W3oUZ C	7wDOV7d1DH 8THjgQ9FK5N 🔮 K Canc	Sa ▼ Su Sa el Em	ngfor Techno pport: +60 127-1 les: +60 127-117 nail: tech.support	ologies Inc. 17-129(7511) -129(7511) @sangfor.com

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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.

2.6.2 Date and Time

You can change date and time on Sangfor HCI platform and sync its time with NTP server.

e and Time	m > Date and Time	e			
Sprc Time with NTP Server Server: pool ritpoorg	e and Time				
Sync Sync Time with NTP Server Server: pool ntp. org V Save			11 12 1 9 3 8 4 7 6 5	12:34:08 2020-03-29 Sunday (UTC+00:00) Irkutsk, Beijing Change	
Server: pool.ntp.org V Save	Sync				
Server: pool.ntp.org	🖂 Sync Tir	me with NTP Server			
	Server:	pool.ntp.org	✓ Save		

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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Date and	d Time						×
Sun Mo 1 2 8 9	202 n Tue) 3 10	20- _{Ned} 4 11	3 Thu 5 12	Eri 6 13	▶ <u>Sat</u> 7 14	12:34:25	
15 16 22 23 29 30	6) 17 3) 24 6) 31	18 25	19 26	20 27	21 28	(UTC+08:00) Irkutsk, Beijing	~
						OK Cancel	

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:

Time Sync			
⊠ Sync Tin	ne with NTP Server		
Server:	pool.ntp.ord	Save	
	pool.ntp.org		·
	time.windows.com		
	time.nist.gov		
	time-nw.nist.gov		
	time-a.nist.gov		
	time-b.nist.gov		•

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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Message			×
0	🗌 Sync Now		
	ок	Cancel	

2.6.3 System Administrators and Permissions

You can add multiple admin accounts and assign different privileges to those accounts.

System > Administrators and Permissions			Administra	ators	Permissions								
🕿 🗉 Group Q	0	Refresh	Add New A		🗈 New Group	C Move	🗇 Delete	Login & Password	Polic				
🖃 🧰 Administrators(13)		Usemame	÷	Role	÷	Description	÷	Group	÷	Resources	Password Validity	Operation	Login wit
Default Group(13)		admin		Super	ldmin	-		Default Group		-	Unlimited	Edit Reset Password Certific	\odot
		sengyuan		System	Admin			Default Group		CPU: Unlimited; Memory: Unlimited;	Unlimited	Edit Reset Password Certific	\odot
		ť		System	Admin	-		Default Group		CPU: Unlimited; Memory: Unlimited;	Unlimited	Edit Reset Password Certific	\odot
		calvin		System	Admin	-		Default Group		CPU: Unlimited; Memory: Unlimited;	Unlimited	Edit Reset Password Certific	\odot
		sangfor		System	Admin	@		Default Group		CPU: Unlimited; Memory: Unlimited;	Unlimited	Edit Reset Password Certific	\odot

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:

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Add Administrato	rs account		×
Name:			
Description:			
Group:	Default Group		~
Password:			
Retype Password:			
Permissions:	Settings		
		ок	Cancel

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.

Permissions						×
Permissions	Resources	Syste	m			
O By default, no resource	e is selected. You may create a re	source group for	Administrators or select reso	urces from the resource	e pool.	
Available		Select	ed			
V E E	Name	Q				Clear
Asset		Ass	et		Permissions	Delete
All Resources	ichine twork Device irage Disk					
					ок	Cancel

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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Permissions		×
Permissions	Resources System	
CPU:	No limit Max cores for powered-on VM(s) core(6)	
Memory:	No limit Max memory for powered-on VM(s) GB	
Storage:	No limit Max disk size for all the VM(s) GB	
Note: The above Administrato	resources are allocated to this Administrator to create virtual machines o r that are managed by this Administrator.	nly, not as resources used by the virtual machines created by other
		OK Cancel

As for **System**, it includes **Physical resources**, **System configuration and maintenance** and **Service maintenance**.

Permissions Resources Administrators with configuration permissions under Home, Storage and Nodes menus, as well as read-only permissions on all the virtual machines. OWrite Read-only @ Invisible System Setting and Maintenance Assign permissions on some page, Including Licensing, Date and Time, Alarm Options, Cluster, System Backup and Restore, Tech Support & Download. OWrite @ Read-only @ Invisible System Setting and Maintenance Assign permissions on some page, Including Licensing, Date and Time, Alarm Options, Cluster, System Backup and Restore, Tech Support & Download. OWrite @ Read-only @ Invisible Others Assign permissions on some webpage in Others, Including VM Backup and Recovery, Recycle Bin, HA & Resource Scheduling. Write @ Read-only	missions					>
Physical Resources Assign Administrators with configuration permissions under Home, Storage and Nodes menus, as well as read-only permissions on all the virtual machines. Write Read-only @ Invisible System Setting and Maintenance Assign permissions on some page, Including Licensing, Date and Time, Alarm Options, Cluster, System Backup and Restore, Tech Support & Download. Write Read-only @ Invisible Others Assign permissions on some webpage in Others, Including VM Backup and Recovery, Recycle Bin, HA & Resource Scheduling. Write Read-only @ Invisible	Permissions	Resources	System			
System Setting and Maintenance Assign permissions on some page, including Licensing, Date and Time, Alarm Options, Cluster, System Backup and Restore, Tech Support & Download. Write Read-only Invisible Others Assign permissions on some webpage in Others, including VM Backup and Recovery, Recycle Bin, HA & Resource Scheduling. Write Read-only	Physical Resources Assign Administrators v OWrite O Read-only () invisible	vith configuration permissions (under Home, Storage and Nod	es menus, as well as read-o	nly permissions on all the virtual ma	achines.
Others	System Setting and Mail Assign permissions on OWrite ORead-only Invisible	ntenance	g, Date and Time, Atarm Option	is, Ciluster, System Backup :	and Restore, Tech Support & Down	lload.
Assign permissions on some webpage in Others, including VM Backup and Recovery, Recycle Bin, HA & Resource Scheduling. OWrite ORead-only Comparison	Others					
O Read-only @insciple	Assign permissions on a	some webpage in Others, inclu	ding VM Backup and Recovery	Recycle Bin, HA & Resour	ce Scheduling.	
@invisions	ORead-only					
Contract of the second s	Invisible					
					ок	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.

Login & Password Policy					
Password Policy					
Minimum Length:	8		٦		
Password Complexity:	Simple	~	٠		
Validity:	Unlimited	~			
Max Password Retry Attempts:	5	~	()		
Login Policy					
Login Interval:	1 second	~			
Session Timeout:	24 hours	~	Ð		
Disable multiple logins for same user () The same account can only be used to log in on one IP address.					
Google Authentica	tor OTP ()				
To send verificatio	n code by email, configure SMTP Server				
Restore Defaults	ОК	Can	cel		

2.6.3.3 Assigning Permissions

On the **Permissions** tab, accounts can be assigned with different permissions, as shown below:

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```
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```

After adding accounts and having assigned permissions to those accounts, you can edit permissions on the **Compute** and **Networking** page, as shown below.

	Administrators	Permissions				
🔆 Refresh 💿 New 🗂 Delete						
Name			Description		0	Edit
- Admin			All permissions			
- Deploy virtual machine			Deploy virtual machine			•
- Read-only permission			Read-only permission			-
- No permission						· ·
VM administration			Use virtual machines		-	
			Cae residix lancome		L	2
Edit Permissions				×		
Name:	Network administ	ration				
Description:	Use network fund	tions				
Vi II			Name	Q		
- All permission	6					
E Compute						
🕀 🖉 Networkin	9					
			ок	Cancel		
System > System Administrators and Permissions	Administrators	Permissions				
			a Development			10
- Admin			All permissions		Ÿ	- CON
- Deploy virtual machine			Deploy virtual machine			
- Read-only permission			Read-only permission			
- No permission						-
VM administration			Use virtual machines			
Vetwork administration			Use network functions			ß

Permission of editing virtual network is similar to that of editing VM

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Sys	tem > System Administrators and Permissions	Administrators	Permissions		
	⊖Refresh ⊙ New 🖻 Delete				
	Name Name		Φ	Description	\$ Edit
	Admin			All permissions	-
	Deploy virtual machine			Deploy virtual machine	-
	Read-only permission			Read-only permission	-
	No permission			•	-
C	VM administration			Use virtual machines	
6	Network administration			Use network functions	
0	No permission VM administration Network administration			- Use initial machines Use network functions	2

2.6.4 Alarm

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	Ma dium Alavea	
Virtual Machine		N for 40 minutes
Virtual Network Device	Most memory usage is above	% for 10 minutes V
License	Most swap partition usage is above	% for 10 minutes V
	Host CPU usage is above 90	% for 10 minutes V
	Host CPU temperature is too high for 10 minutes	
	Critical Alarms	
	Physical interface is disconnected	
	Node is offline	
	Overlay network interface (vxLAN) is down	
	Node is disconnected from gateway	
	Host packet loss rate is above	% for 60 seconds 🗸
	Host NIC anomaly lasts for 10 minutes	
	Save	

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Node	Storage Alarm-Triggering Events					
Storage						
Virtual Machine	Medium Alarms					
Virtual Network Device	Storage IO is busy for 30 minutes					
licansa	Backup repository IO is busy					
License	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	VM Alarm-Triggering Events					
Storage	- Medium Alarms					
Virtual Machine	Memory usage is above 90 % for 10 minutes					
Virtual Network Device	CPU usage is above 90 % for 10 minutes V					
License						
	✓ 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	Networking Alarm-Triggering Events					
Storage	r Medium Alarms					
Virtual Machine						
Virtual Network Device	Virtual network device encounters internal error					
License						
	Critical Alarms					
	Image file of virtual network device is damaged					
	Router fails to run					
	Packet loss rate on virtual interface is above 10 % for 60 seconds V					
	ALG usage is above 90 % for 30 seconds 🗸 🕕					
	Virtual network device is disconnected from physical network					
	Save					
Node	Licensing Alarm-Triggering Events					
Storage	- Critical Alarms					
Virtual Machine						
) (intruct National Densis	License expiration					
License	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	- N	lotiti	ca:	tin

	7	
\sim	'l Send Alarms to Recip	ient Address

Pecipitent Address: tingforg One entry per line, a maximum of 5 entries allowed. Notification: Critical Alarms Periodic: Immediate • • Every • 6 hours (one notification for alarms in a same category) • • Medium Alarms Periodic: • Immediate • • Every • 6 hours • One entry per line, a maximum of 5 entries allowed. • Some address: • Periodic: • Immediate • • Every • 6 hours • Cone notification for alarms in a same category) • • SmTP Server • Sender Address: • entry prail com Port • Address: • entry prail com Port • Address: • entry grail com • Port • Protecol: • SSL • Authentication required • username: • entry periodic: • Categol		ver is configured	Settings		
Recipient Address: Immediate Periodic: Immediate Immediate	SMIT SEN	er is coningureu.	Settings		
One entry per line, a maximum of 5 entries allowed. Notification: Critical Alarms: Periodic: Every 15 minutes (one notification for alarms in a same category) Medium Alarms: Periodic: Immediate Wedium Alarms: Periodic: Immediate Every 6 hours Sender Address: kend Server Address: smp gmail.com Port 465 Secure connections Protocol: SSL	Recipient Address:	tingfong			
Notification: Critical Alarms: Periodi:: Immediate • • Every 15 minutes • (one notification for alarms in a same category) • • Medium Alarms Periodi:: • Immediate • • Every 6 hours • (one notification for alarms in a same category) • SMTP Server Sender Address: kenc Server Address: smtp gmail.com Port 465 Protocol SsL • Authentication required Username: ke: Password: •		One entry per l	ine, a maximum of 5	entries allowed	ed. 🖉 Send Test En
Periodic: Immediate () Every 15 minutes Medium Alarms Periodic: Immediate () Every 6 hours SMTP Server Sender Address: kenk Sender Address: kenk Server Address: kenk Secure connectors Port Athentication required Username: ke: Password:	Notification:	🗹 Critical Alari	ms		
Is minutes (one notification for alarms in a same category) Medium Alarms Periodi: Immediate • Immediate • (one notification for alarms in a same category) • SMTP Server Server Address: Immediate • Server Address: Immediate • Server Address: Immediate • Server Address: Server Address: State Secure connections State Authentication required Username: ke: Password: OX Cancel		Periodic:	🔿 Immediate 🕕		
Medium Alarms Periodic: © Every © hours (one notification for alarms in a same category) SMTP Server Sender Address: ken Server Address: smtp gmail com Port 465 Protocol: SsL Authentication required Username: ke: Password:			Every 15 min	nutes 🗸 🗸	\checkmark (one notification for alarms in a same category) 🕕
Periodic: Immediate () () Every 6 hours () one notification for alarms in a same category) () SMTP Server Sender Address: kenc Server Address: smtp.gmail.com Port 465 Secure connections Protocol: SSL Authentication required Username: ke: Password:		🗹 Medium Ala	rms		
Image: Bours <		Periodic:	🔵 Immediate 🕕		
SMTP Server × Sender Address: kent Server Address: smtp.gmail.com Port d65 Secure connectoor Protoco: SSL Authentication regured Lsername: ke: Password:			Every 6 hour	s 🗸	\checkmark (one notification for alarms in a same category) \bigcirc
SMTP Server × Sender Address: kene Server Address: smtp.gmail.com Port. 465 Secure connections Protocol: SSL Authentication request Username: ke: Password:					
Sender Address: ken Server Address: smtp.gmail.com Pot 465 Protocol: SSL Authentication required Username: ke Password: Concol	SMTP Server				×
Sender Address: kene Server Address: smtp.gmail.com Port. 465 Secure connections Protocol: SSL Quarthentication required Username: ke: Password:					
Server Address: smtp.gmail.com Port 465 Secure connections Protocol: SSL Authentication required Username: ke: Password: OK	Sender Address:	kene			
Port 465 Secure connections Protocol: SSL Authentication required Username: ke: Password:	Server Address:	smtn amail o	om		
Port 465 Secure connections Protocol: SSL ✓ Authentication required Username: ke: Password: • • • • • • • • • • • • • • • • • • •		ornip.grhan.or			
Secure connections Protocol: SSL Authentication required Username: ke: Password:	Port:	465			
Secure connections Protocol: SSL Authentication required Username: ke: Password:					
Protocol: SSL Authentication required Username: ke: Password:	Secure connect	ions			
Authentication required Username: ke: Password:	Protocol:	SSL			~
Authentication required Username: Password: OK Cancel					
Username: ke: Password:	Authentication re	equired			
Password:	Username:	ke:			
OK Cancel	Password:	•••••			
OK Cancel					
				ок	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 Alar	ms			
	Periodic:	🔘 Immed	iate 🕕		
		Every	15 minutes	~	(one notification for alarms in a same category) 🕕
	🗹 Medium Ala	rms			
	Periodic:	◯ Immed	iate 🕕		
		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.

2.6.5.1Cluster 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: 192.
Netmask: 255.255.255.0
Cluster Name: CTI
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.

System						
	Export Logs Export System Configuration					
	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: 2020-01-16 15:57:51					

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 Sangfor Technologies

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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.

1. Restore from a scheduled bac	ckup	
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	
2020-03-29 08:43:41 Restore 2. Restore from a backup on the Select *.bcf file Restore	v Iocal disk Last Backup: 2020-03-29 16:10:55	Browse

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 a	All nodes will be restored to factory defaults and removed from SANGFOR aCloud.				
SANGFOR aCloud will also be res	tored to factory defaults, including Cluster, System Administrators and Permissions, VM Backup and Recovery, Date and Time, Alarm				
Options, etc.	Options, etc.				
Please operate with caution!	Please operate with caution!				
Unreasonable Reasons:	Unreasonable Reasons: Reasonable Reasons:				
1. Remove node(s) from the cluster	1. Return testing device				
2. Fix system problems	2. Reset settings of all clustered nodes				
3. Replace damaged node 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

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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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Message	×
?	Reason: Return testing device Before returning testing device, make sure all data on clustered nodes have been backed up and business system migrated, to prevent data loss, business interruption, since the operation is irrecoverable . To continue restoring factory defaults, click on Proceed
	Cancel

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.

Alert		×
	All data of clustered nodes will get lost and business interrupted once it is restored to factory defaults, which is irrecoverable.	
	To continue restoring factory defaults, click on Proceed	
	Cancel	

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:

Alert		×
	Are you sure you want to restore to factory defaults? Once confirmed, restoration operation is performed, all data of clustered nodes get lost and business is interrupted, which are irrevocable. Please operate with caution.	
	Enter password of (admin) to confirm operation:	
	OK Cancel	

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.

Alert		×
	All data of clustered nodes will get lost and business interrupted once it is restored to factory defaults, which is irrevocable.	
	To continue restoring factory defaults, click on Proceed Cancel	

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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Alert		×
	Are you sure you want to restore to factory defaults? Once confirmed, restoration operation is performed, all data of clustered nodes get lost and business is interrupted, which are irrecoverable. Please operate with caution.	
	Enter admin password to confirm operation: Password]
	Confirm Cancel	

If you have other reasons, contact us at +60127-117-129(7511)

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.

VMware vCenter	Nodes	
🕞 Refresh 🛛 🕀	Add vCenter Serv	ver 🔅 Manage VMs
vCenter 192. CPU Usage Memory Usage	▲ 32% 51%	
Disk Usage	51%	

⚠

Currently only vCenter server 5.0, 5.1, 5.5, 6.0 and 6.5 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.

VMware vCenter	Nodes	
🕝 Refresh 🛛 🖯	Add vCenter Serve	er 💮 Manage VMs
-		
	<u> </u>	
vCenter		
CPU Usage	32%	
Memory Usage	51%	
Disk Usage	51%	

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 S	Server	×
✔ If there is ES migration and (In Nodes > F	Ki hosts being managed by the VMware vCenter based on domain name or hostname, configure a DNS server to not affect VM I backup from/to VMware vCenter. Physical Interfaces > Advanced > Others)	
Name:	Name displayed on SANGFOR aCloud	
Address:	This field is required.	
Username:		
Password:		
Port:	443	
Description:	Optional	
	OK	

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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SANGFOR aCloud VMware vCenter								
Uiew By Node	🕂 Panel 📃 List		resh 🕂 New 🚦	Selec	t J⊒Sort∨			
Center								
🗄 🌆 сті ЕЅХІ	windows201: CPU Usage	23%	windows.	22%	Yong CPU Usage	0%	VLS2.1_fo CPU Usage	3%
	Memory Usage	41%	Memory Usage	16%	Memory Usage	3%	- Memory Usage	3%
	Disk Usage	9%	Disk Usage	8%	Disk Usage	100%	Disk Usage	100%

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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System > VMware vCenter > vCenter							
🖓 Refresh 📃 Console 💮 Manage VMs 🖉 Edit							
Status CPU Usage	Mernory Usage	Disk Usage	Assets 1 Data Center(s)				
Used: 3.58 GHz Total: 11.39 GHz	Used: 16:14 GB Total: 31.78 GB	Used: 943.48 GB Total: 1.81 TB	1 Node(s)	VMs • Running. 4 • Others: 10			
Basics	Alarms						
Version: RED	Severity	Object 🌲	Description	Timestamp 🔶 Status 🔶			
Name: vCenter	Oritical	Datacenters	The recovery RPO is not being met. The current RPO \ldots	2020-02-18 08:34:55 Unread			
Server Address: 19."	Oritical	Datacenters	VRA is powered off	2020-02-18 08:28:55 Unread			
Port: 443	🔀 🏮 Critical	Datacenters	Journal history problem. The amount of history is less	2020-02-13 18:02:46 Unread			
Description:	Critical	Datacenters	Journal history problem. The amount of history is less	2020-02-13 18:02:46 Unread			

To edit vCenter server's name, port or description, click **Edit**, as shown below:

Edit			×
Name:	vCenter		
Port:	443		
Description:	Optional		
		ОК	Cancel

To reconnect Sangfor HCI to vCenter server, click **Reconnect**, and enter password to start reconnection.

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Reconnect			×
Address:	192		
Username:	administrator	<u>.</u>	
Password:			
		ОК	Cancel

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 vCent	er Server	×
	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	
	Enter OK (case-insensitive)	
	Delete Cancel	

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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Service and Tec	h Support
	Remote Technical Support
	 Call the following hotline and apply for an authorization code to ask for remote diagnostics, troubleshooting, recovery or system enhancement. 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)
0	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) .
0	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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vnload		
SANGFOR aCloud Software	SANGFOR Converter	
SANGFOR aCloud	s	ANGFOR Converter
Download ISO Image:	For Windows-Based Server:	For Linux-Based Server:
Update Server in USA	Update Server in USA	Update Server in USA
Update Server outside USA	Update Server outside USA	Update Server outside USA

2.6.9 Task

It includes Tasks and Resource Scheduling Logs.

			Tasks Res	source Scheduling Logs				
C Refresh						Action,	node, object, description C	Advanced Y
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)	192.16 3	Administr	ad [,]	View
🛞 Failed	Log in	2020-03-29 16:33:29	2020-03-29 16:33:29	admin(192.200.19.4)	192.1	Administr	8	View
📀 Completed	Delete edge	2020-03-29 11:11:21	2020-03-29 11:11:21	admin(192.168.20.3)	192.1	edge	10 A	View
📀 Completed	Auto merge backups	2020-03-29 03:11:15	2020-03-29 03:11:16	admin(192.168.20.3)	192.1	Schedule	-	View
🤣 Completed	Auto merge VM ba	2020-03-29 01:15:34	2020-03-29 01:17:30	admin(192.168.20.4)	192.1	Virtual Ma	۶	View
🕑 Completed	Auto merge VM ba	2020-03-29 01:14:45	2020-03-29 01:15:29	admin(192.168.20.3)	192.1	Virtual Ma	С з	View
🕑 Completed	Auto merge VM ba	2020-03-29 01:13:14	2020-03-29 01:14:40	admin(192.168.20.5)	192.1	Virtual Ma	alv *	View
🕑 Completed	Auto merge VM ba	2020-03-29 01:12:12	2020-03-29 01:13:07	admin(192.168.20.4)	192.1()	Virtual Ma	w	View
🕑 Completed	Auto merge VM ba	2020-03-29 01:11:15	2020-03-29 01:12:08	admin(192.168.20.3)	192.1	Virtual Ma	0 ~1	View
🕑 Completed	Auto merge backups	2020-03-29 01:11:15	2020-03-29 01:17:37	admin(192.168.20.3)	192.1	Schedule	м	View
🤣 Completed	Scan for bad sectors	2020-03-29 01:01:27	2020-03-29 06:01:55	admin(192.168.20.3)	192.16	Storage	Vir	View
📀 Completed	Enable scheduled	2020-03-28 23:09:29	2020-03-28 23:10:34	admin(192.168.20.5)	192.16	Virtual Ma	A- 5	View
					4 5 6 2	98 > En	ries Per Page 50 🗸 Pa	age 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			
C Refresh					VM, node, reason, description	Q Advanced 🛩
-						
Status	Virtual Machine	Current Node	Destination Node	Start Time	End Time	Operation
			No data available			
					of 0 Entries Per Page 50 🗸	Page 1

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2.6.10 System Upgrade

In **System > Upgrade**, you can see the upgrade page as below:

Current Version: SANGFOR aCloud 5.8.7_R1_EN Build20190506 Upgrade Rollback • No updates found? Check for Updates Online Current Version Node Name Status 192.168.20.171 Online 5.8.7_R1_EN-2018-05-06_20.48:56 192.168.20.172 Online 5.8.7_R1_EN-2018-05-06_20.48:56	Environment	Upload Packag	e — 4 Update Package	6 Upgr
Node Name Status Current Version 192.168.20.171 Image: Continue 5.8.7_R1_EN-2018-05-06_20.48:68 192.168.20.172 Online 5.8.7_R1_EN-2018-05-06_20.48:68	Current Version: SA	NGFOR aCloud 5.8	.7_R1_EN Build20190506	Upgrade Rollback No updates found? Check for Updates Online
192.168.20.171 Image: Online 5.8.7_R1_EN-2018-05-06_20.48.56 192.168.20.172 Online 5.8.7_R1_EN-2018-05-06_20.48.56	Node Name 💠	Status 🌲	Current Version	¢
192.188 20.172 Online 5.8.7_R1_EN-2018-05-06_20.48:56	192.168.20.171	🥏 Online	5.8.7_R1_EN-2019-05-06_20:48:56	
	192.168.20.172	Online	5.8.7_R1_EN-2019-05-06_20:48-56	

Click Upgrade and the device will enable the maintenance mode automatically as below:

1 Current Version ——	— 2 Environme	nt	— 3 Upload P:	ackage	Update Package —	— 6 Confirm —	6 Upgrade	— 7 Finish
	Current Versio	n: SANG	GFOR aCloud	5.8.	7_R1_EN Build20190506	Upgrade No updates found? Checl	Rollback *	
	Current Version							
	Node Name		Status		Current Version			
	192.168.20.171		📀 Online		5.8.7_R1_EN-2019-05-06_20:48:56			
	192.168.20.172		Online		5.8 7_R1_EN-2019-05-08_20-48-68 Enable Maintenance mode			

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Then, the device will perform checking on the hardware status. If the devive pass all the check, it will display message as below:

🗸 Current Version —	2 Environment 3	Upload Package	Update Package —	Confirm	- 6 Upgrade	7 Finish
	Results:				Check Again	
	ltems	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 witness link	Completed				
	Check VM status	📀 Completed				
					Maintenance mode	e is enabled successfully.
	Back			Next	Exit	

Click 'Next' and enter into the Upload Package page as below:

Current Version ——	— 🕜 Environment ——	 4 Check Update Package	6 Confirm	6 Upgrade	7 Finish
		an or click to open file			
Bac	k		Next	Exit	

In this step, we can either click on the 'Drag or click open file' to upload the upgrade package, **Sangfor Technologies**

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Current Version —	V Environment	3 Upload Package	Update Package	Confirm	6 Upgrade	7 Finish
	Uploading, ple	ase wait			1%	
	Uploading: Sangfor_a	Cloud_6.0.1_EN(20200307).pkg		Ca	ncel	
	Back			Next	Exit	

or directly drag and drop the file into the provided space:

After upload completed, click close



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Click **Next** and then HCI will do initializing checking on the package.



It will begin the upgrad and the page will display as below:



🥑 Currant Varsion ——— 🤡 Environment ——— <table-cell></table-cell>	Uplaad Package —	Update Package	6 Confini	Opgrade	- 6
Progress:					
Upgrading (0.00 %)					
Details			Try Again	Download Logs	
Upgrade Procedure	Status	Start Time	End Time		
Performing upgrade	Processing	2018-07-30 20:09:17	-		

It will take some times for the device to finish upgrade:

Current Version —	— 📀 Environment —	— 💙 Upload Package —	Update Package	6 Canilmu	6 Upgrade —	- 7 Finish
	Progress:					
				c	Completed	
After upgrad	de completed, c	lick Next:				
Finnally, clic	k Restart Now	to finish the սր	ograde:			
🕑 Current Version —		Upload Package —	Updzte Package	6 Confini	6 Upgrade	— 🕜 Finish
		Upgrad	e completed			
		New updates require n	ode to restart to take effect.			
		Rest	tart Now			

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.

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	Health Check To gain Insights into cluster health, performance and system bottlenecks with one click. Start	
Entity Type		
🗹 🛛 🕂 Running Status	Check running status of cluster services and resources	~
System Services		
Configuration Files		
System Partitions		
Datastore Usage		
Virtual Storage Data		
🗹 🔅 Configuration	Check cluster configuration	~
🗹 License		
Network Interface		
Virtual Storage Settings		

Types of entities to be detected are **Running Status**, **Configuration** and **Physical Resources**.

After health check completes, you will see the score and results.

Time Tak 100 Task (Warnings	en: 00:02:11 Progre COMPLETECL: 6 € ; should be eliminated 1	ss: 100% entity(ies) giving alarm, to ensure cluster performance and fai	, 0 entity(ies) failed Bac	:k •business continuity.	Check Again
 🖉 🔺 Q	 Results 				Í
Running Status	Object 🔶	Datastore Usage			
Datastore Usage 🔒 🔒	192	4.0%			
Configuration	192.	2.1%			
Network Interface	192 c	♂ 3.5%			
Storage Network In 🛕	ISCSI	A 92.6%			
🔤 Interface Configura 🛕	ISCSI-Secondary	37.9%			
Physical Resources	Object 🌲	Virtual Storage Usage	Available Capacity for 2 Replicas	Available Capacity for 3 Replicas	Invalid Capacity
	VirtualDatastore1	⊘ 26.4%	⊘ 16.0TB	✓ 10.4TB	Normal
└── NICs ▲	Object 🔶	Fault Domain Usage			
NICs A			No data available		
	Object 🌲	Virtual Storage Status			
	192.168.20.3	🥏 Mount path is normal.			

If there is something wrong with storage, the specific issue will be detected, and the

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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.

Reliab		Backup Policies	VMware Backup	Policy Backups	VMware Backups	Backup Repositories	Global Settings		
Di	sable backup 💿 🕣 Add Ne	w Policy 💿 New CDP	Policy 📅 Delet					Policy name	Q
	Policy Name	Description	VMs	Schedule		Backup Repository	Archive Datastore	Status	Operation
	BackunTolsosi		0	Every Eriday, start at 23:00		ISCSI-Secondary		 	Edit Delete
	Default backup policy	New virtual machine will b	20	Everyday start at 23:00		VirtualDatastore1		0	Edit
	Demo backup		11	Everyday, start at 23:00		VirtualDatastore1		~	Edit Delete
	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:

Disable backup 💿 Add New Policy 🕤 New CDP Policy 🖞					
--	--	--	--	--	--

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 Adding New Backup Policy section. to **2.6.12.1.1**

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To add a new CDP policy, click **New CDP Policy**. For details, refer to **2.6.12.1.2** Adding **New CDP** Policy section.

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 **V**.

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:

Policy Name	Description	VMs	Schedule	Backup Repository	Archive Datastore	Status	Operation
BackupTolscsi		0	Every Friday, start at 23:00	ISCSI-Secondary		 	Edit Delete
Default backup policy	New virtual machine will b	20	Everyday, start at 23:00	VirtualDatastore1		0	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.

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Status: Displays status of the backup policy, enabled or disabled. To enable a backup policy, click on the Sicon. To disable backup policy, click on the sicon.

Operation: To edit or delete a backup policy, click **Edit** or **Delete** under **Operation**. The default scheduled backup policy cannot be deleted.

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 period 1. Periodic full 2. Full backup timeout. 3. Periodic full which increme performance of	c full backup backup task takes priority over other backup tasks. will be taken although no new data are generated and its task will not be canceled upon backup consumes more storage resources and may take more time to complete, during intal backup is not allowed. But it shortens VM Backup Chain and improves IO of recovered VM in data fetching phase.	

To edit a backup policy, click **Edit** and enter the following page:

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: Start Time: Max Duration:	 Weekly O Daily O Hourly Friday 23:00 48 hour(s) 1 	
Enable periodic fi 1. Periodic full ba 2. Full backup wil 3. Periodic full ba shortens VM Bac	Le cancel ongoing backup task upon timeout ull backup I be taken although no new data are generated and its task will not be canceled upon timeout. I be taken although no new data are generated and its task will not be canceled upon timeout. I be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated will not be canceled upon timeout. I be taken although no new data are generated wil	
Merge earlier backups • Preserve all backups • By default, it retains 5 backups will be retai	to free up storage space s for the recent 1 months. 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 ned to ensure VM data reliability.	
Backup Retention S	ettings 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	O 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 ongoir	ng backup task upon t	imeout
Enable periodic full he	full backup	ity over other backup	tacks

Full backup will be taken although no new data are generated and its task will not be canceled upon timeout.
 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 ba	ckup						
 Periodic full backup Full backup will be t Periodic full backup shortens VM Backup C 	task takes priority ov aken although no nev consumes more sto Chain and improves R	ver other backup ta v data are generat rage resources ar O performance of	asks. ed and its nd may tak recovered	task will no ke more time VM in data	: be canceled upon e to complete, durin fetching phase.	timec 1g whi	out. .ich incremental backup is not allowed. But it
Monthly Full Backup:	Jan,Feb,Mar,Apr,	May,Jun,Jul,Aug,	Sept,Oct	~			
				00.00			

Backup Retention Setting: It specifies the longest period that backups will be kept. The longest period is three months.



Daily: To have data backed up on daily basis, choose Daily for Periodic, as shown below:

Periodic: Backup Period:	Weekly • Daily 23:00 • to 08:00 • (the following day since policy creation) ()
	Cancel ongoing backup task upon timeout
Enable periodic fu 1. Periodic full ba 2. Full backup wil 3. Periodic full ba schortens VM Bac	ull backup ckup task takes priority over other backup tasks. I be taken although no new data are generated and its task will not be canceled upon timeout. ckup consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it was chain and improved LO performance of recovered VML relate factoring 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 bac	:kup						
 Periodic full backup f 2. Full backup will be ta 3. Periodic full backup shortens VM Backup C 	task takes priority over o iken although no new da consumes more storagi hain and improves IO p	ther backup tasks. ta are generated and its e resources and may tak erformance of recovered	task will not be c ke more time to c VM in data fetch	anceled upoi omplete, duri ng phase.	on timeout. ring which incremental	backup is not allowed. But	it
Monthly Full Backup:	Jan,Feb,Mar,Apr,Ma	y,Jun,Jul,Aug,Sept,Oct	~				
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.





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 Periodic full backup task takes priority over other backup tasks. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout. 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 storag	e space						
Merge earlier backups to Preserve all backups for	free up storag	e space days.						
Merge earlier backups to Preserve all backups fo Retain one Every day p 	free up storag or the recent 3 reserved for ov	e space days. ver 3 days to	1 weeks (last backup in each of those days by default).					
Merge earlier backups to Preserve all backups fo Retain one Every day p By default, it retains the	free up storag or the recent 3 reserved for ov alatest backup:	e space days. ver 3 days to s within the i) 1 weeks (last backup in each of those days by default). retention period, backups preserved for more than 1 weeks will be merged to free up storage space. However, at least 5					
Merge earlier backups to Preserve all backups fo Retain one Every day p By default, it retains the backups will be retained i	free up storage or the recent 3 reserved for ov alatest backup to ensure VM d	e space days. ver 3 days to s within the lata reliability) 1 weeks (last backup in each of those days by default). retention period, backups preserved for more than 1 weeks will be merged to free up storage space. However, at least 5 A					

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 bac 1. Periodic full backup t 2. Full backup will be ta 3. Periodic full backup o shortens VM Backup C	ckup task takes priority over other backup tasks. aken although no new data are generated and its task will not be canceled upon timeout. consumes more storage resources and may take more time to complete, during which incremental backup is not allowed. But it 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 V Friday V 22:00 V	

Backup Retention Setting: It specifies the longest period that 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 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						×
Sacl	kup Periodic — 2 Select Virtual Mac	hine —	Backu	p Repository ——	4 Policy Name		
O CE	DP and scheduled backup are invalid for VMs havin	g disks mirrored	directly from	n physical/shared disks	(not via file system).		
Available	2				Selected		
ᄩ	E	Group	~	Name Q			Clear
	VM Name	Туре	VM Size	Backup Policy	VM Name		Remove
	🖃 🦳 Virtual Machine						
	⊕ <mark>──</mark> ──						
						No data available	
	1						
Bac	ĸ					Next	Cancel
C	lear. To clear the sele	octed v	irtual	machine	s click `C	lear'	

To remove a virtual machine from the selected list, click $\begin{tabular}{c} egin{array}{c} egin{array}{c}$

 \triangle

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.

3. Specify backup repository to store virtual machine backups, as shown below:

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Add New Policy				×
Sackup Periodic —	- 🗸 Select Virtual Mac	nine — 3 Backup Repository	4 Policy Name 5 Finish	
Backup Repository.	ISCSI-Secondary Total: 498 GB	Free: 308.23 GB	First Backup Size: 15.88 GB	
Archive backups to oth Merge backups and arc Archive Repository:	er datastores chive them to specified datastr ISCSI Total: 496 GB	ore, which cannot be a Windows shared fol Free: 36.49 GB	ler or the backup repository specified above.	
Archives will be retained • Archive backups on th • Preserve all the backur Advanced	d in the following ways: he last Saturday of Every mon ups for the recent 12 months,	th (start at 22) one for each year in the earlier 12 to 36 mo	nths and delete all for even earlier 36 months.	
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 Period	ic — 🗸	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:

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

2.6.12.1.2 Adding New CDP Policy

To add a new CDP policy, click **New CDP Policy to enterthe 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	×
1 Continuous Backup — 2 Select Virtual Machine — 3 Backup Repository — 4 Policy Name — 6 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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Continuous Backup 2 Select Virtual Machine 3 Backup Repository 4 Policy Name 6 Finish ID Activity Logs Retention Period: 2 4 hours (earlier disk IO activity logs will be merged automatically) ID Activity Logging Interval: 5 secs • Backup Periodic: Every 1 hours • ID Activity Logs Retention Period: Every 1 hour • ID Activity Logging Interval: 5 secs • Backup Periodic: Every 1 hour • ID Activity Logs Retention Period: Every 1 hour • ID Activity Logs Interval: 5 secs • Backup Periodic Every 1 hour • ID Activity Logs Interval: 5 secs • ID Activity Logs Interval: 5 secs • Backup Periodic Every 1 hour • ID Activity Logs Interval: 5 secs • ID Activity Logs Interval: 5 secs • ID Activity Logs Interval: 5 secs • ID Activity Logs Retention Period: Every 1 hour ID Activity Logs Interval: 5 secs • ID Activity Logs Interval: Secon - secon ID Activity Logs Interval: Secon - secon ID Activity Logs Interval: Secon - secon ID Activity	Continuous Backup 2 Select Virtual Machine 3 Backup Repository 4 Policy Name 6 Finish	CDP Policy								
I O Activity Logs Retention Period: 24 hours (earlier disk IO activity logs will be merged automatically) I O Activity Logging Interval: 5 secs Backup Periodic: Every 1 hour ♥ I Periodic full backup 1. Periodic full backup task takes priority over other backup tasks. 2. Full backup utask takes priority over other backup tasks. 3. Full backup utask takes priority over other backup tasks. 3. Full backup utask takes priority over other backup tasks. 3. Full backup utask takes priority over other backup tasks. 3. 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 weeks to 2 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 retained to ensure VM data reliability.	ID 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 athrough no new data are generated and its task will not be canceled upon timeout. 3. Full backup will be taken athrough no mew data are generated and its task will not be canceled upon timeout. 3. 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 3 days to 1 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.	Continuous Backup — 2) Select Virtual Machin	e — 3 B	ackup Repository	- 4	Policy Name	6	Finish	
IO Activity Logs Retention Period: 24 hours clearlier disk IO activity logs will be merged automatically) IO Activity Logging Interval: 5 secs Backup Periodic: Every 1 hour ♥ Backup Periodic full backup I. Periodic full backup task takes priority over other backup tasks. 1. Periodic full backup task takes priority over other backup tasks. 3. Periodic full backup up task takes priority over other backup tasks. 3. Periodic full backup up task takes priority over other backup tasks. 3. Periodic full backup up task takes priority over other backup tasks. 3. Periodic full backup up task takes priority over other backup tasks. 3. Periodic full backup up task takes priority over other backup tasks. 3. Periodic full backup up the staten atthrough no new data are generated and its task will not be canceled upon timeout. 3. Periodic full backup will backup tasks takes priority over other backup tasks. 5. Periodic full backup chain and improves IO performance of recovered VM in data fetching phase. Perserve all backups to free up storage space 9. Preserve all backups for the recent 3 days. 9. Retain one Every week preserved for over 1 weeks (last backup in each of those days by default). 9. Retain one Every week preserved for over 1 weeks to 2 weeks (Sunday's backup by default). 9. 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.	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 I Periodic full backup 1. Periodic full backup task takes priority over other backup tasks. 3. Periodic full backup task takes priority over other backup tasks. 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. Preserve all backups to free up storage space • Preserve all backups for the recent 3 days. • Retain one Every week preserved for over 1 weeks (last backup in each of those days by default). • Retain one Every week preserved for over 1 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 free up storage space. However, at least 5 backups will be retained to free up storage space.									
IO Activity Logging Interval: 5 secs Backup Periodic: Every 1 hour ♥ 0 Backup Periodic full backup • Every 1 hour ♥ 0 Image: Periodic full backup task takes priority over other backup tasks. • Periodic full backup task takes priority over other backup tasks. 1. 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 backups within the retention period, backups preserved for more than 2 weeks will be merged to free up storage space. However, at least backups will be retained to ensure VM data reliability.	IO Activity Logging Interval: 5 secs Backup Periodic: Every 1 hour Backup Periodic full backup • Interval: 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 with be retained bity.	IO Activity Logs Retention Period:	24 hours 🗸	(earlier disk IO act	ivity logs will be me	rged automatic	ally)			
Backup Periodic: Every 1 hour Image: Comparison of the second of th	 Backup Periodic: Every 1 hour Every 1 hour Enable periodic full backup Enable periodic full backup tasks. Full backup will be taken although no new data are generated and its task will not be canceled upon timeout. 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 backups will be retained to ensure VM data reliability. 	IO Activity Logging Interval:	5 secs 🗸	•						
Preserve all backups to free up storage space Preserve all backups for the recent 3 days. Retain one Every day preserved for over 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 2 weeks will be merged to free up storage space. However, at least 5 backups will be retained to ensure VM data reliability.	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 day 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 Periodic:	Every 1 hour 🗸	0						
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.	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). 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.	snortens vivi Backup Chain and	i improves iO performance	; of recovered VM in	data tetching phase	9.				
 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. 	 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. 	Merge earlier backups to free up stor	age space							
 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. 	 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. 	Preserve all backups for the recent	t 3 days.							
 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. 	 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. 	Retain one Every day preserved for	r over 3 days to 1 weeks (ast backup in each o	of those days by def	fault).				
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.	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.	Retain one Every week preserved t	for over 1 weeks to 2 weel	ks (Sunday's backup	by default).					
5 backups will be retained to ensure VM data reliability.	5 backups will be retained to ensure VM data reliability.	By default, it retains the latest back	ups within the retention pe	riod, backups prese	rved for more than 3	2 weeks will be	emerged to free	up storage sp	ace. However,	at least
		5 backups will be retained to ensure								
	Packup Patentian Sattings		VM data reliability.							

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 Polic	су						×
Continuous	s Backup — 2 Select Virtual M	achine —	— 3 Ba	ckup Repository ——	Policy Name		
Q CDP and s	scheduled backup are invalid for VMs having) disks mirro	red directly from	n physical/shared disks ((not via file system).		
Available					Selected		
¥: E		Group	~	Name Q			Clear
VM Nan	ne	Туре	VM Size	Backup Policy	VM Name		Remove
	Virtual Machine						
	} <mark></mark> (
)- T E						
	}					No data available	
	} <mark>—</mark> D						
)- <mark></mark>						
	} <mark></mark> C						
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 Repository:	ISCSI-Secondary			~		
	Total: 496 GB	Free: 308	3.23 GB	First Backup Size: 0 B		
IO Activity Log Repositories:	One for all	One for each virtual mac	chine			
IO Activity Log Repository:	ISCSI-Secondary			~		
Max IO Activity Log Size:	When disk IO activity also change this valu	logs size reaches this value e in Backup/CDP tab.	e, the earliest logs will be	merged to free up disk for newly g	generated logs. You may	
	Size For Each VM:		GB (0 B currently)			
Archive backups to other	datastores					

Backup Repository: It specifies backup repository, you may select an existing datastore or choose to add a new Windows shared folder. Once backup repository is specified, total capacity, available backup repository size and first backup size of the selected datastore will be displayed.

IO Activity Log Repositories: There are two options: One for all, One for each virtual machine, which enables you to specify a same IO activity log repository for all the virtual machines at a time or specify different IO activity log repository for each virtual machine, as shown below:

IO Activity Log Repositories:	One for all	One for each virtual mac	hine			
IO Activity Log Repository:	ISCSI-Secondary			~		
Max IO Activity Log Size:	When disk IO activit also change this val	When disk IO activity logs size reaches this value, the earliest logs will be merged to free up disk for newly generated logs. You may also change this value in Backup/CDP tab.				
	Size For Each VM:	800	GB (0 B currently)			

IO Activity Log Repository: The repository should be a datastore that node(s) where the selected virtual machine(s) reside has access to. The default IO activity log repository is same with backup repository.

Max Log Size: When disk IO activity logs size reaches this value, the earliest logs will be deleted to free up disk for newly generated logs. You may also change this value in

```
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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.

New	CDP Policy	
	Continuous Backup — 🔗 Select Virtual Machine — 🔗 B	Backup Repository — 4 Policy Name — 5 Finish
	Name: cf 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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Name	103		
Backup Periodic	Every 1 hour		
Backup Repository	ISCSI-Secondary		
First Backup Size	38.24 GB		
Reserved Space of Backup Repositor	7 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		

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 platfrom or recovered to VMware vCenter

On the toolbar, there are Enable/Disable backup, New, Delete, Enable, Disable and Backup, as shown below:

Reliability > Scheduled Backup/CDP		Backup Policies	VMware Backup Pol	Backups	VMware Backups	Backup Repositories	Global Settings
Disable backup	∘	lew 📅 Delete					P

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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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 **V** 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

Policy name Q

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:

	 Jabio Bacilap					T oney name	~
ŀ							0
L	Policy Name	Description	VM(S)	Backup Repository	Periodic	Status	Operation
l	vCenter_VM_Backup		2	Datastore_2_copy	Every Friday, start at 23:00	 Image: A set of the set of the	Edit Delete
L							

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 V icon. To disable backup policy, click on the V 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 Fold	ler
Periodic: Weekly O Daily O Hourly O Minutely	
Start Time: Friday V 23:00 V	
Max Duration: 48 hour(s) ()	
Backup Retention Period: One month	
Enable VSS File system of related virtual machines will be locked for a few seconds before backup data in cache and memory can be saved to disk to ensure the data integrity. This featu VMware Tools be installed on the virtual machines running in VMware vCenter and red those running applications like SQL Server and Exchange.	starts, so that ure requires commended for
ОК	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 —	Backup Periodic	3 Backup Repository	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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Add N	lew Policy						×
1 s	elect Virtual Machine (2 Backup Periodic -	3	Backup Repository	4 Policy Nam	• 5) Finish
Availabl	e			Selected			
5		Name	Q	€: E		Total: 9.11 GB	Clear
	VM Name	Backup File	Ва	VM Name		Backup File Size	Remove
	Center		^	Center			
			- 11				
			- 11	192			
		2.33 GB	- 11	- DYo		9.11 GB	団
	- 2	17.32 GB	- 11				
	- 5	45.45 GB					
		44.12 GB					
	- 5	37.61 GB					
	 X	9.11 GB	-				
					N	ext	Cancel

Clear: To clear the selected virtual machines, click Clear.

To remove a virtual machine from the Selected, click 💼

3. Specify Backup Periodic.

Backup periodic can be on weekly basis, daily basis, hourly basis and minutely basis. There are another two options: **Cancel ongoing backup task upon timeout, Enable VSS.** You may enable those options based on your own needs.

Select Virt	ual Machine	(2 Backup Pe	eriodic ———	3 Backup Repository	4 Policy Name	5 Finish
Periodic:	• Weekly	🔿 Daily	O Hourly	O Minutely			

Weekly: Select Weekly and configure the fields on the following page:

Max Duration: 48	hour(s) 🕕	
	Cancel ongoing backup task upon timeout	
ackup Retention Period: O	e month	

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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:



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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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:

Periodic: OWeek	dy 🔿 Daily	Hourly OMinutely					
Interval:	1 hour(s)	~					
Backup Retention Period:	lackup Retention Period: One week						
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 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 confiudre the related fields, as shown below:

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Periodic: OWeek	ly 🔿 Daily) Hourly	Minutely				
Interval:	10 minutes	~					
Backup Retention Period:	One month	~					
Merge earlier backup Enable this to autom weeks (the one crea	o <mark>s to free up stora</mark> atically preserve a ted on Sunday on	ge space () ill the backups t y).	for the previous 3 days, one backup (the last one) for the earlier week and one backup for each of the even earlier				
File system of related on Canady only. 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 Polic	sy .				×
Select Virtua	al Machine	Sackup Periodic	3 Backup Repository —	Policy Name	5 Finish
Backup Repository:	VirtualDatastore1		~		
	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 Polic	У	×
Select Virtual	I Machine 🧭 Backup Periodic 🎸 Backup Repository 4 Policy Name 6 Fini	ish
Name: Description:	test	

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:

Select Virtual Machine	Sackup Periodic —— Sackup Repository —— Spoincy Name —— 5	Finis
Backup Policy Summary		
Name:	test	
Periodic Incremental Backup:	Everyday, start at 23:00	
	ISCSI-Secondary	
Backup Repository:	·····,	

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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Reliability > Scheduled Backup/CDP	Backup Policies	VMware Backup Pol	Backups V	Mware Backups	Backup Repositories	Global Settings	
💾 View By Group 🗸 🗸	G Refresh 🕚	Recover 🔟 Delete				Na	me Q
E Group Q	VM Name	🔶 Back	ips 🌲 Tota	Previous Back	up Repository 🜲 La	test Backup	Backup Policy \$
All (24)	🗌 🐐 Ya	1	14	/IB VirtualDatastor	e1 20	19-11-13 23:48:39	-
Deleted Virtual Machine (11)	🗆 🔆 AD		i 7.1	GB VirtualDatastor	e1 20:	20-03-06 23:06:14	Demo backup
	🗆 🔆 AC		5 10	38 VirtualDatastor	e1 20	20-03-16 23:11:49	Demo backup
# -	🗌 🐐 МТ	1	15.1	38 VirtualDatastor	e1 20	20-03-16 23:06:11	Demo backup
	🗌 🐐 Ora	8	15.6	38 VirtualDatastor	e1 20	20-03-29 23:04:21	Demo backup
	🗌 🔆 Ora	ε	21.3	38 VirtualDatastor	e1 20:	20-03-29 23:05:33	Demo backup
	🔲 🐐 МС	9	26.3	38 VirtualDatastor	e1 20	20-03-29 23:06:39	Demo backup
	🗌 👫 alway	8	35.9	38 VirtualDatastor	e1 20:	20-03-29 23:03:52	Demo backup
	🔲 🐐 Win 7	2	36.7	38 VirtualDatastor	e1 20	19-12-02 10:59:18	-
	🔲 🐐 Windows2	016	71.6	38 VirtualDatastor	e1 20:	20-03-29 23:00:57	Demo backup
	🔲 🐐 BBC2.5.P		101.5	38 VirtualDatastor	e1 20	20-03-29 23:06:09	Demo backup
	🔲 🐐 Ubuntu16.	14, 9	102	38 VirtualDatastor	e1 20	20-02-05 23:05:27	-
	📋 👫 alwayso, _	e	775.5	3B VirtualDatastor	e1 20:	20-03-16 23:05:08	Demo backup

repository, last backup and backup policy will be displayed.

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.



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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.

Reliability > Scheduled Backup/CDP	Backup Policies	VMware Backup Pol	Backups V	Mware Backups	Backup Repos	tories Global Sett	ings		
Le View By Node	🖯 Refresh 🕚 Re	cover 🛅 Delete					Name		Q
E Group Q	 VM Name 	Backups	🔶 Total 👙	Previous Backup Repo	ository 👙	Latest Backup	÷	Backup Policy	÷
	Yong_Server	2003 1	1.7 GB	ISCSI-Secondary		2020-03-15 17:20:40		-	
Deleted Virtual Machine	🗹 🔁 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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Recover Virtual Machine			×
	Select a destination I	ocation to recover.	
	Recover to SANGFOR aCloud	Recover to VMware vCenter	
	Recover virtual machine instantly on SANGFOR aCloud	Recover virtual machine to VMware vCenter	

Recover to	SANGFOR aCloud								
💡 vmTools will b	e automatically installed on virtual ma	chines, which may take	about 5 minu	ites. Wind	lows virtual machines w	ill restart automatically u	upon first startup.		
Src VM	Recover to Backup	New VM	Recover to	Group	Recover to the C	Storage Policy	Recover to the C	Operation	
Yong_Serve	2020-03-15_17-14-54 🗸 🗸	Yong_Server 200	Default Gro	up	ISCSI-Secondary	-	Auto	Select Desti	
	Backup Name	Time	Backup Re		Repository				
	2020-03-15_17-14-54	2020-03-15 17:20:40		ISCSI-S	econdary				

Recover to	VMware vCenter							×
Src VM	Recover to Backup	New VM	Recover to	VMvv	Recover to Group	Recover to the C	Recover to the C	Operation
Yong_Serve	2020-03-15_17-14-54 🗸	Yong_Server 200	vCenter		CTI ESXI	192.200.19.30	datastore1	Select Desti
	Backup Name	Time		Backup	Repository			
	2020-03-15_17-14-54	2020-03-15 17:20:40		ISCSI-Se	econdary			

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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Delete Backu	ps	×
0	Are you sure that you want to delete backups of those virtual machines in the VMware vCenter? Backup(s) will go to Recycle Bin and will be preserved for 30 day(s). Enter admin password to confirm operation:	
	Confirm Cancel	

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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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 Datastore to Backup Repositories					×
Available 🕕	Selected				
🖽 Expand All 🛛 🗐 Collapse All					🗙 Clear
Datastore	Datastore	Free/Total	Backup Reposit	Available Backup Repository Space 🕕	Remove
No data available			No da	ita available	
				OK	Cancel

Add New Windows Shared Folder: To add a new Windows shared folder for storing backups, click Add New Windows Shared Folder.

Shared Folder:		
	Example: \\200.200.164.114\share	-
	🗌 Anonymous login	
Username:		?
Password:		
		1
	OK Cancel	

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Delete: To move the datastore out of the backup repository, select the datastore(s) and click **Delete**.

Message	×
0	Are you sure that you want to remove the datastore out of the backup repositories?
	Confirm Cancel
Ý	

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	Туре	Capacity	Free 🙏	Total (for backu 🛓	Free 🌲	VMs 🍦	Max Read S 🖕	Max Write S 🖕	Backup
8	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:

Total (for backu 🌲	Free	.≜ ▼	
500 GB	308.23 GB		
Total: 496 GB Free Space: 308.23 GB Total (for backups & a 500 GB	rchives):		
	ОК	Cancel	

Backup: To view and manage the backups, click View under the Backup column, as shown Sangfor Technologies

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below:

Ma	anage Backups										×
	Backups	VMw	are Backups								
0	Refresh 🔾	Delete								Name	Q
	Virtual Machine	\$	Backups 🌲	Total	\$ Percent	Å.	Previous Backup 🍦	Latest Backup	\$ Backup Policy	*	Backup Repository 🍦
	🔆 Monitoring2		1	98.46 GB		20 %	ISCSI-Secondary	2020-02-14 23:00:59	-		-
	🔆 MGR		1	11.62 GB		2 %	ISCSI-Secondary	2020-02-10 11:22:16	Demo backup		VirtualDatastore1
	🔆 yong test0001		5	10.44 GB		2 %	ISCSI-Secondary	2020-02-21 23:00:47	-		-

												Close
Ma	anage Backups											×
	Backups VN	/ware Backups										
0	Refresh 🔾 Dele										Name	Q
	Virtual Machine	Backups 🖨	Total	A V	Percent	Å	Previous Backup 🍦	Latest Backup	*	Backup Policy	*	Backup Repository 👙
	Tong_Server 2003	1	1.66 GB			0 %	ISCSI-Secondary	2020-03-15 17:20:4	0	-		-

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	
O Specify how many backup tasks	can be implemented concurrently, according to the bandwidth and performance of the backup datastore.
Max Tasks Per Datastore: 10	0
Max Backup Speed Per VM: 80	MB/s
Save Restore Def	aults
Backup Archiving	
O Specify how many backup archiv	ing tasks can be implemented concurrently, according to the bandwidth and performance of the backup datastore.
Max Archiving Tasks Per Datastore:	
Save Restore Def	aults
Backup Recovery	
Specify the maximum concurrent	t recovery tasks supported by a node according to system performance.
Max Tasks Per Node: 2	0
Max Speed Per VM: 50	MB/s 🕐
Save Restore Def	aults
Backup Merging	
Max Merging Tasks Per Datastore:	2
Max Merging Speed Per VM:	50 MB/s ()
Save Restore Def	aults

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

Recycle bin helps to preserve deleted items such as network devices and virtual machines for 30 days, beyond which, those items will be deleted permanently. Connections to those **Sangfor Technologies**

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devices will not be restored.

Network devices, virtual machines, shared disks, and junk files can be recovered from Recycle Bin.

Syster		Network Devices	Virtual Machines	Shared Di	ks Junk Files						
Ş		ete \land Empty						💡 ltems	will be dele	eted permanently after be	ing preserved for 30 days
	Name	÷	Description	\$ Туре	÷	Size	÷	Time Deleted	÷	Days Preserved	÷
	Couter2			Rou	er	-		2020-03-04 16:52:45		3 days	
	Router2			Swit	h	-		2020-03-04 16:52:45		3 days	
	iswitch4			Swit	:h	-		2020-03-18 16:52:11		17 days	
	iwitch7			Swit	h	-		2020-03-18 16:36:35		17 days	
	iwitch6			Swit	h	-		2020-03-18 16:40:23		17 days	
	🍅 switch9			Swit	h			2020-03-18 16:37:30		17 days	

2.6.14 High Availability & Resource Scheduling

2.6.14.1 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.

The minute node's hardware, st	torage or network fails, virtual machines are recover	ed seamlessly onto another node to ensure service	e continuity.	
Monitoring Sensitivity:	Low-medium (default)			
	If node fails for 5 minutes , shut down virtual mach	ines and recover onto another clustered node.		
Migration Triggers:	Management Interface	Edge Connected Directly or via a Switch	Storage	HA Enabled
	0	0	۲	
	O	٢	۲	
	8	S	\otimes	
	8	\odot	0	
	O	\odot	O	
	8	\odot	0	
	8	0	0	
	🛞 Failed 🛛 💎 Normal			

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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.

2.6.14.2 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.

🗹 Enable	resource sch	eduling									
Turn on thi	is feature, so t	hat virtual m	achines can be migra	ited to and	ther node when running low on resources, to guarantee business stability and continuity.						
Automation	In Level: Automated (virtual machines are automatically migrated to another node)										
		O Manual ((migration recommen	dations wi	II be given and need to be applied manually)						
Resource:		() CPU	() Memory	● CPU	or Memory						
Trigger:		Host CPU ι	isage exceeds	80	%						
		Host memo	iry usage exceeds	80	96						
Sensitivity	Level:	Conserva	tive (recommended)) 🗸 (m	igration will be triggered if CPU and/or memory usage exceed the above usage for 10 minutes)						
Prefer The	e Node with VN	1 Replica:	Enable	~ (0	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 \	/Ms:	Set	tings (spec	ify automa	tion 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 **Sangfor Technologies**

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machines will be automatically migrated to another node.

2.6.14.3 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.
- 4. Go to edit virtual machines to enable CPU hot add and memory hot add.

	Storage Policy:	2_replica				~						
	Run on Node:	192.168.20.3				\sim						
	Guest OS:	Windows Server 2012 64 bit						/				
	High Priority:	ect after VN	after VM reboot) 🕕									
Configuration	n Advance	d										
😑 Processor	4 core(s)		Momony Siza:			GR						
Memory	8 GB		Mernury Size.			68						
📑 Disk 1	250 GB			0.00								
O CD/DVD 1	None			868						_		
🖷 ethO	Connected To: switch2	2, IP Address: 192.1	1 1 1 3 ²¹⁰ 1 ¹⁰ 2 ¹⁰	ା ଜି ୍ଡି	,	ା । ନେଶ୍ୱ କର୍ଷ) *	- P	- -			
			Enable huge-page m	emory 🕕								
			Performance of VMs applications, but disk	will be impro s will be pre-	ved if huge allocated.	-page mem	iory is ena	bled for	specific			
			Enable memory hot a	dd (change	could be m	ade in povve	ered-off st	ate) <mark>Gue</mark>	st OSes			

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Edit Virtual Mac	hine (Windows sen	/er 2012-SC)	
	Storage Policy:	2_replica	~
	Run on Node:	192.168.20.3	~
	Guest OS:	Windows Server 201	12 64 bit 🗸
	High Priority:	Guarantee resource	s even overall resources are inadequate (takes effect after VM reboot) 🕕
Configuratior	n Advance	d	
😑 Processor	4 core(s)		
🚥 Memory	8 GB		
🦰 Disk 1	250 GB	×	Virtual Sockets: 1
O CD/DVD 1	None		Coras Bar Sacket
吨 eth0	Connected To: switch2	, IP Address: 192.1	
			🗹 Enable NUMA Scheduler 🕕
			Use CPU from host 🕕
			Para-virtualized clock 🕕
👹 Other Hardwa	ares		Enable CPU hot add (change could be made in powered-off state) Guest OSes Support
📀 Add Hardware	•▼		

 Go to System > HA & Resource Scheduling > Automated Hot Add, select Enable automated memory/CPU hot add, and configure Resource, Trigger and Sensitivity Level fields.

oottiingo	
Prior to enabling hot-add features	or 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 m	iemory/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 OMemory OCPU or Memory
Trigger:	Guest CPU usage exceeds 80 % (one virtual socket will be added each time, but eventual number be less than doubles)
	Guest memory usage exceeds 80 % (one eighth of the configured memory size will be added each time, but eventual number be less than doubles)
Sensitivity Level:	Conservative (recommended) 🗸 (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				Selected		
Expand All 📄 Collapse All	Group	✓ Name	a Q	🗇 Clear		
VM Name	*	Current C	Hot-Add Supp	VM Name	÷	Delete
- 🕞 🦳 Virtual Machine						
-						
-						
- 🕀 🗖 Database Group						
-						
-				No dat	a available	
				O	د c	ancel

7. Click **OK** to save changes.

2.6.14.4 Configuring Advanced Settings

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2.6.15 Customization

2.6.15.1 Customizing Basics

In **System > Customization > Basics**, it displays the following information:Company Abbreviation, Company Full Name, Product Abbreviation, Product Full Name, Version, Support, Sales and Email.

Basics		
Logos	Basics	
Links	Company Abbreviation:	Sangfor
Others	Company Full Name:	Sangfor Technologies Inc.
	Product Abbreviation:	SANGFOR aCloud
	Product Full Name:	SANGFOR aCloud
	Version:	Display version Number
	Support:	+60 127-117-129(7511)
	Sales:	+60 127-117-129(7511)
	Email:	tech.support@sangfor.com
		Save

Company Abbreviation: Specifies abbreviation of company name.

Company Full Name: Specifies company full name, as shown below:



Product Abbreviation: Specifies abbreviation of product name, as shown below:



Product Full Name: Specifies product full name, as shown below:

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Version: There is a Display version Number option. To show or edit product version, select that option. Once the option is checked, you will see the version number, as shown below:



Support: Specifies technical support hotline.



Sales: Specifies sales contact:

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Support: +60 127-117-129(7511) Sales: +60 127-117-129(7511) Email: tech.support@sangfor.com

Email: Specifies email address to contact technical support.

Sangfor Technologies Inc.

Support: +60 127-117-129(7511) Sales: +60 127-117-129(7511) Email: tech.support@sangfor.com

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2.6.15.2 Customizing Logos

On the Logos tab, you can customize Company Logo (Login Page), Product Logo (Navigation Menu), and Address Bar Icon(Favicon).

Basics				
Logos	Product Logo (Navigation Menu):	logo_44_40.png	ব্র	(Recommended size:44px*40px) 🕕
Links				
Others				
	Address Bar Icon (Favicon):	favicon.ico	ব্র	(Recommended size:32px*32px) 🕕
		\$		
		Save		
Δ				
Pixel of the logo p	pictures to be uploa	ded should be the	e recomr	mended size.

2.6.15.3 Customizing Links

On the Links tab, you can specify address of Official Site and Official Community, and Official QR Code.

Basics		
	Official Site: 🗹 Enable 🕕	
Logos	http://www.sangfor.com	
Linke		
LINKS	Sangfor Community: V Enable U	
Others	http://community.sangfor.com	
	Save	

You may change as follows: Sangfor Technologies Block A1, Nanshan iPark, No.1001 Xueyuan Road, Nanshan District, Shenzhen, China T.: +60 12711 7129 (7511) | E.: tech.support@sangfor.com | W.: www.sangfor.com

Customizing Others

Support & Downloa	ad,	_
Basics		
Logos	SANGFOR aCloud:	🖌 Enable 🕕
	Tech Support & Download:	🖌 Enable 🕕
Links		Save
Others		

On the Others tab, you can disable and hide such modules as Getting Started and Tech

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.

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:

Configuration	Advanced	
📃 Processor	4 core(s)	
📟 Memory	8 GB	
🦰 Disk 1	500 GB	Virtual Sockets:
🦰 Disk 2	500 GB	
🦰 Disk 3	500 GB	
O CD/DVD 1	CD/DVD Drive	Enable NUMA Scheduler 🕕
吨 ethO	Disconnected	Use CPU from host 🕕
吨 eth1	Disconnected	Para-virtualized clock 🕛
dther Hardwar	es	Enable CPU hot add (change could be made in powered-off state) Guest OSes Support
🕁 Add Hardware'	•	

5. Click **OK** to save the changes.

⚠

Once Enable NUMA scheduler is selected in System > HA & Resource Scheduling > 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.

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Advanced System Settings							
NUMA Scheduler 🗹 Enable NUMA S	NUMAScheduler 🗹 Enable NUMAScheduler 🕦						
Save							
Memory Overcommitment Setti	ngs						
Memory Allocation							
Memory Overcommitment Reser	ved Preallocated	Available	📕 Reserved: Memor	y for system running			
Ratio (100%)			Preallocated: Men	nory reserved for page-memory enabled VMs			
Ratio (>100%)	wed Preallocated	Available Overcommitted	Available: Memory for dynamic provisioning				
	Total		Overcommitted: Av	vailable Memory * (Memory Overcommitment Ratio - 100%)			
		C-RAM					
		Anocatable					
Global Memory Overcommitment Ratio:	120% 🗸						
Node Name	100% (No risk)	Total		MEM Overcommitment Ratio 🕕	Allocatable		
192.168.20.5	140% (Alarm)	256 GB		120% 🗸	265.6 GB		
192.168.20.3	160%	256 GB		120%	264.8 GB		
192.168.20.4	192.168.20.4 180% 256 GB			120%	263.3 GB		
	200% (High risk)						
	22070						
	240%						
Save	260%						
	280%						
	300% 👻						

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. This 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.

When host health monitoring is enabled, the system can automatically identify whether the host is healthy. Healthy hosts are preferred for VM startup, HA or other tasks. Alarms will be sent to notify users to reboot the unhe What is An Unhealthy Host?						
Enable host health monitoring Recovery Method Auto-removed from unhealthy host list Status of unhealthy hosts will be checked upon each startup and reboot. Hosts restored to normal state will be automatically removed from the Aiam Notification: By email ① Settings	An unhealthy host is marked by the following issues which cause the host to get stuck: Memory Failure: • UECC memory • ECC memory System Disk Failure: • Bad Sector • Remaining lifetime is less than 12%.					

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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.

C Refresh				Search	Q
Node IP	Issue	Description	Time Detected		Operation
		No data available			

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.

2.6.18 System Diagnostics

Simple troubleshooting and information gathering can be carry out throughout the command available on **System > System Diagnostics**.

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> System Diagnostics	
ver: 192.168.20.5 🗸	
Command	Description
help	Show this help text help
clear	Clear screen clear
term	End running program term
arping	Send an ARP request to an adjacent host arping [-I interface] [-S source] <destination ip=""></destination>
chping	Check multicast connectivity chping hostname
df	Display disk partitions df
dparping	Send an ARP request to an adjacent node via NIC dparping <destination ip=""></destination>
iostat	Display disk IO information iostat [interval] [<sdx> []]</sdx>
lsblk	Display information of available block devices lsblk
lspci	Display PCI information of the current node lspci
locatedisk	Display drive letter locatedisk /dev/sdx
multipath	Display multipath information multipath
ping	Test connectivity to a host address ping [-c count] [-I interface] host
perf bench mem all	Display memory capacity perf bench mem all
route	Display routing table route
smartctl	Check health of physical disks smartctl [-x] [-a] /dev/sdx
telnet	Test connectivity to a port on a host telnet host port
turbostat	Display CPU clock speed turbostat
vtpclustat	Check status of clustered nodes and cluster vtpclustat
lsusb	View USB List lsusb [-v] [-t]

Server: Select the corresponding node to execute the command.

> : Enter the available command shown above to execute.

2.6.19 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.

v					
	🗸 Enable 🛇 Disable C Refresh				
	Service	Port	Protocol	Description	Status
L	Host discovery	4099	udp	Port for new node discovery that aims to discover nodes with Sangfor HCI installed	~
	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.	×
	P2V migration	4000-4010,10809-10900	tcp/udp	Port for processing migration requests and transmit data during executing P2V tasks	×
L	Samba	139,445	tcp	Port for management of Samba shared directories	×
	Correlated security service	4433	tcp	Port providing an API gateway for correlated security services	×
L	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 ce	×
	VMware VM console proxy	4481	tcp	Port for access to admin console of VMware aCenter virtual machine	0
	- iscsi	3260	tcp	Port for external access to storage based on ISCSI virtual disks and shared disks, ISCSI protocol parsing and data transmission	\sim
	- Access to web admin console of the virtual netwo	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	tep	Port for web access to HCI admin console	~
L					

2.6.20 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.

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```
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```

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.

- <u>1</u> 4-	Sangfor HCI Hyper-Converged Infrastructure		Compute	Networking	Storage	Nodes							Health Check	* 9	admin Super Admin
Reliability															
C Ref	resh 🛛 🕂 Add UPS 🔏 Attach To Noc	des 🏟 UPS-Pov	vered VM Shutdow	n 📄 View Auto Si	nut-Down ∨Ms			Scheduled Backu	p/CDP						
								Snapshots		Resource Scheduling					
UPS Na	me 🍦 UPS:	Status	÷	Battery Remaining		Battery R	Runtim			Automated HotAdd	¢	Connected Node:	s	Op	eration
										VM Scheduling					
										Host Health Monitoring					
										UPS					
I															
Reliabili	y ≻ UPS														
C Re	fresh 🕒 Add UPS 🗞 Attach To No	ides 🔅 UPS-Po	wered VM Shutdov	m 📄 View Auto S	hut-Down ∀Ms										
UPS N	iame 🎄 UPS	Status	¢	Battery Remaining		Battery F	Runtime		\$	UPSIP	\$	Connected Nodes		Ope	eration

Configure the UPS setting under Reliability > UPS

Add UPS: Add new UPS to the HCI.

- i. Name : Enter the name for the UPS.
- ii. IP Address : IP Address of the UPS.
- iii. Version : SNMP version with 3 options, version 1,2 and 3.
- iv. Read Community : The read community in the SNMP setting.
- v. OID : Select whether it is APC or Standard MIB. For other OID, please contact Sangfor Support teams for further assistance.

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Add UPS	×
Name: IP Address:	
Version:	SNMP V1.0
Read Community	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.

- i. Attach UPS: Select the UPS to be attach to the selected nodes.
- ii. **UPS Deployment Guide**: View the UPS deployment guide for different scenario with single UPS, 2 UPS and multiples UPS.

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Att	ach To Nodes						×
♀ 1. ∪ 2. ar	If a UPS runs out of pow PS Deployment Guide to The system can only det nd the physical switch col	er, it cannot provid connect UPS and ect connectivity be nnecting UPS and	e power to the conne nodes. tween UPS and node node is still connecte	cted nodes, causing bus es. Please make sure no ed to UPS.	siness interruptio odes are connect	on. To avoid this, follow ted to the attached UPS('s)
G	Refresh 🕂 Attach	UPS				OPS Deployment	t Guide
	Node Name	Attached	IUPS			Operation	
	192.168.20.5	-				Attach	
	192.168.20.3	-				Attach	
	192.168.20.4	-				Attach	
UPS) Deployment Guide					ОК С	rancel X
	[Single UPS D	eployment			
		Connect each node	in the cluster to a UPS to) have them protected by the	same UPS.		
	Single Electricity Provider:			Dual Electricity Provide	ers:		
	😥 Network			😥 Network			
	Node	UPS	ovider A	Node	tricity Provider A Power UPS	Electricity Provider B	
						c	к

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-Powere	d VM Shutdown		×
Notes: 1. When a node shown in the figu- else it will be trig 2. When a UPS of specified thresh attached nodes. 3. When a node shutdown is trig power by battery specified thresh 4. If resource sci 5. If UPS status	is powered by electricity provider and ure), do not enable UPS-powered VM gered in case that UPS runs out of p on battery has remaining battery lowe old, sequentially shut down VMs run is attached to multiple UPSs, UPS-p gered only when all the attached UPS and their battery remaining are lowe old. heduling is enabled, VMs will not be shows it is offline, the system will no	d UPS (as A shutdown, or bower. er than ning on the bowered VM Ss provide er than migrated to the nodes powered VM	Disable UPS-Powered VM Shutdown
Status: Shutdown Trigge	Enabled er: Ms will be shut down first, set virtual	machines running importa	ant 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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View	Auto Shut-Down VMs			×
UPS-P	'owered VM Shutdown: 🔵	Enabled (applied to all UPS	s)	
The fol	llowing VMs have been automa	tically shut down:		
G	Refresh 🕑 Power On	📅 Clear		
	VM Name	Working Location	Latest Shutdown	Results
		No data ava	ilable	
				Close

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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 a**nd 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 Virtu	ial Machine						;
	Name:						
92.	Group:	Default Group			~		
	Tag:	Select			•••		
	HA:	Migrate VM to anoth	er node if the node fails	HA Settings			
	Datastore:	VirtualDatastore1			~		
	Storage Policy:	2_replica			~	⊙	
	Run on Node:	<auto></auto>			~		
	Guest OS:	Select which type of	OS to install		~		
	High Priority:	Guarantee resource	s for VM operation and r	ecovery 🕕			
Configuration	Advanced						
Standard: Low	Typical High		Cores: 8 c	ore(s)			
🧧 Processor	8 core(s)						
Memory	16 GB		Virtual Sockets:	1 🗸			
e Disk 1	120 GB		Cores Per Socket:	8 🗸			
						ОК	Cancel

Information of the virtual machine that has been created will be displayed as follows:

SANGFOR aCloud	VMware v	Center													
E View By Group	~	Par	el 🗏 List	Refresh	(+) New	Ŀ	>_	Console	Shut D	own •••Mo	re		Name		Q Advance
E E Group	Q		Basics	N	ode		\bigtriangleup	Power On	ed	Host Reso	urces	Ва	ckup	P	ermissions
🖃 🧰 Virtual Machine(8)			Status	🜲 VM Name		Å				\$	CPU Usage	÷	Memory Usage	÷	Disk Usage
 _ acmp_2020-03-	07-23-46-18(3		O powered o	off v			Ó	Take Snapshot	oup		-		-		-
Default Group(5			O powered o	off VVin7_			\$	Backup	0-03-07-23-4	6-18	-		-		-
			O powered o	ff VVin7_			þ	Clone	0-03-07-23-4	6-18	-		-		-
			O powered o	ff Windov		•		Edit	0-03-07-23-4	6-18	-		-		-
			O powered o	iff k			삅	Summary	oup		-		-		-
			O powered o	iff ka			3	Backup/CDP Policy	oup		-		-		-
			O powered o	off VA1		•		More	oup		-		-		-
			O powered o	iff v			-	Default G	iroup		-		-		-

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 to start this operation.

Method 2: Go to Nodes > Storage > Local Storage > More > Manage,

Click **Upload** to upload ISO image files to datastore.

: 📄 Virtua												
Refresh					Cleanup							
Name						÷	Size	Тур	• (÷	Last Modified	÷
🥑 expor	t_vm						-	Fold	er		-	
🧾 iso							-	Fold	er		-	
📙 privati	e						-	Fold	er		-	
	Virtua Refresh Name	VirtualDatastore1 Refresh New Folder Name report_vm report_vm	VirtualDatastore1 Refresh New Folder Delete Name refresh export_vm refresh iso refresh private	Virtual/Datastore1 Refresh New Folder Delete Rename arre report_vm report_vm report_vm report_vate	Virtual/Datastore1 Refresh New Folder Delete Rename Upload Name refresh report_vm refresh refresh report_vm refresh report_vm refresh report_vm refresh report_vm refresh refresh report_vm refresh	VirtualDatastore1 Refresh New Folder Delete Rename Upload Clearup Name refresh export_vm refresh iso ref	Virtual/Datastore1 Refresh New Folder Delete Rename Upload Cleanup Name	Virtual/Datastore1 Refresh New Folder Delete Rename Upload Cleanup Name	Virtual/Datastore1 Refresh New Folder Delete Rename Uptoad Cleanup Name	Virtual/Datastore1 Refresh New Folder Delete Rename Upload Cleanup Name	Virtual/Datastore1 Refresh New Folder Delete Rename Upload Cleanup export_vm - Folder iso private - Folder 	VirtualDatastore1 Refresh New Folder Delete Rename Upload Cleanup arme arme arme arme arme billete arme billete billete billete billete billete billete billete billete billete billete billete billete billete billete billete billete<

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 been uploaded in the **Load ISO image file** field, save the changes and go back to the **Sangfor Technologies**

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Compute.

Configuration	Advanced
Standard: Low	Typical High
🧧 Processor	8 core(s)
Memory	16 GB
Cisk 1	120 GB
CD/DVD 1	None
💼 ethO	Connected To: Edge1
🍓 Other Hardwan	es
🔶 Add Hardware	•

Click **Power On** to power on the virtual machine, as shown below:

Basics	Node		Throughput	IO S	peed	Host Res	ources		Backup		Permissions	
Status 🌲	VM Name	Å.	IP Address	Group		A V	CPU Usage	Å	Memory Usage	*	Disk Usage	*
powered off	AD_Calvin	•	Console				-		-		-	
O powered off			- Power On				-		-		-	
O powered off							-		-		-	
O powered off	Br				9-07-05-10-42	-26	-		-		-	
O powered off	с-		Pol Take Shapshot				-		-		-	
O powered off	C						-		-		-	
O powered off	c c		Clone				-		-		-	
O powered off	c		🗹 Edit				-		-		-	
O powered off	c –		🖳 Summary				-		-		-	
O powered off	Chu		Backup/CDP P	olicy			-		-		-	
O powered off	Ch.		More				-		-		-	

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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Compute > (Yong_WinServer2012)	Summary Snapshot	Backup/CDP Permissions	Tasks Alarms	
🔾 Refresh 👘 🗔 Console 👘 ⊳ Power On	🗌 Shut Down 📲 Suspend 🔹 🖸	Take Snapshot 🛛 🖸 Backup 👘 🖉 Edi	it More 🗸	
CPU Usage 0 % 2.2 GHz X.4 core(s) CPU Usage 93 % Total: 8 GB Free: 692.87 MB	Disk Usage 8 % Total 999 99 68 Free: 921 53 GB	Throughput CPU Memory 4kbps	 Power Off Reset Clone Migrate Migrate to VMware vCenter Migrate Across Clusters Export Repair Disk Deploy VM Convert to VM Convert to VM Convert to Template wbound 2 Kbps — Outbound 1.4 Kbps 	;

Click Migrate, specify destination datastore and node, and click OK to start migration

	Current Location			D	estination Location	
Datastore:	VirtualDatastore1	~	>	Datastore:	VirtualDatastore1	~
Storage Policy:	2_replica	~		Storage Policy:	<use original="" policy<="" storage="" td=""><td>~</td></use>	~
Current Node:	192.200.19.19	~		Destination Node:	192.200.19.18	~

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:

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Go to System > System Administrators and Permissions > Administrators, click New Account to add an administrator account first, as shown below:

General	Licensing Upgrade license to ga additional SANGFOR capabilities	in access to aCloud	8	System Administrators and Permissions Create system administrator accor and assign permissions	unts	9	Date and Time Set date and time and sync time with NTP server
	Cluster Settings Configure cluster IP an SANGFOR aCloud	id name for	D	System Backup and Restor Back up logs and system configuration and restore system to factory defaults	re o	¦ ¦	Advanced Settings Set NUMA scheduler and memory overcommitment ratio
Add	Administrator	Account				×	
1	Name:]	
E	Description:						
(Group:	Default Group			~		
F	Password:						
F	Retype Password:						
F	Permissions:	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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Permissions			×
Permissions Resources	System		
Q By default, no resource is selected. You may create a reso	arce group for Administrators or select resources from the	e resource pool.	
Available	Selected		
Name Q	E E		Clear
Asset	Asset	Permissions	Remove
All Resources	No data availa	ible	_
🕀 - 💭 🛑 Virtual Machine			
- Virtual Network Device			
Virtual Storage			
- D Physical Disk			
		ок с	ancel

Click **Resources** 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.

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Permissions			×
Permissions	Resources	System	
CPU:	No limit Max cores for powered-on VN	(5)	core(s)
Memory:	No limit Max memory for powered-on	VM(s)	GB
Storage:	No limit Max disk size for all the VM(s)		GB
Note: The abov created by	e resources are allocated to this Ar other Administrator that are manag	dministrator to create virtu ed by this Administrator.	al machines only, not as resources used by the virtual machines
			OK Cancel

As for **System**, it includes **Physical Resources**, **System Settings** and **Maintenance** and **Others**, as shown below:

missions						
Permissions	Resources	System				
Physical Resources						
Assign Administrators v	vith configuration permission	s under Home, Storage a	and Nodes menus, as w	ell as read-only permissio	ns on all the	virtual
machines.						
◯ Write						
Read-only						
 Invisible 						
 Invisible 						
Others						
Assign permissions on	all the pages under Reliabilit	y Services (including Dat	a Protection and Busine	ess Reliability), and Recyc	le Bin in Syst	tern > Others.
🔘 Write						
Read-only						
 Invisible 						
				0	к	Cancel

Accounts can be assigned with different permissions on virtual machines and virtual network.

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System > System Administrators and Permissions	Administrators Permissions			
⊖ Refresh ⊙ New 🛅 Delete				
□ Name	Å	Description	÷	Edit
- Admin		All permissions		
- Deploy virtual machine		Deploy virtual machine		
- Read-only permission		Read-only permission		-
- No permission				
VM administration		Use virtual machines		
Network administration		Use network functions		

Log in with test account.



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