VirtualSAN: HA and Hyper-Converged iSCSI SAN for Citrix XenServer

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Overview

The Virtual SAN is native version of KernSafe iSCSI SAN cross-platform which can work in the VMWare cSphere (ESX, ESXi) and Citrix XenServer host machine. It quickly brings the benefits are:

- Build Hyper-Converged Infrastructure or high availability visualization server with only two servers (two nodes high availability).
- 2. Convert VMWare vSphere and Citrix XenServer into hyper converged servers, allows it can provide both compute and storage service.

Citrix Xen Server[™] is the only enterprise-class, cloud-proven virtualization platform that delivers the critical features of live migration and centralized multi-server management at no cost. Xen Server is an open and powerful server virtualization solution that radically reduces datacenter costs by transforming static and complex datacenter environments into more dynamic, easy to manage IT service delivery centers.

High availability is the implementation of technology so that if a component fails, another can take over for it. By using highly available platforms, the downtime for a system can be reduced, and, in many cases, it can be reduced to a short enough time that the users of the system do not see the failure.

Name	IP Address	OS	Usage
Manage Node	Any	Windows	Management
Node1	192.168.0.231	Bare or Linux	Compute and storage
Node2	192.168.0.232	Bare or Linux	Compute and storage

Now, assume you have two servers want to run XenServer, have IP address as follows:

Install XenServer

You need two servers which running XenServer. XenServer must first be installed on to a suitable machine that will be used to create the virtual environment. For how to obtain or install Citrix Xen Server, please contact the Citrix supplier.

Install Virtual Native SAN

Logon to XenServer nodes to console by local server machine or ssh:

#ssh root@192.168.0.231

Download KernSafe Virtual Native SAN:

#wget http://www.kernsafe.com/download/virtual-native-san.5.30.tar.gz

Note the version number can be changed if new version available.

#tar -zxvf virtual-native-san.5.30.tar.gz

Enter the VirtualSAN directory:



partitionplugin.so smtpplugin.so snapshot.so supersan supersand

target_common.so userplugin.so Users.db vhdplugin.so ximageplugin.so

Install it

#./install

[root@localhost package]# ./install.sh Stoping KernSafe SuperSAN OK Starting KernSafe SuperSAN OK [root@localhost package]# _

Now the VirtualSAN has been installed to XenServer host machine, redo the work on another node.

Configure firewall

You need add TCP port 3260 and 3261 to be opened in firewall, or just disable if you are running in testing mode:

#service iptables stop

Configuring on Management Node

The same as XenServer, VirtualSAN does also need Windows based machine as management node, in Windows:

Launch KernSafe iSCSI SAN Management Console.

Click Server->Add another server menu item, the Add Server dialog shows.

Add Server		Х
Enter the hose to add and ye	st name or IP address and port of the server you our user login credentials for that server.	want
Server:	192.168.0.231	~
Port:	3261	<u>B</u> rowse
User login	credentials	
User name:	root	
Password:	•••••	
	ОК	Cancel

Fulfill the dialog with the credential of remote KernSafe VirtualSAN server, then click the OK button to add.

Do the same way with the second server.

Note: if you are running trial mode, you need click the "Start" button to manually start iSCSI service.

KernSafe iSCSI SAN Management Co	insole		-	
File Server Storage Clients Vi	ew loois reip	- 🎲 🖶 🕕 Settings Print About		
Servers Tree ×	KernSafe iSCSI Server: 192.168.0.232			
inclusion of additional from the second seco	General Simple largets Advanced Targets Applica	tions IPFilters Users Groups Logs Device Type Source	Capacity Authentication	Status
Advanced Targets Advanced Targets PipFilters Users Groups SCSI Targets Applications UPFilters Groups Logs Logs				
	1		S Connected: 192.168.0.232	20-Days Trial)

Create Target on Node1

Launch the **iStorage Server Management Console**, press the **Create** button on the toolbar of iStorage Server management console, the **Create Device Wizard** is shown.

Select a device type

iSCSI Device Type Select which device type of the iSCSI target you want to create.	
Hard Disk Create iSCSI target by using physical disk, partition, standard image file or VHD.	
 Optical Device Create iSCSI target by using physical optical drive or CD / DVD image file. Advanced Device Create advanced iSCSI target such as CDP device and snapshot linked device. 	
< Back Next > Cance	el

Choose Hard Disk.

Press the **Next** button to continue.

Select a medium type.

Create iSCSI Target Wizard	Х
iSCSI Medium Type Select medium of the iSCSI disk you want to create.	4
Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD).	
RAM Space Create iSCSI disk by using memory space	
Security Images Create iSCSI disk images for each initiators, any image is individual for each initiator.	
Disk Partition Create iSCSI target by using a disk partition	
Physical Disk Create iSCSI target by using physical disk.	
< <u>B</u> ack <u>N</u> ext >	Cancel

Choose Image File in iSCSI Medium Type window.

Then press **Next** button to continue.

Select an Image type.

Create iSCSI Target Wizard	×
iSCSI Image Type Select image type of the iSCSI disk you want to create.	4
 Standard Image File Create iSCSI disk by using a standard disk image file. Virtual Hard Disk (VHDX) 	
Create iSCSI disk by using a VHDX (maximum 64T) image file.	
Create iSCSI disk by using a Virtual Hard Disk image file.	
< Back Next >	Cancel

Choose Standard Image File.

Press the **Next** button to continue.

Specify image file path and size.

Create iSCSI Target Wizard	×
Virtual Image Disk Configuration Specify a image file full path and parameters.	4
Image file parameters	
Create a new image file O Use existing image file	
Full path and name of the image file:	
/mnt/sdb/xen.img	Browse
Device Size in MBs: 80000	
Fill with zeros	
File system options	
Sparse file (Recommended for image files smaller then 1TB)	
Compressed (Enable file system compress feature)	
Encrypted (Enable NTFS encryption feature)	
< <u>B</u> ack <u>N</u> ext >	Cancel

Specify the image file.

Specify the device size.

Press the **Next** button to continue.

Set authorization mode.

×
<u>&</u>
ancel

Choose **Anonymous** authorization.

Press the **Next** button to continue.

Finish creating iSCSI Target

Create iSCSI Target Wizard	×
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.)
Basic Target Information Target Name: iqn.2006-03.com.kemsafe.xenserver1.ImageDisk0 ☑ Report as readonly device when initiator can not get write access ☑ Enable multiple initiators with full access connected (sharing and clustering)	
Note By default, only one client has full access right, when the second initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS. < Back	

Type a target name in the Target Name field, we use **iqn.2006-03.com.kernsafe:xenserver1.ImageDisk0** as an example.

Check the Enable multiple initiators with full access connected (sharing and clustering) check box.

Press the **Finish** button to complete create target.

Create Target on Node2

Launch the **iStorage Server management consolle**, press the **Create** button on the toolbar of iStorage Server management console, the **Create Device Wizard** is shown.

Select a device type

Create iSCSI Target Wizard	×
iSCSI Device Type Select which device type of the iSCSI target you want to create.	3
 Hard Disk Create iSCSI target by using physical disk, partition, standard image file or VHD. Optical Device Create iSCSI target by using physical optical drive or CD / DVD image file. Advanced Device Create advanced iSCSI target such as CDP device and snapshot linked device 	
Create advanced ISCSI target such as CDP device and snapshot linked device.	
< <u>Back</u> <u>N</u> ext >	Cancel

Choose Hard Disk.

Press the **Next** button to continue.

Select a medium type.

Create iSCSI Target Wizard	Х
iSCSI Medium Type Select medium of the iSCSI disk you want to create.	<u>&</u>
Image File Create iSCSI disk by using standard image file or Virtual Hard Disk (.VHD).	
RAM Space Create iSCSI disk by using memory space.	
Security Images Create iSCSI disk images for each initiators, any image is individual for each initiator.	
O Disk Partition Create iSCSI target by using a disk partition.	
O Physical Disk Create iSCSI target by using physical disk.	
< <u>B</u> ack <u>N</u> ext >	Cancel

Choose Image File in iSCSI Medium Type window.

Then press **Next** button to continue.

Select an Image type.

Create iSCSI Target Wizard	×
iSCSI Image Type Select image type of the iSCSI disk you want to create.	2
Standard Image File Create iSCSI disk by using a standard disk image file.	
Virtual Hard Disk (VHDX) Create iSCSI disk by using a VHDX (maximum 64T) image file.	
Virtual Hard Disk (VHD) Create iSCSI disk by using a Virtual Hard Disk image file.	
< <u>B</u> ack <u>N</u> ext >	Cancel

Choose Standard Image File.

Press the **Next** button to continue.

Specify image file path and size.

Create iSCSI Target Wizard	×
Virtual Image Disk Configuration Specify a image file full path and parameters.	2
Image file parameters	
<u>C</u> reate a new image file Use existing image file	
Full path and name of the image file:	
/mnt/sdb/xen.img	<u>B</u> rowse
Device Size in MBs: 80000	
Fill with zeros	
File system options	
Sparse file (Recommended for image files smaller then 1TB)	
Compressed (Enable file system compress feature)	
Encrypted (Enable NTFS encryption feature)	
< <u>B</u> ack <u>N</u> ext >	Cancel

Specify the image file.

Specify the device size.

Press the **Next** button to continue.

Set authorization mode.

Create iSCSI Target Wizard	×
Authorization You can select an authorization mode, Anonymous, CHAP or IP filter.	3
Anonymous Select this option to disable any authorization.	
CHAP Select this option to use CHAP authorization.	
O IP Filter Select this option to use IP address authorization.	
Mixed Select this option to use both CHAP and IP address authorization.	
Inherit security roles from global settings.	
C Back Next >	Cancel
	Cancer

Choose Anonymous Authorization.

Press the **Next** button to continue.

Finish creating iSCSI Target

Create iSCSI Target Wizard	<
Completing the Create iSCSI Wizard You can specify a target name and other options to complete iSCSI target creating.	
Basic Target Information Target Name: iqn.2006-03.com.kemsafe xenserver2.lmageDisk0 ✓ Report as readonly device when initiator can not get write access ✓ Enable multiple initiators with full access connected (sharing and clustering)	
Note By default, only one client has full access right, when the second initiaor log on with full access, it will fail. But this option is usfull for clustering, disk sharing and NAS.	
< <u>B</u> ack Finish Cancel	

Type a target name in the Target Name field.

Check the Enable multiple initiators with full access connected (sharing and clustering) check box.

Press the **Finish** button to complete create target.

Creating Application on Node1

On Server1, right click **Applications** on the left tree of the main interface, choose **Create Application** on the pop-up menu, the **Create Application Wizard** widow will be shown.

Create Application Wizard		×
Application Type Select which type application that you	want to create.	2
Synchronous Replication Create real-time remote synchronous repli	cation to iSCSI target or image file.	
Asynchronous Replication Create real-time remote asynchronous rep	lication to iSCSI target or image file.	
High Availability Node Create a high-availability iSCSI SAN node	e or synchronizing with other iSCSI targets.	
	< <u>Back</u> <u>N</u> ext > Ca	ancel

Choose High Availability Node.

Then press **Next** to continue.

Create Application Wizard		×
Failover Configuration You can specify two servers to fail over each other.		4
Base Target		
Target Name	Device Type	
✓ iqn.2006-03.com.kemsafe xenserver1.lmageDisk0	Disk	
Partner Target		Setting
< <u>B</u> ack	<u>N</u> ext >	Cancel

Check the **iqn...xenserver1.ImageDisk0** storage and click **Edit** to find the mirror target.

Select iSCSI Target	×
iSCSI Source	
Host Name: 192.168.0.232	Port: 3260
CHAP	
User Name:	
Secret:	
Target	
Target: iqn.2006-03.com.kemsafe.xens	erver2.lmageDisk0 🗸
Discovery	OK Cancel

Input the IP and port of server2 in **iSCSI Source** tab, and then click **Discovery** on the bottom of the window to find the mirror target, choose the **iqn...xenserver2.ImageDisk0** in the down-list.

Press **OK** button to continue.

Note: If the target needs CHAP authorization, you should provide User name and secret to logon.

Create Application Wizard		×
Failover Configuration You can specify two servers to fail over each other.		4
Base Target		
Target Name	Device Type	
✓ iqn.2006-03.com.kemsafe xenserver1.lmageDisk0	Disk	
Partner Target		
iqn.2006-03.com.kemsafe.xenserver2.lmageDisk0		Setting
< <u>B</u> ack	<u>N</u> ext >	Cancel

The mirror target will be added to the window, then click **Next** button to continue.

Create Application Wi	izard			×
Synchronization S You can speci	Settings fy parameters for synchro	onization.		2
Sync				
Local Address:	Any	~	Local Port:	Any 🗸
Remote Address:	192.168.0.232	~	Remote Port:	3260
Alternative Sync 1				
Local Address:	Any	~	Local Port:	Any 🗸
Remote Address:		~	Remote Port:	0
Alternative Sync 2				
Specify a folder to	save temporary data dump	(folder must e	xist):	
/tmp				Browse
		< <u>B</u> ack	<u>N</u> ext >	Cancel

Specify local interface, port for Sybc interface and Heartbeat interface, if you have two NIC for each server ,you can sepcify different address-pair for Sync interface and Heartbeat interface, if you have only one NIC for synchronous, you can use same address for Sync and Heartbeat.

Specify the portal and port.

Press Next to continue

Mirror Synchronization	×
Synchronization Type	
O Create mirror device with full synchronization from base iSCSI target	
Create mirror device without synchronization (Manual Initialization)	
Warning: all data on the mirror device will be destroyed after synchronization. OK Cancel	

Now, the mirror target should be synchronized to the base target, if the two targets are both the new one and do not be initialized, we can choose **Create mirror device without synchronization (Manual Initialization)**, otherwise, we must choose **Create mirror device with full synchronization from base iSCSI target**.

Press **OK** button to continue.

Create Application Wizard	×
-	Completing the Create Applicatio Wizard
	Application name: SAN Cluster
	Cluster type: iSCSI
	Local node: iqn.2006-03.com.kemsafe.xenserver1.lmageDisk0
	Local portal: Any:Auto
	Remote node: iqn.2006-03.com.kemsafe.xenserver2.lmageDisk
	Remote portal: 192.168.0.232:3260
	Work path: /tmp
	To close this wizard, click Finish.
	< <u>B</u> ack Finish Cancel

Click **Finish** button to complete the application creation.

Creating Application on Node2

On server node2, right click **Applications** on the left tree of the main interface, choose **Create Application** on the pop-up menu, the **Create Application Wizard** widow will be shown.

Create Application Wizard	×
Application Type Select which type application that you want to create.	<u></u>
Synchronous Replication Create real-time remote synchronous replication to iSCSI target or i	image file.
Asynchronous Replication Create real-time remote asynchronous replication to iSCSI target or	r image file.
High Availability Node Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing with other Create a high-availability iSCSI SAN node or synchronizing w	ner iSCSI targets.
< Back Ne	xt > Cancel

Choose High Availability Node.

Then press **Next** to continue.

Create Application Wizard		×
Failover Configuration You can specify two servers to fail over each other.		2
Base Target		
Target Name	Device Type	
iqn.2006-03.com.kemsafe xenserver2.lmageDisk0	Disk	
Partner Target	<u>N</u> ext >	Setting

Check the **iqn...xenserver2.ImageDisk0** storage and click **Setting** to find the partner target.

Select iSCSI Ta	arget X
- iSCSI Sour	ce : 192.168.0.231 Port: 3260
CHAP	Use CHAP to logon
User Name	:
Secret:	
Target —	
Target:	iqn.2006-03.com.kemsafe.xenserver1.lmageDisk0
	Discovery OK Cancel

Input the IP and port of server1 in **iSCSI Source** tab, and then click **Discovery** on the bottom of the window to find the mirror target, choose the **iqn...xenserver2.ImageDisk0** in the down-list.

Press **OK** button to continue.

Note: If the target needs CHAP authorization, you should provide User name and secret to logon.

Create Application Wizard		×
Failover Configuration You can specify two servers to fail over each other.		2
Base Target		
Target Name	Device Type	
✓ iqn.2006-03.com.kemsafe.xenserver2.lmageDisk0	Disk	
Partner Target		
iqn.2006-03.com.kemsafe.xenserver1.lmageDisk0		Setting
< <u>B</u> ack	<u>N</u> ext >	Cancel

The mirror target will be added to the window, then click **Next** button to continue.

Create Application Wi	izard			×
Synchronization S You can speci	Settings fy parameters for synchro	onization.		4
Sync				
Local Address:	Any	~	Local Port:	Any 🗸
Remote Address:	192.168.0.231	~	Remote Port:	3260
Alternative Sync 1				
Local Address:	Any	×	Local Port:	Any 🗸
Remote Address:		~	Remote Port:	0
Alternative Sync 2				
Specify a folder to	o save temporary data dump	(folder must ex	xist):	
/tmp				Browse
		< <u>B</u> ack	<u>N</u> ext >	Cancel

Specify Sync and Heartbeat interface.

Press the Next button to continue.

Mirror Synchronization	\times
Synchronization Type	
O Create mirror device with full synchronization from base iSCSI target	
Create mirror device without synchronization (Manual Initialization)	
Warning: all data on the mirror device will be destroyed after synchronization. OK Cancel	

Now, the mirror target should be synchronized to the base target, if the two targets are both the new one and do not be initialized, we can choose **Create mirror device without synchronization (Manual Initialization)**, otherwise, we must choose **Create mirror device with full synchronization from base iSCSI target**.

Press **OK** button to continue.



Click **Finish** button to complete the application creation.

Configuring XenServer

Log On to XenServer

Open XenCenter.

😣 XenCenter				- 0	×
<u>File View Pool Server VM Sta</u>	<u>o</u> rage <u>T</u> emplates Too <u>l</u> s <u>H</u> elp	a			
General General Content of the second	New Server Wew Pool No	ew Storage 🔲 New VM 🔘	Shut Down 🛞 Reboot 🔟 Suspen	nd	
A XenCenter	Home Search				
	Jean	<u> </u>	-		
		Citrix X	enServer		
	Industry leadin	ng, open source platform f	or cloud, server and desktop v	irtualization	
			- the		
			La al	Le la	
	LEARN	ADD	PURCHASE	TRY	
	about using	a server	support	Desktop	
	XenCenter			Virtualization	
		Community St	unnart Partnors		
			upport Partners		
		Network	with other XenServer users		
		Visit the	Citrix Knowledge Center		
fnfrastructure]	• Learn mo	ore about partner offerings		
Objects					
Organization Views					
Saved Searches					
A Notifications 1					
					.::

Click **Add New Server** in the tool bar.

Add New Server dialog is shown.

😣 Add New S	erver	?	×
Enter the hos and your use	st name or IP address of the server you want r login credentials for that server.	to add	
Server:	192.168.0.231		\sim
User login c	redentials		
<u>U</u> ser name:	root		
Password:	•••••		
	Add	Can	cel

Input IP address / Name with which running Xen Server, User name and password.

Press the **Add** button to continue.

Repeat the steps to add another server.

😣 Add New S	erver	?	×
Enter the hos and your use	st name or IP address of the server you want er login credentials for that server.	to add	
Server:	192.168.0.232		~
User login c	redentials		
<u>U</u> ser name:	root		
Password:	•••••		
	Add	Cano	cel

The XenCenter which is connected by XenServers is shown as follows.

🔇 XenCenter			-	D X
<u>File View Pool Server VM Sto</u>	rage <u>T</u> emplates Too <u>l</u> s	Help		
🕒 Back 👻 🜍 Forward 👻 📑 Add N	lew Server 🍟 New Pool '	👕 New Storage 🔃 New VM 🛛 🕑 Shut Down 🥳 Reboot 🕕	Suspend	
Search	xenserver1		Logged in as: Loc	al root account
Aencenter Aencenter Aencenter	General Memory Storage	Networking NICs Console Performance Users Search		
DVD drives	Server General Proper	ties		
Removable storage	Properties		Expand all	Collapse all
xenserver2 DVD drives				· · · ·
Local storage	General			
📷 Removable storage	Name:	xenserver1		
	Description:	Default install of XenServer		
	Tags:	<none></none>		
	Folder:	<none></none>		
	Enabled:	Yes		
	iSCSI IQN:	iqn.2016-05.com.example:067df5c4		
	Log destination:	Local		
	Server uptime:	48 minutes		
	Toolstack uptime:	46 minutes		
	UUID:	1b236af7-4a54-4655-9d0f-2d5745d4d47e		
	Management Interfa	aces		
	DNS hostname:	xenserver1		
Objects	Management interface:	192.168.0.231		
Organization Views	Managari			
Saved Searches	Memory			
A Notifications 1	Version Details			

Enable Multipathing

Before to add storage, we must ensure that the Xen Server have enabled multipathing, we should to this by entering maintenance mode and change this property, click **Server->Enter Maintenance mode**, the following window is shown.

S Enter Maintenance Mode - xenserver2		?	Х
This operation will migrate or suspend all VMs running on this serve into maintenance mode.	er and tr	ansitior	ı it
Virtual machines on this server:			
Enter Maintenance Mod	le	Cancel	

Click Enter Maintenance button, the server will enter maintenance mode.

Click **Server->properties**, click **Multipathing** on the left panel of the pop-up window, the following window is shown.



Check **Enable multipathing on this server** and press **OK** button to exit, this server has now enabled multipathing.

Repeat the same setups on another xenserver node.

Add iSCSI storage device into XenServer

Click New Storage, New Storage Repository dialog is shown.

S New Storage Repository - xens	erver1	- 🗆 X
Choose the type of ne	w storage	0
Type Name Location	Virtual disk storage NFS isCSI Hardware <u>H</u> BA Software FCo <u>E</u> ISO library <u>W</u> indows File Sharing (SMB/CIFS) NFS <u>I</u> SO	iSCSI or Fibre Channel access to a shared LUN can be configured using LVM. Using an LVM for a shared SR provides the same performance benefits as a unshared LVM for local disk storage but also enables VM agility.
CİTRİX		
		< <u>Previous</u> <u>N</u> ext > Cancel .::

Select **iSCSI**, press the **Next** button to continue.

🔕 New Storage Repository	- xenserver1 – 🗆 🗙
📔 What do you war	nt to call this Storage Repository?
Туре	Provide a name and a description (optional) for your SR.
Location	Na <u>m</u> e: [iSCSI virtual disk storage
	✓ Autogenerate description based on SR settings (e.g., IP address, LUN etc.) Description:
CİTRIX	
	< <u>P</u> revious <u>N</u> ext > Cancel

Type storage **Name** and press the **Next** button to continue.

S New Storage Repository - xense	rver1		_	
Enter a path for your is	SCSI storage			0
Type Name	Provide a target host for your before proceeding.	iSCSI storage, indicating your target	IQN and your target LUN	
Location	Target <u>h</u> ost name/IP address:	192.168.0.231,192.168.0.232	: 3260	
	Use <u>CHAP</u> CHAP <u>u</u> sername: CHAP pass <u>w</u> ord: <u>Scan Target Host</u> iSCSI target Target <u>I</u> QN: Target <u>L</u> UN:			× ×
CITRIX				
			< <u>P</u> revious <u>Finish</u>	Cancel

Input IP address and port (if not 3260) of the two servers, If the target you want to connect to has CHAP Authentication, check **Use CHAP** and input user name and secret.

Press the **Scan Target Hosts** button, a list of Targets in drop-down control is shown.

😣 New Storage Repository - xense	rver1 – 🗆 X
Enter a path for your is	SCSI storage
Type Name	Provide a target host for your iSCSI storage, indicating your target IQN and your target LUN before proceeding.
Location	Target <u>h</u> ost name/IP address: 192.168.0.231,192.168.0.232 : 3260
	□ Use <u>CHAP</u> CHAP <u>username</u> : CHAP password: Scan Target Host iSCSI target Target <u>IQN</u> : * (192.168.0.231,192.168.0.232:3260)
	Target <u>L</u> UN: LUN 0: 01D25063698D0680: 78.1 GB (KernSafe) ✓ ✓
CİTRIX.	
	< <u>P</u> revious <u>F</u> inish Cancel

Select *(192.168.0.231, 192.168.0.232:3260) and LUN 0: ... Target LUN in the list.

Press the **Finish** button to continue.

The following dialog is shown, press the **Yes** button to proceed.



Now Xen Server is carrying on a series of operations, such as **Creating SR**, to create data structures required by data repositories.

XenCenter	
Creating SR	
	Cancel

Sorted! You now see an iSCSI storage device successfully added into Xen Server.

😣 XenCenter		- 🗆 X
<u>F</u> ile <u>V</u> iew <u>P</u> ool <u>S</u> erver V <u>M</u> St <u>o</u> r	age <u>T</u> emplates Too <u>l</u> s	Help
🕒 Back 👻 💿 Forward 👻 🛛 📑 Add Ne	ew Server 🕕 🏪 New Pool	🛅 New Storage 🛅 New VM 🗉 🍈 Shut Down 🛞 Reboot 🕕 Suspend
Search Q	iSCSI virtual disk sto	brage Logged in as: Local root account
🖂 🌧 XenCenter	General Storage Search	
☐ ☆ xenserver1 ØVD drives ØVD drives Ø Local storage	Storage General Prop	erties
Removable storage	P <u>r</u> operties	Expand all <u>Collapse all</u>
iSCSI virtual disk storage	General	
Local storage	Name:	iSCSI virtual disk storage
Kemovable storage	Description:	iSCSI SR [192.168.0.231 (iqn.2006-03.com.kernsafe:xenserver1.lmageDisk0; LUN 0: 01D1BA7FDE153600: 78.1 GB (KernSafe))]
	Tags:	<none></none>
	Folder:	<none></none>
	Туре:	LVM over iSCSI
	Size:	4 MB used of 78.1 GB total (0 B allocated)
	SCSI ID:	201d1ba7fde153600
	UUID:	3da0c2c5-f3c0-66c8-301e9ecf5afd
	Status	
	State:	ОК
nfrastructure	xenserver2:	Connected
Objects	Multipathing	
Organization Views -	xenserver2:	1 of 1 paths active (1 iSCSI sessions)
C Saved Searches -		
A Notifications 1		
		.#

😣 XenCenter		– 🗆 X
<u>F</u> ile <u>V</u> iew <u>P</u> ool <u>S</u> erver V <u>M</u> St <u>o</u>	rage <u>T</u> emplates Too <u>l</u> s	Help
🕒 Back 👻 💮 Forward 👻 🛛 📑 Add N	lew Server 🕕 🏪 New Poo	I 🛅 New Storage 🛅 New VM 🛛 🔘 Shut Down 🛞 Reboot 🍈 Suspend
Search Q	iSCSI virtual disk s	torage Logged in as: Local root account
Ann Center	General Storage Search	
DVD drives	Storage General Pro	perties
	P <u>r</u> operties	Expand all <u>Collapse all</u>
iSCSI virtual disk storage	General	
Local storage	Name:	iSCSI virtual disk storage
👹 Removable storage	Description:	iSCSI SR [192.168.0.231 (iqn.2006-03.com.kernsafe:xenserver1.lmageDisk0; LUN 0: 01D1BA7FDE153600: 78.1 GB (KernSafe))]
	Tags:	<none></none>
	Folder:	<none></none>
	Туре:	LVM over iSCSI
	Size:	4 MB used of 78.1 GB total (0 B allocated)
	SCSI ID:	201d1ba7fde153600
	UUID:	3da0c2c5-f3c0-66c8-36be-301e9ecf5afd
	Status	
	State:	ОК
nfrastructure	xenserver2:	Connected
👕 Objects	Multipathing	
Organization Views -	voncon/or ²	2 of 2 paths active (1 iSCS) convious)
🔾 Saved Searches 🗸	Xenserverz.	z or z patris active (+ 15C3) sessions/
A Notifications 1		

At the bottom of this interface you can see there are 2 of 2 paths active.

If by some reasons you will see only 1 path active, go back to your server console and type:

/opt/xensource/sm/mpathcount.py

This causes to refresh multipath status in virtual storage.



After you will do it, you should be able to see proper 2 out of 2 paths active.

You can type:

#multipath -II

```
[rootexenserver2 ~]# multipath -11
May 31 13:36:25 | multipath.conf line 12, invalid keyword: polling_interval_10
201d1ba7fde153600 dm-1 KernSafe,iSCSI Adapter
size=786 features='0' hwhandler='0' wp=rw
l-+- policy='round-robin 0' prio=1 status=enabled
l `- 12:0:0:0 sdc 8:32 active ready running
`-+- policy='round-robin 0' prio=1 status=enabled
 `- 13:0:0:0 sdd 8:48 active ready running
[root@xenserver2 ~]#
```

Create Pool in XenServers

Click on the Pool->New Pool... menu item then Create New Pool dialog shows.

😣 Create Ne	w Pool		?	×
To create yo like to be ad	ur pool provide a name a ded to the pool.	and select which serv	vers you wo	uld
<u>N</u> ame:	New Pool			
Description:			(opt	tional)
Servers				
<u>M</u> aster: x	enserver2			\sim
Additional	members: ver2 Master ver1			
📑 Add N	ew <u>S</u> erver			
		<u>C</u> reate Pool	Canc	el

Type Name and Description and select the both server, then click the Create Pool button to create pool.

S Configure HA	-
1 HA configuration pres	requisites 🕜
Prerequisites Heartbeat SR HA Plan Finish	 Welcome to the Configure HA wizard This wizard helps you configure HA (high availability) on a XenServer resource pool. Before you begin, ensure that the following requirements are satisfied for all servers and virtual machines in the pool: Shared storage must be available, including at least one iSCSI, NFS or Fibre Channel LUN of 356MB or greater. This LUN will be used for the heartbeat SR. If you are using a StorageLink SR, then you should manually provision a separate iSCSI, NFS or Fibre Channel LUN to use for the heartbeat. All the virtual machines you want to protect with HA must be agile. We strongly recommend the use of a bonded management interface on the servers in the pool if HA is enabled, and multipathed storage for the heartbeat SR. To continue, click Next.
CITRIX	
	< Previous Next > Cancel

Press the **Next** button to continue.

S Configure HA			_	
Difference of the construction of the construc	1			0
Prerequisites Heartbeat SR	Select a heartbeat SR that will be u must use shared storage.	sed to monitor the availability a	and health of servers in the pool. He	eartbeat SRs
HA Plan	Storage repository	Description	Comment	
Finish	iscsl virtual disk storage	iSCSI SR [192.168.0.231 (i	qn.2006-0	
CİTRIX				
•				
			< <u>P</u> revious <u>N</u> ext >	Cancel

Select the iSCSI storage as hartbeat SR and press the $\ensuremath{\textit{Next}}$ button to continue.

S Configure HA					-	×
Difigure the H	IA restart priority, restart order	and delay interval for the	VMs in this pool			3
Prerequisites	✓ HA is guaranteed. T	he maximum number of serve	r failures that HA can p	protect against is 2.		
Heartbeat SK	Virtual machine	Restart priority	Start order	Delay interval	Agile	
Finish						
	<u>H</u> A restart priority: <u>S</u> tart order: <u>A</u> ttempt to start next VM	after:	Server failure lin You can specify need to be able nds <u>F</u> ailures tolerate	nit the number of serv to tolerate in the po ed: 2 (m	er failures you ool. ax = 2)	I
CITRIX	How can I increase the n	naximum failover capacity?				
			< <u> </u>	erevious <u>N</u> ext	> Ca	ncel

Specify HA settings, and press the $\ensuremath{\textbf{Next}}$ button to continue.

🔇 Configure HA	- 🗆 X
Review configuration	and activate HA 🕜
Prerequisites Heartbeat SR HA Plan	Review the final HA configuration below. You can press the Finish button to enable HA with this configuration or use the Previous button to alter the configuration.
Finish CİTRĮX'	Heartbeat SR: iSCSI virtual disk storage Failure tolerance: 2 Restart: 0 VMs Restart if possible: 0 VMs Do not restart: 0 VMs
	< <u>P</u> revious <u>Finish</u> Cancel

Press the **Finish** button to finish creating pool.

🔇 XenCenter		- 0	×
<u>File View P</u> ool <u>S</u> erver V <u>M</u> St <u>o</u> r	rage <u>T</u> emplates Too <u>l</u> s <u>F</u>	Help	
🕒 Back 👻 💿 Forward 👻 🗌 🛺 Add N	ew Server 🕕 🏪 New Pool 📍	🛅 New Storage 🛅 New VM 🗉 🔘 Shut Down 🛞 Reboot 🕕 Suspend	
Search Q	iSCSI virtual disk stor	rage Logged in as: Local root acco	ount
Arrow Reel	General Storage Search		
received out xenserver2 DVD drives	Storage General Prope	erties	
Local storage	P <u>r</u> operties	Expand all <u>Collapse</u>	<u>all</u>
□ ➡ xenserver1 ■ DVD drives	General		
Local storage	Name:	iSCSI virtual disk storage	
iSCSI virtual disk storage	Description:	iSCSI SR [192.168.0.231 (iqn.2006-03.com.kernsafe:xenserver1.lmageDisk0; LUN 0: 01D1BA7FDE153600: 78.1 GB (KernSafe))]	
	Tags:	<none></none>	
	Folder:	<none></none>	
	Туре:	LVM over iSCSI	
	Size:	520 MB used of 78.1 GB total (516 MB allocated)	
	SCSI ID:	201d1ba7fde153600	
	UUID:	3da0c2c5-f3c0-66c8-36be-301e9ecf5afd	
	Status		
	State:	ОК	
nfrastructure	xenserver2:	Connected	
Dbjects	xenserver1:	Connected	
Organization Views -	Multipathing		
Q Saved Searches ▼	xenserver2;	2 of 2 paths active (1 iSCSI sessions)	
A Notifications 20	xenserver1:	Not active	~
			.::

Create a virtual machine

Click **New VM** on Xen Server console.

Select **Windows 7 x64** in the following wizard.

😣 New VM				_		×
5 Select a VM templat	te					•
Template	Search		Q			
Name	Name	Category	^			
Installation Media	Arr Windows 7 (32-bit)	Windows				
Home Server	🎝 Windows 7 (64-bit)	Windows				
CPU & Memory	🎝 Windows 8 (32-bit)	Windows				
Storage	₽ Windows 8 (64-bit)	Windows				
Networking	Server 2003 (32-bit)	Windows				
Finish	Server 2003 (64-bit)	Windows				
	Server 2008 (32-bit)	Windows				
	Server 2008 (64-bit)	Windows				
	Server 2008 R2 (64-bit)	Windows				
	Windows Server 2012 (64-bit)	Windows				
	Server 2012 R2 (64-bit)	Windows				
	🐉 Windows Vista (32-bit)	Windows				
	A		*			
CİTRIX	Copy host BIOS strings to VM					
			< <u>P</u> reviou	ıs <u>N</u> ext >	Car	icel

Input the desired name and description.

S New VM			_		×
Dame the new virtual	machine				?
Template Name Installation Media Home Server CPU & Memory Storage Networking Finish	Enter a name software and Server. This n You can also a Na <u>m</u> e: <u>D</u> escription:	that will help you to identify the virtual machine later. This could b hardware such as RHEL DHCP Server, Win2K3 XenApp Server or Exc some will also be displayed in XenCenter's Resources pane and can b add a more detailed description of the VM, if you wish. Windows 7 (64-bit) (1)	e a name that c hange 2007 Cli le changed late	lescribes ent Acces r.	its 55
CİTRIX'					
		< <u>P</u> revious	<u>N</u> ext >	Can	cel

Press the **Next** to continue.

Select installation media for operating system.

😣 New VM	- D ×		
Locate the operating system installation media ?			
Template Name	Select the installation method for the operating system software you want to install on the new VM.		
Installation Media Home Server CPU & Memory Storage Networking Finish	 Install from ISO library or <u>D</u>VD drive: <u>DVD drive 0 on xenserver1</u> <u>Boot from network</u> 		
	< <u>P</u> revious <u>N</u> ext > Cancel		

Choose **physical DVD Drive** on XenServer.

Press the **Next** button to continue.

Specify the number of CPUs and memory size.

😣 New VM				_		×
Dillocate processor and	d memory resources					?
Template Name Installation Media Home Server CPU & Memory Storage Networking Finish	Specify the number of virtual to the new virtual machine. Number of v <u>C</u> PUs: <u>T</u> opology: <u>M</u> emory:	CPUs, their topology and the amount in the second s	int of memory t	hat will be initi	ally alloca	ited
CİTRIX.			< <u>P</u> revious	Next >	Can	cel

Select number of vCPUs.

Specify initial memory size.

Press the **Next** button to continue.

Select storage device.

😣 New VM			_		×
Configure storage for	the new VM				3
Template Name Installation Media Home Server CPU & Memory Storage	The virtual machine template you selected earlier prov properties of these virtual disks, and add more disks if Alternatively, you can select the second option below network and does not use any virtual disks. When you have finished configuring disks for the new step. © Use these virtual disks:	vides the virtual disks liste required. to create a diskless VM th virtual machine, click Ne	ed below. You hat can be boo	can change ted from th to the next	e the ne t
Networking	Location	Size	Shared	<u>A</u> dd	
Finish	🗃 iSCSI virtual disk storage	24 GB	True	<u>D</u> elete	e
				P <u>r</u> opert	ies
	Use storage-level <u>f</u> ast disk clone				
CITRIX.	 Create a diskless VM that boots from the network 				
•		< <u>P</u> revious	<u>N</u> ext >	Can	cel

First you see an **iSCSI Virtual disk storage** device, which is previously create. It is Xen Server's default storage device. If you want to add other virtual disk, press the **Add** button.

Select **iSCSI virtual disk storage...** and then press the **Next** button, the **Disk Settings dialog** is shown.

😣 New VM			_ 🗆	×
Ready to create the ne	w virtual machine			?
Template Name Installation Media Home Server	All the necessary inf machine using the s Review these setting create the new VM.	ormation has been collected and the wizard is ready to provision the ne settings shown below. Is, then click Previous if you need to change anything. Otherwise, click It may take several minutes to create the new VM.	ew virtual Create Nov	v to
CPU & Memory Storage Networking	Name Install Method	Windows 7 (64-bit) (1) CD		^
Finish	Home Server vCPUs	xenserver1 1		
	Topology Memory Disk 0	1 socket with 1 core per socket 1024 MB 24 GB		
	Network Interface 0	Network 0		~
CITRIX.	☑ <u>S</u> tart the new VM	l automatically		
		< <u>P</u> revious <u>C</u> reate N	low C	ancel

Specify the size of the new virtual disk.

Press the **OK** button to finish the wizard.

A virtual machine is built.

Note that before Version6.5 in the Storage labels of your virtual machine, you need to exchange the position of iSCSI Virtual Storage and Local Storage (make sure iSCSI Virtual Storage at position 0) so that the operating system can be installed on this iSCSI device.

Install Operating system

Run the virtual machine and set up the operating system.

The process is just like that on real machine.





Press the Install Now button to install OS.

😣 XenCenter	- D X
<u>File View Pool Server VM Sto</u>	grage Iemplates Tools Help
Back - C Forward - Add N	Vew Server 👘 New Pool 🏐 New Storage 🛄 New VM 🍥 Shut Down 😸 Reboot 🕕 Suspend 🔘 Force Shut Down
Search	Windows 7 (64-bit) (1) on 'xenserver-mvrkokbj' Logged in as: Local root account
E Rev Pool	General Memory Storage Networking Console Performance Snapshots Search
xenserver-lznbflak	DVD Drive 1: DVD drive 0 on xenserver-mvrkokbj Eject
Socal storage	
🗑 Removable storage	🚱 🦉 Install Windows
Windows 7 (64-bit) (1)	Where do you want to install Windows?
Local storage	
Removable storage	Name Total Size Free Space Type
Best virtual disk storage	Disk 0 Unallocated Space 24.0 GB 24.0 GB
	Prive options (advanced)
	🚱 Load Driver
h Infrastructure	
	Net
Organization Views	
♥ Saved Searches ▼	1 Collecting information 2 Installing Windows
🐥 Notifications 🚺	
	Send Ctrl+Alt+Del (Ctrl+Alt+Insert)

Select the 24G disk. Just like that on a real hard disk.

Setup starts copying files



Last, with all work done, we'll see iSCSI virtual storage device in the virtual operating system.

arch	🔾 🖪 Windows 7 (64-bit) (1) on 'x	enserver1'	Logged in as: Loca	al root accou
 XenCenter New Pool xenserver1 Windows 7 (64-bit) DVD drives Local storage Removable storage 	General Memory Storage Networ DVD Drive 1: DVD drive 0 on xensi DVD drive 1: DVD drive 0 on xensi File Action View Help File Action View Help Image: Action View Help Image: Action View Help	king Console Performance	Snapshots Search	Eject
 Kenserver2 DVD drives Local storage Removable storage iSCSI virtual disk storage 	Computer Management (Loc. System Tools Task Scheduler Shared Folders Shared Folders Scheduler and Group Serformance Device Manager Storage Disk Management Services and Applications	al Volume (C:) GSPIRMCULXFRER_EN_DVD System Reserved S Disk 0 Basic 24.00 GB 100 MB NTF Online Control Con	General Policies Volumes The volumes contained on this disk are listed below. Disk: Disk 0 Type: Basic Status: Online Pattion style: Master Boot Record (MBR) Capacity: 24575 MB Unablocated space: 0 MB Volume Capacity Volume 24474 MB Image: 100 MB	
Infrastructure Objects Organization Views Saved Searches		CD-ROM 0 CD-ROM 3.09 GB UB Online Do GSP1RMCU 3.09 GB UD Healthy (Pri Unallocated Primary parti	Properties OK Canon toon 428 6/10/	AM 2016

Likewise, you may install Windows Server 2008, Windows10 and Windows Server 2012, or even any version of Linux as you need.

By the same way, you can create more targets and create HA application to link them together so that you can create 3 or more nodes hyper- converged solutions.

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