iStorage Server: High-Availability iSCSI SAN for Citrix Xen Server

Monday, Apr 25, 2011

KernSafe Technologies, Inc.

www.kernsafe.com

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Overview

iStorage Server is a network based storage virtualization software powered by KernSafe Technologies, Inc. Being a powerful, full-featured and software-only iSCSI Target SAN solution, that can quickly convert existing Windows computer into IP SAN. Storage media of iSCSI Target can include existing storage devices such as the entire hard disks or partitions, CD-RWs, tapes and USB storage devices, as well as disk image file or CD image files including ISO9660(,iso), .bin, .mdf, .cdi, .b5i, .nrg, .ccd, .sub, .img, .raw and other image file formats. Furthermore, iStorage Server also supports a lot of features such as: VHD (Virtual Hard Disk) target, snapshots, STPI, RAID-1 and failover, these features are very important and poplar in storage industry world and make iStorage Server is suitable for any size of business.

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.

After iStorage Server 2.0, it supports server side mirroring, synchronous replication and failover which allows user to create a high-availability iSCSI SAN for Citrix XenServer.

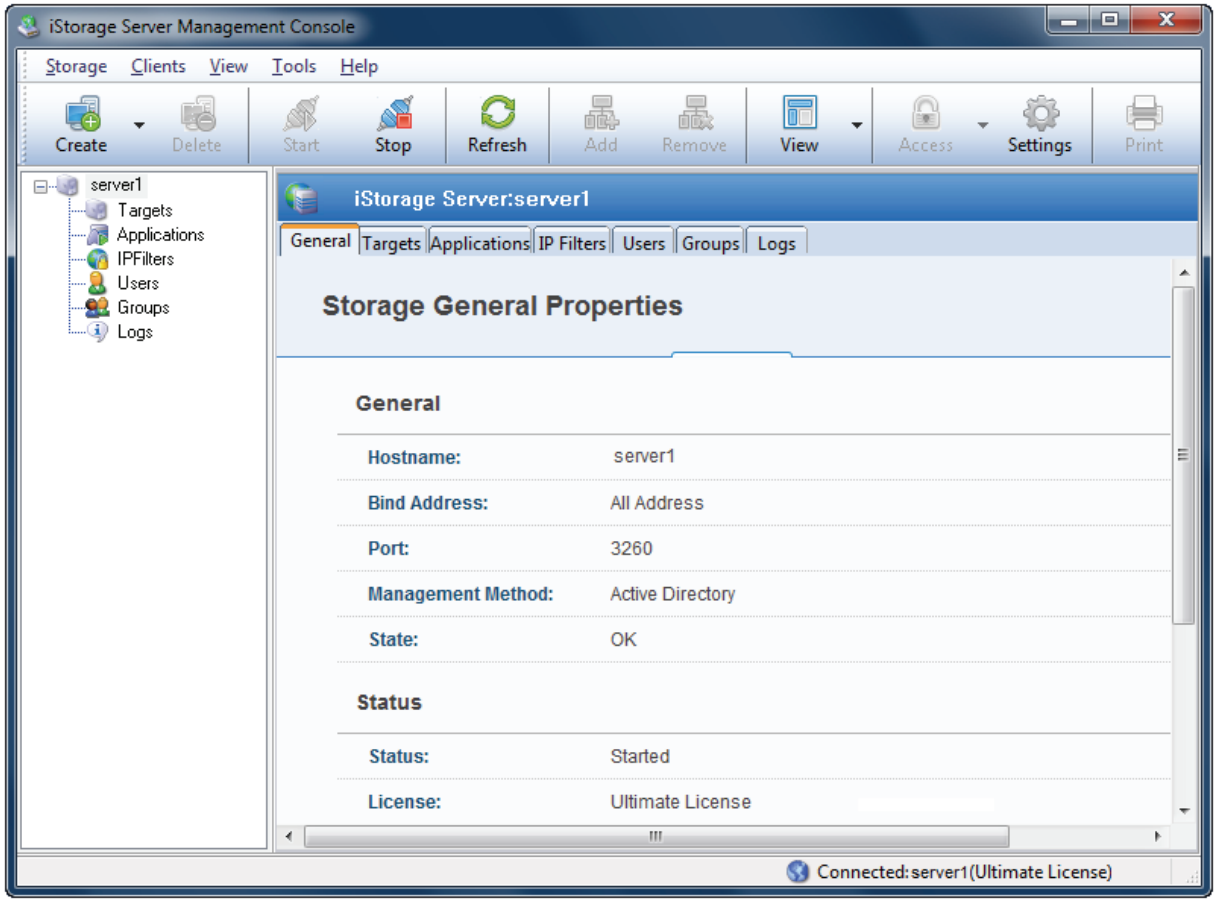
We need two targets which has the same name and the same size on two servers, in this document, we used server1 192.168.0.195 and server2 192.168.0.111.

Install Xen Server

You need a server running Xen Server. Xen Server 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.

Configuring on Server1

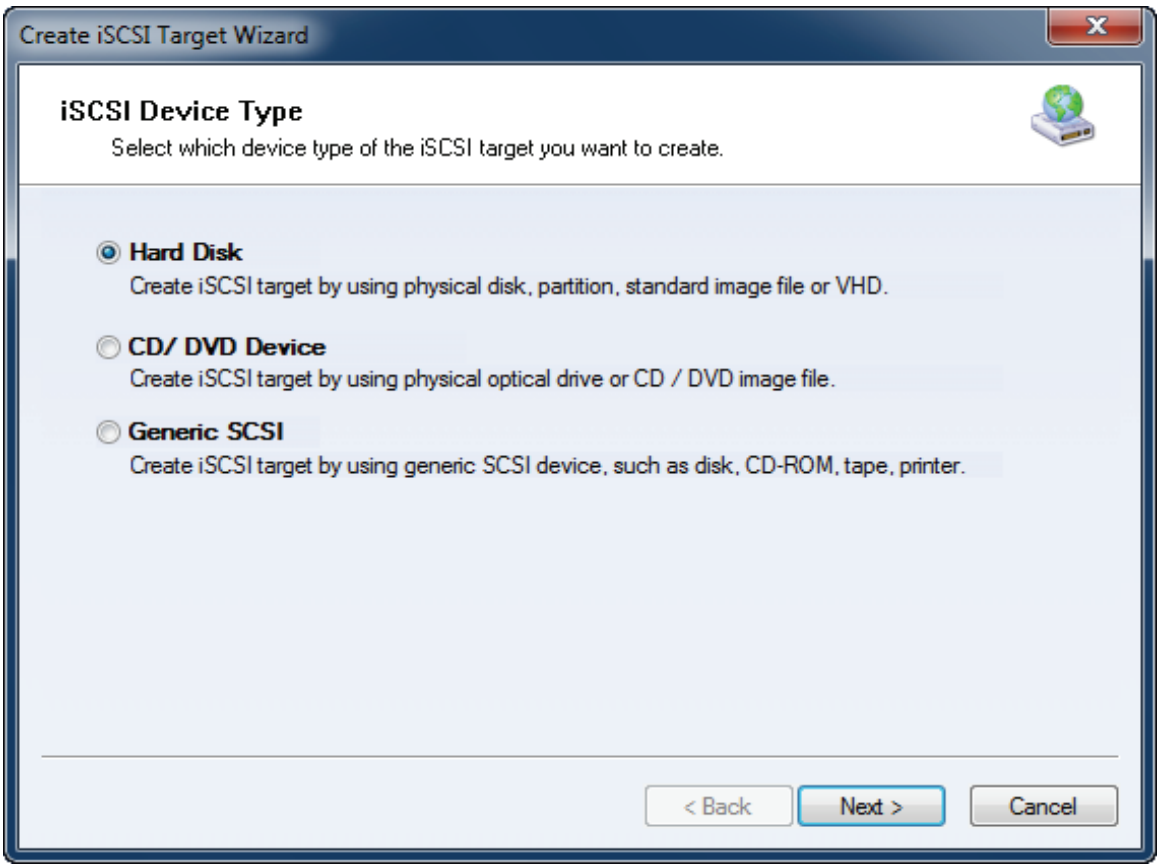
Open **iStorage Server Management Console.**



Create Target

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

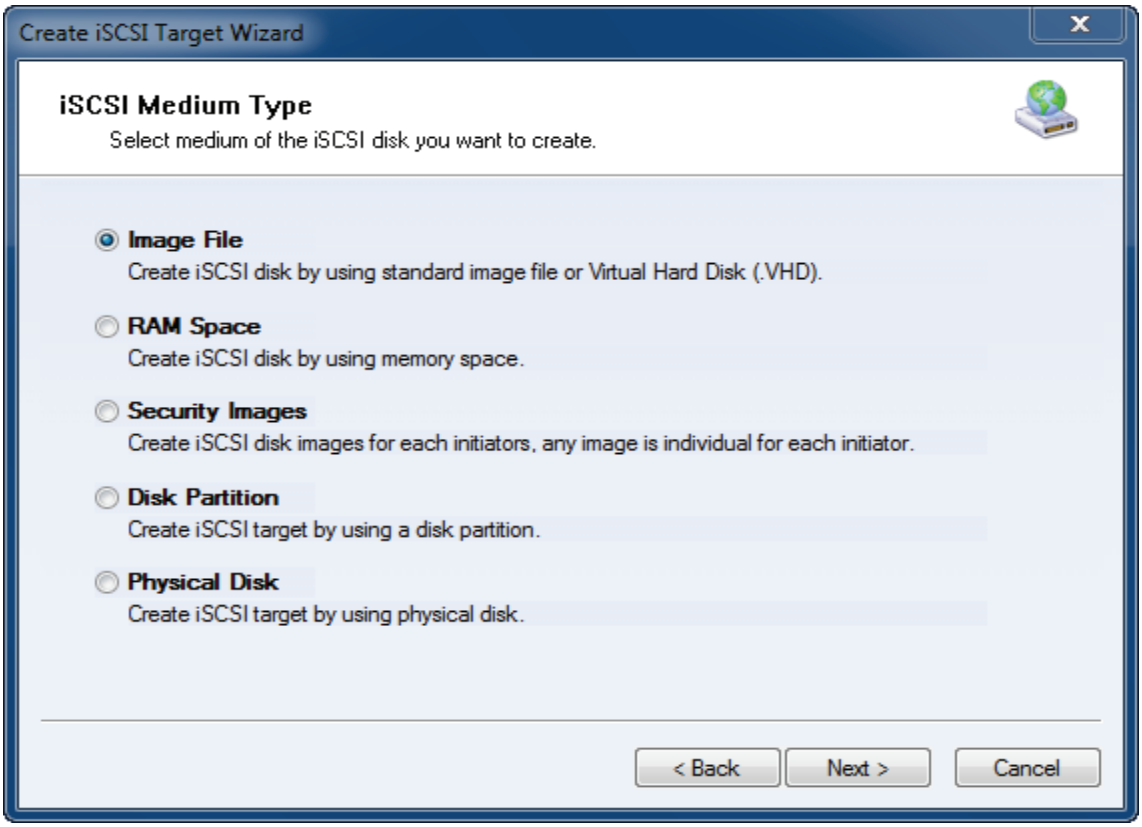
Select a device type



Choose **Hard Disk**.

Press the **Next** button to continue.

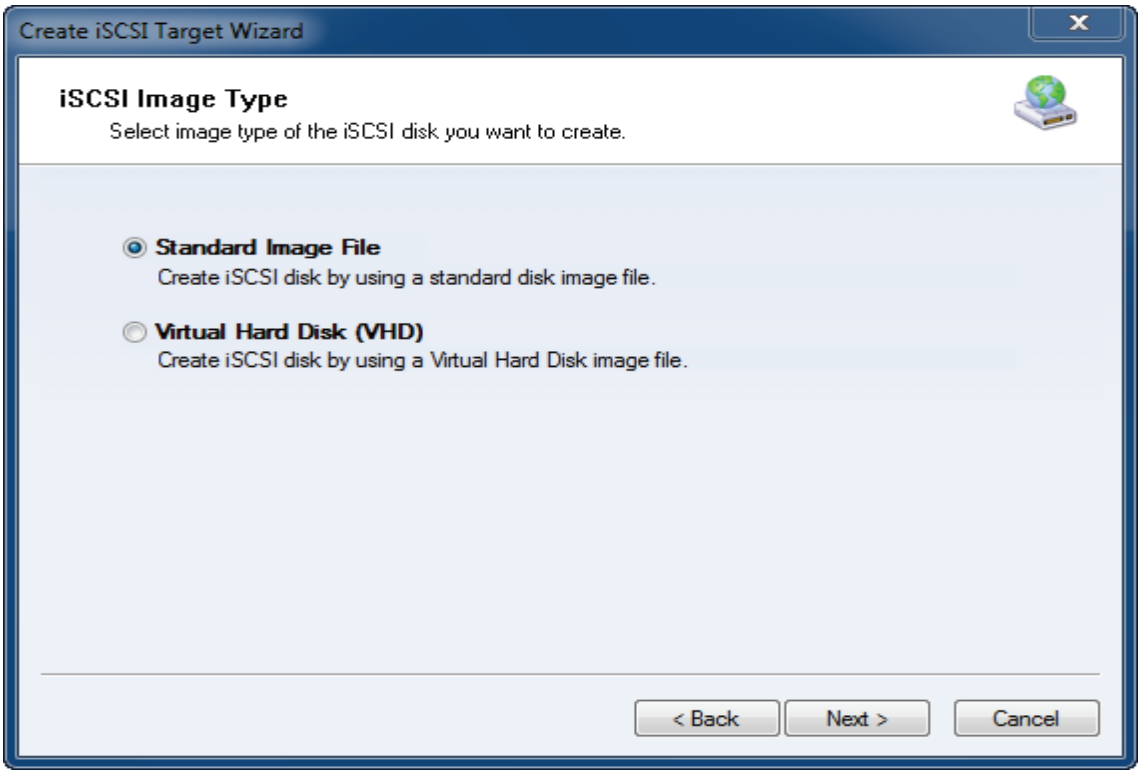
Select a medium type.



Choose **Image File** in **iSCSI Medium Type** window.

Then press **Next** button to continue.

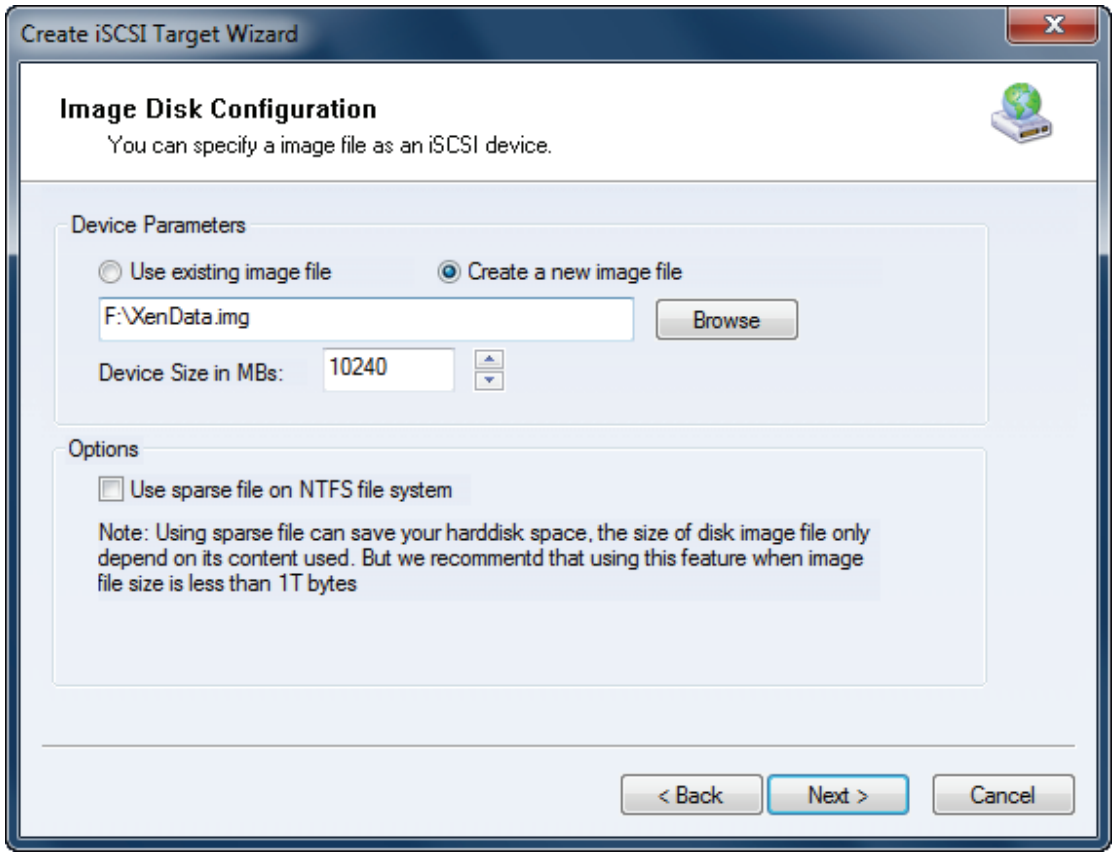
Select an Image type.



Choose **Standard Image File.**

Press the **Next** button to continue.

Specify image file path and size.



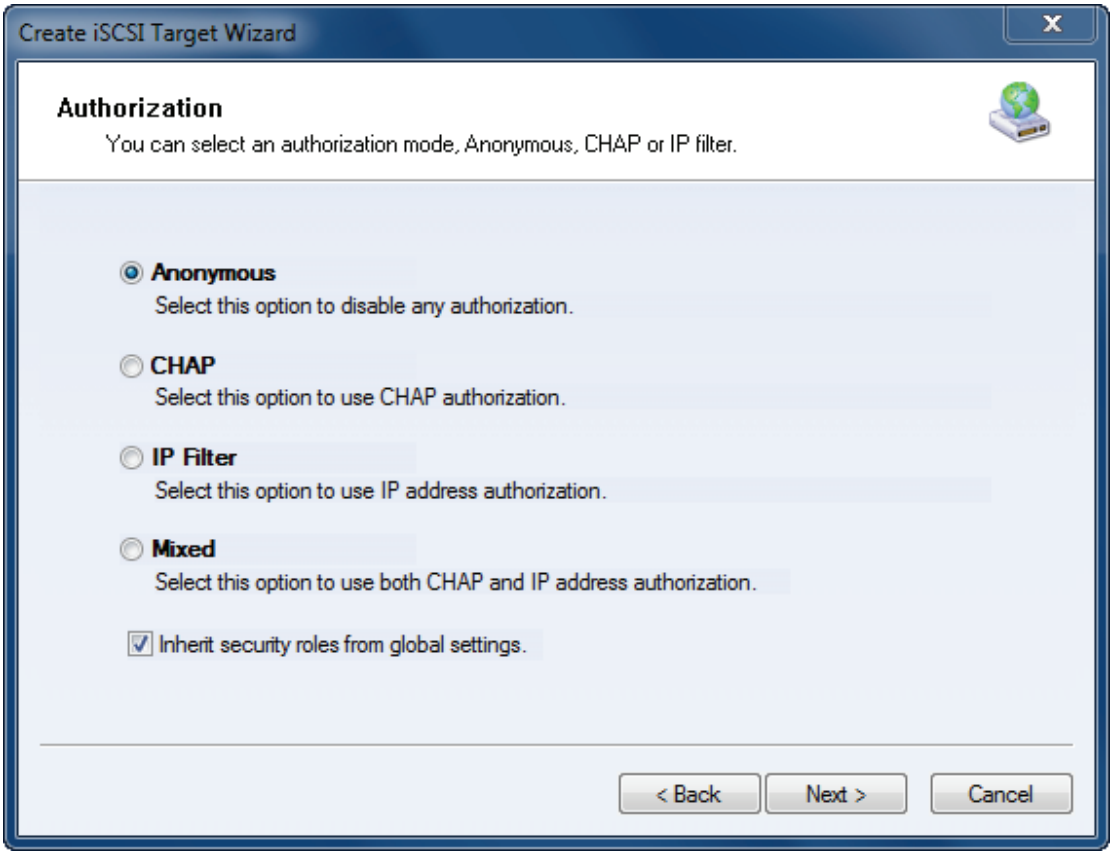
Specify the image file.

Specify the device size.

If you check **Use sparse file on NTFS file system**, the size of disk image file only depend on its content used, it can save your hard disk space.

Press the **Next** button to continue.

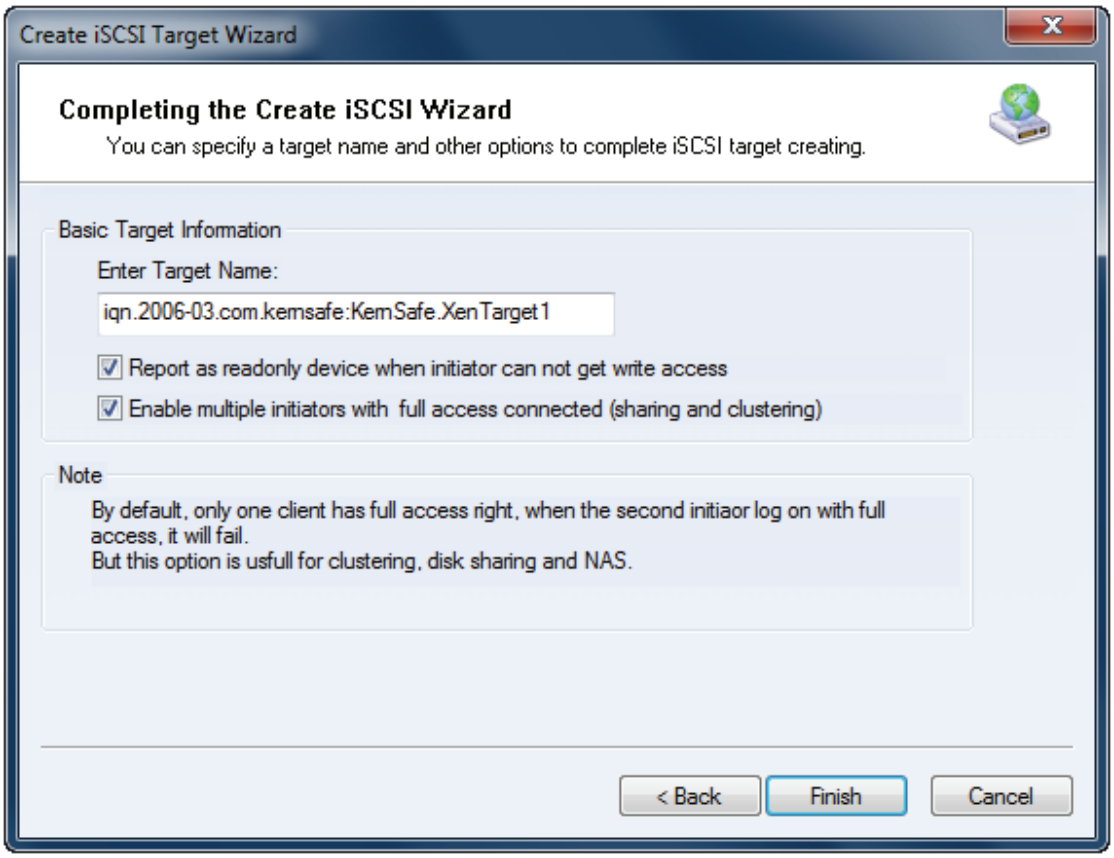
Set authorization mode.



Choose **Anonymous** authorization.

Press the **Next** button to continue.

Finish creating iSCSI Target



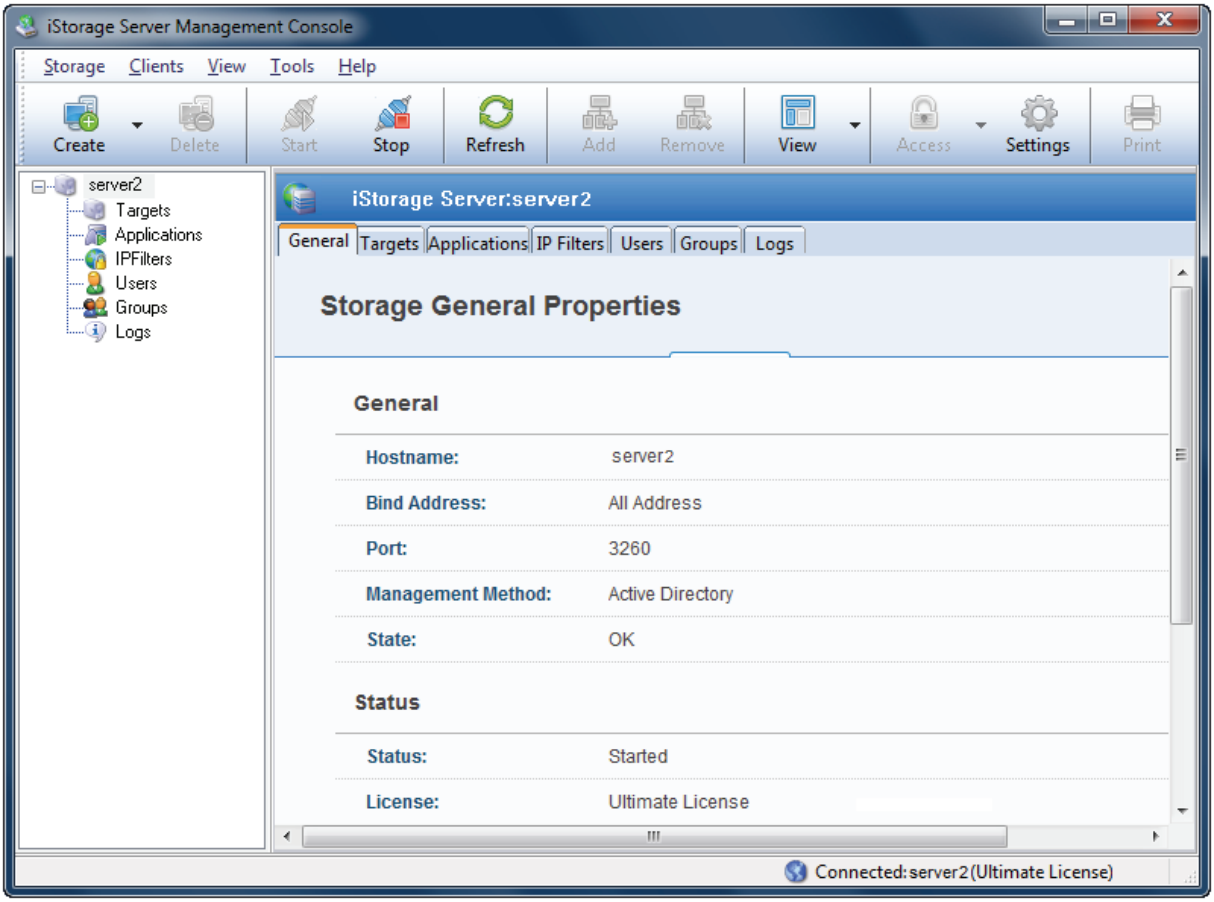
Type a target name in the Target Name field, we use **KernSafe. XenTarget1** as an example.

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

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

Configuring on Server2

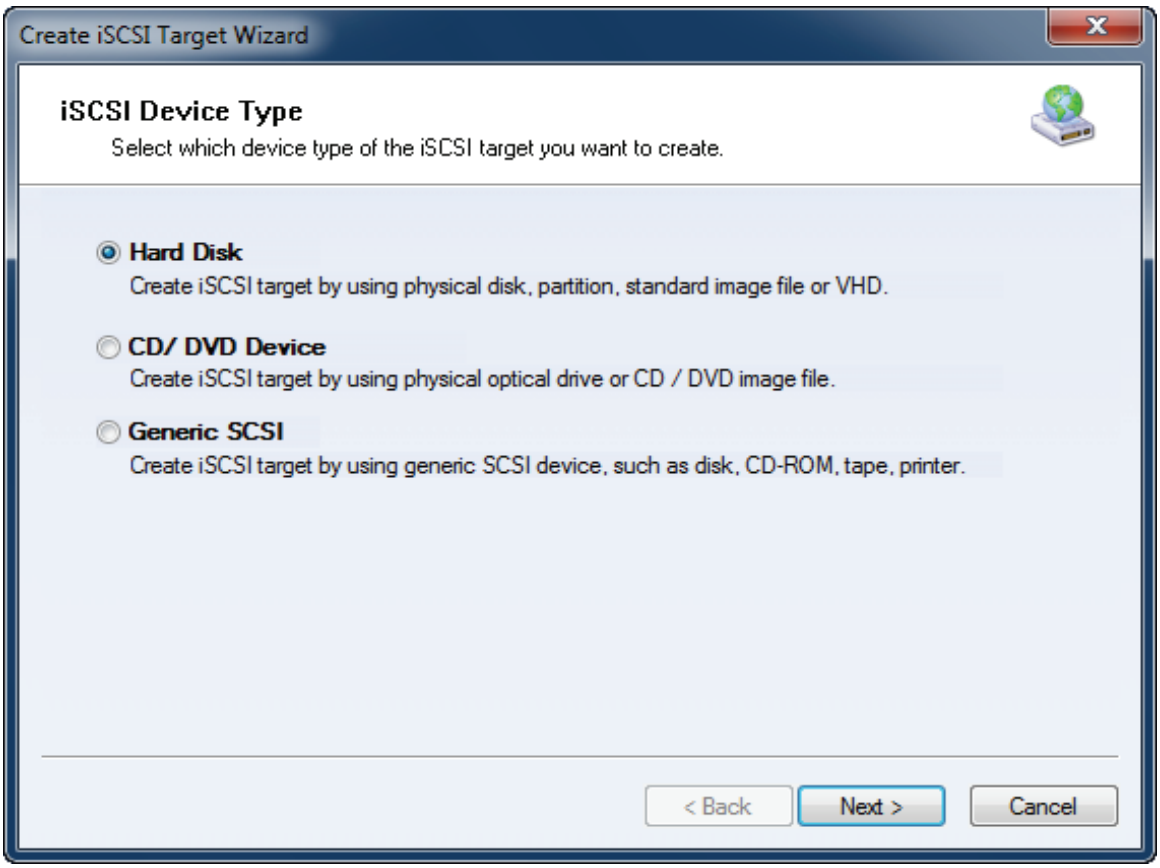
Open **iStorage Server Management Console.**



Create Target

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

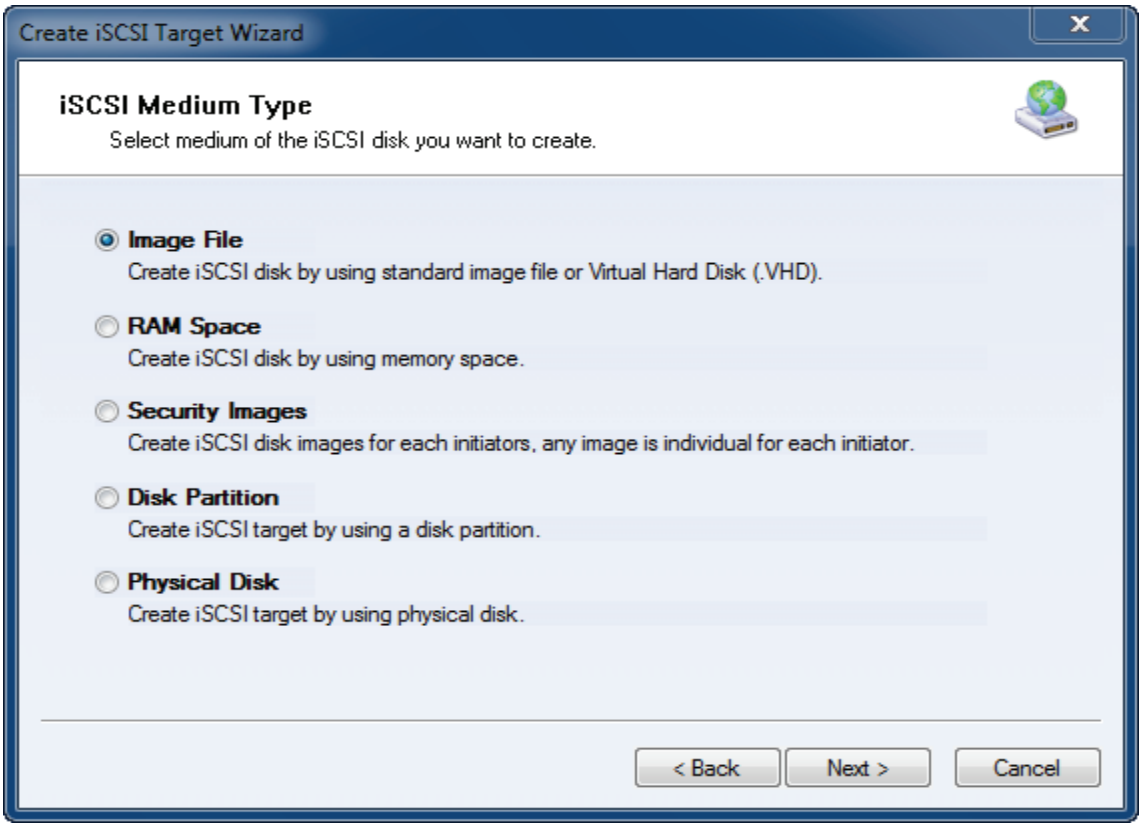
Select a device type



Choose **Hard Disk**.

Press the **Next** button to continue.

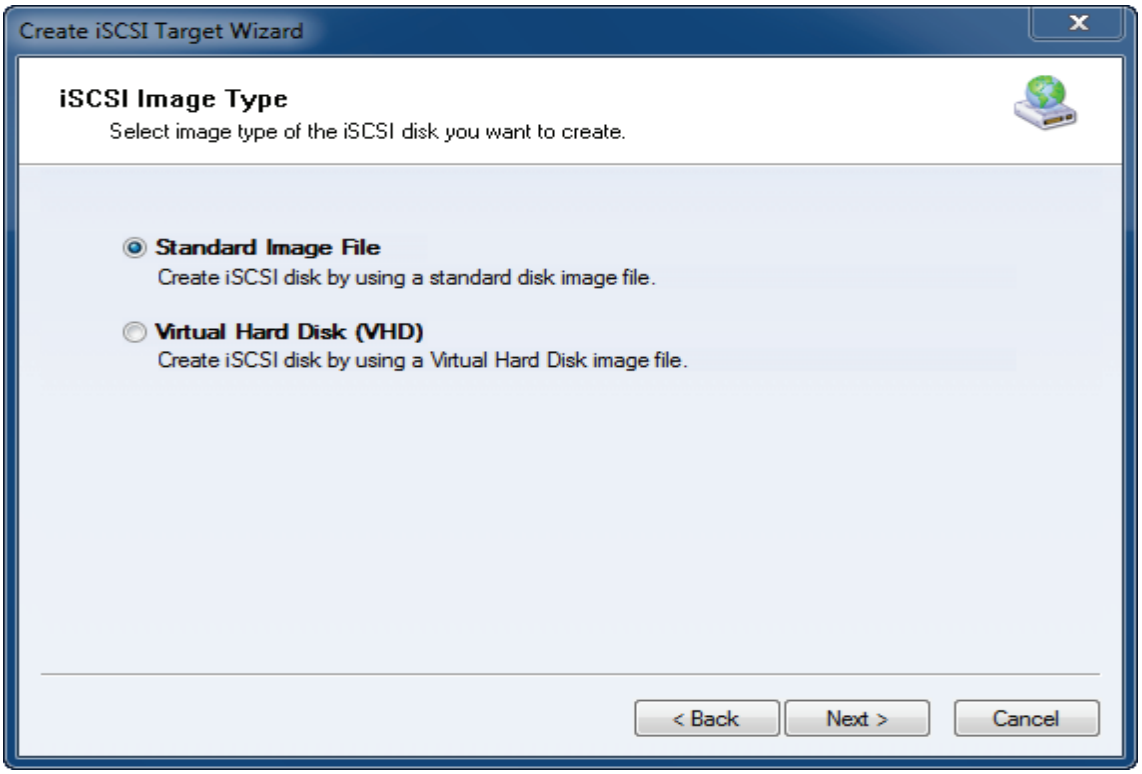
Select a medium type.



Choose **Image File** in **iSCSI Medium Type** window.

Then press **Next** button to continue.

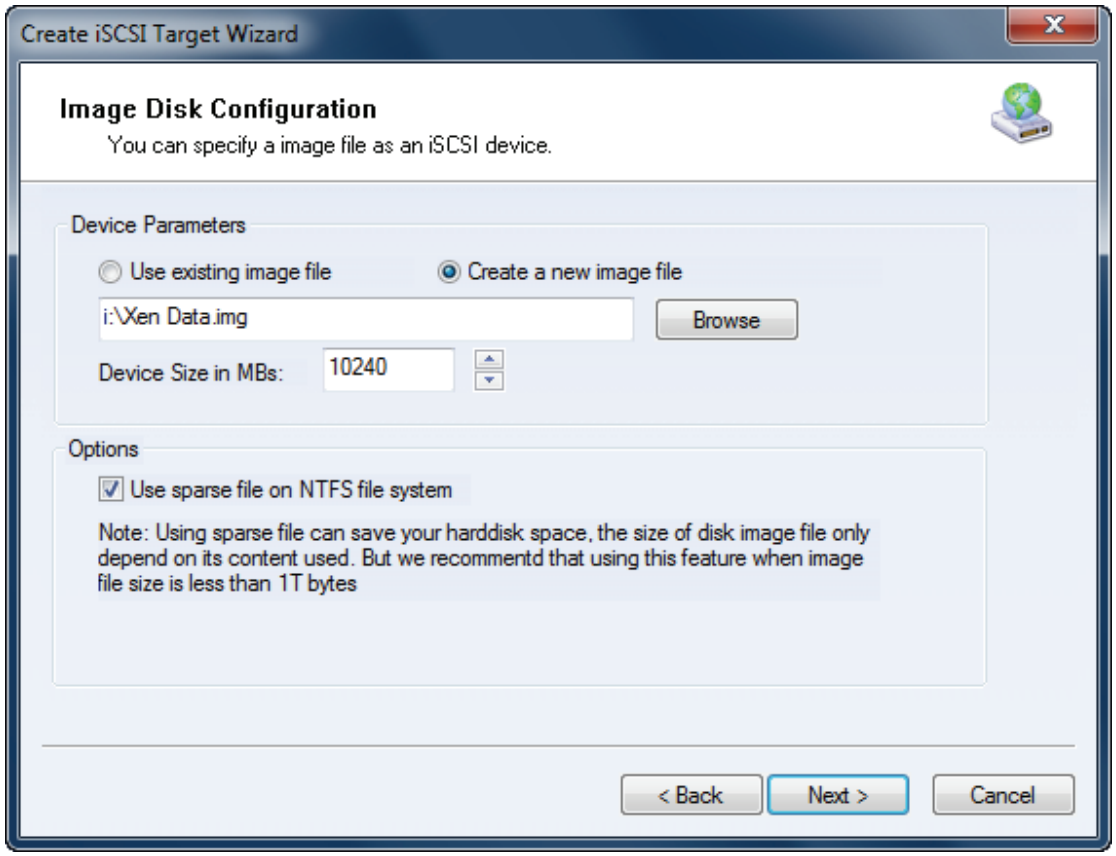
Select an Image type.



Choose **Standard Image File.**

Press the **Next** button to continue.

Specify image file path and size.



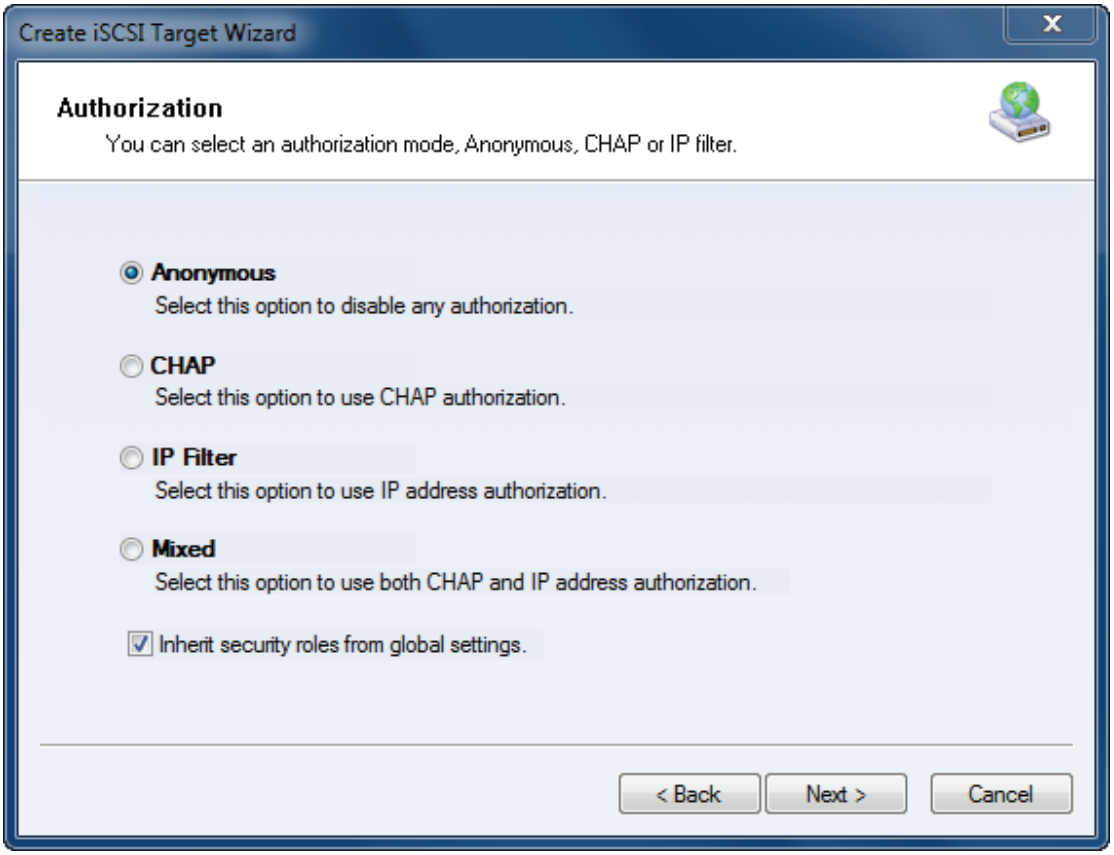
Specify the image file.

Specify the device size.

If you check **Use sparse file on NTFS file system**, the size of disk image file only depend on its content used, it can save your hard disk space.

Press the **Next** button to continue.

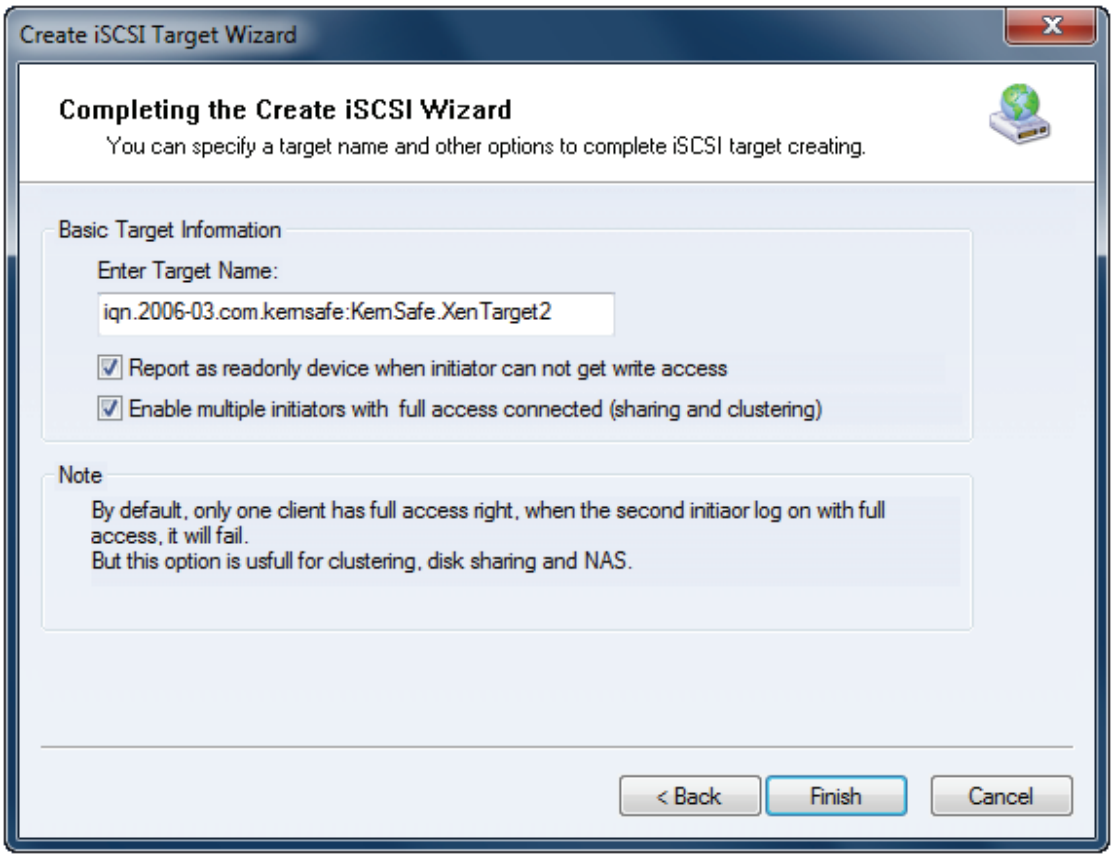
Set authorization mode.



Choose **Anonymous** Authorization.

Press the **Next** button to continue.

Finish creating iSCSI Target



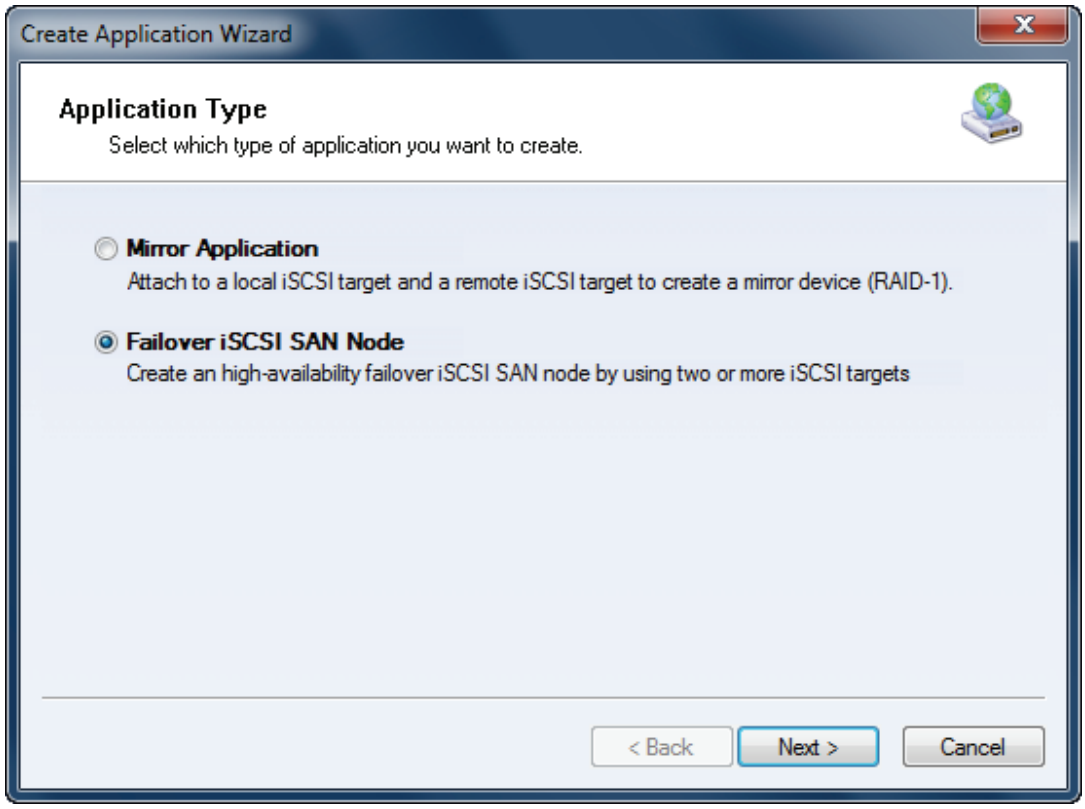
Type a target name in the Target Name field, the target name must be the same as the target on server1.

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

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

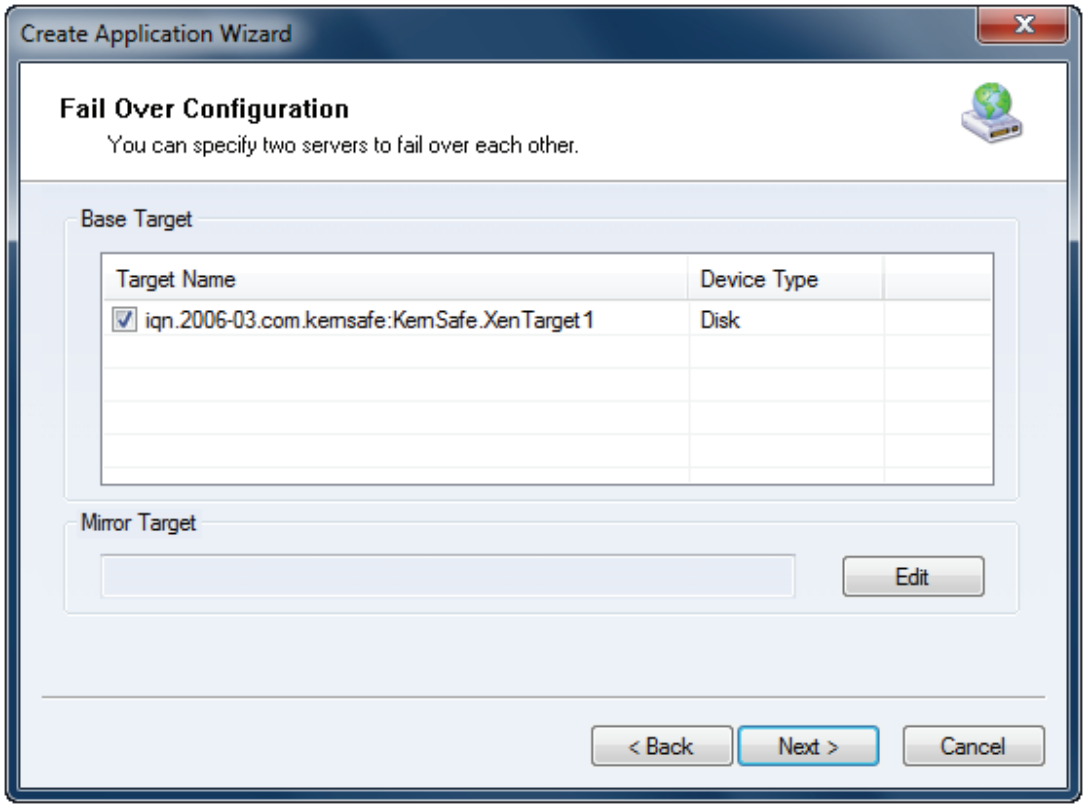
Creating Application on server1

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.

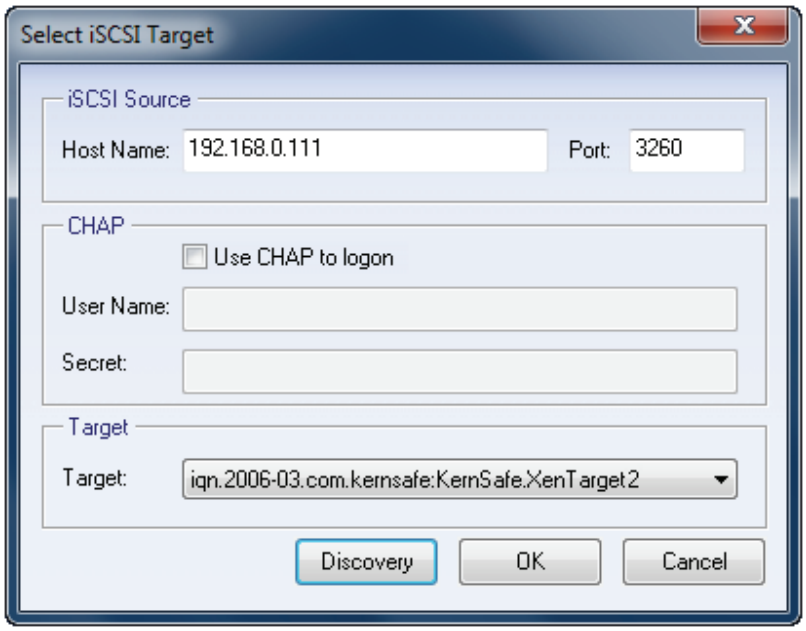


Choose **Failover iSCSI SAN** Node.

Then press **Next** to continue.



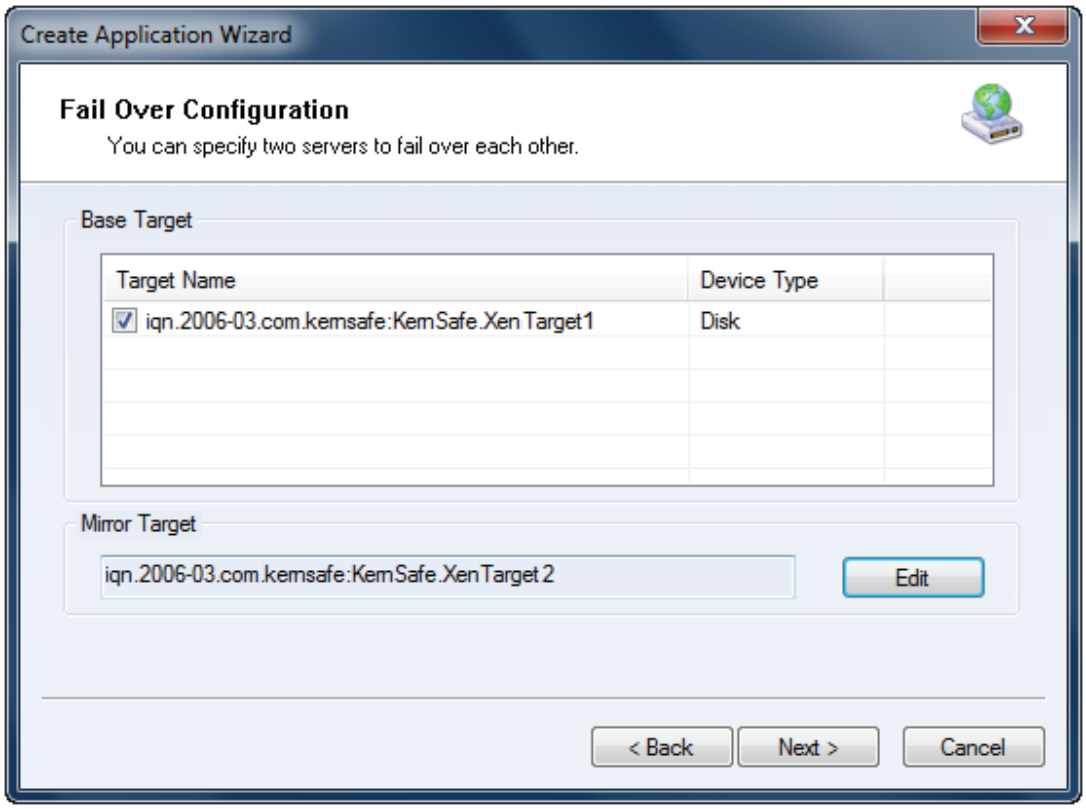
Check the **KernSafe.XenTarget1** storage and click **Edit** to find the mirror target.



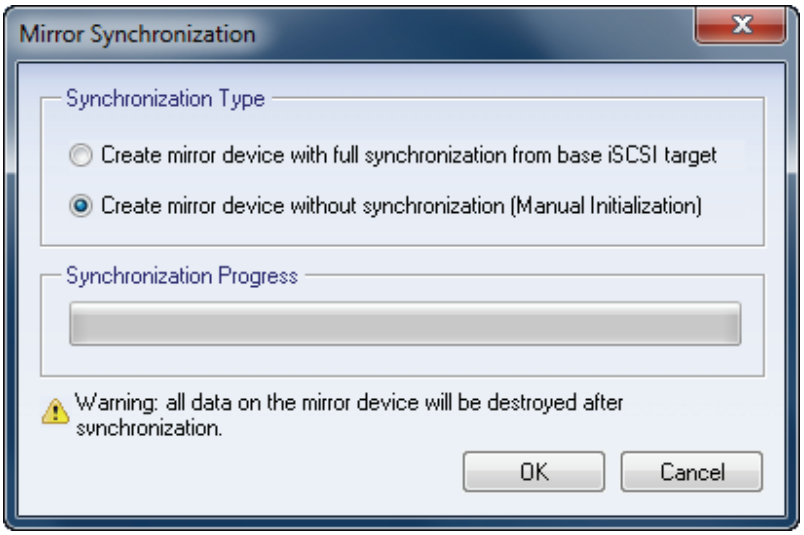
Input the IP and port of server2 in **iSCSI Source** tab, and then click **Discovery** on the bottom of the window to find the mirror target, choose the **KernSafe.XenTarget2** in the down-list.

Press **OK** button to continue.

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

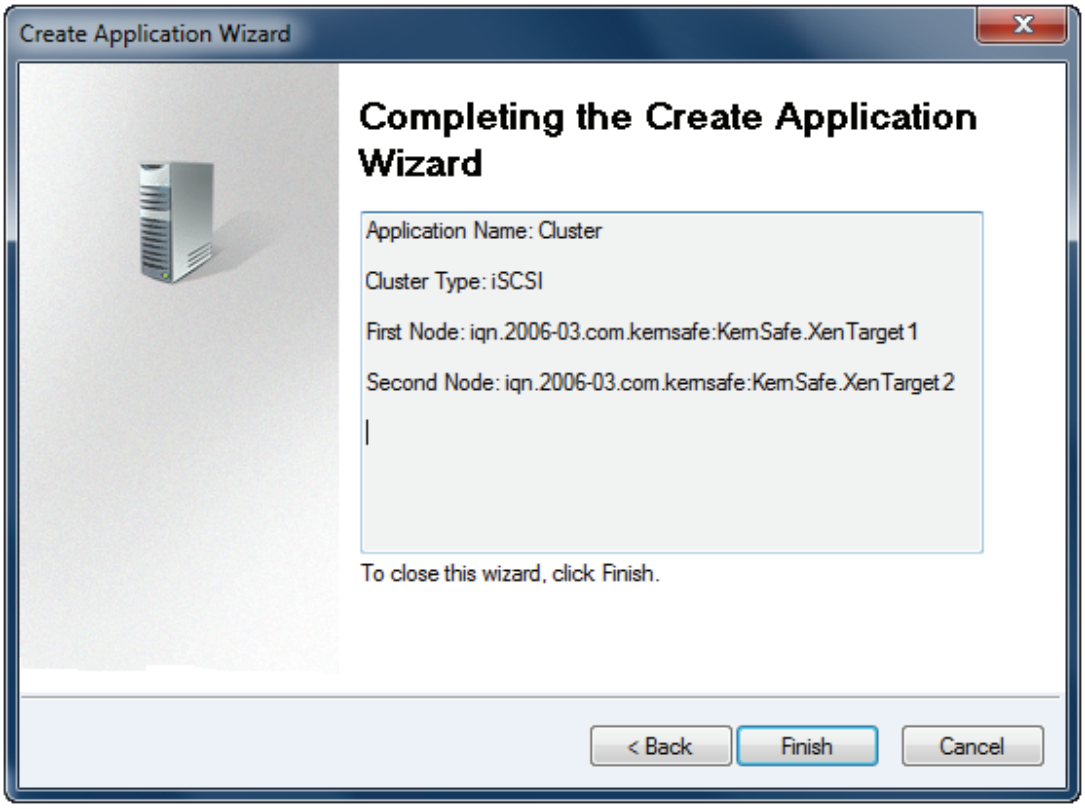


The mirror target will be added to the window, then click **Next** button to continue.



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**.

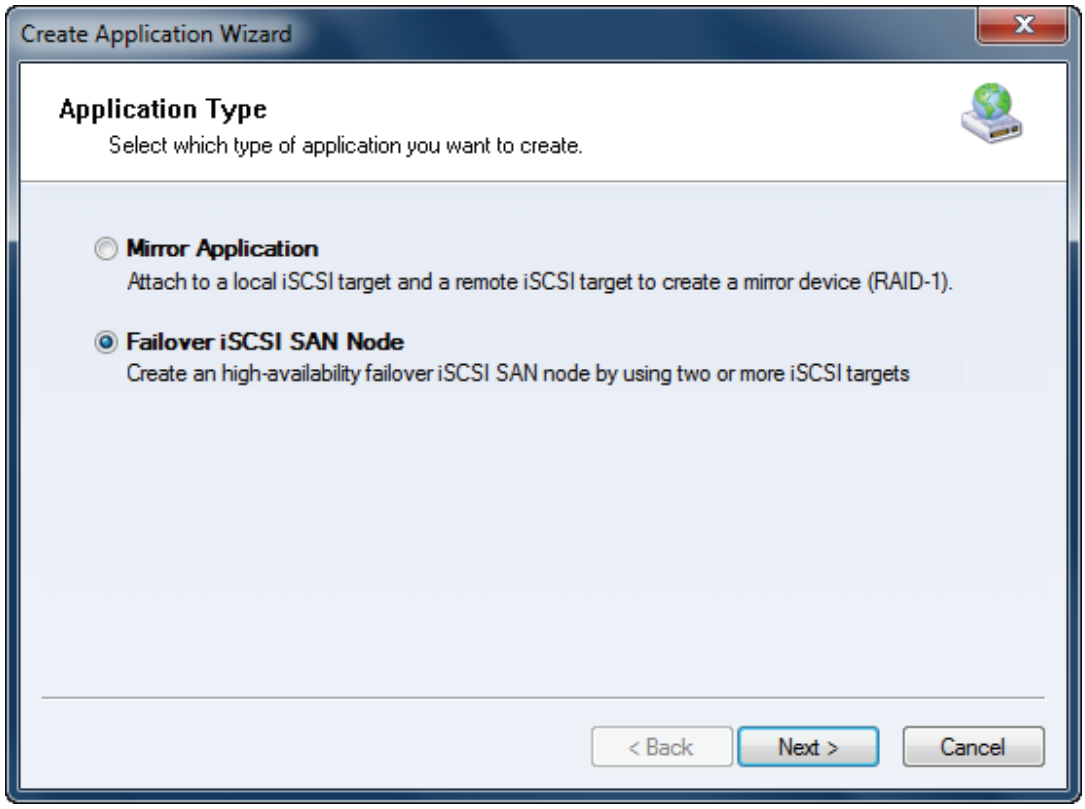
Press **OK** button to continue.



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

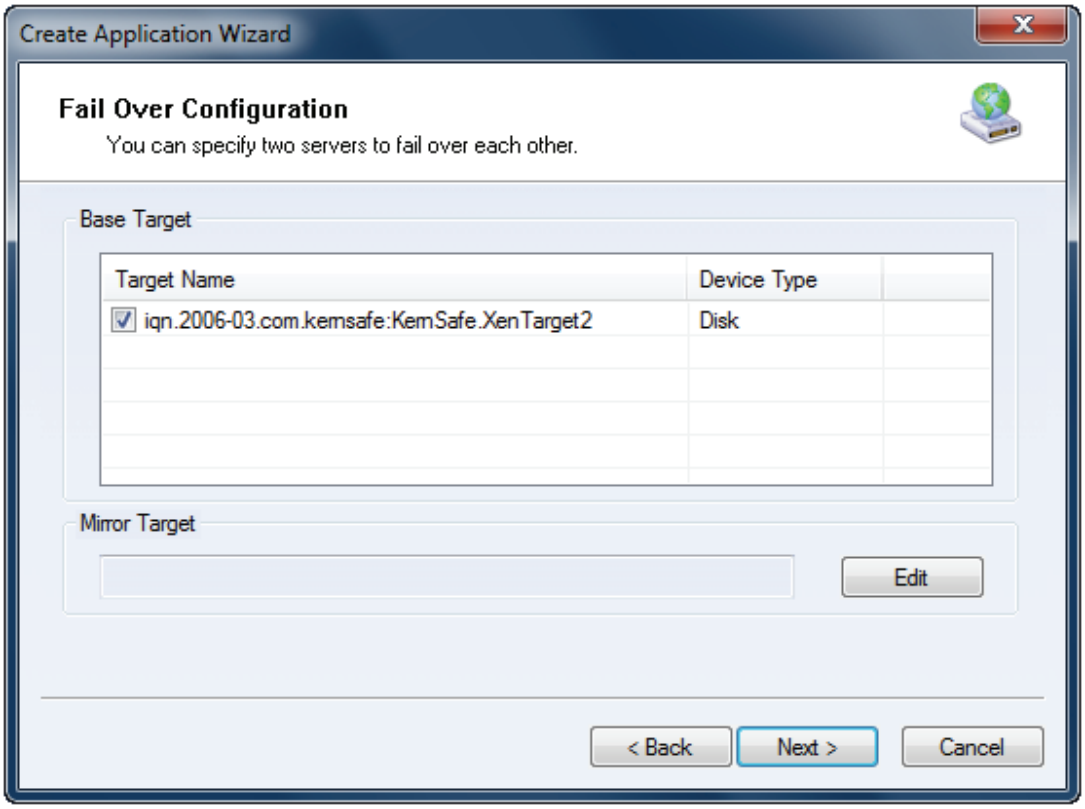
Creating Application on server2

On Server2, 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.

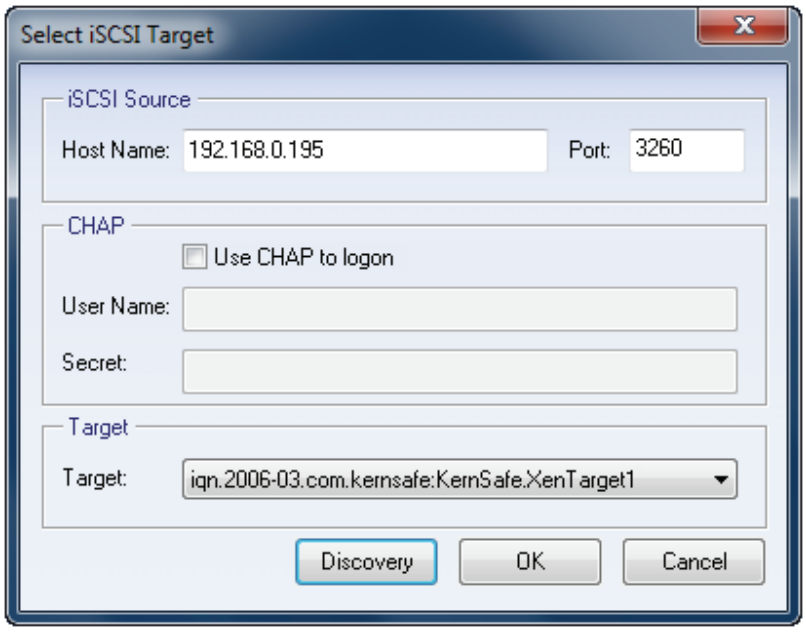


Choose **Failover iSCSI SAN** Node.

Then press **Next** to continue.



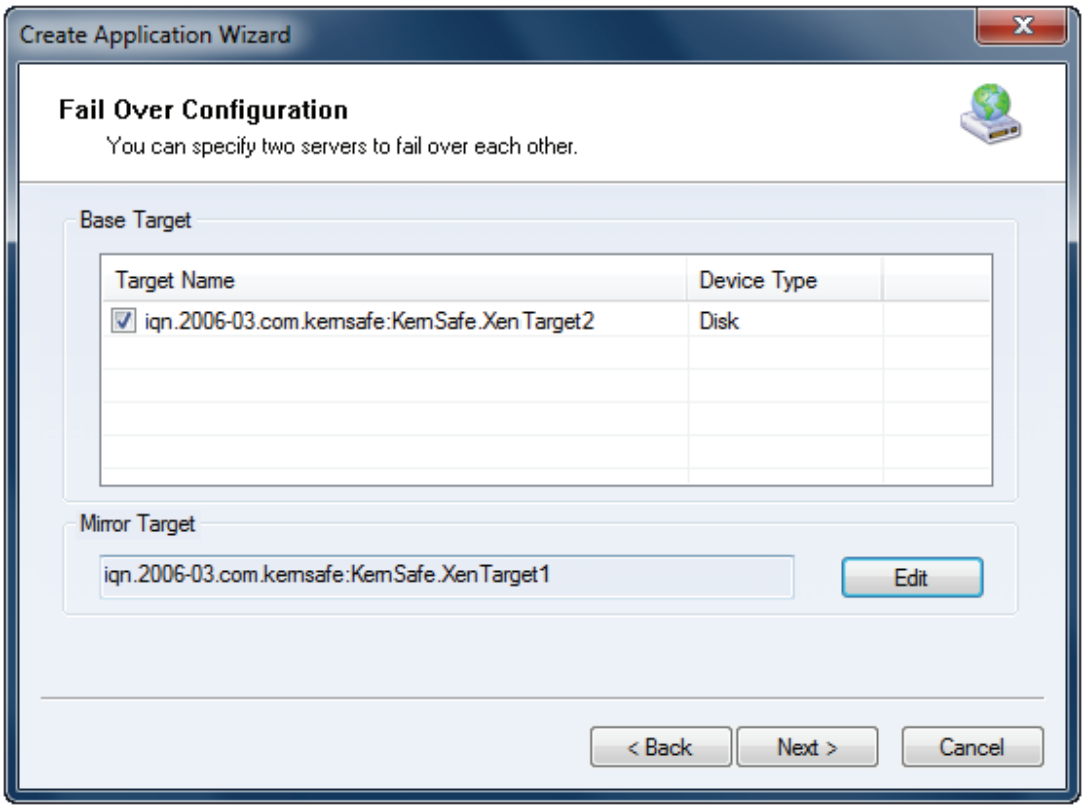
Check the **KernSafe.XenTarget2** storage and click **Edit** to find the mirror target.



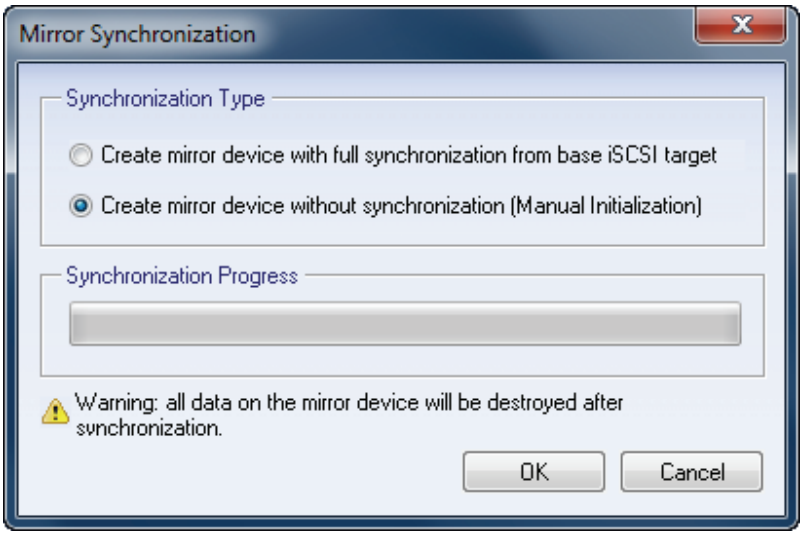
Input the IP and port of server1 in **iSCSI Source** tab, and then click **Discovery** on the bottom of the window to find the mirror target, choose the **KernSafe.XenTarget1** in the down-list.

Press **OK** button to continue.

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

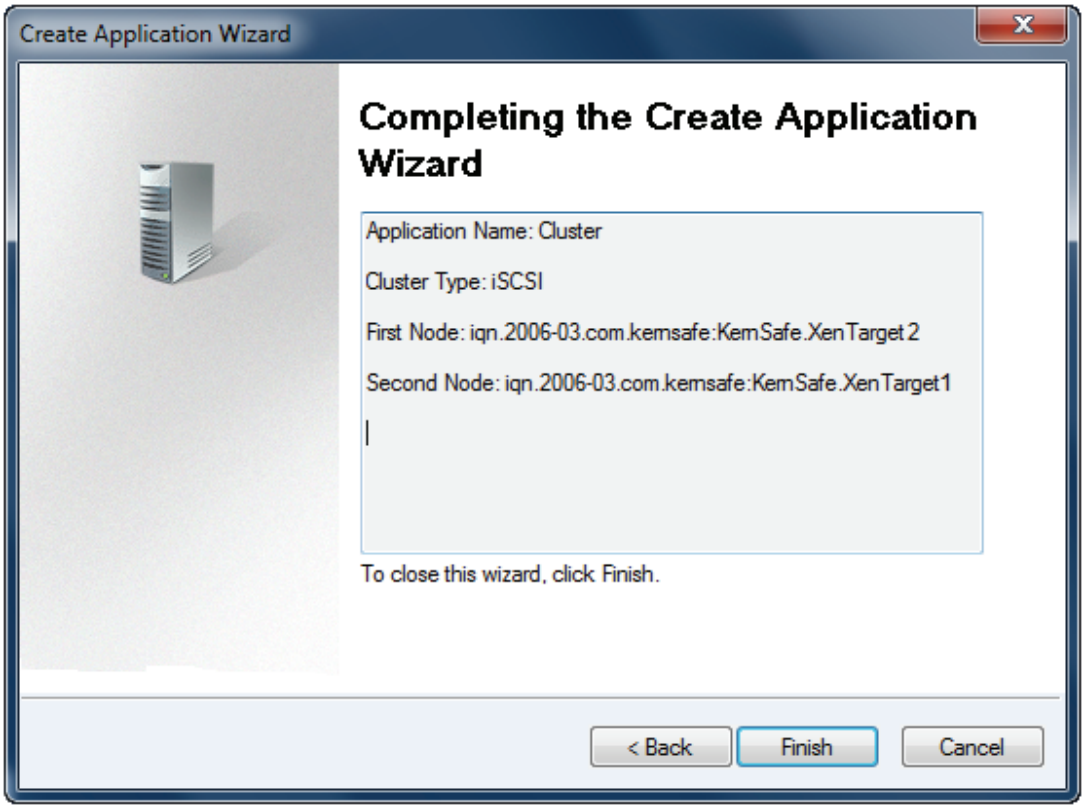


The mirror target will be added to the window, then click **Next** button to continue.



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.

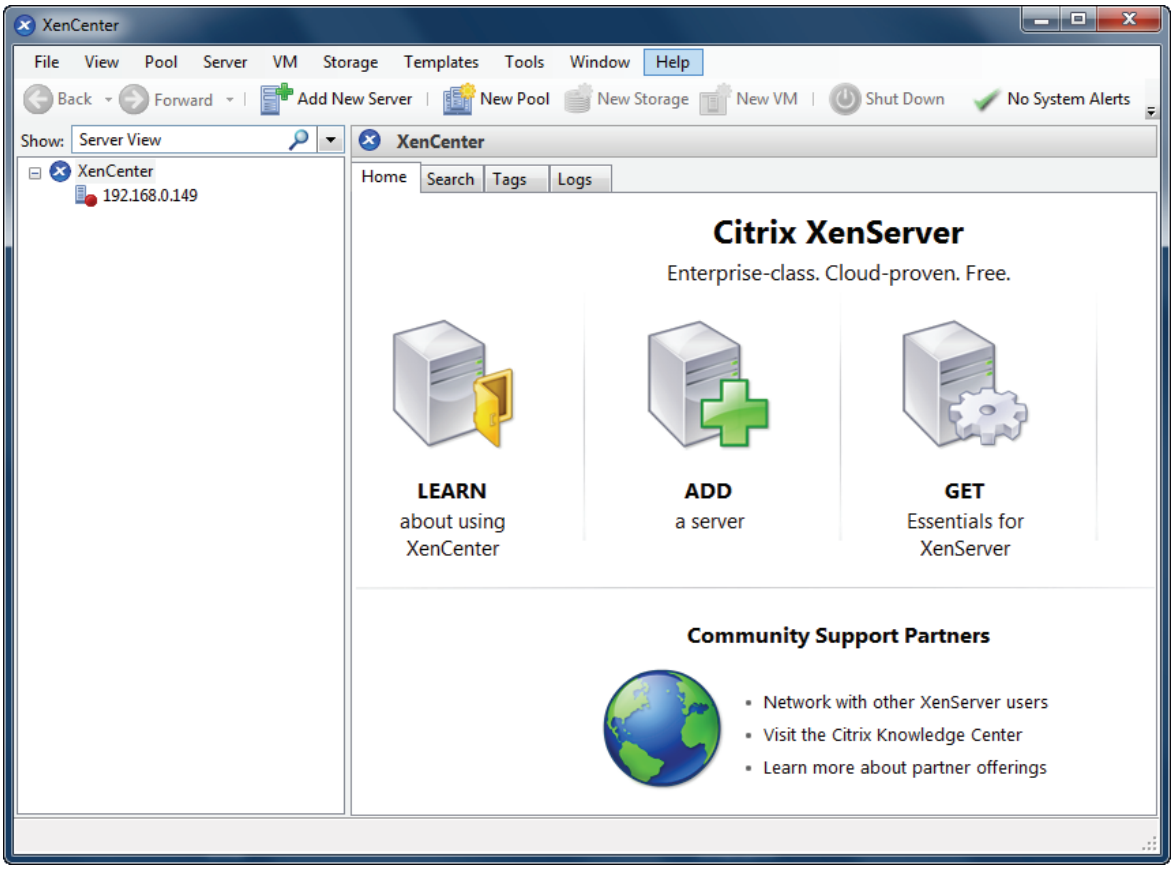


Click **Finish** button to complete the application creation.

Configuring Xen Server

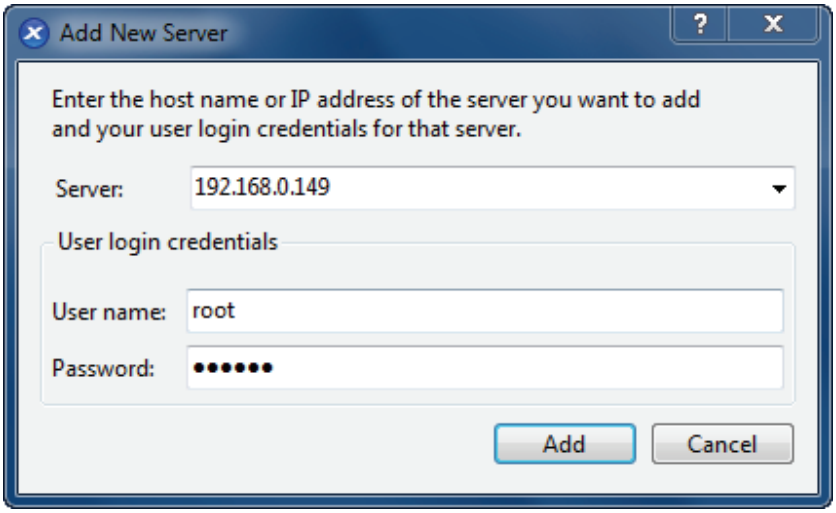
Log On to Xen Server

Open Xen Server console.



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

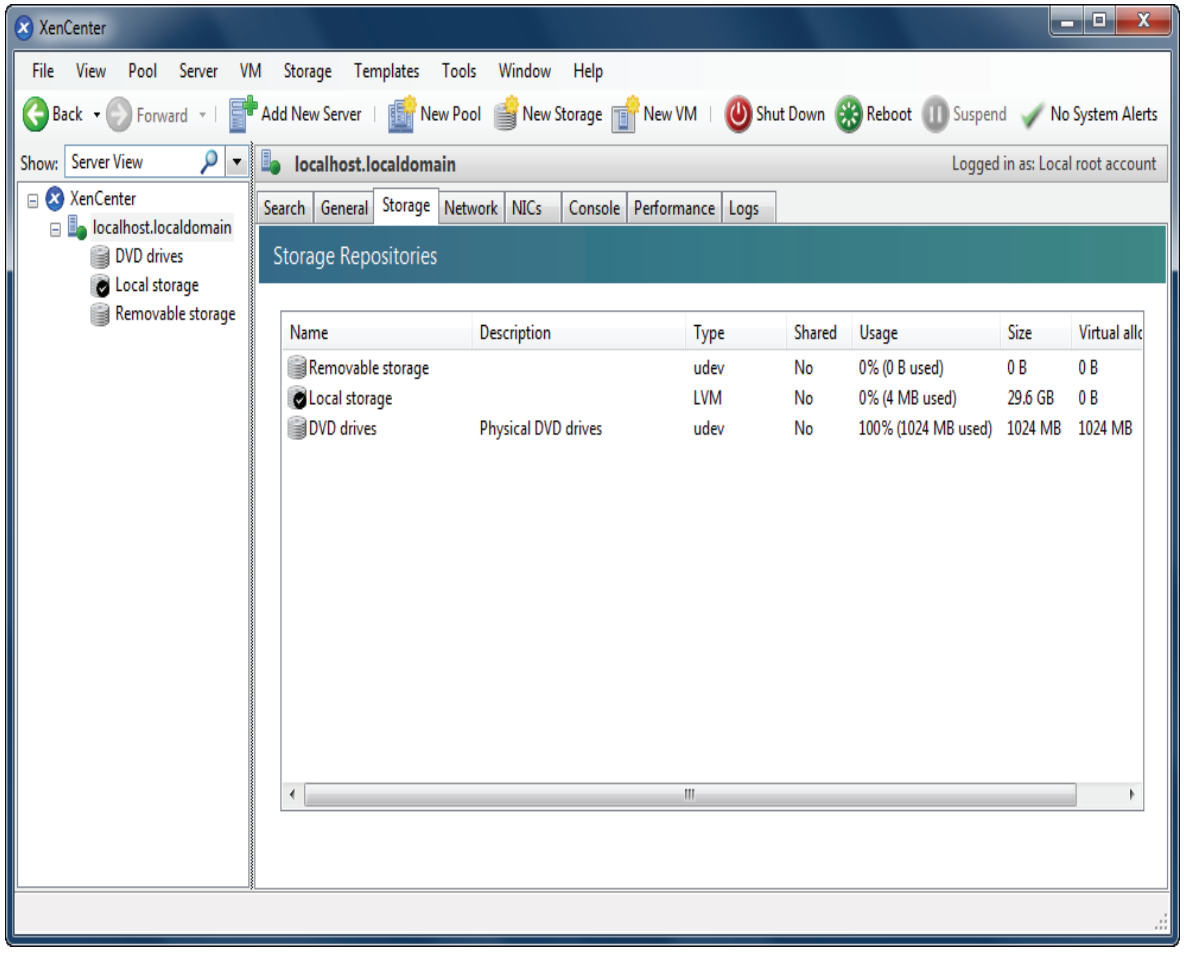
Add New Server dialog is shown.



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

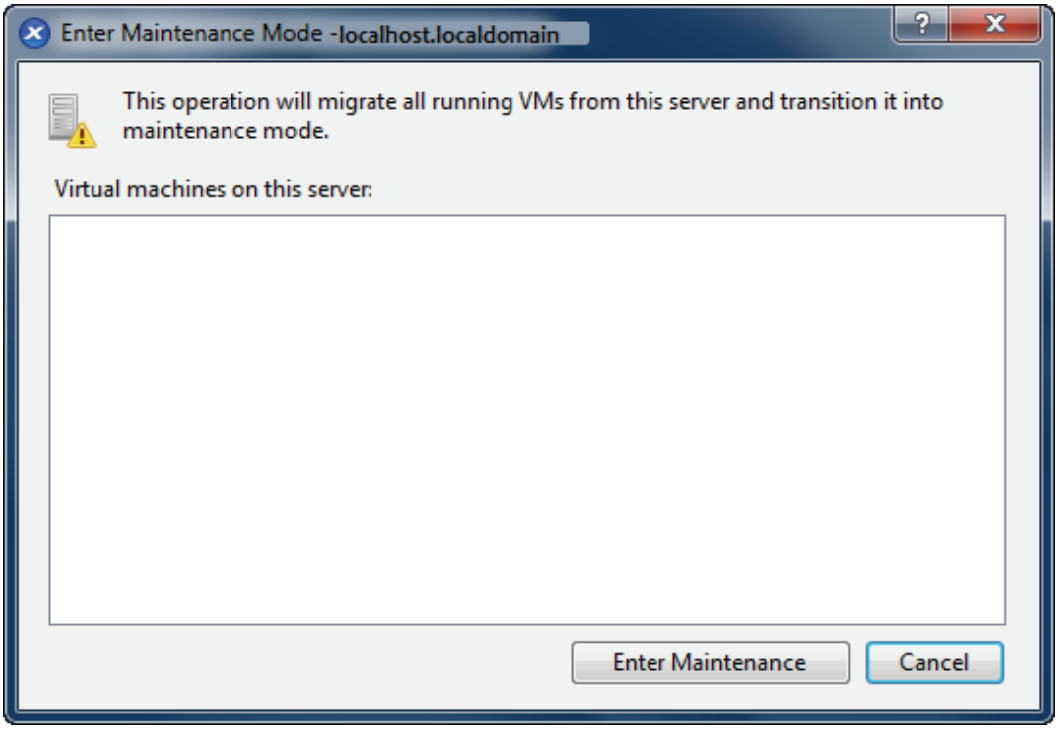
Press the **Connect** button to continue.

The XenCenter which is connected to Xen Server is shown.



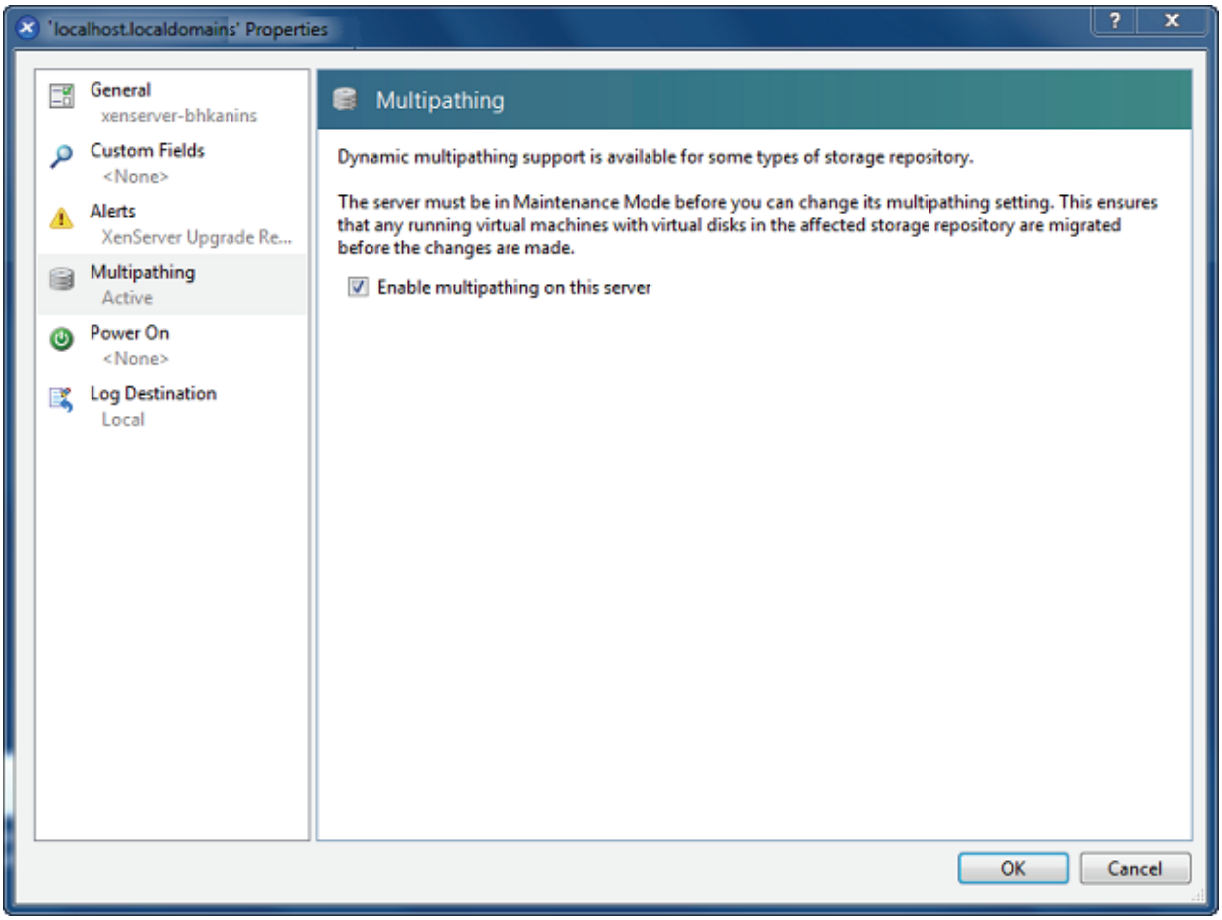
Enable Multipathing

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.



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 have now enabled multipathing.

After enabling multipath on server you need to add a KernSafe device to multipath configuration file.

You can do it by switching to server console and starting typing fallowing commands:

 # cd etc

vi multipath.conf

After you will start editing (by pressing **i**) that document, go to devices and add fallowing KernSafe device:

```
device {
        vendor "KernSafe"
        product "*"
        path_checker tur
        path_grouping_policy failover
        failback 30
}
```

```
                path_checker tur
                failback immediate
                no_path_retry 12
        }
        device {
                vendor "DataCore"
                product "SAN*"
                path_checker tur
                path_grouping_policy failover
                failback 30
        }
        device {
                vendor "KernSafe"
                product "*"
                path_checker tur
                path_grouping_policy failover
                failback 30
        }
        device {
                vendor "IBM"
                product "1723*"
                prio_callout "/sbin/mpath_prio_rdac /dev/%n"
                path_grouping_policy group_by_prio
-- INSERT --
```

Save the document by pressing **ESC** and **ZZ**.

Next step is to restart multipath service by typing:

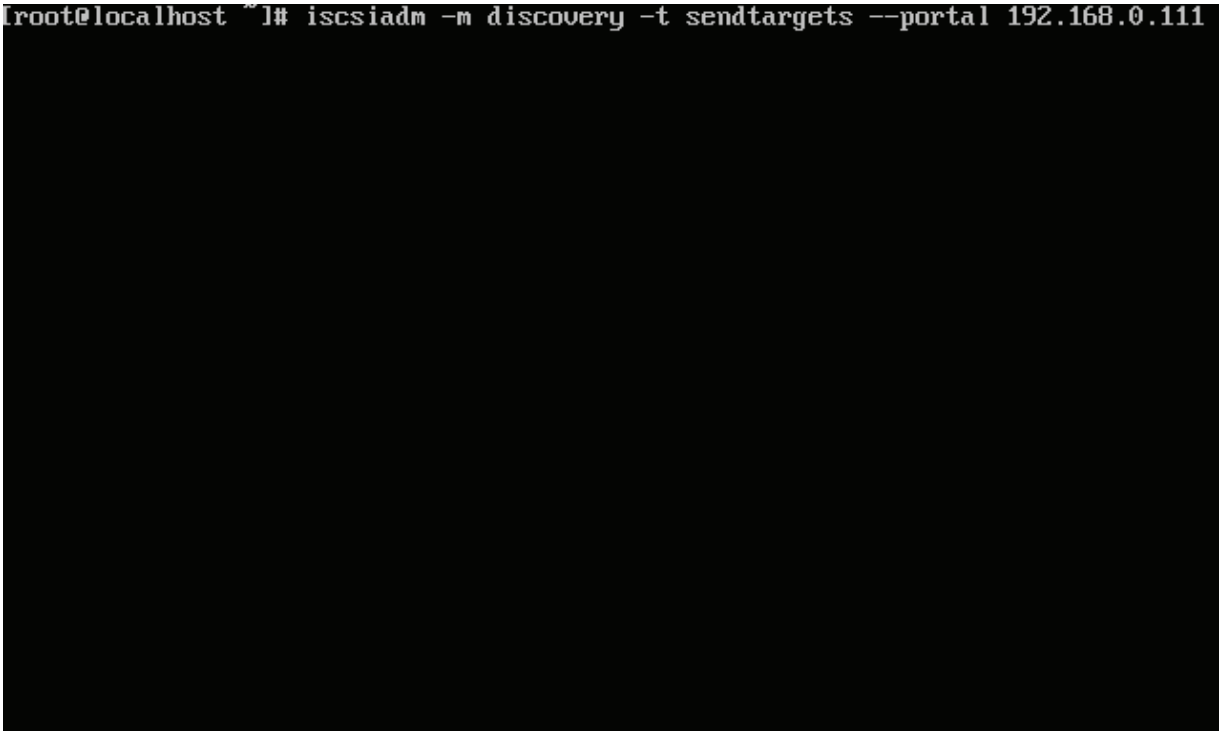
 # chkconfig multipathd reset

```
[root@localhost ~]# chkconfig multipathd reset
[root@localhost ~]#
```

In the next step we need to discover and connect to our iSCSI targets.

We can discover targets using this command:

 # iscsiadm -m discovery -t sendtargets --portal 192.168.0.111



Do the fallowing for second portal as well.

After you will successfully discover two targets you can log into then using this command:

 # iscsi -m node -T iqn.2006-03.com.kernsafe:KernSafe.XenTarget1 -p 192.168.0.111 --op update -n node.startup -v automatic

It will also connect automatically to iSCSI target upon boot.

```
[root@localhost ~]# # iscsi -m node -T iqn.2006-03.com.kernsafe:KernSafe.XenTarg
et1 -p 192.168.0.111 --op update -n node.startup -v automatic
```

Do the fallowing for second target as well.

After connecting to those two targets, you can check if multipath feature is turned ON using:

 # multipath –ll

```
[root@localhost etc]# multipath -ll
201cbf097272d9de0 dm-0 KernSafe,iSCSI Adapter
[size=30G][features=0][hwhandler=0][rw]
\_ round-robin 0 [prio=1][active]
 \_ 6:0:0:0 sdb 8:16  [active][ready]
\_ round-robin 0 [prio=1][enabled]
 \_ 7:0:0:0 sdc 8:32  [active][ready]
[root@localhost etc]#
```

We have now successfully enabled multipath on our targets.

Other useful commands:

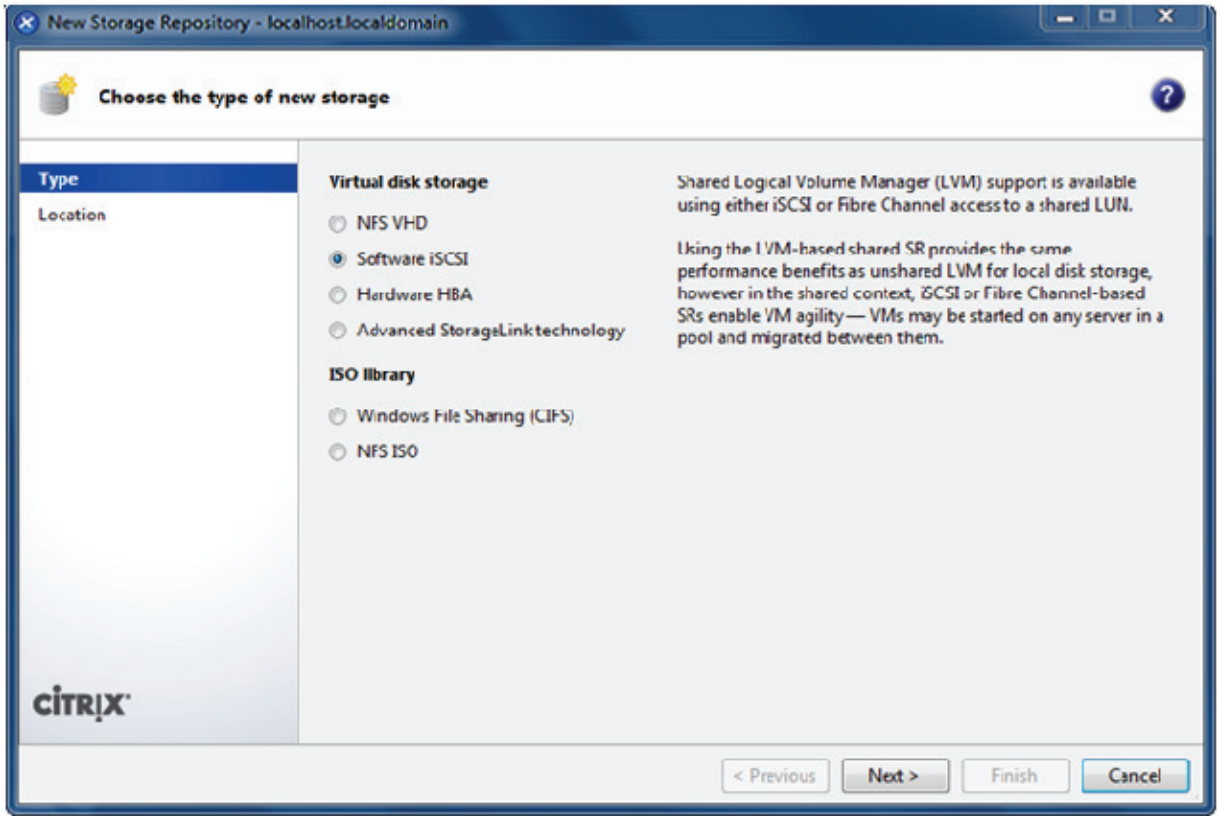
 # chkconfig open-iscsi restart - Restart open-iscsi service:

 # iscsiadm –m node –T iqn.2006-03.com.kernsafe:KernSafe.XenTarget1 –p 192.168.0.111 -u - Log off the target

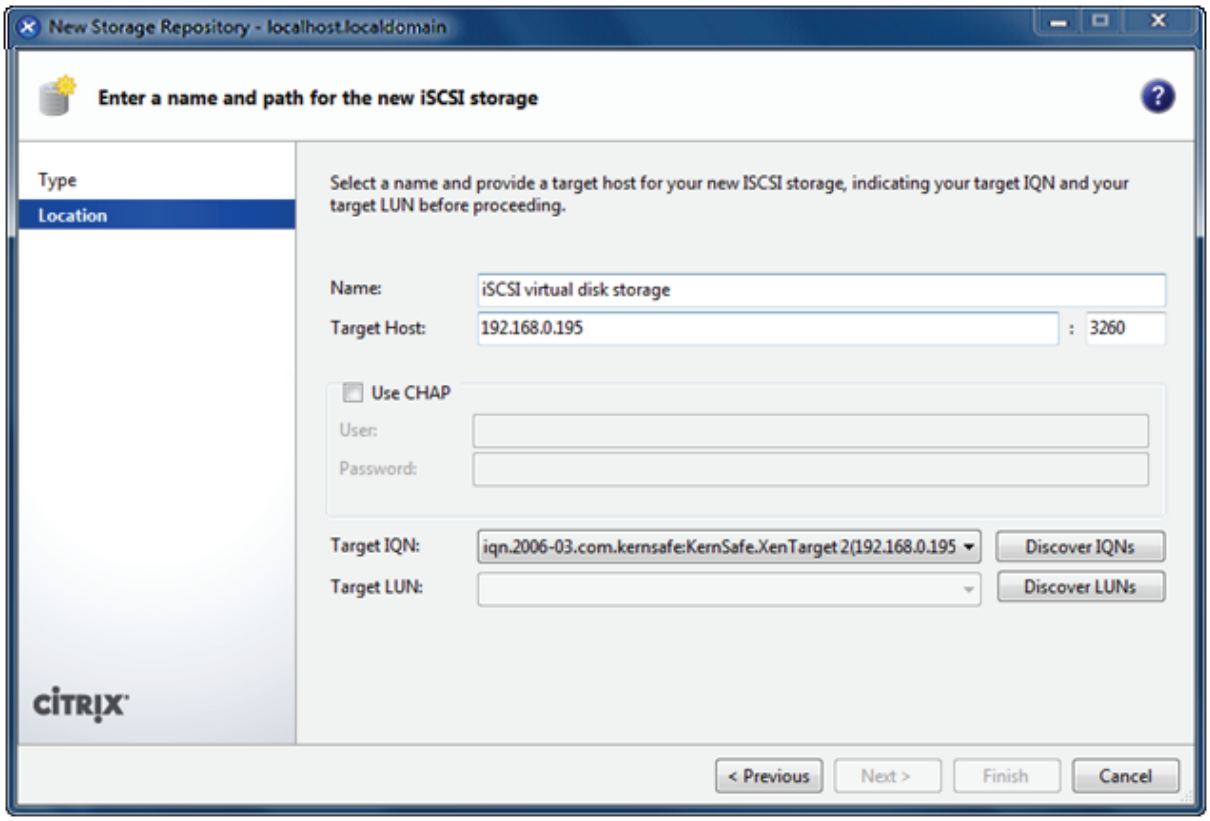
For more information, please visit http://support.citrix.com/article/CTX118791.

Add iSCSI storage device into Xen Server

Click **New Storage**, **New Storage Repository** dialog is shown.



Input IP address and port (if not 3260) of the Host that runs iStorage Server, press the **Discover IQNs** button, a list of Targets in drop-down control is shown.

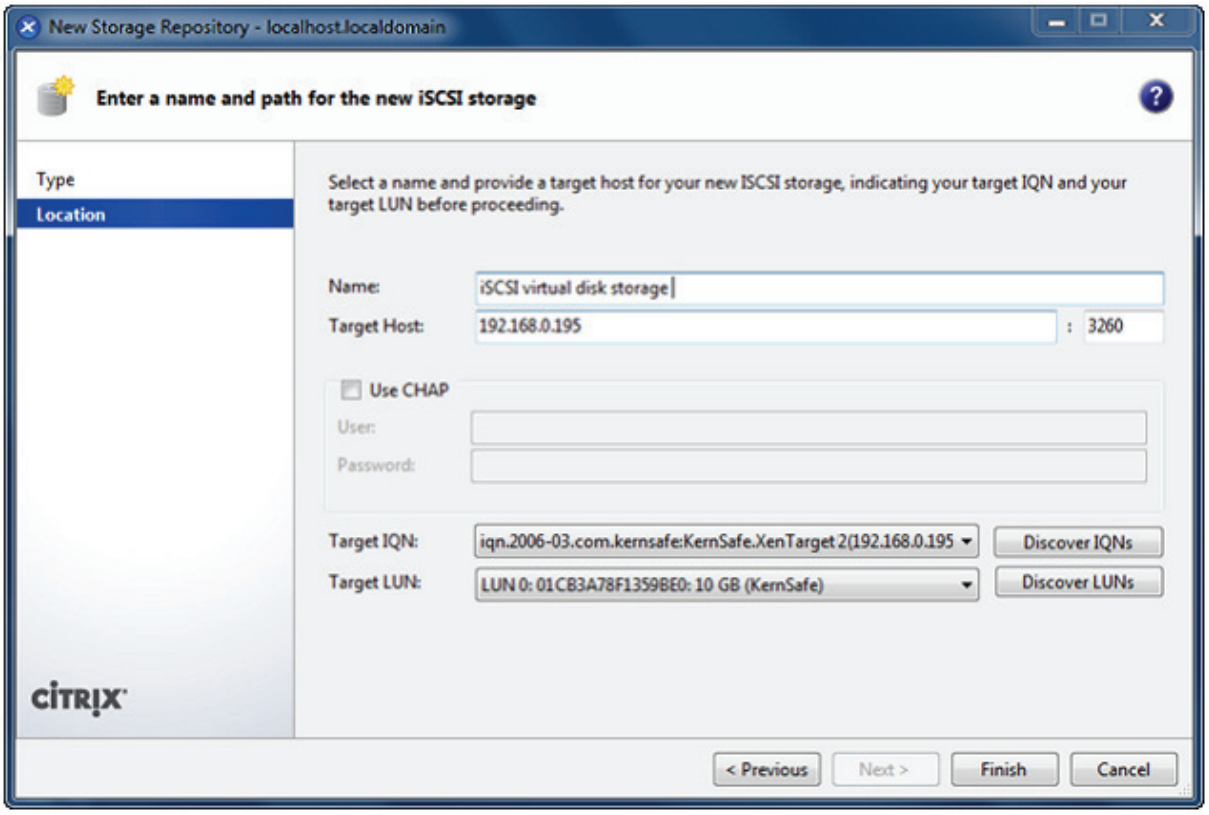


Select desired target in the list.

If the target you want to connect to has CHAP Authentication, check **Use CHAP** and input user name and secret.

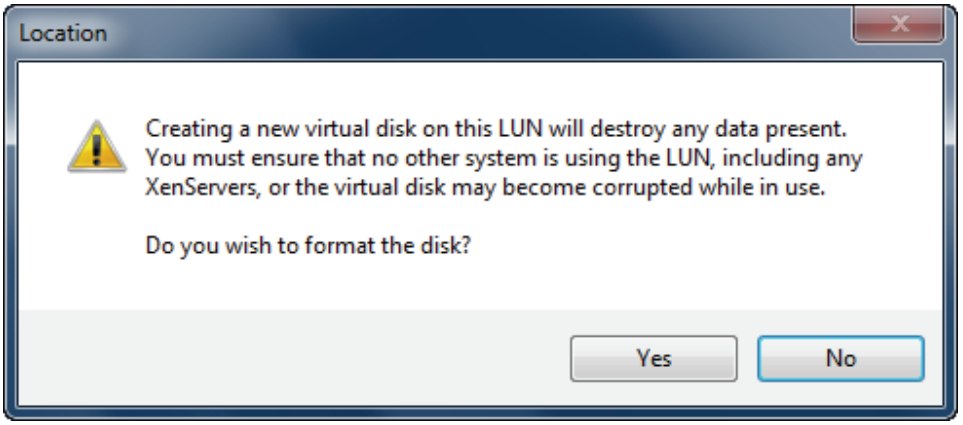
Press the **Discover LUNs** button.

The iSCSI Target now contains a valid LUN. Here we create a 10G image file device as a demo.

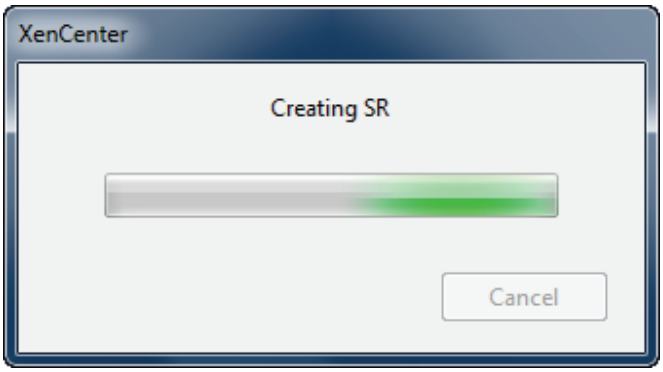


Press the **Finish** button to continue.

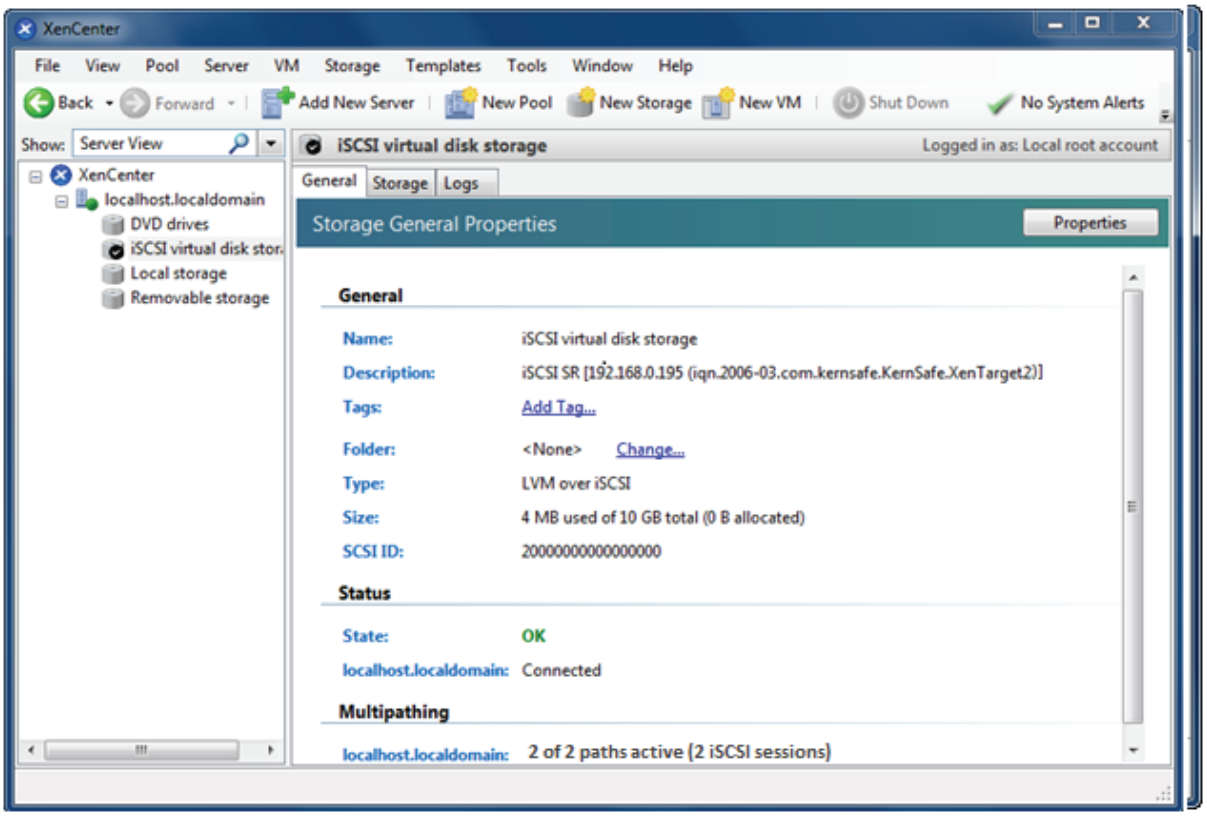
The following dialog is shown, press the **Yes** button to proceed.



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



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



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

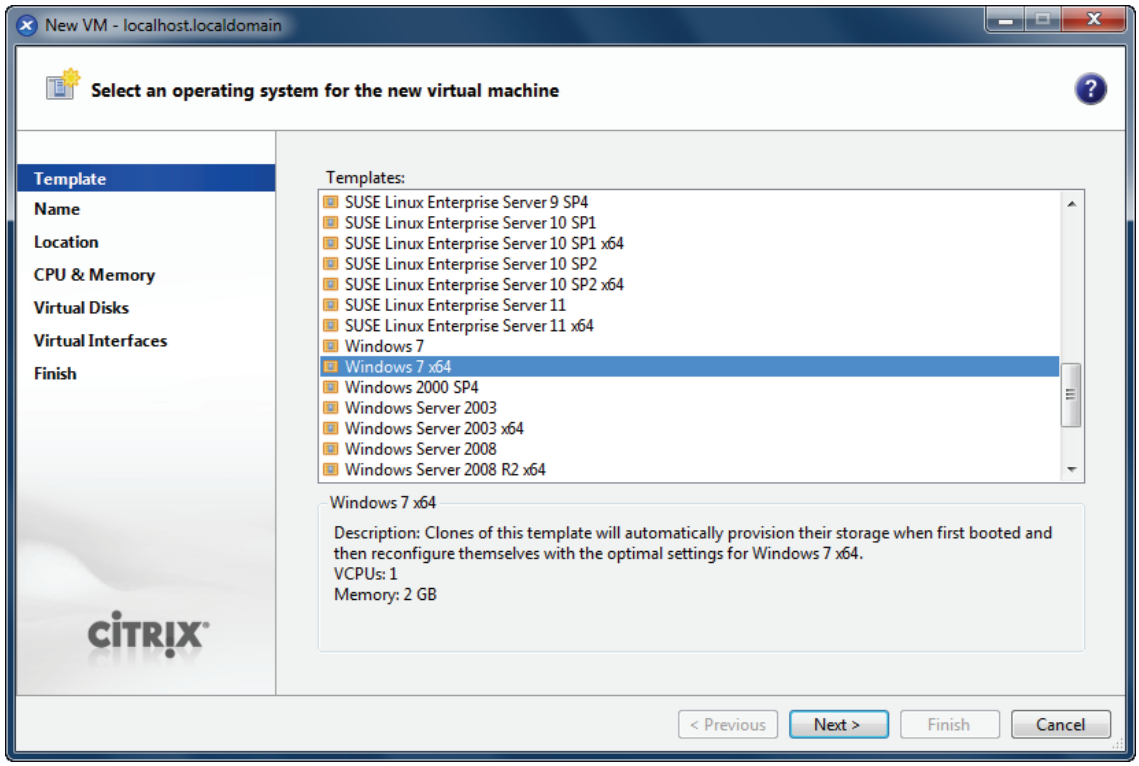
This causes to refresh multipath status in virtual storage.

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

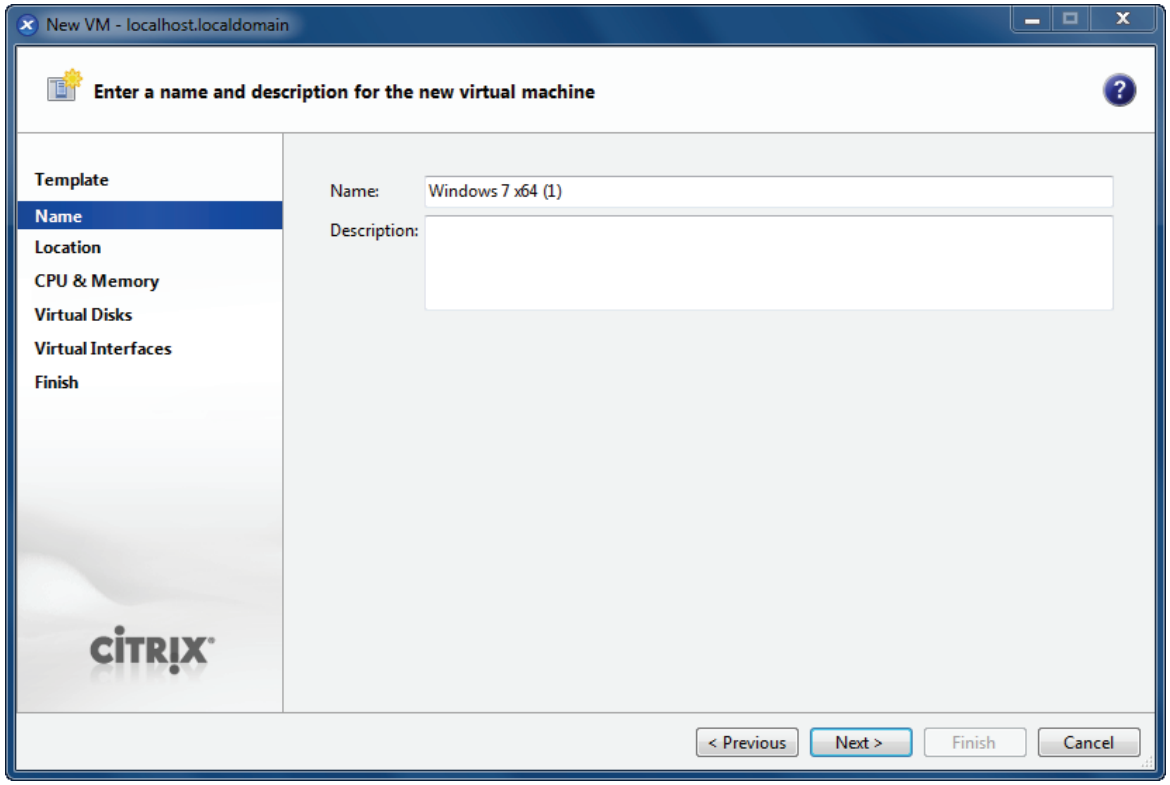
Create a virtual machine

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

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

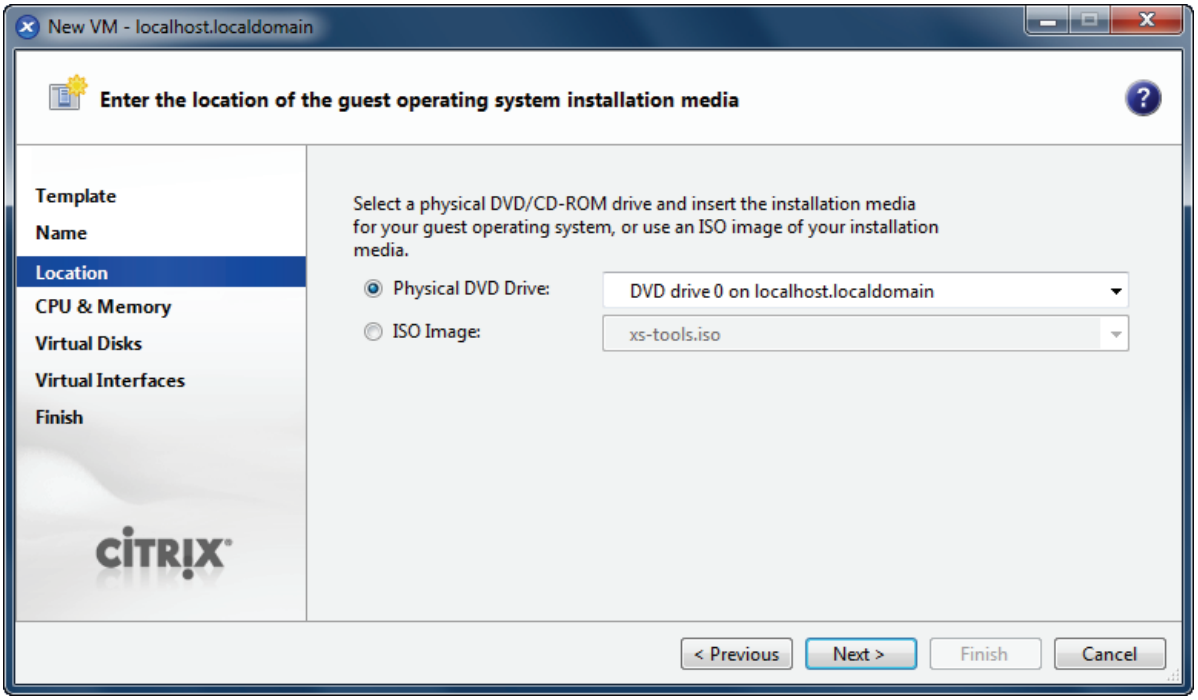


Input the desired name and description.



Press the **Next** to continue.

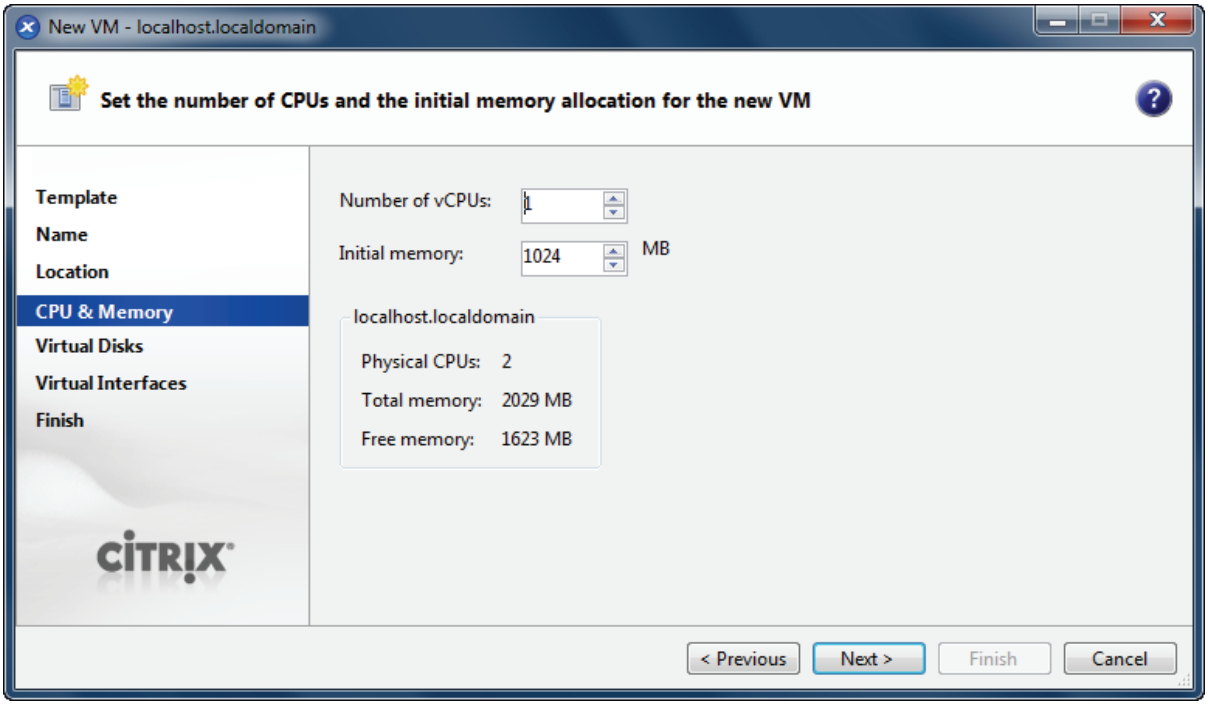
Select installation media for operating system.



Choose **physical DVD Drive** on XenServer.

Press the **Next** button to continue.

Specify the number of CPUs and memory size.

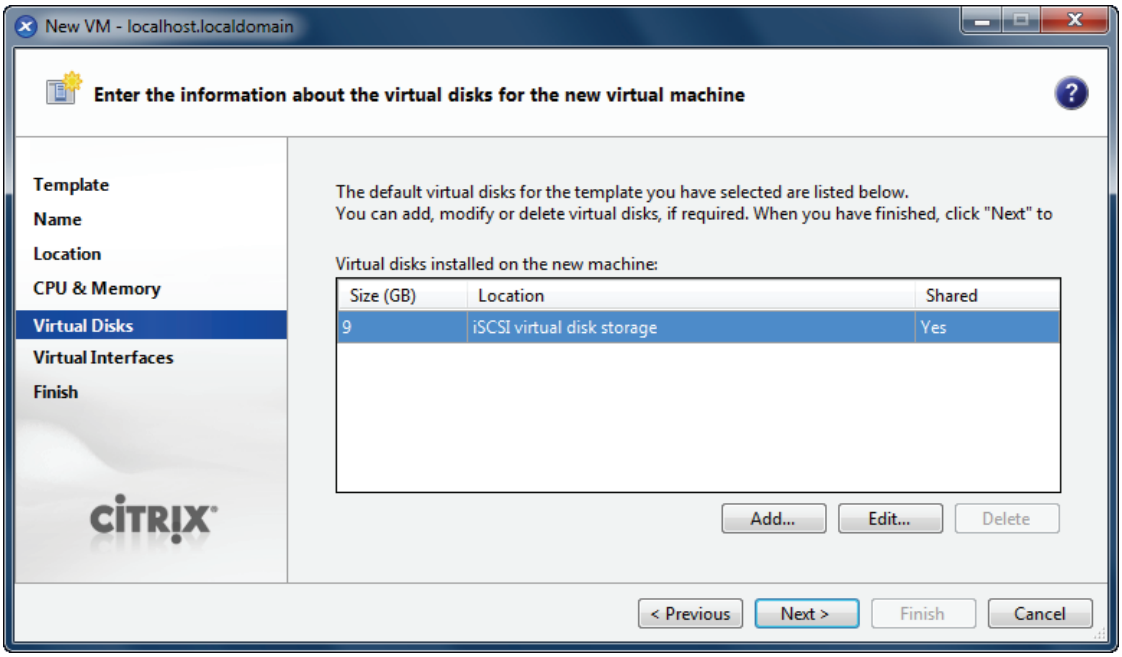


Select number of vCPUs.

Specify initial memory size.

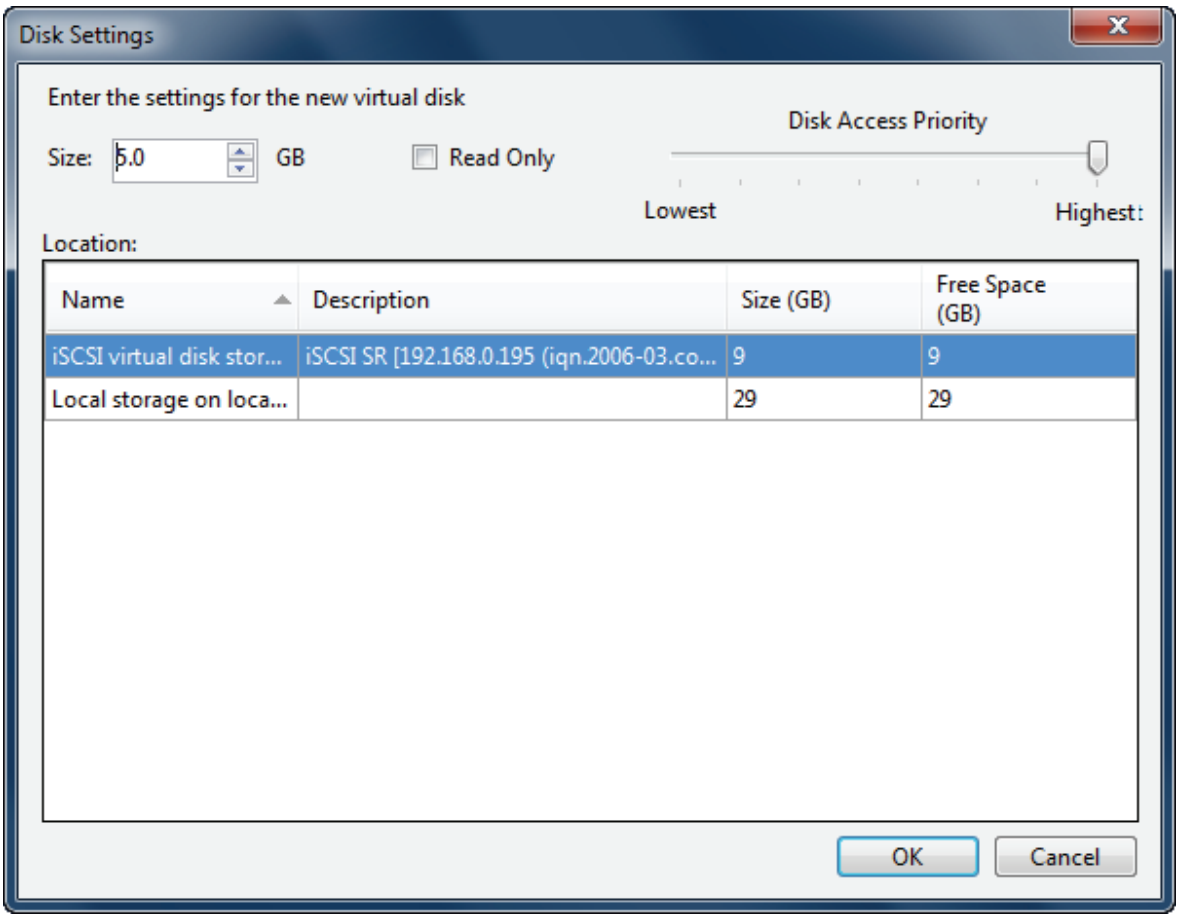
Press the **Next** button to continue.

Select storage device.



First you see an **iSCSI Virtual disk storage** device, which is previously created by iStorage Server. 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.



Specify the size of the new virtual disk.

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

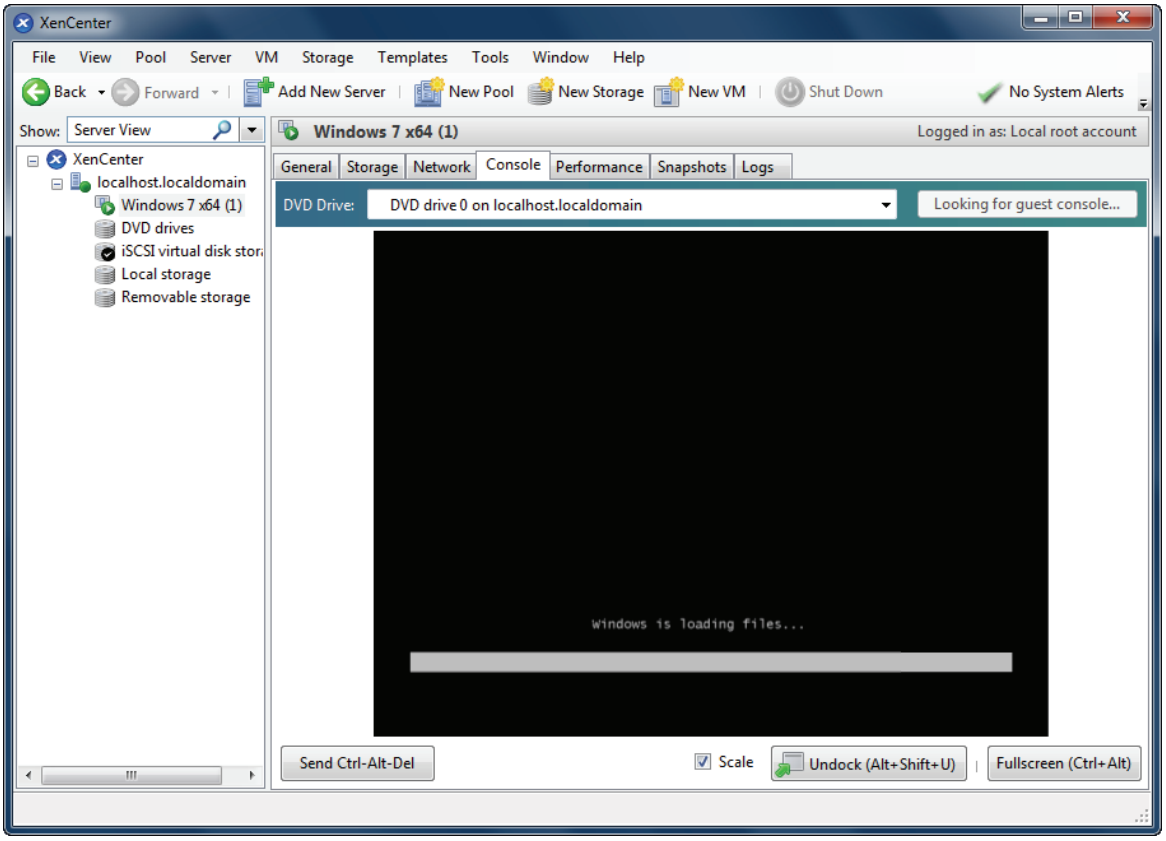
A virtual machine is built.

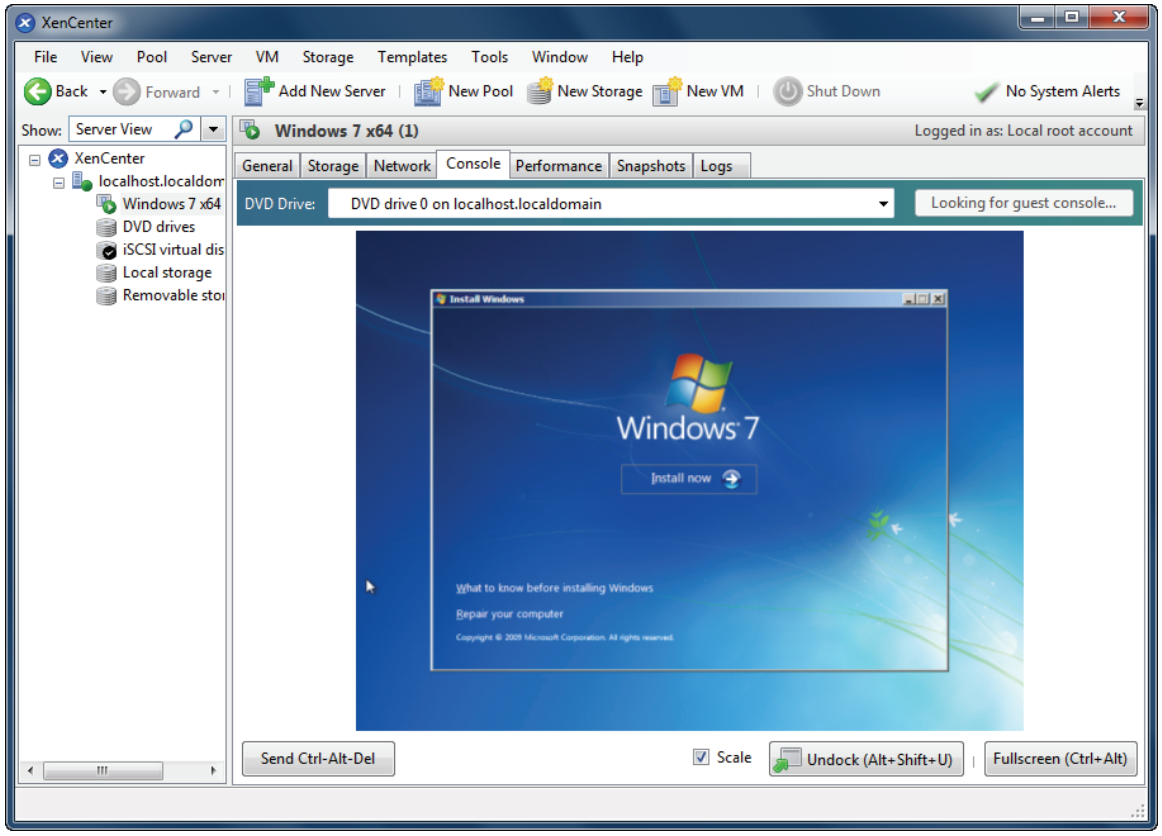
Note that before Version 5.5 update1 in the Storage labels of your virtual machine, you need to exchange the position of iSCSI Virtual Storage and Local Storage (make sure iSCSI Virtual Storage at position 0) so that the operating system can be installed on this iSCSI device.

Install Operating system

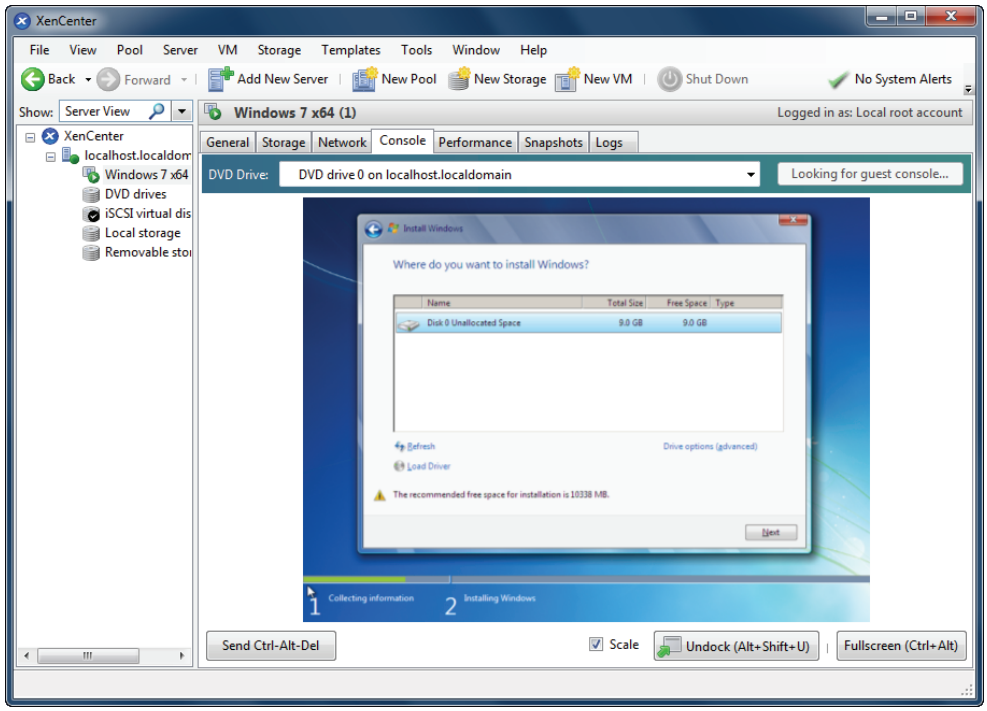
Run the virtual machine and set up the operating system.

The process is just like that on real machine.


XenCenter
File View Pool Server VM Storage Templates Tools Window Help
Back Forward Add New Server New Pool New Storage New VM Shut Down No System Alerts
Show: Server View
XenCenter
localhost.localdomain
Windows 7 x64 (1)
DVD drives
iSCSI virtual disk stor
Local storage
Removable storage
Windows 7 x64 (1)
Logged in as: Local root account
General Storage Network Console Performance Snapshots Logs
DVD Drive: DVD drive 0 on localhost.localdomain
Looking for guest console...
Windows is loading files...
Send Ctrl-Alt-Del
Scale
Undock (Alt+Shift+U)
Fullscreen (Ctrl+Alt)

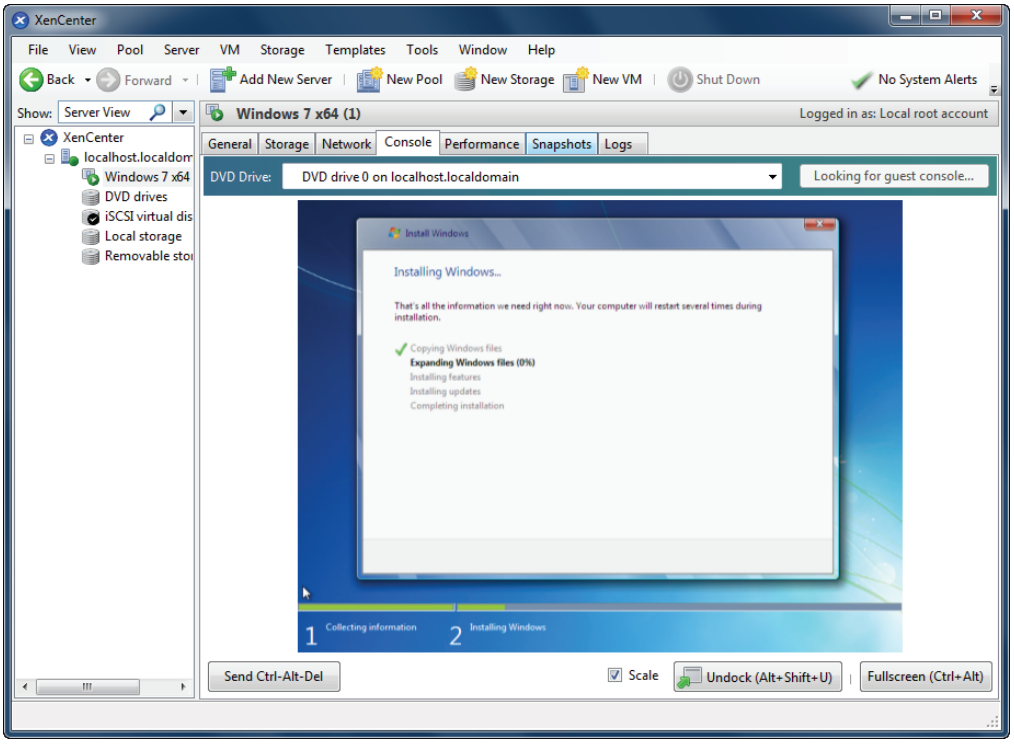


Press the **Install Now** button to install OS.

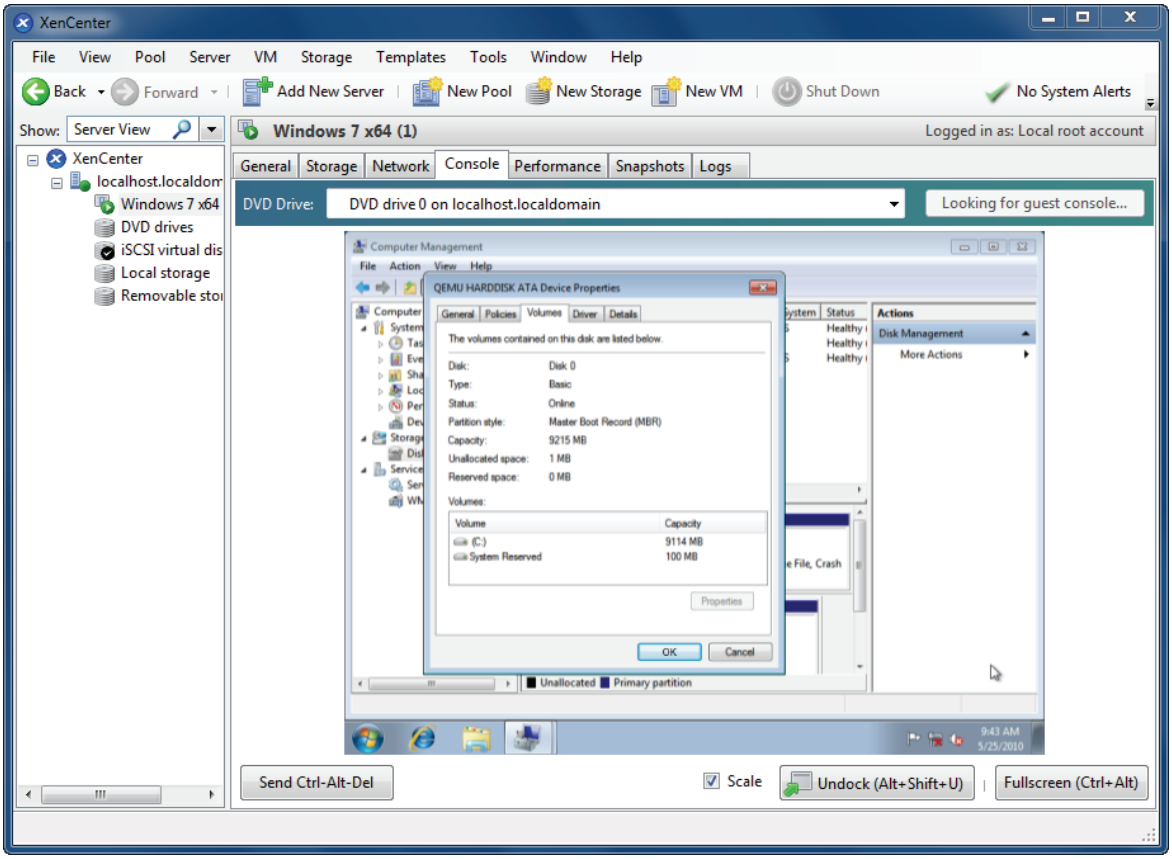


Select the 9G disk. Just like that on a real hard disk.

Setup starts copying files



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



Likewise, you may install Windows Server 2003, Windows XP, Vista and Windows Server 2008, or even any version of Linux as you wish.

Contact

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