

# Citrix XenServer with Dell PS Series Storage Deployment and Configuration

Dell EMC Engineering  
January 2017

## Revisions

Date	Description
March 2016	Initial XenServer 6.5 release
January 2017	Updated for XenServer 7.0 and PS Series firmware v9.0

## Acknowledgements

Author: Chuck Armstrong

The information in this publication is provided “as is.” Dell Inc. makes no representations or warranties of any kind with respect to the information in this publication, and specifically disclaims implied warranties of merchantability or fitness for a particular purpose.

Use, copying, and distribution of any software described in this publication requires an applicable software license.

Copyright © 2017 Dell Inc. or its subsidiaries. All Rights Reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be the property of their respective owners. Published in the USA. [1/9/2017] [Deployment and Configuration Guide] [3131-CD-V]

Dell EMC believes the information in this document is accurate as of its publication date. The information is subject to change without notice.

# Table of contents

Revisions.....	2
Acknowledgements.....	2
1 Introduction.....	4
1.1 Scope.....	4
1.2 Audience.....	4
1.3 Document conventions.....	4
1.4 Terminology.....	5
2 Citrix XenServer and Dell Storage product overview.....	6
2.1 Citrix XenServer.....	6
2.2 Dell PS Series storage.....	6
3 XenServer storage overview.....	7
3.1 Shared iSCSI storage.....	7
3.2 SR-to-VM mapping.....	8
3.3 Multipathing.....	8
4 XenServer storage using Open-iSCSI initiator (software).....	9
4.1 Open-iSCSI initiator with Dell PS Series.....	11
4.2 Configuring Open-iSCSI multipathing with Dell PS Series Storage.....	11
4.2.1 XenServer Open-iSCSI initiator configuration.....	12
4.2.2 Assign NIC functions using the XenCenter management GUI.....	13
4.2.3 Assign NIC functions using the XE CLI.....	15
4.2.4 Configure iSCSI interfaces.....	17
4.2.5 Optional iSCSI performance tuning.....	17
4.2.6 Verify MPIO settings.....	18
4.2.7 Enable multipathing in XenCenter.....	19
4.2.8 Identify PS Series storage Group iSCSI information.....	20
4.2.9 Configure LUN access in Group Manager.....	21
5 Create new Storage Repository (SR).....	27
5.1 Create SR with software iSCSI.....	27
5.2 Verify multipath status.....	31
A Additional resources.....	32
A.1 Technical support.....	32
A.2 Related documentation.....	32

# 1 Introduction

This document provides examples, tips, recommended settings, and other storage guidelines for configuring a Citrix® XenServer® environment to use Dell™ PS Series storage. Frequently asked questions regarding various PS Storage features are also addressed.

For additional installation and configuration information, Dell recommends reviewing related [XenServer](#) and [XenCenter](#) documentation, which is publicly available on the [Citrix Product Documentation](#) website.

## 1.1 Scope

This paper covers configuration steps and best practices for a Citrix XenServer environment using Dell PS Series iSCSI storage. This document is focused on XenServer 7.0 and its related features, however, most of the information also applies to XenServer 6.x.

## 1.2 Audience

This paper is intended for storage administrators, network administrators, SAN system designers, storage consultants, or anyone tasked with configuring a SAN infrastructure for Dell PS Series storage when used to support a Citrix XenServer environment.

It is assumed that readers have a received formal training or have advanced working knowledge of:

- Installation and configuration of Citrix XenServer
- Configuration and operation of Dell PS Series storage
- Guest operating systems (such as Microsoft® Windows Server® or Linux®)
- *Citrix XenServer 7.0 Administrator's Guide*

**Note:** The specific information contained within this document is based on the test environment built for the creation of this document. Actual configuration details may vary in any other environment.

## 1.3 Document conventions

Table 1 lists the formatting conventions used in this document.

Table 1 Document conventions

Format	Description	Example
Command-line text	User command-line input	<code>iscsiadm -m node --login</code>
<i>Italic command-line text</i>	Placeholder or variable	<code>new_initiator_iqn</code>

## 1.4 Terminology

The following terms are used throughout this document:

**iSCSI Qualified Names (IQNs):** Unique iSCSI initiator (host server) or iSCSI target (storage) addresses are referred to as iSCSI Qualified Names (IQNs). IQNs are the identifiers used for iSCSI connectivity between host servers and iSCSI storage platforms.

**Logical unit (LUN):** A number identifying a logical device, usually a volume that is presented by an iSCSI or Fibre Channel storage controller.

**Multipath I/O (MPIO):** A host-based software layer that manages multiple paths for load balancing and redundancy in a storage environment.

**Network interface card (NIC):** A network interface card or network interface controller is an expansion board inserted into the computer/server so that the computer/server can connect to a network. Most NICs are designed for a particular type of network (typically Ethernet) protocol (typically TCP/IP) and media.

**Physical Block Devices (PBDs)\*:** Physical Block Devices represent the interface between a physical server and an attached Storage Repository (SR). PBDs are connector objects that allow a given SR to be mapped to a XenServer host. PBDs store the device configuration fields that are used to connect to and interact with a given storage target.

**Storage area network (SAN):** A Fibre Channel, Ethernet, or other specialized network infrastructure specifically designed to carry block-based traffic between one or more servers to one or more storage and storage inter-process communications systems.

**Storage Repositories (SRs)\*:** A Storage Repository is a particular storage target, in which virtual machine (VM) Virtual Disk Images (VDIs) are stored.

**Virtual Block Devices (VBDs)\*:** Virtual Block Devices are connector objects (similar to the PBD described previously) that allows mappings between VDIs and VMs. In addition to providing a mechanism for attaching (also called plugging) a VDI into a VM, VBDs allow for the fine-tuning of parameters regarding Quality of Service (QoS), statistics, and the bootability of a given VDI.

**Virtual Disk Images (VDIs)\*:** A Virtual Disk Image is a storage abstraction which represents a virtual hard disk drive in a VM. VDIs are the fundamental unit of virtualized storage in XenServer. VDIs are persistent, on-disk objects that exist independently of XenServer hosts.

**Virtual LAN (VLAN):** A method of virtualizing a LAN to make it appear as an isolated physical network. VLANs can reduce the size of and isolate broadcast domains. VLANs still share resources from the same physical switch and do not provide any additional QoS services such as minimum bandwidth, quality of a transmission, or guaranteed delivery.

**Virtual machine (VM)\*:** A virtual machine (VM) is a computer composed entirely of software that can run its own operating system and applications as if it were a physical computer. A VM behaves exactly like a physical computer and contains its own virtual (software-based) processor, RAM, hard disk, and NIC.

**Note:** Definitions identified with an asterisk (\*) are provided by the *Citrix XenServer 7.0 Administrator's Guide*, which is available on the [Citrix Product Documentation](#) website.

## 2 Citrix XenServer and Dell Storage product overview

This section provides an overview of Citrix XenServer and the Dell PS Series storage technologies presented in this paper.

### 2.1 Citrix XenServer

Citrix XenServer is a leading server virtualization and hypervisor management platform that enables reductions in total cost of ownership for desktop, cloud, and server virtualization infrastructures. The ability to consolidate and contain workloads on XenServer provides a means for any organization to address the challenges present in today's IT data center by transforming their compute infrastructure.

### 2.2 Dell PS Series storage

Dell PS Series arrays deliver the benefits of consolidated networked storage in a self-managing iSCSI SAN that is affordable and easy to use, regardless of scale. Built on an advanced, peer storage architecture, PS Series storage simplifies the deployment and administration of consolidated storage environments, enabling perpetual self-optimization with automated load balancing across PS Series members in a pool. This provides efficient scalability for both performance and capacity without forklift upgrades. PS Series storage provides a powerful, intelligent, and simplified management interface.

### 3 XenServer storage overview

XenServer environments utilize shared storage as part of the virtualization platform. Shared storage can be connected through iSCSI, Fibre Channel (FC), or NFS. The information contained in this document is focused on iSCSI block storage connectivity because the PS Series storage platform is an iSCSI block storage platform. The addition of FluidFS storage (a file-based NAS platform) to the PS Series platform can provide NFS storage, but is not covered as part of this document.

**Note:** Additional information regarding FluidFS storage platforms can be found on the page, [FluidFS technical content](#).

Block storage devices in the form of iSCSI LUNs are presented to the XenServer hosts, from which SRs are created. SRs, which are connected to all XenServer hosts participating in the XenServer pool, are the entity on which VDIs reside. VDIs are recognized by VMs as physical disks, and are persistent on the SRs.

#### 3.1 Shared iSCSI storage

XenServer using Dell PS Series storage provides support for shared SRs on iSCSI-attached LUNs. iSCSI LUNs can use the Open-iSCSI software initiator or a supported iSCSI host bus adapter (HBA). Figure 1 and Figure 2 illustrate how both the Open-iSCSI software initiator and iSCSI HBA environments look conceptually.

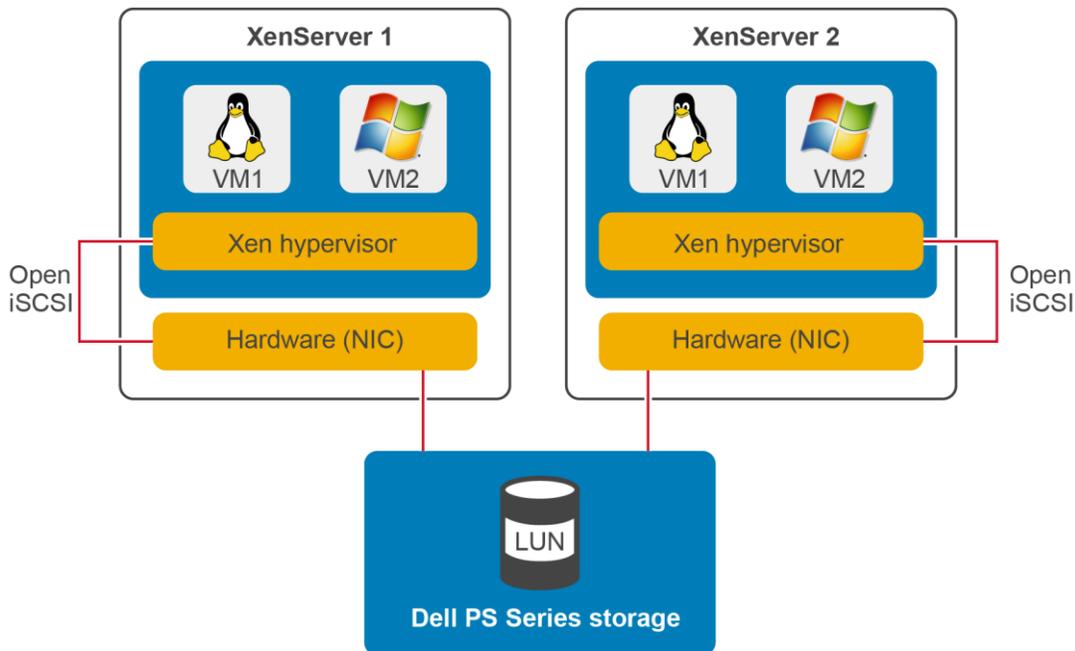


Figure 1 Shared iSCSI storage using the Open-iSCSI software initiator

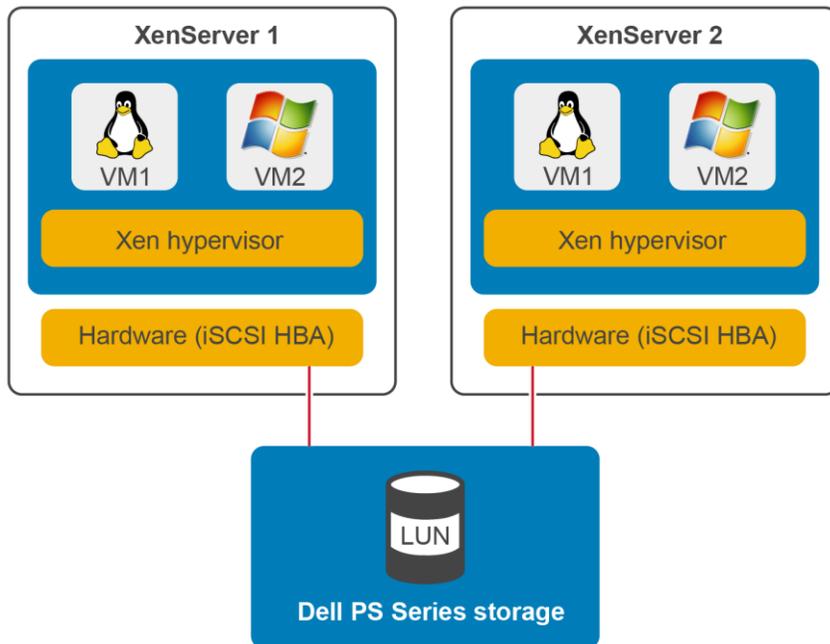


Figure 2 Shared iSCSI storage using iSCSI HBAs

**Note:** Configuration of iSCSI HBAs is not covered in this document. Consult the [Dell Storage Compatibility Matrix](#) for supported adapters and the iSCSI HBA manufacturer for configuration information.

## 3.2 SR-to-VM mapping

XenServer is capable of deploying a many-to-one, VM-to-SR (volume) deployment. The ideal number of VMs per SR largely depends on the workload and IOPS requirement of the VMs being deployed. When multiple VDIs share an SR, they also share the disk queue for that SR on the host. For this reason, care should be taken to prevent bottleneck conditions on the SR. Additionally, replication and DR become a factor when hosting multiple VMs on an SR. This is due to replication and recovery taking place on a per-SR (volume) basis.

## 3.3 Multipathing

Multipathing allows for failures in storage adapters (Open-iSCSI and HBA), switch ports, SAN switches, and storage I/O ports. Use of multipathing is recommended to increase availability and redundancy for production deployments of XenServer when hosting critical VM workloads.

XenServer supports Active/Active multipathing for iSCSI I/O data paths. Dynamic multipathing uses a round-robin mode load balancing algorithm resulting in active traffic on all paths during normal operation. Multipathing can be enabled using XenCenter or the command line interface. Enabling multipathing requires a restart of the XenServer host and should be enabled before storage is added to the server. Only use multipathing when there are multiple paths to the storage.

**Note:** Additional information on multipathing with XenServer hosts can be found in the *Citrix XenServer 7.0 Administrator's Guide*, which is available on the [Citrix Product Documentation](#) website.

## 4 XenServer storage using Open-iSCSI initiator (software)

XenServer iSCSI storage repositories are supported with Dell PS Series storage through the use of the Open-iSCSI initiator.

Shared iSCSI SRs using the software-based host initiator are capable of supporting VM agility using XenMotion® — VMs can be started on any XenServer host in a resource pool and migrated between them with no noticeable interruption.

iSCSI SRs utilize the entire LUN specified at creation time and may not span more than one LUN. Support for the Challenge-Handshake Authentication Protocol (CHAP) is provided for client authentication, during both the data-path-initialization and the LUN-discovery phases.

**Note:** Use dedicated network adapters for iSCSI traffic. The default connection can be used, but the best practice is to separate iSCSI and network traffic.

XenServer hosts support a single iSCSI initiator, which is automatically created and configured with a random IQN during host installation. iSCSI targets commonly provide access control through iSCSI initiator IQN lists, so all iSCSI targets/LUNs to be accessed by a XenServer host must be configured to allow access by the host initiator IQN. Similarly, targets/LUNs to be used as shared iSCSI SRs must be configured to allow access by all host IQNs in the resource pool.

**Note:** Access to PS Series storage can also be configured based on the IP address or IP address range of the hosts, or by CHAP. This paper covers access provided based on IQN.

Changing the default XenServer IQN to one that is consistent with a naming schema in the iSCSI environment is recommended. The XenServer host IQN value can be modified using the XenCenter GUI, or the XE CLI.

### To set the host IQN using XenCenter:

Right-click the host, select **Properties**, enter the desired **iSCSI IQN**, and click **OK**.

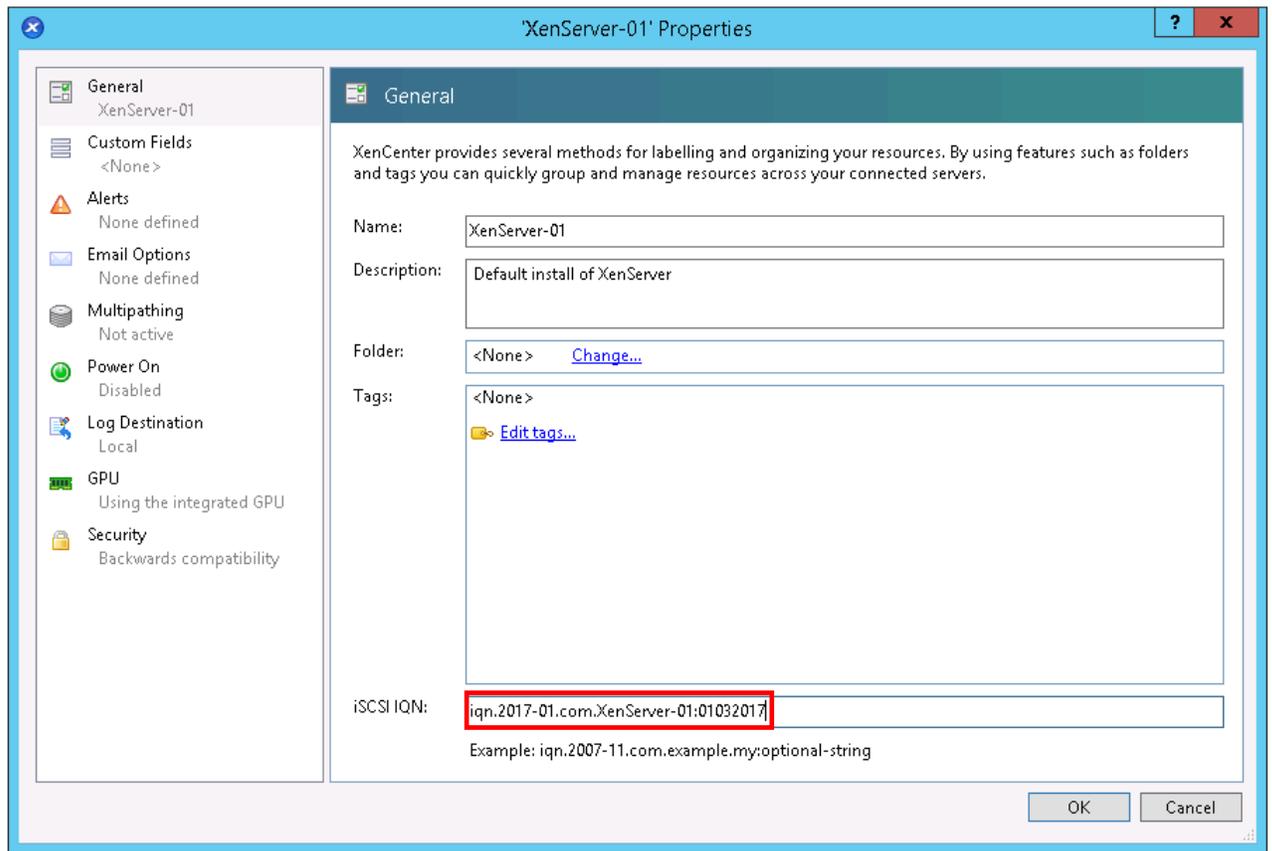


Figure 3 XenCenter: Set host IQN

### To set the host IQN using the XE CLI:

From the XE CLI, execute the following command to modify the host IQN.

```
xe host-param-set uuid=host_uuid other-config:iscsi_iqn=new_initiator_iqn
```



Figure 4 XE CLI: Set host IQN

**Caution:** Do not change the XenServer host IQN with iSCSI SRs attached. Doing so can result in failures connecting to new targets or existing SRs.

**Caution:** When changing the host (Initiator) IQN, it is imperative that each IQN is unique. If a non-unique IQN identifier is used, data corruption and/or denial of LUN access can occur.

## 4.1 Open-iSCSI initiator with Dell PS Series

When planning a Dell PS Series iSCSI network, the best practice is to isolate the iSCSI traffic from management traffic through the use of a separate subnet and switches. Failure to follow this best practice may result in compromised reliability or performance.

When implementing multipathing with iSCSI storage, be certain none of the redundant iSCSI paths are configured to share the same subnet or physical network as the XenServer management interface. If this occurs, the iSCSI initiator will not be able to successfully establish a session over any iSCSI path on the management network or subnet.

When implementing multipathing with the XenServer Open-iSCSI initiator connecting to PS Series storage, a single iSCSI subnet is required. In this configuration, the iSCSI ports on the PS Series storage Group and Members, as well as the XenServer iSCSI ports, are all on a single subnet. This option uses MPIO for multipathing, and is the recommended option when high availability (HA) is required.

## 4.2 Configuring Open-iSCSI multipathing with Dell PS Series Storage

Using XenServer Open-iSCSI multipathing to properly connect to PS Series storage requires the following:

- XenServer 6.2 or later
- iSCSI using two unique, dedicated storage NICs and a dedicated subnet; the subnet should be different from the XenServer management network to comply with Citrix best practices
- Multipathing enabled on all XenServer hosts in the pool
- iSCSI target IP address for the PS Series Group; for the example included in this document, the PS Series Group is assigned the iSCSI IP address 10.10.10.200/24

**Note:** XenServer version 6.0 and 6.1 can be patched to enable multipath. Refer to Citrix support article [CTX138429](#) for additional information.

In this configuration, the PS Series storage Group and member are configured with the iSCSI ports on a subnet different from the management subnet, as recommended. The PS Series storage is configured with one member. Multipathing is controlled through native MPIO.

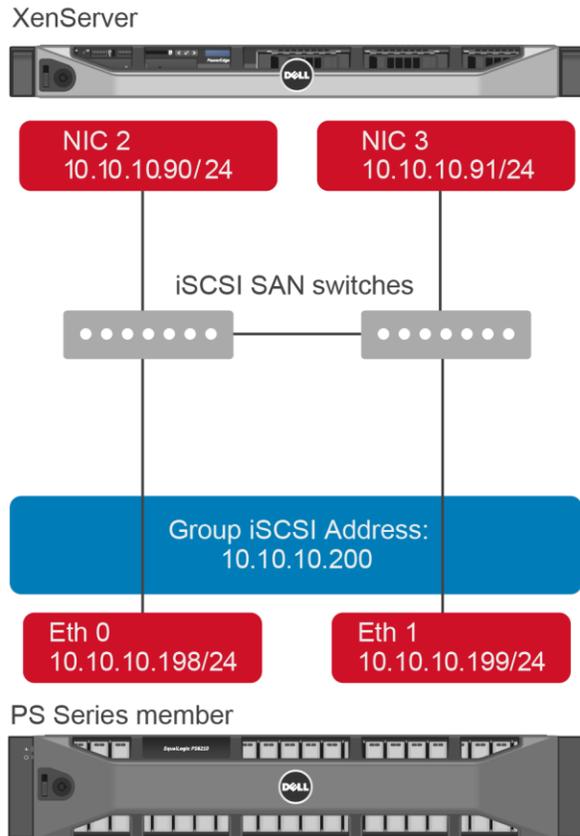


Figure 5 Open-iSCSI with MPIO

#### 4.2.1 XenServer Open-iSCSI initiator configuration

The XenCenter management GUI or the XE CLI can be used to configure dedicated NICs for iSCSI storage traffic use. Assigning a NIC for iSCSI use will prevent the use of the NIC for other functions such as host management. However, appropriate network configuration is also required to ensure the NIC is used for the desired traffic. For example, to dedicate a NIC to iSCSI storage traffic, the NIC, storage target, switch, and VLAN (if a VLAN is used) must be configured so the iSCSI storage target is only accessible over the assigned NIC.

Ensure that the dedicated NICs used for iSCSI storage all use the same IP subnet which is not routable from the XenServer management interface. Enforcing this ensures storage traffic will not be directed over the management interface after a host reboot, which would otherwise be possible due to the order in which network interfaces are initialized.

## 4.2.2 Assign NIC functions using the XenCenter management GUI

To perform these steps using the CLI rather than the XenCenter GUI, see section 4.2.3.

### 4.2.2.1 Optional steps: implementing Jumbo Frames

1. In the XenCenter management GUI, navigate to the **Infrastructure** view, drill down through the objects, select the desired XenServer host, select the **Networking** tab, select the desired **Network** from the list, and click **Properties**.

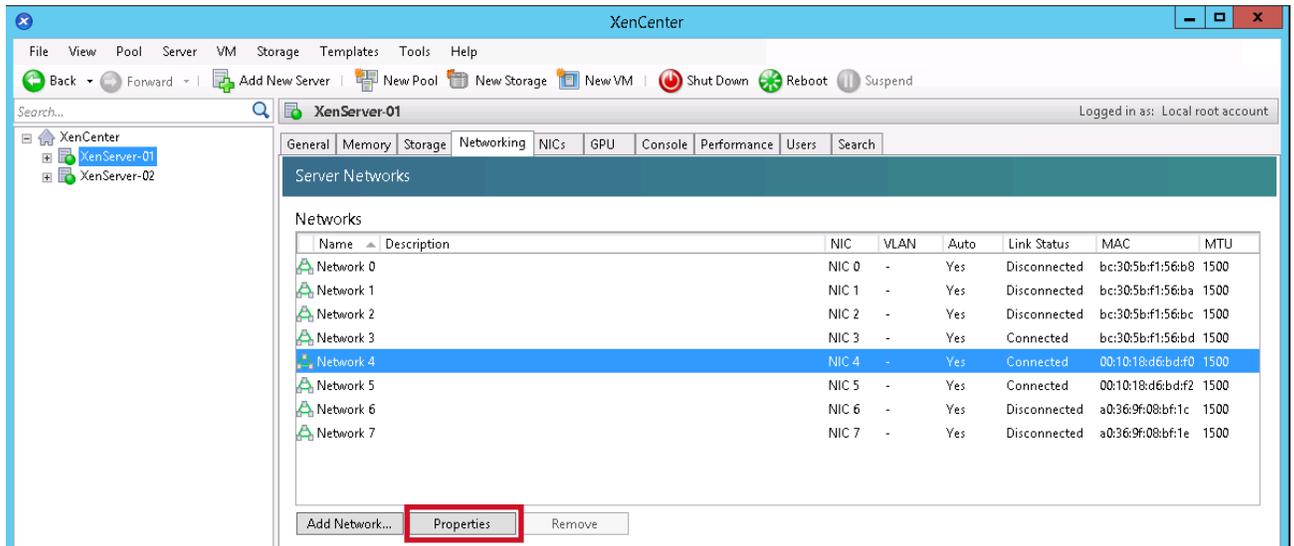


Figure 6 Modifying network properties in XenCenter

2. Select **Network Settings**, input the **MTU of 9000** (default value is 1500), and deselect the checkbox so this network will not be added to new VMs.

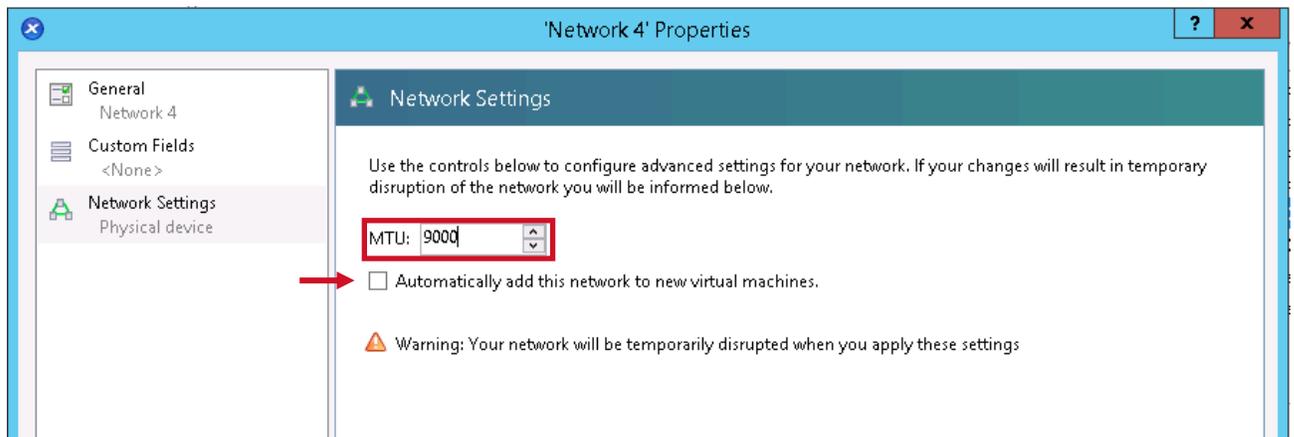


Figure 7 Enabling Jumbo Frames in XenCenter

3. Repeat steps 1–2 for each additional network dedicated for iSCSI storage.

## 4.2.2.2 Required steps

**Note:** If Jumbo Frames are to be used, the steps in section 4.2.2.1 must be completed prior to executing the following steps.

1. In the XenCenter management GUI, navigate to the **Infrastructure** view, drill down through the objects, select the desired **XenServer** host, select the **Networking** tab, and click **Configure**.

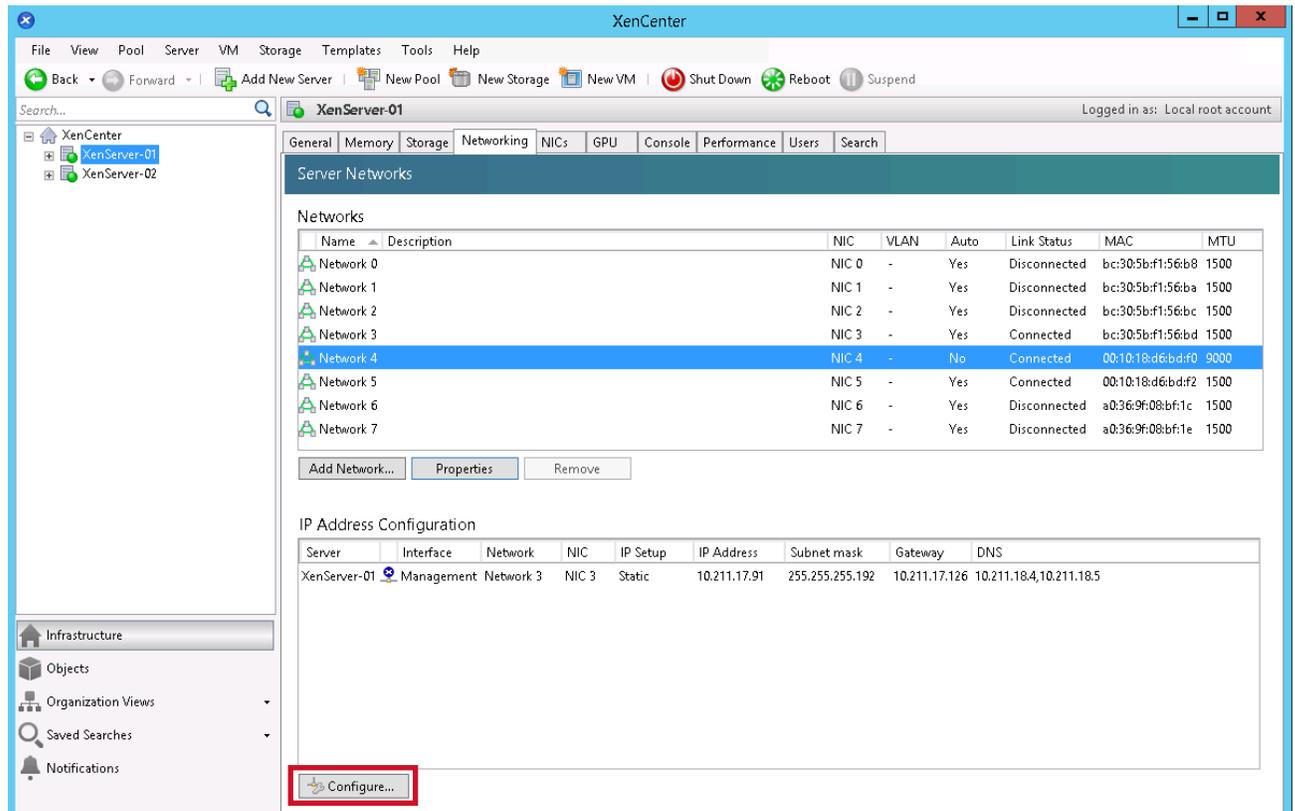


Figure 8 Configuring NIC information in XenCenter

2. Click **Add IP address**, enter the desired name, select the **Network** from the drop-down box, and enter the **IP address settings** for the dedicated iSCSI storage NIC. Click **OK**.

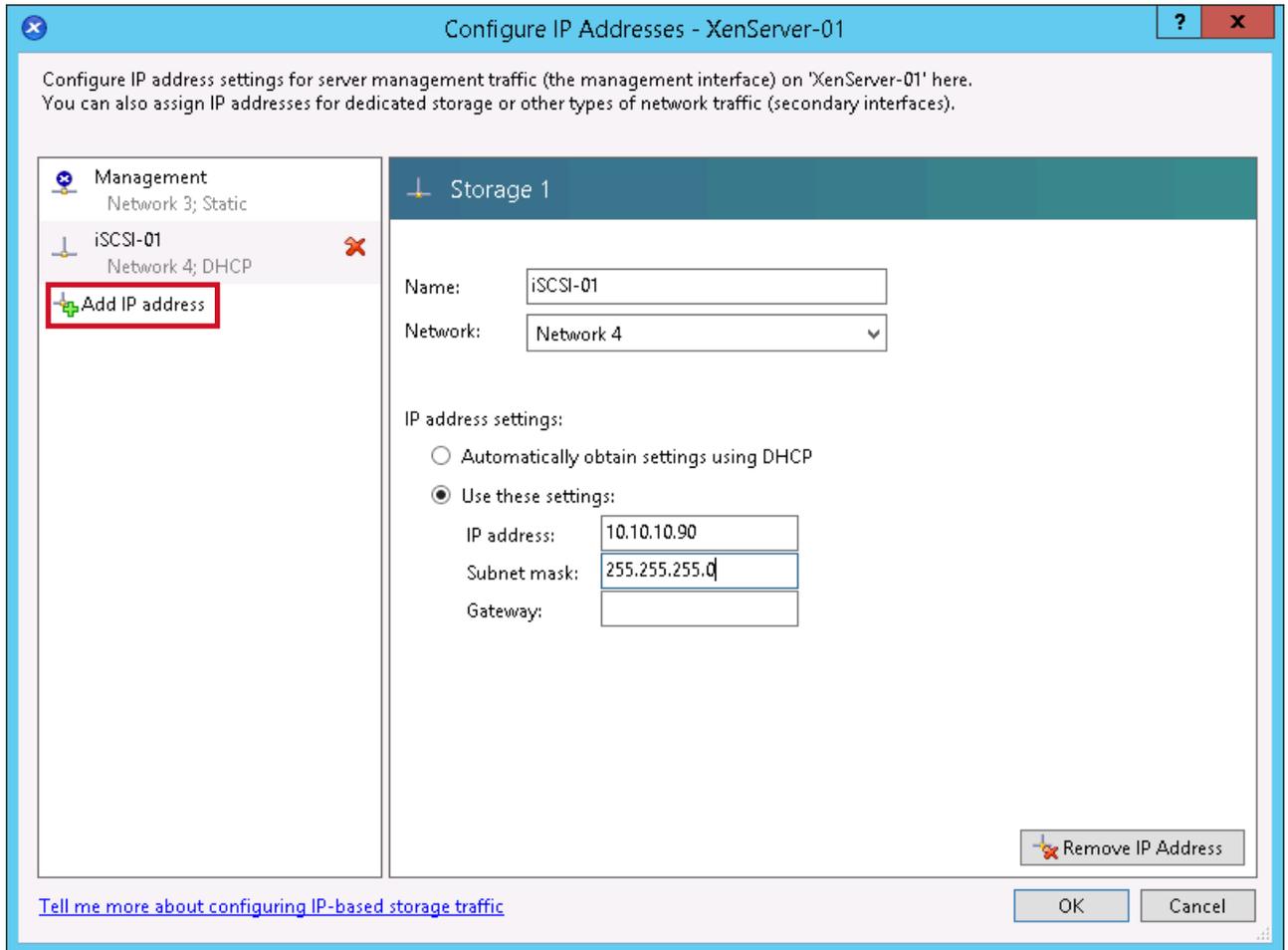


Figure 9 Setting IP information in XenCenter

3. Repeat steps 1–2 for each additional NIC dedicated for iSCSI storage.

### 4.2.3 Assign NIC functions using the XE CLI

If NIC functions were assigned using the XenCenter GUI in section 4.2.2, please skip to section 4.2.4 to configure the iSCSI interfaces.

#### 4.2.3.1 Optional steps: implementing Jumbo frames

1. Get the PIF UUID for the interface:
  - For a standalone XenServer host: Execute `xe pif-list` to list the PIFs on the server.
  - If the XenServer host is part of a pool:
    - i. Execute `xe host-list` to retrieve a list of the hosts and UUIDs.
    - ii. Execute `xe pif-list host-uuid=host-uuid` to list the PIFs on the selected host.

2. Set the MTU parameter to 9000 (default value is 1500):

```
xe pif-param-set other-config:mtu=9000 uuid=Pif-UUID
```

3. Repeat this process for each eth interface dedicated for iSCSI storage traffic on each XenServer host connecting to the PS Series storage.

### 4.2.3.2 Required steps

**Note:** If Jumbo frames are to be used, the steps in section 4.2.3.1 must be completed prior to executing the following steps.

1. Ensure that the physical interface (PIF) is on a separate subnet or that routing is configured to suit your network topology, forcing the desired traffic over the selected PIF.
2. Get the PIF UUID for the interface:
  - For a standalone XenServer host: Execute `xe pif-list` to list the PIFs on the server.
  - If the XenServer host is part of a pool:
    - i. Execute `xe host-list` to retrieve a list of the hosts and UUIDs.
    - ii. Execute `xe pif-list host-uuid=host-uuid` to list the PIFs on the selected host.
3. Set up an IP configuration for the PIF, adding appropriate values for the mode parameter, and if using static IP addressing, add values for the IP, netmask, gateway (if required), and DNS parameters:

```
xe pif-reconfigure-ip mode=DHCP|static uuid=pif-uuid
```

**Example:** `xe pif-reconfigure-ip mode=static ip=10.10.10.90  
netmask=255.255.255.0 gateway=10.10.10.1 uuid=Pif-UUID`

**Note:** When setting IP information for iSCSI connection, the gateway parameter is only required if iSCSI traffic must route to another IP subnet and has access to the appropriate router.

4. Set the PIF disallow-unplug parameter to true:

```
xe pif-param-set disallow-unplug=true uuid=Pif-UUID
```

5. Set the management purpose of the interface:

```
xe pif-param-set other-config:management_purpose="iSCSI-01" uuid=Pif-UUID
```

6. Disable automatic assignment of network to new VMs:

```
xe pif-param-set other-config:automatic="false" uuid=Pif-UUID
```

7. Repeat steps 3–6 for each eth interface dedicated for iSCSI storage traffic on each XenServer host connecting to the PS Series storage. For iSCSI MPIO configurations, a minimum of two eth interfaces on each XenServer host, in the same subnets is required.

**Note:** XE CLI uses `xe pif` to identify ethx devices where *x* identifies which device. The XenCenter management GUI identifies the same devices with the NIC *x* designation, where *x* identifies which device. While the designation differs (eth vs NIC), the *x* identifier is consistent between utilities.

**Note:** For more information on this topic see the *Citrix XenServer 7.0 Administrator's Guide*, which is available on the [Citrix Product Documentation](#) website.

## 4.2.4 Configure iSCSI interfaces

Creating iSCSI interfaces for the storage network is done through the XenServer CLI.

1. For each network interface being used for iSCSI, execute the following command:

```
iscsiadm -m iface --op new -I c_iface $n$ 
```

The value of  $n$  would be the numeric identifier for the Network in the XenCenter GUI (Network 0 would be `c_iface0`, Network 1 would be `c_iface1`).

For example:

```
iscsiadm -m iface --op new -I c_iface1  
iscsiadm -m iface --op new -I c_iface2
```

2. For each iSCSI interface created in the previous step, a bridge interface must be created and bound by executing the following command:

```
iscsiadm -m iface --op update -I iface_name -n iface.net_ifacename -v \  
Xen_Bridged_Network#
```

The *interface name* would be the appropriate `c_iface $n$`  from the previous step. The value of *Xen bridged network #* would be `xenbr $n$` , where  $n$  is the same value for both `c_iface $n$`  and `xenbr $n$` .

For example:

```
iscsiadm -m iface --op update -I c_iface1 -n iface.net_ifacename -v xenbr1  
iscsiadm -m iface --op update -I c_iface2 -n iface.net_ifacename -v xenbr2
```

3. Repeat section 4.2.4 for each XenServer host connecting to PS Series storage.

## 4.2.5 Optional iSCSI performance tuning

To optimize iSCSI performance with XenServer using PS Series storage, the `iscsid.conf` file must be modified on each XenServer connecting to the storage.

**Note:** If multiple vendor storage devices are connected to the XenServer, consult with the other vendors prior to modifying the `iscsid.conf` file.

The XenServer iscsid.conf file can be modified from the CLI using your preferred editor.

Modify the following parameters:

```
node.session.cmds_max = 1024                (Default = 128)
node.session.queue_depth = 128             (Default = 32)
node.session.iscsi.FastAbort = No          (Default = Yes)
```

Each XenServer must be rebooted for the changes to take effect.

**Note:** iSCSI performance tuning can be performed at any time and requires a reboot. However, if this is a new configuration, the reboot can take place after enabling multipathing in section 4.2.7.

## 4.2.6 Verify MPIO settings

For MPIO to function properly on XenServer with PS Series storage, the multipath.conf file on each XenServer should contain the following section.

```
device {
    vendor          "EQLOGIC"
    product         "100E-00"
    path_grouping_policy multibus
    path_checker    tur
    failback        immediate
    path_selector   "round-robin 0"
    rr_min_io       3
    rr_weight       priorities
}
```

This can be verified by showing the contents of the multipath.conf file from the CLI on the XenServer using the command:

```
cat /etc/multipath.conf
```

Should this section of the multipath.conf file need modification, use your preferred editor to make the appropriate changes.

**Note:** If modification of the multipath.conf file is required, it is recommended to make a backup copy of the file prior to editing.

If the multipath.conf file required changes and multipath is already running, following the changes, the multipath service must be restarted from the CLI on the XenServer using the command:

```
/etc/init.d/multipathd restart
```

Repeat section 4.2.6 for each XenServer host connecting to PS Series storage.

## 4.2.7 Enable multipathing in XenCenter

1. Right-click the server in XenCenter and select **Enter Maintenance Mode**.
2. Right-click the server and select **Properties**.
3. In the **Properties** window, select **Multipathing**.
4. Check the **Enable multipathing on this server** box and click **OK**. The server will need to be restarted for multipathing to take effect.

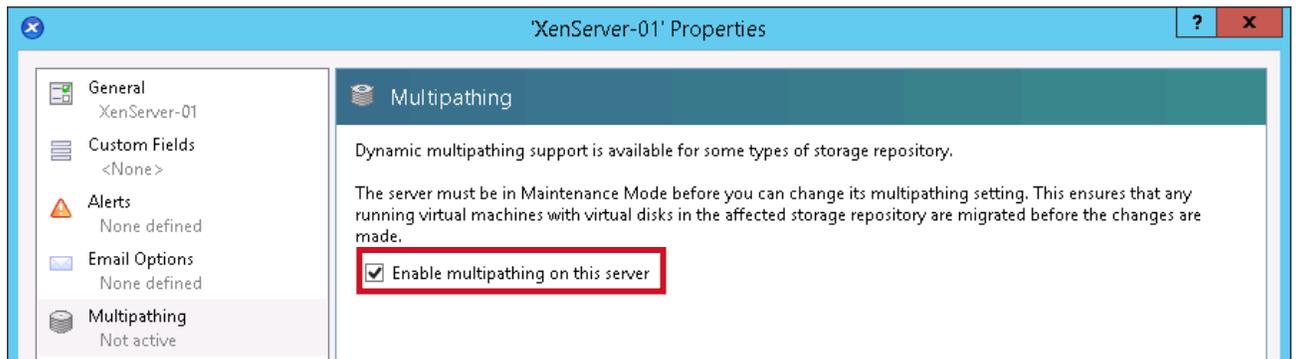


Figure 10 Enable multipathing in XenCenter

5. Right-click the server and select **Reboot**.
6. Right-click the server in XenCenter and select **Exit Maintenance Mode**.

## 4.2.8 Identify PS Series storage Group iSCSI information

To gather PS Series storage iSCSI target information, within Group Manager, navigate to the **Group Configuration** object in the appropriate PS Series Group, and select the **General** tab. This should display the **Group IP address** in the iSCSI network. The target address should be on the same IP subnet as the server's storage NICs.

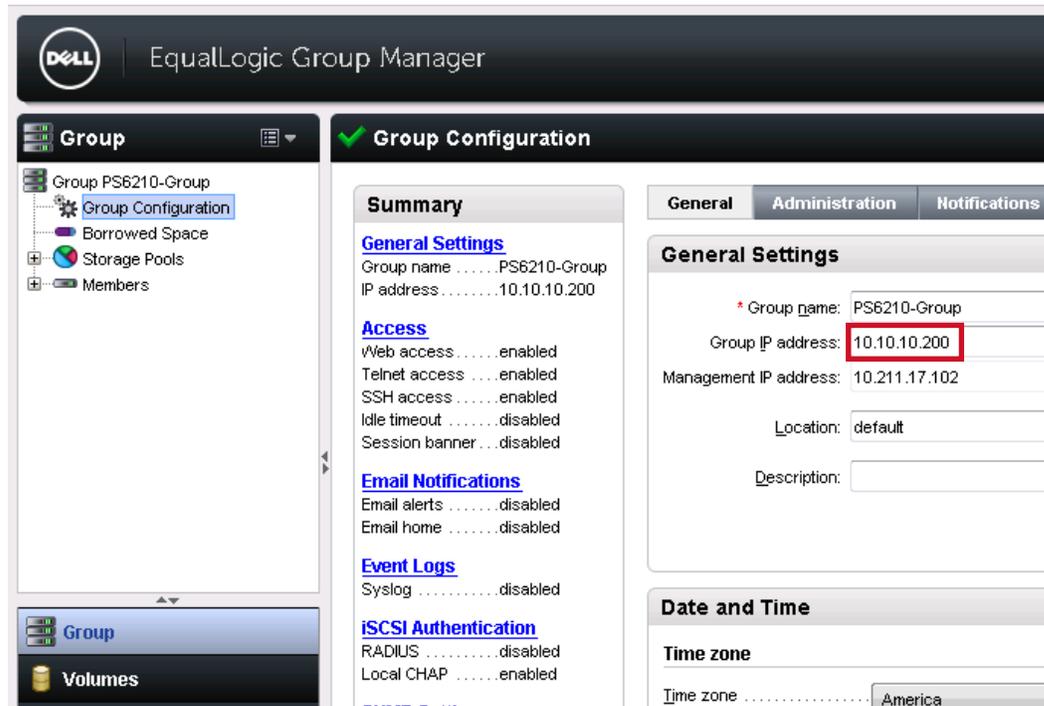


Figure 11 Identifying PS Series iSCSI Group IP address

In this example, the IP address is: 10.10.10.200/24

## 4.2.9 Configure LUN access in Group Manager

Use the following steps to configure XenServer access to an existing Volume on the PS Series storage:

**Note:** If multiple XenServers will access the Volume (XenServer pool), the Volume must be set to allow simultaneous connections from initiators with different IQNs (Volume > **Modify Settings** > **Advanced** tab).

1. Within Group Manager, navigate to the desired **Volume** object in the appropriate PS Series Group, and select the **Access** tab. This should display all access points, policies, and policy groups with access to the volume. Next to **No access policy groups**, click **Add**.

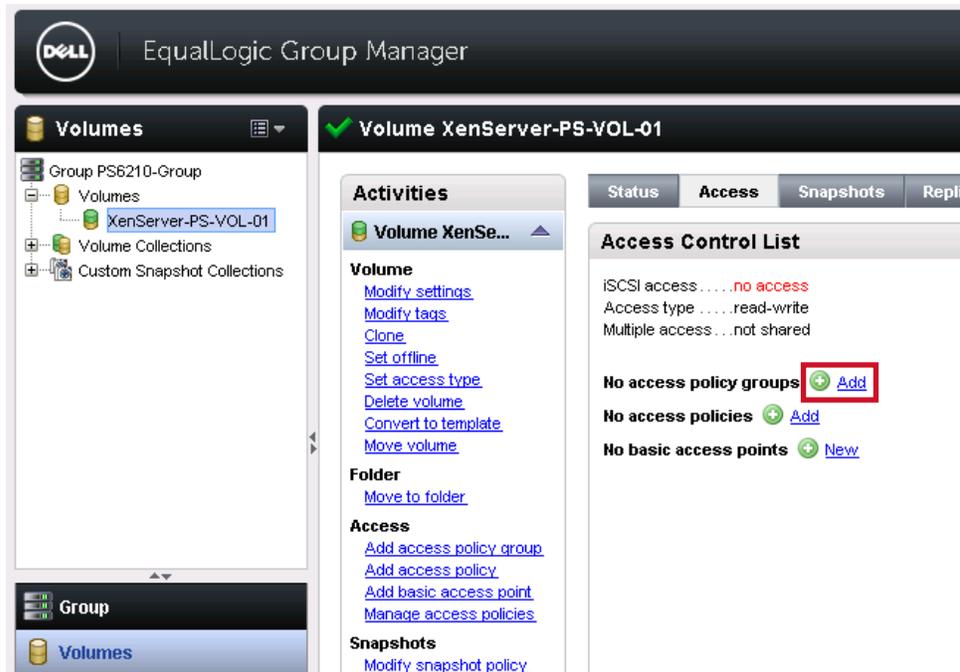


Figure 12 Add access policy group

2. Click **New**.

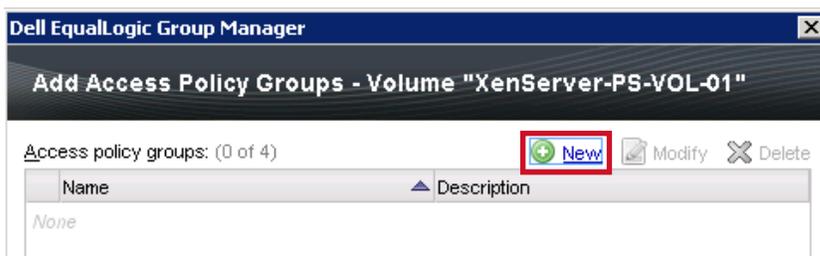


Figure 13 Create new access policy group

3. Enter the **Name** and **Description** for the new Policy Group and click **Add**.

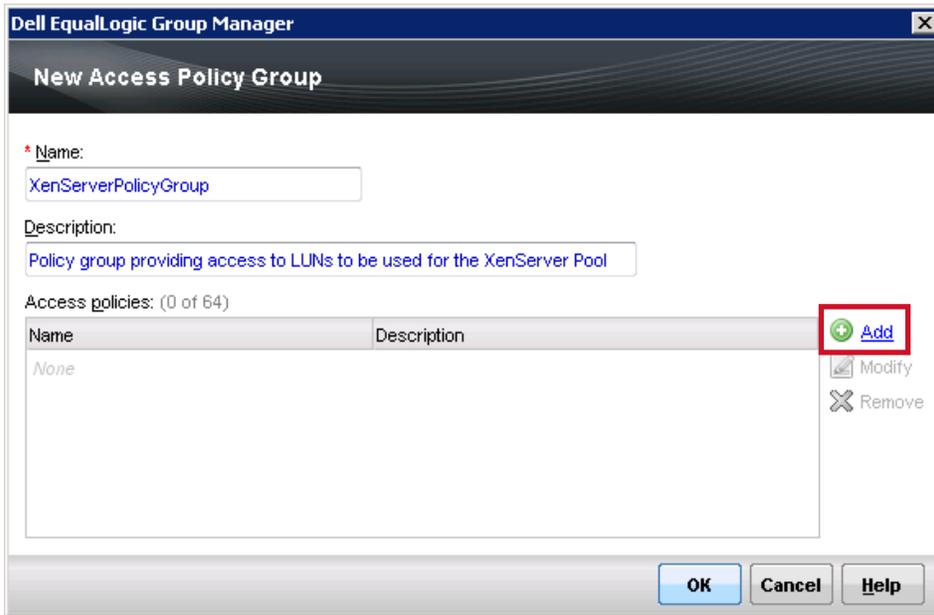


Figure 14 Name new policy group and add access policy

4. Click **New** to create a new access policy.



Figure 15 Create new access policy

5. Enter the **Name** and **Description** of new access policy and click **New**.

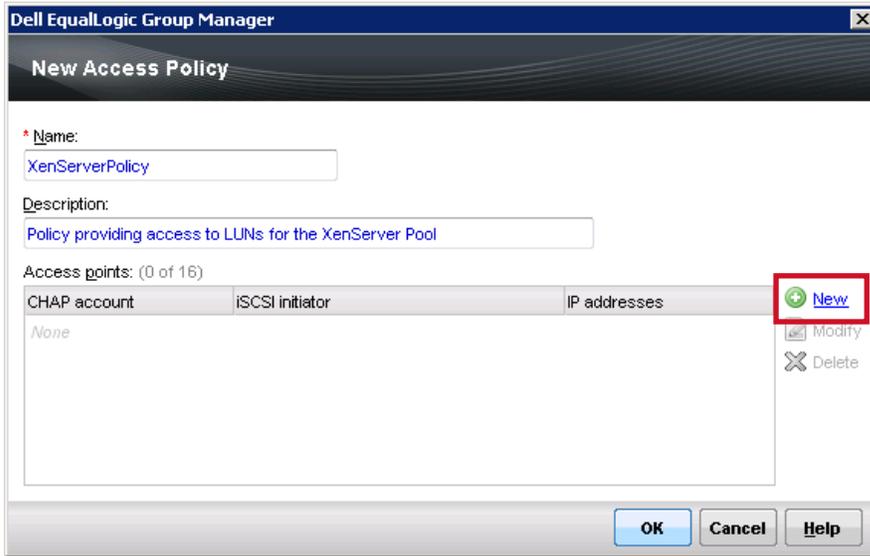


Figure 16 Name new access policy and create new access point

6. Enter the **Description** for the new access point (XenServer), the **iSCSI Initiator Name**, and click **OK**.

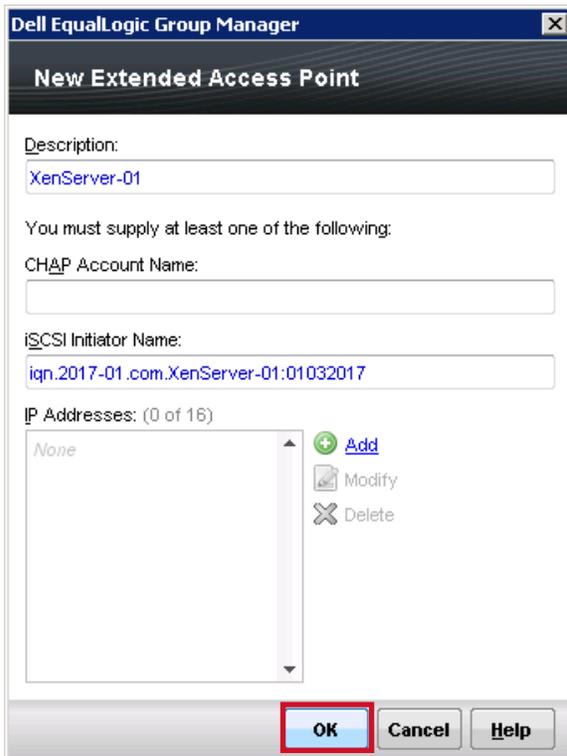


Figure 17 Enter description and iSCSI Initiator name for new access point

7. To add additional XenServers, click **New**. Otherwise, click **OK** to accept the new access point(s).

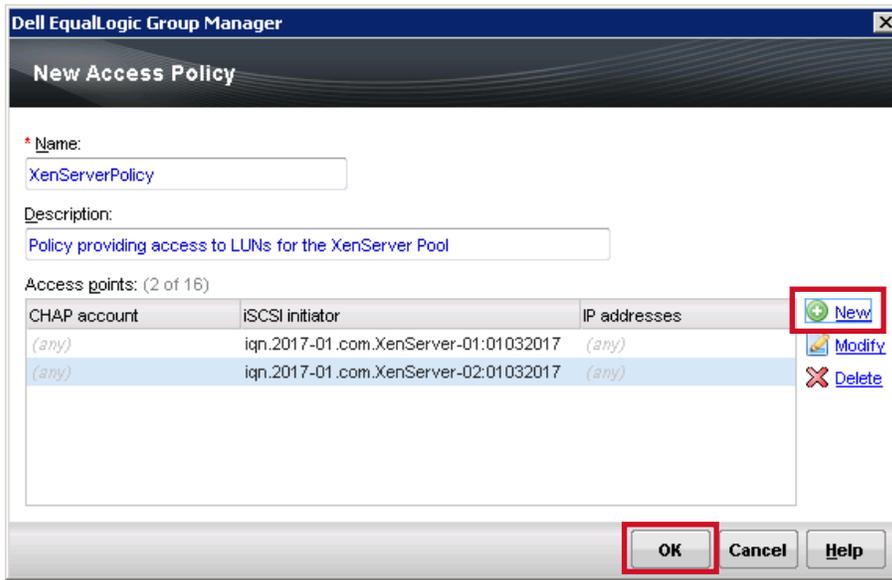


Figure 18 Add additional XenServer (access point) or accept access points for the access policy.

8. Click **OK** to accept the new access policy.

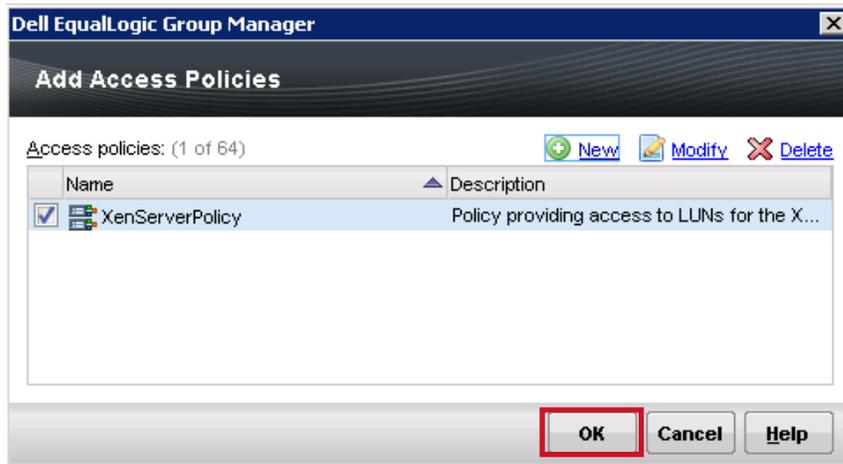


Figure 19 Accept new access policy

9. Click **OK** to accept the new access policy group.

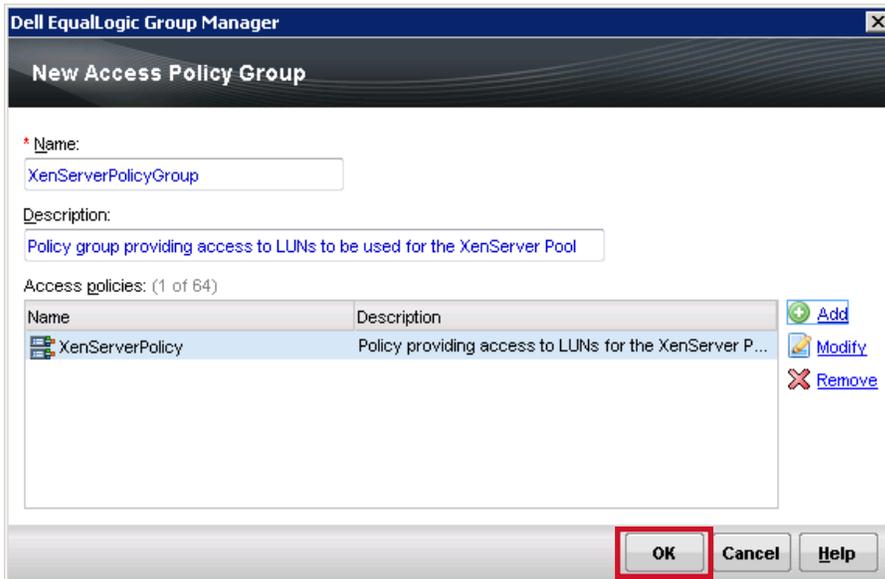


Figure 20 Accept new access policy group

10. Click **OK** to apply the new access policy group to the volume.

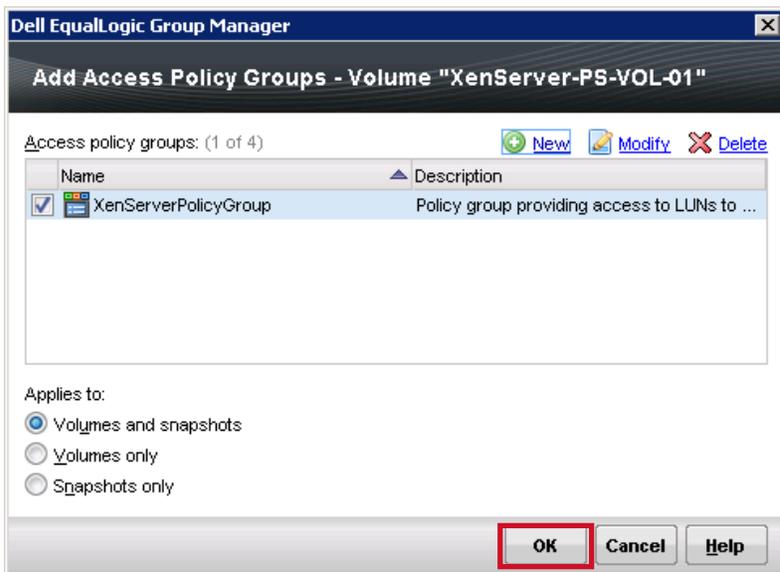


Figure 21 Apply new access policy group to volume

The new access policy group now shows as active for the selected volume.

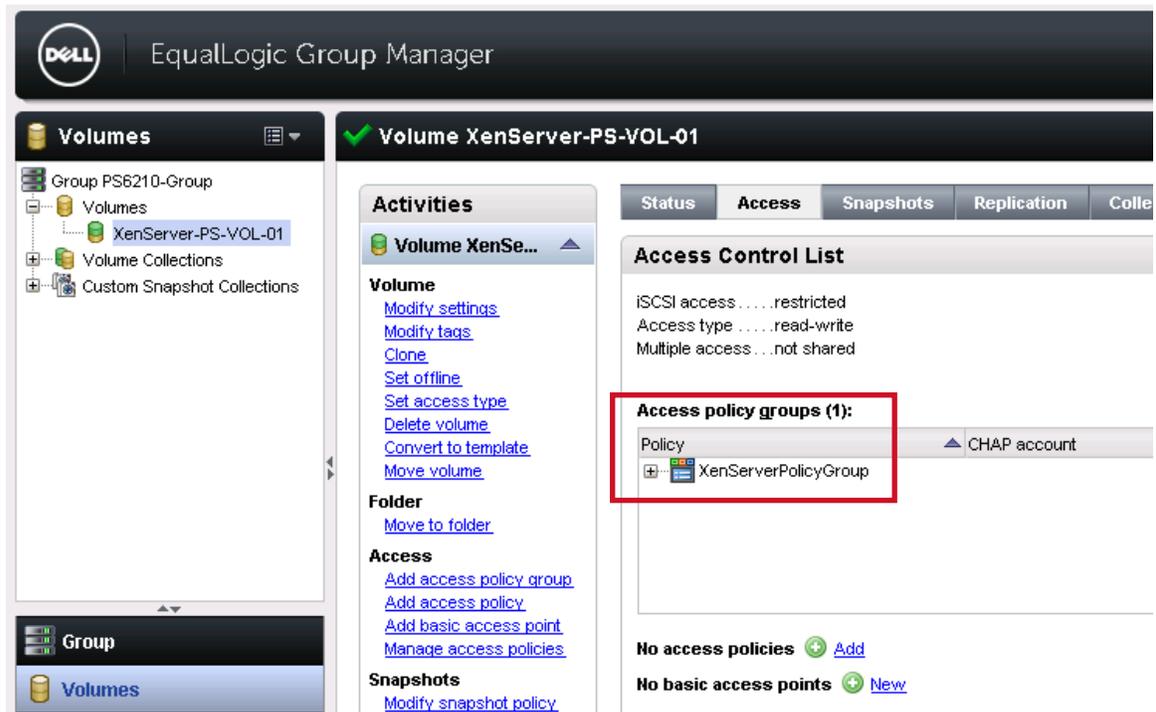


Figure 22 Volume and applied access policy group

**Note:** Access policies and access policy groups are commonly created only once for each host or host cluster and can be applied to multiple volumes.

## 5 Create new Storage Repository (SR)

Once the volumes are mapped to the servers, they can be added to the XenServer using XenCenter or the CLI. The following steps detail adding storage using XenCenter. The steps for adding storage through the CLI can be found in the *Citrix XenServer 7.0 Administrator's Guide* available on the [Citrix Product Documentation](#) website.

**Note:** The following steps assume a XenServer Pool is in use and XenServer hosts are members of the pool.

### 5.1 Create SR with software iSCSI

1. In XenCenter, navigate to the **XenServer Pool**, select the **Storage** tab, and click **New SR**.

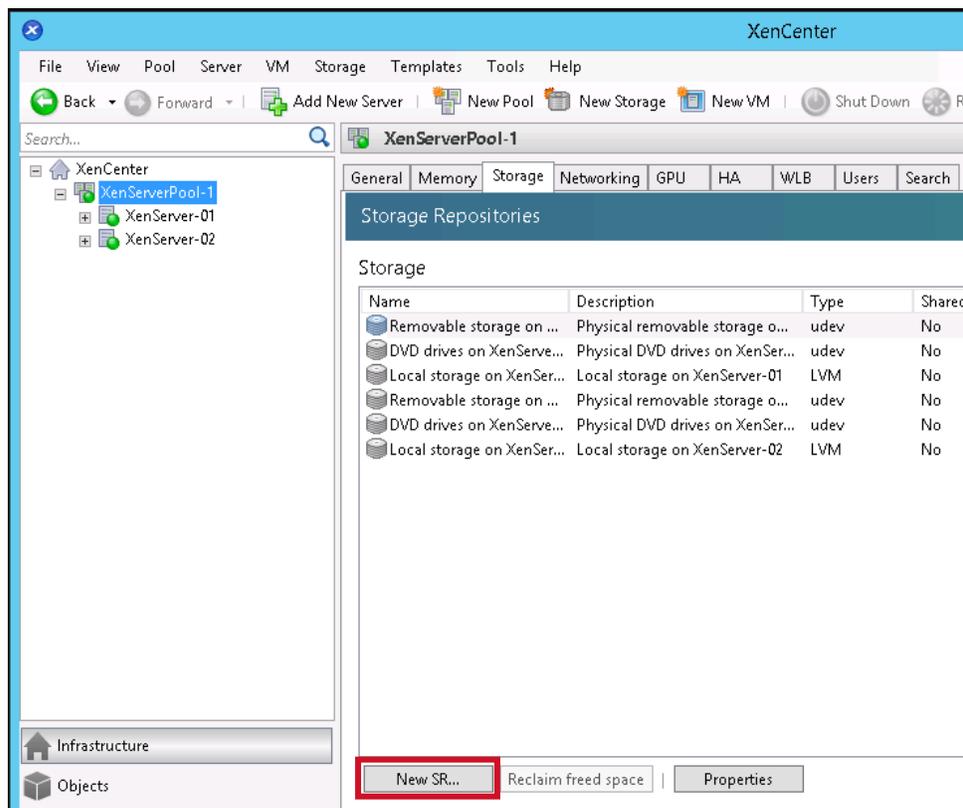


Figure 23 Create a new SR in XenCenter

2. Under **Virtual disk storage**, select the **iSCSI** option, and click **Next**.

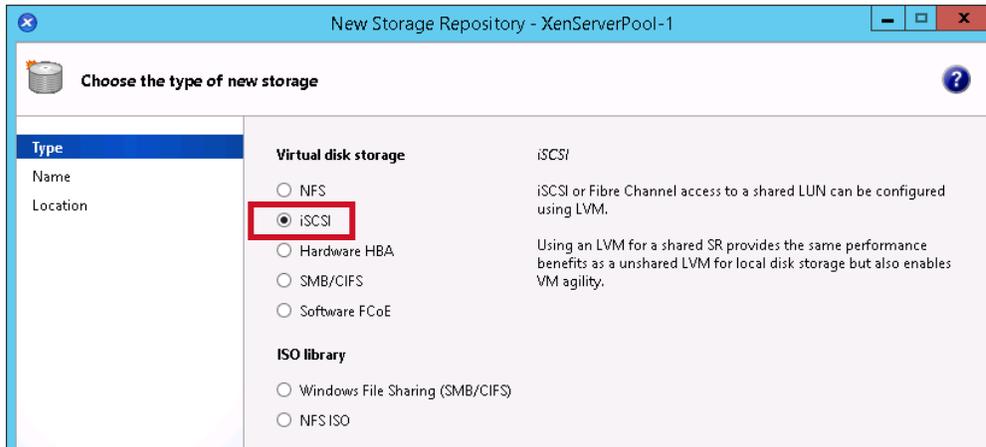


Figure 24 Create new software iSCSI SR

3. Give the new storage repository a name and click **Next**.

**Note:** Uncheck the box, **Autogenerate description based on SR settings**, to enter additional description information such as PS Series Group IP address, array model information, capacity, RAID level, or administrative contact information.

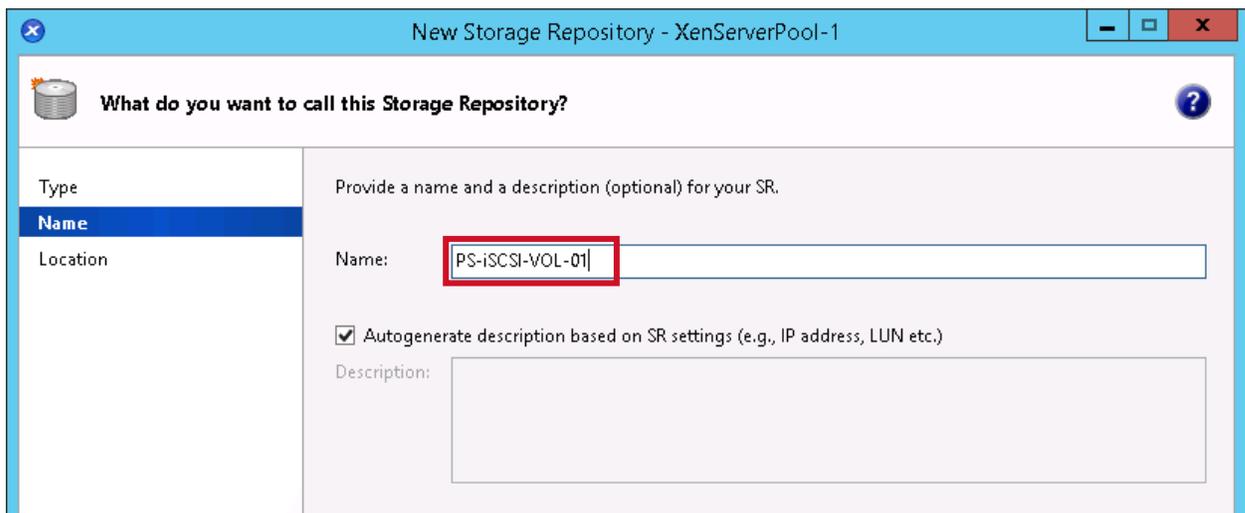


Figure 25 Provide iSCSI SR name

4. In the **Target hostname/IP address** field, enter the PS Series storage Group iSCSI address, and click **Scan Target Host**.

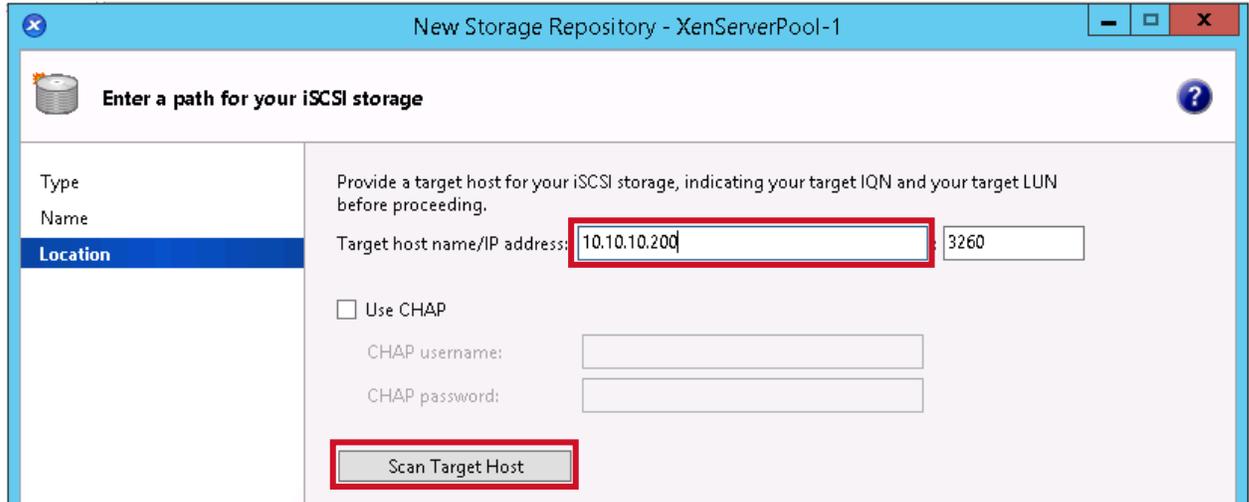


Figure 26 Enter iSCSI target IP address

5. In the **Target IQN** drop-down list, select the desired Target LUN IQN.

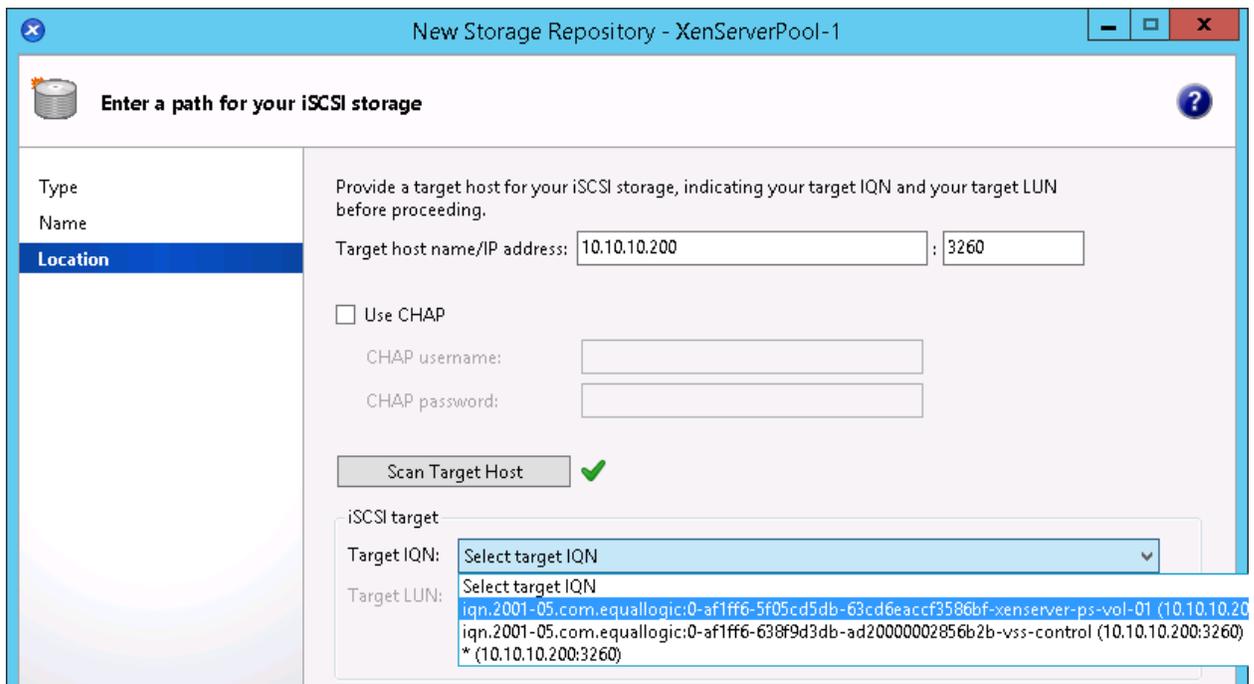


Figure 27 Select Target LUN IQN

- The LUN on which the new SR will reside is automatically populated in the **Target LUN** drop-down list, based on the LUN IQN from the previous step. Click **Finish**.

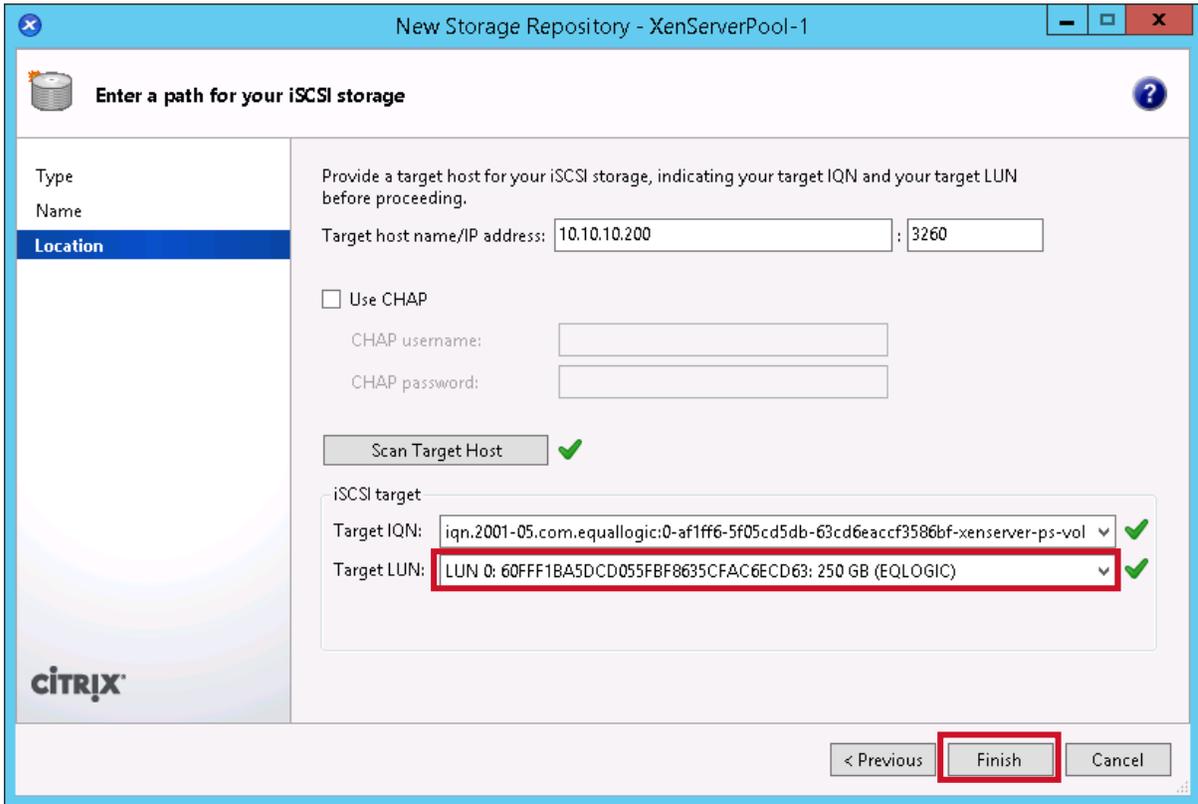


Figure 28 Target LUN auto-populates based on Target LUN IQN

- Click **Yes** to format the disk.

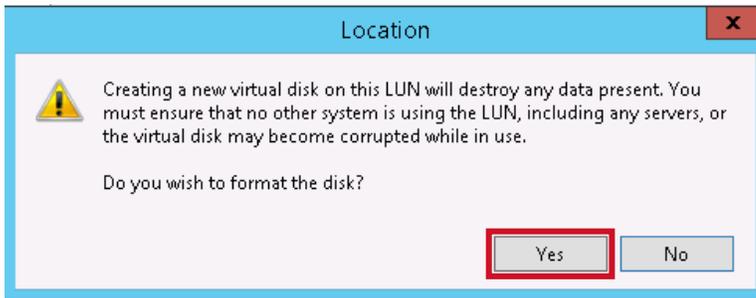


Figure 29 Format new SR for use

The new SR is now available to the server or pool. Repeat these steps for mapping and adding storage for any additional SRs.

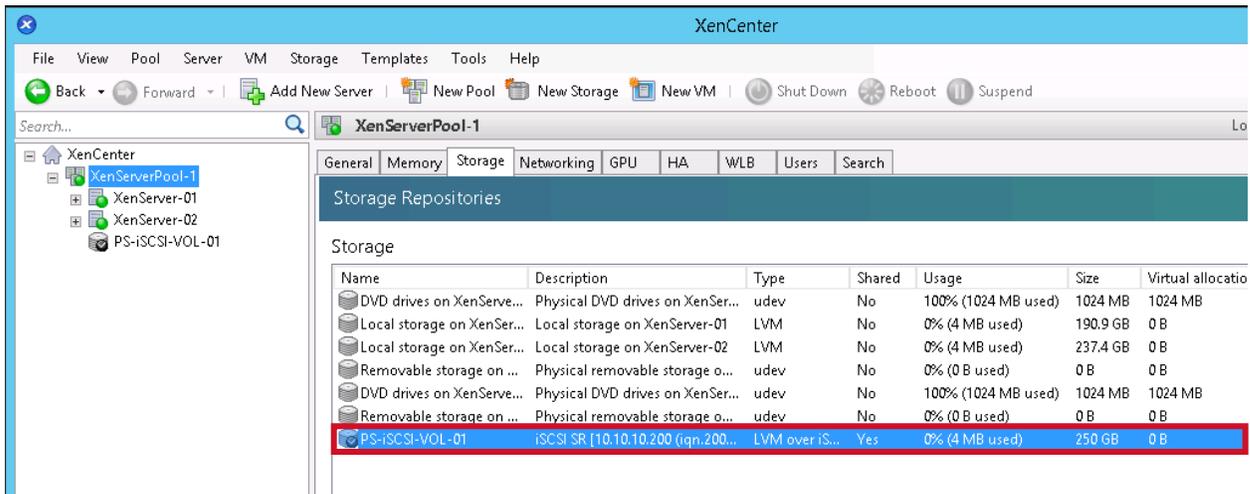


Figure 30 Newly configured PS Series storage SR

## 5.2 Verify multipath status

With the creation of the first SR, the XenServer hosts now have an active connection to the PS Series storage. With the active connection, the status of multipath can be verified using either of the following CLI commands:

```
mpathutil status
multipath -ll
```

```
[root@xenserver-01 ~]# mpathutil status
show topology
360ff1ba5dcd055fbf8635cfac6ecd63 dm-1 EQLOGIC ,100E-00
size=250G features='0' hwhandler='0' wp=rw
`-+- policy='round-robin 0' prio=1 status=active
  |- 29:0:0:0 sdb 8:16 active ready running
  `-- 30:0:0:0 sdc 8:32 active ready running
[root@xenserver-01 ~]# multipath -ll
360ff1ba5dcd055fbf8635cfac6ecd63 dm-1 EQLOGIC ,100E-00
size=250G features='0' hwhandler='0' wp=rw
`-+- policy='round-robin 0' prio=1 status=active
  |- 29:0:0:0 sdb 8:16 active ready running
  `-- 30:0:0:0 sdc 8:32 active ready running
[root@xenserver-01 ~]# █
```

Figure 31 Display multipath status

## A Additional resources

### A.1 Technical support and resources

[Dell.com/Support](https://www.dell.com/support) is focused on meeting customer needs with proven services and support.

[Dell TechCenter](https://www.dell.com/techcenter) is an online technical community where IT professionals have access to numerous resources for Dell software, hardware and services.

[Storage Solutions Technical Documents](#) on Dell TechCenter provide expertise that helps to ensure customer success on Dell Storage platforms.

### A.2 Related documentation

See the following referenced or recommended Dell and Citrix XenServer publications:

- [Citrix XenServer 7.0 Installation Guide](#)
- [Citrix XenServer 7.0 Administrator's Guide](#)
- [Citrix XenCenter Managing Storage Repositories \(SRs\)](#)
- [iSCSI Multipath for Arrays that Only Expose a Single Target](#)
- *Dell EqualLogic Group Manager Administrator's Manual* available at [eqlsupport.dell.com](https://www.dell.com/support) (login required)
- [Dell Storage Compatibility Matrix](#)
- [Switch Configuration Guides for Dell PS Series or SC Series storage](#)