Introduction to the Active Storage mRAID16 Storage Systems

Active Storage systems are innovative mid-range and high-end offerings that are ready to meet your current and future storage requirements. They are designed to provide medium- and large-scale enterprises with improved storage performance, efficiency, data security, scalability, and manageability.

mRAID16 SAN Quick Configuration Guide

Before You Start

a Overview

This document helps you quickly configure the mRAID16.

b Where to get help

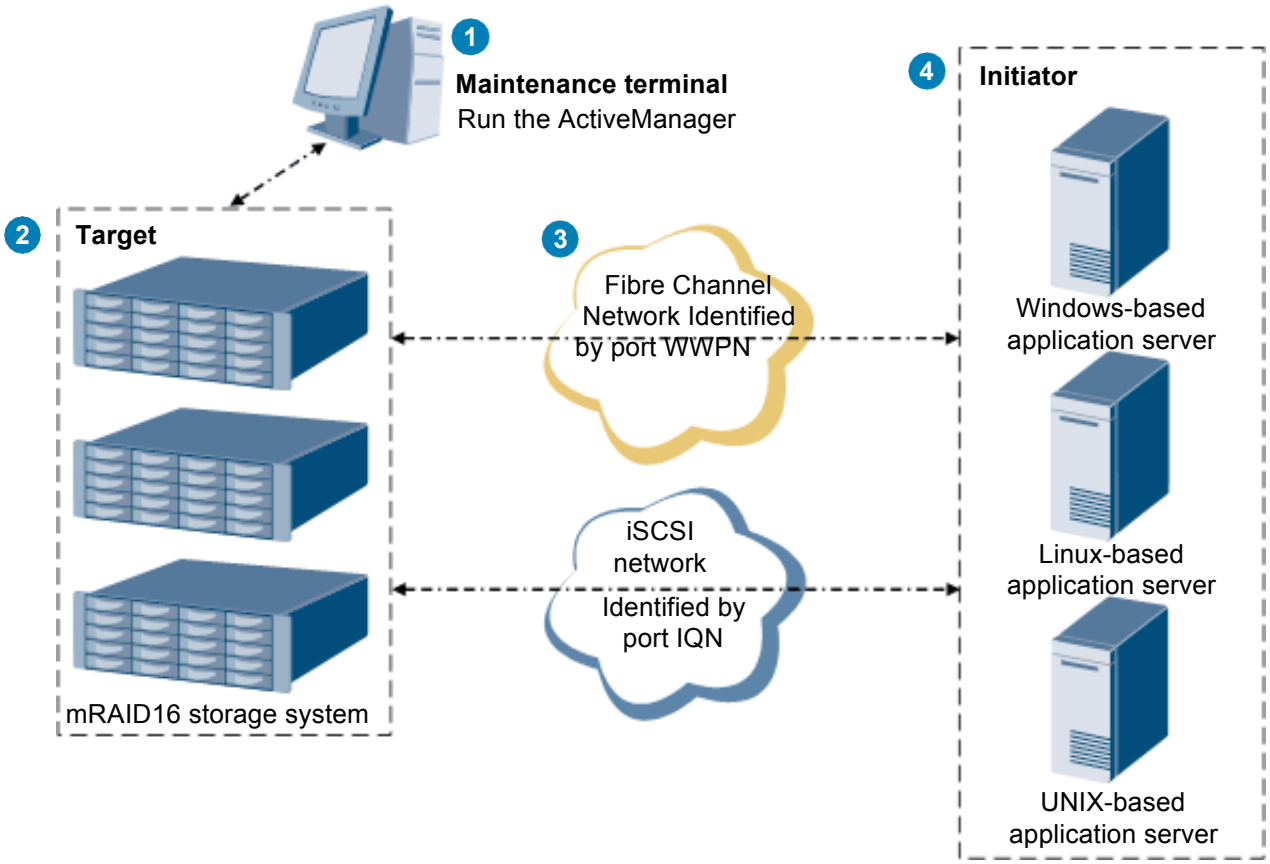
You can obtain this document from http://active-storage.com/documents/. You can also submit a request on our website for support and download valuable information.

c Feedback

Your feedback is important to us. If you have any comments about this document, please submit them to us on the Active Storage website.

1 Introduction

1a Basic application scenario



1 Users can manage and maintain the storage system from a maintenance terminal running the ActiveManager program developed by Active Storage. The maintenance terminal connects to the management network port of the storage system.

2 The storage system provides storage space for application servers.

3 The Active Storage mRAID16 storage systems can be connected to application servers running different operating systems including Windows, Linux, and UNIX over an Internet Small Computer Systems Interface (iSCSI), and Fibre Channel network.

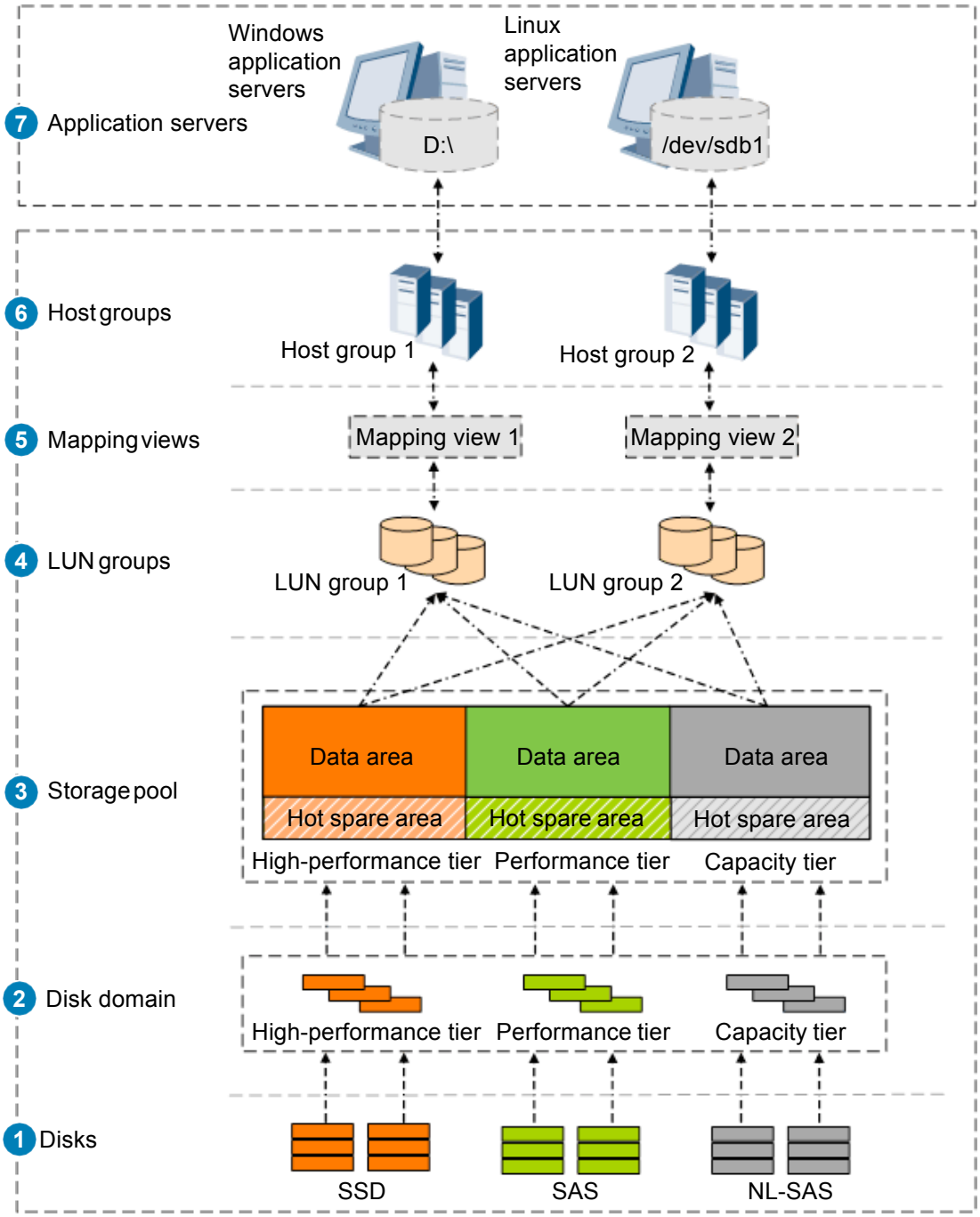
According to data transmission protocols, an application server functions as the initiator for data transmission, and a storage system serves as the target for the information. The initiator sends data read and write requests to the target. The target receives, processes, and responds to the requests.

NOTE

This document describes the configuration procedure for iSCSI and Fibre Channel networks.

4 Application servers run client programs. The storage system can connect to application servers running different operating systems including Windows, Linux (SUSE, and Red Hat), and UNIX (Solaris, AIX, and HP-UX).

1b Storage system



1. The storage system automatically identifies all disks.
2. Disk domains are comprised of different types of disks. Services of different disk domains are isolated from each other.
3. Storage pools are created in disk domains and comprised of RAID groups formed by disks of different performance. Storage pools provide logical storage space.
4. A LUN obtains storage space from the storage pool. LUNs are the minimum logical storage units that can be identified by application servers. A LUN group may contain one or multiple LUNs.
5. After mappings between host groups and LUN groups are established, related application servers can access LUNs.
6. After initiators are added to hosts, one-to-one logical mappings between hosts and application servers are established. Then application servers can use storage space provided by the storage system. A host group may contain one or multiple hosts.
7. The application server identifies LUNs as logical disks. Then it can access the detected logical disks in the same way it would access local disks.

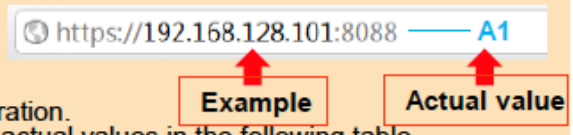
2 Data Preparation and Operation Instructions

2a Data Preparation

Before operations, follow instructions in the following table to prepare data and enter actual values in the **Value** column.

CAUTION

This document uses example values to describe the configuration.
Replace example values using actual values during actual configuration.
The figure in the right shows the mappings of example values and actual values in the following table.



Preparation Item	Source	Example	Value
Maintenance terminal: Logging in to the ActiveManager			
Management network port IP addresses	Network administrator	Default value: 192.168.128.101	**A1**
User name and password for logging in to the ActiveManager You are advised to change the default password immediately after you have logged in to the storage system for the first time and periodically change your password in the future. This reduces the password leakage risks.	System administrator	Default user name: admin Default password: Active@active	**A2**
Maintenance terminal: Creating a disk domain			
Disk domain name	User-defined	DiskDomain000	**B1**
Disk encryption type	Service provider	Non-Encrypting Disk	**B2**
Number of disks forming disk domains High-performance tier uses SSDs. Performance tier uses SAS disks. Capacity tier uses NL-SAS disks.	Service provider	Performance tier (SAS): 8 Hot Spare Policy: High Capacity tier (NL-SAS) : 16 Hot Spare Policy: High	**B3** Multi-choice ▭ High-performance tier SSDs: Hot Spare Policy: ▭ Performance tier SAS disks: Hot Spare Policy: ▭ Capacity tier NL-SAS disks: Hot Spare Policy:
Maintenance terminal: Creating a storage pool			
Storage pool name	User-defined	StoragePool000	**C1**
Storage pool usage	Service provider	Block Storage Service	**C2**
Storage pool owning to Disk domain	Service provider	DiskDomain000	**C3**

Preparation Item	Source	Example	Value
Storage tier and capacity	Service provider	Performance tier RAID Policy: RAID 5(4D+1P) Capacity: 1 TB Capacity tier RAID Policy: RAID 6(4D+2P) Capacity: 1 TB Total Storage Pool Capacity: 2 TB	**C4** Multi-choice □ High-performance tier RAID Policy: Capacity: □ Performance tier RAID Policy: Capacity: □ Capacity tier RAID Policy: Capacity:
Maintenance terminal: Creating a LUN			
LUN name	User-defined	LUN000	**D1**
Capacity	Service provider	100 GB	**D2**
Quantity	Service provider	1	**D3**
LUN owning to Storage pool	Service provider	StoragePool000	**D4**
Maintenance terminal: Creating a LUN group			
LUN group name	User-defined	LUNGroup000	**E1**
LUNs from the LUN group A LUN group may contain one or multiple LUNs.	Service provider	LUN000	**E2**
Networking mode of application servers and storage arrays	Network administrator	FC network	**E3** □ iSCSI network □ FC network
Application server: Configuring an iSCSI initiator (applicable to iSCSI connection)			
Whether the application server installed the UltraPath program	System administrator	No	**F1** □ Yes □ No
iSCSI initiator name	User-defined	initiator01	**F2**
IP address of the iSCSI host port	Network administrator	10.10.10.11	**F3**
IP address of the application server network port	Network administrator	10.10.10.12	**F4**
Application server user name/password	Network administrator	User name:root Password:123456	**F5**
Maintenance terminal: Creating a host			
Host name	User-defined	Host000	**G1**
Operating system of the application server	System administrator	Windows	**G2**

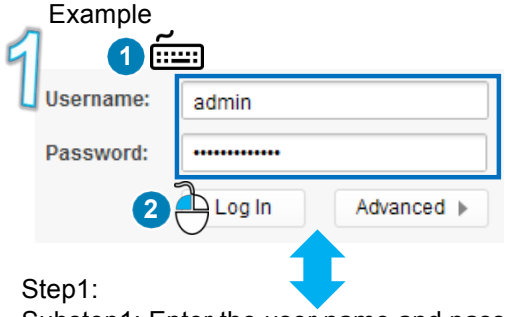
Preparation Item	Source	Example	Value
WWPN or IQN If the iSCSI network is adopted, use the initiator name that is created during the iSCSI initiator configuration. If the Fibre Channel network is adopted, use the WWPN of the Fibre Channel port of the application server.	System administrator	21000024ff2d91a8	**G3**
Maintenance terminal: Creating a host group			
Host group name	User-defined	HostGroup000	**H1**
Hosts from the Host group A host group may contain one or multiple hosts.	Service provider	Host000	**H2**
Maintenance terminal: Creating a port group (applicable to networks requiring specific ports for communication)			
Whether you need to create a port group	Service provider	Yes	**I1** □ Yes □ No
Port group name	User-defined	PortGroup000	**I2**
Ports from the Port group A port group may contain one or multiple ports.	Service provider	FC port CTE0.A0.P0	**I3**
Maintenance terminal: Creating a mapping view			
Mapping view name	User-defined	MappingView000	**J1**
LUN group from the Mapping view	Service provider	LUNGroup000	**J2**
Host group from the Mapping view	Service provider	HostGroup000	**J3**
Port group from the Mapping view If specific ports are required for communication, select the created port group.	Service provider	PortGroup000	**J4**
Application server: Using storage space (applicable to Linux, and UNIX)			
Mount directory	User-defined	/directory	**K1**

2b Operation instructions

Before operations, learn about the meaning of icons involved in the configuration, as shown in the following table.

Icon	Meaning
	Double-click
	Click
	Right-click
	Input or Set
1 2	Step
1 2	Substep

Example



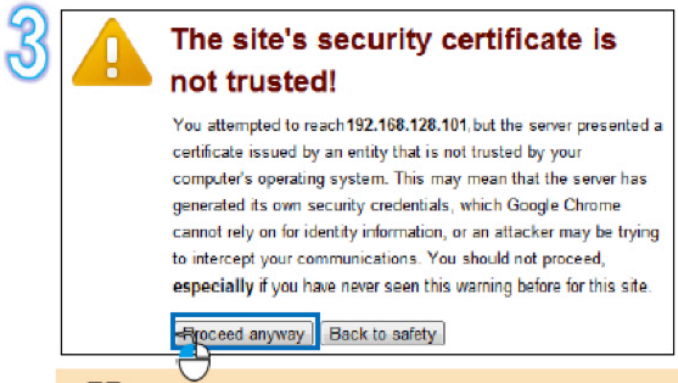
Step1:
Substep1: Enter the user name and password.
Substep2: Click **Log In**.

The screenshots in this manual may differ from the actual pages. The actual environment prevails.

3 Allocating Storage Space

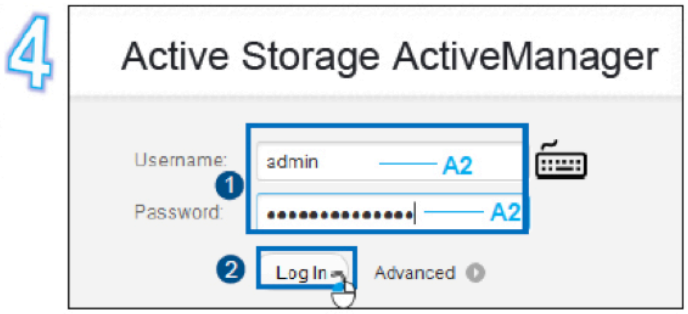
3a Logging in to the ActiveManager

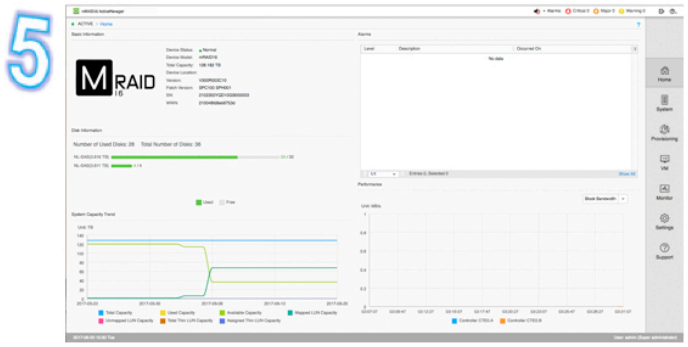
1. Enter **https://***XXX.XXX.XXX.XXX***:8088**, where *XXX.XXX.XXX.XXX* indicates the IP address of the management network port. *192.168.128.101* is used as an example.
2. Click **Enter**.



NOTE

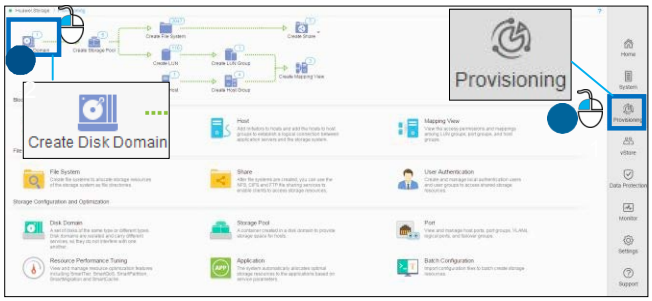
The security certificate prompt message varies with operating systems and browser versions of maintenance terminals. Ignore the message and continue accessing storage devices.





3b Creating a disk domain

1



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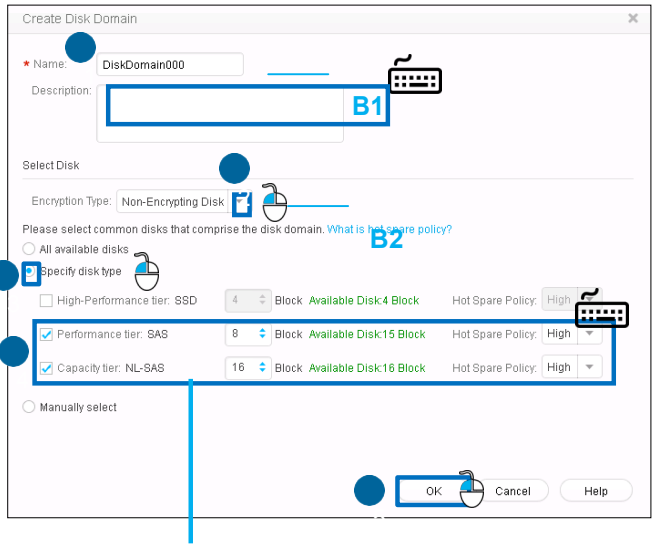
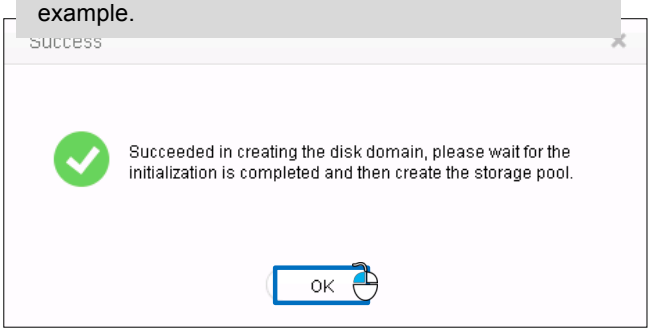


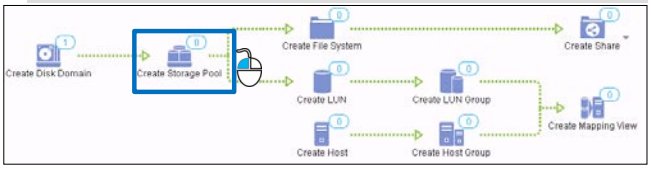
For the actual disk numbers, see **B3** in your data preparation table. The figure above takes performance tier and capacity tier creations as an example.

3

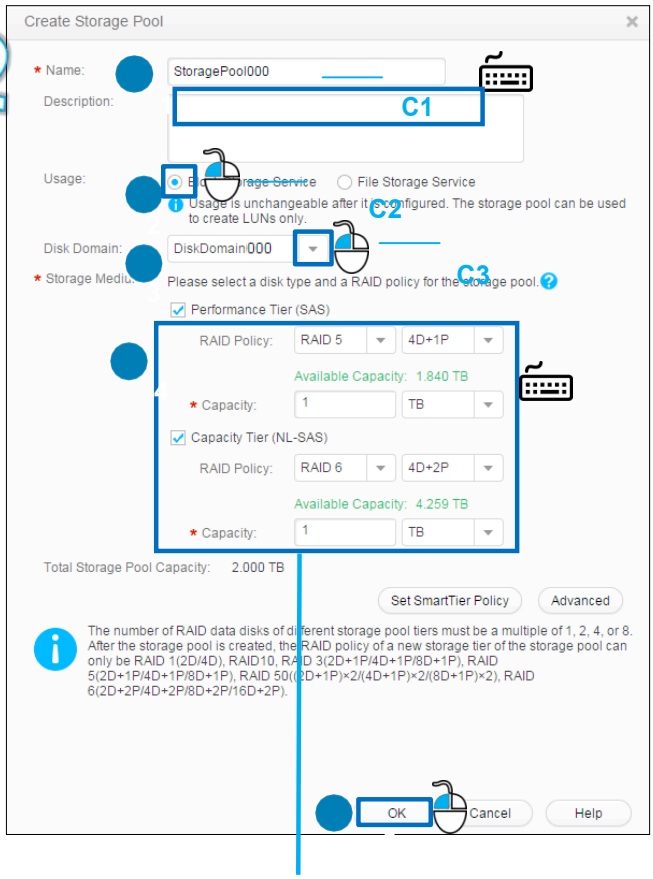


3c Creating a storage pool

1



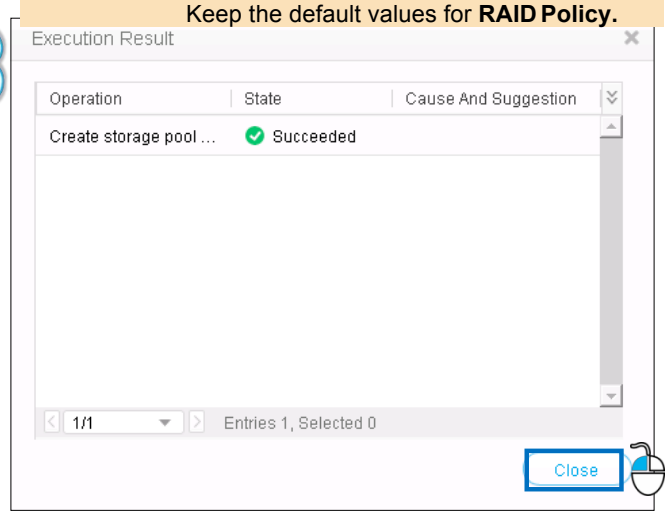
2



To create storage tiers, see the actual value from **C4** in your data preparation table. The figure above takes capacity tier creation as an example.

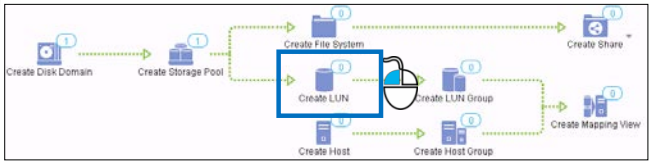
Keep the default values for **RAID Policy.**

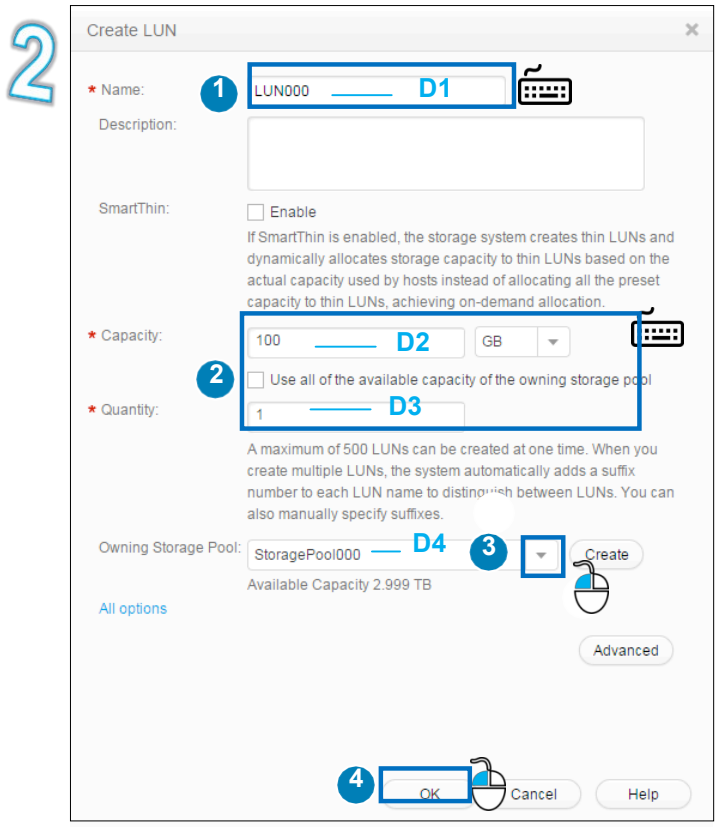
3



3d Creating a LUN

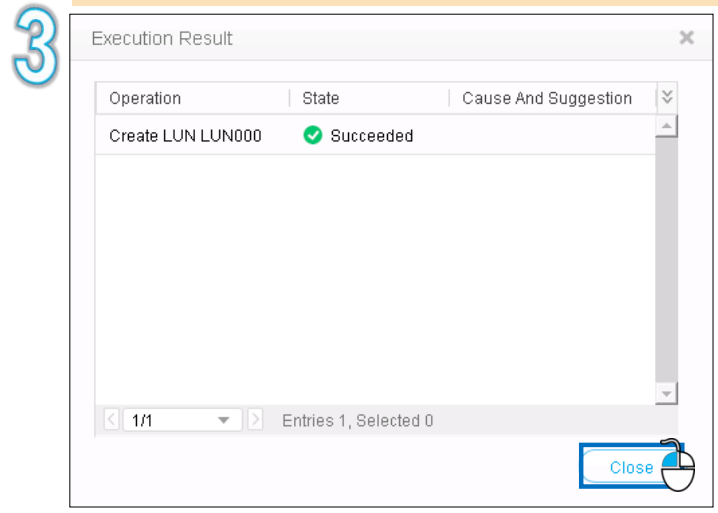
1



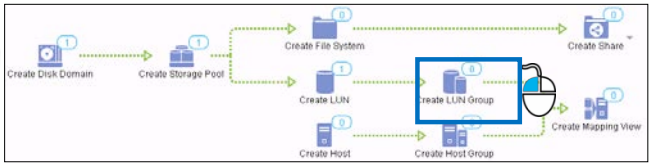


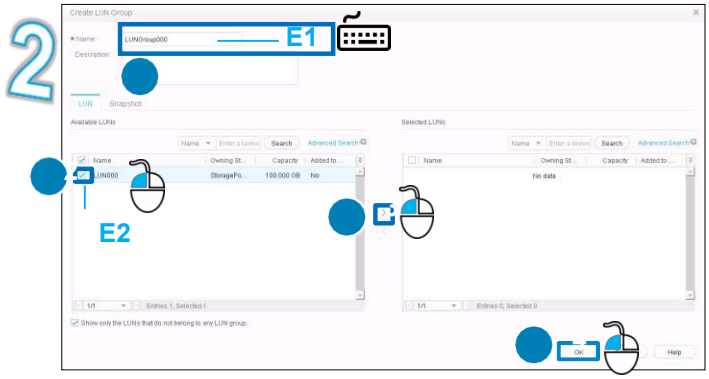
NOTE

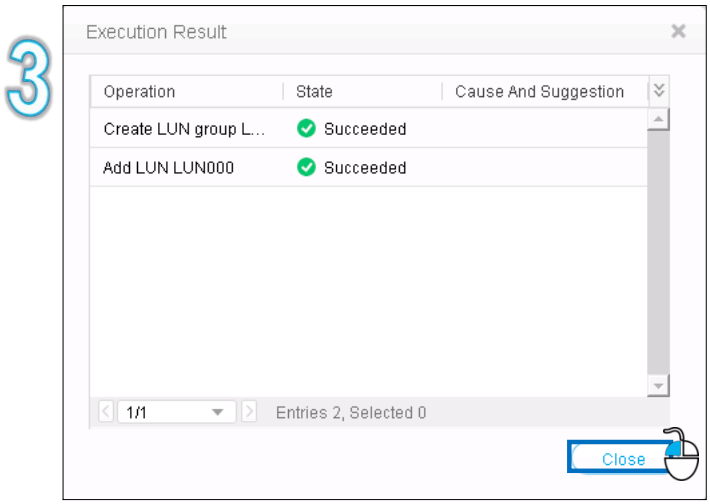
If you need to create thin LUNs, enable the SmartThin function. The value of **Initial allocated capacity** is the initial capacity of the LUN, and that of **Capacity** is the maximum capacity of the LUN.



3e Creating a LUN group







Perform the next step based on your network type. See the actual value from **E3** in your data preparation table. iSCSI network → 4 Configuring an iSCSI Initiator (Page 10) FC network → 5 Setting Up a Connection (Page 19)

4 (Optional) Configuring an iSCSI Initiator

4a Windows Server 2008

Determine the operation sequence based on whether the UltraPath is installed. See the actual value from **F1** in your data preparation table.

If UltraPath is installed, perform the following steps: 1 > 2 > 3 > 4 (1) (2) (3) (4) (7) (8)

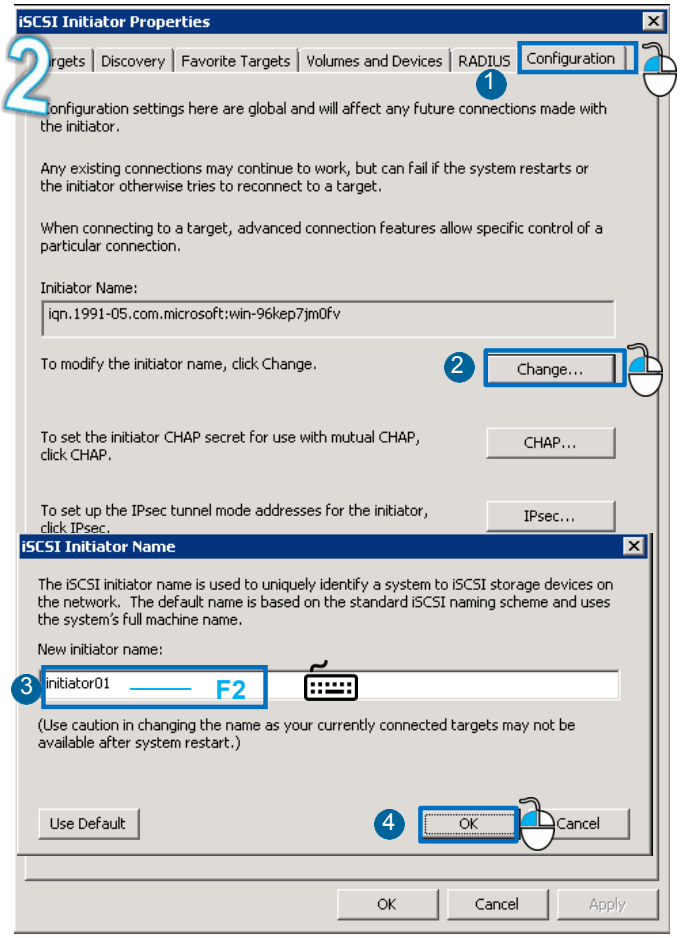
If UltraPath is not installed, perform the following steps: 1 > 2 > 3 > 4 (1) (2) (3) (4) (5) (6) > 5 > 4 (7) (8)

((1) (2) (3) (4) (7) (8)) indicate substeps 1, 2, 3, 4, 7, and 8 in the dialog box of step 4.

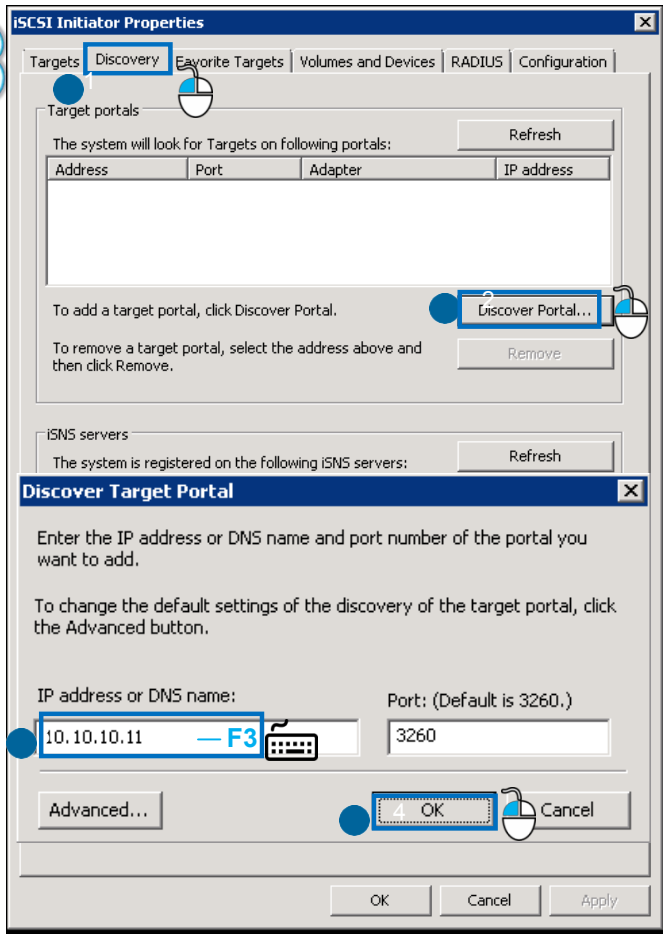
⚠ CAUTION

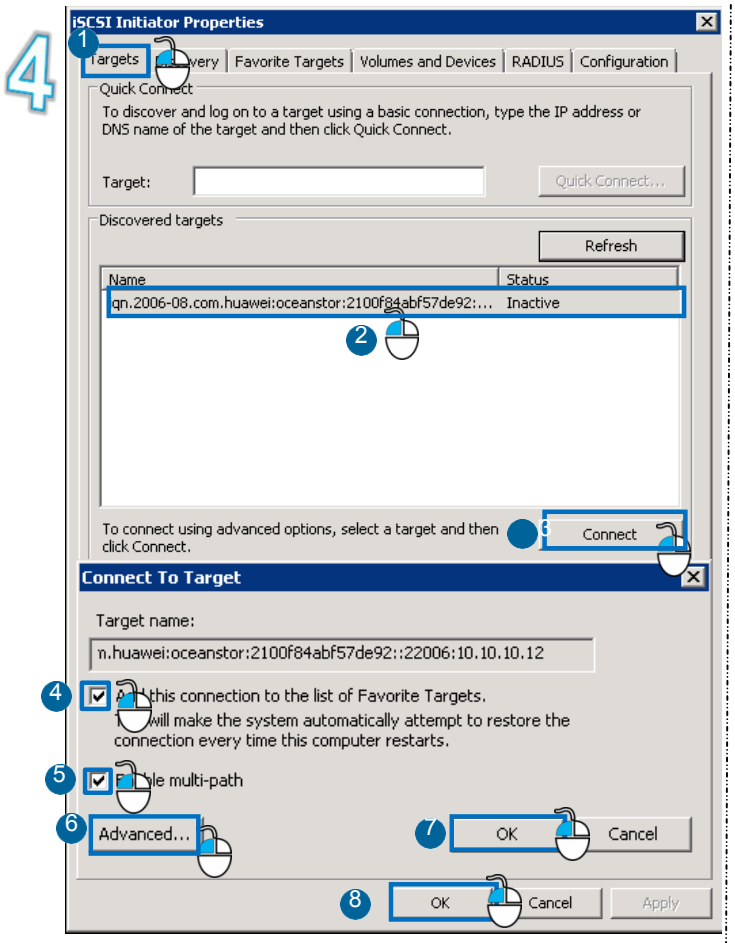
The name of an initiator must be unique. Otherwise, the connection between the storage system and the application server fails.

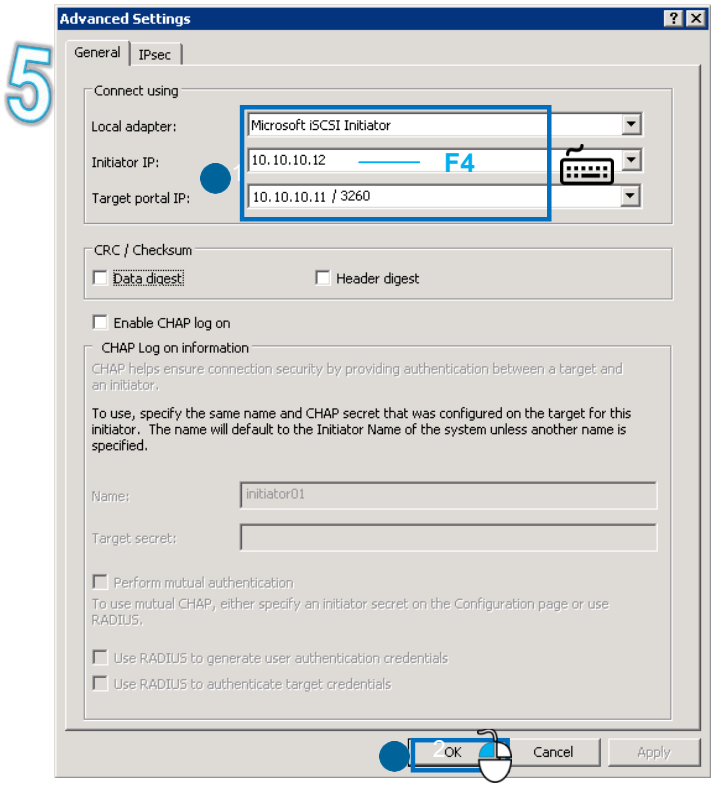
1



3







You have finished configuring an iSCSI initiator

5 Setting Up a Connection (Page 19)

4b SUSE 11

CAUTION

- The name of an initiator must be unique. Otherwise, the connection between the storage system and the application server fails.
- Example values of command variables and example output are in italic. Replace the values in italic with the actual values.
- Before modifying the configuration file, back up it.

Operation	SUSE 11
Log in to the application server	Enter **root** and its password
Verify the iSCSI initiator installation	Run **rpm -qa|grep open-iscsi** If the command output contains the iSCSI initiator version, the iSCSI initiator has been installed. If no command output is returned, the iSCSI initiator has not been installed.
Start the iSCSI service	Run **/etc/init.d/open-iscsi start** or **service open-iscsi start**
Set the iSCSI initiator name	**1.** Run **vi /etc/iscsi/initiatorname.iscsi** **2.** Press **i** 3. For the actual value. See **F2** in your data preparation table to modify the parameter in your command. Modify **InitiatorName=*initiator01*** **4.** Press **Esc** **5.** Run **:wq**
Set the automatic connection based on the iSCSI host port	1. For the actual value. See **F3** in your data preparation table to modify the parameter in your command. Run **iscsiadm -m discovery -t st -p** *10.10.10.11* **2.** Run **iscsiadm -m node -l** **3.** Run **vi /etc/iscsi/iscsid.conf** **4.** Press **i** **5.** Modify **node.startup=automatic** **6.** Press **Esc** **7.** Run **:wq**
Restart the iSCSI service for the configuration to take effect	Run **rcopen-iscsi start**
Check whether the settings are correct	Run **iscsiadm -m node -p** *10.10.10.11* The system displays the following information: `no records found!` The previous information indicates that the login to the target failed. Verify that the network connection is normal and previous parameter settings are correct.

You have finished configuring an iSCSI initiator → 5 Setting Up a Connection (Page 19)

4c Red Hat 6.X

CAUTION

- The name of an initiator must be unique. Otherwise, the connection between the storage system and the application server fails.
- Example values of command variables and example output are in italic. Replace the values in italic with the actual values.
- Before modifying the configuration file, back up it.

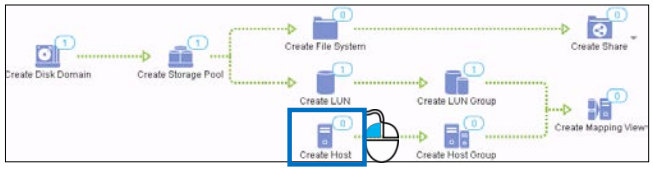
Operation	Red Hat 6.X
Log in to the application server	Enter **root** and its password
Verify the iSCSI initiator installation	Run **rpm -qa|grep iscsi** If the command output contains the iSCSI initiator version, the iSCSI initiator has been installed. If no command output is returned, the iSCSI initiator has not been installed.
Start the iSCSI service	Run **/etc/init.d/iscsi start** or **service iscsi start**
Set the iSCSI initiator name	**1.** Run **vi /etc/iscsi/initiatorname.iscsi** **2.** Press **i** 3. For the actual value. See **F2** in your data preparation table to modify the parameter in your command. Modify **InitiatorName=*initiator01*** **4.** Press **Esc** **5.** Run **:wq**
Set the automatic connection based on the iSCSI host port	1. For the actual value. See **F3** in your data preparation table to modify the parameter in your command. Run **iscsiadm -m discovery -t st -p** *10.10.10.11* **2.** Run **iscsiadm -m node -p** *10.10.10.11* **-l** **3.** Run **vi /etc/iscsi/iscsid.conf** **4.** Press **i** **5.** Modify **node.startup=automatic** **6.** Press **Esc** **7.** Run **:wq**
Restart the iSCSI service for the configuration to take effect	Run **/etc/init.d/iscsi restart**
Check whether the settings are correct	Run **iscsiadm -m node** If no command output is displayed, the login to the target failed. Verify that the network connection is normal and previous parameter settings are correct.

You have finished configuring an iSCSI initiator → 5 Setting Up a Connection (Page 19)

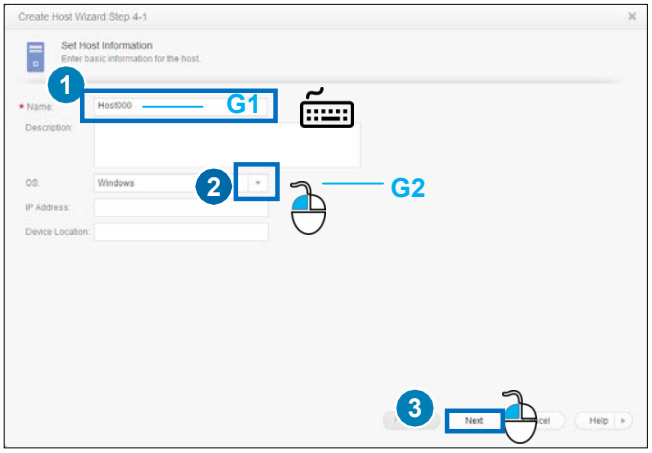
5 Setting Up a Connection

5a Creating a host

1



2



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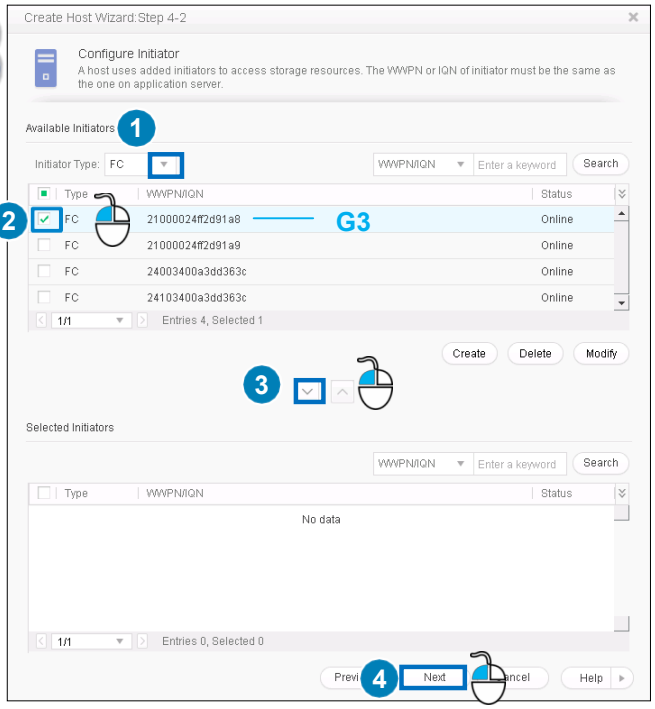
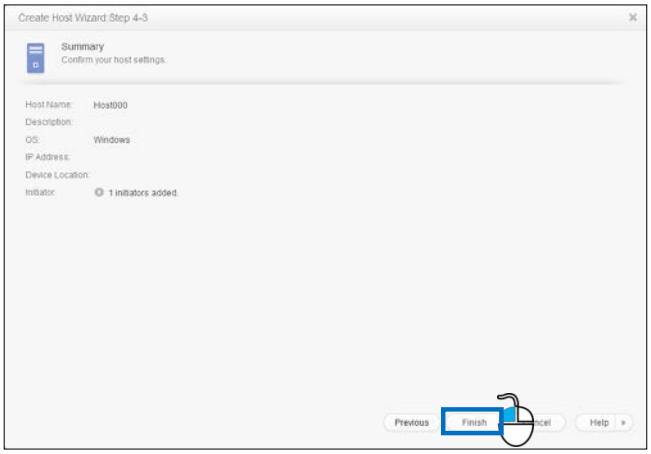


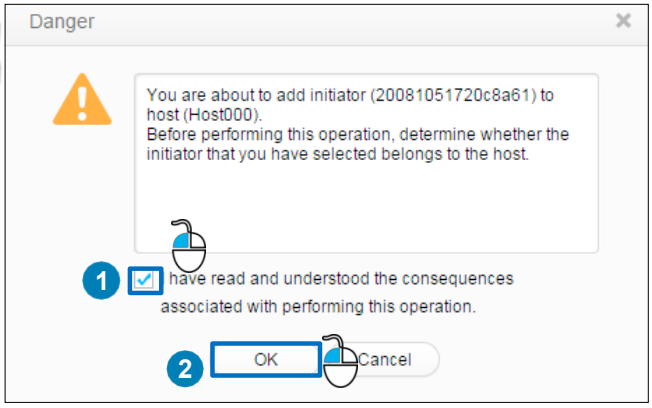
NOTE

In a Fibre Channel network environment, select **FC** for **Initiator Type**. In an iSCSI network environment, select **iSCSI** for **Initiator Type**.

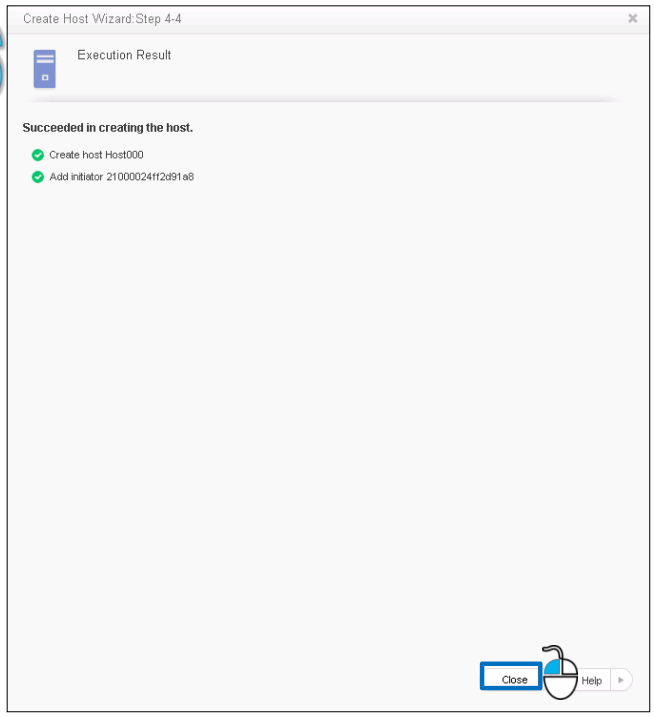
4



5

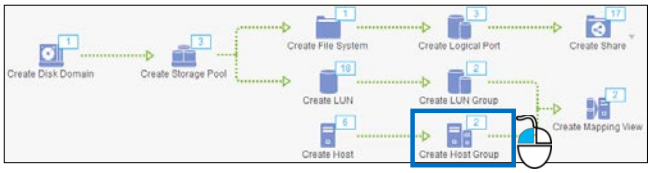


6



5b Creating a hostgroup

1



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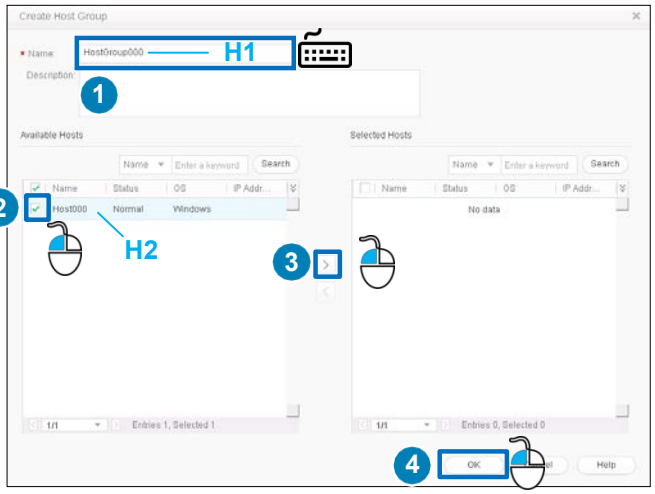

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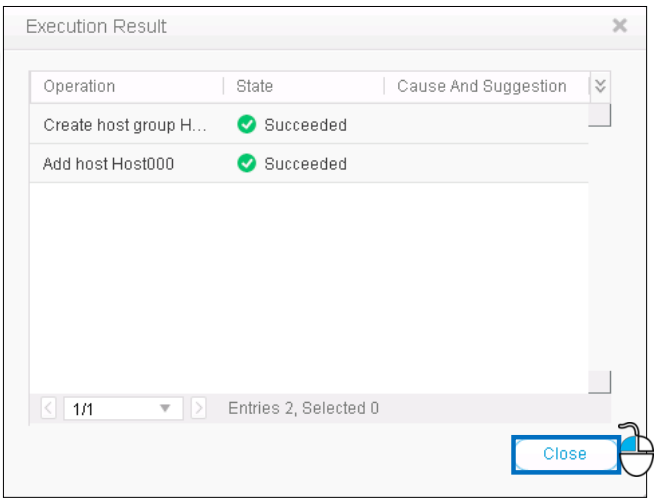
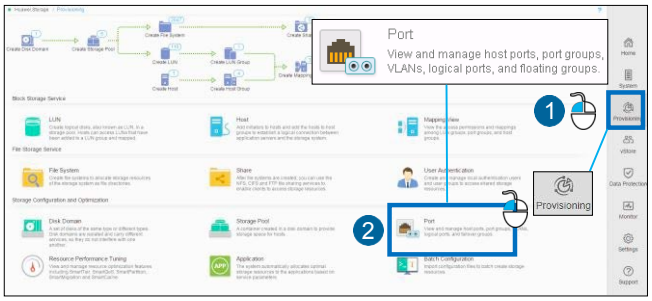


Determine whether to create a port group. See the actual value from **I1** in your data preparation table.

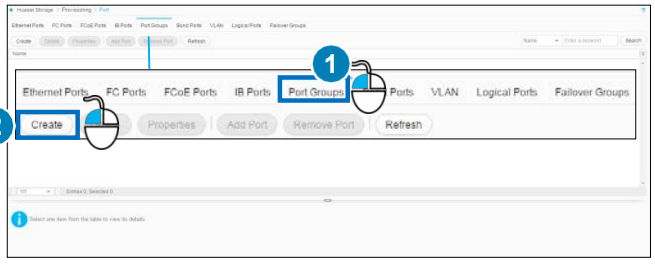
Yes	5c Creating a port group
No	5d Creating a mapping view

5c Optional: Creating a port group

1



2



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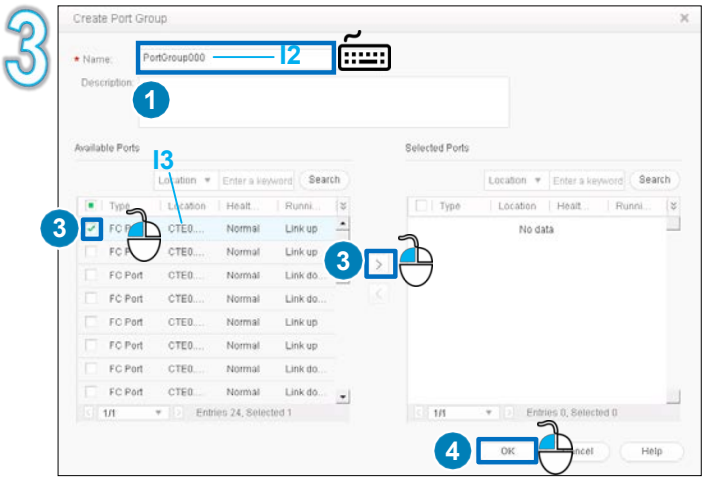

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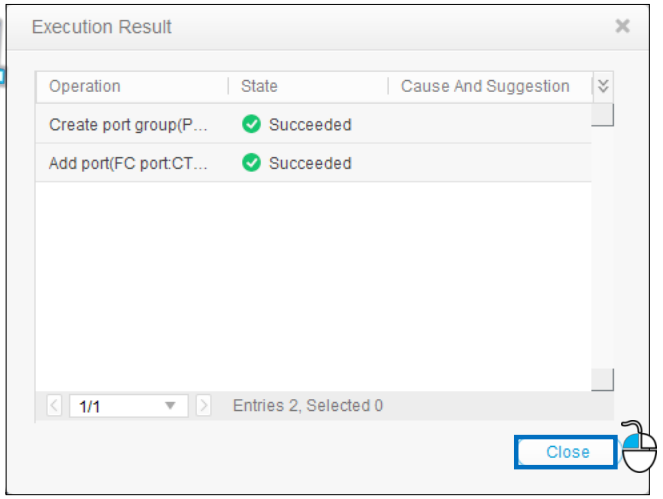
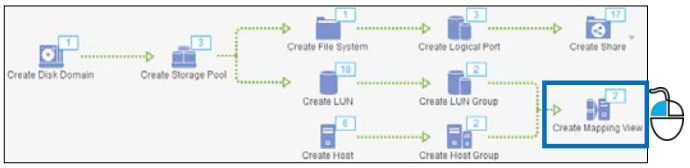


5d Creating a mapping view

1



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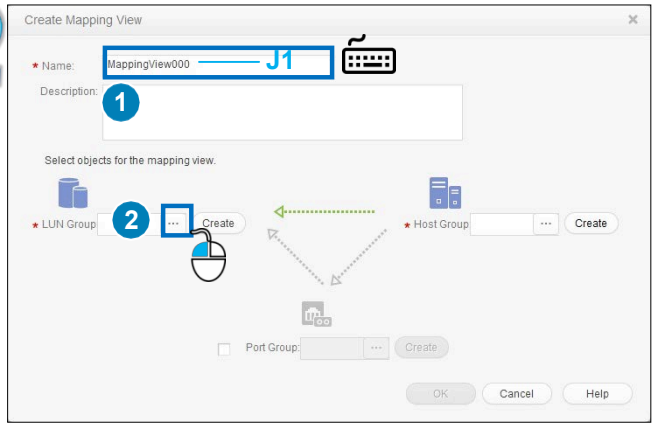
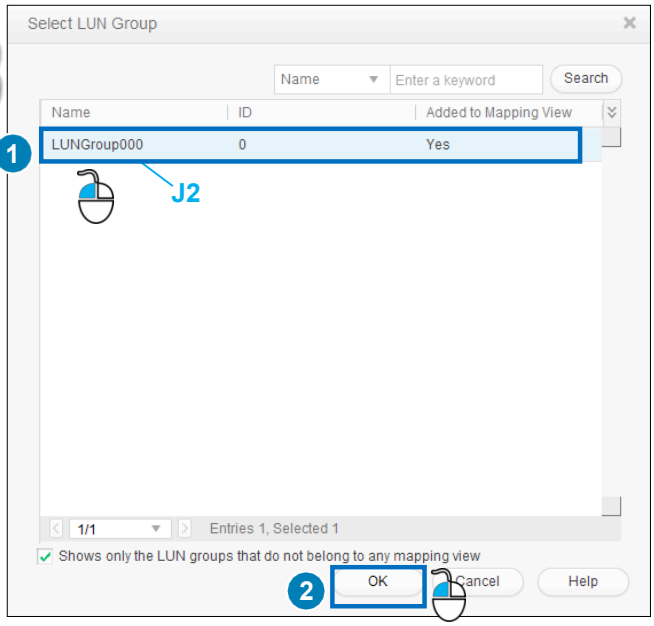
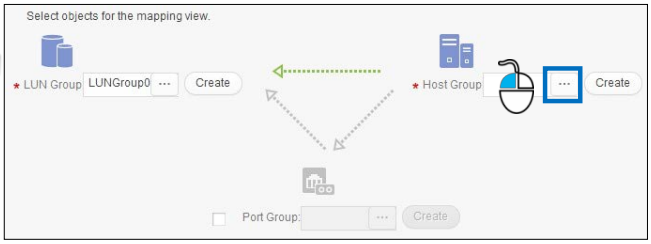


3



4



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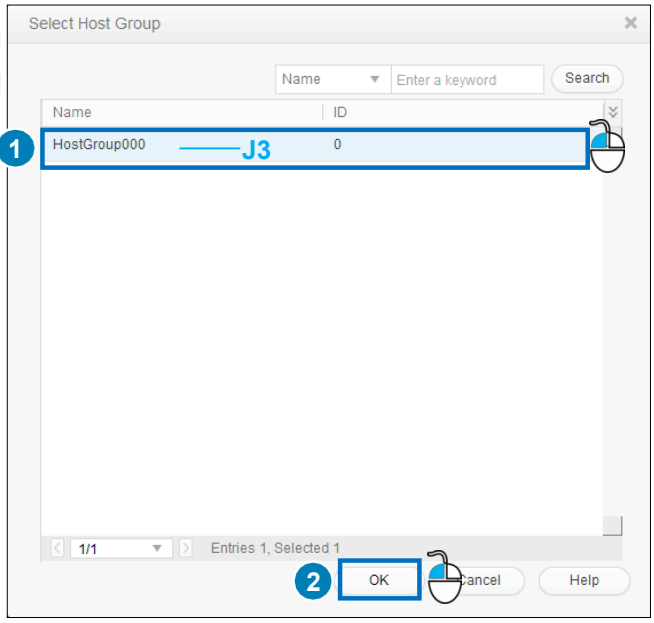
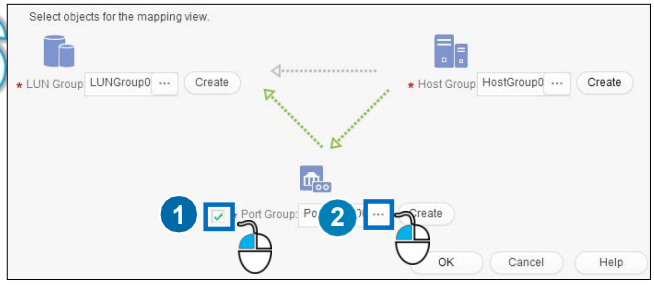


If a port group has been created → 6

If a port group has not been created → 8

6



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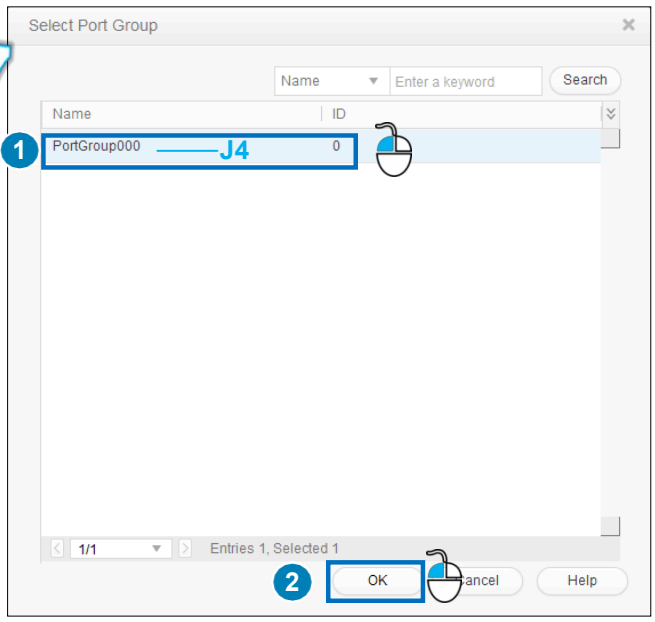

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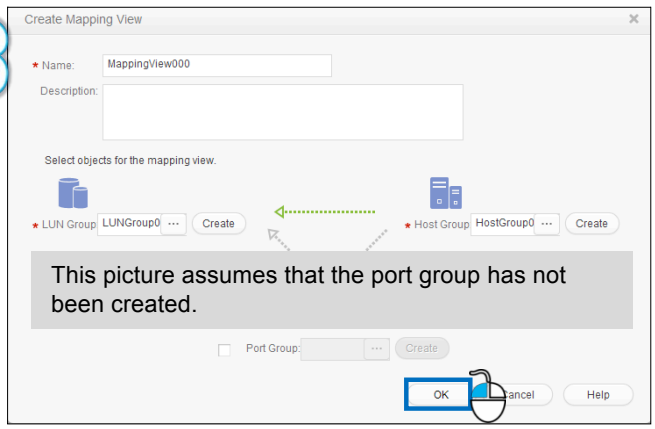

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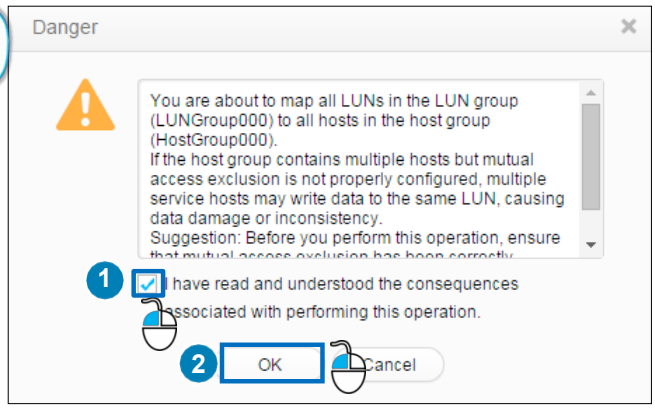

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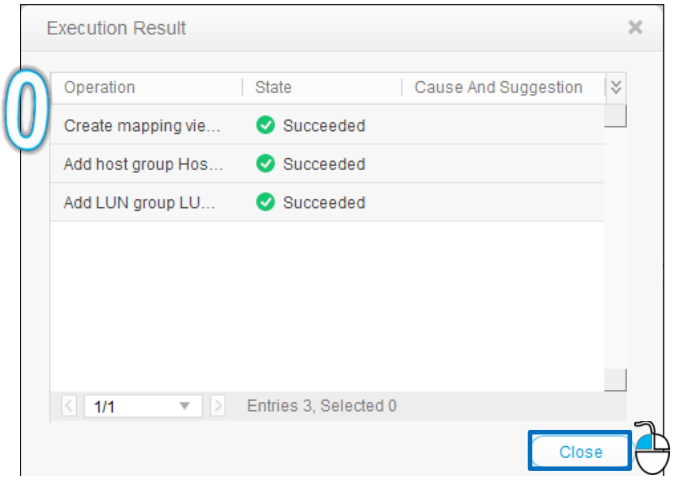
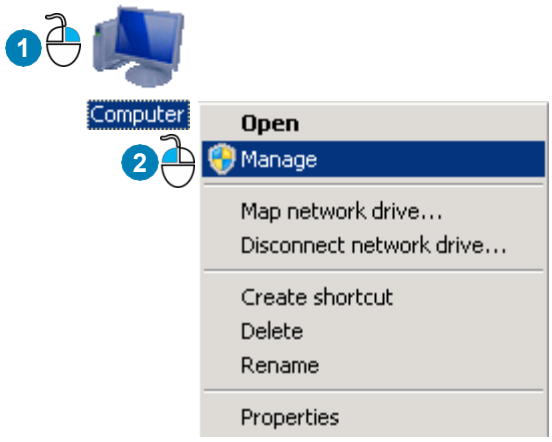


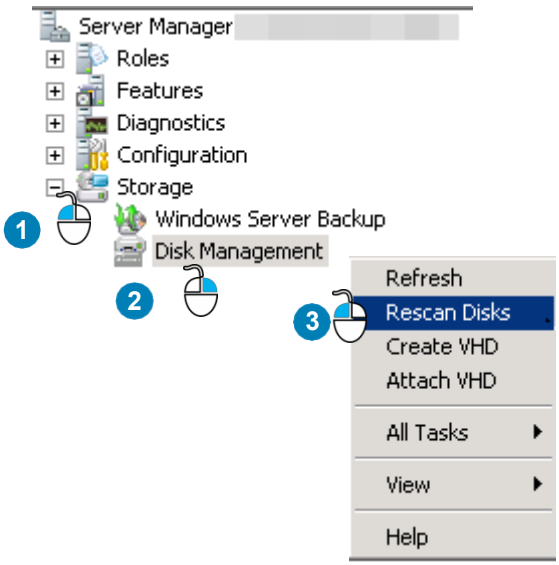
6 Using Storage Space

6a Windows Server 2008

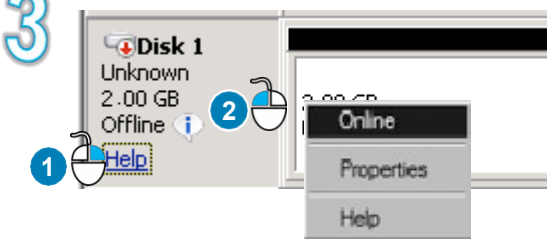
1



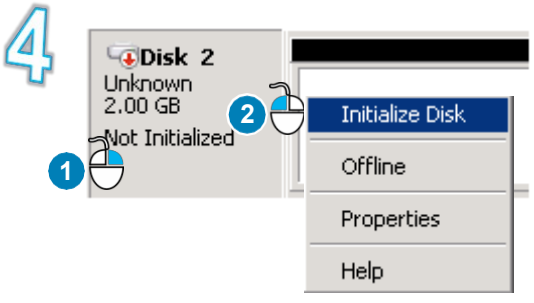
2



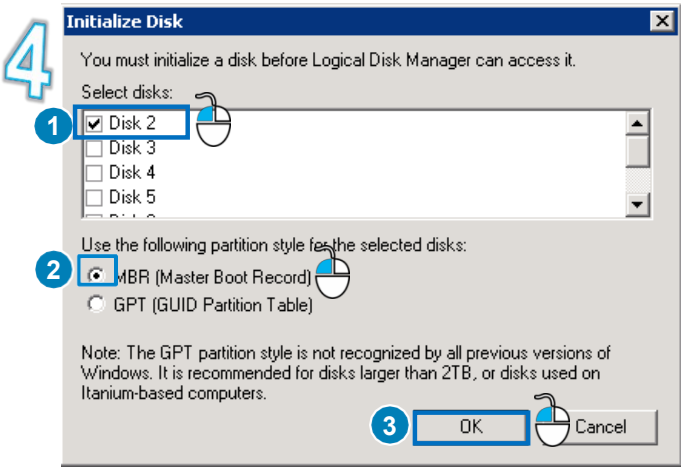
3



4



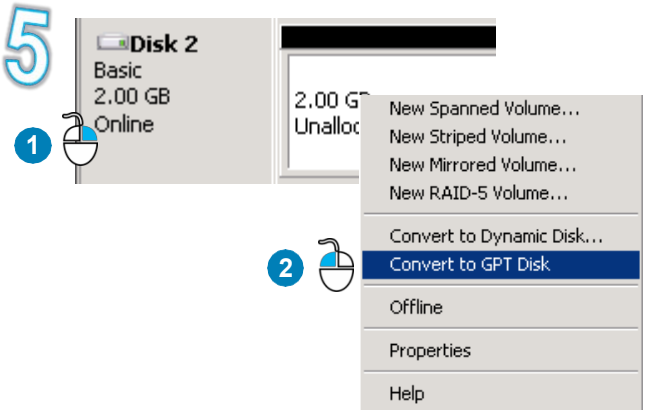
4



NOTE

Perform this step when the logical disk partition is larger than 2 TB.

5



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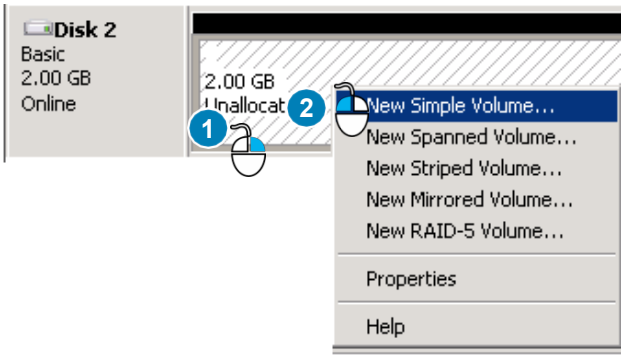
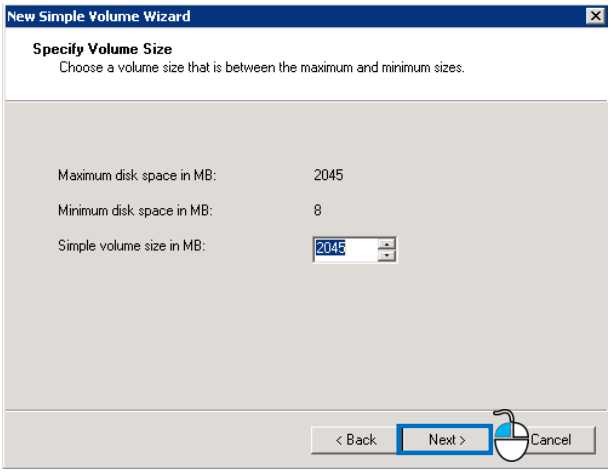


7

8



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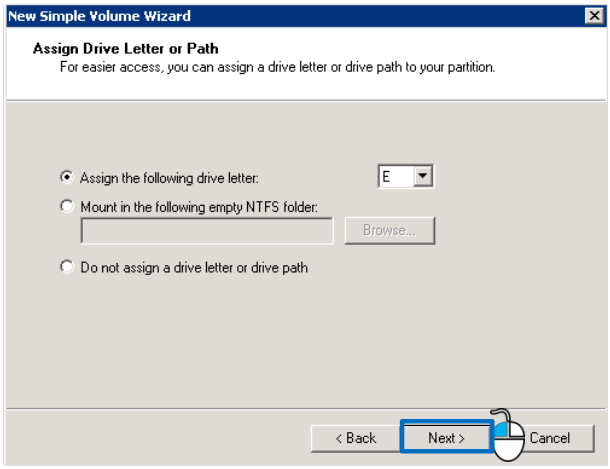

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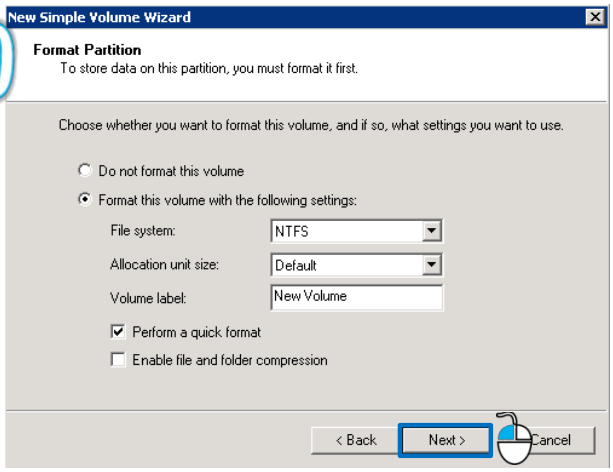
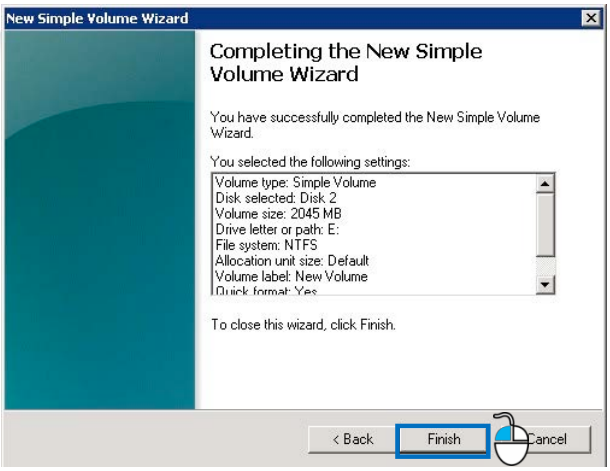
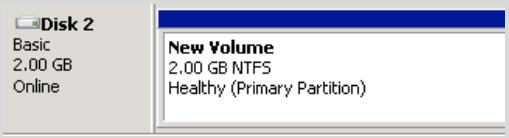


11



After partitioning, the logical disk that has been formatted is displayed as follows:



You have finished all configuration tasks. Now you can use the storage space provided by the storage system as a local disk.

6b SUSE 11

Operation	SUSE 11
Log in to the application server	Enter **root** and its password
Verify the UltraPath installation	Run **rpm -qa|grep UltraPath** If the command output contains the UltraPath version, the UltraPath has been installed.
Scan for LUNs	●iSCSI network and no UltraPath installed Run **/etc/init.d/open-iscsi restart** ●FC network and no UltraPath installed **1.** Run **lspci | grep -i fibre** The optical HBA type is displayed after **`Fibre Channel:`**. 2. --Emulex optical HBA Run **lsmod | awk '{print $1}' |grep lpfc** --QLogic optical HBA Run **lsmod | awk '{print $1}' |grep qla** The command output is the optical HBA driver name, for example, **xxxx**. *3.* Run **rmmod** *xxxx* *4.* Run **modprobe** *xxxx* ●iSCSI or FC network and UltraPath installed Run **hot_add**
View the information about all disks	Run **fdisk -l** The system displays the following information: `Disk /dev/sdc doesn't contain a valid partition table` **/dev/sdc** is the newly mapped logical disk and does not contain any partitions, ***/dev/sdc*** is used as an example.
Partition the logical disk	*1.* Run **fdisk** */dev/sdc* **2.** Enter **n** and press **Enter** **3.** Enter **p** and press **Enter** **4.** Enter **1** and press **Enter** The command output is: `First sector (…, default …)` **5.** Enter the value of **default** and press **Enter** The command output is: `Last sector, + sectors or +size{K,M,G} (…, default …)` **6.** Enter the value of **default** and press **Enter** **7.** Enter **w** and press **Enter**
Create a file system	Run **mkfs.ext3** */dev/sdc1*
Create a file directory	For the actual value. See **K1** in your data preparation table to modify the parameter in your command. Run **mkdir** */directory* **NOTICE** After mounting logical disks, modify the /etc/fstab file, set automatic loading configuration items, and bond universally unique identifiers (UUIDs) to prevent automatic logical disk loading failures or drive letter changes when the application server is restarted. For details, contact your operating system supplier or system administrator.

Operation	SUSE 11
Mount the partitioned logical disk to the directory	Run **mount** */dev/sdc1 /directory*
Check whether the logical disk has been mounted	Run **mount** The system displays the following information: `/dev/sdc1 on /directory type ext3 (rw)` The logical disk is mounted successfully.

You have finished all configuration tasks. Now you can use the storage space provided by the storage system as a local disk.

6c Red Hat 6.X

Operation	Red Hat 6.X
Log in to the application server	Enter **root** and its password
Verify the UltraPath installation	Run **rpm -qa|grep UltraPath** If the command output contains the UltraPath version, the UltraPath has been installed.
Scan for LUNs	●iSCSI network and no UltraPath installed Run **/etc/init.d/iscsi restart** ●FC network and no UltraPath installed **1.** Run **lspci | grep -i fibre** The optical HBA type is displayed after **Fibre Channel:**. 2. --Emulex optical HBA Run **lsmod | awk '{print $1}' |grep lpfc** --QLogic optical HBA Run **lsmod | awk '{print $1}' |grep qla** The command output is the optical HBA driver name, for example, **xxxx**. *3.* Run **rmmod** *xxxx* *4.* Run **modprobe** *xxxx* ●iSCSI or FC network and UltraPath installed Run **hot_add**
View the information about all disks	Run **fdisk -l** The system displays the following information: `Disk /dev/sdc doesn't contain a valid partition table` **/dev/sdc** is the newly mapped logical disk and does not contain any partitions, ***/dev/sdc*** is used as an example.
Partition the logical disk	*1.* Run **fdisk** */dev/sdc* **2.** Enter **n** and press **Enter** **3.** Enter **p** and press **Enter** **4.** Enter **1** and press **Enter** The command output is: `First cylinder (…, default …)` **5.** Enter the value of **default** and press **Enter** The command output is: `Last cylinder, +cylinders or +size{K,M,G} (…, default …)` **6.** Enter the value of **default** and press **Enter** **7.** Enter **w** and press **Enter**
Create a file system	Run **mkfs.ext3** */dev/sdc1*

Operation	Red Hat 6.X
Create a file directory	For the actual value. See **K1** in your data preparation table to modify the parameter in your command. Run **mkdir** */directory* **NOTICE** After mounting logical disks, modify the /etc/fstab file, set automatic loading configuration items, and bond universally unique identifiers (UUIDs) to prevent automatic logical disk loading failures or drive letter changes when the application server is restarted. For details, contact your operating system supplier or system administrator.
Mount the partitioned logical disk to the directory	Run **mount** */dev/sdc1 /directory*
Check whether the logical disk has been mounted	Run **mount** The system displays the following information: `/dev/sdc1 on /directory type ext3 (rw)` The logical disk is mounted successfully.

You have finished all configuration tasks. Now you can use the storage space provided by the storage system as a local disk

7 How to Contact Active Storage

●**Active Storage customer service center**
Address: 9233 Eton Ave., Chatsworth, CA 91311 USA
Tel: +1 (818) 709-1133
Email: info@activestorage.com
Website: http://activestorage.com

●**Active Storage technical support personnel**
Obtain technical support information at http://support.active-storage.com/hc/en-us