IBM Storage Management Console for VMware vCenter Version 3.2.1

User Guide



Note

Before using this document and the product it supports, read the information in "Notices" on page 99.

Edition notice

Publication number: GA32-0929-10. This publication applies to version 3.2.1 of the IBM Storage Management Console for VMware vCenter and to all subsequent releases and modifications until otherwise indicated in a newer publication.

© Copyright IBM Corporation 2010, 2014.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

Figuresv
Tables
About this guide. ix Who should use this guide ix Conventions used in this guide ix Related information and publications ix Getting information, help, and service ix Ordering publications ix Sending your comments ix
Chapter 1. Introduction 1 Main features and benefits. 1 Concept diagram 2 Compatibility and requirements 3 Download site. 3
Chapter 2. Installation. 5 First-time installation vs. upgrade 5 Running the installation wizard 5 Removing the IBM Storage Management Console software 7
Chapter 3. Configuration 9 Using the CLI configuration wizard 9 Restarting vSphere Client and verifying the installation. 10 Modifying the Management Console settings in the Windows Server registry 12 Modifying general settings 12 Replacing the common SSL certificate with a private certificate 14 Setting the storage pool or file system usage alert thresholds (color indications) 15 Assigning the required vCenter privileges 16
Chapter 4. Connecting to (adding) IBM storage systems 19 Adding an IBM storage system 19 Modifying access credentials for an IBM storage system 24 Setting multipath policy enforcement for a storage system 25 Enabling multipath policy enforcement 26 Changing the multipath policy 27 Disabling multipath policy enforcement 27 Removing an IBM storage system 28
Chapter 5. Attaching and detaching storage pools or file systems
Chapter 6. Creating, viewing, and managing volumes or file shares

Viewing volumes or file shares that are used by virtual machines															
Choosing which volumes to show															. 51
Viewing information in the LUN Details pane															
Viewing information in the File Share Details pane															. 59
Managing storage volumes (LUNs)															. 60
Extending a volume															. 61
Increasing datastore capacity on an extended volume															. 62
Renaming a volume															. 64
Moving a volume to another storage pool															
Mapping a storage volume to one or more ESX hosts															. 66
Unmapping a storage volume from one or more hosts															
Setting multipath policy enforcement for a storage volume															
Changing the multipath policy enforcement for a storage volume															
Disabling the multipath policy enforcement for a storage volume															
Deleting an unused storage volume															
Managing file shares															
Setting a quota for a file share															. 71
Disabling the quota of a file share															. 72
Exporting a NAS file share to hosts															
Removing a NAS file share from hosts															
Deleting an unused file share															
	•	•	• •	•	•	•	•	•	•	•	•	•	•	•	1
Chapter 7. Using volumes or file shares for datastor	00														77
Creating VMware datastores in storage volumes	•	·	• •	·	·	•	•	•	•	•	·	·	·	·	. //
$C \rightarrow C \rightarrow$															
Creating VMware datastores in file shares															
Creating VMware datastores in file shares															
Creating a virtual machine and connecting it to a datastore		•		•		•		•	•	•	•	•	•		. 85
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting			· ·					•							. 85 87
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms			•••												. 85 87 . 87
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file			•••	• • •										•	. 85 87 . 87 . 88
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	•	•••	••	••••	• • •	•		- -		• • •	• • •	• • •		• • •	. 85 87 . 87 . 88 . 88
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	•	• • • •	· ·	•	• • • •	•	• • •	- - -		• • •				• • •	. 85 87 . 87 . 88 . 88 . 88
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	• • • •	• • • • • •	· · ·	•	• • • •	•	• • •	- · ·					•	•	. 85 87 . 87 . 88 . 88 . 88 . 88 . 89
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	· · · ·	• • • • • •	· · ·	•	• • • • •	•	• • • •	- · ·	• • • •	• • • •			• • • •	•	. 85 87 . 87 . 88 . 88 . 88 . 88 . 89 . 90
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	· · · ·	• • • • • • • •	· · ·	•	· •	•	• • • • • • • • • • • • • • • • • • • •	- · ·	•	•	• • • • •	· • • •	•	•	. 85 87 . 87 . 88 . 88 . 88 . 88 . 89 . 90 . 91
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	· · · ·	· · ·	· · ·	•	· •	• • • • • • • • •	•	- · · · · · · · · · · · · · · · · · · ·	• • • • • • •	• • • • • • • • •	•	•	•	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 88 . 89 . 90 . 91 . 91
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	· · · · ·	• • • • • • • • •	· · ·	•	•	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	•	•	· · · · · · · · · · · · · · · · · · ·	•	•	•	. 85 87 . 87 . 88 . 88 . 88 . 89 . 90 . 91 . 91 . 92
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	• • • • • • • • • •	• • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	•	•		•	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	• • • • • • • • • •	• • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	•	•		•	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	• • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • •	•		• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • •	•	· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • •	. 85 87 . 87 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting Monitoring the status of recent tasks and triggered alarms Viewing the log file	• • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • •	•		• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • •	•	· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • •	. 85 87 . 87 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95
Creating a virtual machine and connecting it to a datastore	• • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	•		•	• • • • • • • • • • • • • • • • • • • •	•	•	· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • • • • • • • • •	. 85 87 . 87 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95
Creating a virtual machine and connecting it to a datastore	• • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 88 . 88 . 90 . 91 . 91 . 91 . 92 . 94 . 95 . 96 97
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting	· · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97
Creating a virtual machine and connecting it to a datastore	• • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97
Creating a virtual machine and connecting it to a datastore Chapter 8. Monitoring and troubleshooting	• • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97
Creating a virtual machine and connecting it to a datastore	• • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97
Creating a virtual machine and connecting it to a datastore	· · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97 99
Creating a virtual machine and connecting it to a datastore	• • • • • • • • • • • • •		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97
Creating a virtual machine and connecting it to a datastore	· · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	. 85 87 . 87 . 88 . 88 . 88 . 90 . 91 . 91 . 92 . 94 . 95 . 96 97 . 97 . 97 99

Figures

1.	Primary relationships and interaction between components	. 2
2.	Language selection dialogue box	. 6
3.	IBM Storage Management Console for VMware vCenter - installation wizard	. 6
4.	Destination Folder panel - default installation directory	. 7
5.	IBM Storage icon on the vSphere Client management tools.	. 11
6.	IBM Storage plug-in listed in the Plug-in Manager	. 11
7.	IBM Storage tab added to the vSphere GUI.	. 12
8.	IBM Storage plug-in listed in the Plug-in Manager ISU IBM Storage tab added to the vSphere GUI ISU Windows Registry Editor ISU	. 13
9.	Different colors displayed for storage pools and file systems	. 15
10.	IBM Storage management panels	
11.	Clicking Add on the pop-up menu.	20
12.	Add an IBM Storage System wizard	. 20
13.	Select Storage Pools name	23
14.	Select File Systems nanel	23
15.	Clicking Modify on the pop-up menu.	24
16.	Storage system details	
17.	Set Multipath Policy Enforcement dialog box	. 20
18.	Clicking Remove on the pop-up menu	29
10. 19.	Viewing attached storage pools and file systems of the selected storage systems	. 27
20.	XIV – Amount (GB) and percentage of free hard disk space on the storage pool.	
20. 21.	XIV – Amount (GB) and percentage of used hard disk space on the storage pool	
21.	XIV – Amount (GB) and percentage of used hard disk space on the storage poor	
22.	XIV – Amount (GB) and percentage of soft space used for snapshots	. 32
23. 24.	XIV – Amount (GB) and percentage of hard disk space currently in use by snapshots.	. 32
24. 25.	XIV – Amount (GB) and percentage of free soft space remaining for thin provisioning and snapshots	
	DS8000, Storwize, and SAN Volume Controller – Amount (GB) and percentage of real used capacity on the	. 33
26.		22
	storage pool	. 33
27		
27.	DS8000, Storwize, and SAN Volume Controller – Amount (GB) and percentage of free capacity on the	22
	storage pool	. 33
28.	storage pool	. 33
28. 29.	storage pool	. 33 33
28. 29. 30.	storage pool	. 33 33 . 33
28. 29. 30. 31.	storage pool	. 33 33 . 33 . 34
28. 29. 30. 31. 32.	storage pool	. 33 33 . 33 . 34 . 34
28. 29. 30. 31. 32. 33.	storage pool	. 33 33 . 33 . 34 . 34 . 34 . 35
 28. 29. 30. 31. 32. 33. 34. 	storage pool	. 33 33 . 33 . 34 . 34 . 34 . 35
 28. 29. 30. 31. 32. 33. 34. 35. 	storage pool	. 33 33 . 33 . 34 . 34 . 35 . 36 . 38
 28. 29. 30. 31. 32. 33. 34. 35. 36. 	storage pool	. 33 33 . 33 . 34 . 34 . 35 . 36 . 38 . 39
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 	storage pool	 33 33 33 34 34 35 36 38 39 40
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 	storage pool	 . 33 . 33 . 33 . 34 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 40
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 	storage pool	 . 33 . 33 . 33 . 34 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 40 . 41
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 	storage pool	 . 33 . 33 . 33 . 34 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 41 . 42
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 	storage pool	. 33 33 . 33 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 40 . 41 . 42 . 42 . 42
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 	storage pool	 . 33 . 33 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 41 . 42 . 42 . 43
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 	storage pool	 . 33 . 33 . 34 . 34 . 34 . 35 . 36 . 38 . 39 . 40 . 40 . 41 . 42 . 42 . 42 . 43 . 44
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 	storage pool DS8000, Storwize, and SAN Volume Controller – Amount (GB) of total capacity on the storage pool Storwize V7000 Unified and SONAS – Amount (GB) of used capacity on the storage pool or file system Storwize V7000 Unified and SONAS – Amount (GB) of total capacity on the storage pool or file system Attach button Clicking Attach Pools on the pop-up menu Attach Storage Pools or File Systems dialog box Pop-up menu for selected storage pools and file systems Displaying the storage adapters of a host Create New Volume on the pop-up menu Create New Volume wizard (SAN Volume Controller example) Setting the volume size with the graphic space marker Creating multiple volumes SAN Volume Controller and Storwize volume properties DS8000 volume properties with Enable Thin Provisioning option selected. Selecting the hosts, clusters, or datacenters for LUN mapping. Create New File Share on the pop-up menu Create New File Share of a selected datastore and the details of a selected volume (LUN) Displaying volumes of a selected datastore and the details of a selected volume (LUN) Displaying volume details when a virtual machine is selected.	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 	storage pool	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

54.	Snapshots view for XIV snapshots
55.	Mirroring view for an XIV volume
56.	Summary view for a regular DS8000 volume
57.	Mirroring view for an XIV volume. 54 Summary view for a regular DS8000 volume 54 FlashCopy replicas of a DS8000 volume 55
58.	Remote Copy details of a DS8000 volume
59.	Summary view for a regular Flex System, Storwize, or SAN Volume Controller volume
60.	FlashCopy replicas of a Flex System, Storwize, or SAN Volume Controller volume
61.	Remote Copy details of a Flex System, Storwize, or SAN Volume Controller volume
62.	Mirror Copy details of a Flex System, Storwize, or SAN Volume Controller volume
63.	Summary view for a NAS file share with quota
64.	Snapshots view for a NAS file share
65.	Snapshots view for a NAS file share
66.	Resize Volume dialog box - using the mouse pointer.
67.	Resize Volume dialog box - using the mouse pointer. 62 Datastore Configuration Tab – Properties button 63
68.	Datastore Properties dialog box
69.	Selecting the extended volume for the datastore size increase
70.	Clicking Rename on the pop-up menu
71.	Clicking Move on the pop-up menu to move the volume to another pool.
72.	Map LUN to Hosts dialog box
73.	Map LUN to Hosts dialog box
74.	Clicking Set Multipath Policy Enforcement on the pop-up menu.
75.	Setting Multipath Policy Enforcement on a volume
76.	Clicking Delete on the pop-up menu
77.	Clicking Set Quota on the pop-up menu
78.	Clicking Set Quota on the pop-up menu
79.	Clicking Export on the pop-up menu.
80.	Export NAS file share to hosts dialog box
81.	Remove export of NAS file share to hosts dialog box
82.	Clicking Delete on the pop-up menu
83.	Add Storage Wizard - Select Host Panel
84.	Add Storage Wizard - Select Host Panel
85.	Add Storage Wizard - Select Disk/LUN Panel
86.	Add Storage Wizard - Current Disk Layout Panel. 80
87.	Add Storage Wizard - Entering a datastore name
88.	Add Storage wizard 'Disk/LUN Formatting' panel
89.	Add Storage wizard – 'Disk/LUN – Formatting' panel
90.	Add Storage wizard – Select Host parter
91.	Add Storage wizard Entering a datastore name
91. 92.	Add Storage wizard – Entering a datastore name
92. 93.	Create New Virtual Machine wizerd Detectore selection papel
93. 94.	Create New Virtual Machine wizard – Datastore selection panel
94. 95.	vSphere Recent Tasks monitoring panel
	vopilete Recent Tasks Illollilollilg patier
96. 97.	vSphere Triggered Alarms monitoring panel
	vSphere Plug-in Manager – Disable option
98. 00	
99.	vSphere Plug-in Manager – Enable option

Tables

1.	Registry keys for general settings of the IBM Storage Management Console
2.	Required vCenter privileges
3.	Credentials required for accessing a storage system
	vSphere information event messages
	vSphere warning event messages
	vSphere error event messages
	Windows information event messages
	Windows warning event messages.
	Windows error event messages

About this guide

This guide describes how to install, configure, and use the IBM[®] Storage Management Console for VMware vCenter.

Who should use this guide

This guide is intended for system administrators who are familiar with the VMware vCenter and vSphere environments, and with the specific IBM storage system that is in use.

Conventions used in this guide

These notices are used in this guide to highlight key information.

Note: These notices provide important tips, guidance, or advice.

Important: These notices provide information or advice that might help you avoid inconvenient or difficult situations.

Attention: These notices indicate possible damage to programs, devices, or data. An attention notice appears before the instruction or situation in which damage can occur.

Related information and publications

You can find additional information and publication related to the IBM Storage Management Console for VMware vCenter on the following IBM, VMware, and Microsoft websites.

- IBM Storage Host Software Solutions Information Center (publib.boulder.ibm.com/infocenter/strhosts/ic)
- IBM Flex System[™] Information Center (publib.boulder.ibm.com/infocenter/ flexsys/information)
- IBM Scale Out Network Attached Storage (SONAS) Information Center (publib.boulder.ibm.com/infocenter/sonasic/sonas1ic)
- IBM Storwize[®] V3500 Information Center (publib.boulder.ibm.com/infocenter/ storwize/v3500_ic)
- IBM Storwize V3700 Information Center (publib.boulder.ibm.com/infocenter/ storwize/v3700_ic)
- IBM Storwize V7000 Information Center (publib.boulder.ibm.com/infocenter/ storwize/ic)
- IBM Storwize V7000 Unified Information Center (publib.boulder.ibm.com/ infocenter/storwize/unified_ic)
- IBM System Storage[®] SAN Volume Controller Information Center (publib.boulder.ibm.com/infocenter/svc/ic)
- IBM System Storage DS8000[®] Information Center (publib.boulder.ibm.com/ infocenter/dsichelp/ds8000ic)

- IBM XIV[®] Storage System Information Center (publib.boulder.ibm.com/ infocenter/ibmxiv/r2)
- VMware ESXi and ESX Info Center (www.vmware.com/products/vsphere/esxiand-esx)
- VMware Product Support for VMware vSphere (www.vmware.com/support/ product-support/vsphere), including support for ESX, ESXi, and vCenter
- VMware Technical Resources (www.vmware.com/technical-resources)
- VMware Documentation (www.vmware.com/support/pubs)
- VMware knowledgebase (kb.vmware.com)
- Microsoft TechNet website for Windows Server (technet.microsoft.com/en-us/ windowsserver)

Getting information, help, and service

If you need help, service, technical assistance, or want more information about IBM products, you can find various sources to assist you. You can view the following websites to get information about IBM products and services and to find the latest technical information and support.

- IBM website (ibm.com[®])
- IBM Support Portal website (www.ibm.com/storage/support)
- IBM Directory of Worldwide Contacts website (www.ibm.com/planetwide)

Ordering publications

The IBM Publications Center is a worldwide central repository for IBM product publications and marketing material.

The IBM Publications Center website (www.ibm.com/shop/publications/order/) offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download at no charge. You can also order publications. The publications center displays prices in your local currency.

Sending your comments

Your feedback is important in helping to provide the most accurate and highest quality information.

Procedure

To submit any comments about this guide or any other IBM Storage Host Software documentation:

- Go to the online feedback form (http://pic.dhe.ibm.com/infocenter/strhosts/ic/ topic/com.ibm.help.strghosts.doc/icfeedback.htm). You can use this form to enter and submit comments.
- You can send your comments by email to starpubs@us.ibm.com. Be sure to include the following information:
 - Exact publication title and version
 - Publication form number (for example: GC00-1111-22)
 - Page, table, or illustration numbers that you are commenting on
 - A detailed description of any information that should be changed

Note: When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Chapter 1. Introduction

The IBM Storage Management Console for VMware vCenter is a software plug-in that integrates with the VMware vCenter Server platform and enables VMware administrators to independently and centrally manage their storage resources on the following IBM storage systems:

- IBM Flex System V7000
- IBM Scale Out Network Attached Storage (SONAS)
- IBM Storwize V3500
- IBM Storwize V3700
- IBM Storwize V7000
- IBM Storwize V7000 Unified Storage System
- IBM System Storage DS8000
- IBM System Storage SAN Volume Controller
- IBM XIV Storage System

Depending on the IBM storage system in use, administrators can self-provision volumes (LUNs) in selected predefined storage pools, or self-provision file shares in selected predefined file systems. The volumes or file shares are mapped to VMware ESX and ESXi hosts, clusters, or datacenters as logical drives that can be used for storing VMware datastores (virtual machine data containers).

Main features and benefits

The IBM Storage Management Console for VMware vCenter runs as a Windows Server service on the vCenter server.

Any VMware vSphere client that connects to the vCenter server detects the service on the server and automatically enables the IBM storage management features on the vSphere client.

After the plug-in is installed and configured, the IBM Storage Management Console enables full integration with the VMware vSphere graphical user interface (GUI), in the form of an IBM Storage resource management tool and a dedicated IBM Storage management tab.

When using any supported IBM storage system except SONAS, the IBM Storage Management Console features and enables the following capabilities:

- Full control over storage volumes, including volume creation, resizing, renaming, migration to a different storage pool, mapping, unmapping, multipath policy enforcement, and deletion.
- Easy and integrated allocation of volumes to VMware datastores, used by virtual machines that run on ESX and ESXi hosts, clusters, or datacenters.

When using the IBM Storwize V7000 Unified and SONAS storage systems (as opposed to the other supported storage systems), the IBM Storage Management Console features and enables the following capabilities:

• Full control over file shares, including file share creation, setting file share quota, disabling file share quota, exporting to hosts, removing from hosts, and deletion.

• Easy and integrated allocation of file shares to VMware datastores used by virtual machines that run on ESX and ESXi hosts, clusters, or datacenters.

Concept diagram

The following concept diagram illustrates how IBM storage systems are accessed and controlled through the VMware environment.

It also shows the primary relationships and interaction between the VMware components and the IBM storage systems that provide the storage pools and file systems in which the volumes and file shares are created.

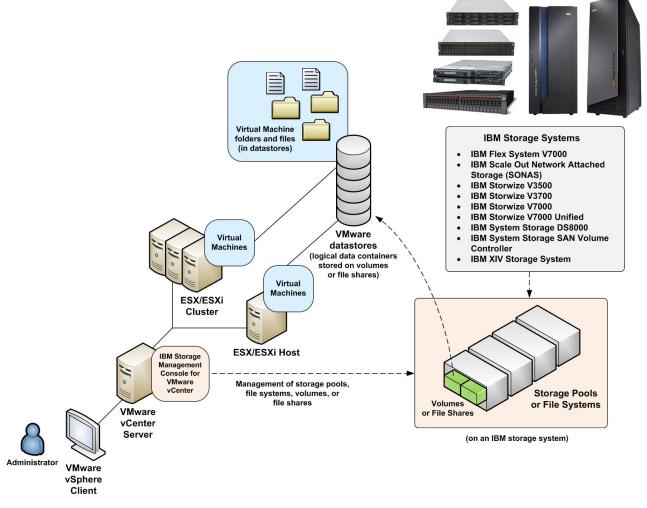


Figure 1. Primary relationships and interaction between components

Note: The IBM Storage Management Console for VMware vCenter can use only predefined storage pools or file systems. New storage pools or file systems cannot be created from the IBM Storage Management Console.

Compatibility and requirements

For complete and up-to-date information about the compatibility and requirements of the IBM Storage Management Console for VMware vCenter, refer to the latest release notes.

You can find the latest release notes on the IBM Storage Host Software Solutions Information Center (publib.boulder.ibm.com/infocenter/strhosts/ic) or on the IBM Fix Central (www.ibm.com/support/fixcentral).

Note: Refer to the relevant VMware documentation for information about how to install the compatible versions of vCenter Server and vSphere Client. You should also refer to the latest installation and configuration instructions for ESX and ESXi servers.

Download site

The IBM Storage Management Console for VMware vCenter is available as a free plug-in for VMware vCenter.

You can download the latest version at any time from the IBM Fix Central (www.ibm.com/support/fixcentral).

Chapter 2. Installation

After downloading the IBM Storage Management Console software package, you can begin the installation as described in the following sections.

- "First-time installation vs. upgrade"
- "Running the installation wizard"
- "Removing the IBM Storage Management Console software" on page 7

First-time installation vs. upgrade

When you run the installation on a system with an existing installation of the IBM Storage Management Console, the uninstallation wizard is automatically invoked and you must uninstall the existing version.

The installation wizard of the new version (see "Running the installation wizard") starts only after the previous version has been uninstalled. During the uninstallation, the existing database is not removed, but kept for use by the new software version. However, if you have been using your own private SSL key and a signed SSL certificate, you should replace these files again after the upgrade, as described in "Replacing the common SSL certificate with a private certificate" on page 14.

Note: The upgrade of the IBM Storage Management Console for VMware vCenter takes effect only after you close and restart the VMware vSphere client software.

Running the installation wizard

Perform the following procedure to install the IBM Storage Management Console on the VMware vCenter server.

Procedure

- 1. Depending on the operating system architecture, run the installation package file.
 - On x86 architectures, run: IBM_Storage_Management_Console_for_VMware_vCenter-3.2.1-x86.exe
 - On x64 architectures, run: IBM Storage Management Console for VMware vCenter-3.2.1-x64.exe
- 2. From the language selection dialog box, select the language that you want to use in the installation wizard, and then click **OK**.

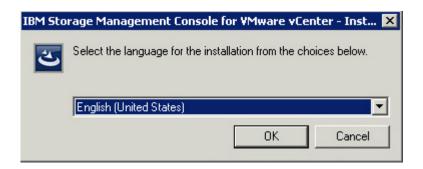


Figure 2. Language selection dialogue box

Note: The language selection affects only the text that is displayed on the installation wizard, including the language used in the IBM license agreement. It does not affect the configuration wizard and GUI of the IBM Storage Management Console for VMware vCenter, which are available in English only.

The installation wizard of the IBM Storage Management Console for VMware vCenter starts.

🙀 IBM Storage Management	Console for VMware vCenter - InstallShield Wizard 🛛 🗙
2	Welcome to the InstallShield Wizard for IBM Storage Management Console for VMware vCenter
	The InstallShield(R) Wizard will install IBM Storage Management Console for VMware vCenter on your computer. To continue, click Next.
	WARNING: This program is protected by copyright law and international treaties.
	<pre> Eack Next > Cancel </pre>

Figure 3. IBM Storage Management Console for VMware vCenter - installation wizard

- 3. Click Next. The License Agreement panel is displayed.
- 4. Read the IBM License Agreement and then select **I accept the terms in the license agreement**.
- 5. Click Next. The Destination Folder panel is displayed.

6. Use the default installation directory (C:\Program Files\IBM\IBM Management Console for VMware vCenter) or click **Change** to install in a different directory.

🛃 IBM Stor	age Management Console	for ¥Mware vC	enter - InstallShie	eld Wizard 🛛 🗙
	on Folder kt to install to this folder, or clic	ck Change to insta	ll to a different folde	C
	Install IBM Storage Managen C:\Program Files\IBM\IBM Ma vCenter\			Change
InstallShield -		< Back	Next >	Cancel

Figure 4. Destination Folder panel - default installation directory

- 7. Click **Next**. The Ready to Install the Program panel is displayed.
- **8**. Click **Install** to begin the installation. After the installation is complete, the Completed panel is displayed.
- 9. Select Launch the Configuration Wizard, and then click Finish.

Note: Select the **CLI configuration wizard** option to start it automatically (see "Using the CLI configuration wizard" on page 9) after the installation.

Removing the IBM Storage Management Console software

If you want to remove the IBM Storage Management Console from the vCenter server, perform the following procedure.

Procedure

1. Close the vSphere Client application.

Important: Do not uninstall the IBM Storage Management console software before closing the vSphere Client application.

2. Go to **Control Panel** > **Programs** > **Programs and Features**, select the IBM Storage Management Console for VMware vCenter from the list of installed programs, and then click **Uninstall**. The uninstallation wizard guides you through the remaining uninstallation steps.

What to do next

After the uninstallation, if you want to clear the locally saved configurations, perform the following steps.

- 1. Go to the Windows/Temp directory.
- 2. Delete the keys_temp folder, along with the following files:
 - vc_plugin.db
 - vc_plugin_reg.bck

Chapter 3. Configuration

Before you start using the IBM Storage Management Console for VMware vCenter, different configuration and verification procedures are required, as detailed in the following sections.

- "Using the CLI configuration wizard"
- "Restarting vSphere Client and verifying the installation" on page 10
- "Assigning the required vCenter privileges" on page 16

In addition, refer to "Modifying the Management Console settings in the Windows Server registry" on page 12 for information about optional configuration.

Using the CLI configuration wizard

Use the command-line interface (CLI) configuration wizard to log in to the vCenter server and register extensions on the server.

About this task

The CLI configuration wizard starts right after the installation if the option to launch it was selected. If the option was not selected and the wizard does not start, you can start it from the IBM folder that is located on the **All Programs** list of the **Windows Start** menu.

The Welcome message is displayed when the configuration wizard starts.

```
Welcome to the IBM Storage Management Console for VMware vCenter setup wizard,
version 3.2.1.
Use this wizard to configure the IBM Storage Management Console for VMware vCenter.
Press [Enter] to proceed.
```

Procedure

Perform the following steps to configure the IBM Storage Management Console for VMware vCenter:

1. Press Enter. The following message is displayed:

The Wizard will now install the IBM Storage Management Console service and register the extension in the vCenter server. Do you want to continue? [default: yes]:

2. Press **y** to proceed. The following message is displayed:

The IBM Storage Management Console requires a valid username for connecting to the vCenter server. This user should have permission to register the Plug-in in the Plug-in Manager. Please enter a username:

3. Enter the user name for accessing the VMware vCenter server. Then, enter your password.

Note: You must have permission to register extensions on the vCenter server. If the password that you enter is not correct, you are prompted to enter your user name and password again.

After you successfully log in to the vCenter server with your user name and password, the following message is displayed:

The IBM Storage Management Console for VMware vCenter web component requires a valid network port number. Please enter a port number for the web component [default: 8880]:

4. Enter the port number that should be used for HTTP requests, from the vSphere client. The following message is displayed:

The IBM Storage Management Console for VMware vCenter is now configured. Press $[{\rm ENTER}]$ to proceed.

5. Press **Enter**. An extension is registered and verified on the vCenter server and the installation is complete.

Note: If any error occurs during the configuration, a record is added to the log file (see "Viewing the log file" on page 88).

Restarting vSphere Client and verifying the installation

After you install and configure the IBM Storage Management Console for VMware vCenter with the CLI configuration wizard, you must restart the vSphere Client application.

After the vSphere Client restarts, the IBM Storage icon becomes available on the vSphere management tools.

	nventory Administratio					
l 🖬 💧	Home					
nventory						
Q	P	Ð		9		
Search	Hosts and Clusters	VMs and Templates	Datastores	Networking		
Administration						
6	>_			₽	Q2	2
Roles	Sessions	Licensing	System Logs	vCenter Server Settings	vCenter Service Status	Licensing Reporting Manager
Management		/				
20		14	1	B	TBM	
Scheduled Tasks	Events	Maps	Host Profiles	Customization Specifications Manager	IBM Storage	

Figure 5. IBM Storage icon on the vSphere Client management tools

In addition, the IBM Storage plug-in appears on the Installed Plug-ins list of the vCenter Plug in Manager.

Plug-in	n Name	Vendor	Version	Status	Description	Progress	Errors
Instal	lled Plug-ins			43 5 10 10 10 10 10 10 10 10 10 10 10 10 10			heree weeks
8	VMware vCenter Storage Mon	VMware Inc.	5.5	Enabled	Storage Monitoring and		
					Reporting		
3	vCenter Service Status	VMware, Inc.	5.5	Enabled	Displays the health status of		
					vCenter services		
3	vCenter Hardware Status	VMware, Inc.	5.5	Enabled	Displays the hardware status of		
					hosts (CIM monitoring)		
A	IBM Storage Management C	IBM, Corp.	3.2.1	Disabled	Manage IBM Storage Arrays		
🐣 Availa	able Plug-ins	Ibn, corp.	51211	Disabica	Hanage ton Storage Hirays		
-		ibn, cop.	512.12	District	nanagu tan skuragu niraya		

Figure 6. IBM Storage plug-in listed in the Plug-in Manager

When the IBM Storage Management Console is properly installed, the IBM Storage tab is added to the vSphere management GUI. You can access the tab from the Datacenter, Cluster, Host, Datastore, and Virtual Machine inventory views. From the IBM Storage tab, you can view and fully manage storage volumes and file shares, as explained in the next chapters.

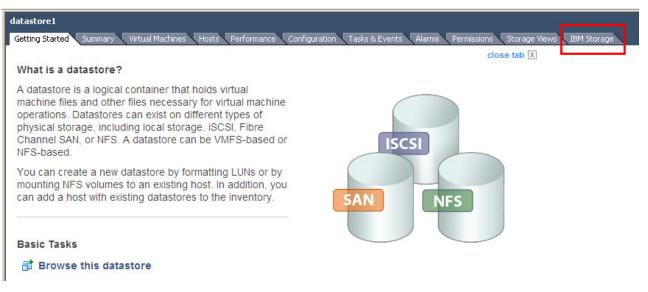


Figure 7. IBM Storage tab added to the vSphere GUI

Modifying the Management Console settings in the Windows Server registry

You can modify different functionalities of the IBM Storage Management Console by changing registry keys of the Windows Server upon which the VMware vCenter software is installed.

Attention: Perform registry changes with caution. All changes that apply to the IBM Storage Management Console must be performed on the vCenter server and not on the vSphere client. Before making any change, it is recommended to back up the Windows Server registry.

This section describes:

- "Modifying general settings"
- "Replacing the common SSL certificate with a private certificate" on page 14
- "Setting the storage pool or file system usage alert thresholds (color indications)" on page 15

Modifying general settings

Perform the following steps to access the relevant registry keys and change general settings of the IBM Storage Management Console for VMware vCenter.

Procedure

- 1. From the Windows taskbar, select **Start** > **Run**. The Run dialog box is displayed.
- 2. Type **regedit** and then press **Enter**. The Registry Editor is displayed.

3. Go to the following registry tree path:HKEY_LOCAL_MACHINE\SYSTEM\ CurrentControlSet\Services\IBMConsoleForvCenter\Parameters

🗄 🔚 flpydisk	▲ Name	Туре	Data
🗄 📲 FltMgr	ab (Default)	REG SZ	(value not set)
E FontCache	Cache_update_in	REG DWORD	0x00000708 (1800)
E- 🐌 FontCache3.0.0.0	ab db relative path	REG SZ	data\vc plugin.db
E B FS_Rec	👸 essni_port	REG DWORD	0x00006364 (25444)
🗄 🎍 FsDepends	100 level	REG DWORD	0x0000000a (10)
🗄 🎍 gagp30kx		REG SZ	eventlog,file
E gpsvc	page_refresh_int	이 이 이 아들은 것이 이 가지 않는 것이 있다.	0x00000002 (2)
E homon	page_reload_inte		0x00001c20 (7200)
HDAudBus	Bipool major thres		0x0000005f (95)
HidBatt	pool minor thres		0x0000005a (90)
∃ hidserv Hid∪sb	pool_warning_thr		0x00000050 (80)
HidUsb Fill hkmsvc	10 port	REG DWORD	0x000022b0 (8880)
	ab ssl_ca_certificate		ssl\cacert.pem
	ab ssl_private_key_file		ssl\privkey.pem
	time_to_wait_for		0×0000003c (60)
i8042prt		REG DWORD	0x00000000 (0)
	ab vcenter_fqdn	REG SZ	localhost
IBMConsoleForvCenter	- Weinen _ idan	NEG_DE	localitose
Parameters			

Figure 8. Windows Registry Editor

4. Use the following table to determine the parameters that you want to change. In addition, refer to the following subsections to change additional parameters.

Table 1. Registry keys for general settings of the IBM Storage Management Console

Registry key	Description	Default value
cache_update_interval	The time interval (in seconds) between each cache update operation. Information from the vCenter server is updated in the cache upon each update operation.	1800 (30 minutes)
essni_port	Relevant only to the DS8000 storage system. The Java [™] Daemon ESSNI port number through which the DS8000 system information is retrieved in order to carry out DS8000 operations from the IBM Storage Management Console GUI.	25444
log_level	 The type of messages to be logged in the log file: 10 – Debug messages – Use this value only if instructed to do so by IBM support. 20 – Info messages 30 – Warning messages 40 – Error messages Mote: Do not modify this key manually unless you are requested to do so by IBM Support. For more information, see "Viewing the log file" on page 88 and "Event messages in Windows Server" on page 91. 	20 (info)

Registry key	Description	Default value
log_target	The target of the logging operation. By default, the log is written to a file and to the Event Viewer application log. Note: Do not modify this key manually unless you are requested to do so by IBM Support.	eventlog, file
page_refresh_interval	The refresh interval in seconds for updating the information displayed on the vSphere client. This parameter does not reload cache information.	2

Table 1. Registry keys for general settings of the IBM Storage Management Console (continued)

Important: After you have made the required registry modifications:

- 1. Close the vSphere client application.
- 2. Restart (end and then start) the Windows service of the IBM Storage Management Console.
- **3**. Start the vSphere client application.

Replacing the common SSL certificate with a private certificate

The IBM Storage Management Console uses a Secure Sockets Layer (SSL) protocol for communication between the vSphere client and the vCenter server.

About this task

The installation package includes a private SSL key and an unsigned SSL certificate. For non-interruptible management from vSphere Client, it is recommended to replace the provided key and certificate with your own private key and a signed certificate.

Important: If you choose to replace these files, you should repeat this file replacement action after installing a newer version of the IBM Storage Management Console. For more information, see "First-time installation vs. upgrade" on page 5.

Procedure

Perform the following procedure to replace the SSL private key and certificate.

- 1. Copy a private key file and a certificate file to the SSL subdirectory of the installation directory.
- 2. Go to the following registry tree path: HKEY_LOCAL_MACHINE\SYSTEM\ CurrentControlSet\Services\IBMConsoleForvCenter\Parameters
- **3**. Modify the following registry keys with the relative path to your own SSL files (the ones that you copied to the SSL subdirectory):
 - ssl_ca_certificate_file Contains the relative path to the certificate file.
 - ssl_private_key_file Contains the relative path to the private key file.

Setting the storage pool or file system usage alert thresholds (color indications)

You can change the usage alert triggering thresholds for storage pools and file systems by modifying the relevant registry keys.

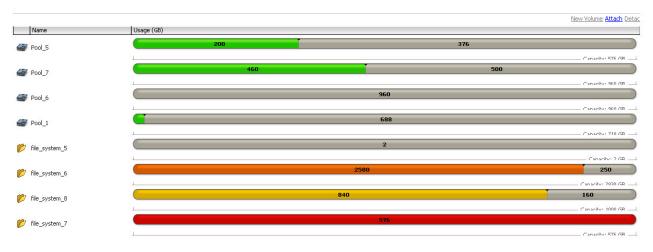
Procedure

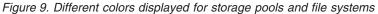
If necessary, change the following registry keys:

- **pool_warning_threshold** Contains the pool size limit percentage beyond which the storage pool or file system bar color changes to yellow, notifying you about over-the-limit use of pool space. The default limit value is 80%.
- **pool_minor_threshold** Contains the size limit percentage beyond which the storage pool or file system bar color changes to orange, notifying you about near-critical over-the-limit use of pool space. The default limit value is 90%.
- pool_major_threshold Contains the size limit percentage beyond which the storage pool or file system bar color changes to red, alerting you about critical over-the-limit use of pool space. The default limit value is 95%. These registry keys are located under the same registry path that is used for all other settings:HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\ IBMConsoleForvCenter\Parameters

The following figure shows how different colors are displayed for storage pools and file systems.

Note: Storage pools are applicable to all storage systems except SONAS. File systems are applicable to Storwize V7000 Unified and SONAS.





Note: For more information about storage pools and file systems, refer to Chapter 5, "Attaching and detaching storage pools or file systems," on page 31.

Assigning the required vCenter privileges

Depending on your actual usage of the IBM Storage Management Console for VMware vCenter, you must have minimum vCenter user privileges, as detailed in the following table.

Table 2.	Required	vCenter	privileaes
10010 -	i ioquii ou	10011101	privilogoo

Actual usage	Required vCenter user privilege	
Monitoring only	 Extension - Select all privileges in this category. Global - In this category, select Log Event. Tasks - Select all privileges in this category. 	
Storage provisioning	 All privileges required for monitoring only (see above). Host - In this category, select Configuration > Storage partition configuration. 	

Add New Role	×
Edit the role name or select check boxes to change privileges for this Name: Allow Storage Provision Privileges	role.
 Host CIM Configuration Advanced settings Authentication Store Change date and time settings Change PciPassthru settings Change settings Change SNMP settings Connection Firmware Hyperthreading Maintenance Memory configuration Network configuration Power Query patch Scurity profile and firewall Storage partition configuration System Management 	
Help OK	Cancel

For more detailed information about how to set vCenter privilege types, refer to the VMware publication (www.vmware.com/pdf/vi3_vc_roles.pdf).

Chapter 4. Connecting to (adding) IBM storage systems

Before you can create volumes or file shares for datastores, you must first connect to (add) at least one IBM storage system, by using appropriate credentials.

Accordingly, this chapter describes:

- "Adding an IBM storage system"
- "Modifying access credentials for an IBM storage system" on page 24
- "Setting multipath policy enforcement for a storage system" on page 25
- "Removing an IBM storage system" on page 28

Adding an IBM storage system

Perform the following procedure to add an IBM storage system on which you can create and manage storage volumes (LUNs) or file shares.

Procedure

1. Click the IBM Storage icon located on the vSphere Client management tools (see Figure 5 on page 11). The IBM Storage management panels are displayed.

Storage Systems		Storage Pools				
		Add Modify Remove				New Volume Attach Detad
Model Ic	dentification Multi	ipath Policy	Name	Usage (GB)		
Storwize V7000 Unified 79	92079394769872812 Not E	Enforced	mdiskgrp0	2	300	3276
			📂 waynetest1	C	2	Capacity: 2 GB
			📂 waynetest2		106	Capacity: 107 GB
Details			📂 vCenterTest		149	Capacity: 150 GB
System ID	792079394769872	2812				
System Name	06evk24.ibm					
User Name	storageadmin					
Version	1.3.0.2-120110000	503				
Management IP / Hostname	9.115.246.11					
Interface IPs 💭	9.115.246.14 9.115.246.15			Т		

Figure 10. IBM Storage management panels

- The **Storage Systems** panel shows the IBM storage systems that are currently connected to the IBM Storage Management console for VMware vCenter.
- The **Details** panel shows the details of the selected (highlighted) storage system.
- The **Storage Pools** panel shows the storage pools that are attached to the selected (highlighted) storage system. For Storwize and SONAS systems, it also shows the file systems that are attached to the selected (highlighted) storage system.
- 2. On the Storage Systems panel, click **Add**. Alternatively, right-click the storage systems table heading and click **Add** on the pop-up menu.

	TJ;C;;	Add Modify
odel	Add	AN UNIC AND PROPRIES
	Modify	d
rwize V7000 Un	MOUILY	٦ ا
wize V7000	Remove	d
	Set Multipath Policy B	Inforcement
	Attach Pools	

Figure 11. Clicking Add on the pop-up menu

The Add an IBM Storage System wizard is displayed.

3. From the drop-down list box, select the brand of the IBM storage system that you want to add, and then click **Next**.

The Set Credentials	panel is	displayed.
---------------------	----------	------------

Add an IBM Storage System		
Select Storage System Which IBM storage system bi	rand would you like to add?	
Select Storage System Set Credentials Confirmation	This wizard will guide you through the necessary steps connecting to an IBM storage system and adding it to the IBM Storage Management Console for VMware vCe Select the IBM storage brand that you want to add. IBM Storage Brand: DS8000 IBM Storage Brand: DS8000 Flex System V7000 SONA5 Storwize V3500/V3700 Storwize V7000 Unified SVC XIV	
	Next	Cancel

Figure 12. Add an IBM Storage System wizard

4. Enter the required credentials for the storage brand that you have selected, as detailed in the following table.

Credential type	Description	Required and displayed for
Authentication method	 Select an authentication method: Authenticate the user name with a key file – Authenticate your user name with a key file (the default option). Authenticate the user name with a password – Authenticate your user name with a password. This option is applicable only to SAN Volume Controller or Storwize with microcode version 6.3 or later. Note: Based on your selection, other credentials that are relevant to the selected authentication method are displayed. 	 Flex System V7000 SAN Volume Controller Storwize V3500 Storwize V3700 Storwize V7000
IP Address / Hostname	IP address or hostname (properly formatted domain address) of the IBM storage system to which you want to connect.	 DS8000 Flex System V7000 SAN Volume Controller SONAS Storwize V3500 Storwize V3700 Storwize V7000 Storwize V7000 Unified XIV
User Name	User name for accessing the specified IBM storage system. Important: If you are using SAN Volume Controller or Storwize V7000 system with microcode version 6.2 or earlier, enter "admin" as your user name. Using "admin" does not necessarily mean that you have administrator credentials, but rather a user name spelled as "admin". It also does not mean that the matching user name defined on the storage system is also "admin". The pairing between the vSphere user and the storage system user account is performed only by the SSH key pairing (any valid SSH key grants access; see info below).	 DS8000 Flex System V7000 SAN Volume Controller SONAS Storwize V3500 Storwize V3700 Storwize V7000 Storwize V7000 Unified XIV

Credential type	Description	Required and displayed for
Password	Password for accessing the specified IBM storage system.	 DS8000 Flex System V7000 SAN Volume Controller SONAS Storwize V3500 Storwize V3700 Storwize V7000 Storwize V7000 Unified XIV Note: For Storwize V7000 and SAN Volume Controller with microcode version 6.3.0 or later, this credential appears only if you chose to authenticate the user name
SSH Private Key	To access the specified IBM storage system with a private SSH key, click Browse to locate the SSH key file. Important: The private SSH key must be in OpenSSH file format. If your key is not in OpenSSH file format, you can use a certified OpenSSH conversion utility. For more information, refer to the OpenSSH website (www.openssh.org).	 with a password. Flex System V7000 SAN Volume Controller Storwize V3500 Storwize V3700 Storwize V7000 Note: For Storwize V7000 and SAN Volume Controller with microcode version 6.2.0 or earlier, this credential always appears. For Storwize V7000 and SAN Volume Controller with microcode version 6.3.0 or later, this credential appears only if you chose to authenticate the user name with a key file.
Passphrase	If the private SSH key requires a passphrase for accessing the specified IBM storage system, enter the passphrase in this text box. Otherwise, if the private SSH key does not require a passphrase, leave this text box blank.	 Flex System V7000 SAN Volume Controller Storwize V3500 Storwize V3700 Storwize V7000 Note: For Storwize V7000 and SAN Volume Controller with microcode version 6.2.0 or earlier, this credential always appears. For Storwize V7000 and SAN Volume Controller with microcode version 6.3.0 or later, this credential appears only if you chose to authenticate the user name with a key file.

Table 3. Credentials required for accessing a storage system (continued)

5. Click **Next**. For all storage systems except SONAS, the **Select Storage Pools** panel is displayed (see Figure 13 on page 23); for SONAS, the Select File Systems panel is displayed (see Figure 14 on page 23).

Select Storage System Set Credentials	Storage	Pools on 792079394	769872812
Select Storage Pools		Name	Capacity(GB)
Confirmation		💕 mdiskgrp0	5576
		💕 vCenter	0
	E 🛛	🎐 waynetest2	107
		🎐 jerrytest	45
	E 🛛	🎐 waynetest	2
	E 🛛	🎾 vCenterTest	150
	E 🛛	🎐 vmware	1562
		tpcsmac_cp1	200

Figure 13. Select Storage Pools panel

Select File Systems Select the file systems tha	t you want to attach and make available f	or the vCenter server.
Select Storage System Set Credentials	File Systems on 1240277923	8980844832
Select File Systems	Name	Capacity(GB)
Confirmation	🗖 🥟 gpfs0	3
	🗖 🥟 autotpcsmac	20

Figure 14. Select File Systems panel

6. If you have provided admin-level credentials, you can attach predefined storage pools or file systems that are available on the IBM storage system that you are adding. Select the name of the storage pool or file system that you want to add.

Note: For more information about attaching or detaching storage pools and file systems, and the admin-type credentials required to do so, refer to Chapter 5, "Attaching and detaching storage pools or file systems," on page 31.

- 7. Click **Next**. The Confirmation panel is displayed.
- 8. Review the details of the storage system that is about to be added, and then click **Finish** to confirm its addition as detailed. If you want to change any detail that was set in a previous step, click **Back**.

Modifying access credentials for an IBM storage system

Whenever needed, you can modify the IP address or hostname of any storage system that was added, as well as the user credentials for connecting to that storage system.

Procedure

Perform the following procedure to modify the details of an added storage system.

- 1. Click the IBM Storage icon located on the vSphere Client management tools (see Figure 5 on page 11). The Storage Systems and Storage Pools management panels are displayed.
- 2. Select (highlight) the name of the storage system that you want to modify, and then click **Modify**. Alternatively, right-click the name of the storage system and then click **Modify** on the pop-up menu.

itorage Sys	tems				
			ė	Add Modify Remove	
Model 🤝		Identification	Multip	Multipath Policy	
XIV		XIV 1310129	Not E	Not Enforced	
Storwize V7000		00000200A0802ED3-I.	Not E	Not Enforced	
Storwize V7(Add	702070204720072012	NIAE E	nforced	
	Modify				
	Remove				
	Set Multipath Policy Enforcement				
		Pools			

Figure 15. Clicking Modify on the pop-up menu

3. In the Update Storage System Credentials dialog box, edit the storage system details (described in Table 3 on page 21), and then click **Update**. The modified system details appear in the Details pane. The different storage systems have different details.

		territer in the second
		Add Modify
1odel	Identification	Multipath Policy
Storwize V7000 Unified	792079394769872812	Fixed
XIV	XIV 1310129	Not Enforced
etails		
etails		
e tails	9.115.246.30	
	9.115.246.30	
ostname	9.115.246.30	
ostname		
ostname ystem Version		
	11.0.0	
ostname ystem Version ser Name	11.0.0	
ostname ystem Version	11.0.0 admin 1310129	
ostname ystem Version ser Name	11.0.0 admin	

Figure 16. Storage system details

Setting multipath policy enforcement for a storage system

You can set multipath policy enforcement at the storage system level, by setting a multipath policy for a specific storage system.

This policy is then enforced on any volume that you create from the management console.

Note: You can also set multipath enforcement on individual volumes. See "Setting multipath policy enforcement for a storage volume" on page 68.

Setting the policy at the storage system level enforces it on any volume that you create from the management console from the time that this enforcement is set. It does not apply automatically to volumes that are already located on this storage system.

Important: For DS8000, Flex System, SAN Volume Controller, and Storwize systems, the **Round Robin** multipath policy is enforced by default. For SONAS and XIV, no multipath policy is enforced by default.

The Storage Systems panel displays one of the following values under the **Multipath Policy** column, for each defined storage system (see Figure 16):

- Not Enforced Multipath policy enforcement is disabled.
- Any of the following multipath policies that has been assigned to the storage system:
 - Most Recently Used
 - Round Robin
 - Fixed

Note: For more detailed information about multipath policy enforcement, refer to the relevant VMware article on the VMware Knowledge Base website (kb.vmware.com/selfservice/microsites/search.do?language=en_US &cmd=displayKC&externalId=1011340)

Refer to the following sections for information about the multipath enforcement options that are available for all storage systems:

- "Enabling multipath policy enforcement"
- "Changing the multipath policy" on page 27
- "Disabling multipath policy enforcement" on page 27

Enabling multipath policy enforcement

You can enable multipath policy enforcement on a storage system, so that a specified policy is enforced on newly created volumes in the storage system.

Procedure

Perform the following procedure to set multipath policy enforcement on a storage system.

- 1. Click the IBM Storage icon located on the vSphere Client management tools (see Figure 5 on page 11). The Storage Systems and Storage Pools management panels are displayed.
- 2. Right-click the name of the storage system for which you want to set a multipath policy, and then click **Set Multipath Policy Enforcement** on the pop-up menu. The Set Multipath Policy dialog box is displayed.

Set Multipath policy enfo	prcement	×
Set Multipath Policy Er	nforcement	
Storage System: Path Selection:	792079394769872812-06evk24.ibm C Disable Multipath Policy Enforcement C Set Multipath Policy Enforcement Most Recently Used Round Robin Fixed	
	Set Cancel	

Figure 17. Set Multipath Policy Enforcement dialog box

- **3**. Select the **Set Multipath Policy Enforcement** option, and from the drop-down list that appears, select the required policy (for more information about these policy types, see "Setting multipath policy enforcement for a storage system" on page 25).
- 4. Click **Set** to apply the selected policy.

Changing the multipath policy

For any storage system with multipath policy enforcement, you can change the policy that is to be enforced on newly created volumes in the storage system.

Procedure

Perform the following procedure to change the multipath policy.

- 1. Click the IBM Storage icon located on the vSphere Client management tools (see Figure 5 on page 11). The Storage Systems and Storage Pools management panels are displayed.
- 2. Right-click the name of the storage system for which you want to change the multipath policy, and then click Set Multipath Policy Enforcement on the pop-up menu. The Set Multipath Policy dialog box is displayed (as shown in "Enabling multipath policy enforcement" on page 26).
- **3**. From the drop-down list under **Set Multipath Policy Enforcement**, select a different policy.
- 4. Click **Set** to apply the selected policy.

Disabling multipath policy enforcement

You can disable multipath policy enforcement so that a specific policy is not enforced on newly created volumes. The policy is not changed on volumes that have already been created.

About this task

Important: Disabling multipath policy enforcement does not modify the policy in any way.

Procedure

Perform the following procedure to disable multipath policy enforcement on a storage system.

- 1. Click the IBM Storage icon located on the vSphere Client management tools (see Figure 5 on page 11). The Storage Systems and Storage Pools management panels are displayed.
- 2. Right-click the name of the storage system for which you want to disable multipath policy, and then click **Set Multipath Policy Enforcement** on the pop-up menu. The Set Multipath Policy dialog box is displayed (as shown in "Enabling multipath policy enforcement" on page 26).
- **3**. Select the **Disable Multipath Policy Enforcement** option, and click **Set** to apply the disabling.

Removing an IBM storage system

When a storage system is no longer needed, you can remove it from the list of added storage systems.

About this task

Attention: If you remove a storage system that contains working volumes, file shares, and datastores, the information of these volumes, file shares, and datastores is no longer displayed in the IBM Storage tab. However, these volumes and/or file shares and datastores **remain active and functional**.

Procedure

Perform the following procedure to remove a storage system.

- 1. Click the IBM Storage icon located on the vSphere Client management tools. The Storage Systems and Storage Pools management panels are displayed.
- 2. Select (highlight) the name of the storage system that you want to remove, and then click **Remove**. Alternatively, right-click the name of the storage system and then click **Remove** on the pop-up menu.

			Add Modify
Model	Ic	dentification	Multipath Policy
Storwize	Add Modify)t Enforced
	Remove N		
	Set Multipat Attach Pools	n Policy Enforceme	nt

Figure 18. Clicking Remove on the pop-up menu

3. In the removal confirmation dialog box, click Yes.

Note: You can add again any storage system that you have removed.

Chapter 5. Attaching and detaching storage pools or file systems

After the required IBM storage systems are added, you can start attaching the predefined storage pools or file systems with which you want to work.

Accordingly, this chapter describes:

- "Viewing the details of currently attached storage pools and file systems"
- "Attaching storage pools or file systems" on page 34
- "Detaching storage pools or file systems" on page 35

Important:

- When working with IBM storage systems, storage pools can be attached only with Admin, Storage Admin, System Admin, or Security Admin user credentials.
- When working with Storwize V7000 Unified or SONAS, file systems can be attached only with Admin, Storage Admin + Export Admin, or Security Admin user credentials.
- When working with DS8000, storage pools can be attached only with Admin or Logical Operator user credentials.

Any other type of user credentials (read-only, application admin) cannot perform storage pool or file system attachment. If your credentials are not sufficient to perform pool or file system attachment, contact your storage administrator for assistance.

Viewing the details of currently attached storage pools and file systems

Attached storage pools or file systems are predefined storage areas that were specifically chosen to be used for volumes and VMware datastores.

For each added storage system (see "Adding an IBM storage system" on page 19), you can view the details of the storage pools and file systems that are defined on that system and are currently attached to the vCenter server.

Note:

- DS8000, SAN Volume Controller, Storwize V3500, Storwize V3700, Storwize V7000, and XIV systems use **storage pools**.
- Storwize V7000 Unified and SONAS systems use file systems.

Click the name of a storage system to view its currently attached storage pools or file systems (see Figure 19 on page 32).

Note: If the selected storage system has incorrect credentials or its system ID has been changed, an alert dialog box is displayed. In such a case, modify the storage system credentials (see "Modifying access credentials for an IBM storage system" on page 24) or remove the storage system (see "Removing an IBM storage system" on page 28).

Important: Storage pools and file systems that were not yet attached (or were detached) are not displayed, even if these pools and file systems were predefined on the storage system for use in the VMware environment.

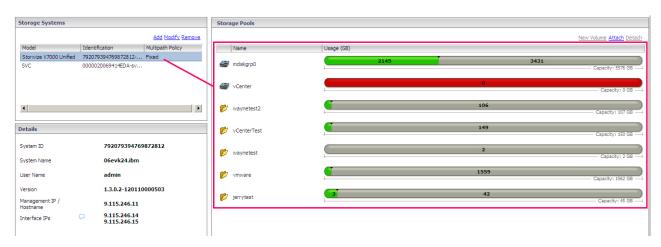


Figure 19. Viewing attached storage pools and file systems of the selected storage systems

By placing the mouse pointer over different areas of any displayed storage pool or file system, you can view different types of information, as shown in the following figures.



Figure 20. XIV – Amount (GB) and percentage of free hard disk space on the storage pool



Figure 21. XIV – Amount (GB) and percentage of used hard disk space on the storage pool



Figure 22. XIV – Amount (GB) and percentage of soft space used for volumes (LUNs)

		Snapshots Size: 515	of 5016 GB (10%)
	2938	515	1563
721		4243	
			Hards 5016 C

Figure 23. XIV – Amount (GB) and percentage of soft space reserved for snapshots

		Soft: 5016 GB
	4106	515 395
738	4209	
W	Used By Snapsho	ts: 68 of 5016 GB (1%) -

Figure 24. XIV – Amount (GB) and percentage of hard disk space currently in use by snapshots

		Soft Free: 1	563 of 501	6 GB (31%) -
0	2938	515	<u> </u>	.563
721		4243	1	
				Hard: 5016 GB -

(

Figure 25. XIV – Amount (GB) and percentage of free soft space remaining for thin provisioning and snapshots

- A5	222
<u> </u>	233
+ 1/2	Real Capacity: 45 of 278 GB (16%)

Figure 26. DS8000, Storwize, and SAN Volume Controller – Amount (GB) and percentage of real used capacity on the storage pool

2300	3276
	Free Capacity: 3276 of 5576 GB (58%)

Figure 27. DS8000, Storwize, and SAN Volume Controller – Amount (GB) and percentage of free capacity on the storage pool

	5
45	233
	- Capacity: 278 GB

Figure 28. DS8000, Storwize, and SAN Volume Controller – Amount (GB) of total capacity on the storage pool



Figure 29. Storwize V7000 Unified and SONAS – Amount (GB) of used capacity on the storage pool or file system

	8N
45	933
	233
	Capacity: 278 GB

Figure 30. Storwize V7000 Unified and SONAS – Amount (GB) of total capacity on the file system

Important: You cannot create storage pools and file systems from vSphere Client. To create storage pools and file systems, connect directly to the IBM storage system via its dedicated storage management interface. Alternatively, contact your storage system administrator and ask for storage pools or file systems to be defined.

Attaching storage pools or file systems

You must attach to the vCenter server any predefined storage pool (predefined by the storage administrator) that you want to use for volume (LUN) and datastore management operations, as well as any predefined file system that you want to use for file share and datastore management operations.

About this task

Note:

- DS8000, SAN Volume Controller, Storwize V3500, Storwize V3700, Storwize V7000, and XIV systems use **storage pools**.
- Storwize V7000 Unified and SONAS systems use file systems.

Procedure

Perform the following procedure to attach storage pools or file systems to the vCenter server.

- 1. In the **Storage Systems** management panel (see Figure 16 on page 25), click the name of the storage system to which you want to attach storage pools or file systems.
- In the Storage Pools management panel, click Attach (see Figure 31). Alternatively, right click the name of the storage system and then click Attach Pools on the pop-up menu (see Figure 32). The available storage pacels or file systems are displayed in the Attach Storage

The available storage pools or file systems are displayed in the Attach Storage

Storage Pools 💭		
		New Volume Attach Detach
Name	Usage (GB)	

Figure 31. Attach button

		Add Modify Rem
Model	Identification	Multipath Policy
Storwize V7000 Unified	7020703047608728	12 Not Enforced
Ad	ld	
Mo	odify	
Re	move	
Se	t Multipath Policy Enfo	rcement
At	tach Pools N	

Figure 32. Clicking Attach Pools on the pop-up menu

Pools or File Systems dialog box.

3. Select the name of a storage pool(s) or file system(s) that you want to add, and then click **Add Pools**.

Attach Sto	rage Pools or File 9	Systems	×
Select the	storage pool(s) that y	you want to add:	
	Name	Capacity(GB)	
	💕 mdiskgrp1	136	
	💕 mdiskgrp0	9	
		Add Pools C	ancel

Figure 33. Attach Storage Pools or File Systems dialog box

Note: For the Storwize V7000 Unified and SONAS storage systems, the subtitle in the dialog box is:

Select the file system(s) that you want to add:

- 4. Enter the required credentials for the storage system from which you are attaching storage pools or file systems, as detailed in Table 3 on page 21.
- 5. Click Finish.

Detaching storage pools or file systems

You can detach from the vCenter server any storage pool or file system that you no longer need.

About this task

Attention:

- If you detach a storage pool that contains working volumes and datastores, the information of these volumes and datastores is still displayed in the IBM Storage tab; however, you are not able to perform volume management operations on these pools.
- If you detach a file system that contains working file shares that are not used by datastores, the information of these file shares is not displayed in the IBM Storage tab. If these file shares are used by datastores, the relevant information is displayed in the IBM Storage tab, but you cannot perform operations on these file shares.
- If you detach a DS8000 storage pool that contains working volumes and datastores, the information of these volumes and datastore is displayed in the IBM Storage tab only until the next scheduled cache update (defined by the cache_update_interval registry key; see "Modifying general settings" on page 12), or until the **Update** button on the IBM Storage tab is clicked.

Procedure

Perform the following procedure to detach storage pools or file systems.

- 1. In the **Storage Pools** management panel, click and highlight the name of the storage pool or file system that you want to detach, or use the CTRL or SHIFT keyboard keys to select and detach multiple storage pools or file systems.
- 2. Click the **Detach** button (located at the top right corner). Alternatively, right-click the selected storage pools or file systems, and then click **Detach** on the pop-up menu.

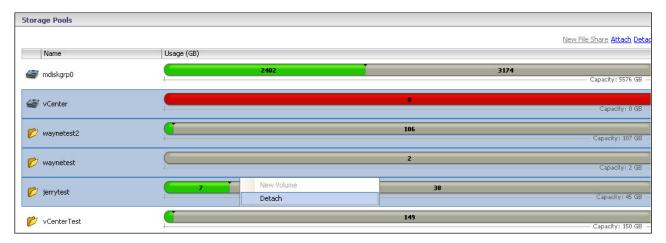


Figure 34. Pop-up menu for selected storage pools and file systems

Note: The Detach label on the pop-up menu changes depending on your selection:

- If you select to delete storage pools only, the label is changed to **Detach Storage Pool**.
- If you select to detach file systems only, the label is changed to **Detach File System**.
- 3. In the Detachment Confirmation dialog box, click Yes.

Chapter 6. Creating, viewing, and managing volumes or file shares

After the IBM storage systems are added and the storage pools are attached to the vCenter server, you can start the volume (LUN) creation and management operations (relevant for all storage systems except SONAS).

For the Storwize V7000 Unified and SONAS storage systems, you can also create file shares after the file systems have been attached to the vCenter server.

To learn about these different tasks, refer to the following sections:

- "Performing a target connectivity check"
- "Creating a new storage volume (LUN)" on page 38
- "Creating a new file share" on page 43
- "Viewing volume and file share details" on page 46
- "Managing storage volumes (LUNs)" on page 60
- "Managing file shares" on page 71

Performing a target connectivity check

Before you create a new volume, verify that the iSCSI or FC target connectivity between the ESX/ESXi hosts and the newly defined IBM storage system is properly set.

Procedure

Perform this one-time procedure for each ESX/ESXi host (you do not need to perform this more than once per host), before creating the first volume on an IBM storage system.

- 1. Contact the storage administrator to obtain the list of WWPNs or iSCSI IQNs of the newly connected IBM storage system.
- 2. From the vSphere Home page, go to **Inventory** > **Hosts and Clusters**.
- **3**. On the left-pane Datacenter tree, click on a single host, and then click the **Configuration** tab.
- 4. Click Storage Adapters. The details of the adapters in use are displayed.

Model: Licensed Features iSCSI Name: Time Configuration iSCSI Name: DNS and Routing connected Targets: Devices: Power Management View: Devices Virtual Machine Startup/Shutdown Target LUN	Processors 314E58/632xE58/3100 Chipset SATA Storage Controller IDE Memory Storage Networking Block SCSI Networking LP11000 4Gb Fibre Channel Host Adapter Storage Adapters Winbba1 Network Adapters Winbba2 Power Management Wickers DVS and Routing Model: ISCSI Allas: Connected Targets: DVS and Routing View: Devices: Paths: View: Devices Paths View: Devices Paths View: Devices Paths	ardware	Storage Adapters			Refresh	Rescan All
Memory 31xE5B/632xE5B/3100 Chipset SATA Storage Controller IDE Storage Withba3 Networking Withba32 Storage Adapters Withba32 Network Adapters Withba3 Advanced Settings Pibre Channel Host Adapter Power Management Pibre Channel 20:00:00:00:c9:66:51:e4 10:00:00:00:c9:66:51:e5 Network Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 10:00:00:00:c9:66:51:e5 Advanced Settings Pibre Channel 20:00:00:00:c9:66:51:e5 10:00:00:00:c9:66:51:e5 Network Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 10:00:00:00:c9:66:51:e5 Network Adapters Network Adapters Advanced Settings Pibre Channel 20:00:00:00:c9:66:51:e5 Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 Network Adapters Network Adapters Network Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 Network Adapters Network Adapters Network Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters Network Adapters<	Memory 31xESB/632xESB/3100 Chipset SATA Storage Controller IDE Storage @ vmhba3< Networking Block SCSI Vetworking Block SCSI Vetwork Adapters @ vmhba3 Advanced Settings Pibre Channel Host Adapter Power Management @ vmhba1 Fibre Channel Settings I et use.set Power Management Devices Power Management Devices Power Management Model: Iscss / Ratings I et use.set Power Management Devices Power Management Model: Vitual Machine Saruto/Shudown Powices Vitual Machine Saruto/Shudown Target Usersed Features Runtime Name Time Configuration Status DNS and Routing Powices Authenbication Services Powices Power Management Target	Processors	Device	Туре	WWN		
Storage Image: Storage Winhba3 Block SCSI Networking Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Storage Adapters Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Network Adapters Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Network Adapters Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Advanced Settings Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Power Management Image: Storage Adapters Image: Storage Adapters Image: Storage Adapters Vicus: Storage Image: Storage Adapter Ad	Storage Image: Storage Storage Block SCSI Networking Pilobid Storage Block SCSI Storage Adapters Image: Storage Adapters Storage Adapters Network Adapters Image: Storage Pibre Channel Host Adapter Image: Network Adapters Image: Storage Image: Storage Network Adapters Image: Storage Pibre Channel 20:00:00:00:69:66:51:e4 10:00:00:00:00:69:66:51:e5 Advanced Storage Image: Storage Image: Storage Power Management Details Image: Storage Model: Image: Storage Image: Storage Insc Configuration SicSI Alias: Image: Storage DNS and Routing Connected Targets: Devices: Paths: Authenbication Services Provices: Paths: Virtual Machine Swapfile Location Target LUN Staruge Yorfile Image: Staruge Yorfile		31xESB/632xESB/3100 Ch	nipset SATA Storage Co	ntroller IDE		
Networking Storage Adapters Network Adapter Network Adapt	Networking Storage Adapters Network Adapters Network Adapters Advanced Settings Power Management Uicensed Features Time Configuration DNS and Routing Authentication Services Power Management Virtual Machine Startup/Shutdown Virtual Machine Swapfile Location Security Profile		🔘 vmhba3	Block SCSI			
Storage Adapters Vinitian Pibre Channel Host Adapter Storage Adapters Storage Adapters Network Adapters Storage Adapters Advanced Settings Pibre Channel Host Adapter Vinitian Storage Adapters Pibre Channel 20:00:00:00:c9:66:51:e4 10:00:00:00:c9:66:51:e5 Vinitian Storage Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 10:00:00:00:c9:66:51:e5 Vinitian Storage Adapters Pibre Channel 20:00:00:00:c9:66:51:e5 10:00:00:00:c9:66:51:e5 Vinitian Storage Adapters Devices: Vinitian Storage Adapters Power Management Vinitian Storage Adapters Devices: Vinitian Storage Adapters Devices: Vinitian Machine Swepfie Location Target	Storage Adapters P11000 4Gb Fibre Channel Host Adapter Network Adapters withbal Advanced Settings Fibre Channel Power Management Details Ware Model: Licensed Features ISCSI Name: Time Configuration SCSI Name: DNS and Routing Connected Targets: Power Management Devices: Ware View: Devices View: Devices Paths:		📀 vmhba32	Block SCSI			
wetwork Adapters import Channel 20:00:00:00:c9:66:51:e4 ware introduct propert bit ad position idensed Features idensed Features time Configuration idense is DVS and Routing Connected Targets: Devices: Authentication Services View: Devices: View: Devices: Paths: View: Devices: Paths:	Vetwork Adapters Advanced Settings Vower Management Vetwork Adapters Vetwo		LP11000 4Gb Fibre Chann	el Host Adapter			
Advanced Settings Power Management Ware Ucensed Features Time Configuration DNS and Routing Authentication Services Power Management Virtual Machine Startup/Shutdown Virtual Machine Swapfile Location Virtual Machine Swapfile Location Virtual Machine Swapfile Location	Advanced Settings Power Management Model: ISCSI Name:	-	🕝 vmhba1	Fibre Channel	20:00:00:00:c9:66:51:e4 10:00:00:00:c9:66:51:e4		
Power Management Details Proper Model: iSCSI Name: iSC	Details Details ware Model: ISCSI Name: ISCSI		🕝 vmhba2	Fibre Channel	20:00:00:00:c9:66:51:e5 10:00:00:c0:c9:66:51:e5		
ware Model: Propertion idensed Features Model: ISCSI Name: isCSI Name: ISCSI Name: ISCSI Name: iSCSI Alas: Connected Targets: Devices: Owner Management Propertion View: /irtual Machine Swapfie Location Target LUN	ware Model: iscensed Features Model: isCSI Name: isCSI Name: <td></td> <td>LETIOS/F</td> <td></td> <td></td> <td></td> <td></td>		LETIOS/F				
Model: iSCSI Name: iSCSI Name:	Model: iSCS1 Name: Itime Configuration iSCS1 Name: DNS and Routing Connected Targets: Devices: Power Management View: Devices: Virtual Machine Statup/Shutdown Target LUN Security Profile LUN	Power Management	Details				
Licensed Features ISCSI Name: Time Configuration ISCSI Nalas: DNS and Routing Connected Targets: Devices: Paths: Paths: View: Devices: Paths: View: Devices: Paths: View: Devices: Paths:	Jicensed Features ISCSI Name: Time Configuration ISCSI Alias: DNS and Routing Connected Targets: Devices: Paths: Paths: Authentication Services View: Devices: Paths: View: Devices: Virtual Machine Skartup/Shutdown Target LUN Virtual Machine Swapfile Location Security Profile	ware					Propertie
Ine Configuration ISCS1 Name: ISCS1 Name: ISCS1 Name: ISCS1 Na	Inscinguration Inscingration Inscinguration Inscingu		Model:				
DNS and Routing Connected Targets: Devices: Paths: Authentication Services View: Devices: Paths: Power Management Runtime Name Target LUN Virtual Machine Swapfile Location Target LUN Status	DNS and Routing Connected Targets: Devices: Paths: Authentication Services View: Devices: Paths: Source Management Runtime Name Target LUN Status Status Status						
View: Devices Paths Power Management Virtual Machine Startup/Shutdown Virtual Machine Swapfile Location	Nuclearity Code View: Devices Paths View: Devices Paths Runtime Name Target LUN Status						
View: Devices Paths /irtual Machine Swapfile Location Target LUN Status	View: Devices Paths Virtual Machine Skartup/Shutdown Runtime Name Target LUN Status virtual Machine Swapfile Location Security Profile Status Status	ONS and Routing	Connected Targets:	Devices:	Paths:		
Vover Management	Vower Management Virtual Machine Startup/Shutdown Virtual Machine	Authentication Services	View Devices Paths				
Inclua Machine Scarup) Shudown I	Inclusi Machine Startup) shutdown i	Power Management					
	Security Profile	/irtual Machine Startup/Shutdown	Runtime Name Target		LUN Status		
Jecurity Profile		/irtual Machine Swapfile Location					
	Surface Descurse Allecthics	Security Profile					
Avanced Settinas		Advanced becongs					

Figure 35. Displaying the storage adapters of a host

- 5. Perform the following checks:
 - For Fibre Channel (FC) connected storage, click each FC host bus adapter (HBA) and then click **Paths**. Then, verify that at least one of the storage system WWPNs appears in the table.
 - For iSCSI connected storage, click on the iSCSI software adapter ports. Then, click **Properties** and verify that the storage system IQNs appear in the **Static Discovery** tab.

Creating a new storage volume (LUN)

On all IBM storage systems except SONAS, you can create new volumes (LUNs) on which you can save datastores or raw mapped volumes.

About this task

Any volume can be mapped to ESX hosts, clusters, or datacenters, so that the virtual machines on these hosts, clusters, or datacenters are able to save datastore information on that volume. For the concept illustration, see "Concept diagram" on page 2.

In addition to single volume creation, you can create multiple volumes simultaneously. In this case, the created volumes are assigned with different number postfixes that are automatically generated by the system in consecutive order.

Note:

- You can create volumes only on storage pools that have been attached to the vCenter server. For more information, see Chapter 5, "Attaching and detaching storage pools or file systems," on page 31.
- The Host, Cluster, and Datacenter views in vSphere Client are similar to each other; each queries information from the relevant vCenter entity.

Important:

- You must perform the target connectivity verification prior to creating a new volume. Without this verification, volumes that you create may be non-detectable. For more information, see "Performing a target connectivity check" on page 37.
- The ESX hosts and clusters to which you map the created volumes must be predefined on the storage system side. For more information, refer to your IBM storage system documentation.

Procedure

Perform the following procedure to create a new storage volume.

1. In the **Storage Pools** management panel, click and highlight the storage pool on which you want to create a new volume, and then click **New Volume**. Alternatively, right click the storage pool and click **New Volume** on the pop-up menu.

Storage Pools					
					New Volume Attach Detach
Name	Usage (GB)				
👹 mdiskgrp0		2300	New Volume	3276	Capacity: 5576 GB
			Detach Storage Pool		
📂 waynetest1	+		-		Capacity: 2 GB

Figure 36. Clicking New Volume on the pop-up menu

Note: The New Volume option is not available when:

- There is no free space in the storage pool.
- More than one storage pool is selected.
- You have read-only permissions (on either vSphere or the IBM storage system).

The Create New Volume wizard is displayed.

reate New Volume Properties			
Specify the properties for th	e new volume.		
Specify Properties	Storage System: 000002006F21	4ED6-svc112	
LUN Mapping Confirmation	Storage Pool: mdiskgrp1	I/O Group:	io_grp0 🔹
	Volume Size: 1	Number of Vo	lumes: 1
	Volume Name: gfdhgj		
	🗖 Enable Thin Provisioning 💭	🗖 Enable Dal	ta Compression
	🔽 Enable Vdisk Mirroring		
			Total Capacity: 39 GB
	1	37	
	•	0	0
	Allocated	Volume Size	Free
			Next Cancel

Figure 37. Create New Volume wizard (SAN Volume Controller example)

2. In the Volume Size text box, enter the size for the new volume (for IBM XIV – in Gigabytes; for IBM Flex System, Storwize, SAN Volume Controller, and DS8000 – in Gibibytes). Alternatively, place the mouse pointer on the graphic image of the storage pool, and then click and slide the space marker rightward to set the new volume size (marked in yellow). The numerical value in Volume Size is automatically updated accordingly.

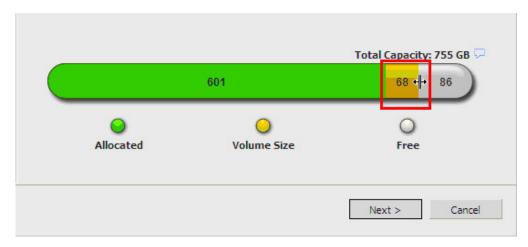


Figure 38. Setting the volume size with the graphic space marker

Note: XIV volume sizes are automatically rounded to the next multiple of 17 GB.

- **3**. In the **Volume Name** text box, enter the name that you want to assign to the new volume. This also becomes the display name of the LUN in vSphere.
- 4. If you want to create multiple volumes simultaneously (if not, skip to step 5 on page 41): In the **Number of Volumes** text box, enter the number of volumes that you want to create simultaneously. Two small text boxes appear next to the **Volume Name** text box and display a range of postfix values (see Figure 39 on page 41). You can change the postfix of the volume to be created first.

Note: The postfix number of the last volume is automatically displayed in the adjacent grayed-out text box, based on the total number of volumes to be created.

Volume Size:	1	Number of Volumes: 6
Volume Name:	test	5 10

Figure 39. Creating multiple volumes

- 5. Only if you are creating the volume on an IBM Flex System, DS8000, SAN Volume Controller, or Storwize storage system (otherwise, skip to the next step):
 - Select the **I/O Group** to which the volume should belong. Not applicable to DS8000.
 - Optional: Select **Enable Thin Provisioning** if you want the volume to be defined as thin provisioned and not as a fixed hard disk allocation. When this option is selected, the available capacity and total capacity are displayed based on the requested volume size. For DS8000, the over-provision ratio information is also displayed.
 - Optional: Select **Enable Data Compression** if you use data compression on SAN Volume Controller or Storwize V7000 of microcode 6.4.0 or later, on Storwize V3500 or Storwize V3700 of microcode 6.4.1 or later, or on Storwize V7000 Unified of microcode 1.4.0 or later. Not applicable to DS8000.
 - Optional: Select **Enable Vdisk Mirroring** if you want to use virtual disk mirroring for the volume or volumes that you create. Not applicable to DS8000.

Note:

- XIV volumes are not associated with I/O groups and are always thin-provisioned.
- Compressed volumes SAN Volume Controller or Storwize storage systems (if supported by the microcode) are always thin-provisioned.

Properties Specify the properties for th	e new volume.	3	I
Specify Properties LUN Mapping Confirmation	Storage System: 00000200 Storage Pool: pool2 Volume Size: 1 Volume Name: Vol_Test	I/O Group: Number of Volume	
	6 3	30	
	Allocated	Volume Size	O Free
	Allocated	Volume Size	Free Next Canc

Figure 40. SAN Volume Controller and Storwize volume properties

Storage System: IBM.2107-75VD231-D58700-02
Storage Pool: R10P10_Performance Volume Size: 1 Number of Volumes: 1 Volume Name: V

Figure 41. DS8000 volume properties with Enable Thin Provisioning option selected

- 6. Click **Next**. If you selected **Enable Vdisk Mirroring** on the previous step (otherwise, skip to the next step), a list of storage pools appears and you must select the secondary storage pool on which you want the mirrored volume or volumes to be created. Then, click **Next**.
- 7. In the Volume Mapping panel, select the host(s), cluster(s), or datacenter(s) to which you want to map the new volume. The selected host(s), cluster(s), or datacenter(s) are now able to utilize the new volume for datastores or raw mapped LUNs. If you select a datacenter, its member clusters and hosts are automatically selected.

Volume Mapping	
	uster(s), or datacenter(s) to which you want to map the volume.
Specify Properties	
LUN Mapping Confirmation	🖃 🗖 🛃 win-qpqum6d3s92
Commission	🖂 🗖 🌆 New Datacenter
	9.115.246.90
	9.115.246.100 (Not connected to the vCenter)
	9.115.246.80 (Not connected to the vCenter)
	< Back Next > Cancel

Figure 42. Selecting the hosts, clusters, or datacenters for LUN mapping

Note: ESX or ESXi hosts that were not defined on the storage system side, as well as disconnected or non-responsive hosts are grayed-out and cannot be selected. However, when creating a DS8000 volume, ESX or ESXi hosts that are properly connected to the DS8000 system are not grayed-out, even if these hosts were not yet defined on the DS8000 system. In such a case, these hosts can be selected, and IBM Storage Management Console automatically defines these hosts on the on the DS8000 system.

Important: You must map the volume to at least one ESX host, cluster, or datacenter in order to enable vSphere management of the created volume.

- 8. Click Next. The Confirmation panel is displayed.
- 9. Review the details of the new volume that is about to be created, and then click **Finish** to confirm its creation as detailed. If you want to change any detail that was set in a previous step, click **Back**.

Creating a new file share

On Storwize V7000 Unified and SONAS, you can create a new file share from a selected file system, and create an NFS export of the file share to a list of ESX hosts or clusters.

About this task

The created NAS file share is linked to the following path: /<file system mount point>/<file share name>. Any file share can be exported to ESX hosts, clusters, or datacenters, so that the virtual machines on these hosts, clusters, or datacenters are able to save datastore information on that file share.

Note:

- You can create file shares only on file systems that have been attached to the vCenter server. For more information, see "Viewing the details of currently attached storage pools and file systems" on page 31.
- The Host, Cluster, and Datacenter views are similar to each other; each one queries information from the relevant vCenter entity.

Procedure

Perform the following procedure to create a new file share.

 In the Storage Pools management panel, click and highlight the file system on which you want to create a new file share, and then click New File Share. Alternatively, right click the file system and click New File Share on the pop-up menu.

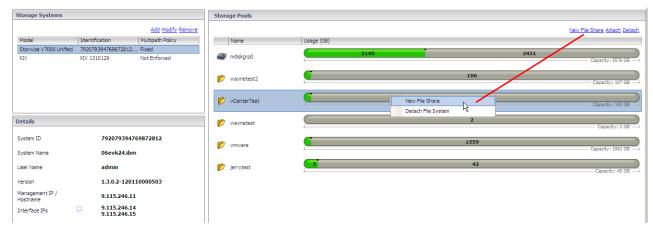


Figure 43. Clicking New File Share on the pop-up menu

Important: The New File Share option is not available when:

- There is no free space in the file system.
- More than one file system is selected.
- You have read-only permissions (on either vSphere or the IBM storage system).

The Create New File Share wizard is displayed.

Create New File Share			×
File Share Details Specify the size and name o	f the file share that you want	to create.	
Specify Properties Select Hosts Confirmation	Storage System File System: Path: Set Quota	: 792079394769872812-06evk24.ib vCenterTest /ibm/vcentertest/	m
			Next Cancel

Figure 44. Create New File Share wizard

- 2. In the Path text box, enter the file share name.
- **3**. If you want to set a quota for the file share (otherwise, skip to the next step), select **Set Quota**, and then set the maximum size of the file share by either entering a value in the text box, or by clicking and sliding the space marker rightward (marked in yellow). The numerical value in the text box is automatically updated accordingly.

Important: Without a quota, the entire capacity of the file system is used.

Specify Properties Select Hosts	Storage System: 7920793	94769872812-06evk24.ibm	
Confirmation		terTest	
		vcentertest/john	
	Set Quota 52		
			Total Capacity: 150 GB
	52	97	
	•	0	0
	Allocated	File Share Quota 52 GB	Free 97 GB

Figure 45. Setting the file share details

4. Click Next. The Select Hosts panel is displayed.

Note: If the file share name is already used by another file share, the following error message appears:

File share with this name was already defined.

In such a case, type a different path name and click **Next** again.

which you want to map the file share. pqum6d3s92 ew Datacenter
9.115.246.90 9.115.246.100

Figure 46. Create New File Share Wizard - Selecting Hosts

5. Select the ESX host(s), cluster(s), or datacenter(s) to which you want to export the file share. The selected host(s), cluster(s), or datacenter(s) are now able to utilize the new file share for datastores.

Note:

- If you select a datacenter, its member clusters and hosts are automatically selected.
- Disconnected or non-responsive ESX hosts are grayed-out and cannot be selected.

Important: You must export the file share to at least one ESX host, cluster, or datacenter in order to enable vSphere management of the created file share.

- 6. Click **Next**. The Confirmation panel is displayed.
- 7. Review the details of the new file share that is about to be created, and then click **Finish** to confirm its creation as detailed (otherwise, click **Back**). The file share is created and exported to ESX hosts over NFS (see Figure 45 on page 45).

Viewing volume and file share details

As you navigate through the different vSphere inventory views, you can view the details of existing volumes and file shares on the IBM Storage tab, as described in the following sections.

- "Viewing volumes or file shares that are used by datastores" on page 47
- "Viewing unused volumes and file shares" on page 49

- "Viewing volumes or file shares that are used by virtual machines" on page 50
- "Choosing which volumes to show" on page 51
- "Viewing information in the LUN Details pane" on page 52
- "Viewing information in the File Share Details pane" on page 59

Viewing volumes or file shares that are used by datastores

When you want to check which storage volumes or file shares are used by specific datastores or datastore clusters, and also view the specific details of these volumes or file shares, perform the following procedure.

About this task

Note: A datastore can have either volumes or a file share; not both. A datastore can comprise only one NAS file share.

Procedure

- 1. Go to Home > Inventory > Hosts and Clusters.
- 2. On the left-pane tree of datacenters, click an icon of a datacenter, cluster, or host, and then click the **IBM Storage** tab. The table on the right pane displays the details of the datastores that are used by the element that you selected in the tree (datacenter, cluster, or host).

Note: If you select a datacenter, its member clusters and hosts are automatically selected.

3. On the displayed datastores list (under **View: Datastores**), click the name of a datastore to display the storage volumes or file share that it uses.

Note:

- If the selected datastore contains volumes, the volumes are listed in the volumes list underneath the Datastores list (see Figure 47).
- If the datastore contains a NAS file share, it is listed in the File Share list underneath the Datastores list (see Figure 48 on page 49).

🗆 🚰 WIN-QO	FOF37MOJ	9.115.246.80 VMwa	are ESX, 4.0.0, 2	61974							
🖃 🛄 Data	enter1 .115.246.100 (disconnected)	Getting Started S	iummary Virtua	al Machines Resource A	location Performance	Configuration Tasks & Ever	ts Alarms Permissio	ons Maps Storage Views Hardware	Status IBM Storage		
H 🚺 S	115.246.70 (not responding)	View : Datastores	Unused LUN	s/File Shares	<u> </u>	5	1011 - 1014 1011	 42 44 	Last update	time: 12/26	5/2012 02:10:42 Upda
	115.246.80 Dev_vCenter_plugin	Datastore	Statu		Capacity (GB) Fre	e (GB) Type				4.073
	pmr_vcenter	Storage1	Acces	sible		557	82 VMFS				
6	SCOM-dev-84	Storage2	Acces	sible	1	278	64 VMPS				
6	VASA_2k3_160	ESEvc01	Inacce	essible		4	4 VMFS				
	VASA_VP_158_win2k8_X86	DCtest	Acces	sble		20	18 VMPS				
	VASA_VP_161_2k8R2 VASA_VP_87_Win2k3_64bit										
	vcenter leanne	Show All LUNs 👻									
F	vcenter-151	Identifier		Name		Storage System	Model	Capacity (GB) Use	Serial	LUN	Path Selection
6	vcenter-dev-82	naa.60050768028f0	0bb4c000000000	00008 VolDC2		792079394767797976	2145	21 Extent	0200a3c02ed3XX00	5	Most Recently
6	vcenter-fvt										
	VCServer5_163										
	Whware Workbench 2.0.0.38295;										
	115.246.90 (disconnected) 115.247.79										
	155clone										
	Dev vCenter plugin3.2										
	DSCIM5.6.3										
	vss_2k3sp2x64	LUN Details									~
	vss_2k8r2_189 vss_2k8sp2x64	View : Summary	FlashCopy®	Remote Copy Mirrored	ору						
1		21 0	B Capacity	Volume Name:	VolDC2	Volume UID:	60050768028F00884C0	0000000000008			
	Win2008_x64_SP2_250_vCenter		B 📕 Used	Storage Pool:	CIMEVT	Thin Provisioned:	yes				
			B 🛄 Free	Data Compressed:	yes	Compression Savings:	10.21% (0.24 GB)				
				FlashCopy®:		Remote Copy:					
		and the second sec		Status:	online						
				Scacas.	OTHERS						

Figure 47. Displaying volumes of a selected datastore and the details of a selected volume (LUN)

The datastores list (above the volumes list) displays the following details per datastore:

Datastore

Name of the datastore.

Status Current[®] status of the datastore (valid per the last update time).

Capacity (GB)

Total size of the datastore in Gibibyte (not Gigabyte) units.

Free (GB)

Size of the free space remaining in the datastore, in Gibibyte units.

Important: The sizes of the total capacity and free space are displayed in Gibibyte (GiB) units and not in Gigabyte (GB) units because the datastore information is taken from the VMware hosts.

Type Type of file system used in the datastore.

If the selected datastore contains volumes (as in Figure 47 on page 47), a list of its volumes appears underneath the datastores list, and the following details are displayed per volume:

Identifier

Unique alphanumerical string (with a dot) that identifies the volume on the vCenter server.

Name Name of the volume. If the volume was created now and in this version, this is the name assigned by the user. Otherwise, if the volume was created in the past or with an earlier version of VC plug-in, the name displayed is a generic name assigned by VMware.

Storage System

Identification name of the IBM storage system on which the volume is defined.

Note: "Unknown" is a generic array name, automatically given to any non-IBM storage system or to any IBM system that is not currently added (for more information, see "Adding an IBM storage system" on page 19).

Model Model of the IBM storage system on which the volume is defined.

Note: Although not technically correct, the term "LUN" is also used to refer to the volume itself, because a LUN is widely referred to as a volume in the storage administration community.

For more information about the LUN Details pane (under the volumes list), see "Viewing information in the LUN Details pane" on page 52.

If the selected datastore contains a file share (as in Figure 48 on page 49), its details are displayed underneath the datastores list:

9.115.246.70 2k8R2_64_134_bk			rce Allocation VPerformance VConfigura	ition Tasks & Events Alarms Perm	issions Maps Stor		
Clone20fWin2008R2	View : Datastores					Last update time: 3	5/18/2011 2:49:26 AM Up
🚡 CloneOfWindows200	Datastore	Status	Capacity (GB)	Free (GB) Type			
HyperV-VMM	nasda	Accessible	45	38 NA5			
TPL-Win2k8R2-V55-C	ds_fromvc2	Inaccessible	0	0 NAS			
🖆 Unknown (inaccessil	storage2	Accessible	279	4 VMFS			
🚰 Unknown 1 (inacces:	storage4	Accessible	279	12 VMFS			
Unknown 2 (inacces:	Storage1_1	Accessible	278	25 VMFS			
Unknown 3 (inacces:							
Unknown 4 (inacces:							
Unknown 5 (inacces: Disknown 6 (inacces:							
Unknown 6 (inacces: Unknown 7 (inacces:	Server	Path	Name	Storage System	Model	Capacity (GB)	
VASA_VM_2_73		06evk24.ibm:/ibm/jerrytest/dep	export_dep	792079394769872812	2145	45	
VCenterSever SCVM	101101210111	oocviz nom/onycrycostdep	exbord geb	772077371707072012	2110	15	
vCo Appliance							
vcPlugin-FVT-Win20(
win2008-32-5COM-2							
win2008-64-141							
win2008-cn-143							
win2008-R2-64-VMM							
win2008r2-sp1-64-5							
min2008-5COM-2-21	File Share Details						
indows2008R25P1	View : Summary	Snapshot					
🗉 🚺 9.115.246.80 (not respi	view : Summary						
	45 GE		/ibm/jerrytest/dep Da	ata in use: 1			
	1 GB	Used File System:	jerrytest Qu	uota: Disabled			
	44 GF	B Free Used Inodes:	: 1 Ma	ax Inodes: 0			
		Snapshot:					

Figure 48. Displaying file share of a selected datastore and file share details

The following details are displayed for the file share:

Server NFS Server IP address.

Path Path to the file share.

Name Name of the file share (assigned by the user).

Storage System

Identification name of the IBM storage system on which the file share is defined.

Note: "Unknown" is a generic array name, automatically given to any non-IBM storage system or to any IBM system that is not currently added (for more information, see "Adding an IBM storage system" on page 19.

Model Model of the IBM storage system on which the file is defined.

Capacity (GB)

Total size of the file share in Gibibyte (not Gigabyte) units.

For more information about the File Share Details pane (under the File Share information), see "Viewing information in the File Share Details pane" on page 59

Viewing unused volumes and file shares

Volumes that are not assigned to datastores as Datastore Extent or Mapped Raw LUN as well as file shares that are not assigned to datastores, are listed on the Unused LUNs/File Shares list, which you can view separately under **View: Unused LUNs/File Shares**.

These volumes and file shares can be accessed by the host.

 9.115.246.70 9.115.246.80 (not resp) 	View: Datastores Unused LUNs/	File Shares			Last update time: 1	Last update time: 12/26/2012 02:10:14 Update			
Dev_vCenter_plugin	Identifier	Name	Storage System	Model Capacit	y (GB) Serial	LUN	Path Selectio		
pmr_vcenter (discor	naa.600507630affc20200000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311842	28	Fixed		
🚡 SCOM-dev-B4 (disco	naa.600507630affc202000000000000	. RemoteTest1	Unknown	2107900	10 75VD2311850	40	Round Robin		
🗿 VA5A_2k3_160 (disc	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311843	29	Fixed		
🔁 VA5A_VP_158_win2	naa.600507630affc20200000000000	. RemoteTest2	Unknown	2107900	10 75VD2311851	41	Round Robin		
VA5A_VP_161_2k8R	naa.6005076802908168e0000000000	IBM iSCSI Disk (naa.600507680290816	Unknown 2145	2145	1 0200a4205a38XX00	0	Fixed		
VA5A_VP_162(151 c	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311844	30	Fixed		
VASA_VP_164_Win2 VASA_VP_87_Win2k	naa.600507630affc20200000000000	. RemoteTest3	Unknown	2107900	10 75VD2311852	42	Round Robin		
VASA_VP_87_Win2k	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311845	31	Fixed		
VA5A_VP_89_Win2k	naa.600507630affc202000000000000	. RemoteTest4	Unknown	2107900	10 75VD2311853	43	Round Robin		
👔 vcenter_leanne (dis	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311846	32	Fixed		
🗿 vcenter-151 (discon	naa.600507630affc20200000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311847	33	Fixed		
🚯 vcenter-dev-82 (disi	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	0 unavailable	30	Fixed		
🖆 vcenter-fvt (disconr.	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311848	34	Fixed		
VCServer5_163 (dis	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	6 75VD2311301	3	Fixed		
VMware Workbench 9.115.246.90 (disconne)	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	1 75VD2311849	35	Fixed		
9.115.247.103 (not rest	naa.600507630affc202000000000000	. IBM Fibre Channel Disk (naa.60050763	Unknown	2107900	6 75VD2311303	4	Fixed		
NS5-Dev-SVC-D5 (di	naa.60050768029600bb7c000000000	fyutyiuyuoi	00000200A5802EDF	2145	5 0200a5802edfXX00	0	Round Robin		
🚯 9.119.47.137 (not respi	naa.60050768029600bb7c0000000000.	terrrpp111	00000200A5802EDF	2145	1 0200a5802edfXX00	1	Round Robin		
🚯 9.119.47.142 (not respi	naa.60050768029600bb7c0000000000	pppxxxyy2	00000200A5802EDF	2145	1 0200a5802edfXX00	3	Round Robin		
	LUN Details								
	View : Summary FlashCopy® F	temote Copy Mirrored Copy							
	5 GB Capacity	olume Name: fyutyiuyuoi	Volume UID:	600507680296008B7C00000000000	00				
	5 GB 🗖 Used 🖇	itorage Pool: mdiskgrp1	Thin Provisioned:	no					
	0 GB Free I	ata Compressed: no	Compression Savings:						
		lashCopy®:	Remote Copy:						

Figure 49. List of unused volumes (LUN) and file shares

Selecting (highlighting) a volume or file share in the Unused LUNS/File Shares displays its detailed information in the LUN Details pane or File Share Details pane on the bottom of the screen.

For more information about the LUN Details pane, see "Viewing information in the LUN Details pane" on page 52. For more information about the File Share Details pane, see "Viewing information in the File Share Details pane" on page 59.

Viewing volumes or file shares that are used by virtual machines

When you want to check which storage volumes and file shares are in use by virtual machines, perform the following procedure.

Procedure

- 1. Go to Home > Inventory > VMS Templates.
- 2. On the left-pane tree of virtual machines, click an icon of a virtual machine, and then click the **IBM Storage** tab. The table on the right pane displays the details of the virtual hard disks that are used by the virtual machine that you selected on the tree.
- **3.** Click the name of a hard disk to display the storage volumes and file shares that are currently defined on it and are used by the datastores of the selected virtual machine.

🛃 WIN2K3X86-103 - vSphere Client								- 6 -
Elle Edit View Igventory Administration Blug-ins Help								
🔛 🔝 🔥 Home 🕨 👸 Inventory 🕨 👘 Hosts and Clust	ters				<u>8</u>]-	Search Inventory		e
🖬 II 🕨 G 🙆 🖓 🗊 🖷 🕪 🧇								
E 🕼 WIN2K3K86-103	VM_lun							
New Datacenter 9.115.246.80		n Performance Tasks & Events	Alarms Console Permissions Maps Store	The Views A. IBM Storage				
B 9.115.246.00	Hard Disks	, , , , , , , , , , , , , , , , , , , ,				Last unda	te time: 2/28/2	012 1:00:04 AM Update
New Virtual Machine	Label	Size (GB) Filename		Datastore	Туре			
soe2 SCOM_PVT_DO_NOT_TOUCH_156 (orphaned)	Hard disk 1	20 [ds_jerrytest011] New Ye	tual Machine 1/New Virtual Machine 1.vmdk	ds_jerrytest011	Virtual Disk			
scom_scomm	Hard disk 2	6 [ds_jerrytest011] New Vir	tual Machine 1/New Virtual Machine 1_4.vmdk	ds_jerrytest011	Mapped Raw LUN			
SCOM-dev-1								
SCOM-dev-2 (Hinown (Inaccessible)								
🔂 Unknown (naccessible)								
WASA_VP_157_Win2H8R2								
VASA_VP_158_win2k8_X86 VASA_VP_160_Win2003_32bit								
WSA_W_160_WIn2003_320k WSA_WP_161_2k8R2								
VASA_VP_162(151 done)								
VASA_VP_164_Win2k8R2								
WASA_VP_87_Win2k3_64bit VASA_VP_88_win2k3_32bit								
WASA_VP_89_Win2k8_64bit								
vcenter-151								
vcenter-dev-148 vcenter-fvt								
vcencer-rvc vcO Appliance (2)								
VCServer5_163								
VM_fileshare								
0 VM Jun Wwware Workbench 2.0.0.382952	Show All LUNs +							
While Workbench 2.0.0.302302	Show All LUNS + Identifier	Name	Storage System	Model	Capacity (GB) Use	Serial	LUN	Path Selection
	naa.60050768028200bb4c00000000001e	jerrytest011000	792079394769872812	2145	100 Extent	0200a0802ed3XX00	2	Fixed
	naa.60050768028200bb4c000000000328	vol vmdisk1	792079394769872812	2145	4 Extent	0200a0802ed3XX00	0	Fixed
	LUN Details							4
	View : Summary FlashCopy® Remote Co	PY						
	100 GB Capacity Volume	Name: jerrytest011000	Volume UID: 60050768028200	BB4C000000000001E				
	4 GB 🔳 Used Storag		Thin Provisioned: yes					
	96 GB Free Status		FlashCopy@:					
	Remote	e Copy:						
	1							

Figure 50. Displaying volume details when a virtual machine is selected

For more information about the LUN Details pane (under the Volumes list), see "Viewing information in the LUN Details pane" on page 52. For more information about the File Share Details pane (under the File Share), see "Viewing information in the File Share Details pane" on page 59.

Choosing which volumes to show

In the different inventory views, you can choose which storage volumes to display for the entity (datacenter, cluster, host, or virtual machine) that you select on the left-pane tree.

Three viewing options are available:

Show	v All LUNs 👻
~	Show All LUNs
	Show Mapped Raw LUNs
	Show Datastore Extent LUNS

Figure 51. LUN viewing options

Show all LUNs

Show all volumes (LUNs) that are related to the selected entity.

Show Mapped Raw LUNs

Show only the Mapped Raw volumes (LUNs) that are related to the selected entity.

Note: In raw device mapping, a special file in a VMFS volume acts as a proxy for another raw storage device. The mapping file contains metadata that is used to manage and redirect disk accesses to the physical device.

Show Datastore Extent LUNs

Show only the Datastore Extent volumes (LUNs) that are related to the selected entity.

Note: The VMware file system (VMFS) allows you to extend the size of datastores whenever needed, by creating datastore extents. Volumes that contain extended datastores are regarded as Datastore Extent LUNs.

Note: NAS file shares cannot be used as "Mapped Raw LUN". Accordingly, for an NFS datastore, the **Show All LUNs** and **Show Mapped Raw LUNs** filtering are grayed out.

Viewing information in the LUN Details pane

Depending on the IBM storage system on which the volumes reside, the LUN Details pane displays information of any recognized volume that is selected on the volumes list.

The displayed information is different in each case, as described in the following subsections:

- "Viewing XIV volume details"
- "Viewing DS8000 volume details" on page 54
- "Viewing Flex System, Storwize, or SAN Volume Controller volume details" on page 57

Viewing XIV volume details

For XIV volumes there are three different information views: **Summary**, **Snapshots**, and **Mirroring**.

Click the view that you want to display.

Summary view (see Figure 52 and Figure 53) -

LUN D	etails					
View :	Summary	Snapshots	Mirroring			
	240 G	B Capacity	Volume Name:	esx40-v1	Number of Snapshots:	2
	5 GB	Used	Pool Name:	ran	Last Snapshot:	2011-01-23 11:38:1
	235 G	B 📃 Free	Serial Number:	275	Mirroring:	Not Defined
			Consistency Group:	6		

Figure 52. Summary view for a regular XIV volume

LUN D	LUN Details							
View :	Summ	ary	Snapshots					
		17 GE	Capacity	Volume Name:	cluster_test_3.snapshot_0	0003 Number of Snapshots:	2	
SNAQ	-			Pool Name:	VMWare_pool1	Last Snapshot:	2011-03-21 14:46:38	
	TOR			Serial Number:	2972			
				Consistency Group:				

Figure 53. Summary view for an XIV snapshot volume

LUN pie chart

Graphic representation of the total capacity, used space (orange), and free space (yellow) in the selected volume. The pie chart is not displayed for snapshot volumes.

Volume Name

Name of the volume. If the volume was created now and in this version, this is the name assigned by the VMware administrator. Otherwise, if the volume was created in the past or with an earlier version of VC plug-in, the name displayed is a generic name assigned by VMware.

Pool Name

Name of the storage pool on which the volume was created.

Serial Number

Serial ID number of the volume.

Consistency Group

Indicates whether the volume belongs to a consistency group.

Number of Snapshots

Number of snapshots (if any) that exist for this volume.

Last Snapshot

Date and time at which the last snapshot was taken.

Mirroring

Indicates whether any mirroring is defined for this volume. Mirroring information is not available for snapshot volumes (see Figure 53 on page 52) or if you do not have storage admin permissions.

Snapshots view (see Figure 54) -



Figure 54. Snapshots view for XIV snapshots

Name Unique name of the snapshot file.

Created

Date and time at which the snapshot file was created.

Modified

Indicates whether the snapshot has been modified since its creation.

Serial Number

Serial ID number of the snapshot.

Snapshot Group

Indicates whether the snapshot belongs to a snapshot group. If yes, the name of the group is displayed.

Mirroring view (see Figure 55 on page 54) -

LUN Details					
iew : Sum	imary	Snapshots	Mirroring		
Name	Role	Link State	Status	Remote Volume	Remote System
testing	M		Synchronized	testing_mirror	mn26

Figure 55. Mirroring view for an XIV volume

Note: The Mirroring view is not available for snapshot volumes (see Figure 53 on page 52).

Name Name of the mirroring operation.

Role Role of the mirroring operation.

Link State

Current state of the mirroring link.

Status Current status of the mirroring operation.

Remote Volume

Name of the mirrored remote volume.

Remote System

Name of the remote storage system on which the mirrored volume resides.

Viewing DS8000 volume details

For DS8000 volumes there are three different information views: **Summary**, **FlashCopy**, and **Remote Copy**.

Click the view that you want to display.

Summary view (see Figure 56) -

LUN D	etails					
view :	Summary	FlashCopy®	Remote Copy			
	5 GB	Capacity	Volume Name:	vc02	Volume ID:	1FA1
	0 GB	Used	Storage Pool:	P1	Volume Groups:	V13
, i	5 GB	Free	Status:	Normal	Storage Allocation:	ESE
			FlashCopy®:			
			Metro Mirror/Globa	al Copy:		

Figure 56. Summary view for a regular DS8000 volume

LUN pie chart

Graphic representation of the total capacity, used space (red), and free space (orange) in the selected volume. The pie chart is not displayed for snapshot volumes.

Volume Name

Name of the volume (given by the VMware administrator).

Storage Pool

Name of the storage pool on which the volume was created.

Status Status of the volume, which may be one of the following: Normal, Pinned, Read Only, Inaccessible, Virtual Space Fault, Data Loss, Array Failed, Array Repairing, Array Repaired, Global Metadata Inaccessible, Global Metadata Lost, NVS Data Inaccessible, Configuring, Reconfiguring, Deconfiguring, Merging, Migrating, Migrating (Canceled), Migrating (Paused), Migration Error, Configuration Error, Reconfiguration Error, Deconfiguration Error, Transposition Error. For more information about the meaning of these statuses, refer to the *IBM System Storage DS Command-Line Interface User's Guide for DS8000 series*, available on the IBM System Storage DS8000 Information Center (publib.boulder.ibm.com/ infocenter/dsichelp/ds8000ic).

Metro Mirror/Global Copy

Name of the Metro Mirror or Global Copy group to which the volume belongs.

Volume ID

Identification number (ID) of the volume.

Volume Groups

the Volume group ID of with the volume are associated with

Storage Allocation

One of the following supported storage allocation types:

- Standard: The storage system fully allocated real extents to the volume upon its creation.
- ESE: Physical space for an extent space-efficient logical volume is dynamically allocated and then deallocated from the extent pool.

FlashCopy[®] view (see Figure 57) –

LUN Details	UN Details										
/iew : Summary Fla	shCopy® Remote Copy										
Source Nickname	Source ID	Target Nickname	Target ID	State	Persistent	Recording	Background Copy				
test2221	1020	test2222	102E	Valid	true	false	false				



Source Nickname

Source volume name of the FlashCopy relationship.

Source ID

Source volume ID of FlashCopy relationship.

Target Nickname

Target volume name of the FlashCopy relationship.

Target ID

Target volume ID of the FlashCopy relationship.

State State of the FlashCopy replica, which may be one of the following: , , , , .

- Valid The FlashCopy relationship is in normal state.
- Invalid A general internal error occurred when the query was processed.
- Validation Required The FlashCopy relationship cannot be queried.
- **Volume Inaccessible** The volume cannot be accessed and the query has failed.
- **Target Failed** The FlashCopy relationship is in an error state.

Persistent

The FlashCopy relationship was established with the Persistent option

Recording

The FlashCopy relationship was established with the Record Changes option.

Background Copy

The FlashCopy relationship was established with the Run Background Copy option.

Remote Copy view (see Figure 58) -

LUN Details									
ew: Summary FlashCopy® Remote Copy									
Туре	Source Image	Source ID	Target Image	Target ID	State				
Metro Mirror	IBM.2107-75VD231	1F68	IBM.2107-75VD231	1F67	Target Full Duplex				

Figure 58. Remote Copy details of a DS8000 volume

Type The remote copy and mirror volume relationship type:

- Metro Mirror (synchronous)
- Global Copy (extended distance)
- Unknown

Source Image

Source image of a remote mirror and copy volume relationship.

Source ID

Source volume ID in the source image of a remote mirror and copy volume relationship.

Target Image

Target image of a remote mirror and copy volume relationship.

Target ID

Target volume ID in the source image of a remote mirror and copy volume relationship.

- **State** The current remote mirror and copy volume relationship state, which may be one of the following:
 - **Copy Pending** The relationship is pending a copy operation. A Global Copy (extended distance) relationship is always copy pending.
 - Full Duplex The relationship is working in full duplex mode.
 - **Suspended** The relationship has been suspended. The 'Reason' attribute might indicate why the relationship is suspended.
 - **Target Copy Pending** A copy operation is pending on the target volume side.
 - Target Full Duplex The target volume is working in full duplex mode.
 - Target Suspended The target volume has been suspended.
 - **Invalid State** The source volume is unknown and cannot be queried, while Copy Pending, Full Duplex, or Suspended status cannot be assigned to it. Alternatively, this status might indicate that a general internal error occurred when the query was processed. When this status is displayed, only the following columns are relevant and display information: **Source ID**, **Target ID**. All the other information columns are displayed with a Null (–) value.

- **Validation Required** The status of the volume cannot be determined and further validation is required.
- **Volume Inaccessible** The volume could not be queried. Generally, this information means that the volume is fenced.

Viewing Flex System, Storwize, or SAN Volume Controller volume details

For IBM Flex System, Storwize (V3500, V3700, V7000, V7000 Unified) and SAN Volume Controller volumes there are four different information views: **Summary**, **FlashCopy**, **Remote Copy**, and **Mirror Copy**.

Click the view that you want to display.

Summary view (see Figure 59) -



Figure 59. Summary view for a regular Flex System, Storwize, or SAN Volume Controller volume

LUN pie chart

Graphic representation of the total capacity, used space (red), and free space (orange) in the selected volume. The pie chart is not displayed for snapshot volumes.

Volume Name

Name of the volume (given by the VMware administrator).

Storage Pool

Name of the storage pool on which the volume was created.

Data Compressed

Indicates whether the volume is compressed. Applicable only to SAN Volume Controller or Storwize V7000 of microcode 6.4.0 or later, Storwize V3500 or Storwize V3700 of microcode 6.4.1 or later, and to Storwize V7000 Unified of microcode 1.4.0 or later.

FlashCopy

Name of the volume's FlashCopy replica. If the volume has multiple FlashCopy replicas, "Many" is displayed instead of a particular name.

Status Status of the volume, which may be one of the following:

- **Online** The volume was set online by an administrator, and no failures have occurred. Authorized hosts can access the volume.
- **Offline** The volume was set offline by an administrator, but no failures have occurred. Hosts cannot access the volume.
- **Degraded** I/O errors have been detected on a region of a physical disk in the disk drive.

Volume UID

Unique identification number (UID) of the volume.

Thin Provisioned

Indicates whether the volume is thin-provisioned.

Compression Savings

The amount of storage saving percentage, if data compression is used.

Remote Copy

Name of the Remote Copy relationship group to which the volume belongs.

FlashCopy view (see Figure 60) -

LUN Details								
iew : Summary Flas	hCopy® Remote Copy Mirrored Copy							
Name	Consistency Group	Status	Start Time	Source Volume	Target Volume			
fcmap4		copying	2012/12/13 07:51:59	PPPPPP	ppppppp_02			
fcmap3		stopped		PPPPPP	pppppp_01			

Figure 60. FlashCopy replicas of a Flex System, Storwize, or SAN Volume Controller volume

Name Name of the FlashCopy replica.

Consistency Group

Name of the consistency group to which the FlashCopy replica belongs.

Status Current status of the FlashCopy replica: idle_or_copied, preparing, prepared, copying, stopped, suspended, or stopping. For more information about these statuses, refer to the IBM Tivoli[®] Storage FlashCopy Manager documentation (publib.boulder.ibm.com/infocenter/tsminfo/v6/ index.jsp?topic=/com.ibm.itsm.nav.doc/r_pdf_fcm.html).

Source Volume

Name of the source volume on which the original copy is located.

Target Volume

Name of the target volume on which the FlashCopy replica is located.

Remote Copy view (see Figure 61) –

LUN Details	UN Details										
View : Summary	FlashCopy®	Remote Copy Mirrored	Сору								
Name	Co	onsistency Group	Status	Master Volume	Auxiliary Volume	Master System	Auxiliary System				
rcrel0			inconsistent_stopped	remotetest	pxyress	00000200A4205A38-V7K54	00000200A4205A38-V7K54				

Figure 61. Remote Copy details of a Flex System, Storwize, or SAN Volume Controller volume

Name Name of the volume's remote copy.

Consistency Group

Name of the consistency group to which the remote copy belongs.

Status Current status of the remote copy: inconsistent_stopped, inconsistent_copying, consistent_stopped, consistent_synchronized, idling, idling_disconnected, inconsistent_disconnected, or consistent_disconnected. For more information about these statuses, refer to the storage system product documentation.

Master Volume

Name of the master volume in the remote copy.

Auxiliary Volume

Name of the auxiliary volume in the remote copy.

Master System

Name of the storage system on which the master volume resides.

Auxiliary System

Name of the storage system on which the auxiliary volume resides.

Mirror Copy view (see Figure 62) –

LUN Details								
iew : Summary	FlashCopy® Remote Cop	Mirrored Copy						
Copy ID	Primary	Storage Pool	Capacity (GB)	Used (GB)	Thin Provisioned	Data Compressed	Compression Savings	
0	yes	mdiskgrp0	1.0	0.000152587890625	yes	yes	0% (0.00 GB)	

Figure 62. Mirror Copy details of a Flex System, Storwize, or SAN Volume Controller volume

Copy ID

ID of the mirror copy.

Primary

Indicates whether the mirror copy is the primary copy.

Storage Pool

Name of the storage pool in which the mirror copy is located.

Capacity (GB)

Total capacity of the mirror copy.

Used (GB)

Actual storage size that is used by the mirror copy.

Thin Provisioned

Indicates whether the mirror copy is thin-provisioned.

Data Compressed

Indicates whether the mirror copy uses data compression.

Compression Savings

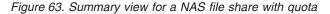
The amount of storage saving percentage, if data compression is used.

Viewing information in the File Share Details pane

Storwize V7000 Unified and SONAS storage systems can comprise an NAS File Share. File shares have two different information views: Summary and Snapshots. Click the view that you want to display.

Summary view (see Figure 63)

	31 GB Quota 💭	Path:	/ibm/waynetest2/design	Data in use:	1
	1 GB 📕 Used	File System:	waynetest2	Quota:	31
· ·)	30 GB 📃 Free	Used Inodes:	1	Max Inodes:	40448
		Interface IPs:	9.115.246.14, 9.115.246	.15	
		Snapshot:	@GMT-2012.03.01-06.15		



Note: For a NAS file share without a quota, the legend of the pie chart shows **Capacity**, i.e. the total capacity of the file system, and **Quota** is disabled.

NFS pie chart

- For a NAS file share with quota A graphic representation of the quota, used space (red), and free space (orange) in the selected NAS file share.
- For a NAS file share without a quota A graphic representation of the total capacity of the file system, used space (red), and free space (orange) in the selected NAS file share.
- **Path** Path to the NFS file system.

File System

Name of the file system, set by the user.

Used Inodes

Number of used inodes.

Interface IPs

IP addresses of network interfaces used to provide NAS services.

Snapshot

Date and time at which the last snapshot was taken.

Data in use

Size of the NAS file share used.

Quota Maximum size of the file share, for a file share with a quota; disabled for a file share without a quota.

Max Inodes

Maximum number available inodes.

Snapshots view (see Figure 64)

File Share Details								
/iew : Summary Snapshot								
Snapshot ID	Status	Rule name	Used (meta data)	Used (data)				
@GMT-2012.03.01-06.15.16	Valid	N/A	0	0				

Figure 64. Snapshots view for a NAS file share

Snapshot ID

Identification of the snapshot, which includes the date and time at which the snapshot was created.

Status Indicates whether the snapshot is valid.

Rule name

Name of the rule, if applicable.

Size of the snapshot meta data.

Used (meta data)

Used (data)

Size of the snapshot data.

Managing storage volumes (LUNs)

After you have created volumes, you can manage the volumes as needed, as detailed in the following sections.

- "Extending a volume" on page 61
- "Increasing datastore capacity on an extended volume" on page 62

- "Renaming a volume" on page 64
- "Moving a volume to another storage pool" on page 65
- "Mapping a storage volume to one or more ESX hosts" on page 66
- "Unmapping a storage volume from one or more hosts" on page 67
- "Setting multipath policy enforcement for a storage volume" on page 68
- "Changing the multipath policy enforcement for a storage volume" on page 69
- "Disabling the multipath policy enforcement for a storage volume" on page 70
- "Deleting an unused storage volume" on page 70

Note: You cannot manage volumes on storage arrays that are reported as "Unknown". Unknown is a generic array name, automatically given to any non-IBM storage system or to any IBM system that is not currently added (for more information, see "Adding an IBM storage system" on page 19).

Important: Before you begin managing volumes:

- You must have storage admin permissions on the relevant storage system.
- Check whether the volumes that you want to manage reside on attached storage pools.
- Check whether the volumes that you want to manage are used as Extent or RDM.

The **Map**, **Unmap**, and **Delete** options are not available for volumes that are used by a datastore as Extent or RDM.

Extending a volume

If enough free space is available on the storage pools, you can extend the size of an existing volume.

Procedure

Perform the following procedure to extend the size of a volume.

 In one of the Inventory views, right-click the row of the volume that you want to extend, and then click Extend on the pop-up menu. The Extend Volume dialog box is displayed.

Identifier	Name
naa.60050768028200bb4c000000	Extend
	Rename
	Move
	Мар
	Unmap
	Set Multipath Policy Enforcement
LUN Details	Delete

Figure 65. Clicking Extend on the pop-up menu

2. In the **Volume Size** text box, enter the new size for the volume. Alternatively, place the mouse pointer on the graphic image of the storage pool, and then click and slide the space marker rightward to set the new volume size (marked

in yellow). The numerical value in Volume Size is automatically updated accordingly.

Extend XIV Volume					×
Properties Please enter the new total size for the s	selected volume.				
Storage Pool:	e Array: XIV Host : VMware_Produ Capacity: 755 G	ction_Pool_4			
447		206	+ +	102	
O Allocated Volume Size: Volume Name:	Volume Size 206 CRM_HD2	GB	O Free		
		Exte	nd	Cancel	

Figure 66. Resize Volume dialog box - using the mouse pointer

Note:

- The data measurement unit for the XIV storage system volume size is **Gigabytes**; for the Storwize and SAN Volume Controller storage systems, the data measurement unit is **Gibibytes**.
- XIV volume sizes are automatically rounded to the next multiple of 17 GB.
- 3. Click Extend.

Important: Extending the size of a volume does not automatically increase the datastore capacity. For more information, see "Increasing datastore capacity on an extended volume."

Increasing datastore capacity on an extended volume

After you have extended the size of a volume (LUN), you can increase the capacity of any datastore that is stored on that volume.

Procedure

Perform the following procedure to increase the size of a datastore.

- 1. Go to Home > Inventory > Datastores.
- 2. Click the datastore that you want to extend, click the Configuration tab, and then click **Properties**.

first dc The following ha	sts are connected to this	ualastore (select a nos	st from the list to v	riew the details):					
second dc Name	State	Status	% CPU	% Memory	Memory Size	CPU Count	NIC Count	Uptime	Last Time Exited Stand
Testing Datacenter 9.151.16	2.167 Connected	🚯 Alert 🛛 0)	6	16382 MB	2	2	22 days	Never
cluster_datastore_1 cluster_datastore2 datastore1 datastore1 (1)	2.170 Connected	🔶 Alert 🛛 0		6	16382 MB	2	2	22 days	Never
third dc									Propertie
cluster data	store 1	979	5.25 GB Capacit	2000					
Location: Hardware Ac	/vmfs/volumes/4d6e642	a-9 76	5.25 GB Capacit 5.38 GB 🔲 Useo 8.87 GB 🔲 Free	. (~					
	/vmfs/volumes/4d6e642. celeration: Unknown	a-9 898	5.38 GB 🔲 Used 3.87 GB 🔲 Free Extents	. (~			/O Control		
Hardware Ac	/vmfs/volumes/4d6e642. celeration: Unknown on (VM Properties Volume Lal	a-9 898 ; ; bel: cluster_data	5.38 GB Used 3.87 GB Free Extents . LUN_2:1	. (~	15.99 GB	Storage I Disabled	/O Control		
Hardware Ac Path Selecti Round Robin Paths	/vmfs/volumes/4d6e642. celeration: Unknown	a-9 76 898 i bel: cluster_data Name: cluster_data	5.38 GB Used 3.87 GB Free Extents . LUN_2:1	. (~	15.99 GB 368.00 GB 591.99 GB		/O Control		

Figure 67. Datastore Configuration Tab – Properties button

The datastore Properties dialog box is displayed.

General		-Format	
Datastore Name: cluster_datastore_1	Rename	File System:	VMFS 3.46
Total Capacity: 975,25 GB	Increase	Maximum File Size:	256 GB
Total Capacity: 975.25 GB		Block Size:	1 MB
Storage I/O Control			
Enabled	Advanced		
ktents		Extent Device	
VMFS file system can span multiple hard disk p	artitions, or		e left resides on the LUN or physical
ktents, to create a single logical volume.		disk described below.	
Extent	Capacity	Device	Capacity
UN_2:1	15.99 GB	LUN_2	111.99 GB
UN_4:1	368.00 GB		
UN_6:1	591.99 GB	Primary Partitions	Capacity
		1. VMFS	15.99 GB

Figure 68. Datastore Properties dialog box

- 3. Click Increase. The Increase Datastore Capacity wizard is displayed.
- 4. Select the volume (referred to as Extent Device by vSphere) that you have resized, click **Next**, and then complete the remaining steps of the Increase Datastore Capacity wizard.

xtent Device	Name, Identifier, Path ID), LUN, Capacity, Expa	ndable or VI	MFS Label con	itains: 👻	Cle
urrent Disk Layout xtent Size	Name	Path ID		Capacity	Expandable	Hardware Accelerati
eady to Complete	LUN 2	vmhba1:C0:T0:L2	2	112.00 GB		Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb27b6)	vmhba1:C0:T9:L4	4	144.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb2dbf)	vmhba1:C0:T9:L5	5	560.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb2d73)	vmhba1:C0:T9:L6	6	176.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb30aa)	vmhba1:C0:T9:L7	7	16.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb30b4)	vmhba1:C0:T9:L8	8	480.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb2dc3)	vmhba1:C0:T9:L9	9	608.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb2ecc)	vmhba1:C0:T9:L10	10	80.00 GB	No	Unknown
	IBM Fibre Channel Disk (eui.00173800fdeb2fc3)	vmhba1:C0:T9:L11	11	480.00 GB	No	Unknown
	I €					

Figure 69. Selecting the extended volume for the datastore size increase

Note: When selecting the resized volume (Extent Device), a notification below the table indicates that the datastore already has an extent on that volume.

Renaming a volume

Whenever required, you can rename any existing volume by performing the following procedure.

About this task

Note: Renaming a volume is a logical action that does not have any physical effect on the volume or its logical connections. Renaming a volume also changes its display name.

Procedure

1. In one of the Inventory views, right-click the row of the volume that you want to rename, and then click **Rename** on the pop-up menu.

Identifier			Name		Storage System	Model
naa.600507	768028f00l	bb4cf Exte	end	ik .	792079394767797976	2145
		Ren	ame			
		Mov	'e			
		Мар	r.			
		Unm	ар			
		Set	Multipath Policy Enforcemer	it		
LUN Detai	ils	Dele	ete			
/iew : Su	ummary	FlashCopy®	Remote Copy Mirrored C	ору		
	21 GE	Capacity	Volume Name:	VoIDC2	Volume UID:	60050768028F00BB4C000000000008
	3 GB	📕 Used	Storage Pool:	CIMEVT	Thin Provisioned:	yes
	18 GE) 🗖 Free	Data Compressed:	yes	Compression Savings:	10.21% (0.24 GB)
			FlashCopy®:		Remote Copy:	
			Status:	online		

Figure 70. Clicking Rename on the pop-up menu

The Rename Volume dialog box is displayed.

- 2. In New Name, enter the new name that you want to assign to the volume.
- 3. Click Rename. The new Volume Name is updated in the LUN Details pane.

Moving a volume to another storage pool

If you want to move a volume to a different storage pool (for example, when the current storage pool has run out of space), perform the following procedure.

About this task

Attention:

- On XIV storage systems, moving a volume to another storage pool is a logical action. No data is actually moved on physical disks as a result.
- On DS8000, Storwize, and SAN Volume Controller storage systems, moving a volume to another storage pool is a **physical** action that causes data to move to a different physical disk. This may cause some performance overhead.
- On DS8000, Storwize, and SAN Volume Controller storage systems, moving a volume to another storage pool is an **asynchronous** action. The capacity of the source and target storage pools may not be updated after the task is completed in vCenter.
- When using mirrored volumes on SAN Volume Controller systems, only the primary copy volumes can be moved. In addition, these volumes can be moved only to the primary storage pool copy (not to the secondary copy).

Procedure

1. In one of the Inventory views, right-click the row of the volume that you want to move, and then click **Move** on the pop-up menu.

Show All LUNs 👻						
Identifier		Name		Storage System		Model
naa,60050768028f00bb4	Extend Rename Move Map Unmap Set Multipath F Delete	iolicy Enforcement		792079394767797976		2145
LUN Details	shCopy® Remote	Copy Mirrored Copy				
21 GB 0	Capacity Volum Used Stora Free Data	ne Name: Vo ge Pool: CII Compressed: ye Copy®:	IDC2 MEVT s	Yolume UID: Thin Provisioned: Compression Savings: Remote Copy:	yes	884C00000000000000000000000000000000000

Figure 71. Clicking Move on the pop-up menu to move the volume to another pool

The Move Volume dialog box is displayed.

2. In the **New Storage Pool** drop-down list, select the storage pool to which you want to move the volume, and then click **Move**. The new storage pool location is updated in the LUN Details pane.

Mapping a storage volume to one or more ESX hosts

Only volumes that are mapped to one or more ESX hosts can be used for creating datastores. Without the volume mapping operation, datastores cannot be created.

About this task

Important: You can map volumes only to ESX hosts that were predefined on the storage system. Accordingly, contact your storage administrator if the mapping option is not available on your vSphere client. For more information, see "Creating VMware datastores in storage volumes" on page 77.

Procedure

Perform the following procedure to map a storage volume to ESX hosts.

- 1. Access the view under View: Unused LUNs/File Shares (see "Viewing unused volumes and file shares" on page 49).
- 2. Right-click the volume that you want to map, and then click **Map** on the pop-up menu. The Map LUN to Hosts dialog box is displayed.

Map LUN to hosts	×
Select the host(s) to which you want to map the LUN. Note: Mapping the same LUN to mulitple hosts is not recommended.	
 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	
Map Cancel	

Figure 72. Map LUN to Hosts dialog box

3. Select the hosts or clusters to which you want to map the volume, and then click **Map**.

Important:

- Although possible, avoid mapping the same volume (LUN) to multiple hosts.
- Grayed-out hosts are either already mapped or not defined on the storage system, and therefore cannot be selected. Hosts that are disconnected or not responding are also grayed-out.

Unmapping a storage volume from one or more hosts

When volumes or ESX hosts are no longer needed, or if new ones are to replace the current ones, you can unmap volumes from the hosts.

About this task

Important:

- A volume (LUN) must remain mapped to at least one host. Otherwise, you cannot view the volume or perform any actions on it from the plug-in.
- If you no longer require a LUN for any host, delete the volume (see "Deleting an unused storage volume" on page 70).

Procedure

Perform the following procedure to unmap a volume.

1. In one of the Inventory views, right-click the row of the volume that you want to unmap, and then click **Unmap** on the pop-up menu. The Remove LUN

Mapping dialog box is displayed.

Map LUN to hosts	×
Select the host(s) to which you want to map the LUN. Note: Mapping the same LUN to mulitple hosts is not recommended.	
 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	
Map Cancel	

Figure 73. Remove LUN Mapping Dialog box

2. Select the hosts or clusters from which you want to unmap the volume, and then click **Unmap**.

Note: ESX hosts that are disconnected or not responding are grayed-out and cannot be selected.

Setting multipath policy enforcement for a storage volume

This section describes how to set multipath policy enforcement for a single volume.

About this task

Note: You can also set multipath policy enforcement for a storage system. For a general explanation on multipath policy enforcement and on how to set it at the storage system level, see "Setting multipath policy enforcement for a storage system" on page 25.

Procedure

Perform the following procedure to set multipath policy enforcement for a volume.

1. In one of the Inventory views, right-click the row of the volume for which you want to set a policy, and then click **Set Multipath Policy Enforcement** on the pop-up menu.

Identifier	Name	2	Storage System
naa.6005076801a5853b6800000000000004	jerry001_rename		0000020069614EDA
naa.6005076801a5853b6800000000000000	jerry01_rename	Extend	614EDA
		Rename	
		Move	
		Мар	
		Unmap	
		Set Multipath Policy Enforc	
UN Details		Delete	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Figure 74. Clicking Set Multipath Policy Enforcement on the pop-up menu

The Multipath Policy dialog box is displayed.

Multipath Policy	×
Set Multipath Policy	r Enforcement
Volume Identifier:	naa.6005076801a5853b680000000000117
Path Selection:	O Disable Multipath Policy Enforcement
	Set Multipath Policy Enforcement
	Fixed 💌
	Most Recently Used Round Robin
	Fixed
	Set Cancel

Figure 75. Setting Multipath Policy Enforcement on a volume

- 2. Select the **Set Multipath Policy Enforcement** option, and then select the required policy from the drop-down list.
- 3. Click Set to apply the selected policy.

Important: After the policy is set, the management console service enforces this policy by overriding any existing policy for this volume. This means that if the policy was previously modified from outside the management console user interface, the policy is enforced back to what you have specified from the management console GUI.

Changing the multipath policy enforcement for a storage volume

For a volume that already has multipath policy enforcement, you can change the policy that is to be enforced on it.

Procedure

Perform the following procedure to change the multipath policy.

- 1. In the Multipath Policy dialog box (see Figure 75 on page 69), select a different policy from the drop-down list under **Set Multipath Policy Enforcement**.
- 2. Click Set.

Disabling the multipath policy enforcement for a storage volume

You can disable multipath policy enforcement so that no policy would be enforced on a volume.

About this task

Note: Disabling multipath policy enforcement does not modify the policy in any way.

Procedure

Perform the following procedure to disable multipath policy enforcement on a volume.

- In the Multipath Policy dialog box (see Figure 75 on page 69), select Disable Multipath Policy Enforcement.
- 2. Click Set.

Deleting an unused storage volume

When a storage volume is unused and no longer required, you can delete it.

Before you begin

Important: You cannot delete volumes that are currently used by datastores.

Procedure

Perform the following procedure to delete an unused volume (LUN).

1. On the **Unused LUNs/File Shares** list, right-click the row of the volume that you want to delete, and then select **Delete** from the pop-up menu.

naa.60050768028200bb4c0000000000018a	IBM Fibre Chappel Dick (page 600507680282
naa.6005076801a5853b6800000000000118	Extend
naa.6005076801a5853b6800000000000119	Rename
naa.60050768028200bb4c00000000000b1	Move
naa.60050768028200bb4c00000000000b2	Мар
naa.60050768028200bb4c00000000000000	Unmap
naa.60050768028200bb4c000000000000c1	Set Multipath Policy Enforcement
naa.60050768028200bb4c000000000000a7	
eui.0017380027911fe8	Delete

Figure 76. Clicking Delete on the pop-up menu

The Volume Delete Confirmation dialog box is displayed.

2. Click **Delete** to confirm the deletion, or **Cancel** to exit without deleting the volume.

Managing file shares

After you have created file shares, you can manage the file shares as needed, as described in the following sections.

- "Setting a quota for a file share"
- "Disabling the quota of a file share" on page 72
- "Exporting a NAS file share to hosts" on page 72
- "Removing a NAS file share from hosts" on page 73
- "Deleting an unused file share" on page 74

Note: You cannot manage file shares on storage arrays that are reported as "Unknown". Unknown is a generic array name, automatically given to any non-IBM storage system or to any IBM system that is not currently added (for more information, see "Adding an IBM storage system" on page 19).

Important: Before you begin managing file shares:

- You must have Admin, StorageAdmin+ExportAdmin, or SecurityAdmin permissions on the relevant storage system.
- Check whether the file shares that you want to manage reside on attached file systems.

Setting a quota for a file share

You can set an upper limit for the disk space that can be allocated to a file share, by setting a quota for the file share.

About this task

Setting a quota allocates limited available disk space in a reasonable way, so that a single file share does not use up all the space of a file system, but only uses up to the amount of space set in the quota. It is especially important to set a quota for file shares of lesser importance, to ensure that important file shares have sufficient space.

Procedure

Perform the following procedure to set or change the file share quota.

1. In one of the Inventory views, right-click the row of the file share for which you want to set a quota, and then click **Set Quota** on the pop-up menu.

06evk24.ibm:/ibm/waynetest2/design design	792079394769872812	21/JE	a 31 N/A	N/A
		Set Quota		
File Share Details		Export		
View : Summary Snapshot		Remove Export		
31 GB Quota 🖵 Path: //b	/waynetest2/design Data in use: 1	Delete		

Figure 77. Clicking Set Quota on the pop-up menu

The Set Quota dialog box is displayed.

- 2. Select the Set Quota option.
- **3**. In the Quota text box, enter the new quota for the file share. Alternatively, place the mouse pointer on the graphic image of the file share, and then click and slide the space marker **rightward** to set the new quota (marked in yellow).

Set Quota				×
Please set the quo	ta for the sele	ected file share.		
Storage System: File System: Path:	waynete			
Path: Set Quota)iom/wa:	ynetest2/design		
Quota:	37	GB		
			Total Capacity: 107 GB	
37			69	
Allocat 1 GB		File Share Quota 37 GB	Free 69 GB	
			Finish Cancel	

The numerical value in New Quota is automatically updated accordingly.

Figure 78. Set Quota dialog box

4. Click **Finish**.

Disabling the quota of a file share

Whenever required, you can disable the quota of a file share.

Procedure

Perform the following procedure to disable the file share quota.

- 1. In one of the Inventory views, right-click the row of the file share for which you want to disable a quota, and then click Set Quota on the pop-up menu (see Figure 77 on page 71). The Set Quota dialog box is displayed (see Figure 78).
- 2. Clear the Set Quota option.
- 3. Click Finish.

Exporting a NAS file share to hosts

You can change the NFS client of any file share by exporting. If the file share belongs to a datastore, this allows the datastore to be shared with more hosts.

About this task

You can only select hosts that are not currently being exported to. Multiple hosts can be selected.

Important: You can export only to ESX hosts that were connected to the vCenter server.

Procedure

Perform the following procedure to export an NAS file share to hosts.

1. In one of the Inventory views, right-click the row of the file share which you want to export, and then click **Export** on the pop-up menu.

06evk24.ibm:/ibm/waynetest2/design	design		792079394769872	812
		Set Quota		
File Share Details		Export		
View : Summary Snapshot		Remove Export		
31 GB Quota 🖵	Path:	Delete	e:	1
1 GB 📕 Used	File System:	waynecesiz	Quoca.	31
30 GB 🗖 Free	Used Inodes:	1	Max Inodes:	40448
	Interface IPs:	9.115.246.14, 9.115	.246.15	
	Snapshot:	@GMT-2012.03.01-0	6.15.16	

Figure 79. Clicking Export on the pop-up menu

The Export File Share to Host(s) dialog box is displayed.

xport File Share To Host(s)		×
Select the host(s) to which you war	nt to export the NAS	File Share.
🗆 🗖 🛃 VSSP-Win2k8R2		
🖃 🗖 <u>ଲ</u> datacenter		
🖂 🗖 🛱 cluster 1		
🔲 🗐 9.115.246.70		
🔲 🗐 9.115.246.90 (N	lot connected)	
9.115.246.80		
_		
	Export	Cancel

Figure 80. Export NAS file share to hosts dialog box

2. Select the hosts to which you want to export the NAS file share, and then click **Export**.

Note: Grayed-out hosts are already exported, and therefore cannot be selected. Hosts that are disconnected or not responding are also grayed-out.

Removing a NAS file share from hosts

When a file share or ESX hosts are no longer needed, or if new ones are to replace the current ones, you can remove the hosts from the NAS file share exporting.

About this task

Important: You can remove an NAS file share from hosts, provided that the file share is not being used in any datastore.

Procedure

Perform the following procedure to remove the hosts from the NAS file share exporting.

1. In one of the Inventory views, right-click the row of the NAS file share from which you want to remove hosts, and then click **Remove Export** on the pop-up menu. The **Remove File Share Export from Host(s)** dialog box is displayed.

iove File Share Export From H		
Select the host to remove from	the selected export of the N	AS file s
VSSP-Win2k8R2		
🖂 🗖 🌆 datacenter		
🗆 🗖 🛱 cluster1		
🔲 🗐 9.115.246.7	0	
🗖 🗐 9.115.246.9	0	
9.115.246.8	n	
	č	
	Bemoue	ancel
	Remove C	ancei

Figure 81. Remove export of NAS file share to hosts dialog box

2. Select the hosts which you want to remove from the NAS file share exporting, and then click **Remove**.

Note: ESX hosts that are disconnected or not responding are grayed-out and cannot be selected.

Deleting an unused file share

When a file share is unused and no longer required, you can delete it. Deleting the file share deletes all data in the file directory, and all of its snapshot(s).

About this task

For more information on unused file shares, see "Viewing unused volumes and file shares" on page 49.

Attention: You cannot delete file shares that are currently used by datastores.

Procedure

Perform the following procedure to delete an unused file share.

1. On the Unused LUNs/File Shares list, right-click the row of the file share that you want to delete, and then select **Delete** from the pop-up menu.

06evk24.ibm:/ibm/waynetest2/design	design		792079394769872812	
File Share Details View : Summary Snapshot		Set Quota Export Remove Export		
1 GB Used Fi	ath: ile System: sed Inodes:	Delete Waynettest2	Max Inodes:	1 31 40448
30 GB [] 1100 =	nterface IPs:	9.115.246.14, 9.115		10110
Si	napshot:	@GMT-2012.03.01-0	6.15.16	

Figure 82. Clicking Delete on the pop-up menu

The File Share Delete Confirmation dialog box is displayed.

2. Click **Delete** to confirm the deletion, or **Cancel** to exit without deleting the file share.

Chapter 7. Using volumes or file shares for datastores

The following sections briefly describe how to create VMware datastores on IBM storage volumes or file shares, and how to create a virtual machine that uses a datastore on an IBM storage system:

- "Creating VMware datastores in storage volumes"
- "Creating VMware datastores in file shares" on page 82
- "Creating a virtual machine and connecting it to a datastore" on page 85

Reference to existing VMware documentation:

Note: VMware already provides documentation for the standard datastore and VM creation operations described in this chapter. For more detailed information about basic and advanced vSphere operations, visit the VMware Documentation website (www.vmware.com/support/pubs).

Creating VMware datastores in storage volumes

When the storage volumes that you have created are ready for use by datastores, you can start assigning the volumes to the new datastores that you create.

About this task

Use the vSphere Add Storage wizard to create datastores on storage volumes that you have created (for more information, see "Creating a new storage volume (LUN)" on page 38).

Note: The following procedure applies to VMware vCenter version 4.0 or 4.1. For vCenter version 5.0 or later, refer to the VMware documentation.

Procedure

- 1. Start the vSphere Add Storage wizard.
- 2. On the **Select Host** panel, select the ESX host to which storage volumes are mapped, and then click **Next**.

🚱 Add Storage			
Select the Host On which host do you wa	nt to add the datastore?		
Select Host Disk/LUN Ready to Complete	Enterprise Datacenter		
Help		< Back Next >	Cancel

Figure 83. Add Storage Wizard - Select Host Panel

The Select Storage Type panel is displayed.

🛃 Add Storage	
Select Storage Type	at a new volume or use a shared folder over the network. Storage Type Disk/LUN Create a datastore on a Fibre Channel, ISCSI, or local SCSI disk, or mount an existing VMFS volume.
Properties Formatting Ready to Complete	Network File System Choose this option if you want to create a Network File System. Adding a datastore on Fibre Channel or iSCSI will add this datastore to all hosts that have access to the storage media.
Help	< Back Next > Cancel

Figure 84. Add Storage Wizard - Select Storage Type Panel

- 3. Select **Disk/LUN**, and then click **Next**. The Select Disk/LUN panel is displayed.
- 4. From the list of available volumes (LUNs), select the volume on which you want to create the datastore, and then click **Next**.

dd Storage Select Disk/LUN					
	datastore or expand the current one				
5elect Host Disk/LUN	Name, Ide	ntifier, Path ID, LUN, Capaci	ty, Expandable	or VMFS Label contains: 👻 🗍	Cl
Select Disk/LUN	Name	Path ID	LUN 🗠	Capacity VMFS Label	Hardware Acceleration
Current Disk Layout	IBM Fibre Channel Disk (eui.00173800fdeb1fc5)	vmhba1:C0:T17:L1	1	384.00 GB	Not supported
Properties	IBM Fibre Channel Disk (eui.00173800fdeb21a9)	vmhba1:C0:T17:L2	2	1.27 TB	Not supported
Formatting idy to Complete	IBM Fibre Channel Disk (eui.0017380000160114)	vmhba1:C0:T4:L2	2	16.00 GB	Not supported
ay to complete	IBM Fibre Channel Disk (eui.0017380000160aef)	vmhba1:C0:T4:L10	10	176.00 GB	Not supported
	IBM Fibre Channel Disk (eui.0017380000160af2)	vmhba1:C0:T4:L11	11	1.76 TB	Not supported
lelp				< Back I	Vext > Cancel

Figure 85. Add Storage Wizard - Select Disk/LUN Panel

The Current Disk Layout panel is displayed.

🖟 Add Storage				_ 0
Current Disk Layout You can partition and form	at the entire device, all free space, or a single block of	free space.		
Select Host	Review the current disk layout:			
 Disk/LUN Select Disk/LUN Current Disk Layout Properties Formatting Ready to Complete 	Device IBM Fibre Channel Disk (eui.0017380000 Location /vmfs/devices/disks/eui.0017380000160aef The hard dis	Capacity 176.00 GB sk is blank.	Available 176.00 GB	LUN 10
	There is only one layout configuration available. Us pages.	e the Next button	to proceed with the	other wizard
Help		< Back	Next >	Cancel

Figure 86. Add Storage Wizard - Current Disk Layout Panel

- 5. Click Next. The Properties panel is displayed.
- 6. Enter the name of the datastore that you want to create, and then click Next.

🛃 Add Storage	
Properties Specify the properties for	the datatore
Select Host Disk/LUN Select Disk/LUN Current Disk Layout Properties Formatting Ready to Complete	Enter a datastore name

Figure 87. Add Storage Wizard - Entering a datastore name

The 'Disk/LUN – Formatting' panel is displayed.

Add Storage Disk/LUN - Formatting Specify the maximum file	e and capacity of the datastore
Select Host Disk/LUN Select Disk/LUN Current Disk Layout Properties Formatting Ready to Complete	Maximum file size Large files require large block size. The minimum disk space used by any file is equal to the file system block size. 256 GB , Block size: 1 MB
	Capacity Maximize capacity 50.00 GB
Нер	< Back Next > Cancel

Figure 88. Add Storage wizard – 'Disk/LUN – Formatting' panel

7. From the drop-down list, select the maximum file size for the datastore, and specify any maximum capacity that you want to enforce on the datastore. Then, click **Next**. The Ready to Complete panel is displayed.

8. Click Finish. The new datastore is now created on the volume that you selected (in 4 on page 79 of this procedure).

Creating VMware datastores in file shares

When the file shares that you have created are ready for use by datastores, you can start assigning the file shares to the new datastores that you create.

About this task

Note: This section is relevant to Storwize V7000 Unified and SONAS only.

When the file shares that you have created are ready for use by datastores, you can start assigning the file shares to the new datastores that you create.

Use the vSphere Add Storage wizard to create datastores on file shares that you have created (for more information, see "Creating a new file share" on page 43).

Procedure

Note: The following procedure applies to VMware vCenter version 4.0 or 4.1. For vCenter version 5.0 or later, refer to the VMware documentation.

- 1. Start the vSphere Add Storage wizard.
- 2. On the Select Host panel, select the ESX host to which file shares have been exported, and then click Next.

The Select Storage Type panel is displayed.

🛃 Add Storage				_ 🗆 🗡
Select the Host On which host do you	want to add the datastore?			
Select Host ■ NAS Ready to Complete	□ ■ datacenter1 ● 9.115.246.70 ● 9.115.246.80 (not responding)			
Help		< Back	Next >	Cancel

Figure 89. Add Storage wizard - Select Host panel

🛃 Add Storage	
Select Storage Type Specify if you want to forma	at a new volume or use a shared folder over the network?
Select Host NAS Network File System Ready to Complete	Storage Type Disk/LUN Create a datastore on a Fibre Channel, ISCSI, or local SCSI disk, or mount an existing VMFS volume. Network File System Mount a shared folder over a network connection as a datastore.
Help	≤Back Next ≥ Cancel

Figure 90. Add Storage wizard – Select Storage Type panel

3. Select Network File System, and then click Next. The Locate Network File System panel is displayed.

Add Storage Locate Network File System Which shared folder will be u	used as a VMware datastore?
Select Host NAS Network File System Ready to Complete	Properties Server: Examples: nas, nas.it.com, 192.168.0.1 or FE80:0:0:0:2AA:FF:FE9A:4CA2 Folder:
	Example: /vols/vol0/datastore-001 Mount NFS read only Datastore Name
Help	Sack Next ≥ Cancel

Figure 91. Add Storage wizard – Entering a datastore name

4. Enter the information required to locate the network file system – **Server** and **Folder**, from the File Share Details panel.

06evk24.ibm:/ibm/jerrytest/export4_fromvc	export4_fromvc	792079394769872812	2145	42 N/A	ī
06evk24.ibm:/ibm/vcentertest/john2	john2	792079394769872812	2145	10 N/A	्

File Share Details					
View : Summary Snapshot					
10 GB Quota 🖵 🕯	Path:	/ibm/vcentertest/joł	Data in use:	1	
1 GB 🔲 Used	File System:	vCenterTest	Quota:	10	
9 GB 🗖 Free	Used Inodes:	1	Max Inodes:	40448	
	Interface IPs:	9.115.246.14, 9.11	5.246.15		
	Snapshot:				

Figure 92. Folder and Server Information for locating network file system

- In Server, enter any of the interface IPs of the file share.
- In **Folder**, enter the path of your file share.
- 5. In **Datastore Name**, enter the name of the datastore that you want to create, and then click **Next**. The Ready to Complete panel is displayed.

6. Click **Finish**. The new datastore is now created on the file share that you selected (in 4 on page 84 of this procedure).

Creating a virtual machine and connecting it to a datastore

After you have created the required datastores, you can assign each datastore to a virtual machine.

About this task

Use the Create New Virtual Machine wizard to create virtual machines and select the datastores for these virtual machines.

Procedure

Note: The following procedure applies to VMware vCenter version 4.0 or 4.1. For vCenter version 5.0 or later, and for more detailed information about virtual machine creation, refer to the VMware documentation.

- 1. Start the vSphere Create New Virtual Machine wizard.
- 2. On the Datastore panel, select the datastore in which to store the virtual machine files, and then click **Next**.

The Create a Disk	panel is	displayed.
-------------------	----------	------------

Configuration		which to store t	he virtual machir	ne files:				
<u>Name and Location</u> Datastore	Name	Capacity	Provisioned	Free	Туре	Thin Provisioning	Access	
Guest Operating System	[ds_fromvc2 (1	45.00 GB	30.25 GB	39.08 GB		Supported	Single host	
Create a Disk	[ds_jerrytest01	11.50 GB	21.35 GB	8.68 GB		Supported	Single host	
Ready to Complete	[ds_rename]	16.50 GB	28.73 GB	6.26 GB		Supported	Single host	
	[Storage1]	557.25 GB	726.74 GB	14.96 GB	VMFS	Supported	Single host	
	[Storage2]	278.00 GB	309.23 GB	12.77 GB	VMFS	Supported	Single host	
	Compatibility:							
	Validation not applical	ble this time.						

Figure 93. Create New Virtual Machine wizard – Datastore selection panel

🛃 Create New ¥irtual Machin	e		
Create a Disk Specify the virtual disk siz	e and provisioning policy		Virtual Machine Version: 7
Configuration Name and Location Datastore Guest Operating System Create a Disk Ready to Complete	The virtual disk file sta	Datastore 4 49.2 8 GB C pace on demand (Thin Provisioning) arts small and grows as more virtual atures such as Fault Tolerance vill increase the time it takes to crea	disk space is used.
Help		I	< Back Next > Cancel

Figure 94. Create New Virtual Machine wizard – Create a Disk panel

- **3**. Specify the **Virtual disk size**, select the provisioning policy, and then click **Next**. The Ready to Complete panel is displayed.
- 4. Click **Finish**. The new virtual machine is now created on the datastore that you selected (in 2 on page 85 of this procedure).

Chapter 8. Monitoring and troubleshooting

The IBM Storage Management Console for VMware vCenter provides different monitoring capabilities, as described in the following sections.

- "Monitoring the status of recent tasks and triggered alarms"
- "Viewing the log file" on page 88
- "Event messages in vSphere" on page 88
- "Event messages in Windows Server" on page 91

Monitoring the status of recent tasks and triggered alarms

As you work with the IBM Storage Management Console for VMware vCenter, use the vSphere Recent Tasks and Triggered Alarms monitoring panels to detect any possible error or malfunction in the storage usage.

lame	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time 🔻	- Start Time	Completed Time
Retrieve IBM Storage Information from VMware and Storage Arrays	WIN-QPQUM6D35	20%		Administrator	WIN-QPQUM6D3592	26-Feb-12 5:49:03 PM	26-Feb-12 5:49:03 PM	
Create IBM Storage File Share	WIN-QPQUM6D35	Completed		Administrator	WIN-QPQUM6D3592	26-Feb-12 5:48:52 PM	26-Feb-12 5:48:52 PM	26-Feb-12 5:49:03 Pf
Retrieve IBM Storage Information from VMware and Storage Arrays	WIN-QPQUM6D35	Completed		Administrator	WIN-QPQUM6D3592	26-Feb-12 5:43:17 PM	26-Feb-12 5:43:17 PM	26-Feb-12 5:43:43 Pf

Figure 95. vSphere Recent Tasks monitoring panel

ſrigg	jered Alarms					Object	or Name contains: 🕶 🗍		Clear	>
Obje	ct	Stal	tus	Nam	e	Triggered	Acknowledged	Acknowledged B	Зу	_
æ	VCPLUGIN-TESTVC		Warning	0	Health status monitoring	15-Mar-11 11:47:50 AM				
	9.151.162.170	•	Alert	0	Host IPMI System Event Log status	01-Mar-11 4:56:33 PM				
	9.151.162.170	•	Alert	0	Status of other host hardware objects	01-Mar-11 4:56:33 PM				
	9.151.162.156	•	Alert	0	Host connection and power state	24-Mar-11 7:28:34 PM				
8	Tasks 🞯 Alarms						License Period: 58	days remaining 🛛 🗛	Iministrato	N

Figure 96. vSphere Triggered Alarms monitoring panel

For more information about the different messages that may be displayed in the monitoring panels, see "Event messages in vSphere" on page 88.

In addition, any event related to IBM storage processes or components appears in the Windows Application log (on the vCenter server), available through **Server Manager** > **Diagnostics** > **Windows Logs** > **Application**.

E Server Manager						
Eile Action View Help						
🗢 🔿 🔰 🖬 🚺 🖬						
Server Manager (VCPLUGIN-TESTV	Application Nu	mber of events: 16,786				
E PRoles	Level	Date and Time	Source	Event ID	Task C	
🗄 🚮 Features	A Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
E Diagnostics	A Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
 Event Viewer Custom Views 	A Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
Custom Views General Windows Logs	Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
Application	A Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
Security	Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
Setup	Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
System	Warning	4/5/2011 12:55:49 AM	XIV Console For vCenter		None	
Forwarded Events	Information	4/5/2011 12:55:44 AM	XIV Console For vCenter		None	
🕀 🚰 Applications and Service	1 Information		XIV Console For vCenter		None	
Subscriptions	1 uniormation	4/5/2011 12:55:44 AM				
(N) Performance	1 Information	4/5/2011 12:55:44 AM	XIV Console For vCenter		None	
🚔 Device Manager	Information	4/5/2011 12:55:42 AM	XIV Console For vCenter		None	
🗉 🁬 Configuration	(i) Information	4/5/2011 12:55:37 AM	XIV Console For vCenter		None	
🕀 🚰 Storage	1 Information	4/5/2011 12:55:21 AM	RestartManager	10001	None	-
	Event 301, XIV Co	insole For vCenter				×
	General Detai	Is				

Figure 97. Windows Application log

For more information about the different message types and IDs, see "Event messages in Windows Server" on page 91.

Viewing the log file

The IBM Storage Management Console log file is located at: c:\windows\temp\ ibm_console_for_vcenter.log

You can view the contents of the file in any plain-text viewer or editor, such as Notepad.

Note: When the log file reaches a size of 4.76 MB, a new log file is created and named with a sequential number: ibm_console_for_vcenter.log.1, ibm_console_for_vcenter.log.2, and so on.

Event messages in vSphere

This section summarizes the different event types that may be displayed on vSphere Client.

- "vSphere information event messages"
- "vSphere warning event messages" on page 89
- "vSphere error event messages" on page 90

Note: The events also appear in the event list of vCenter Server. The list is accessible from vSphere Client.

vSphere information event messages

Information event messages are non-critical messages that notify you about the different performed operations.

The following table summarizes the information event messages that the IBM Storage Management Console may generate and display in the vSphere monitoring panels (see Figure 95 on page 87 and Figure 96 on page 87).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

ID	Message	Description
401	Multipath policy for LUN < > has been modified from < > to < >	Indicates that the multipath policy of this LUN has been set
402	< > has been created	Indicates that a specific LUN was created
403	< > has been deleted	Indicates that a specific LUN was deleted
404	< > has been renamed to < >	Indicates that a specific LUN was renamed
405	< > has been resized, new size is < >	Indicates that a specific LUN was resized
406	<pre>< > has been relocated in the storage system, details: < ></pre>	Indicates that a specific LUN was relocated within the storage system
407	< > has been mapped to hosts: < >	Indicates that a specific LUN was mapped to a host
408	<pre>< > has been unmapped from hosts: < ></pre>	Indicates that a specific LUN was unmapped from a host
409	< > has been resized, expanded by < > GB	Indicates that a specific LUN was expanded
410	< > has been created	Indicates that a specific file share has been created
411	< > has been added export to hosts: < >	Indicates that a specific file share export has been added to specific host(s)
412	< > has been removed export from hosts: < >	Indicates that a specific file share export has been removed from specific host(s)
413	< > has been set quota	Indicates that a specific file share's quota has been set
414	< > has been deleted	Indicates that a specific file share has been deleted

Table 4. vSphere information event messages

vSphere warning event messages

Warning messages bring to your attention any condition that may result in an error or malfunction.

The following table summarizes the warning event messages that the IBM Storage Management Console may generate and display in the vSphere monitoring panels (see Figure 95 on page 87 and Figure 96 on page 87).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

Table 5. vSphere warning event messages

ID	Messages	Description	
431	Datastore Extent < > is inaccessible	This datastore extent cannot be probed. It might indicate that your host information is not updated. Rescan the host and refresh host information, and then click the Update link in the IBM Storage tab.	
432	Virtual Machine < > has a Raw Mapping LUN filename < > with no matching LUN	Information could not be retrieved regarding a Raw mapped LUN. Click the Update link in the IBM Storage tab.	
433	VPD information could not be found for LUN. Run the Rescan operation to fix this problem.	It might indicate that your host information is not updated. Rescan the host and refresh host information, and then click the Update link in the IBM Storage tab.	
434	Storage Pool < >, which is attached to vCenter, has been deleted from Storage Array < >. Please work with the Storage Administrator to resolve this issue. Either recreate the Storage Pool in the Storage Array or detach it from vCenter.	The storage pool which is attached h been deleted from the storage. Conta the Storage administrator and either detach the storage pool or recreate it using the storage GUI.	
435	Cannot retrieve Virtual Disk attributes for virtual machine < >. It may be inaccessible. Run the Rescan operation to fix this problem.	It might indicate that your host information is not updated. Rescan the host and refresh host information, and then click the Update link in the IBM Storage tab.	
436	Path selection policy was not configured for volume < >. Use the LUN menu to configure a default path selection option for this volume.	Indicates that a multipath policy was not set for this volume.	
437	File System < >, which is attached to vCenter, has been deleted from Storage Array < >. Please work with the Storage Administrator to resolve this issue. Either recreate the File System in the Storage Array or detach it from vCenter.	Indicates that the file system which is attached to vCenter has been deleted from the storage. Contact the Storage Administrator and either detach the file system or recreate it using the storage GUI.	

vSphere error event messages

Error event messages are critical messages regarding errors or malfunctions that have occurred.

The following table summarizes the error event messages that the IBM Storage Management Console may generate and display in the vSphere monitoring panels (see Figure 95 on page 87 and Figure 96 on page 87).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

Table 6. vSphere error event messages

ID	Message	Description		
461	A general error has occurred: < >	Describes a general error that has occurred		
462	Error while setting Multipath policy for < >: < >.	Describes an error that has occurred during a multipath policy setting		
463	Failed while adding LUN on storage array < >: < >	LUN addition failure		
464	Failed while deleting LUN on storage array < >: < >	LUN deletion failure		
465	Failed while extending LUN on storage array < >: < >	LUN extent failure		
466	Failed while moving LUN to another storage pool on storage array < >: < >	LUN move failure		
467	Failed while mapping LUN on storage array < >: < >	LUN mapping failure		
468	Failed while unmapping LUN on storage array < >: < >	LUN unmapping failure		
469	Failed while renaming LUN on storage array < >: < >	LUN rename failure		
470	Failed while trying to connect to storage array < >. Reason: < >	Describes an error which occurred while trying to connect to a storage array		
471	Failed while creating File Share on storage array < >: < >	File Share create failure		
472	Failed while adding Export to File Share on storage array < >: < >	File Share add export failure		
473	Failed while removing Export to File Share on storage array < >: < >	File Share remove export failure		
474	Failed while setting Quota to File Share on storage array < >: < >	File Share set quota failure		
475	Failed while deleting File Share on storage array < >: < >	File Share deletion failure		

Event messages in Windows Server

The IBM Storage Management Console for VMware vCenter generates event messages in the Windows Server application event log (located on the vCenter server), as detailed in the following sections.

- "Windows information event messages"
- "Windows warning event messages" on page 92
- "Windows error event messages" on page 94

Windows information event messages

Information event messages are non-critical messages that notify you about the different performed operations.

The following table summarizes the information event messages that the IBM Storage Management Console may generate and display in the Windows Server application event log (see Figure 97 on page 88).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

ID	Message	Description	
301	Service has started	IBM Storage plug-in service has started.	
302	Service has stopped	IBM Storage plug-in service has stopped.	
303	Service is stopping	Plug-in service is in the process of stopping.	
304	Initializing cache maintainer	Cache maintainer initialization has started.	
305	Cache maintainer has been initialized	Cache maintainer initialization has been completed.	
306	Running cache maintainer	Cache maintainer is currently running.	
307	Cache maintainer is stopping	Cache maintainer is in the process of stopping.	
308	Multipath policy for LUN < > has been set to < > (was < >)	Multipath policy has been set.	
309	IBM Management Console plug-in extension was unregistered	IBM Storage plug-in service has been unregistered.	

Table 7. Windows information event messages

Windows warning event messages

Warning messages bring to your attention any condition that may result in an error or malfunction.

The following table summarizes the warning event messages that the IBM Storage Management Console may generate and display in the Windows Server application event log (see Figure 97 on page 88).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

ID	Message	Description
331	Cache manager did not find any volume that matches extent < >. Please check your VMware environment for inaccessible datastore LUNs.	Volume not found
332	Datastore < > is of type < >, which is unsupported. Please notify IBM support.	Unsupported datastore type
333	Cache manager did not find any volume for Raw Mapping LUN with filename < >, which belongs to VM < >.	Volume has not been found by cache manager.

Table 8. Windows warning event messages. This table lists Window warning event messages.

ID	Message	Description
334	Cache manager reported an error that might be temporary: < >	Temporary cache problem
335	Cache manager found a storage volume but cannot access its properties.	Storage volume cannot be accessed.
	Volume serial = < >	
	The 'Rescan' operation from the host configuration tab may resolve this problem.	
336	Timeout occurred while waiting for Cache update.	Cache timeout problem
	It appears that multiple updates to the Cache were initiated and did not finish within the timeout.	
	If this persists, please notify IBM support.	
337	Cache manager failed to connect to IBM storage system < >.	Connection failure due to a specified reason
	Reason: < >	
	Update the system properties using the IBM Storage link.	
339	Storage Pool < >, which is attached to vCenter, has been removed from Storage Array < >.	Storage pool is not attached.
	Please work with the storage administrator to resolve this issue. Either recreate the storage pool in the storage array or detach it from vCenter.	
340	Failed to match host HBA to a SCSI LUN topology. Searching interface adapter < > for host ID < >.	HBA does not match the SCSI LUN topology.
341	Cannot retrieve virtual disk attributes for virtual machine < >. It may be inaccessible.	Virtual disk attributes are not available.
342	Failed to keep registry keys during uninstallation. If you are upgrading, registry keys will be overridden by the defaults.	Failed to keep registry values
343	Failed to restore registry keys during uninstallation. If you are upgrading, registry keys will be overridden by the defaults.	Failed to restore registry values
344	Failed to keep SSH keys during unconfigure. If you are upgrading, you must provide the SSH keys for SVC / Storwize V7000 again.	Failed to keep SSH keys

Table 8. Windows warning event messages (continued). This table lists Window warning event messages.

ID	Message	Description
345	Failed to restore SSH keys from the backup. If you are upgrading, you must provide the SSH keys for SVC / Storwize V7000 again.	Failed to restore SSH keys
346	 The cache manager found more than one LUN that matches SCSI LUN < >. Topology information is not available for this LUN. To resolve this problem, perform rescanning for host: < >. 	Duplicate volumes
347	Cache manager found a file share but cannot access its properties. File share path = < >. The 'Rescan' operation from Host configuration tab might fix this problem.	Unrecognized file share
348	File System < >, which is attached to vCenter, has been deleted from Storage Array <>.Please work with the Storage Administrator to resolve this issue. Either recreate the File System in the Storage Array or detach it from vCenter.	File System has been deleted.
349	Rescan operation for host <> has reached timeout of < >. This may result in incomplete operation depending on the rescan results.	Rescan host has reached timeout.

Table 8. Windows warning event messages (continued). This table lists Window warning event messages.

Windows error event messages

Error event messages are critical messages regarding errors or malfunctions that have occurred.

The following table summarizes the error event messages that the IBM Storage Management Console may generate and display in the Windows Server application event log (see Figure 97 on page 88).

Note: "< >" stands for a dynamic content parameter that changes based on the context in which it appears.

Table 9. Windows error event messages

ID	Message	Description
361	An error has occurred while updating the cache: < >	Cache error

ID	Message	Description	
362	The IBM Storage Management Console failed to unregister from vCenter server with message: < >. You can remove the plug-in manually by using the extension manager, which is available in the mob directory of your vCenter Server DNS name. For example: https://vcenter1main/ mob.	Plug-in removal failure	
363	The IBM Storage Management Console failed to remove the service with message: < >	Service removal failure	
364	The IBM Storage Management Console failed to register plug-in with message: < >	Plug-in registration failure	
365	The IBM Storage Management Console failed to login to the vCenter Server with current credentials. Please run the Configuration Wizard in order to change username and password.	Login failure due to credentials	
366	The IBM Storage Management Console failed to set multipath policy for < >: < >	Multipath setting failure	
367	The IBM Storage Management Console failed in LUN operation: < >	LUN operation failure	
368	The IBM Storage Management Console failed while trying to use keyring: < >	Keyring error	
369	IBM Storage Management Console for VMware vCenter failed in File Share operation: < >	File Share operation error	

Table 9. Windows error event messages (continued)

Disabling and enabling the IBM Storage plug-in

Whenever required, you can disable the IBM Storage Management Console from the vSphere Plug-in Manager.

In the Plug-in Manager, right-click the row of IBM Storage Management Console for VMware vCenter, and then click **Disable** to disable the functionality of the plug-in.

ig-in Name	Vendor	Version	Status	Description
stalled Plug-ins				
S VMware vCenter Storage Monitoring Service	VMware Inc.	5.5	Enabled	Storage Monitoring
T. 8 8				Reporting
🚱 vCenter Service Status	VMware, Inc.	5.5	Enabled	Displays the health
				vCenter services
🚱 🛛 vCenter Hardware Status	VMware, Inc.	5.5	Enabled	Displays the hardw
				hosts (CIM monitori
BM Storage Management Console for VMware vCenter	IBM, Corp.	3.2.1	. Enabled	Manage IBM Storag
ailable Plug-ins	Copy to Clipboard Ctrl+C			

Figure 98. vSphere Plug-in Manager – Disable option

When you want to restore the IBM Storage Management Console plug-in functionary, right-click its row and then click **Enable**.

Plug-in Manager				
Plug-in Name	Vendor	Version	Status	Description
Installed Plug-ins				
Service VMware vCenter Storage Monitoring Service	VMware Inc.	5.5	Enabled	Storage Monitoring an
				Reporting
inter Service Status	VMware, Inc.	5.5	Enabled	Displays the health st-
				vCenter services
i vCenter Hardware Status	VMware, Inc.	5.5	Enabled	Displays the hardware
				hosts (CIM monitoring
BM Storage Management Console for VMware vCenter	IBM, Corp.	3.2.1	Disabled	Manage IBM Storage (
Available Plug-ins	Enable			
	Copy to Clipboard Ctrl+C			
				•
Help				Close

Figure 99. vSphere Plug-in Manager - Enable option

Resolving miscellaneous issues

For up-to-date information about known issues and possible workarounds, refer to the latest release notes of the IBM Storage Management Console for VMware vCenter.

You can find the latest release notes on the IBM Storage Host Software Solutions Information Center (publib.boulder.ibm.com/infocenter/strhosts/ic) or on the IBM Fix Central (www.ibm.com/support/fixcentral).

Chapter 9. Best Practices

Refer to the general guidance and best practices that are described in the following sections.

Handling datastores

For best performance of VMware datastores:

- Create each datastore on a separate storage volume.
- If you use snapshots/mirroring for volumes, place all Datastore Extents volumes (the building block LUNs of a datastore) in a consistency group (defined by using the storage system GUI or CLI).

Handling ESX hosts

For the best performance of ESX hosts that use XIV-based volumes, define all ESX hosts within a cluster as cluster hosts on the IBM XIV storage system as well.

Following this practice prevents situations in which a storage volume is mapped to different ESX hosts in a cluster using different LUN numbers, thus making this LUN unusable.

Distributing volumes evenly for DS8000 systems

DS8000 storage systems have two rank groups, 0 and 1, each managed by a single server. In addition, each DS8000 extent pool is based on one rank group.

Accordingly, it is recommended to spread volumes (LUNs) evenly across the DS8000 servers. Spreading the volumes equally on the extent pools of rank groups 0 and 1 balances the workload across the DS8000 systems.

Notices

These legal notices pertain to IBM Storage Host Software Solutions product documentation.

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing IBM Corporation North Castle Drive Armonk, NY 10504-1785 U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing Legal and Intellectual Property Law IBM Japan Ltd. 1623-14, Shimotsuruma, Yamato-shi Kanagawa 242-8502 Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation Attn: Office of Legal Counsel 650 Harry Road San Jose, CA 95120-6099 U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of the International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Copyright and trademark information website (www.ibm.com/legal/us/en/copytrade.shtml).

VMware, the VMware logo, ESX, ESXi, vSphere, vCenter, and vCenter Site Recovery Manager are trademarks or registered trademarks of VMware Corporation in the United States, other countries, or both.

Microsoft, Windows Server, Windows, and the Windows logo are trademarks or registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Other product and service names might be trademarks of IBM or other companies.

Index

Α

add a storage systems 19 add IBM storage system 19 attaching storage pools or file systems 31

В

best practices 97 distributing DS8000 volumes 97 handling datastores 97 handling ESX hosts 97

С

change multipath policy 27 change multipath policy enforcement 69 CLI configuration wizard 9 compatibility 3 Concept diagram 2 configuration 9 assign required vCenter privileges 16 color indications 15 modify Management Console settings in Windows Server registry 12 modify Windows Server registry general settings 12 replace common SSL certificate with private certificate 14 restart vSphere Client 10 set file system usage alert thresholds 15 set storage poll usage alert thresholds 15 SSL certificate 14 SSL key 14 using CLI configuration wizard 9 verify installation 10 connect to IBM storage system 19 connect to IBM storage systems 19 modify access credentials 24 removing an IBM storage system 28 set multipath policy enforcement for a storage system 25 change multipath policy 27 disable multipath policy 28 enable multipath policy enforcement 26 create 43 create new file share 43

D

datastore connect virtual machine 85 datastores best practices 97 using file shares 77 using volumes 77 detach storage pools or file systems 35 detaching storage pools or file systems 31 disable 95 disable multipath policy 28 download site 3 DS8000 volume details 54 DS8000 volumes best practices 97

Ε

enable 95 error event messages 90, 94 ESX hosts best practices 97 map a storage volume 66 event messages vSphere 88 Windows Server 91

F

features and benefits 1 file share 43 deleting 74 disable quota 72 export a NAS file share to hosts 72 remove from hosts 74 setting a quota 71 unused 74 view details 46 File Share Details pane view information 59 file shares create 37 create VMware datastores 82 manage 37 managing 71 used by virtual machines 50 view 37 datastores 47 file systems attach 34 attaching 31 detach 35 detaching 31 view details 31 Flex System volume details 57

l

IBM Storage icon 10
IBM Storage Management Console removing 7
information event messages vSphere 89 Windows Server 91
installation 5 first-time installation vs. upgrade 5 installation (continued)
installation wizard 5
removing IBM Storage Management
Console software 7
introduction 1

L

log file view 88 LUN create 38 LUN Details pane view information 52 LUNs managing 60

Μ

Management Console settings modify 12 miscellaneous issues 96 modify access credentials for IBM storage systems 24 monitoring 87, 96 multipath policy enforcement change 69 disable 70 Multipath Policy Enforcement 68

Ν

NAS file share export 72 remove from hosts 74

0

overview 1

Ρ

private certificate 14

R

removing an IBM storage system 28 requirements 3 restart vSphere Client 10 running the installation wizard 5

S

SAN Volume Controller volume details 57 set multipath policy enforcement for a storage system 25 change multipath policy 27 set multipath policy enforcement for a storage system (continued) disable multipath policy 28 enable multipath policy enforcement 26 set usage alert thresholds (color indications) 15 SSL certificate 14 storage pools attach 34 attaching 31 detach 35 detaching 31 view details 31 storage volume create 38 storage volumes create VMware datastores 77 Storage volumes managing 60 Storwize volume details 57 supported storage systems 1

Т

target connectivity check 37 tasks monitor status 87 triggered alarms monitor status 87 troubleshooting 87, 96

V

verify installation 10 virtual machine connect to datastore 85 virtual machines file shares 50 volumes 50 VMware datastores 77 create in file shares 82 volume 69 create VMware datastores 77 extending 61 increasing datastore capacity 62 map to one or more ESX hosts 66 move to another storage pool 65 multipath policy enforcement disable 70 rename 64 setting Multipath Policy Enforcement 68 view details 46 volume details 52 volumes choose which to show 51 create 37 manage 37 used by virtual machines 50 view 37 datastores 47 vSphere 90 error event messages 90 event messages 88 information event messages 89

vSphere (*continued*) warning event messages 89

W

warning event messages
vSphere 89
Windows Server 92
Windows 94
error event messages 94
Windows Server
event messages 91
information event messages 91
warning event messages 92
Windows Server registry
modify management console
settings 12

Х

XIV volume details 52

Printed in USA

GA32-0929-10

