



User Guide
ISE Manager Suite

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Preface

This document describes the installation and use of the X-IO ISE Manager Suite tool. This tool is a Graphical User Interface (GUI) for managing the ISE Storage Systems in groups and SAN groups.

Audience

This document is intended to assist system administrators in managing their ISE Storage Systems.

Conventions

The following conventions are used in this manual.

Element	Convention
Command Line Interface input/output	Courier New, 10 pt, Bold
Document title	<i>Italic</i>
Emphasize a word or phrase	<u>important</u>
File name, path	Arial, 9 pt, Bold
Key, Button	COURIER NEW, 12 PT, SMALL CAPS
Literal	Courier New, 10 pt, Bold
Variable, represents text that must be entered	< Courier New, 10 pt, Bold, Italic >

Table 1: Document Conventions

Related Documents

The following documents should be obtained from <http://support.xiotech.com> and used as a guide through the setup and initialization of the ISE Storage System:

- *ISE Storage System User Guide*
- *ISE Storage System, Archive, 200 Series and Hyper ISE Release Notes*
- *ISE Storage System, iSCSI Release Notes*

ISE Storage System Models

The X-IO ISE Storage Blade comes in two models:

1. **Fibre Channel ISE** – ISE Storage System using Fibre Channel for the host data path
 - Generation one ISE, the first ISE offering
 - Generation two ISE, the Fiber Channel ISE offered currently
2. **iSCSI ISE** – ISE Storage System using iSCSI for the host data path

Executing ISE Manager Suite

ISE Manager Suite should always be run as **Administrator**; to do so, right-click the ISE Manager Suite icon and select **Run as Administrator** from the pop-up menu.

Introduction

The ISE Storage System (throughout this document referred to as “ISE”) is a high-density, fully redundant, rack-mountable storage device that integrates enterprise-class drives with advanced array controllers and environmental support components to provide an extremely reliable self-contained storage unit that outperforms more traditional storage sub-systems.

The ISE Manager Suite is the management interface used to configure, monitor, and manage the ISE. In addition, the ISE Manager Suite provides storage provisioning services for ISE Storage Systems.

Log In, Log Out

The initial ISE Manager Suite (generally referred to as “ISE Manager” in this document) screen is used for logging in. The logout screen is accessible from all ISE Manager Suite screens.

Log In

The ISE Storage System opens with the login screen as shown in the figure below. ISE Manager Suite credentials are required unless Active Directory is being used.



Figure 1. Login Screen

ISE Manager Suite Credentials

To log in using ISE Manager Suite credentials:

1. Enter the user name **Administrator** for ISE Manager credentials. User names are case-sensitive.
2. Enter the Password.

Note. The default password is **made4you** and should be changed using the **Change Password** option.

3. Click **Login**.

To log in while Active Directory controls are being used, you must be logged into the domain.

Welcome Screen

ISE Manager Suite presents the SAN Groups screen on login.

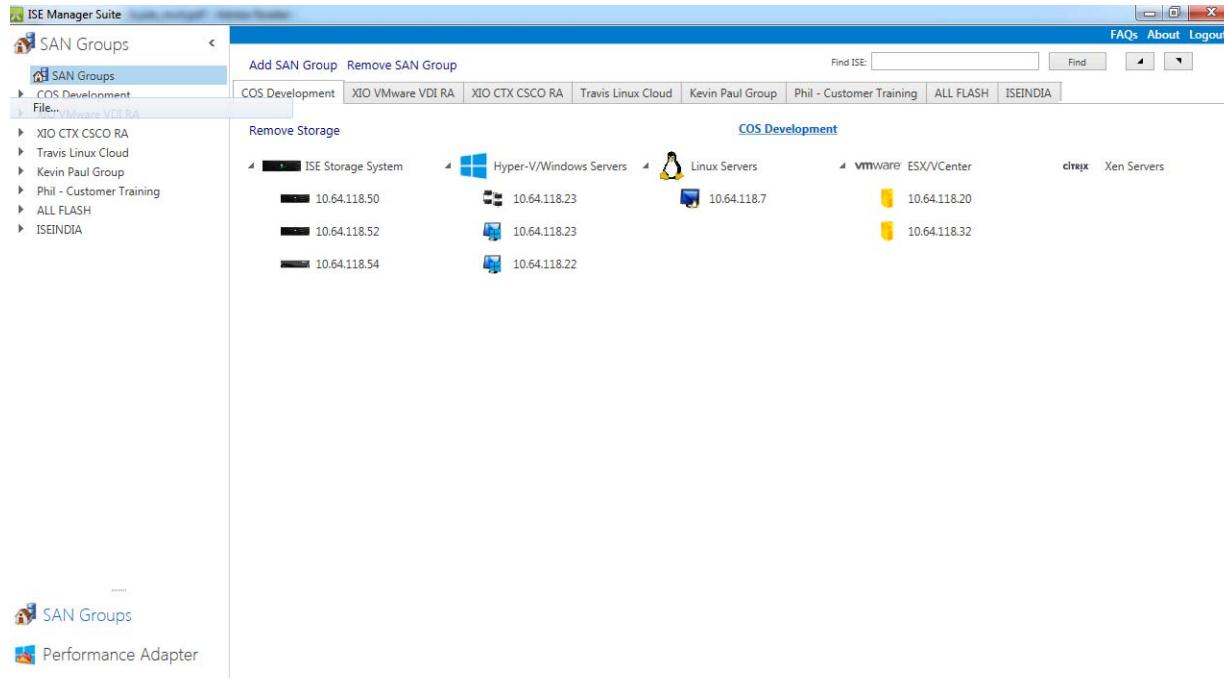


Figure 2. ISE Manager Suite Opening Screen

User Management

The User Roles section of ISE Manager Suite shows the users of the current domain. Users can modify the permissions of the listed users.

The screenshot shows the 'User and Role Management' window. On the left, there's a sidebar with icons for SAN Groups, Performance Adapter, and User Roles. The main area has tabs for 'Operations' (Add User, Delete User, Modify Permissions, Search User) and 'Users'. A table lists users with columns for User, Domain, Role, and Description. One row, 'XIOTESTS', is selected. The table includes rows for built-in accounts like Guest, Administrator, and several service accounts.

User	Domain	Role	Description
wardda	XIOCOP.DOM		Admin Account
wardc	XIOCOP.DOM		
Guest	XIOCOP.DOM		Built-in account for guest access to the computer/domain
APPFNGS	XIOCOP.DOM		
Administrator	XIOCOP.DOM		Built-in account for administering the computer/domain
waynebr	XIOCOP.DOM		Disabled 2-9-05 PCH - Built-in account for administering the computer/domain
smsadmin	XIOCOP.DOM		Disabled 11-11-05 PCH
eservice	XIOCOP.DOM		Runs the Exchange Service - Do not delete
workstation.ins...	XIOCOP.DOM		Workstation.Install
crystaluser	XIOCOP.DOM		Used for AD authentication to reports.xotech.com
momaction	XIOCOP.DOM		Mom Action Account
momdas	XIOCOP.DOM		Mom Das Account
krbtgt	XIOCOP.DOM		Disabled
STAGING\$	XIOCOP.DOM		
XIODEVS	XIOCOP.DOM		
XIOTESTS	XIOCOP.DOM		
XIOS\$	XIOCOP.DOM		
ASAS\$	XIOCOP.DOM		
calladmin	XIOCOP.DOM		calladmin
CiscoCM	XIOCOP.DOM		Call Manager
spsearch	XIOCOP.DOM		Sharepoint Search
shpsvc	XIOCOP.DOM		Sharepoint Service Account
sellmail	XIOCOP.DOM		
100563	XIOCOP.DOM		
Durbins	XIOCOP.DOM		
Mcmiminda	XIOCOP.DOM		India User
backup	XIOCOP.DOM		Admin acct
			Backups Service Account

Figure 3. User and Role Management

Modify Permissions

To modify the permissions of the Active Directory user, follow the steps below.

Note. This applies to individual user accounts only, not to groups.

1. Click **Modify Permissions**.

The *Modify User Role* dialog appears.

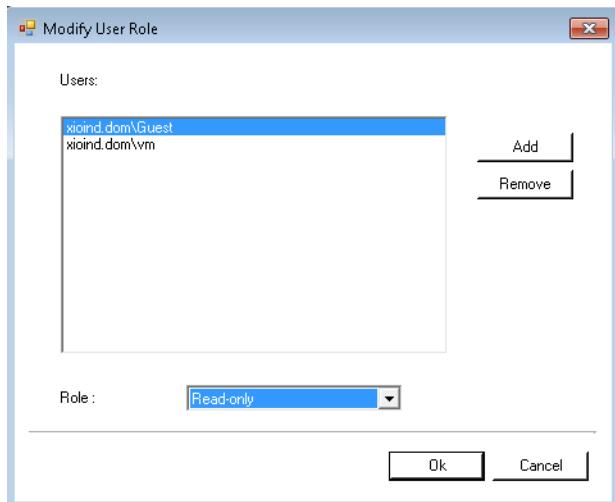


Figure 4. Modify User Role

2. Click **Add**.

The *Select User for Permissions* dialog appears.

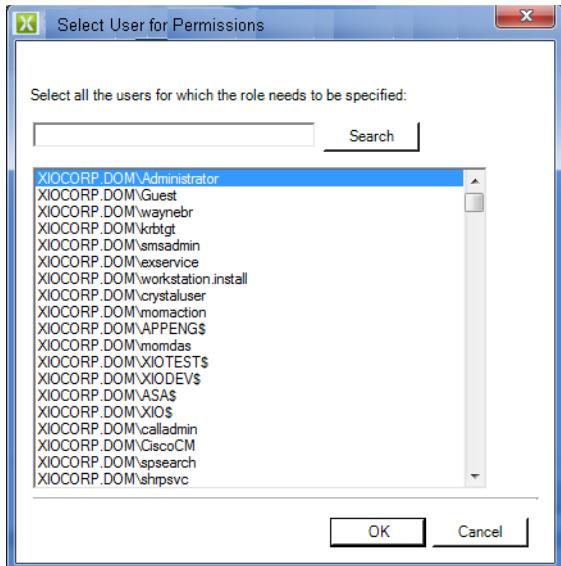


Figure 5. Select User for Permissions

3. Select the user(s) whose permissions will be modified and then click **OK**.
4. In the *Modify User Role* dialog, select the User and select from the drop-down Role list the permissions for the user (options are Administrator, Read-only, and Revoke Rights).
5. Click **OK** to assign the roles for the selected users.

Log Out

To log out of ISE Manager Suite:

1. Select the **SAN Groups** in the left navigation pane (at top).
2. Click **Logout**.

The ISE returns to the login page.

Change Password

The **Change Password** function is used to change the ISE Manager Suite user password (which defaults to **made4you**). It is highly recommended that the user password be changed from the factory default.

Note. User passwords are stored in the **ISEManager.dat** file in an encrypted format.

The following special characters are not allowed in passwords: &, ", /, \, and '.

To change the ISE Manager Suite user password:

1. On the login screen, click **Change Password**.
2. Enter the old password and a new password.

3.



Figure 6. Change Password

4. Click **OK** to finalize the password change.
5. Log in to ISE Manager Suite using the new credentials.

Importing, Exporting Configurations

This section describes how to import a previously saved configuration into a new installation and how to export an existing configuration to any other system or a network drive.

Importing Saved Configuration

To import a saved ISE Manager Suite configuration:

1. Open ISE Manager Suite.
2. On the login screen, right-click and select **Import Configuration**.

The *Import Configuration* screen appears.

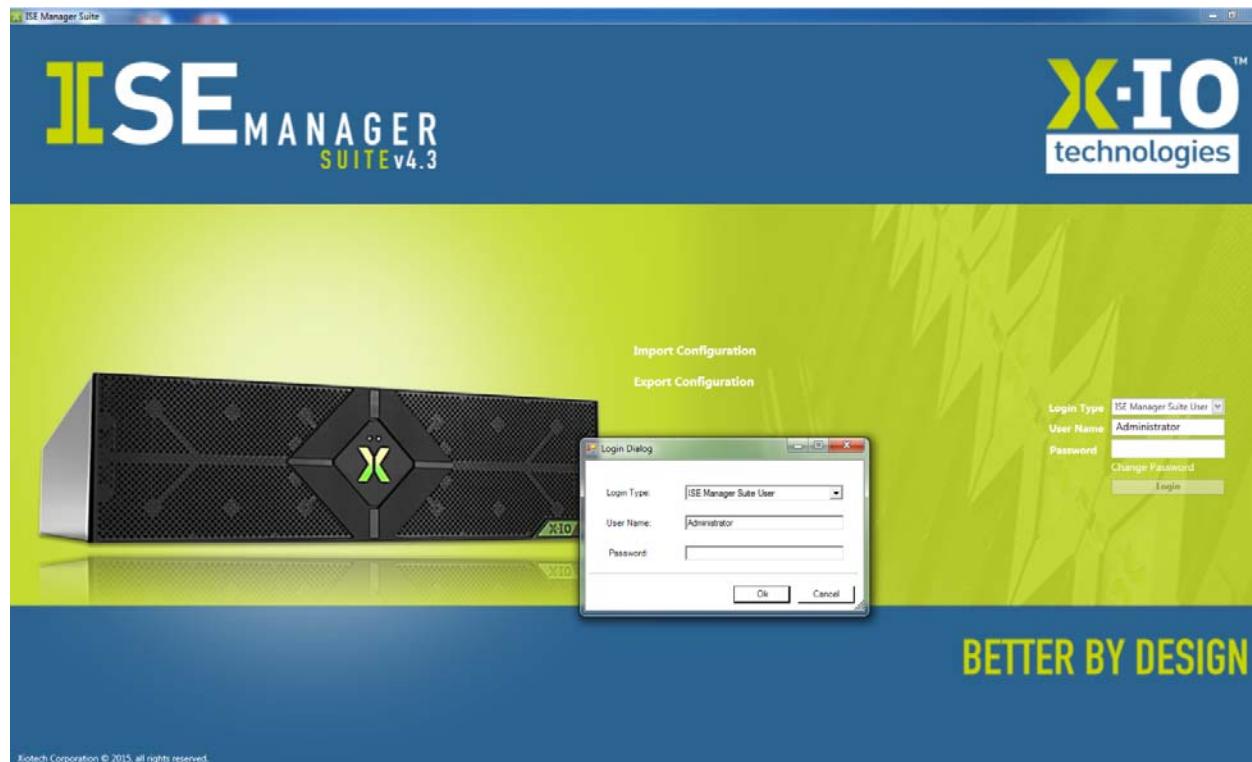


Figure 7. Login Screen—Import Saved Configuration

3. Select a user type, **ISE Manager Suite** or **Active Directory**.
4. Enter the user credentials.
5. Click **OK**.

In the dialog that opens, browse to the location where the configuration files are saved and select the desired configuration file.

6. Click **Next**.

A confirmation dialog appears.

7. Click **Yes** to import.

The summary screen appears.

Exporting Configuration

To export an ISE Manager Suite configuration:

1. Open ISE Manager Suite.

2. On the login screen, right-click and select **Export**.

The **Save as** menu appears.

3. Browse to a location where the configuration is to be saved. Select a location outside of the X-IO ISE Manager Suite folder to protect the file from deletion during uninstall and then click **Save**.

The configuration file is saved as **ISEManager.dat.sav.dat** and a success message appears.

4. Click **OK**.

ISE Manager Suite GUI Anatomy

The ISE Manager Suite graphical user interface (GUI) is shown below with its primary regions labeled.

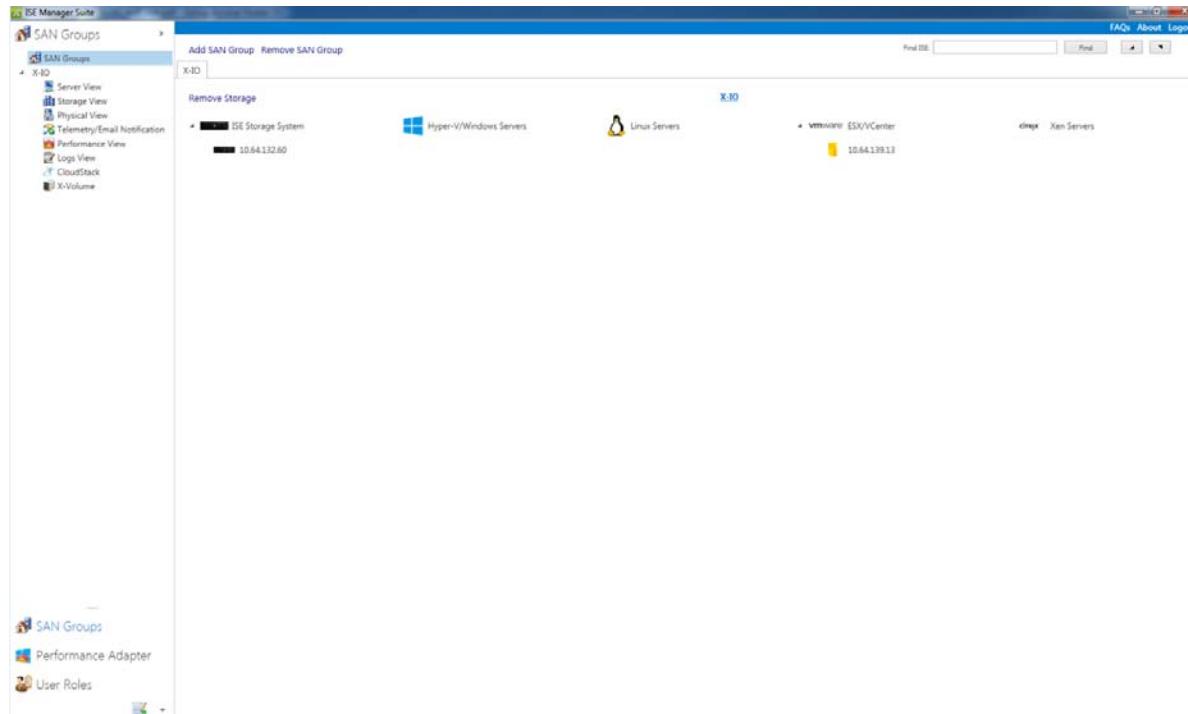


Figure 8. ISE Manager Suite GUI

ISE Manager Suite Graphical User Interface Anatomy

Region	Description
1	Left navigation pane
2	Top horizontal option pane
3	Details pane
4	Frequently Asked Questions, Help, and Logout

Legend

All icons used by ISE Manager Suite are identified within the legend. The legend is accessible by clicking the **Legend** option on the top horizontal navigation bar as shown below.

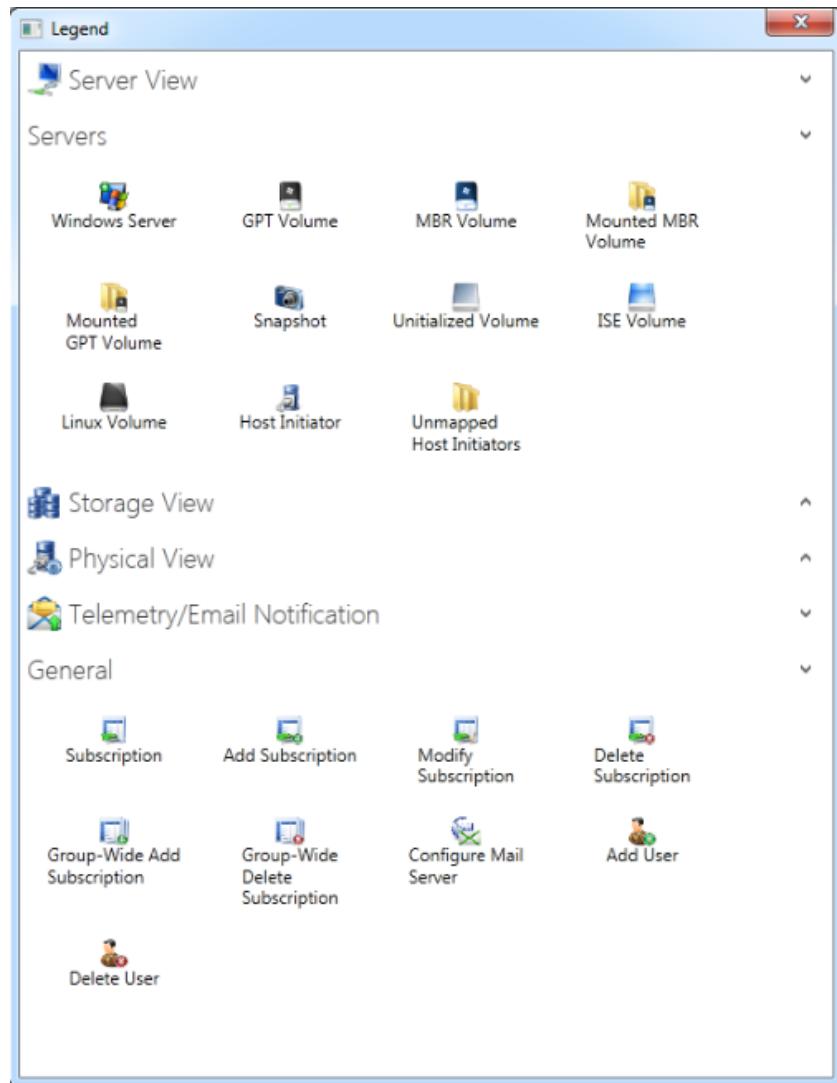


Figure 9. Icon Legend

Send Feedback

The Send Feedback option in the top horizontal navigation bar opens an Outlook e-mail pre-addressed to X-IO for the purpose of improving our users' experience.

SAN Groups

This section describes adding and removing SAN Groups and storage systems. The information is applicable to all ISE Storage Systems.

SAN Groups

Storage Area Networks (SAN) including ISE Storage Systems are easily managed using the ISE Manager Suite.

Add SAN Group

The **Add SAN Group** option is used to create a group as follows:

1. Click **SAN Groups** in the left navigation pane.
2. Click **Add SAN Group** in the top horizontal option pane.

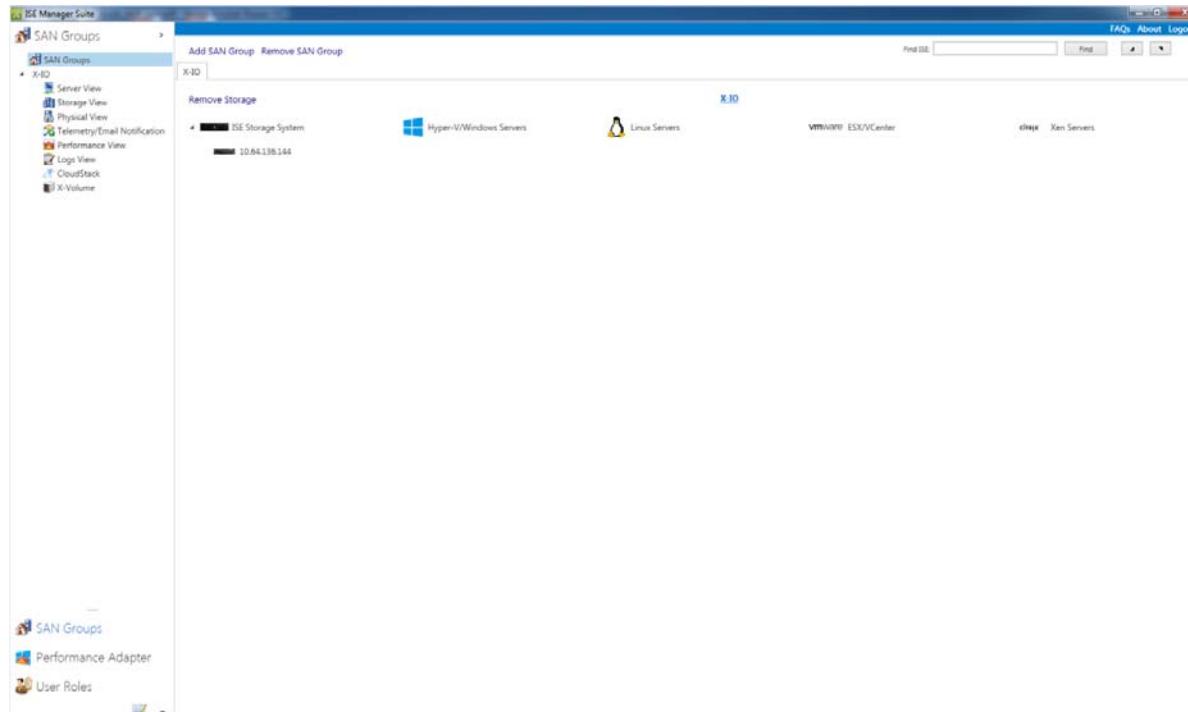


Figure 10. Add SAN Group Screen

The *Add SAN Groups* dialog appears as shown in the following figure.

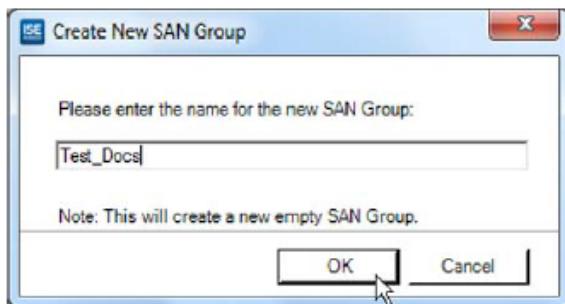


Figure 11. Add SAN Group Dialog

3. Enter a name for the SAN group.
4. Click **OK** and the SAN group is created and subsequently listed under SAN groups.

Remove SAN Group

The **Remove SAN Group** option is used to delete empty SAN groups from the group view as follows:

1. Click **SAN Groups** in the left pane.
2. Click **Remove SAN Group** in the top horizontal option pane.

The Remove SAN group dialog appears.

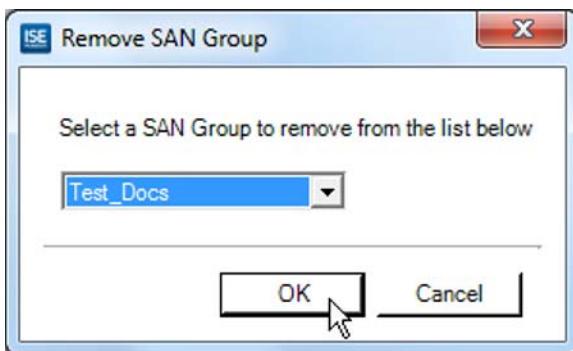


Figure 12. Remove SAN Group Dialog

3. Select the SAN group to delete from the drop-down list.
4. Click **OK** to remove the selected group.

If the selected SAN group is not empty, the following pop-up appears.

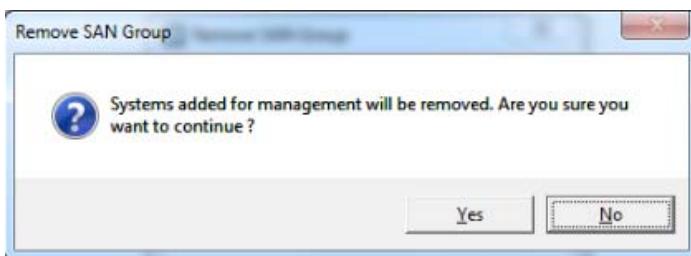


Figure 13. Remove SAN Group Error Pop-up

Rename SAN Group

The **Rename SAN Group** option is used to rename a SAN group as follows.

1. In the left pane, right-click the SAN group to be renamed.
2. Select **Rename SAN Group** from the drop-down menu that appears.

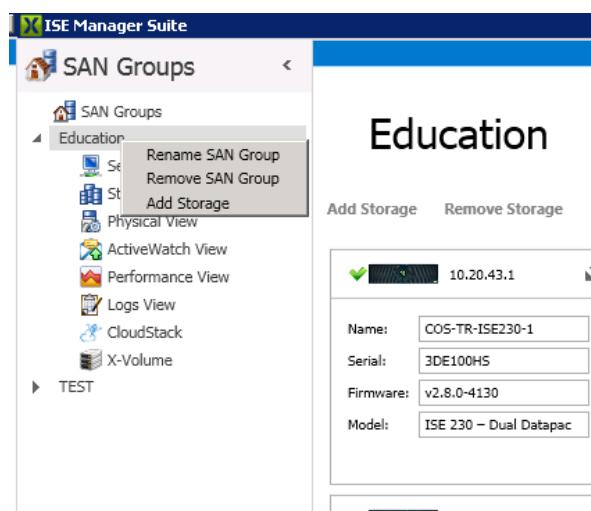


Figure 14. Rename SAN Group drop-down

3. Type a new name in the *Rename SAN Group* dialog that appears.

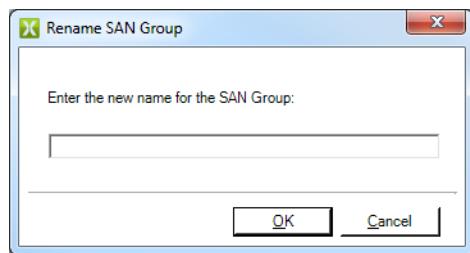


Figure 15. Rename SAN Group dialog

4. Click **OK**.

Storage Systems

The storage systems that are defined as members of a SAN group can be added, removed, and viewed. Various static dashboards can be displayed by clicking in the ISE details located in the central banner.

Add Storage System

The **Add Storage System** option is used to add an ISE system into the current SAN group as follows:

1. Click a SAN group name in the left pane.
2. Click **Add Storage** (top horizontal command bar).

The **Add Storage Systems** screen appears as shown in the figure below.

The screenshot shows the ISE Manager Suite interface. On the left, there is a navigation sidebar with icons for SAN Groups, Performance Adapter, and User Roles. The main area is titled "COS Development". At the top, there are buttons for "Add Storage" and "Remove Storage". A search bar labeled "Sort By: Storage Address" is also present. The main content area displays information about an ISE Storage System, including its status (Operational), model (ISE 228 - Single DataPac), serial number (1DE100260), and global ID (2000001F93100078). It also lists Managed Reliability Controllers (Top MRC and Bottom MRC) and DataPacs. On the right, there are two additional ISE systems listed in a table: one named PBIE2-JF and another named ISE. Below this, there is a "Add Storage Systems" dialog box with fields for IP / DNS Name, User Name, Password, SSL, and Status. The "IP / DNS Name" field contains "10.64.118.51" and has a checked checkbox. The "User Name" field contains "administrator" and the "Password" field contains a masked password. The "Status" field is empty. There is a "Select All" checkbox and an "Add" button at the bottom of the dialog.

Figure 16. SAN ISE Details—Add Storage System

3. Click once in the open space under the **IP/DNS Name** heading to open an input field.
4. Enter the IP address or DNS name of one of the MRCs for the ISE being added.
5. Enter the username and password in the respective fields as necessary.

The error message **Already added in the SAN Group** is presented in the **Status** field if the selected ISE is in any SAN group.

6. Click **Add** and the ISE system is added to the **ISE Details** view.

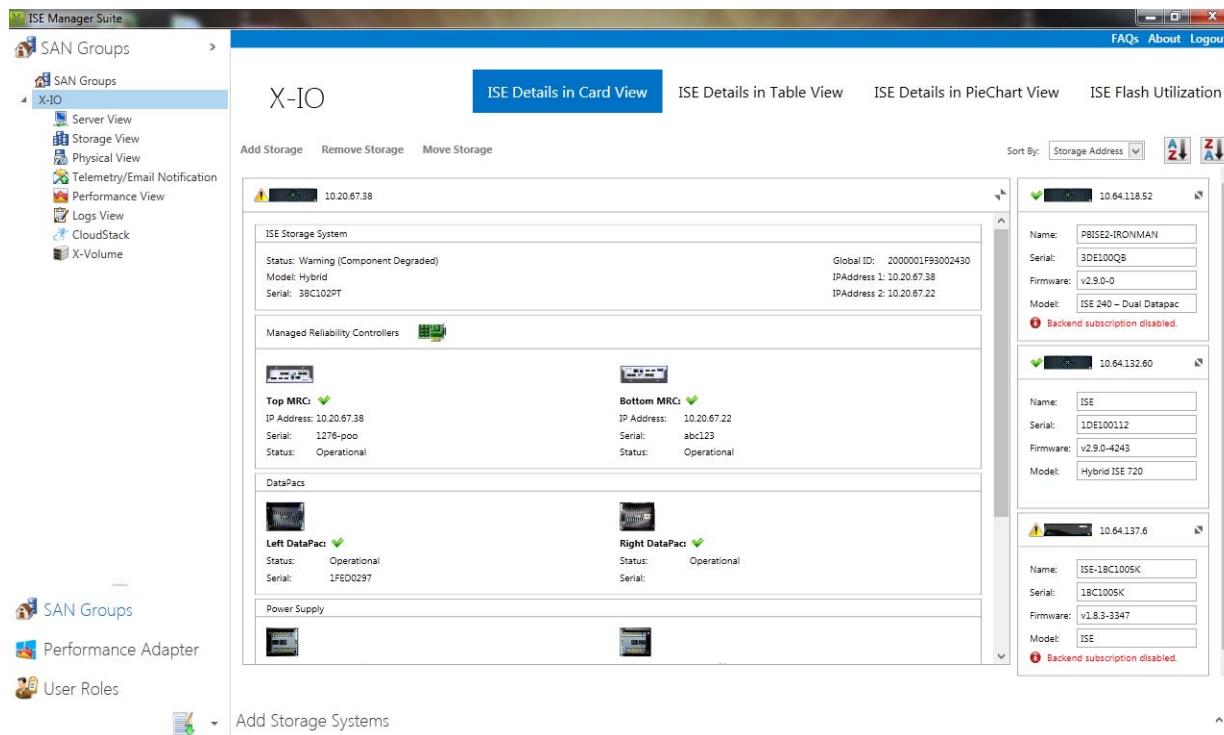


Figure 17. SAN Group View

ISE Details in Table View

ISE Details in Table View											
Change Font: 12 Export data to excel Legend Refresh Tables											
Health Status Storage Details Performance Details											
ISE IP (SerialNumber)	Name	Model	Status	Temp	MRC1	MRC2	Power Supply1	Power Supply2	Battery1	Battery2	
10.20.67.38 (3BC102PT)	ISE	Hybrid	Warning	36	Operational	Operational	Operational	Non-Operational	Operational	Critical	
10.64.118.52 (3DE100QB)	PBISE2-IRONMAN	ISE 240 – Dual Datapac	Operational	37	Operational	Operational	Operational	Operational	Operational	Operational	
10.64.132.60 (1DE100112)	ISE	Hybrid ISE 720	Operational	34	Operational	Operational	Operational	Operational	Operational	Operational	
10.64.137.6 (1BC1005K)	ISE-1BC1005K	ISE	Warning	37	Operational	Operational	Operational	Operational	Operational	Non-Operational	
ROLL UP INFO	Total ISE: 4	ISE 1 = 1 ISE 2 = 2 ISE 3 = 1	Status: Operational = 2 Warning = 2 Critical = 0 Non-Operational = 0 Uninitialized = 0 Unavailable = 0 No Response= 0	Temp: Max:37 Min: 34	Total MRC: 8		Total PowerSupplies: 8		Total Batteries: 8		

Figure 18. ISE Details in Table View

View Table Legend

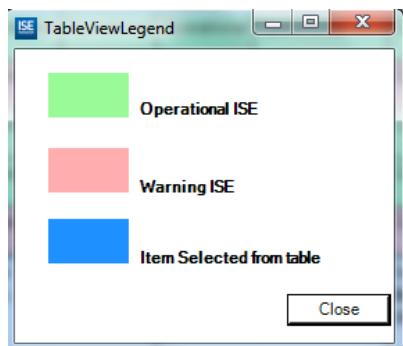


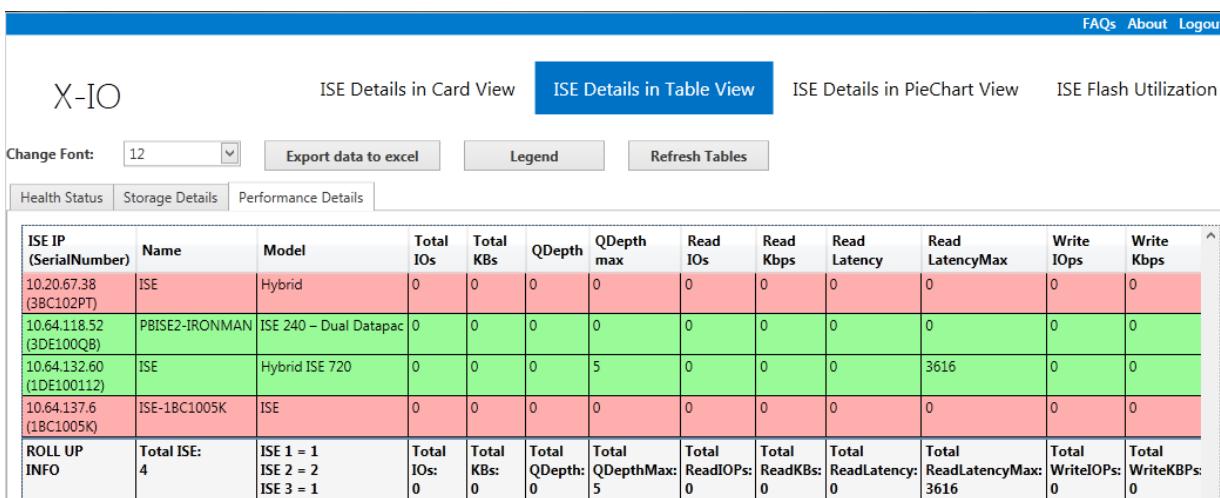
Figure 19. TableViewLegend

The screenshot displays a web-based monitoring interface for storage units. At the top, there are tabs for "ISE Details in Card View", "ISE Details in Table View" (which is currently selected and highlighted in blue), "ISE Details in PieChart View", and "ISE Flash Utilization". Below the tabs are buttons for "Change Font" (set to 12), "Export data to excel", "Legend", and "Refresh Tables". A navigation bar includes links for "FAQs", "About", and "Logout".

The main content area shows a table titled "Storage Details" with the following columns: ISE IP (SerialNumber), Name, Model, ISE Total Capacity GB, ISE Used Capacity GB, ISE Free Capacity GB, ISE Total Volumes, Pool1 Types, Pool1 Capacity, Pool1 UsedSpace, Pool1 FreeSpace, and Pool1 Total Capacity. The table lists five entries, with the last row being a summary for "ROLL UP INFO".

ISE IP (SerialNumber)	Name	Model	ISE Total Capacity GB	ISE Used Capacity GB	ISE Free Capacity GB	ISE Total Volumes	Pool1 Types	Pool1 Capacity	Pool1 UsedSpace	Pool1 FreeSpace	Pool1 Total Capacity
10.20.67.38 (3BC102PT)	ISE	Hybrid	25915 GB	0 GB	25915 GB	0	Hybrid	25915 GB	0 GB	25915 GB	14
10.64.118.52 (3DE100QB)	PBIE2-IRONMAN	ISE 240 – Dual Datapac	34862 GB	749 GB	34113 GB	11	Capacity	17431 GB	390 GB	17041 GB	0
10.64.132.60 (1DE1001Z)	ISE	Hybrid ISE 720	13018 GB	3524 GB	9494 GB	240	Hybrid	13018 GB	3524 GB	9494 GB	14
10.64.137.6 (1BC1005K)	ISE-1BC1005K	ISE	1020 GB	0 GB	1020 GB	0	Unknown	510 GB	0 GB	510 GB	N/A
ROLL UP INFO	Total ISE: 4	ISE 1 = 1 ISE 2 = 2 ISE 3 = 1	Total ISECapacity: 92246 GB	Total UsedCapacity: 4632 GB	Total FreeCapacity: 87614 GB	Total ISE Volumes: 251	Hyper: 0 Perf: 0 Capacity: 0 Balanced: 0 Unknown: 0 None: 0	Total Pool1 Capacity: 56874 GB	Total Pool1 UsedCapacity: 3914 GB	Total Pool1 FreeCapacity: 52960 GB	Total Pool1 Total Capacity: Fl 2E

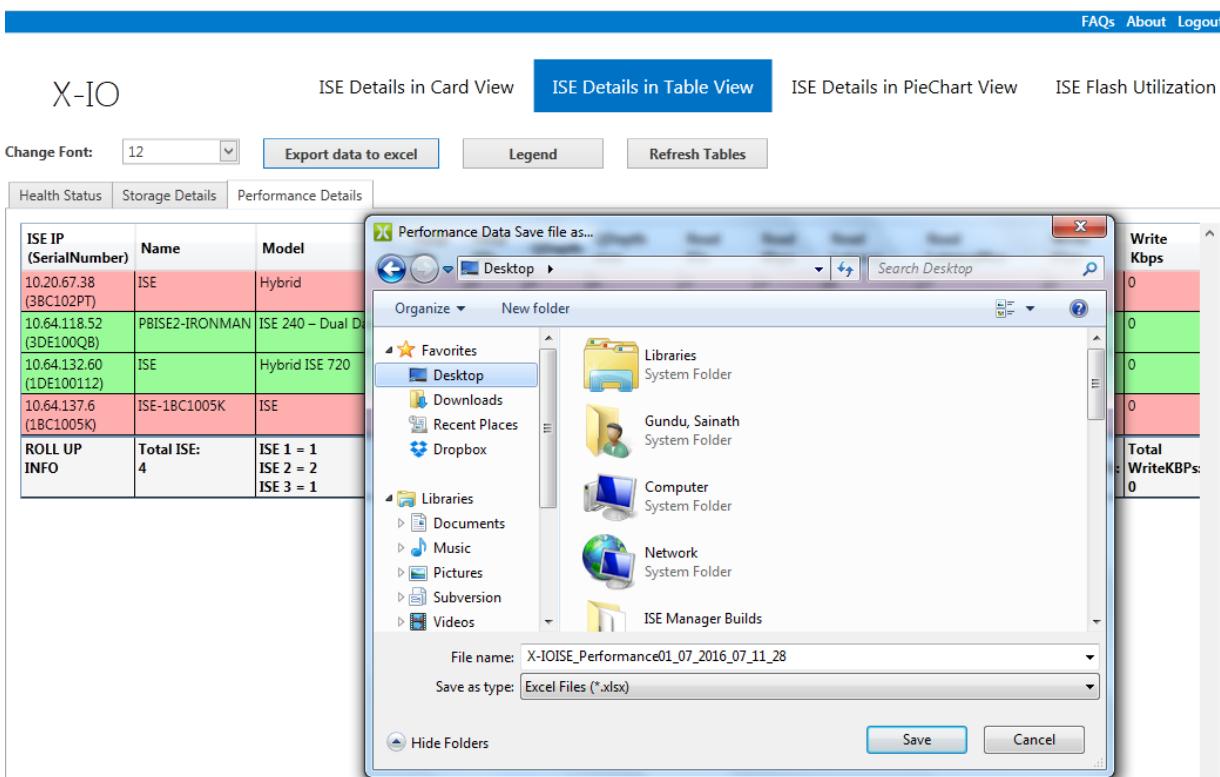
Figure 20. Storage Details in Table View

**Figure 21. Performance Details in Table View**

Export Table View Data to Excel

Click on the Export Data to export the data as a .csv file.

You can then specify where to save the file.

**Figure 22. Performance Data Save file as...**

Add Storage System

The **Add Storage System** option is used to add an ISE system into the current SAN group as follows:

1. Click a SAN group name in the left pane.
2. Click **Add Storage** (top horizontal command bar).

The **Add Storage Systems** screen appears as shown in the figure below.

The screenshot shows the ISE Manager Suite interface. On the left, a sidebar lists 'SAN Groups' with several entries: COS Development (selected), XIO VMware VDI RA, XIO CTX CSCO RA, Travis Linux Cloud, Kevin Paul Group, Phil - Customer Training, ALL FLASH, ISEINDIA, and Julia. The main area displays the 'COS Development' group details. A large central window shows the 'ISE Storage System' configuration for an ISE unit with IP 10.64.118.50. It includes sections for 'Managed Reliability Controllers' (Top MRC and Bottom MRC) and 'DataPacs'. To the right, there are two smaller windows titled 'ISE Details' showing details for two other ISE units: one with IP 10.64.118.51 and another with IP 10.64.118.52. At the bottom, a modal dialog titled 'Add Storage Systems' is open, containing a table with columns: Select, IP / DNS Name, User Name, Password, SSL, and Status. The 'IP / DNS Name' field contains '10.64.118.50' with a checked checkbox. The 'User Name' field contains 'administrator' and the 'Password' field contains a masked password. The 'Status' field is empty. Below the table are 'Select All' and 'Add' buttons.

Figure 23. SAN ISE Details—Add Storage System

3. Click once in the open space under the **IP/DNS Name** heading to open an input field.
4. Enter the IP address or DNS name of one of the MRCs for the ISE being added.
5. Enter the username and password in the respective fields as necessary.

The error message **Already added in the SAN Group** is presented in the **Status** field if the selected ISE is in any SAN group.

6. Click **Add** and the ISE system is added to the **ISE Details** view.

Remove Storage System

Use the **Remove Storage System** option to delete ISE Storage Systems from a group as follows:

1. Select a group name in the left pane.
2. Select the storage system or systems from the list for the selected group in the **Remove Storage System**

screen that opens, as shown below.

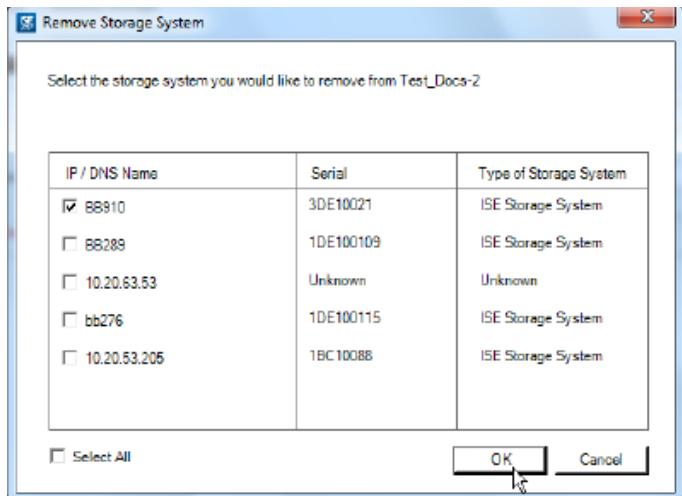


Figure 24. Remove Storage System

3. Check **Select All** to select all storage systems in a given group.
4. Click **OK** to complete the removal.

Move Storage System Between SAN Groups

ISE Manager Suite 4.3 provides the ability to move an ISE from one SAN group to another existing SAN group without having to delete it and then add it back in. An ISE can exist in only one SAN group.

Note. Telemetry settings will need to be reconfigured when an ISE is moved from one SAN group to another.

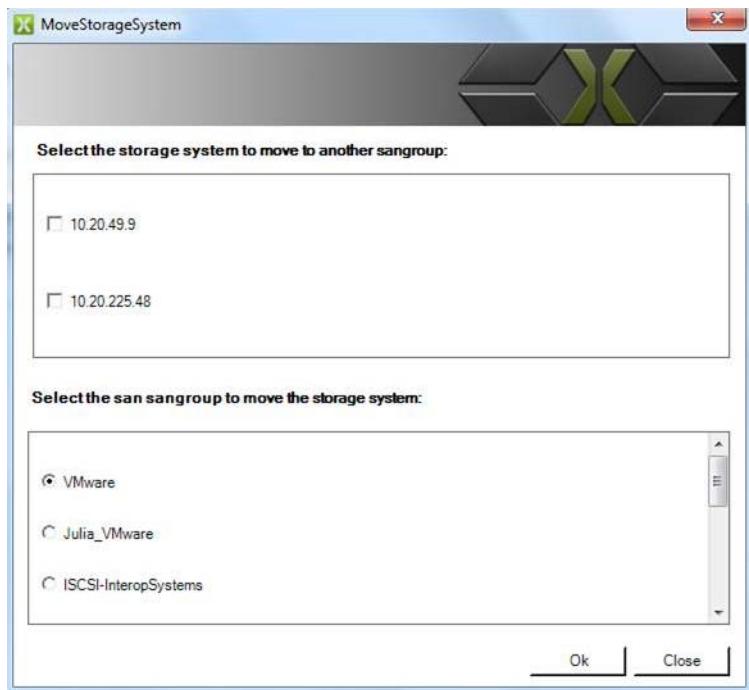


Figure 25. MoveStorageSystem

ISE Details in Pie Chart View

When one or more SAN groups exist, selecting a SAN group presents the option to view the **ISE Storage System Details**. This includes **Storage Details** and **Health Status Details** accessed by clicking **Dashboards**.

Storage Details in Pie Chart View

Clicking **Dashboards** opens the ISE Storage System **Storage Details** dashboard view as shown below.

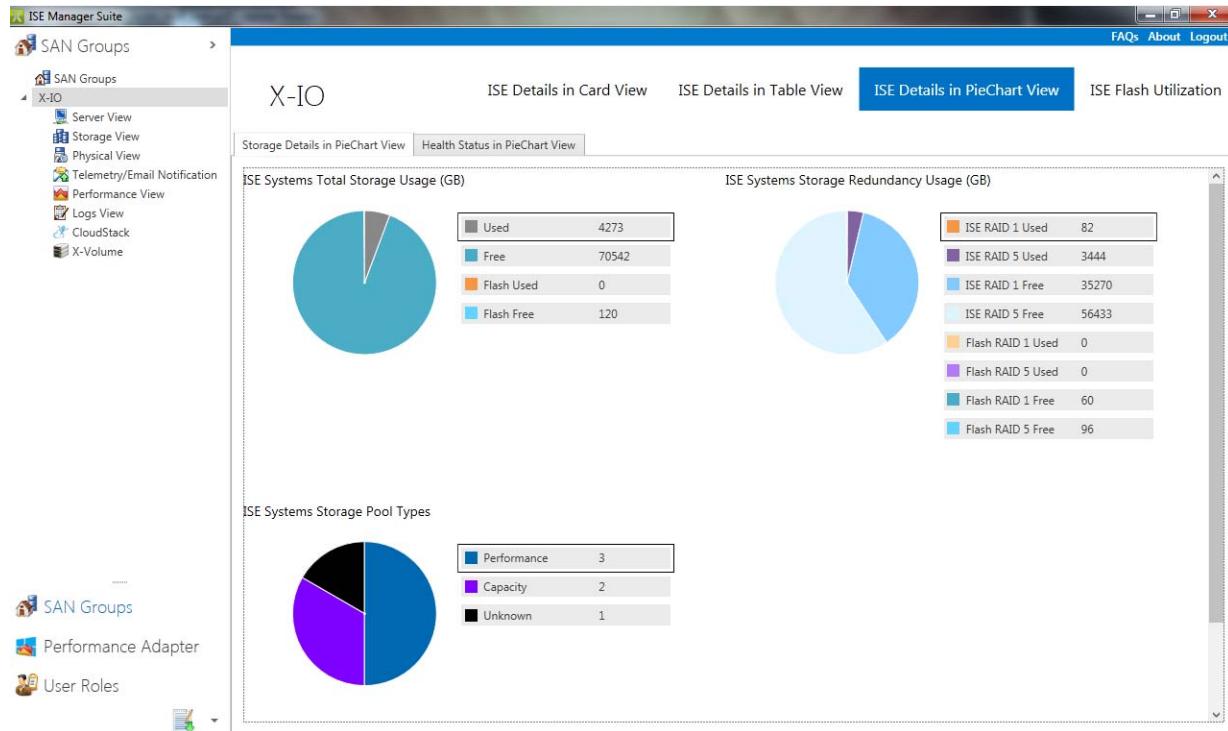


Figure 26. SAN Dashboard—Storage Details

Health Status Details

Clicking Health Status Details opens the **Health Status Detail** dashboard view.

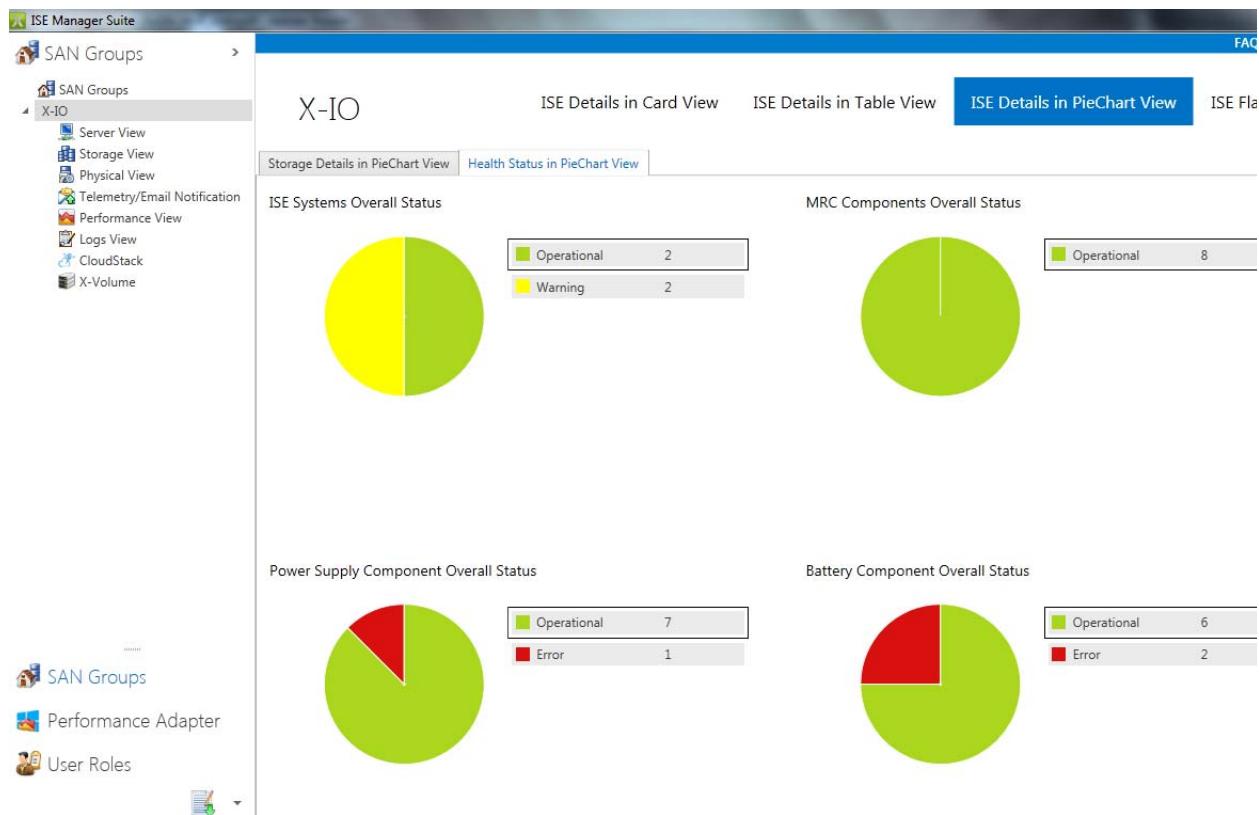


Figure 27. SAN Dashboard—Health Status Details

Flash Utilization Dashboard

Clicking Flash Utilization opens the **Flash Utilization** dashboard view.

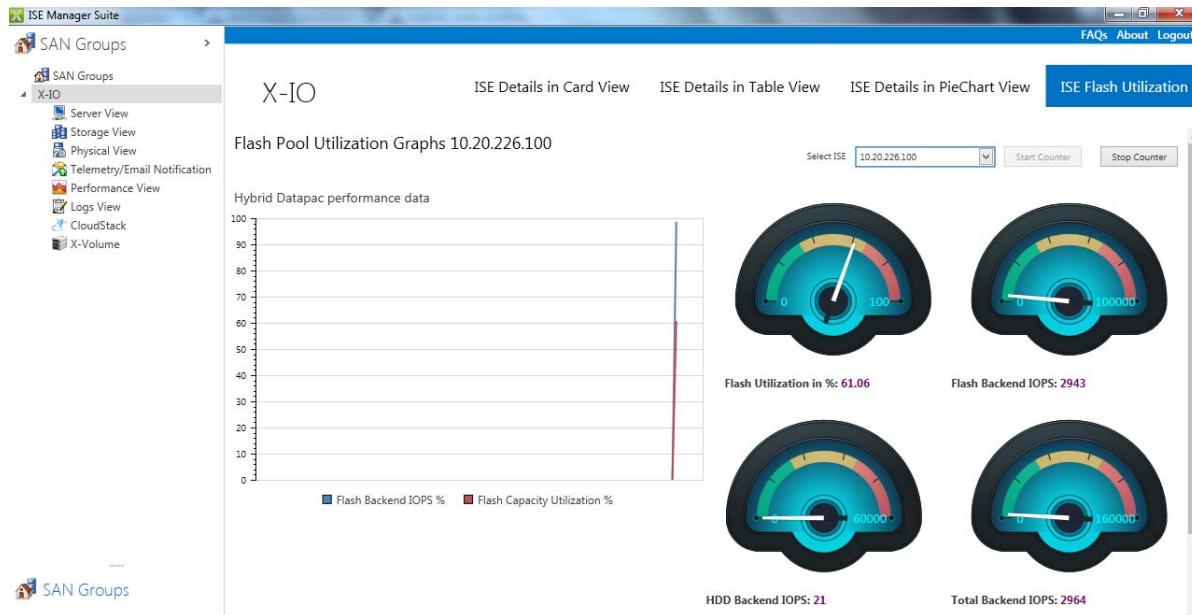


Figure 28. Flash Utilization Dashboard



Figure 29. Flash Utilization Dashboard 2

Server View

This section describes the ISE Manager Suite **Server View** and explains the server view options in detail.

Introduction

In the **Server View**, only ISE Storage Systems accessible through Microsoft Windows, VMware, Citrix, and Linux servers are listed and managed by ISE Manager Suite. To open Server View, click **Server View** in the tree for the desired SAN Group. A sample **Server View** page is shown below.

Notes:

- [1] See the Release Notes or Support Matrix (<http://www.X-IO.com/supportmatrix>) for the versions of Windows and Linux that are supported in **Server View**.
- [2] Windows Server 2003 only: Microsoft Fibre Channel Information Tool (**FCinfo**) must be installed on the Windows servers with Fibre Channel adapters to permit proper data access by ISE Manager Suite. **FCinfo** is available for download at the Microsoft Download Center.

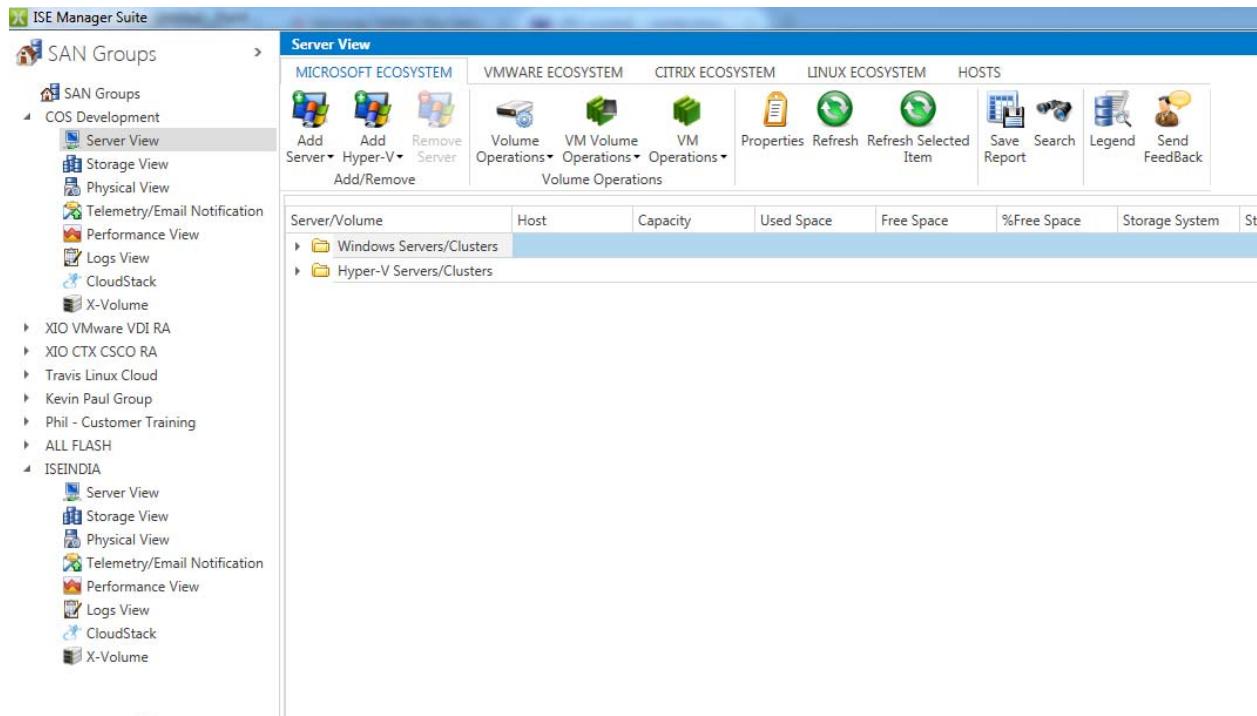


Figure 30. Server View—Microsoft Ecosystem

Add and Remove Windows Servers/Clusters

This section describes how to create and delete host clients.

Add Windows Servers/Clusters

This option is used to add hosts to all ports in the ISE Storage System. After adding a host client, the new host is listed under **Hosts**, making the client available for mapping in Server View.

To create a Windows host client from the **Server View**:

1. Click **Add Server**.

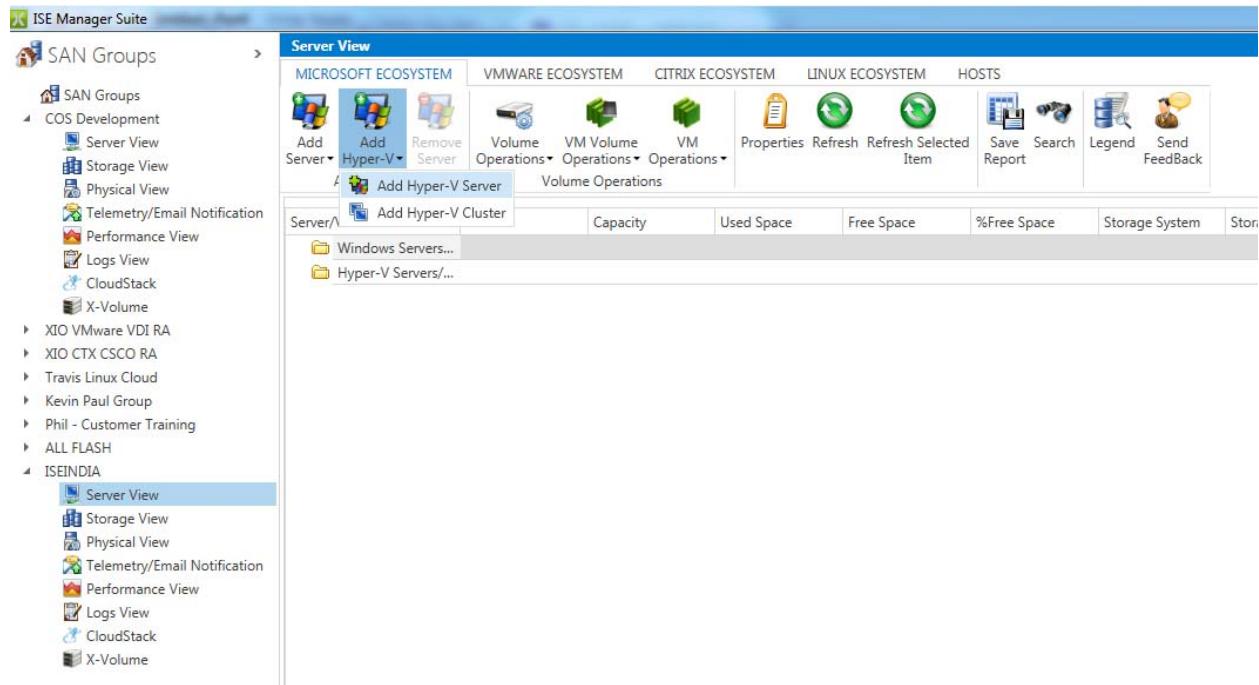


Figure 31. Add Server Client—Select Server Type

2. Select a server type from the drop-down list.

The *Add Server(s) Wizard* opens for the selected server type.

Add Windows Server 2008 (2008 R2)

To add a Windows Server 2008 client:

1. Select Add Windows 2008/2008 R2 Server from the drop-down and the Add Server(s) Wizard appears.

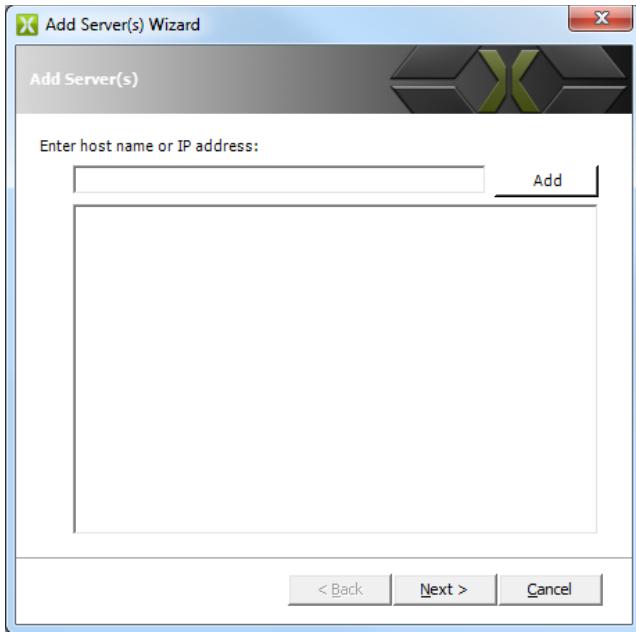


Figure 32. Add Server Wizard

2. Enter a server IP address or DNS name.
3. Click **Add**, repeating steps 2 and 3 as necessary.
4. Click **Next** when all servers are entered and a user ID and password pop-up appears for each server being added as shown below.



Figure 33. Server Log In Credentials

5. Enter the user ID and password for each server.

6. Click **OK** to for each server added.

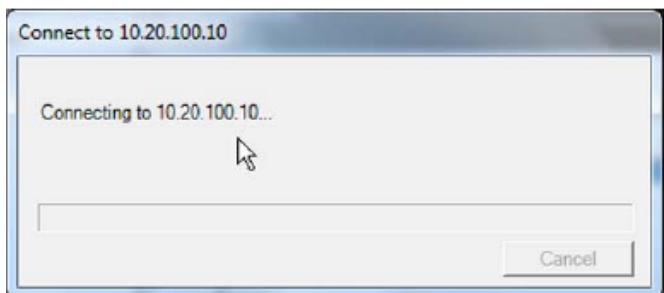


Figure 34. Credentials Verification

The above pop-up appears, indicating that the adding process is running. When the credentials are accepted, the **Finished adding server(s)**. screen pops up as shown below.

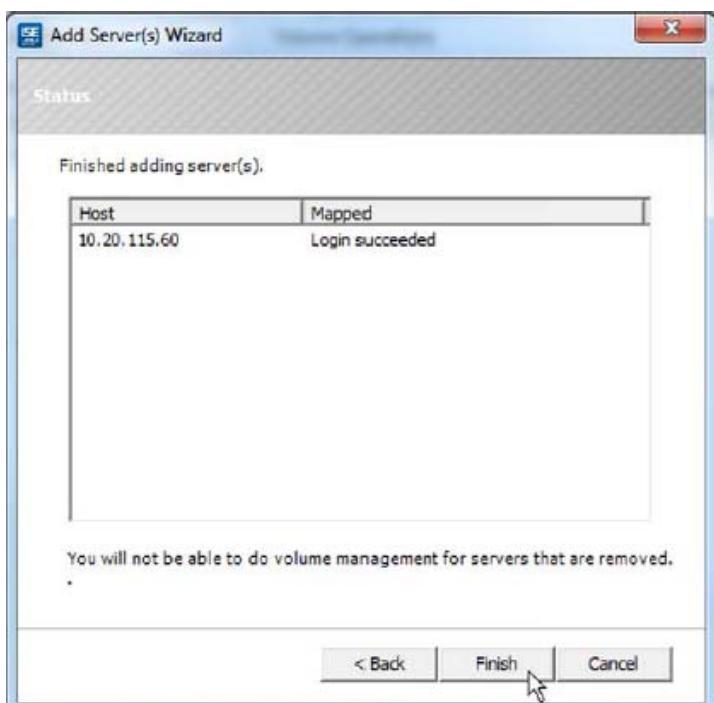


Figure 35. Server Added

7. Click **Finish**.

Add Windows Server 2012 Wizard

To add a Windows Server 2012 client:

1. Select **Add Windows 2012/2012 R2** from the **Add Server** drop-down.

The *Add Windows 2012 Server* wizard dialog appears as shown below.

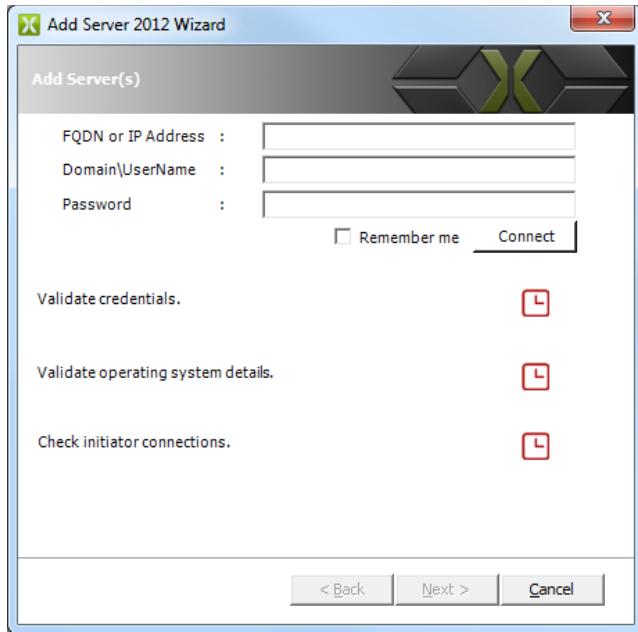


Figure 36. Add Windows Server 2012

2. Enter the DSN name or IP address.
3. Enter the domain and user name separated by a back-slash(\).
4. Enter the password.
5. Click **Connect**.
6. Click **Next**.

Add Windows Hyper-V Server/Cluster

This option is used to add Hyper-V server clients for both World Wide Names (WWN) in the ISE Storage System. After adding a host client, the new host is listed under the **Un-mapped Initiators**, making the client available for mapping in Server View. When adding host WWNs, do not include colons (:).

Note. Ensure that the WWN entered is valid, because the Create Host Client function does not validate the WWN information.

To create a Windows host client from the **Server View**:

1. Click Add Server.

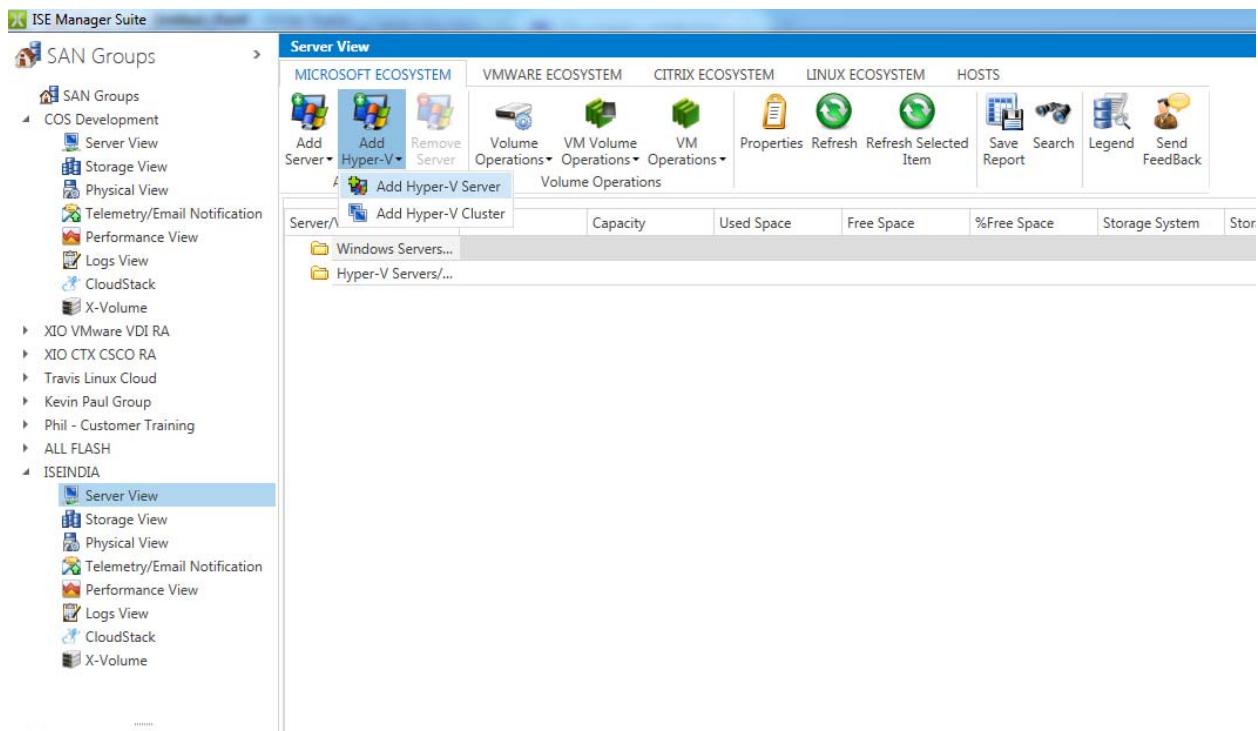


Figure 37. Add Server Client—Select Server Type

2. Select a server type from the drop-down list.

The add server wizard opens for the selected server type.

3. Enter the IP address and login credentials.

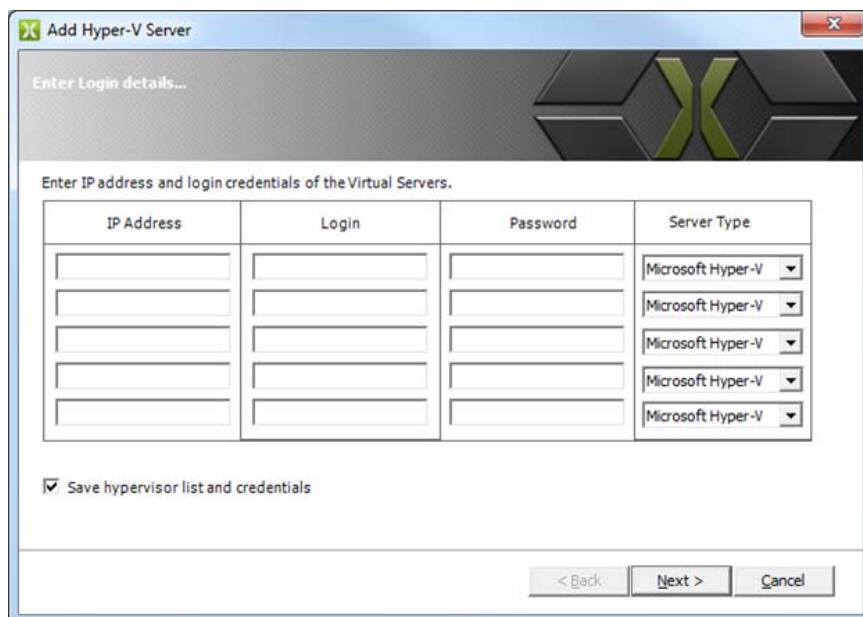


Figure 38. Add Hyper-V Server Wizard

4. Click Next.

5. The *Please Wait* pop-up appears.

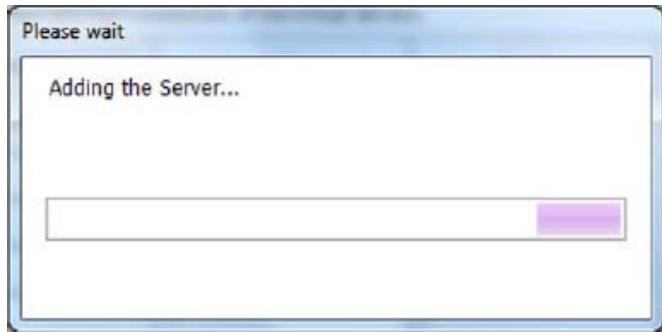


Figure 39. Adding—Wait Pop-up

Remove Server

The **Remove Server** option is used to disconnect a host client from its corresponding storage system as follows:

1. Click **Server** in the top option ribbon.
2. Select the server or servers from the list presented as shown below.

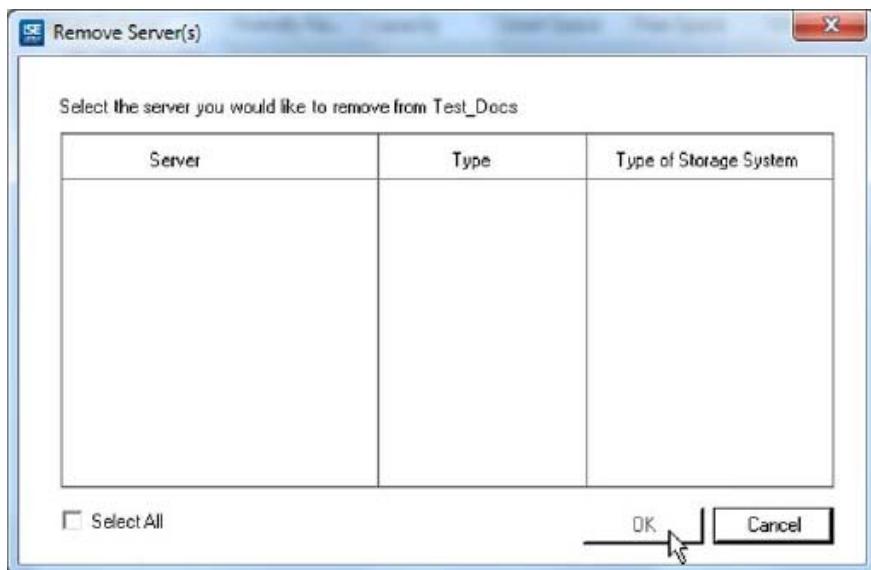


Figure 40. Remove Host Client—Select

3. Click **OK** and the server is removed from the SAN group.

Add and Remove Host Clients

This section describes managing ISE Host clients and shows all the host clients and the available ports for the ISEs configured in the SAN Group.

Add Host Client

Create Host Client is used to create a host client on the ISE.

To create a host client, perform the following steps:

Note. For servers to be mapped, hosts should be created first. Refer to “Add Windows Servers/Clusters” on page 26.

1. Click **Create Host Client** in the **HOSTS** section.

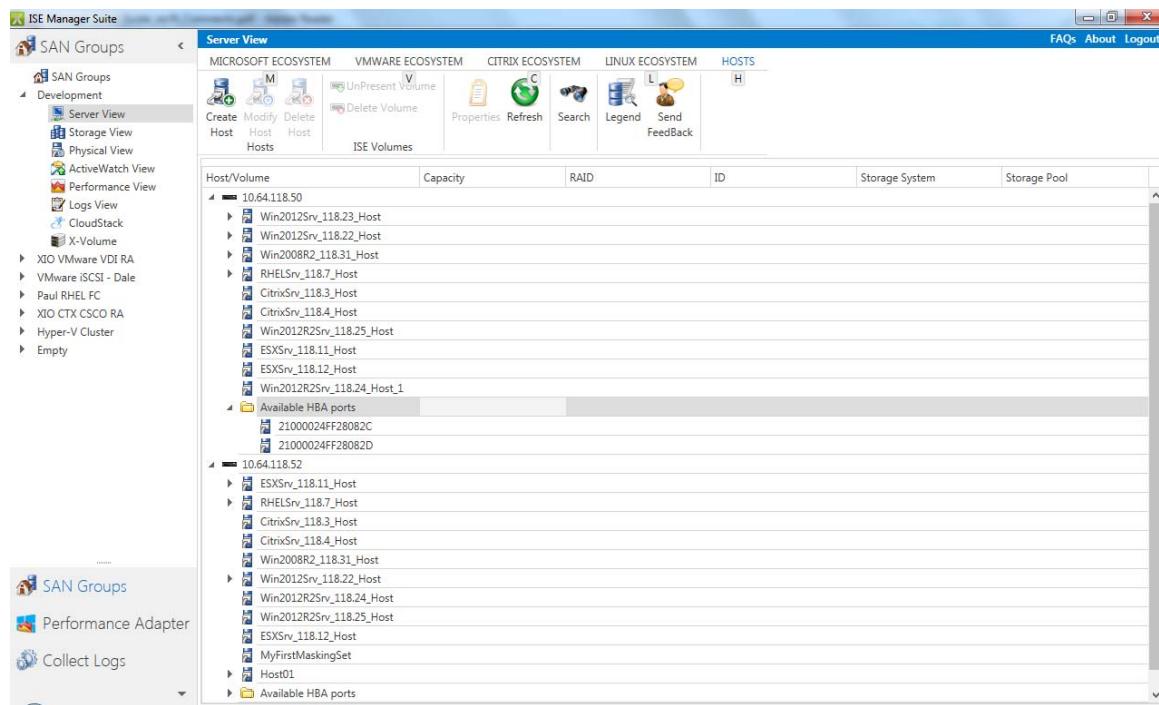


Figure 41. Server View—Unmapped Host Initiators

All Host Clients are shown in a tree view in the details pane.

2. Click **Create Host Client** from the menu and the create window opens.
3. Enter the server name or IP address.
4. Click **Add**.
5. Repeat Steps 2 through 4 to add all the required servers.
6. Click **Create Host**.

A login screen appears for each server added.

7. Log in to each server using appropriate credentials.
8. Click **OK** for each server being mapped.
9. When the status screen shows the list of mapped servers, click **Finish** to exit the wizard.

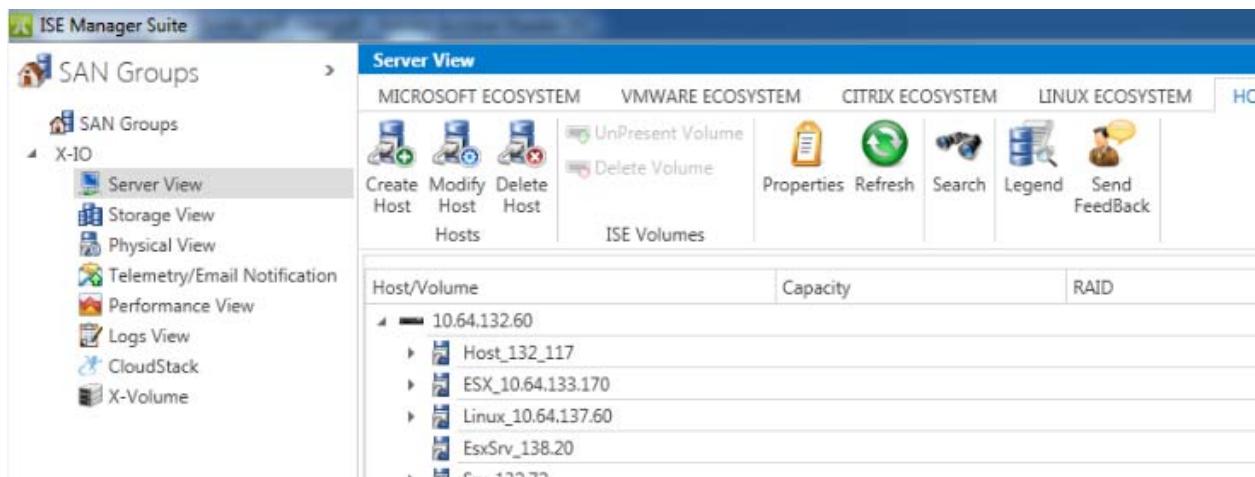


Figure 42. Server View Pane

Remove Host Client

1. Select a Host Client in the HOSTS tab.
2. Click **Delete Host Client**.
3. Click **OK** in the confirmation dialog that appears.

Volume Operations

All general volume operations are available through the drop-down associated with **Volume Operations**. These operations include:

- Create Volume
- Un-assign Volume
- Format Volume
- Expand Volume
- Delete Volume
- Initialize Volume
- Manage Drive Mount Point Paths

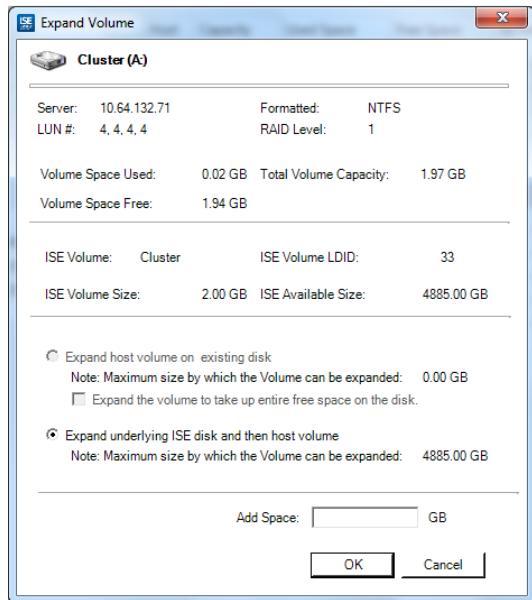


Figure 43. Expand Volume

Create Volume

The *Create Volume* wizard is used to perform the following:

- a. Create a volume
- b. Assign volumes to the server
- c. Operating system-specific actions:
 - **Windows:** assign partition style, format volume, assign drive letter
 - **Linux:** initialize volume, create file system, assign mount point

To create a volume:

1. Click **Volume Operations** (shown below).

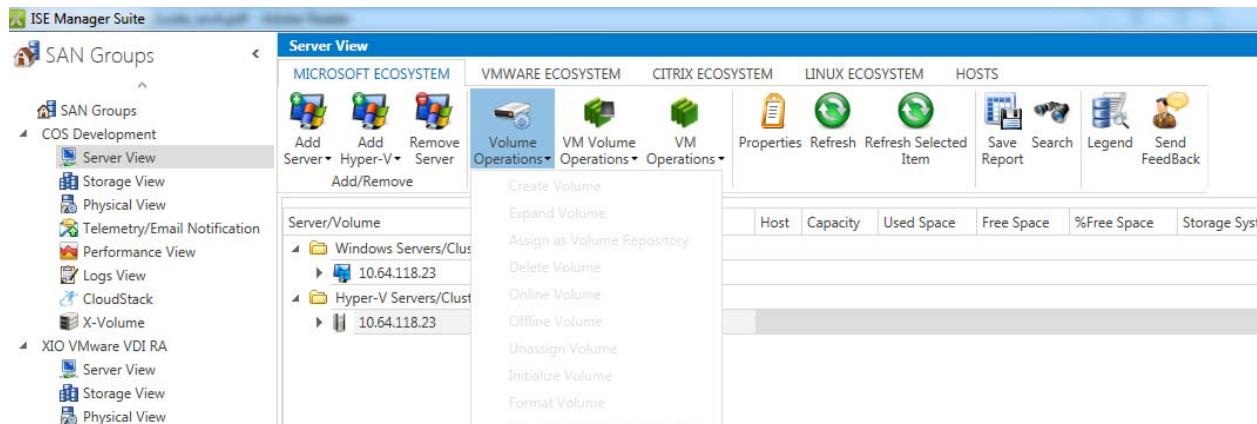


Figure 44. Volume Operations—Create

2. Select **Create Volume**.

The *Create Volume* wizard opens.

For all servers, the **Select DataPac** field has two options: **automatic** and **manual**. If the **automatic** option is selected, ISE Manager Suite creates the volume on the DataPac best suited to the characteristics of the volume (details of the volume creation algorithm are explained in “Appendix A: Storage Pool Algorithm” on page 159). To manually select a DataPac on which the volume is to be created:

1. Select the **manual** option.
2. Click **Browse**.

The *Select DataPac* window appears, showing the available ISEs and their DataPacs with their individual characteristics.

3. Click the desired DataPac.
4. Click **OK**.

The *Create Volume* window appears, showing the selected DataPac in the **Select DataPac** field.

Create ISE Volume on Windows Server

To create an ISE Storage System volume on a Microsoft Windows Server:

1. Select the **Windows Server** tab.
2. Select a Windows server on which the volume is to be created.
3. Click **Create Volume** in the **Volume Operations** section.

The *Create Volume* wizard appears.

4. On the welcome screen, select the volume operation and then click **Next**.

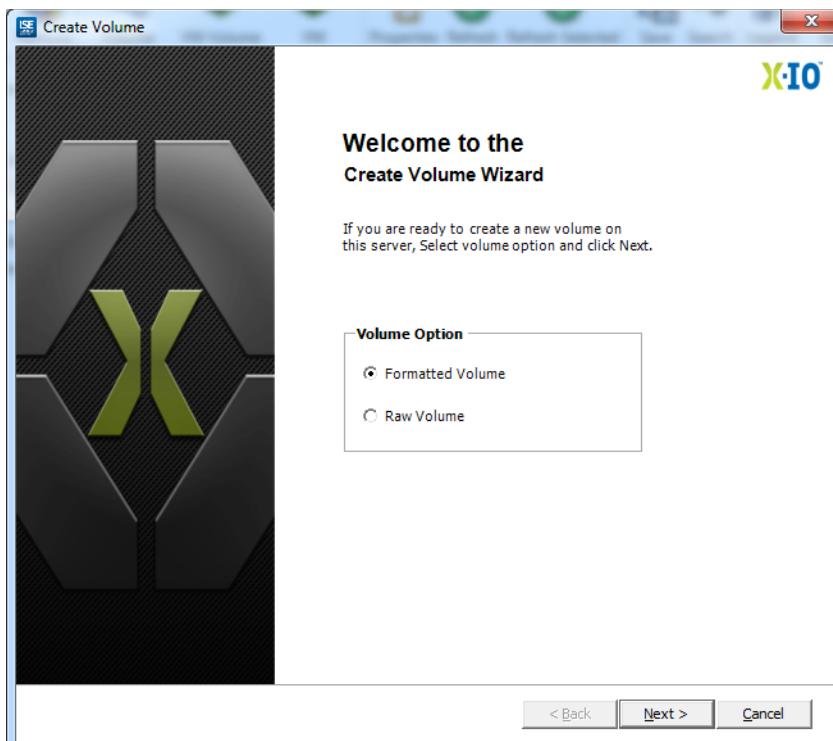


Figure 45. Create Volume Welcome

The *Choose properties of the volume* screen appears as shown below.

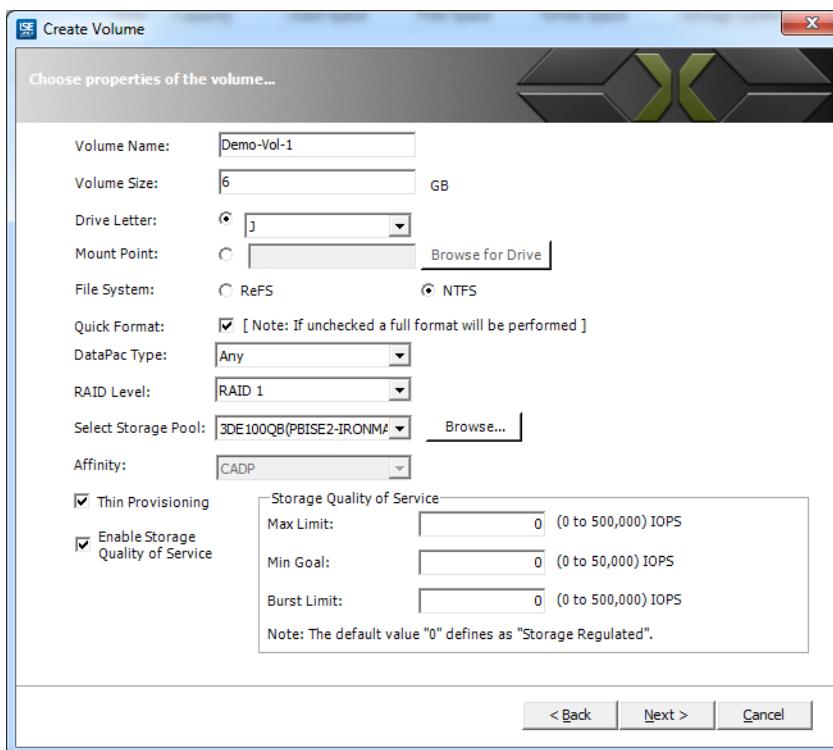


Figure 46. Create Volume—Properties

5. Enter a name for the volume in the **Volume Name** field.
6. Enter the size of the volume in the **Volume Size** field.

7. Choose a **Drive Letter** from the drop-down list or click **Browse for Drive** and select a drive where the mount point is to be created. After selecting a drive letter, ensure that a mount point name is provided.

Example: **E:\Mountpoint1**

8. Select the partition style.

Two partition types are available on Windows servers: **Master Boot Record (MBR)** and **GUID Partition Table (GPT)**. Restrictions in partition style may apply to some operating systems; see the *ISE Manager Suite Release Notes* for details. The recommended partition style is GPT for volumes larger than 2 TB and volumes connected to Itanium-based computers. The GPT partition style is selected by default.

9. Un-check the **Quick Format** check box to perform a full format.

10. Select the **Storage Pool Type**.

All available storage pool types are listed.

11. Choose the storage pool type on which the volume is to be created. The default type is **Any**, which indicates that the volume can be created on any storage pool.

12. Select a RAID level from the drop-down list. The supported RAID levels are **RAID-1** and **RAID-5**.

13. Select a DataPac.

The **Select DataPac** field consists of two options: **automatic** and **manual**. If the **automatic** option is selected, ISE Manager Suite creates the volume on the DataPac best-suited to the defined characteristics of the volume (details of the volume creation algorithm are explained in “Appendix A: Storage Pool Algorithm” on page 159).

To manually choose the DataPac on which the volume is created:

- a. Select the **manual** option and click **Browse**.

The Select DataPac window appears, showing the available ISEs and their DataPacs with their individual characteristics.

- b. Click the desired DataPac.

- c. Click **OK**.

The *Create Volume* window appears, showing the selected **DataPac** in the **Select DataPac** field.

14. Select the **Affinity** type for Hyper ISEs.

15. Click **Next**.

The *Choose initiator to assign the volume* screen appears.

16. Select the host clients to which the specified volume needs to be assigned. By default all the host clients are selected.

17. Select a LUN from the **LUN** drop-down list for each host client.

18. Click **Next**.

The summary screen appears.

19. Review the summary and then click **Finish** to complete the process.

Delete Volume

The **Delete Volume** option is used to remove a specified volume from the storage system as follows:

- Click **Volume Operations** (shown below).

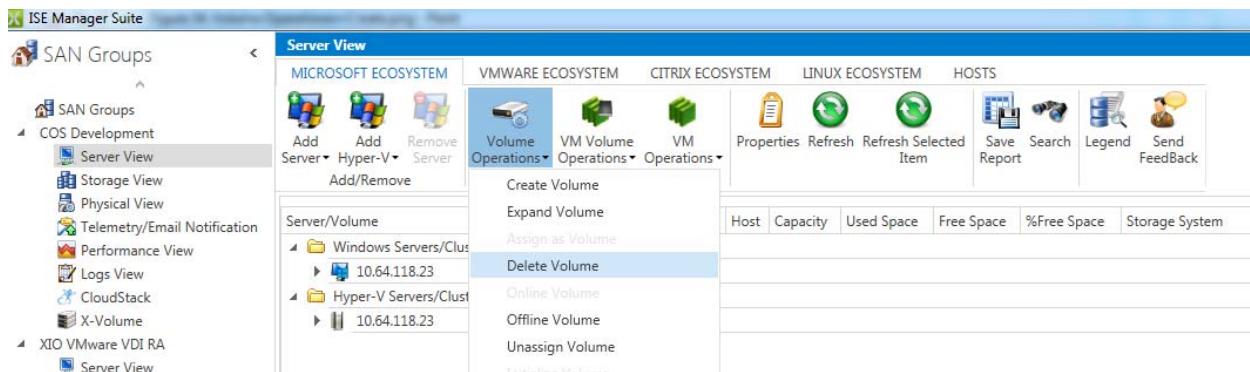


Figure 47. Volume Operations—Delete

- Select **Delete Volume** from the drop-down list and the *Delete Volume* wizard opens.
- Select the volume.
- Click **OK** and a confirmation dialog appears.
- Click **Yes** to delete the volume.

Un-assign Volume

To unpresent or un-assign a volume:

- Click **Volume Operations** (shown below).

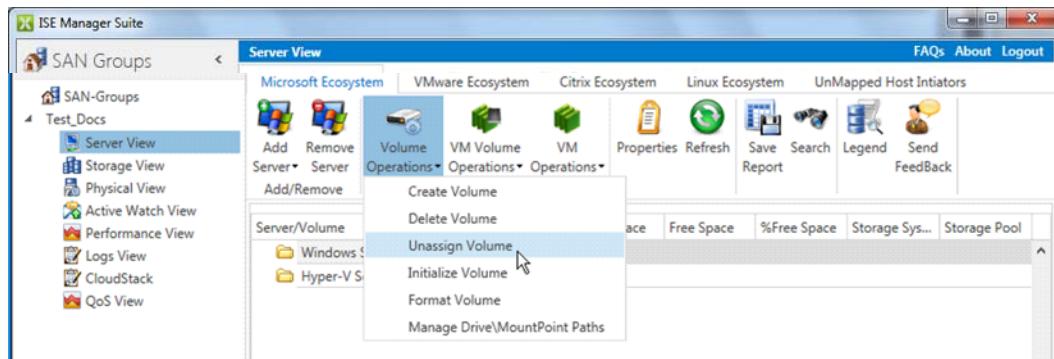


Figure 48. Volume Operations—Un-assign

- Select **Un-assign Volume** from the drop-down list.
- The **Un-assign Volume** wizard opens.
- Select a volume.
 - Right-click the volume and select **UnPresent Volume**.

The **UnPresent Volume** pop-up appears as shown below.

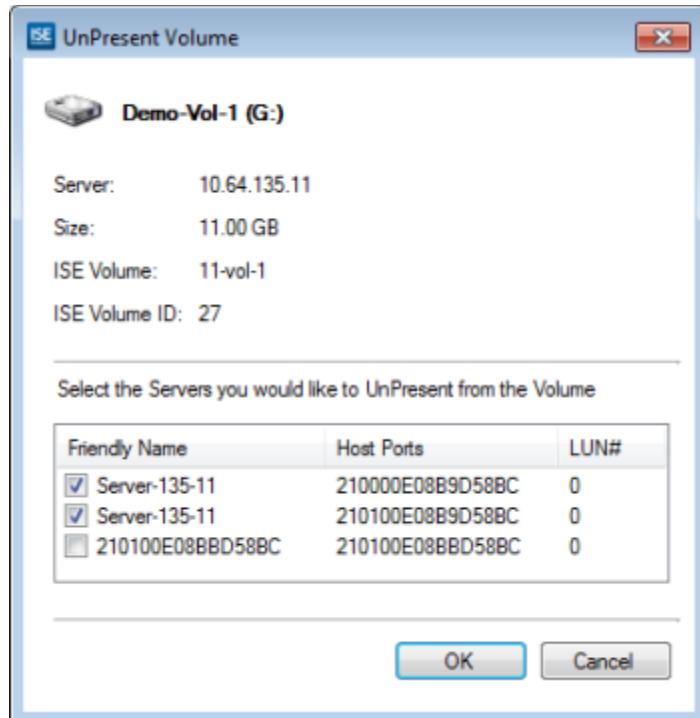


Figure 49. UnPresent Volume—Select Servers

5. Select the servers that apply for this un-assign volume.
6. Click **OK** to remove the assignments.

Initialize Volume

To initialize a volume:

1. Click **Volume Operations** (shown below).

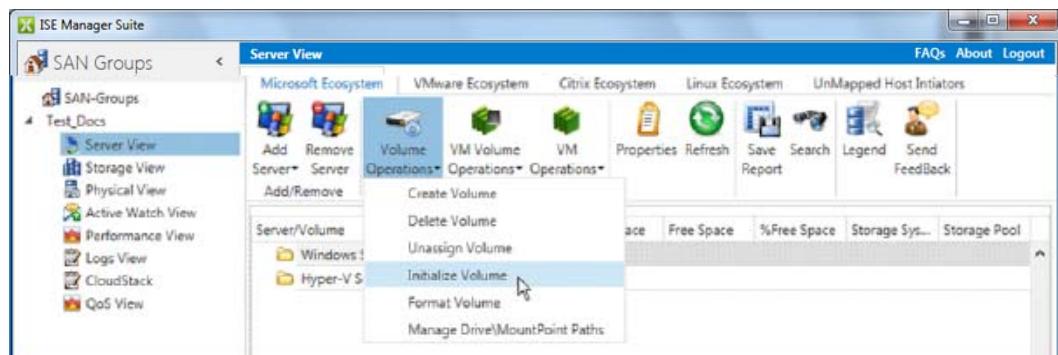


Figure 50. Volume Operations—Initialize

2. Select **Initialize Volume** from the drop-down list.

The **Initialize Volume** wizard opens.

Format Volume

To initialize a volume:

1. Click **Volume Operations** (shown below).

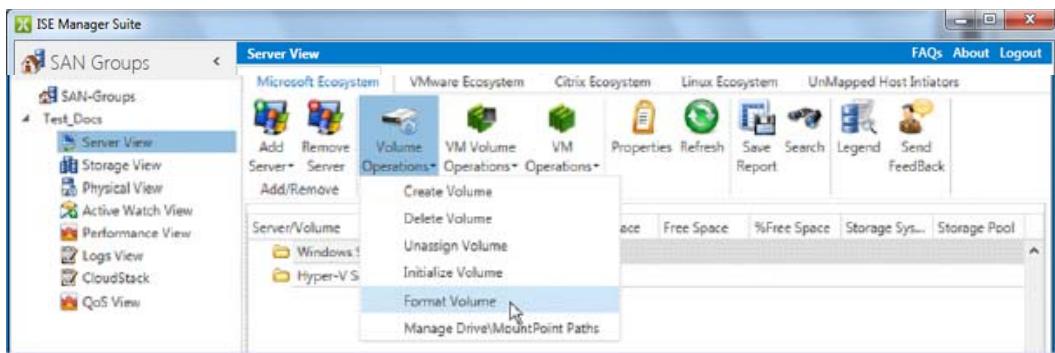


Figure 51. Volume Operations—Format

2. Select **Format Volume** from the drop-down list.

The **Format Volume** wizard opens.

Manage Drive Mount Paths

To manage drive mount paths:

1. Click **Volume Operations** (shown below).

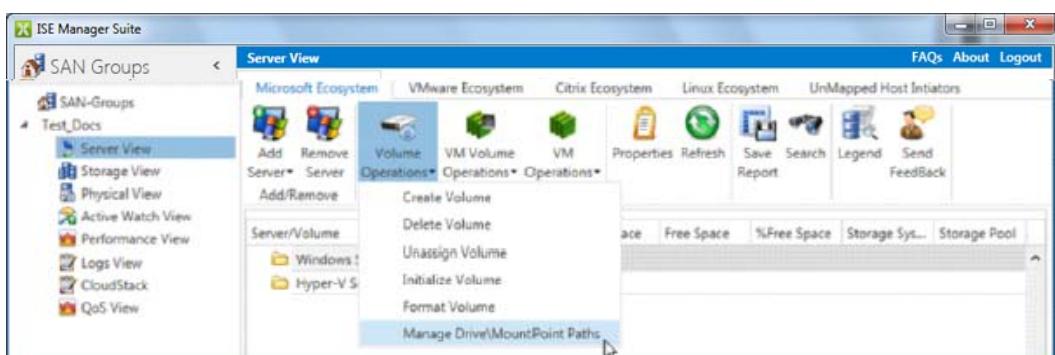


Figure 52. Volume Operations—Manage Drive Mount Paths

2. Select **Manage Drive Mount Paths** from the drop-down list.

The *Manage Drive Mount Paths* wizard opens.

VM Volume Operations

All VM volume operations are available through the drop-down associated with **VM Volume Operations**. These operations include:

- Create VM Volume
- Delete VM Volume
- Assign VM Volume
- Expand VM Volume
- Shrink VM Volume
- Un-assign Volume

Create VM Volume

To create a VM volume:

1. Click **VM Volume Operations** (shown below).



Figure 53. VM Volume Operations—Create

2. Select **Create VM Volume**.

The *Create VM Volume* wizard opens.

Expand VM Volume

To expand a VM volume:

1. Click **VM Volume Operations** (shown below).



Figure 54. VM Volume Operations—Expand

2. Select **Expand VM Volume**.

The *Expand VM Volume* wizard opens.

Delete Volume

The **Delete VM Volume** option is used to remove a specified volume from VM storage systems as follows:

1. Click **VM Volume Operations** (shown below).



Figure 55. Volume Operations—Delete

2. Select **Delete VM Volume** from the drop-down list.

The *Delete VM Volume* wizard opens.

3. Select the volume.
4. Click **OK** and a confirmation dialog appears.
5. Click **Yes** to delete the volume.

Shrink Volume

The **Shrink VM Volume** option is used to remove a specified volume from VM storage systems as follows:

1. Click **VM Volume Operations** (shown below).



Figure 56. Volume Operations—Shrink

2. Select **Shrink VM Volume** from the drop-down list.

The *Shrink VM Volume* wizard opens.

3. Select the volume.
4. Click **OK** and a confirmation dialog appears.
5. Click **Yes** to complete the operation.

Expand Volume

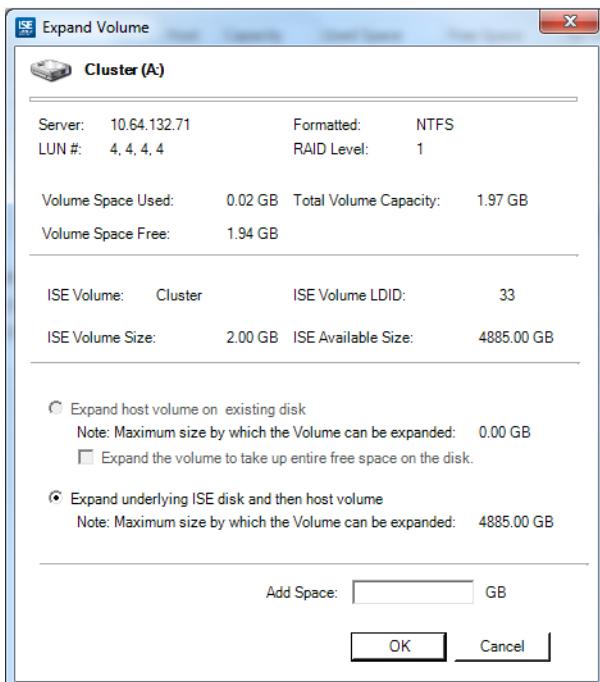


Figure 57. Expand Volume

Assign Volume

The **Assign VM Volume** option is used to link a specified volume with VM server as follows:

1. Click **VM Volume Operations** (shown below).

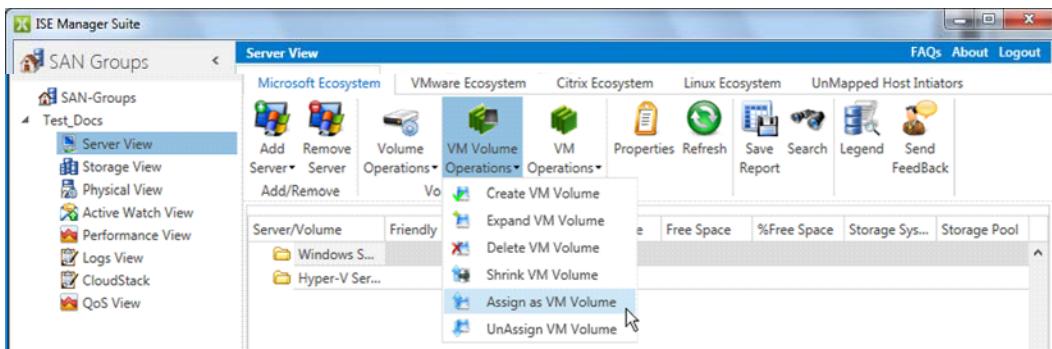


Figure 58. Volume Operations—Assign

2. Select **Assign VM Volume** from the drop-down list.
The *Assign VM Volume* wizard opens.
3. Select the volume.
4. Select the VM server.
5. Click **OK** and a confirmation dialog appears.
6. Click **Yes** to complete the operation.

Un-assign Volume

The **Un-assign VM Volume** option is used to link a specified volume with VM server as follows:

1. Click **VM Volume Operations** (shown below).



Figure 59. Volume Operations—Un-assign

2. Select **Un-assign VM Volume** from the drop-down list and the **Un-assign VM Volume** wizard opens.
3. Select the volume.
4. Click **OK** and a confirmation dialog appears.
5. Click **Yes** to complete the operation.

VM Operations

All VM volume operations are available through the drop-down associated with **VM Volume Operations**. These operations include:

- VM Power Off
- VM Restart
- VM Take Snapshot
- VM Snapshot Manager
- VM Clone
- VM Power On
- VM Suspend
- VM Revert to Current Snapshot
- VM Delete
- VM Migrate

VM Power Off

A VM server can be powered down through the **VM Power OFF** option. To power off a VM server:

1. Click **VM Volume Operations** (shown below).

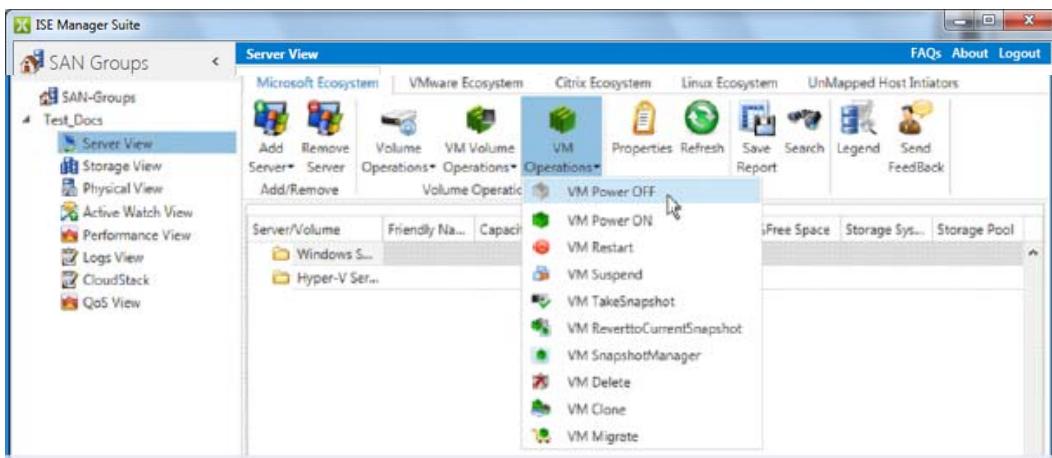


Figure 60. VM Operations—Power Off

2. Select **VM Power OFF**.
3. Select the VM server.
4. Click **OK** in the confirmation pop-up.

VM Power On

A VM server can be powered up through the **VM Power ON** option. To power on a VM server:

1. Click **VM Volume Operations** (shown below).

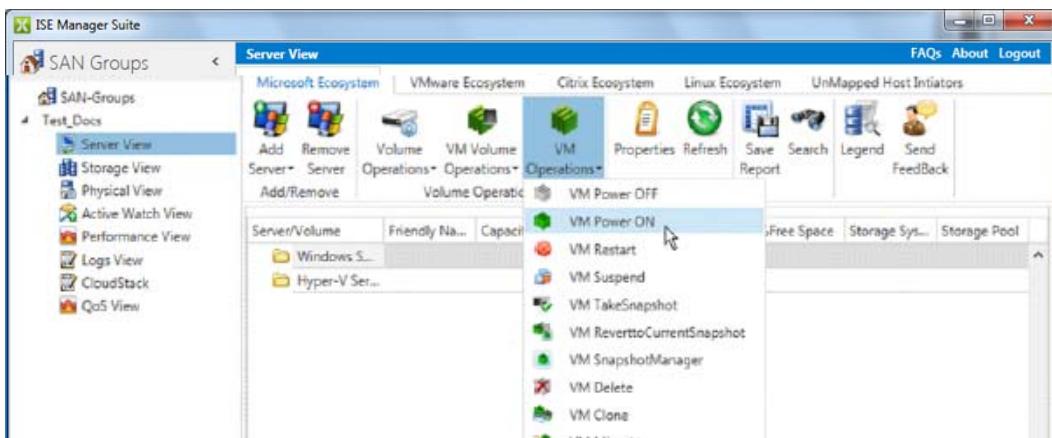


Figure 61. VM Operations—Power On

2. Select **VM Power ON**.
3. Select the VM server.
4. Click **OK** in the confirmation pop-up.

VM Restart

A VM server restart is initiated through the **VM Restart** option. To restart a VM server:

1. Click **VM Volume Operations** (shown below).

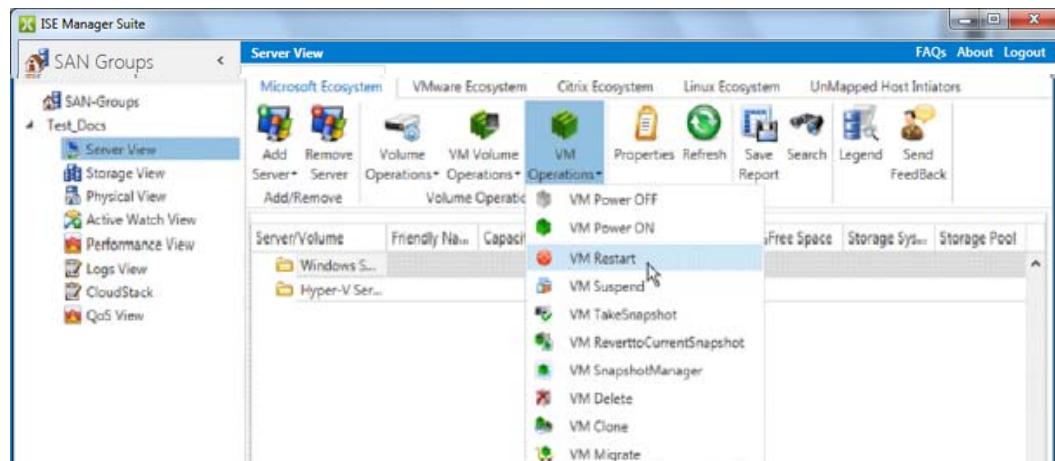


Figure 62. VM Operations—Restart

2. Select **VM Restart**.
3. Select the VM server.
4. Click **OK** in the confirmation pop-up.

VM Suspend

VM servers can be removed from the SAN group using **VM Suspend**. To suspend a VM server:

1. Click **VM Volume Operations** (shown below).

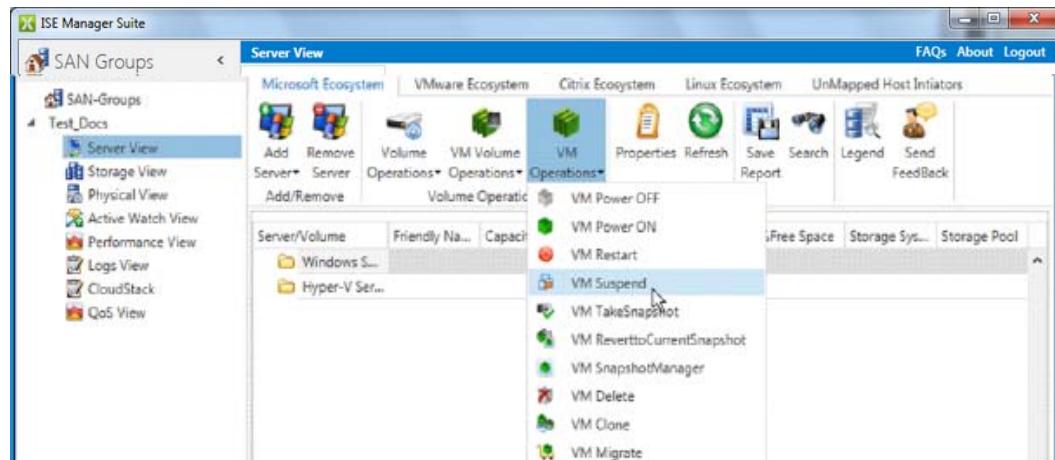


Figure 63. VM Operations—Suspend

2. Select **VM Suspend**.
3. Select the VM server.
4. Click **OK** in the confirmation pop-up.

VM Take Snapshot

Initiating snapshots of VM volumes is accomplished using **VM Take Snapshot**. To initiate a snapshot on a VM server:

1. Click **VM Volume Operations** (shown below).

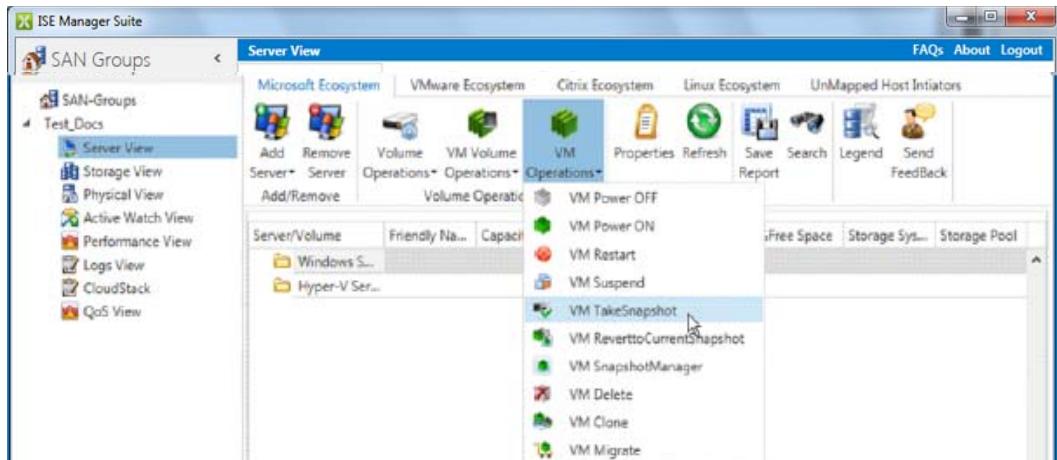


Figure 64. VM Operations—Take a Snapshot

2. Select **VM TakeSnapshot**.
3. Select the VM volume.
4. Click **OK** in the confirmation pop-up.

VM Revert to Current Snapshot

The latest snapshot of a VM volume is accessible through **VM Revert to Current Snapshot**. To access a current snapshot on a VM server:

1. Click **VM Volume Operations** (shown below).

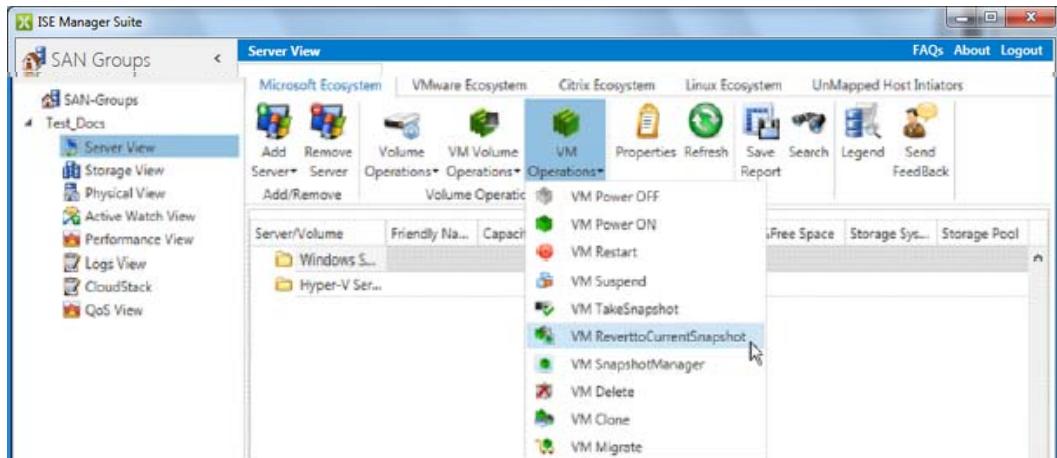


Figure 65. VM Operations—Revert to a Snap Shot

2. Select **VM ReverttoCurrentSnapshot**.
3. Select the VM snapshot volume.
4. Click **OK** in the confirmation pop-up.

VM Snapshot Manager

Snapshots of VM volumes are managed through the **VM Snapshot Manager**. To manage VM snapshots on a VM server:

1. Click **VM Volume Operations** (shown below).

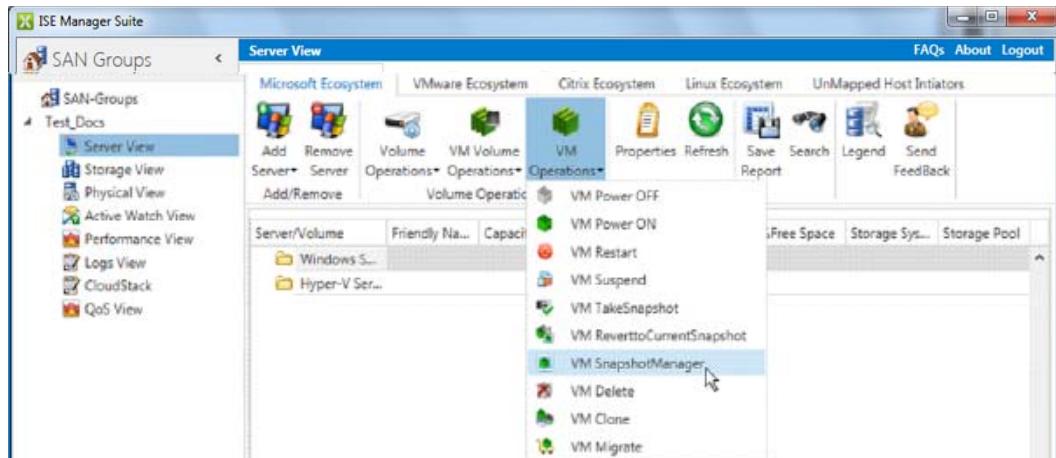


Figure 66. VM Operations—Snap Shot Manager

2. Select **VM SnapshotManager**.
3. Select a snapshot.
4. Click **OK** in the confirmation pop-up.

VM Delete

VM volumes can be deleted using **VM Delete**. To delete a VM volume from a VM server:

1. Click **VM Volume Operations** (shown below).

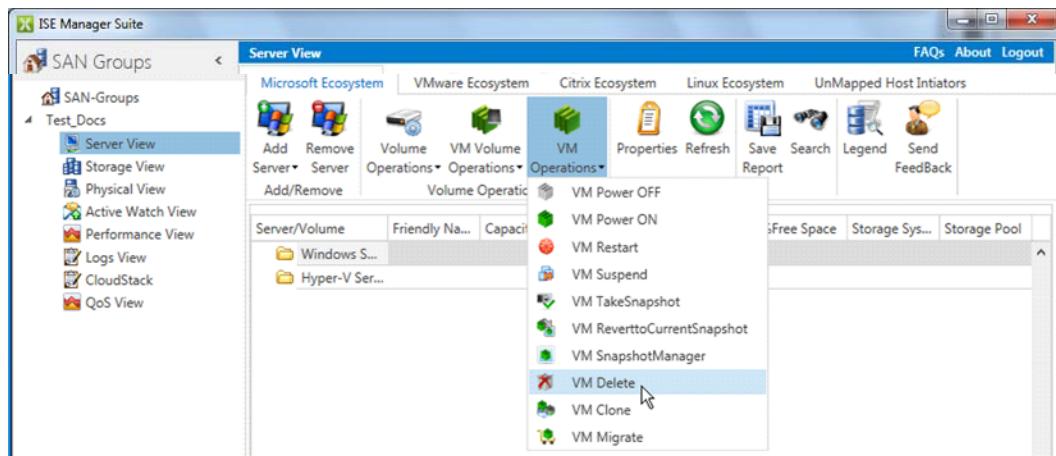


Figure 67. VM Operations—Delete

2. Select **VM Delete**.
3. Select a volume.
4. Click **OK** in the confirmation pop-up.

VM Clone

A cloned copy of VM volumes can be made using **VM Clone**. To clone VM volumes on a VM server:

1. Click **VM Volume Operations** (shown below).

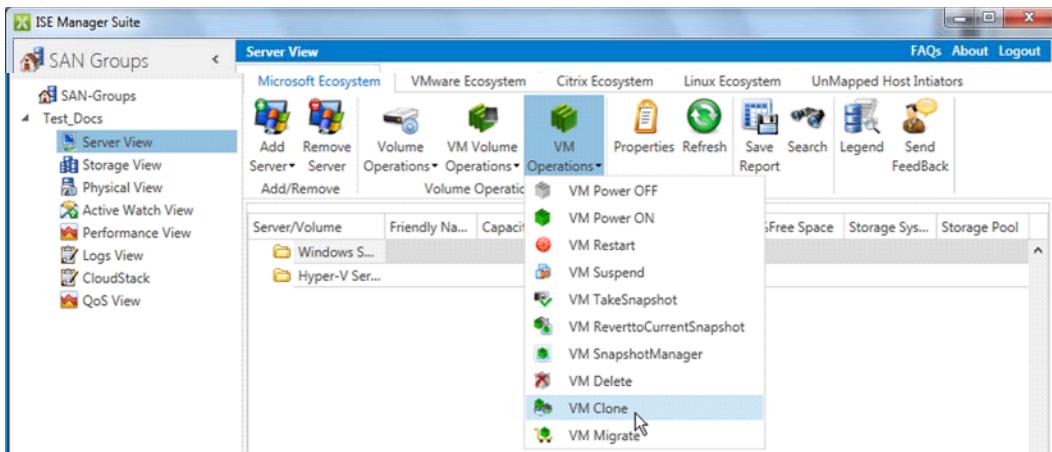


Figure 68. VM Operations—Clone

2. Select **VM Clone**.
3. Select a volume.
4. Click **OK** in the confirmation pop-up.

VM Migrate

To migrate VM volumes on a VM server:

1. Click **VM Volume Operations** (shown below).

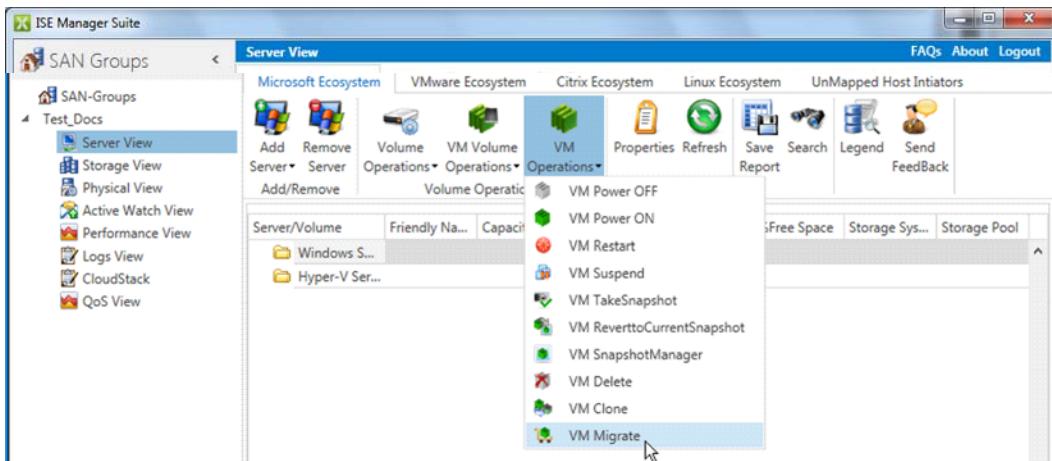


Figure 69. VM Operations—Migrate

2. Select **VM Migrate**.
3. Select a volume.
4. Click **OK** in the confirmation pop-up.

Virtual Machine Console

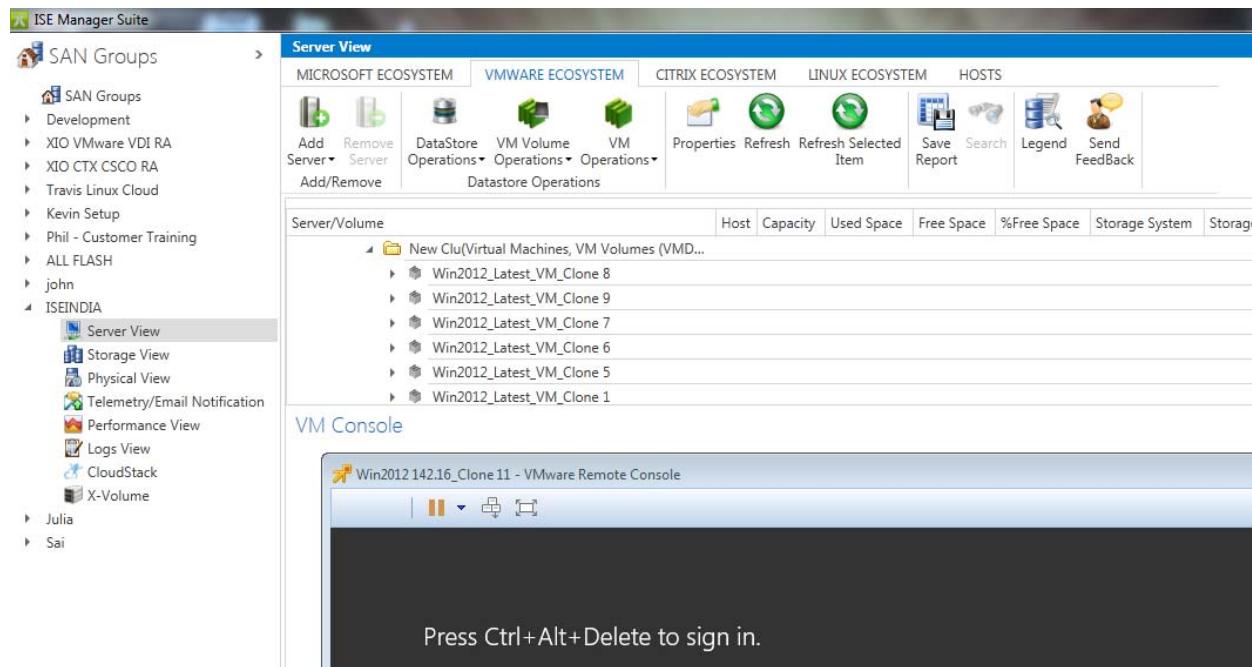


Figure 70. Virtual Machine Console

Windows-Specific Actions

The **Server View** actions pane contains a section listing all the actions that are specific to volumes on Windows servers. These actions include:

- Initialize volume on a Windows server: See “Initialize Windows Volume” on page 51.
- Format volume on a Windows server: See “Format Windows Volume” on page 51.
- Change the drive letter on a volume on a Windows Server: See “Change Drive Letter, Paths for Windows Volume” on page 51.

Initialize Windows Volume

After a volume is created and assigned to a server from **Storage View**, the volume is displayed in **Server View** with **Uninitialized** suffix. The **Initialize Volume** function is used to initialize an **uninitialized** volume.

To initialize a Windows volume:

1. Select **Windows Servers** tab.
2. Select a volume.
3. Click **Create Volume** in the **Volume Operations** section.
The **Initialize Volume** pop-up appears.
4. Choose the desired **Partition Style** by selecting the corresponding radio button.

Two partition styles are available on **Windows Servers**: **GUID Partition Table (GPT)** and **Master Boot Record (MBR)**. Restrictions in partition style may apply to some operating systems; see the current *ISE Manager Suite Release Notes* for details. The recommended partition style is GPT for volumes larger than 2 TB and volumes connected to Itanium-based computers. The GPT partition style is selected by default.

5. Click **OK** to initialize the volume.

Format Windows Volume

The **Format Volume** function is used to format an initialized volume or an existing volume as follows:

1. Select **Windows Servers** tab.
2. Select a volume.
3. Click **Format Volume** in the **Volume Operations** section and the **Format Volume** pop-up appears.
4. Enter the name of the NTFS Volume (NTFS File System is the only valid system).
5. Select an allocation unit from the drop-down list.
6. Perform a **Quick Format** is selected by default. Un-check **Quick Format** if a complete format is required.
7. Click **OK** to format the volume.

Change Drive Letter, Paths for Windows Volume

Assign either a drive letter or mount point to the volume with **Change Drive Letter and Paths** action as follows:

1. Select **Windows Servers** tab.
2. Select a volume.
3. Click **Change Drive Letter and Paths** in **Volume Operations** section. The **Change Drive Letter and Paths** pop-up appears.
4. To select a drive letter, choose the **Assign the Drive Letter** option and then choose a drive letter from the drop-down list.

5. To provide a mount point, choose **Mount in the following empty NTFS folder** option. Use the **Browse for Drive** option to provide a mount point.
6. Click **OK** to accept and change the drive letter or mount point.

Creating, Managing X-Volumes

The following X-Volume (virtual volume) operations are supported in **Server View**.

- a. Create X-Volume
 - Create new X-Volume
 - Create X-Volume on existing disks
- b. Delete X-Volume
- c. Expand X-Volume
- d. Shrink X-Volume

In order to perform any X-Volume operations, the X-Volume driver must be installed on the server on which X-Volume is to be created.

Create X-Volume

To create an X-Volume in ISE Manager Suite:

1. Select **Server View**.
2. Select the **Microsoft** tab.
3. Right-click on a mapped server.
4. Select **X-Volume**.
5. Click **Create New X-Volume**.

The **Create X-Volume** welcome wizard appears.

6. Click **Next**.

The *Choose the properties of volumes* screen appears as shown below.

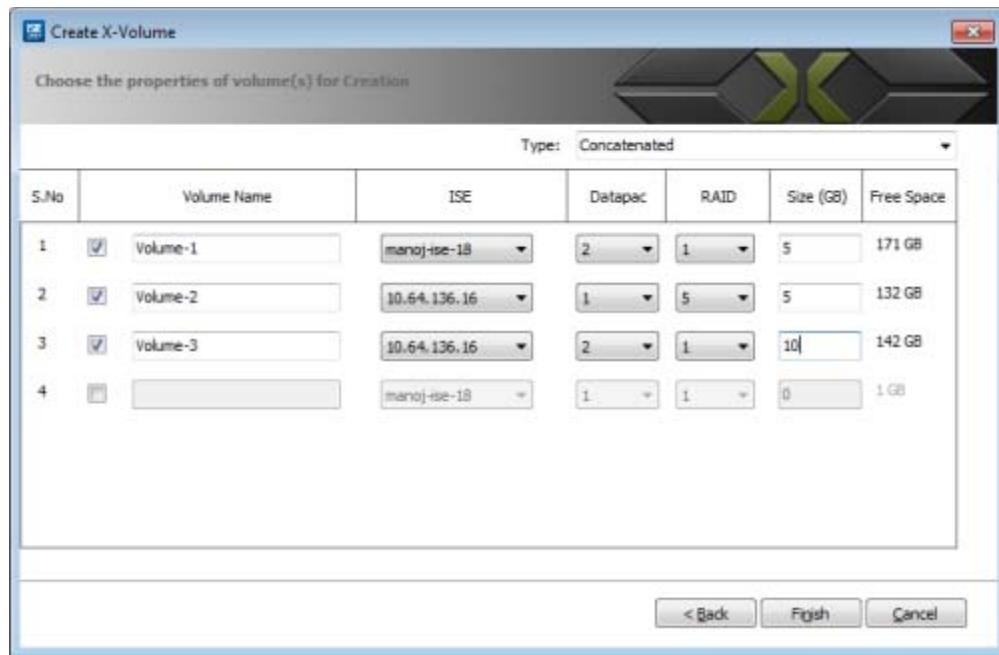


Figure 71. Create X-Volume

7. Select the X-Volume type from the **Type** drop-down.

The X-Volume can be a striped (RAID 0) X-Volume or a spanned X-Volume.

8. For each volume, provide the volume properties:
 - Enter the volume name in the **Volume Name** field
 - Select the ISE
 - Select the DataPac
 - Select the RAID level
 - Enter the size of the X-Volume

9. Click **Finish**.

Create X-Volume (Virtual Volume) on Existing Disks

To create an X-Volume on an existing disk (volume):

1. Select **Server View**.
2. Select the **Microsoft** tab.
3. Right-click on a mapped server.
4. Select **X-Volume**.
5. Click **Create X-Volume on Existing Disks**.

The **Create X-Volume** dialog appears as shown below.

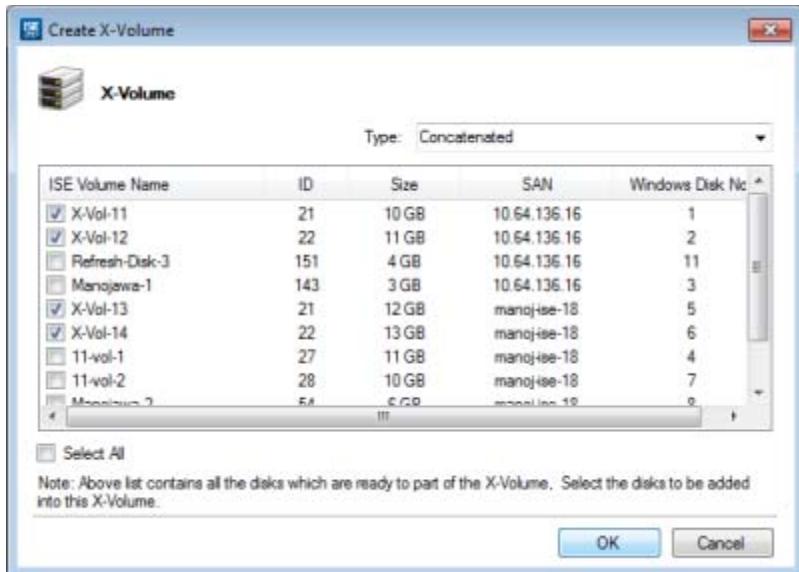


Figure 72. Create X-Volume on Existing Disks

6. Select the X-Volume type from the **Type** drop-down.

The X-Volume can be a striped (RAID 0) X-Volume or a spanned X-Volume.

7. Select the desired volumes from the list.

Use **Select All** option to select all the volumes.

8. Click **OK**.

Delete X-Volume

To delete an X-Volume:

1. Select an existing X-Volume.
2. Right-click.
3. Select **X-Volume**.
4. Click **Delete X-Volume**.

The **Delete X-Volume** dialog appears as shown below.



Figure 73. Delete X-Volume Dialog

5. Click **OK**.
6. Click **Yes** on the confirmation dialog.

Expand X-Volume

To increase the size of an existing X-Volume:

1. Right-click an existing X-Volume.
2. Select **X-Volume**.
3. Click **Expand X-Volume**.

The **Modify X-Volume** dialog appears as shown below.

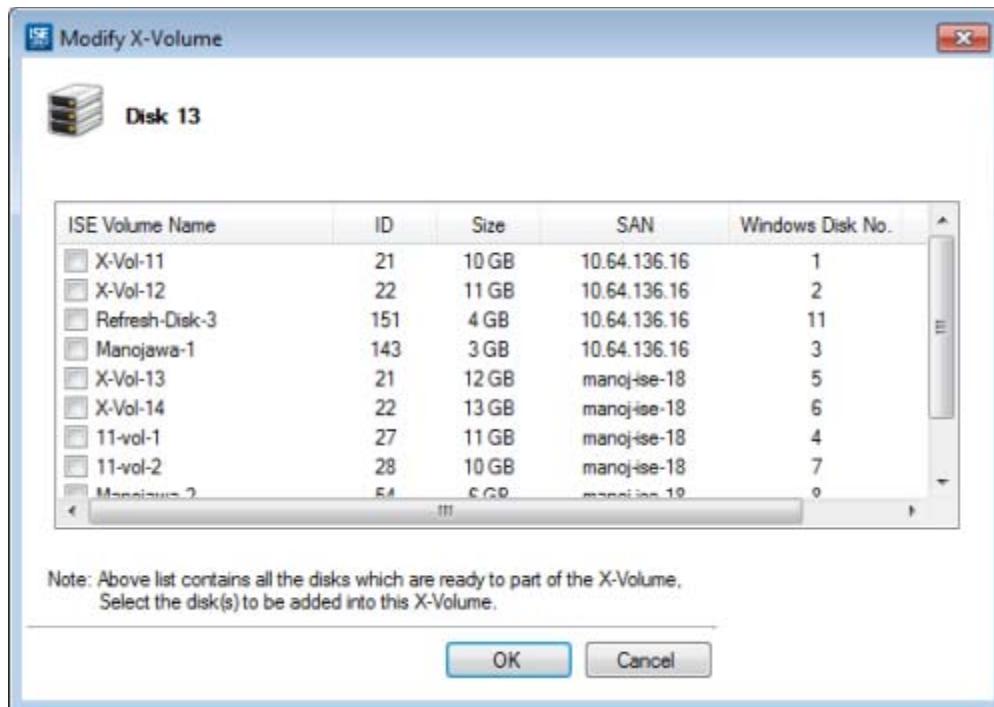


Figure 74. Modify X-Volume Dialog

4. Select the desired volumes from the list.
5. Click **OK**.

Shrink X-Volume

To reduce the size of an existing X-Volume:

1. Right-click an existing X-Volume.
2. Select **X-Volume**.
3. Click **Shrink X-Volume**.

The **Modify X-Volume** dialog appears as shown below.

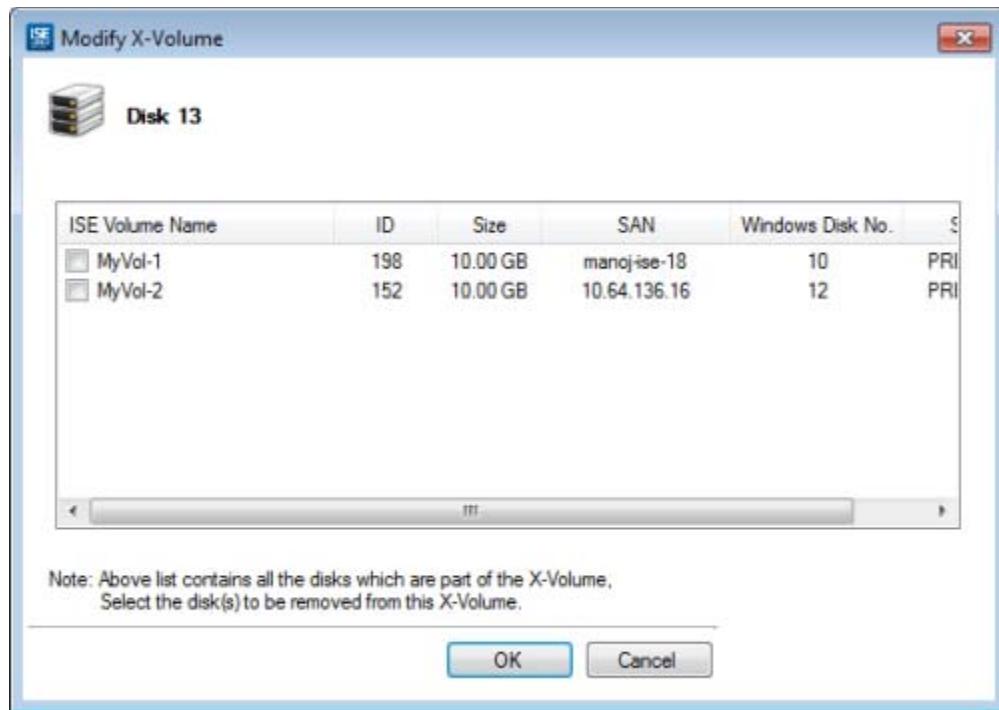


Figure 75. Modify X-Volume Dialog

4. Select the desired volumes from the list.
5. Click **OK**.

Properties

On the **Server View** page, the following properties can be viewed:

- Servers
- Un-mapped Host Initiators
- Volumes

Server Properties

To view the properties of a specific mapped server:

1. Select a mapped server from the list of servers.
2. Click **Properties** in the top horizontal navigation bar.

The mapped server properties are shown in a pop-up.

3. The properties pop-up provides the following information:
 - Name of the server
 - Type of the server (Windows or Linux)
 - IP address
 - Number of volumes
 - ISE Multi-Path Suite: Displays whether X-IO Storage ISE Multi-Path Suite is installed
 - X-Volume service status
 - Host initiator information
4. Click **OK**.

Unmapped Host Initiator Properties

To view the un-mapped host initiator properties:

1. Select an un-mapped initiator from the **UnMapped Host Initiators** view.

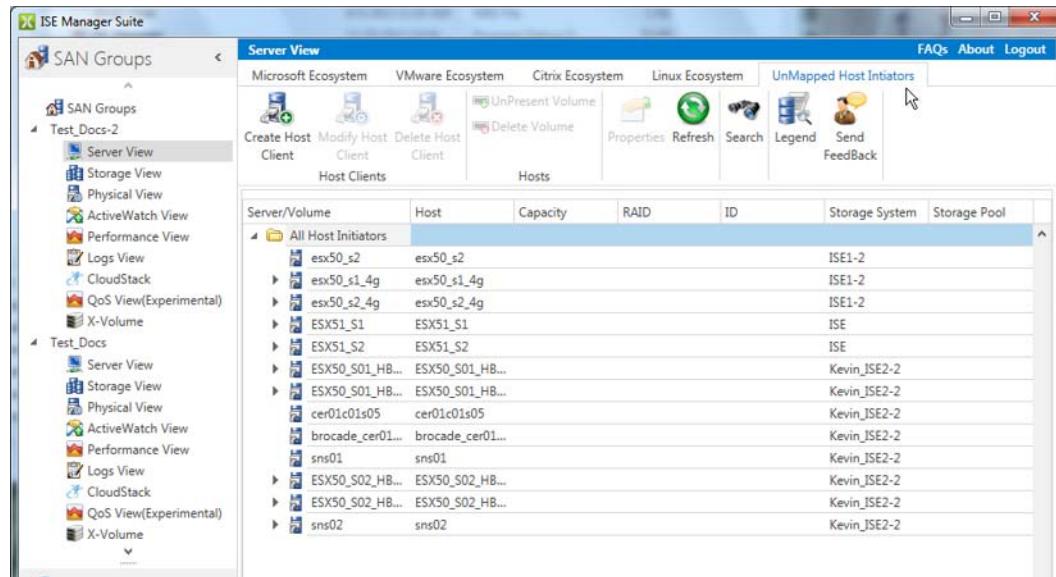


Figure 76. Server View—Unmapped Host Initiators

2. Click **Properties** in the top horizontal navigation bar. The host properties are shown in a pop-up.

The *Host Port Properties* screen provides server and host initiator information as shown below.

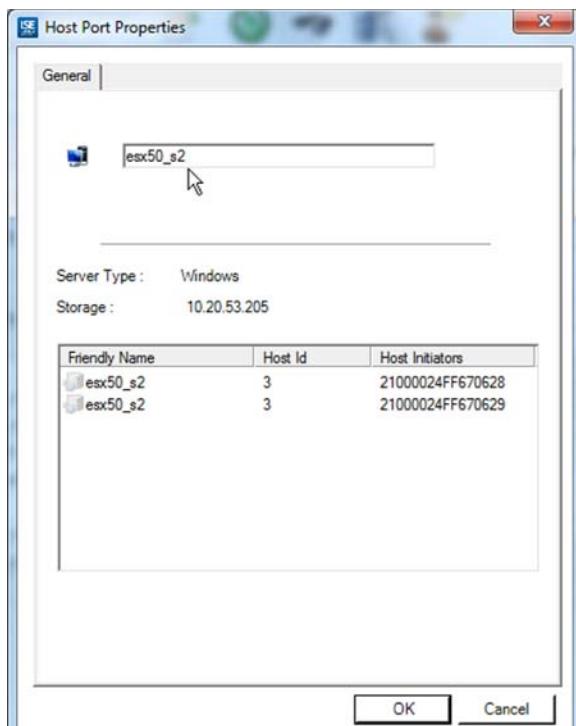


Figure 77. Server View—Unmapped Host Initiators, Properties

3. Click **OK** to close the pop-up.

Volume Properties

To view the properties of a specific volume:

1. Select the volume.
2. Click **Properties** in the top horizontal navigation bar.

The **Volume Properties** pop-up appears.

ISE Manager Suite Volume Properties

The following figure illustrates the ISE Manager Suite volume properties.

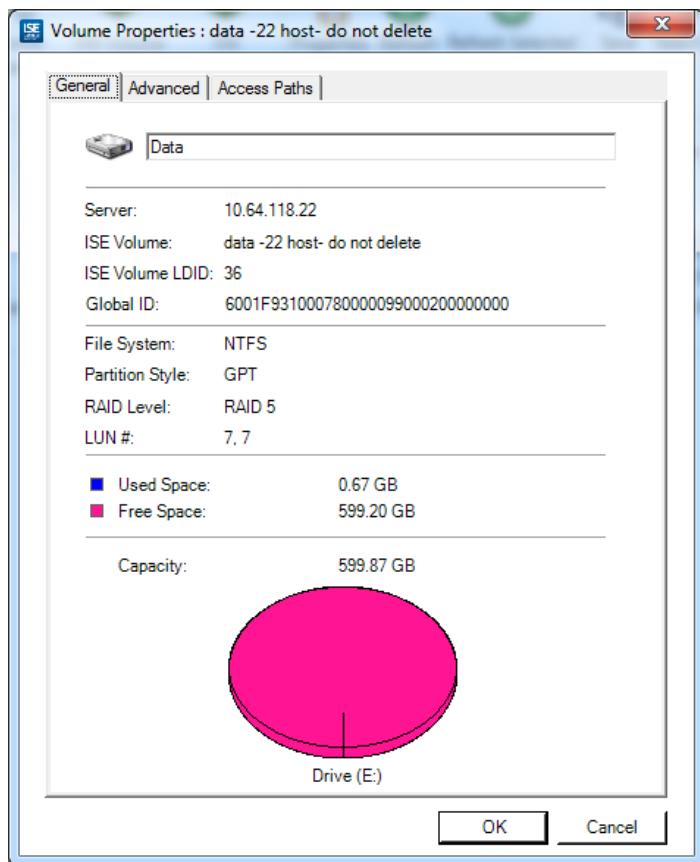


Figure 78. ISE Manager Volume Properties

The *ISE Manager Volume Properties* window consists of the following three tabs:

- **General** tab provides information related to the Volume, Volume ID, File System, Partitions Style, RAID-level, LUN, Used Space, and Free Space. The volume name can be modified in this tab.
- **Advanced** tab displays information related to the host initiators and the LUNs assigned to the specified volume.
- **Access Paths** tab displays information related to the mount point assigned to the specified volume.

VMware

All VMware volume operations are available through the drop-down associated with **DataStore Operations**. These operations include:

- DataStore
- VM
- VM Volume

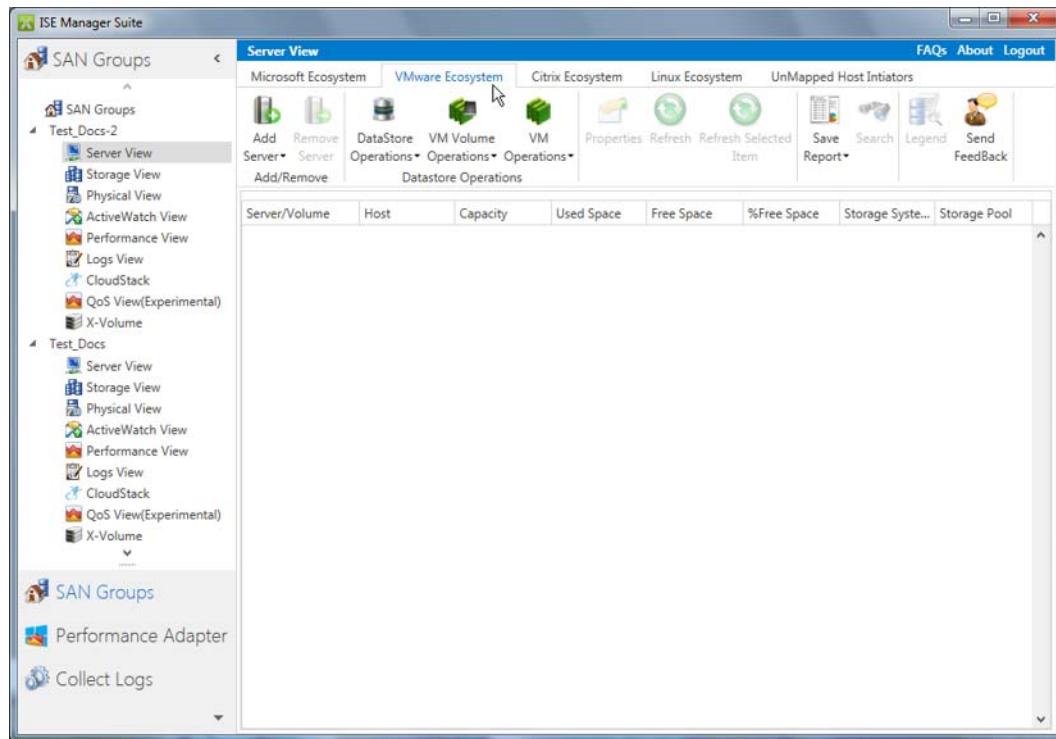


Figure 79. Server View—VMware

Citrix

All Citrix volume operations are available through the drop-down associated with **DataStore Operations**. These operations include:

- Storage Repository
- VM Volume
- VM

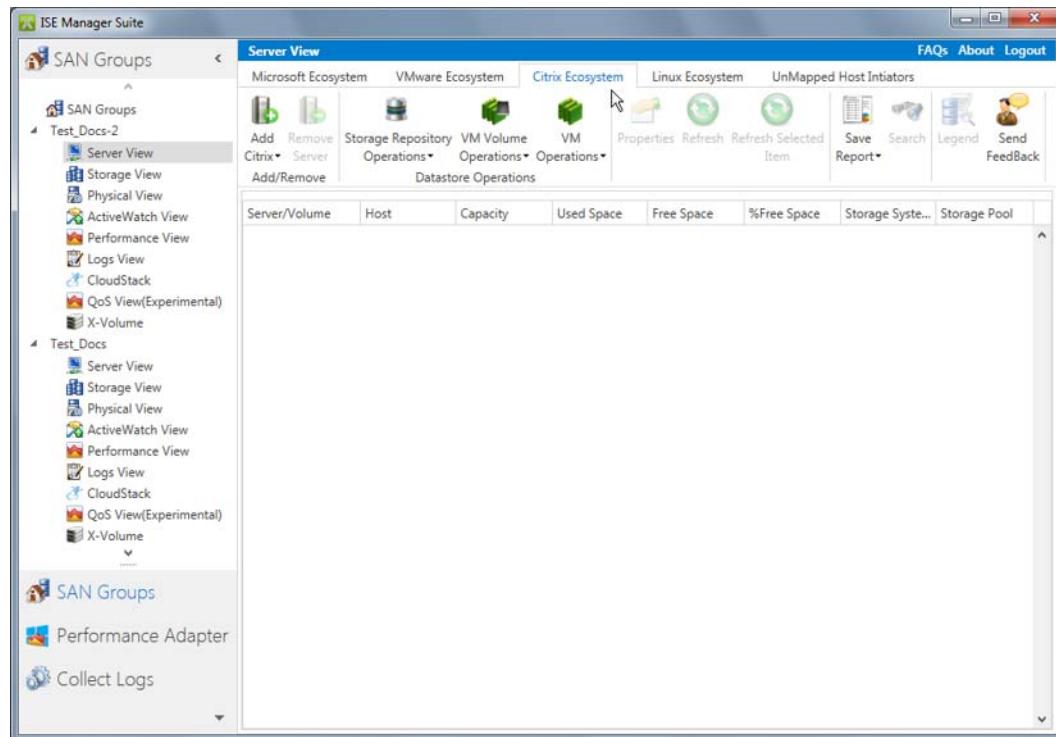


Figure 80. Server View—Citrix

Linux

Server/Volume	Partition	Capacity	Used Space	Free Space	%Free Space	Storage System
10.64.137.60	/mnt/fr1	4.68 GB	0.25 GB	4.43 GB	94.00 %	ISE

Figure 81. Server View—Linux

Figure 82. Add Server View

Unmapped Host Initiators

The Unmapped Host Initiators tab provides the means to manage hosts and host clients. To manage host clients:

1. Select the **UnMapped Host Initiators** tab.
2. Expand the **All Host Initiators**.
3. Click a host to access the client options.

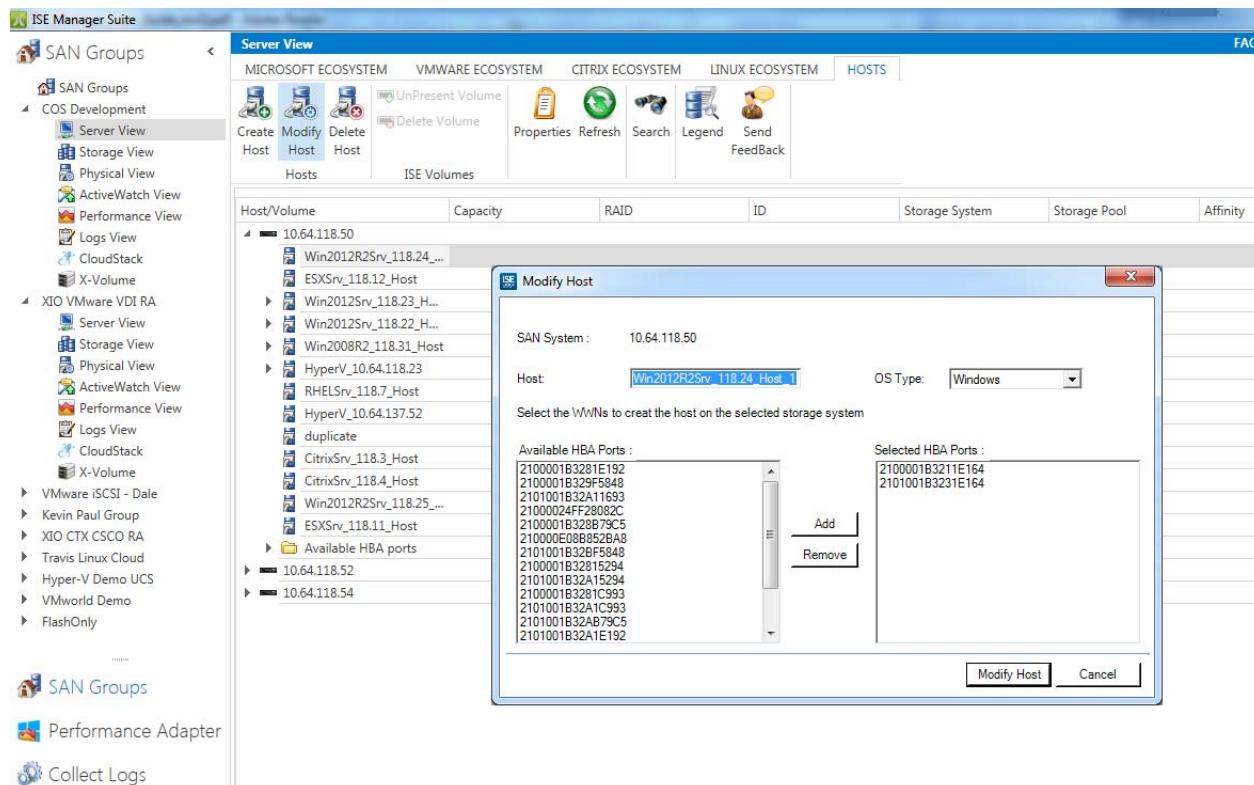


Figure 83. Unmapped Host Initiators—Modify Clients

To manage hosts:

1. Select the **UnMapped Host Initiators** tab.
2. Expand the **All Host Initiators**.
3. Click a volume to access the host options.

The screenshot shows the ISE Manager Suite interface with the 'Server View' tab selected. On the left, there's a tree view under 'SAN Groups' with nodes like 'Test_Docs-2' and 'Test_Docs'. The 'All Host Initiators' node is expanded, showing a list of hosts and their volumes. The table columns are: Server/Volume, Host, Capacity, RAID, ID, Storage System, and Storage Pool. The data includes:

Server/Volume	Host	Capacity	RAID	ID	Storage System	Storage Pool
esx50_s2	esx50_s2				ISE1-2	
esx50_s1_4g	esx50_s1_4g	200.00 GB	1	16	ISE1-2	1
		ESX50_Vol1				
		ESX50_Vol2	200.00 GB	1	17	ISE1-2
esx50_s2_4g	esx50_s2_4g				ISE1-2	
		ESX50_Vol1	200.00 GB	1	16	ISE1-2
		ESX50_Vol2	200.00 GB	1	17	ISE1-2
ESX51_S1	ESX51_S1				ISE	
		ESX50_Vol1	500.00 GB	1	16	ISE
		ESX50_Vol2	500.00 GB	1	17	ISE
		ESX50_Vol3	500.00 GB	1	18	ISE
		ESX50_Vol4	500.00 GB	1	19	ISE
		ESX50_Vol5	500.00 GB	1	20	ISE
ESX51_S2	ESX51_S2				ISE	
		ESX50_Vol1	500.00 GB	1	16	ISE
		ESX50_Vol2	500.00 GB	1	17	ISE
		ESX50_Vol3	500.00 GB	1	18	ISE
		ESX50_Vol4	500.00 GB	1	19	ISE
		ESX50_Vol5	500.00 GB	1	20	ISE
ESX50_S01_HBA1	ESX50_S01_HB...				Kevin_ISE2-2	
ESX50_S01_HBA2	ESX50_S01_HB...				Kevin_ISE2-2	
esn01r01e05	esn01r01e05				Kevin_ISE2-2	

Figure 84. Unmapped Host Initiators—Hosts

Storage View

This section introduces the ISE Manager Suite Storage View and its options in detail.

Introduction

Storage View permits the viewing and management of all the attached ISE storage system. The views include listing all ISE volumes, mirrors, and snapshots that exist along with their assigned host initiators. Volumes and snapshots of a storage system can be assigned to any host initiators that are configured within the specified storage system.

To open the **Storage View** by Storage Systems:

1. Click **SAN Groups** in the left navigation pane.
2. Select a SAN group from the list of groups in the left pane.
3. Click **Storage View** as shown below.

The screenshot shows the Storage View interface with the following details:

- Left Navigation Pane:** SAN Groups, SAN Groups, COS Development, Server View, Storage View (selected), Physical View, Telemetry/Email Notification, Performance View, Logs View, CloudStack, X-Volume, XIO VMware VDI RA, XIO CTX CSCO RA, Travis Linux Cloud, Kevin Paul Group, Phil - Customer Training, ALL FLASH.
- Top Bar:** Storage View, ISE STORAGE SYSTEM, Create, Present, Create Like, Delete, Volume Operations, Snapshot Operations, Search, Save Report, Refresh, Properties, Legend, Send Feedback, Storage Report, Schedule Storage Report.
- Table Headers:** ISE Volume, Lun, Host, Size, RAID, LDID, Storage System, Storage Pool, Affinity, IOPS Max, IOPS Min.
- Table Data:**

ISE Volume	Lun	Host	Size	RAID	LDID	Storage System	Storage Pool	Affinity	IOPS Max	IOPS Min
ISE (1DE100103)						10.64.118.54				
Name: ISE (1DE100103)				Status: Warning				Model: 28.8 TB SAS Hyper		
Storage Quality of Service: enabled										
ISE (1DE10026D)						10.64.118.50				
ISE (1DE10026D)						10.64.118.50				
Storage Pool 1						10.64.118.54				
8083-vol		2.00 GB		1		29		10.64.118.50		
data -22 host...		600.00 GB		5		32		10.64.118.50		
Data-23 host...		600.00 GB		5		31		10.64.118.50		
ds-test		2.00 GB		5		27		10.64.118.50		
OS		500.00 GB		5		22		10.64.118.50		
RDM		2.00 GB		5		41		10.64.118.50		
RERE		2.00 GB		5		40		10.64.118.50		
rerere		2.00 GB		5		38		10.64.118.50		
rr		4.00 GB		5		16		10.64.118.50		
RTV		50.00 GB		1		42		10.64.118.50		
SATYA DATA		500.00 GB		1		37		10.64.118.50		
TDX		500.00 GB		1		~		10.64.118.50		

Figure 85. Storage View—Systems

To open the **Storage View** by Volumes:

1. Click **SAN Groups** in the left navigation pane.
2. Select a SAN group from the list of groups in the left pane.
3. Click **Volumes** as shown below.

Figure 86. Storage View—Volumes

Storage View consists of the following views for ISE Storage Systems as shown in the following table.

View type	Description
All ISE Storage Systems	Displays a list of ISE Storage Systems that shows: <ul style="list-style-type: none"> • Storage Pool(s) for each ISE Storage System. • Volumes and Snapshots created under each Storage Pool.
All ISE Volumes	Displays all the volumes of all ISE Storage Systems.

Table 2: Storage View Type and Description

Create ISE Volumes

Creating volumes on ISE Storage Systems is facilitated by the **Create ISE Volume** option of Storage View.

After creating a volume, the created volume must be assigned to a server using the **Present** option of Storage View. The operating system-specific options must be applied within Server View to complete the volume creation and make it visible for volumes assigned to Microsoft Windows servers:

- Initialize the volume (see “Initialize Windows Volume” on page 51)
- Format the volume (see “Format Windows Volume” on page 51)
- Change the drive letter (see “Change Drive Letter, Paths for Windows Volume” on page 51)

To create a volume on an ISE:

1. Select the **ISE Storage System** tab.
2. In the **ISE Volume Operations** section, click **Create** and the **Create ISE Volume** wizard appears as shown

below.

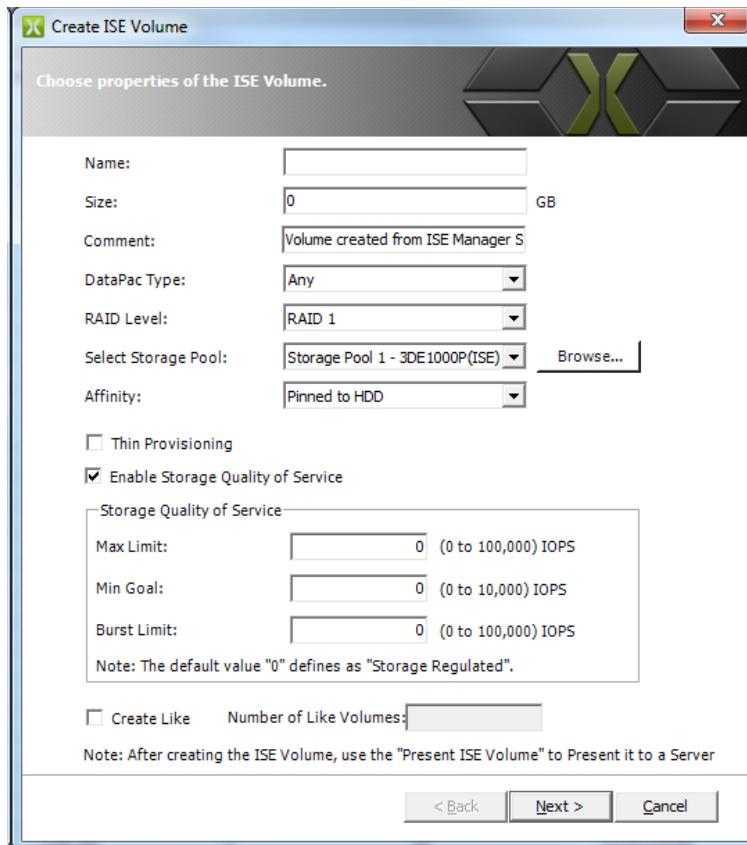


Figure 87. Create ISE Volume—Properties

3. Enter the name and size of the ISE volume.
4. Select the **DataPac Type**. All available DataPac types for the ISE Storage Systems are listed.
5. Choose the DataPac type for the volume to be created. The default type is **Any**, which indicates that the volume can be created on any type of DataPac.
6. Select a **RAID Level** from the drop-down list. The supported RAID levels are RAID-1 and RAID-5.
7. Select the DataPac.

The **Select Storage Pool** field has two options, **automatic** and **manual**. If **automatic** is selected, ISE Manager Suite creates the volume on the DataPac best-suited to the defined characteristics of the volume (details of the best-suited DataPac algorithm are explained in “Appendix A: Storage Pool Algorithm” on page 159).

8. To manually choose the Storage Pool on which the volume is to be created, select the **manual** option and click **Browse**.

The **Select Storage Pool** window appears, showing the available ISEs and their storage pools with their individual characteristics.

9. Select the desired Storage Pool.
10. Select the **Affinity**. The options are CADP, Pinned to HDD, and Pinned to Flash.
 - a. If selecting Pinned to Flash, click **Browse**.
 - b. In the **Select Storage Pool** dialog that appears, ensure that the Quota column lists sufficient space for the pool to be created.

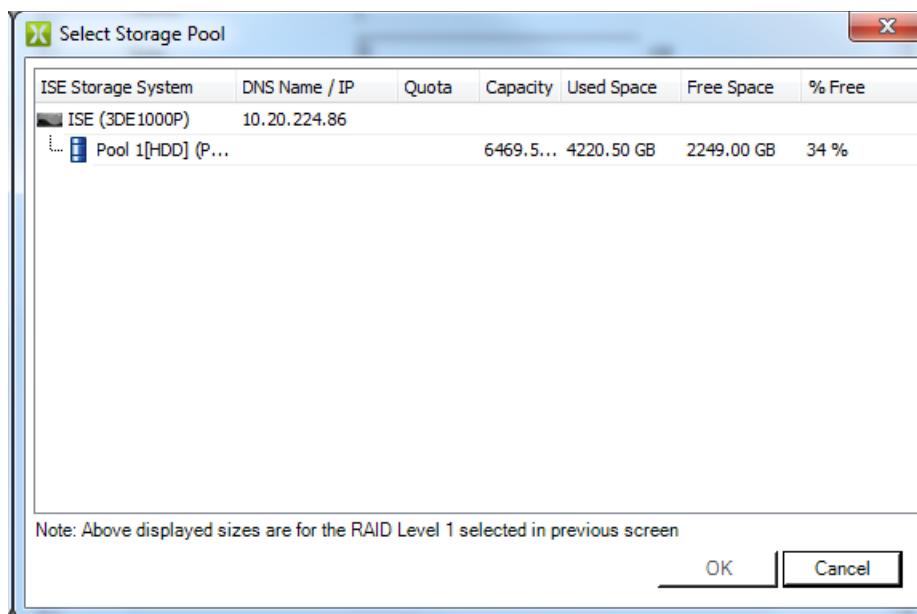


Figure 88. Select Storage Pool

- c. If sufficient space is not available, navigate to the **Storage View** window, select the storage pool, and then click **Edit Pool**.
- d. In the **Modify Pool** dialog that appears, use the slider bar to adjust the pool size, and then click **Modify**.

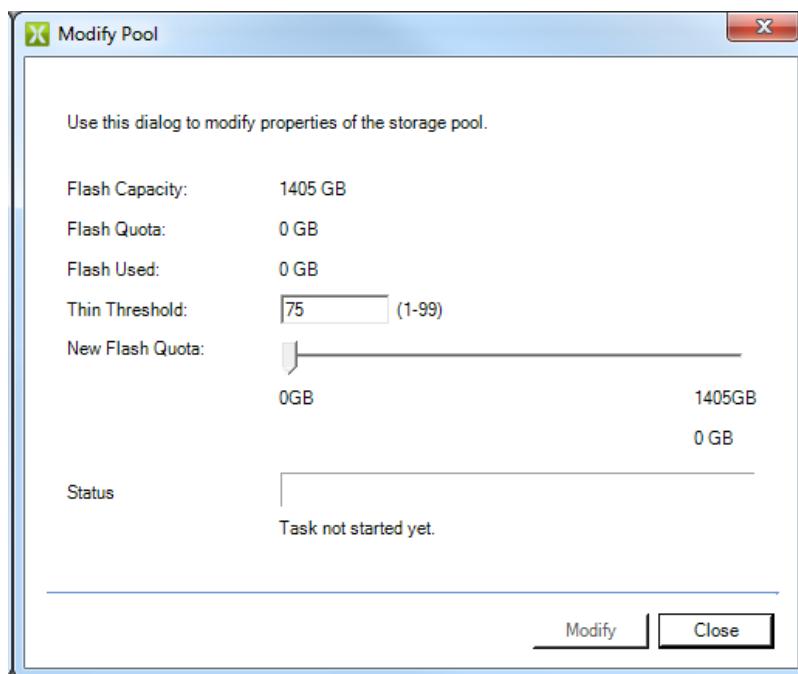


Figure 89. Modify Pool

The Task bar displays the percentage complete.

11. When the percentage reaches 100%, click **Close**.
12. If you want to create more than one like volume for the mentioned details in the *Create ISE Volume* dialog, select the **Create Like** check box and specify the number of like volumes you would like to create.
13. Click **OK**.

The **Create ISE Volume** window appears showing the selected storage pool in the **Select Storage Pool** field.

14. Click **Next** and the *Summary* screen appears.

15. Review the selection summary and click **Finish**.

The newly created volume is visible in Storage View.

Delete Volumes

The **Delete Volumes** option is used to delete volumes from an ISE Storage System as follows:

1. Select the volume(s) to be deleted. (ISE Manager Suite supports multiple volume deletion.)
2. Click **Delete** in the top panel.

The **Delete Volume** screen appears as shown below.

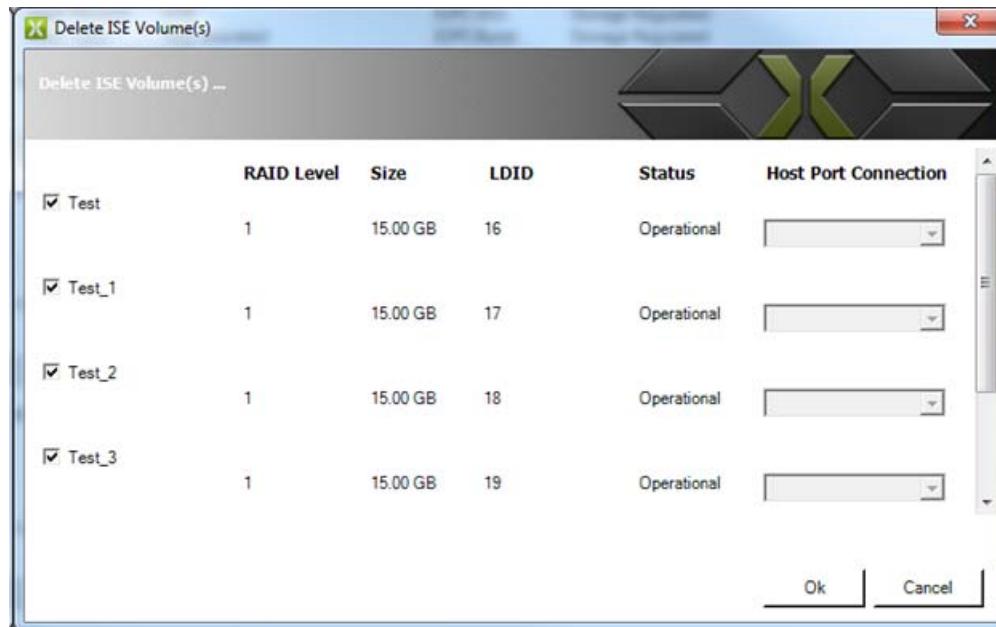


Figure 90. Delete Multiple Volumes

3. Confirm that the selected volumes are those intended for deletion.

4. Click **OK** to proceed with the deletion.

Note. In ISE Storage System, all snapshots must be deleted before deleting the source volume. In addition, snapshots must be deleted in the order of their creation; that is, the first snapshot created must be deleted before deleting the second snapshot. Use the **Date Created** column in the Storage View to determine the creation order of snapshots.

Expand, Shrink Volumes

The **Expand Volume** option is used to increase the size of an existing volume. The **Shrink Volume** option is used to reduce the capacity of an existing volume. These options are supported only for ISE Storage Systems.

Expand Volume

To expand the capacity of an existing, non-snapshot volume:

1. Select **ISE Storage System** tab.

2. Select a volume.
3. In the **ISE Volume Operations** section, click **Expand**.

The *Expand ISE Volume* dialog appears as shown below.

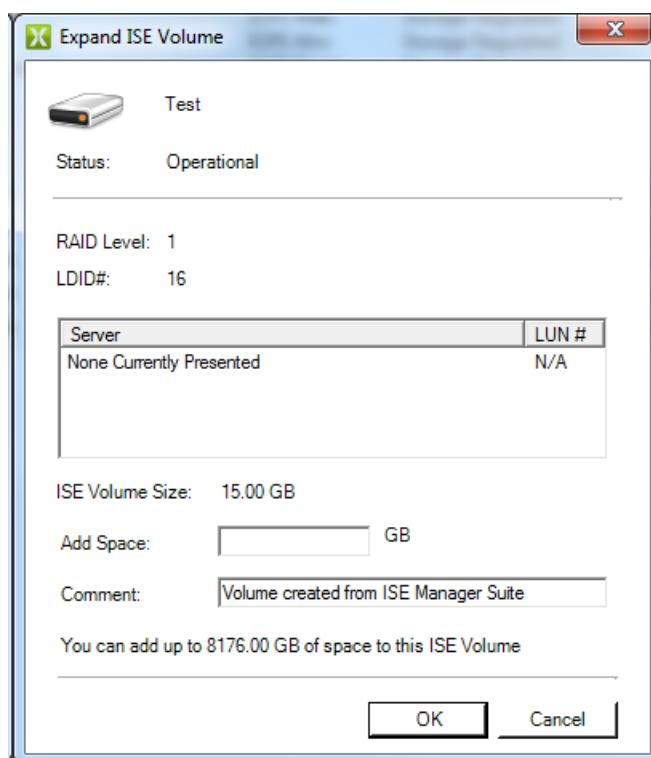


Figure 91. Expand ISE Volume Dialog

4. Enter an amount (in gigabytes) of space in **Add Space** field.
5. Click **OK**.

A message box appears indicating this operation ONLY expands the disk on storage because the disk is assigned to a host; the volume needs to be manually expanded on the host.

Note. For automatic volume expansion, when the host is a mapped Windows server, try expanding from Server View. To expand the volumes on ESX/Xen/Hyper-V servers, use Virtual View.

6. Click **Yes** to continue expanding the ISE volume.

Note. The **Expand Volume** function is not applicable to the snapshots.

Shrink Volume

The **Shrink Volume** option is used to reduce the capacity of a non-snapshot volume. A volume that is not assigned to any server can be reduced in size to a minimum size of 1 GB. To reduce the size of a volume:

1. Select **ISE Storage System** tab.
2. Select a Volume.
3. In the **ISE Volume Operations** section, click **Shrink**.

The *Shrink ISE Volume* dialog appears (see Figure 92).

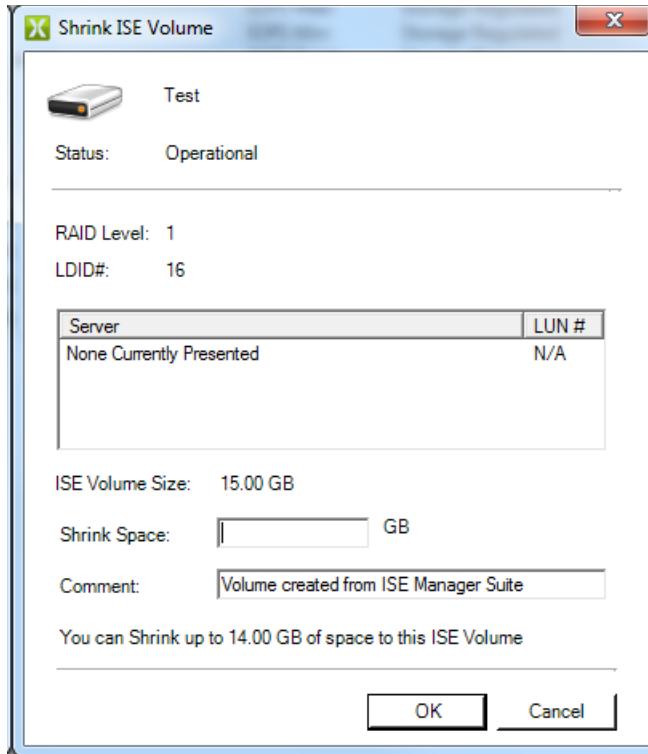


Figure 92. Shrink ISE Volume Dialog

4. Enter the capacity by which the volume is to be reduced in the **Shrink Space** field. The maximum size by which the volume may be reduced is displayed on the *Shrink ISE Volume* dialog.
5. Click **OK** to proceed with the size reduction.

Note. The **Shrink Volume** function is not applicable to the snapshots.

Present, Unpresent Volume

The **Present Volume** option is used to assign a volume to a server or a host initiator. The **Unpresent Volume** option is used to break a volume's assignment to a server or a host initiator.

Present Volume

To present a volume to a host client:

1. Select a volume.
2. In the **Volume Operations** section, click **Present**.

The **Present ISE Volume** dialog appears as shown below. When a volume is already assigned to a server or multiple servers, the server's host initiators are listed in the **Browse Servers** window.

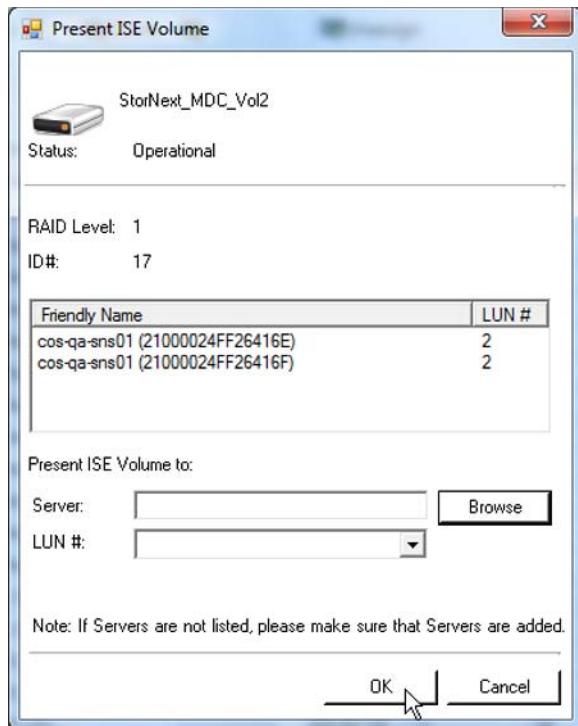


Figure 93. Present Volume

3. Click **Browse** to display a list of host initiators in the **Browse Servers** window.

The *Select Host for Assignment* dialog appears (see Figure 95), listing all the host initiators to which the volume is not presented currently.

The client appear in the **Server** field next to the **Browse** button as shown in the figure below.

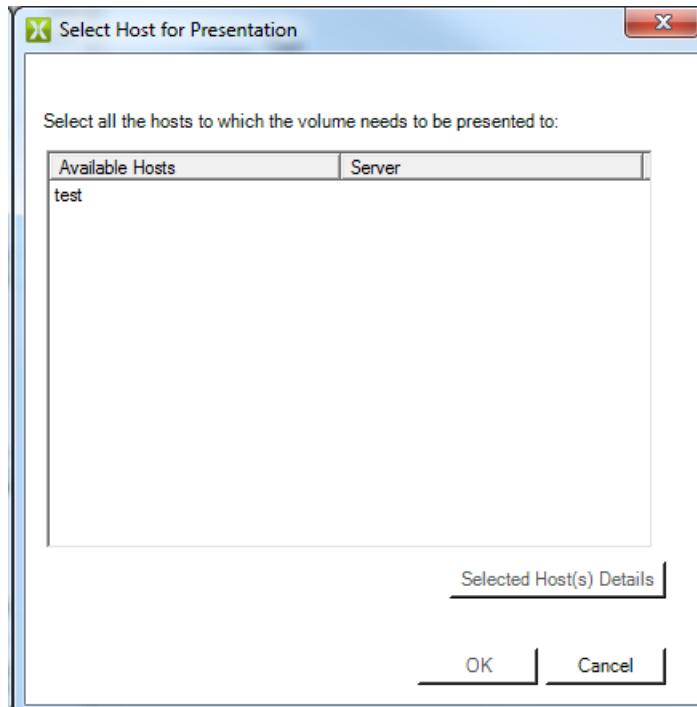


Figure 94. Present Volume

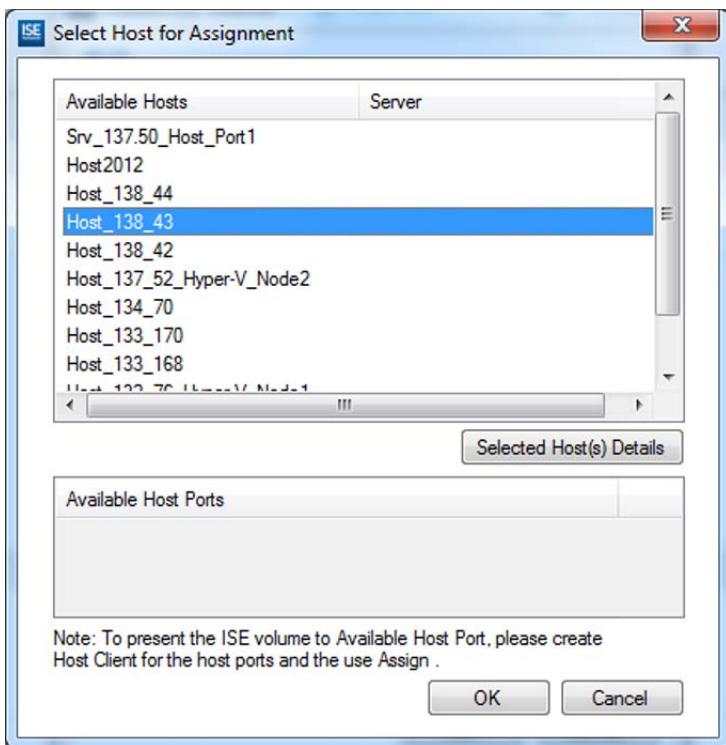


Figure 95. Present Volume—Select Host for Assignment

When a host initiator is mapped to a server whose node is expanded in **Server View** during this session, the server name or IP address appears in the **Select Host for Assignment** pop-up next to the applicable host initiators.

4. Select all host clients to which the volume is to be presented as shown above.
5. Click **OK**.
6. In the **LUN #** field, select the desired LUN from the drop-down list.
7. Click **OK** to complete the process.

Present Multiple Volumes

To present multiple ISE volumes to a single host client:

1. Select all ISE volumes that are to be presented to the host client.
2. On the top panel, click **Present** and the dialog appears as shown below.
3. Click **Browse**.
4. Select the host client that is to receive the presentation of ISE volumes.
5. Review the ISE Volumes list, un-selecting any volumes that are not to be presented.

6. Click **OK** to present the selected volumes to the selected host client.

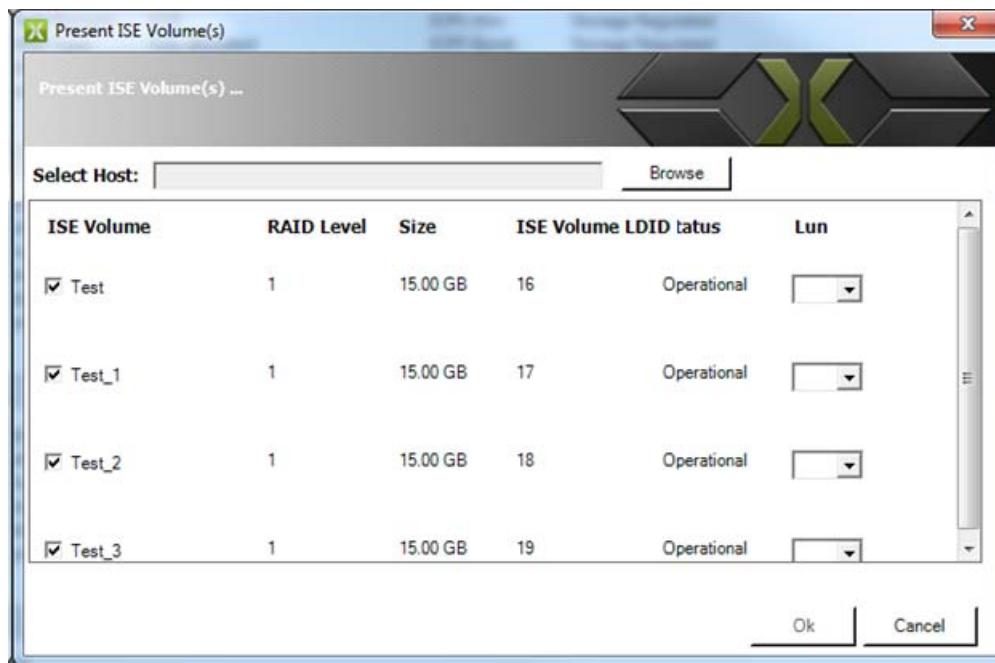


Figure 96. Present Multiple Volumes to a Host

Unpresent Volumes

To remove a presentation of volumes to a host, use the **Unpresent** volume option as follows:

1. Select a volume.
2. In the **Volume Operations** section, click **Unpresent Volume**.

The **Unpresent ISE Volume** pop-up appears, as shown below, with a list of servers.

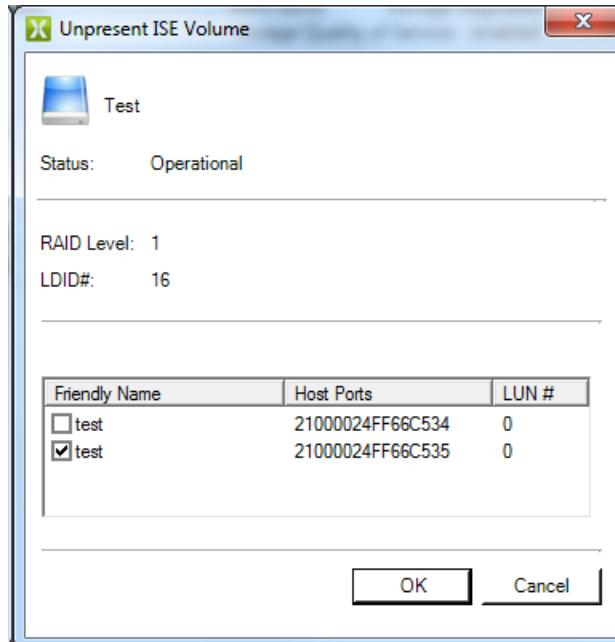


Figure 97. Unpresent Volume

3. Select the host initiators of the host that is to have a volume(s) unpresented.
4. Click **OK** to complete the process.

ISE Manager Suite removes the volume presentation from all the host initiators of a host client even if only one host initiator is selected.

Unpresent Multiple Volumes

To remove multiple volume-host presentations:

1. Select all volumes that are to be un-presented.
2. Click **Unpresent** in the top panel and all host ports are listed and selected.
3. Un-check any host port presentations that are not to be deleted.
4. Click **OK** to continue.

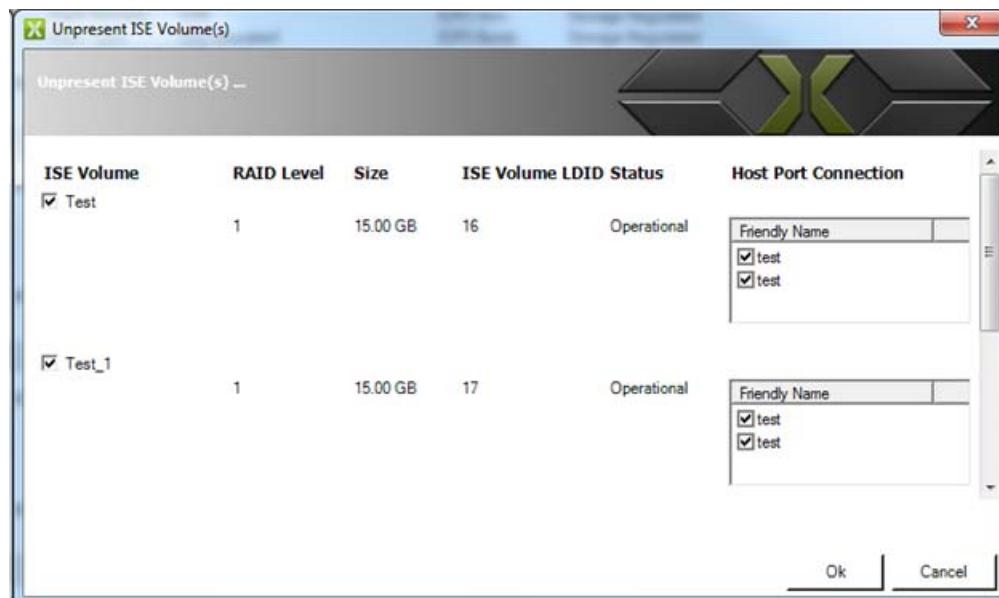


Figure 98. Unpresent Multiple Volumes

Snapshots

The following subsections describe the steps to create snapshots on ISE Storage Systems.

Note. This feature is supported only on Legacy ISE (Model 1400).

Create

A snapshot of a volume can be created on ISE Storage Systems with the requirement that the DataPac on which the source volume resides has sufficient space to contain the snapshot.

To create a snapshot of a volume:

1. Select ISE Storage System.
2. Select a Volume.
3. In the **Snapshot Operations** section, click **Create**.

The *Create Snapshot* dialog appears (see Figure 99).

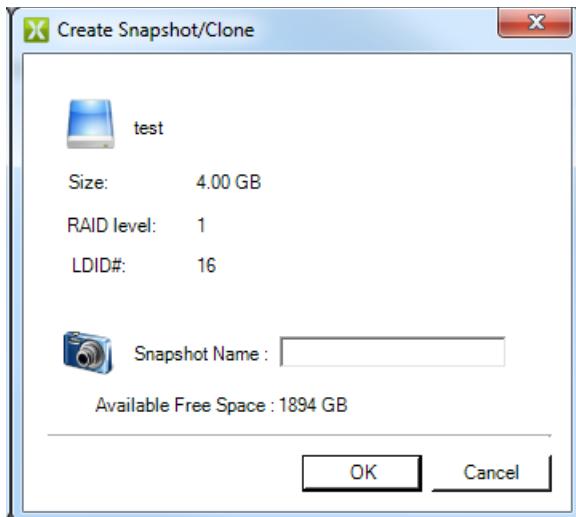


Figure 99. Create Snapshot

4. Enter the name of the snapshot in the **Snapshot Name** field.
5. Click **OK**.

The snapshot is created and appears in the **Storage View** with a camera icon next to the name of the snapshot.

Search

Search enables locating one or a group of commonly named items in the displayed list.

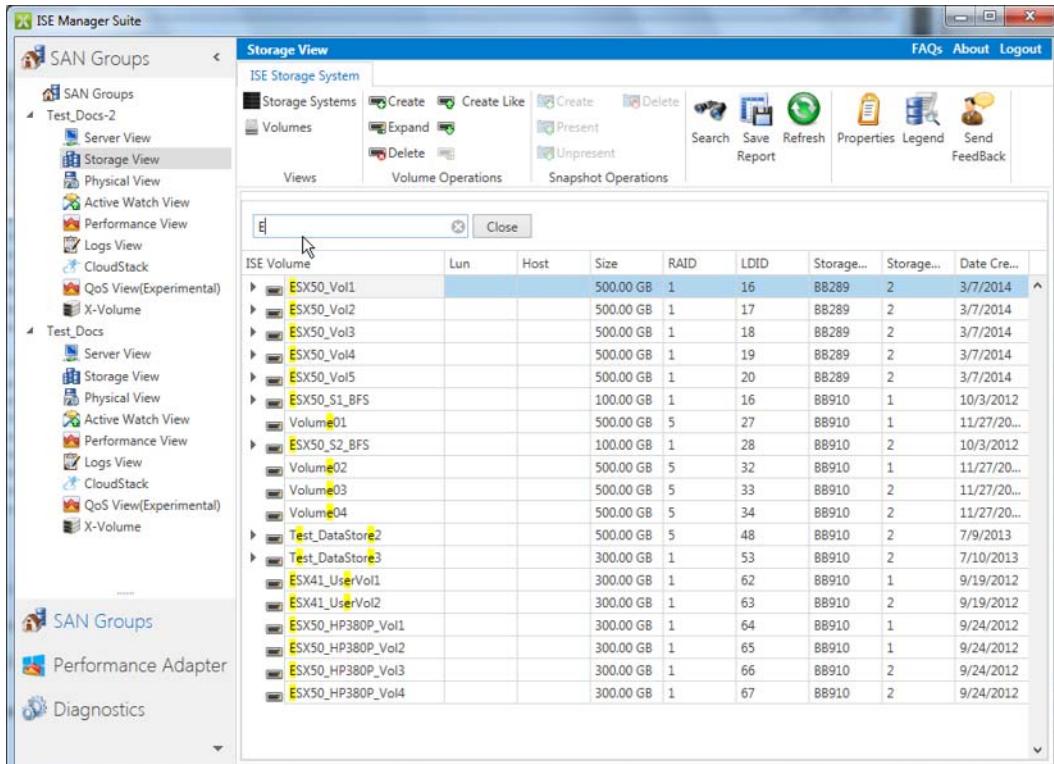


Figure 100. Storage View—Volumes, Search

ISE Command Line Interface

The ISE Command Line Interface (CLI) is accessible from the **Storage View** under Storage Systems by following the steps below.

1. Right-click an ISE name or volume.

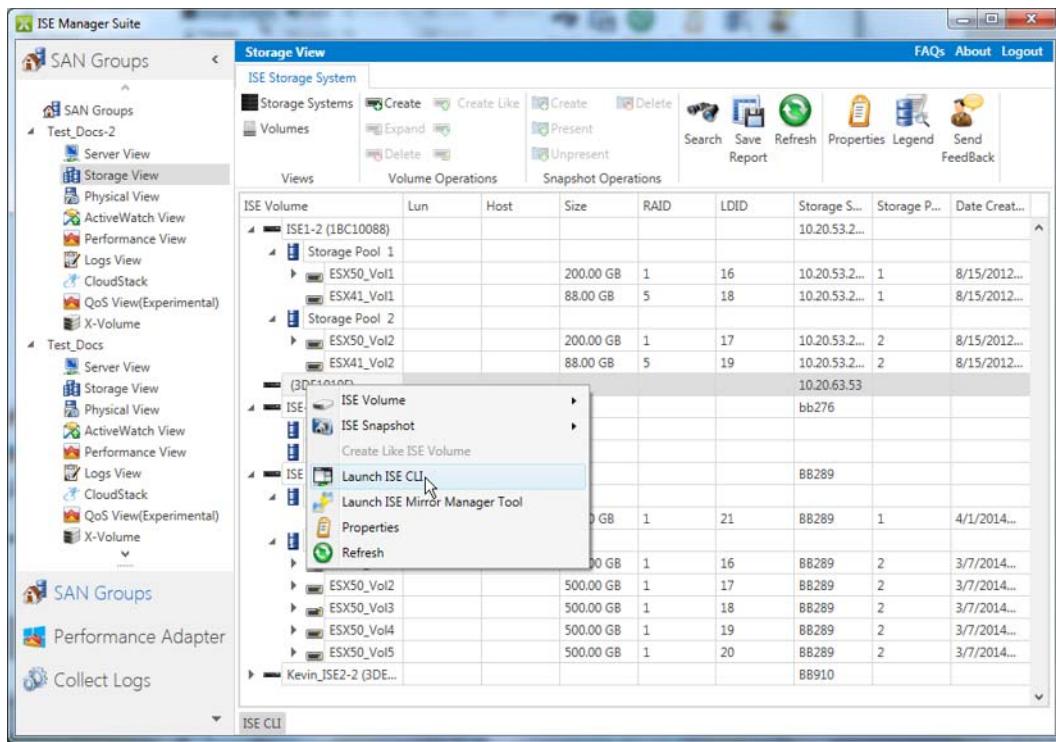


Figure 101. Storage View—Volumes, Open CLI

2. Select **Launch ISE CLI** from pop-up menu.

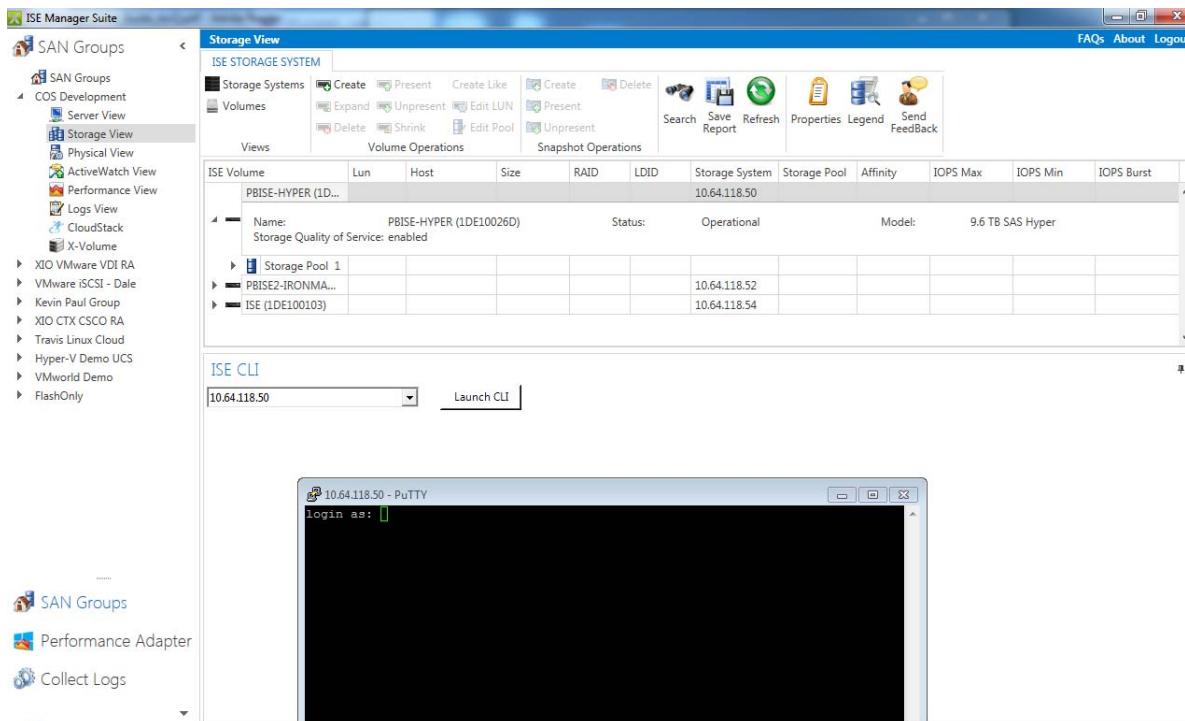


Figure 102. Storage View—Volumes, CLI Window

3. Log in using **administrator** for the user name and **administrator** for the password.

CLI commands can now be entered at the command prompt.

Note. The CLI window can also be accessed by right-clicking the **ISE CLI** icon at the bottom of the action pane and then selecting the ISE from the drop-down list.

Volume Properties

To view the properties of an ISE volume, mirror, or snapshot:

1. Select a volume, mirror, or snapshot.
2. Click **Properties**.

The *Properties* dialog displays the selected ISE properties.

Note. During the snapshot creation process, ISE Manager Suite accesses the volume properties data. The snapshot appears with a warning icon and a warning message.

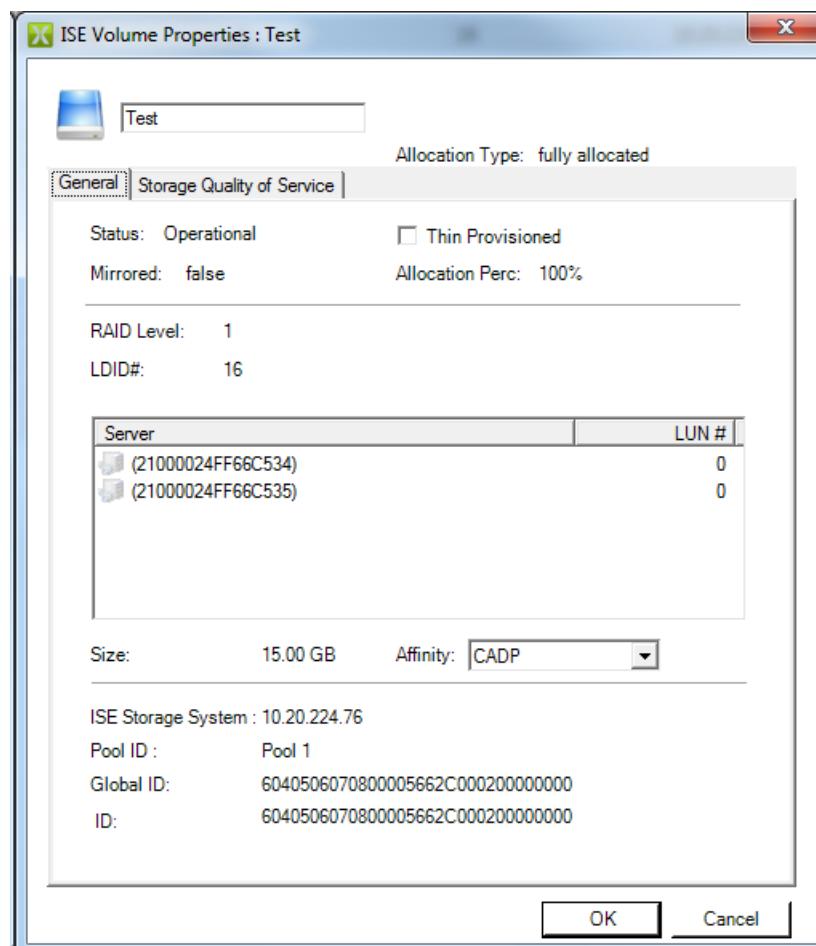


Figure 103. ISE Volume Properties

3. Click **OK** to close the pop-up.

ISE Properties

To view the properties of an ISE system:

1. Select an ISE.
2. Click **Properties**.

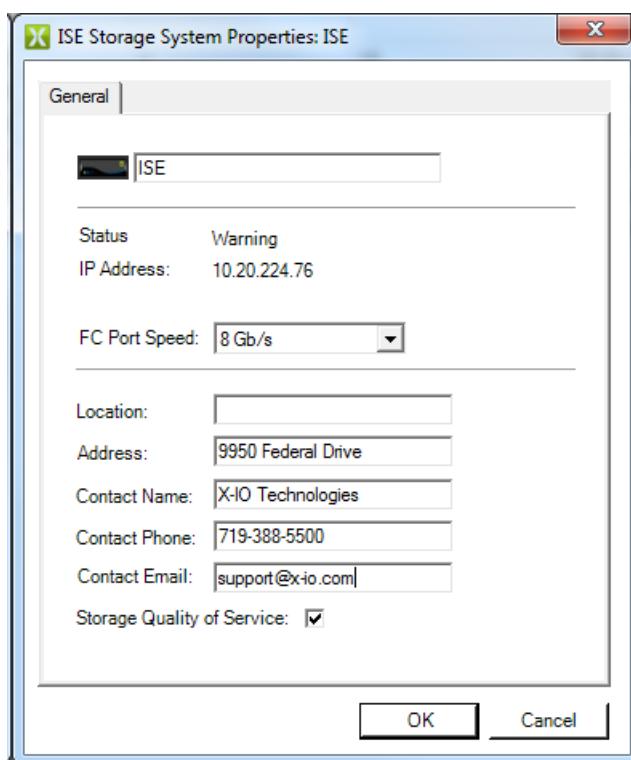


Figure 104. ISE Properties

Save Report

The displayed report can be saved or exported and e-mailed in one of a number of file formats. Other options include a Quick Print, which goes directly to the default printer, and a standard print, in which all print options are available.

The screenshot shows a software interface titled "Storage View Report (ISEINDIA)". At the top is a toolbar with various icons for file operations like save, print, and search. Below the toolbar is a navigation ribbon with tabs and a zoom control set at 100%. The main area features a hierarchical tree view under the heading "ISE Volume". The tree structure includes "ISE (1DE100112)", "Storage Pool 1" (which contains "QUORUM" and two "DATA" sub-pools), and "DATA2". Under "QUORUM", there are four entries: "2100001B32..." (Lun 1, Host Srv_132.72), "2101001B32..." (Lun 1, Host Srv_132.72), "2100001B32..." (Lun 1, Host Srv_132.71), and "2101001B32..." (Lun 1, Host Srv_132.71). Under each "DATA" pool, there are five entries: "2100001B32..." (Lun 2, Host Srv_132.72), "2101001B32..." (Lun 2, Host Srv_132.72), "2100001B32..." (Lun 2, Host Srv_132.71), "2101001B32..." (Lun 2, Host Srv_132.71), and "2100001B32..." (Lun 3, Host Srv_132.72). A detailed table is displayed below the tree view, listing columns for ISE Volume, Lun, Host, Size, RAID, LDID, Storage System, Storage P., Affinity, IOPS Max, IOPS Min, and IOPS Avg. The table data corresponds to the nodes shown in the tree.

ISE Volume	Lun	Host	Size	RAID	LDID	Storage Syst...	Storage P...	Affinity	IOPS Max	IOPS Min	IOPS Avg
ISE (1DE100112)						10.64.132.60					
Storage Pool 1											
QUORUM			10.00 GB	5	16	10.64.132.60	1	CADP	Storage Re...	Storage Re...	Storage Re...
2100001B32...	1	Srv_132.72									
2101001B32...	1	Srv_132.72									
2100001B32...	1	Srv_132.71									
2101001B32...	1	Srv_132.71									
DATA1			20.00 GB	5	17	10.64.132.60	1	CADP	Storage Re...	Storage Re...	Storage Re...
2100001B32...	2	Srv_132.72									
2101001B32...	2	Srv_132.72									
2100001B32...	2	Srv_132.71									
2101001B32...	2	Srv_132.71									
DATA2			20.00 GB	5	18	10.64.132.60	1	CADP	Storage Re...	Storage Re...	Storage Re...
2100001B32...	3	Srv_132.72									

Figure 105. Save Volume Report

Save Options

The save options include the following:

- CSV
- Export to PDF
- Image
- Print to selected printer
- RTF
- XLSX
- E-mail in PDF format
- HTML
- MHT
- Quick Print (default printer)
- XLS
- XPS

Refresh

The current screen content can be refreshed at any time by clicking **Refresh** in the top navigation ribbon.

Storage Report

The Storage Report option is used to save a report with detailed storage information, such as ISE Model, total capacity, free space, used space for each RAID type of each ISE in the SAN group. The report can be saved to an Excel document to the path specified by user.

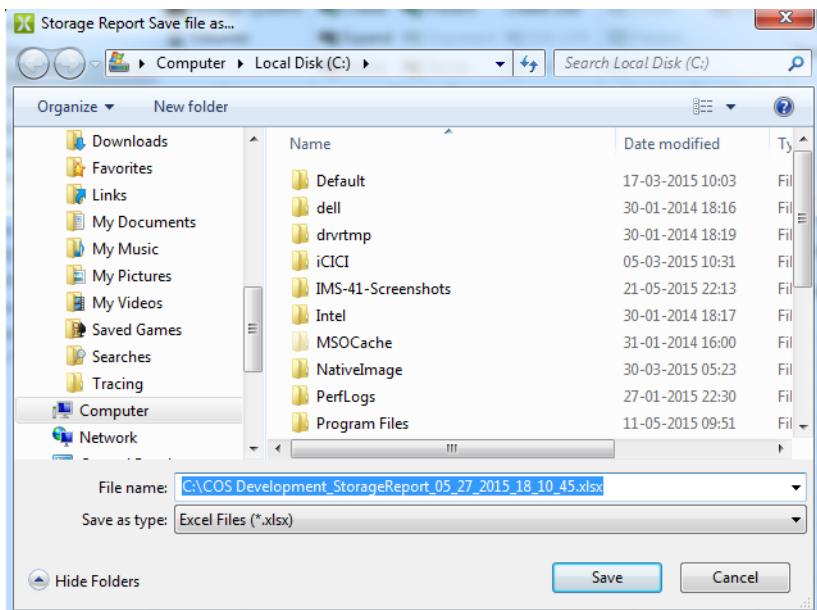


Figure 106. Storage Report Save

Schedule Storage Report

The Schedule Storage Report option is used for scheduling generation of report with detailed storage information of each ISE in the SAN group and to send this report to specified users weekly or monthly as per the user requirement.

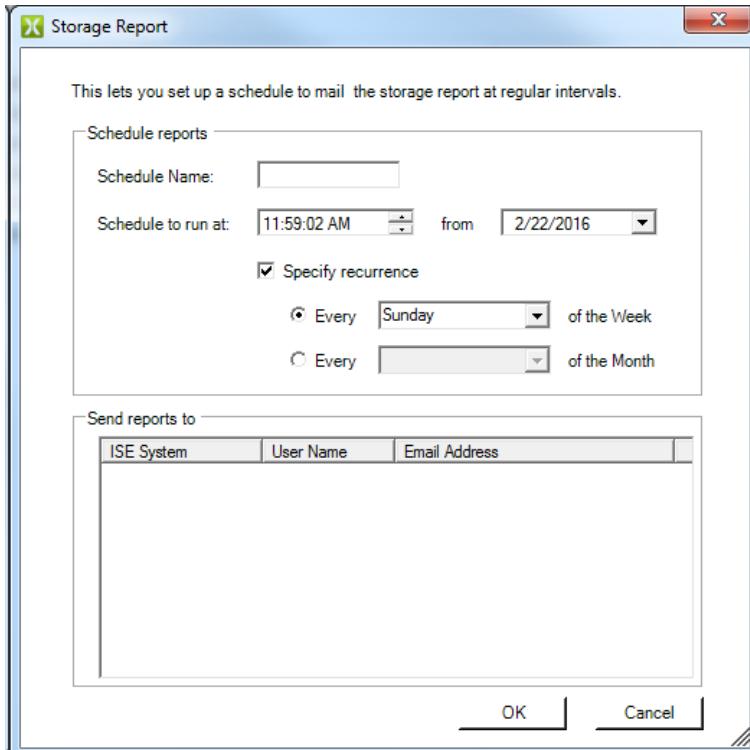


Figure 107. Storage Report Schedule

Flash and HDD Media Affinity and CADP

Flash and HDD Media Affinity provide the administrator the ability to create ISE volumes of either all Flash disks or all HDD disks.

Until the release of ISE 2.8 firmware, the default configuration of a volume leveraged both Flash and HDD in the Hybrid ISE arrays. To provide the best possible performance for different types of workloads, X-IO technologies developed CADP (Continuous Adaptive Data Placement, <http://xiostorage.com/technology/intelligent-software/>). The ISE CADP software employs a patented cost analysis algorithm to ensure that the hottest data blocks are continuously and dynamically up-tiered to the DataPacs' Flash storage, where those data blocks remain for as long as they are "hot." Every five seconds, the CADP engine determines

- which new blocks need to be promoted into Flash
- when the Flash space is at full capacity
- which Flash-resident blocks have cooled and can therefore be returned to HDD storage

CADP not only enables acceleration of data movement to Flash but also provides an even access pattern on the HDD, which in turn provides faster seek operations as there is less time spent on hotspots.

Media Affinity provides the administrator the ability to create volumes for specific purposes where all Flash or all HDD solutions may be preferred by an organization. For example, all Flash solutions are frequently leveraged for VDI environments. In linked clone VMware Horizon View deployments, VMware recommends pinning replica disks to Flash. This is a supported configuration proven to improve performance with specific administrative tasks that generate high read I/O, like refresh, recompose, boot storms, and AV scans.

When all Flash Media Affinity is set up in an environment, objects pinned to the Flash will not use CADP. In the VMware Horizon View example above, the replica disks are pinned to Flash. The linked clones are set up on the default volume configuration, leveraging both Flash and HDD and having the workload managed by CADP. In a configuration like this, the replicas are guaranteed the resources needed for the high read I/O. At the same time, CADP is leveraged to manage the day-to-day activity on the linked clones, providing the best possible performance for the virtual desktops on the array.

Prerequisites

The following are prerequisites for leveraging the new Media Affinity features:

1. ISE Manager Suite 4.0.4.x.
2. ISE 2.8.x firmware and G3 product firmware 3.1.

Create and present an All-Fash volume from ISE Manager Suite 4.0.4.x and ISE Manager Suite 4.1.

In ISE Manager Suite, navigate to the SAN group where the ISE array is located and click Storage Views. This set of instructions is used to create a Flash Media Affinity volume that will be used for VMware Horizon View replica disks. You never have to go to the command line or the VMware Virtual Center client. ISE Manager Suite is highly integrated with the VMware Ecosystem. The process from beginning to end is completed with just two wizards in ISE Manager Suite.

These steps are to define the amount of flash to use, create the volume, and create the Datastore.

1. Modify the Flash Quota. By default the Flash Quota is 0 GB and 100% is allocated for CADP. The Flash Quota is modified in GB. Three values will be presented in the *Modify Pool* screen.
2. To access this screen, navigate to *Storage View*, right-click **Storage Pool**, and select **Edit Pool**.

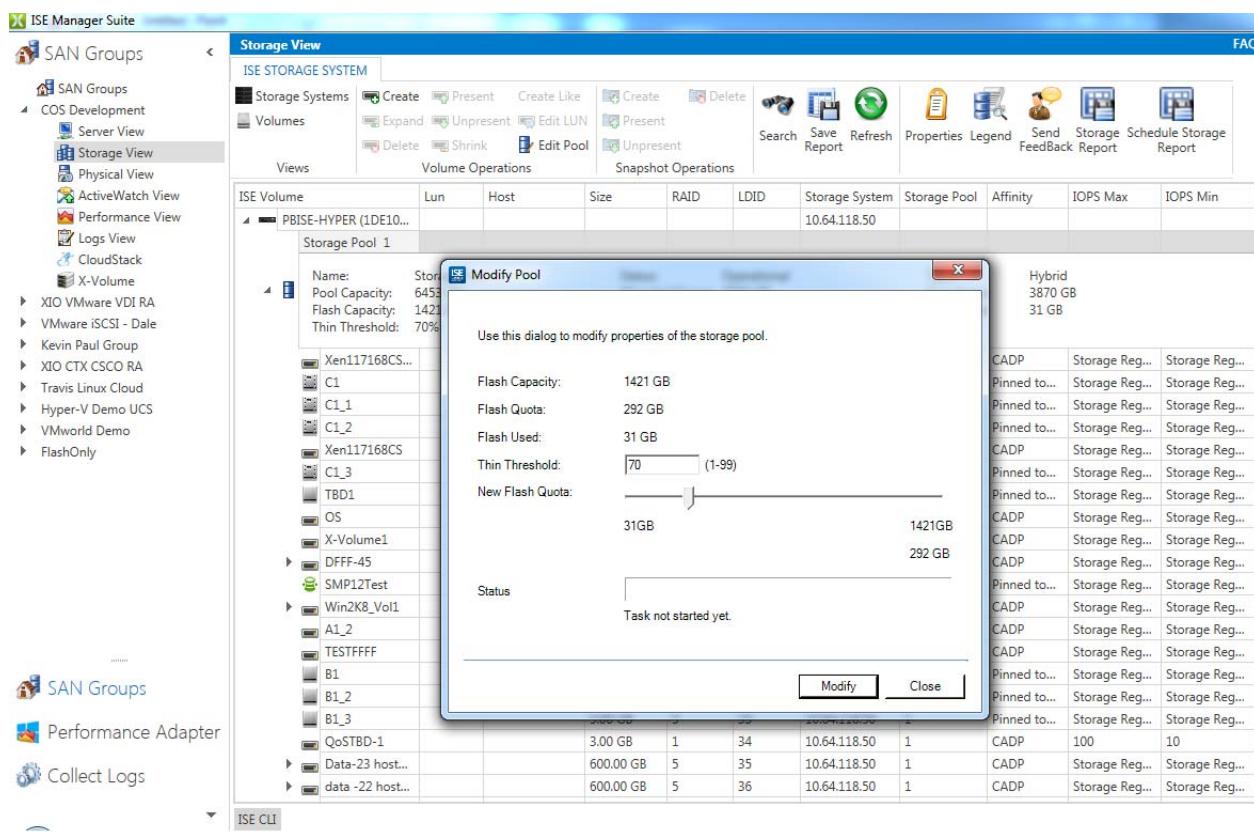


Figure 108. Modify Pool

Flash Capacity: This is the total Flash in the storage pool.

Flash Quota: This is the existing Flash Quota that can be pinned in GB. The default is 0.

Flash Used: This is the amount of the Flash Quota consumed.

New Flash Quota: This sets the Flash Quota. In the figure above, the new Flash Quota extends the existing quota by 300 GB.

- To make the change, click **Modify**.

Note. If CADP is using 100% of the Flash Capacity and you need to set the Flash Quota, “hot data” residing on Flash will be downgraded to HDD by CADP when the quota is reserved. Before the new Flash Quota is available for use, CADP must complete the downgrade. The amount of time it takes to become available depends on the size of the new quota and the system load.

- Create the Datastore.
- Navigate to **Server View** and select **VMware Ecosystem**.
- Right-click on the cluster where you want to see the new Datastore created and select **Create Datastore**.
 - In the *Create Datastore* wizard that launches, click **Next**.
 - In the *Formatting Options* screen, select the correct format for your environment. In this case, we are selecting VMFS 5.
 - Click **Next**.
 - In the *Choose Properties for the Datastore* screen, complete the following fields.
 - Datastore Name:** In this case we are naming it **Replica Datastore**.
 - Datastore Size:** This is the size of the Datastore as you want it presented to ESXi. In this example, the

Flash Quota was set to 300 GB. The actual free space for the Flash Datastore is 300 GB, less the amount consumed on Flash and less the RAID level. In this case we will have RAID 5. On Flash, 12 GB is currently consumed, which results in 229 GB free space for Media Affinity. We will set the Datastore size to 200 GB.

- Select ISE: From the drop-down menu, select **Manual** and click **Browse**. In the popup screen, the Flash pool shows the quota that was set, used space, and free space. Highlight (by clicking) the Flash pool and then click **OK**.
- DataPac Type: Select any.
- RAID level: From the drop-down list, RAID 1 and RAID 5 are available. RAID 1 will provide the best performance, though internal tests at X-IO found RAID 5 was not far off from the RAID 1 performance rating.
- Affinity: Select Pinned to Flash
- Multipath Policy: Select Round Robin

e. Click **Next**.

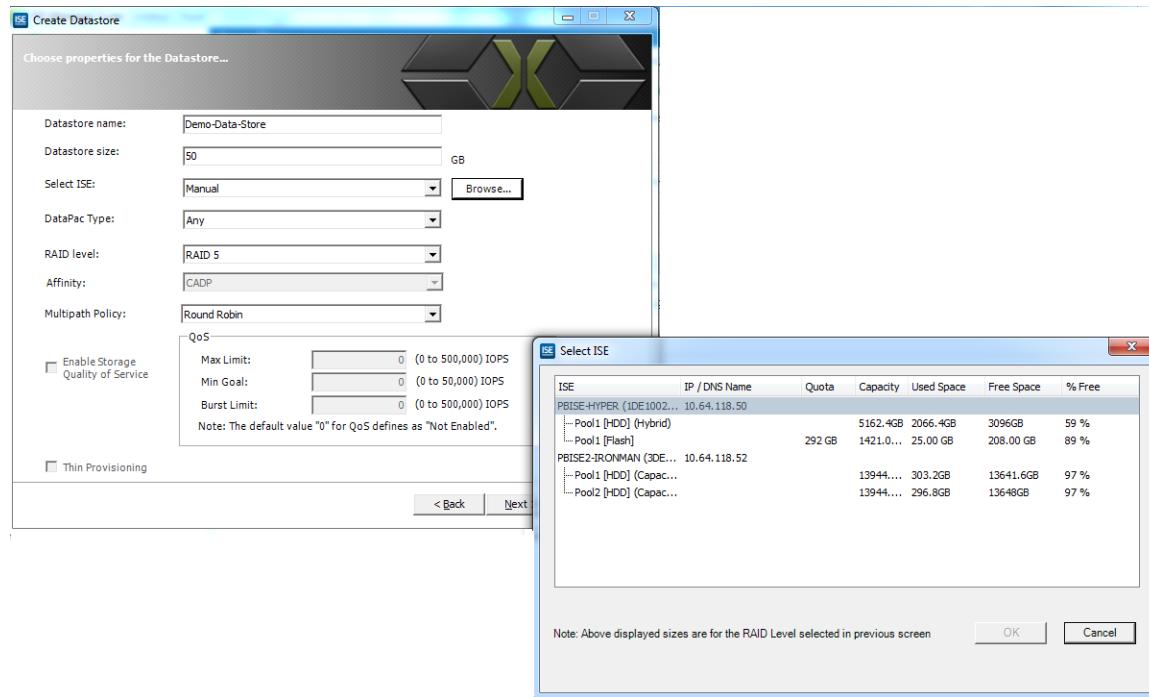


Figure 109. Choose properties for ISE Datastore

In the *Choose Host Initiators* screen, all of the ESXi hosts in the cluster are selected by default. You can either use the LUN number that is listed or choose one that fits your configuration.

f. Select a LUN number and click **Next**.

The *Summary* screen confirms the properties of the new Datastore.

g. Click **Next**.

As the Create Datastore process proceeds, you will be able to see the activity in the Recent Tasks pane of the Virtual Center Client.

1. After the new Datastore is created, refresh the view in ISE Manager Suite in the *VMware Ecosystem* screen to see the Datastore in the list of that cluster.
2. In Storage View, click the properties of the new Datastore to view the Affinity setting in the right side of the screen.

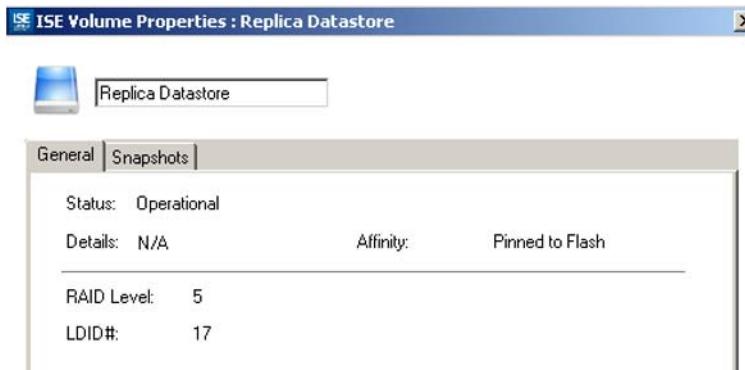


Figure 110. Replica Datastore

You will see that the new Datastore is ready to use.

1. Open the VMware Virtual Center Client and then navigate to **Home / Inventory / Datastores and Clusters**.
2. Click on the Datastore and then select the Hosts tab.
3. All of the hosts selected in the *Choose Host Initiators* screen have visibility to the new Datastore as it was created in ISE Manager Suite.

The Datastore is now ready to be used for replica disks in VMware Horizon View.

Physical View

This section introduces the ISE Manager Suite ISE Physical View and explains its operations in detail. The Physical View provides an overall view of the selected ISE Storage System properties and status.

ISE Properties and Status

To view the detailed status of an ISE Storage System and its components, select the ISE from the top horizontal navigation bar. The following screen shows the status of an ISE and its individual components.

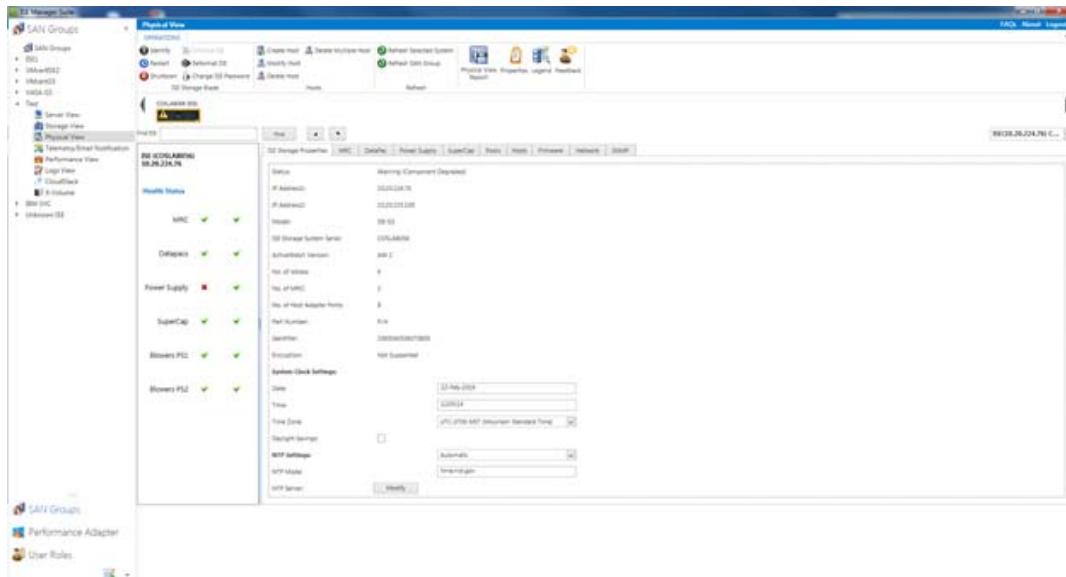


Figure 111. Physical View—ISE Storage Properties

The ISE health status graphically represents the operational states of all the components. The component states are accessed through the following tabs:

- ISE Properties
- MRC
- DataPac
- Power Supply
- Supercapacitor
- Storage Pools
- Hosts
- Firmware
- Network
- SNMP
- Data Networks (iSCSI)

The following figures focus on the ISE Physical View tabs.

ISE Properties

Under the **ISE Storage Properties** tab (default), the System Clock and NTP (limited to the iSCSI ISE) settings can be modified by making the desired changes and clicking **Modify**.

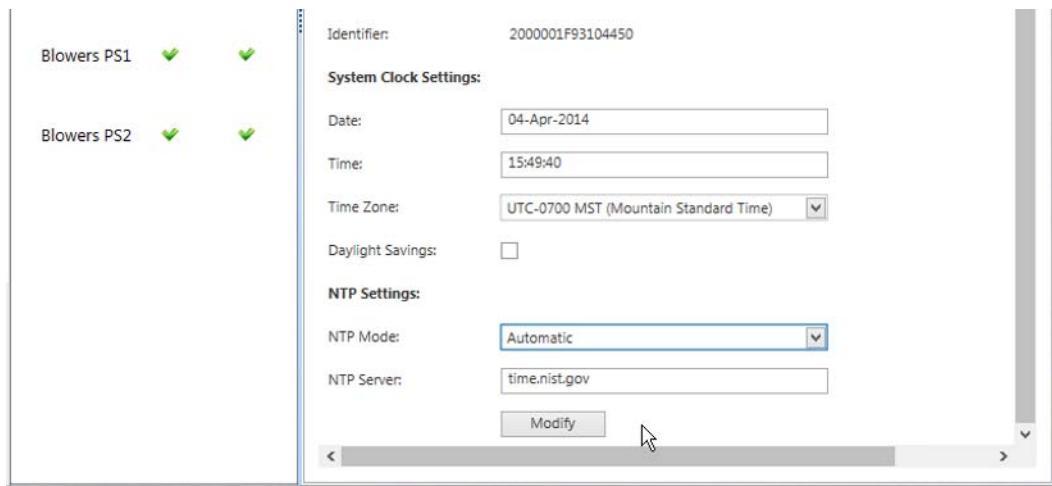


Figure 112. Physical View—ISE Storage Properties, Modify

Note. Modification of the NTP settings is available only on the iSCSI ISE Storage System.

MRC Properties

Under the **MRC** tab (Managed Reliability Controller) the MRC properties and the SFP Status are available. The actions available on this page are:

- Remove and replace an MRC
- Set global data port speed (Fibre Channel only)
- Modify individual data port speed (Fibre Channel only)

Fibre Channel Data Ports

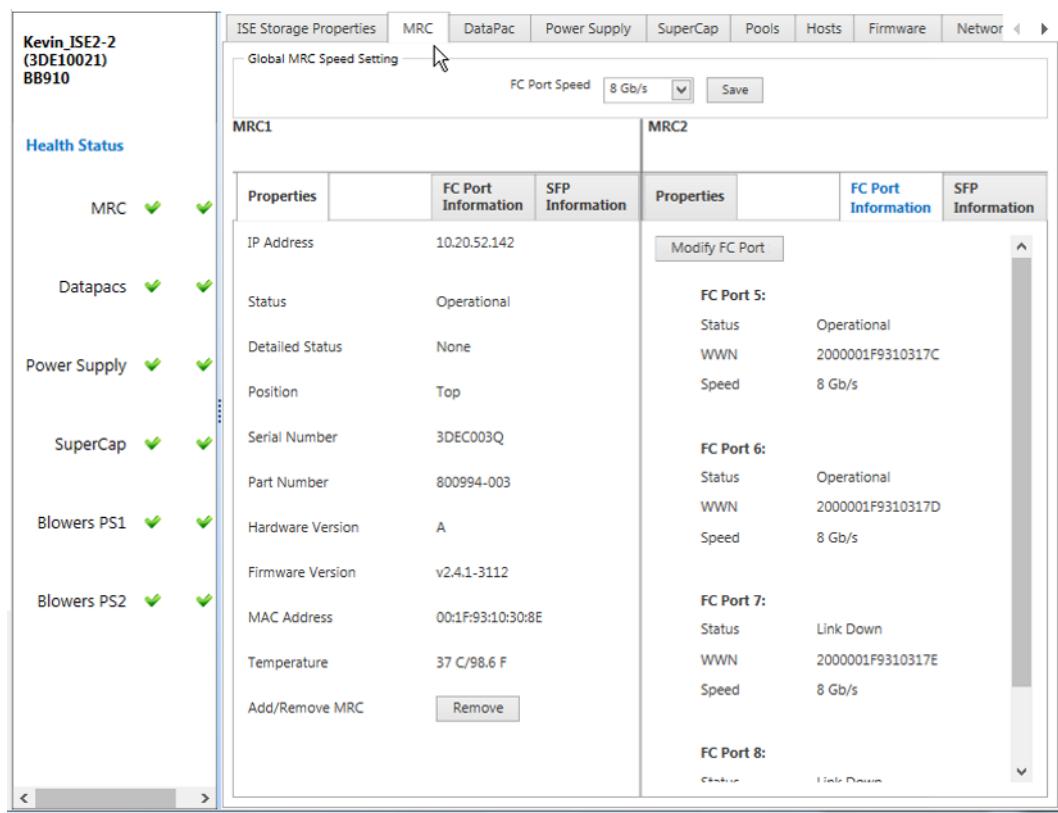


Figure 113. Physical View—Fibre Channel System MRC Properties

Note. When changing the global Fibre Channel data port speed, the change is applied to all ports when **Save** is clicked.

4. Click **Modify FC Port** to change individual port speeds.

Note. This features is available only with ISE-2.

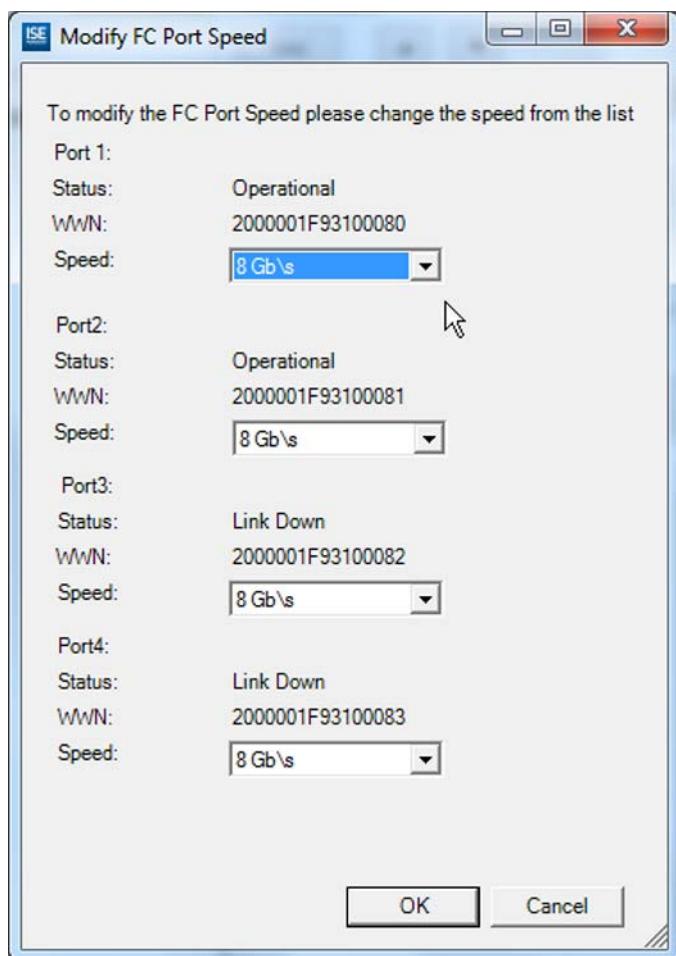


Figure 114. Modify Individual Port Speeds

iSCSI Data Ports

The iSCSI MRC view provides the Data Ports' status along with the ability to remove MRCs.

Health Status		MRC1	MRC2
MRC	✓	✓	
Datapacs	✓	✓	
Power Supply	✓	✓	
SuperCap	✓	✓	
Blowers PS1	✓	✓	
Blowers PS2	✓	✓	

Properties		IO Port Information	
IO Port		ID:	1
		DHCP:	disabled
		Protocol:	ipv4
		Addresses:	192.168.1.1
		IP Mask	255.255.255.0
		Gateway:	0.0.0.0
		MTU:	Standard 40Gbps
		Speed:	40Gbps
		Link Status:	Connected
		IO Network ID:	A
		IQN Name:	iqn.200-4-11.co
IO Port			

Properties		IO Port Information	
IO Port		ID:	4
		DHCP:	disabled
		Protocol:	ipv4
		Addresses:	192.168.2.2
		IP Mask	255.255.255.0
		Gateway:	0.0.0.0
		MTU:	Standard 40Gbps
		Speed:	40Gbps
		Link Status:	Connected
		IO Network ID:	B
		IQN Name:	iqn.200-4-11.co
IO Port			

Figure 115. Physical View—iSCSI ISE System MRC Properties

Removing an MRC

Physical removal of an MRC must be preceded by clicking **Remove** to halt all MRC activity. The system prevents execution of a Remove MRC while an Add, Remove, or Firmware Upgrade is in progress. To force an MRC into a quiescent state and prepare it for physical removal from the system in this manner, follow these steps:

1. Under a SAN group, select **Physical View**.
2. Select the ISE by *ise_name*.
3. Click the **MRC** tab.
4. Click **Remove**.

When the MRC is ready for removal, the Remove MRC view appears with a status of **Offline: Ready to Extract** for this MRC, indicating that it is now ready to be physically removed from the chassis.

Note. X-IO Customer Support should be contacted for assistance in replacing MRCs.

DataPac Properties

The DataPac properties are viewable under the **DataPac** tab. While the **Remove** button is provided, X-IO Customer Support should be contacted for assistance with replacing a DataPac.

Kevin_ISE2-2 (3DE10021) BB910		ISE Storage Properties		MRC	DataPac	Power Supply	SuperCap	Pools	Hosts	Firmware	Network
		Datapac1				Datapac2					
Health Status		Status	Operational		Status	Operational					
MRC	✓ ✓	Detailed Status	None		Detailed Status	None					
		Health	90 %		Health	90 %					
Datapacs	✓ ✓	Position	Left		Position	Right					
		Serial Number	1DED01HY		Serial Number	3DED004P					
Power Supply	✓ ✓	Model	DP900SH21-2001		Model	DP900SH21-2001					
		Part Number	801119-000		Part Number	801119-000					
SuperCap	✓ ✓	Firmware Version	100		Firmware Version	100					
		Type	Hyper		Type	Hyper					
Blowers PS1	✓ ✓	Pool Id	1		Pool Id	2					
		Spare Level	20		Spare Level	20					
Blowers PS2	✓ ✓	Temperature	33C		Temperature	35C					
		Mfg. Date	Wed Jun 8 07:00:00 2011		Mfg. Date	Sat Jul 30 07:00:00 2011					
		Add/Remove DataPac			Remove						

Figure 116. Physical View—DataPac Properties

Power Supply Properties

The Power Supply tab presents the power supply properties and there are no action options on this page.

Kevin_ISE2-2 (3DE10021) BB910		Power Supply			
		Power Supply1		Power Supply2	
Health Status		Status		Status	
MRC		Operational		Operational	
Datapacs		Position		Position	
Power Supply		Right		Left	
Battery		Serial Number		Serial Number	
Blowers PS1		3DEP0284		3DEP0264	
Blowers PS2		Model		PSModel	
Power Supply		Part Number		801111-000	
Battery		Blower1		Blower1	
Blowers PS1		Status		Status	
Blowers PS2		Operational		Operational	
Power Supply		Speed		Speed	
Battery		0 (4860 RPM)		0 (4920 RPM)	
Blowers PS1		Blower2		Blower2	
Blowers PS2		Status		Status	
Power Supply		Operational		Operational	
Battery		Speed		Speed	
Blowers PS1		0 (4800 RPM)		0 (5040 RPM)	
Blowers PS2		Mfg. Date		Mfg. Date	
Power Supply		Thu Aug 25 07:00:00 2011		Thu Aug 25 07:00:00 2011	
Battery		Temperature		Temperature	
Blowers PS1		30 C/86 F		31 C/87.8 F	
Blowers PS2					

Figure 117. Physical View—Power Supply Properties

Supercapacitor/Battery Properties

The SuperCap tab presents the supercapacitor properties with the **UPS Mode**, which can be enabled and disabled.

Kevin_ISE2-2 (3DE10021) BB910		SuperCap			
		SuperCap1		SuperCap2	
Health Status		UPS Mode:		Enable	
MRC		Status		Status	
Datapacs		Position		Position	
Power Supply		Bottom		Top	
Battery		Serial Number		Serial Number	
Blowers PS1		3DES004Q		3DES003B	
Blowers PS2		Part Number		801001-000	
Power Supply		801001-000		801001-000	
Battery		Model		SCAPTEC-400-8	
Blowers PS1		SCAPTEC-400-8		SCAPTEC-400-8	
Blowers PS2		Hardware Version		A	
Power Supply		E		A	
Battery		Type		Super Capacitor	
Blowers PS1		Super Capacitor		Super Capacitor	
Blowers PS2		Voltage		10207 mV	
Power Supply		10397 mV		10207 mV	
Battery		Temperature		Temperature	
Blowers PS1		25 celsius		25 celsius	
Blowers PS2					

Figure 118. Physical View—Supercapacitor Properties

The Battery tab presents properties with the **UPS Mode**, which can be enabled and disabled, and an indicator of the battery's charge level.

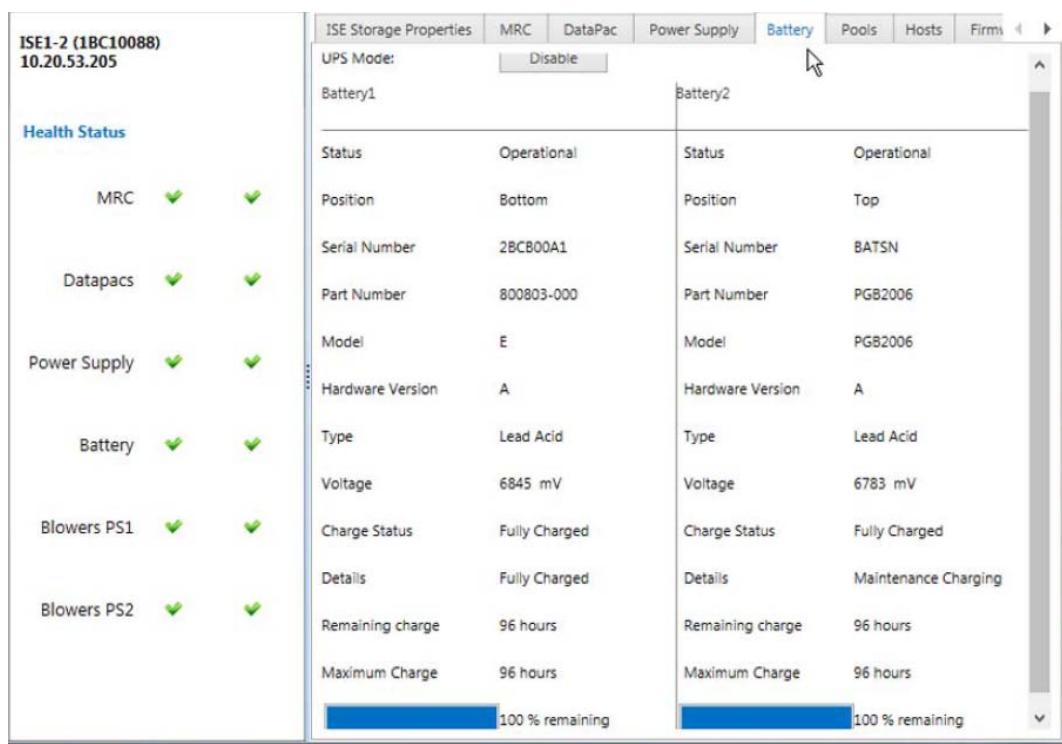


Figure 119. Physical View—Battery Properties

Storage Pool Properties

The **Storage Pools** tab presents the storage pool properties and there are no action options on this page.

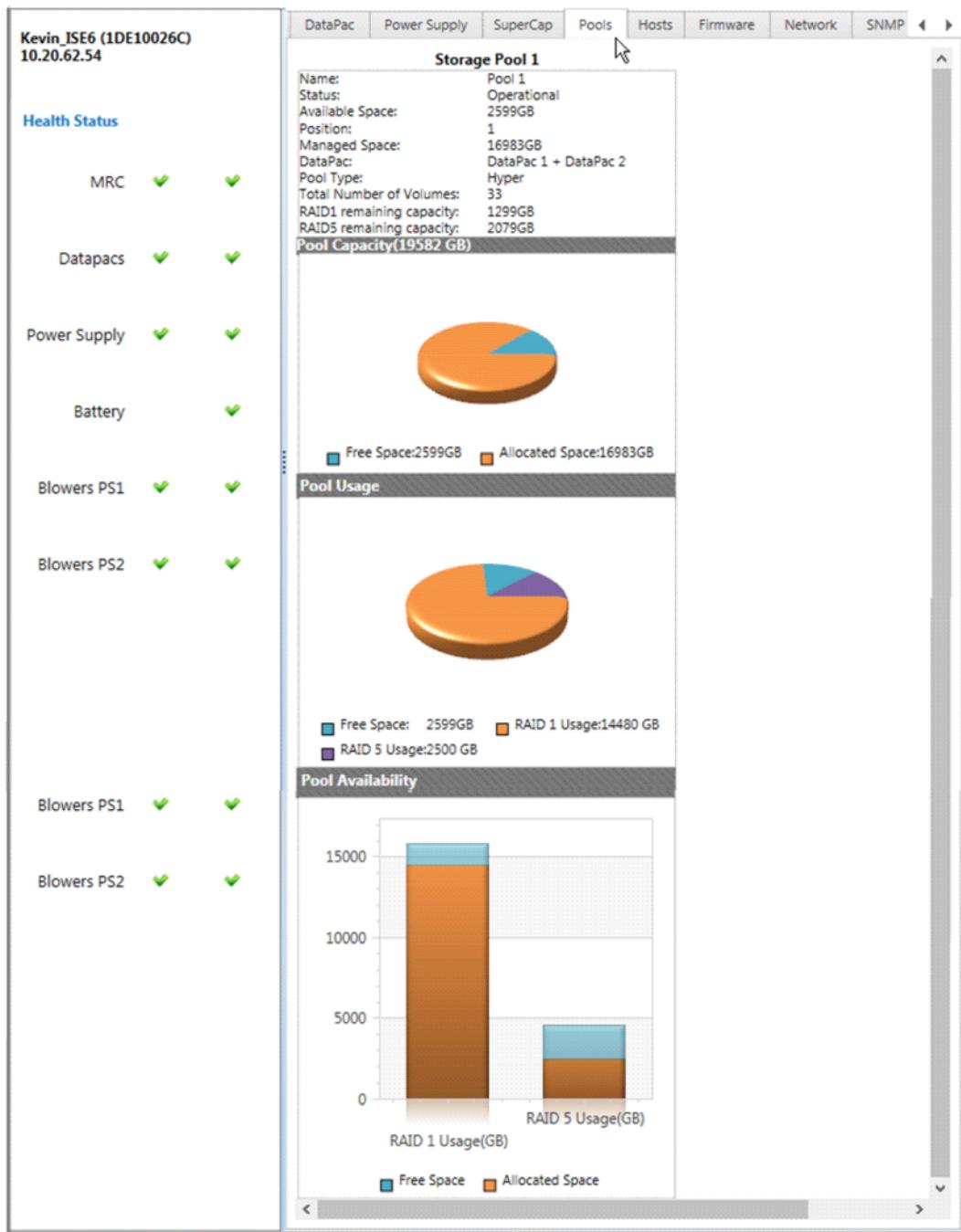


Figure 120. Physical View—Storage Pools Properties

Host Properties

The **Hosts** tab presents all hosts and their properties. Each host entry and volume entry is an active element. By right-clicking on an entry, a number of options are presented in a pop-up.

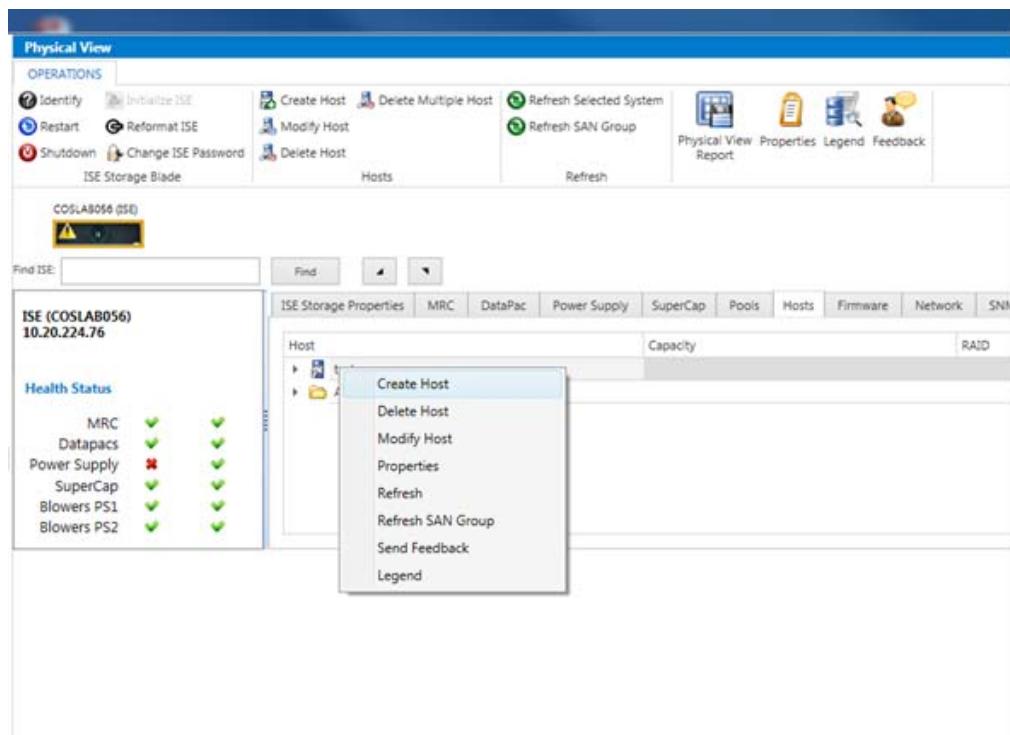


Figure 121. Physical View—Host Properties

Firmware Properties

The **Firmware** tab for current ISE Storage Systems shows the details of the installed ISE Storage System firmware. From this screen the ISE firmware can be upgraded.

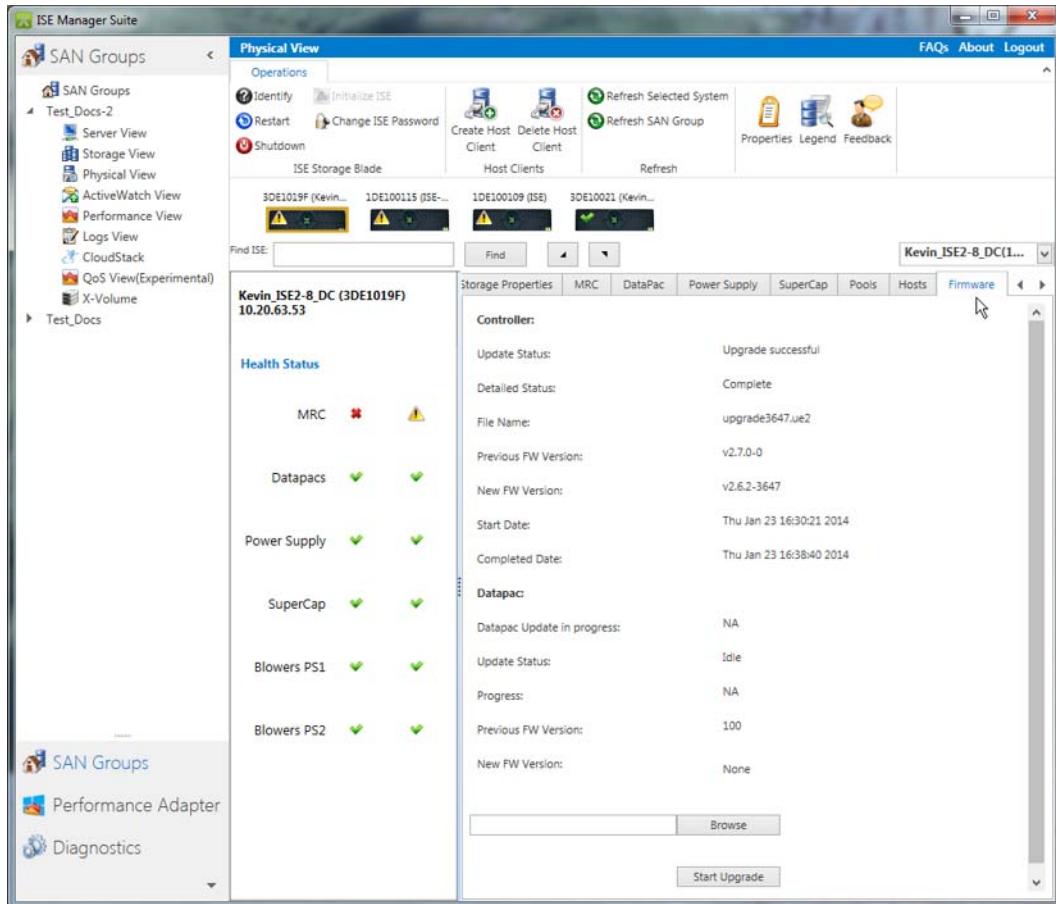


Figure 122. Physical View—Firmware Properties

To upgrade the ISE Storage System:

1. Browse to the upgrade file that was downloaded from the Matrix.
2. Select the upgrade file.
3. Click **Start Upgrade**.

The upgrade process starts.

Firmware Properties—Legacy ISE Storage Systems

The **Firmware** tab for a legacy ISE shows the details of the installed ISE Storage System firmware. ISE firmware upgrade is not available.

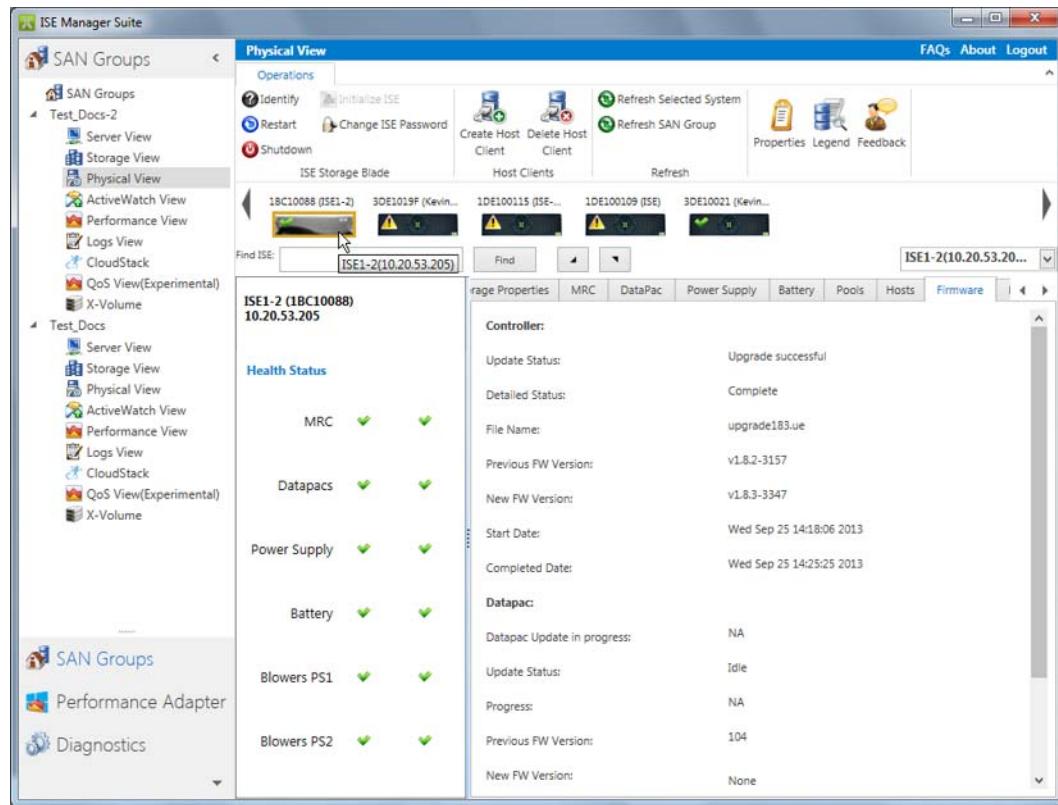


Figure 123. Physical View—Firmware Properties (Legacy)

Network Properties

The **Network** tab presents all management network settings and permits the modification of the DNS, DHCP, and Wake-On-LAN settings.

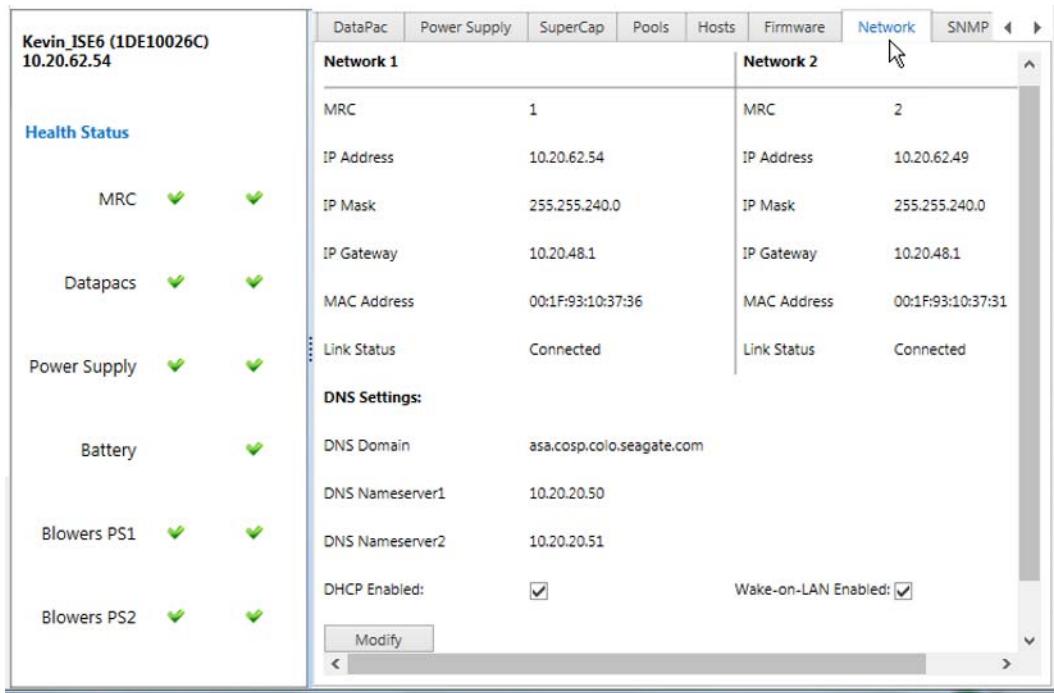


Figure 124. Physical View—Network Properties

Data Networks Properties (iSCSI)

The **Data Networks** properties tab presents the iSCSI Data network settings and permits the modification of the following Data Port settings:

- A IP Addresses
- B IP Addresses
- A Enable DHCP
- CHAP
- A IP Masks
- B IP Masks
- B Enable DHCP
- Jumbo Frames

Note. Jumbo Frames: X-IO recommends selecting 9000 MTU for each Data Network to be configured on the iSCSI ISE. Refer to Figure 125 below.

Caution: Switch settings must also be configured to support Jumbo Frames when the iSCSI ISE is configured to 9000 MTU. Refer to the switch vendor support documentation for details on configuring Jumbo Frames.

Note. Additional recommendations for settings are referenced in the *X-IO iSCSI ISE Best Practices* doc-

ument.

The screenshot shows the ISE Manager Suite Physical View interface. The left sidebar contains navigation links for SAN Groups, COS Development, Server View, Storage View, Physical View, Telemetry/Email Notification, Performance View, Logs View, CloudStack, X-Volume, and various XIO and Travis Linux Cloud entries. The main area is titled "Physical View" and includes sections for "OPERATIONS" (Identity, Restart, Shutdown) and "Hosts" (Create Host, Modify Host, Delete Host). A "Refresh" button and "Properties", "Legend", and "Feedback" links are also present. The "Hosts" section displays two hosts: "1DE100103 (ISE)" and "10.64.118.54". Below these are tabs for "ISE Storage Properties", "MRC", "DataPac", "Power Supply", "SuperCap", "Pools", "Hosts", and "Firmware".

Host 1DE100103 (ISE) 10.64.118.54:

- Health Status:** MRC (green), Datapacs (green), Power Supply (green), SuperCap (red), Blowers PS1 (green).
- Target IQNs:**
 - iqn.2004-11.com.x-iode1e100103-t1
 - iqn.2004-11.com.x-iode1e100103-t3
 - iqn.2004-11.com.x-iode1e100103-t2
 - iqn.2004-11.com.x-iode1e100103-t4
- iNS Name Server:** 0.0.0.0
- CHAP Settings:**
 - CHAP In:** User Name: [empty], Password: [empty]
 - CHAP Out:** User Name: [empty], Password: [empty]

Host 10.64.118.54:

- Health Status:** MRC (green), Datapacs (green), Power Supply (green), SuperCap (red), Blowers PS1 (green), Blowers PS2 (green).
- Data Network: A**
 - ID:** A
 - DHCP:** [checkbox]
 - Protocol:** ipv4
 - IP Address1:** 192.168.70.192
 - IP Address2:** 192.168.70.194
 - IP Mask:** 255.255.255.0
 - MTU:** Standard (1500)
 - Data Port:** 1
 - Speed:** 1Gbps
 - Data Ports:** Data Port: 3, Speed: 1Gbps
- Data Network: B**
 - ID:** B
 - DHCP:** [checkbox]
 - Protocol:** ipv4
 - IP Address1:** 172.16.10.192
 - IP Address2:** 172.16.10.194

Figure 125. Physical View—Data Network Properties

SNMP Properties

The **SNMP** tab presents current SNMP settings and permits the modification of these settings.

SNMP Contact Information

Community	public
Contact	Xiotech Colorado Springs, CO
Organization	Xiotech Corporation
Description	Xiotech iSCSI Intelligent Storage Element
OID Name	1.3.6.1.4.1.xiotech.xiotechAdvStorArch.iseProducts.iseStorage3
OID Number	ise.org.dod.internet.private.enterprise.2366.6.1.3

MIB Files
Click below link to download
[Download MIB File](#)

Event Subscriptions
Select events that you would like to forward to your SNMP client Application

Available Subscriptions	Selected Subscriptions
Host Attribute Changed	Snapshot Volume Deleted
Host Object Create Complete	The ISE has rebooted after an MRC was Add
Host Object Delete Complete	User Logged In
Power Supply Error Detected	SNMP Configuration Changed
FRU has returned to healthy state	MRC Firmware Upgrade Started
Host FibreChannel Interface experienced/cleared	MRC Firmware Upgrade Complete
MRC Redundancy Lost - an MRC is unavailable	Active Watch General Telemetry Started
MRC Redundancy Restored - an MRC has been i	Active Watch General Update Sent
DataPac handle is not secure	Active Watch Subscription Added
Volume Prepared for a Snapshot	Active Watch Subscription Modified
Snapshot Volume Created	Active Watch Subscription Deleted
Volume size has changed	DataPac health is reduced due to a drive red

SNMP Trap Destination Setup
Enter new address or edit/delete existing addresses

Enter Address	Add
Address List	10.20.24.77

Figure 126. Physical View—SNMP Properties

Identify

The **Identify** option is used to identify an ISE Storage System. When an ISE Storage System is selected for identification, the LEDs on the corresponding ISE begin blinking and continue until un-checked.

To identify an ISE:

1. Click on an ISE Storage System in the **Physical View**.
2. Click **Identify**.

The *Identify ISE Storage* dialog appears as shown below.

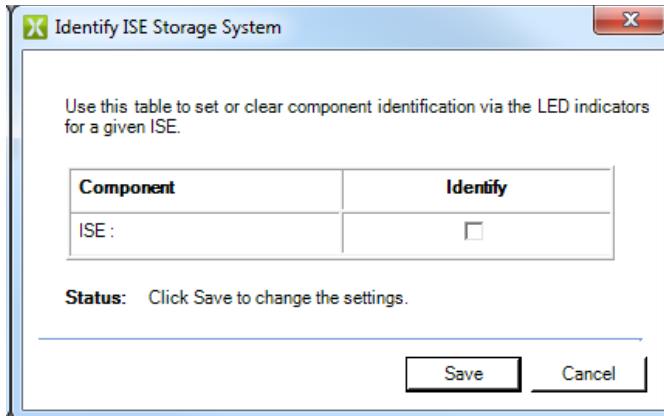


Figure 127. Identify ISE (Current)

3. Click the check box.
4. Click **Save** and a confirmation dialog appears.
5. Click **OK** and the action is executed.

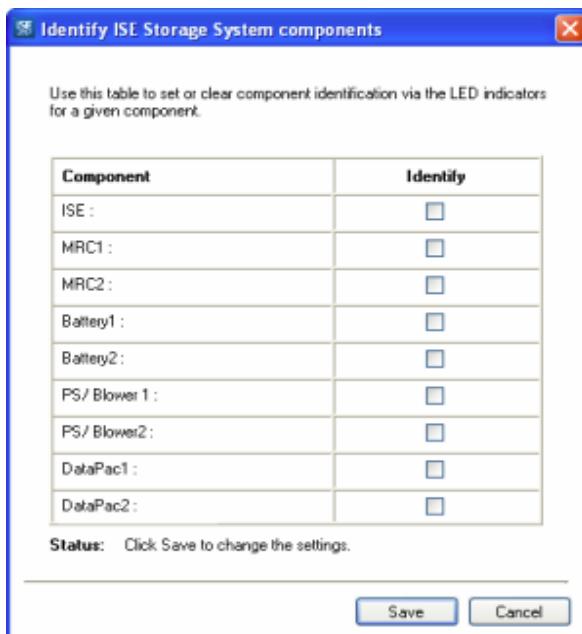


Figure 128. Identify ISE (Legacy)

Initialize ISE Storage System

On ISE Storage Systems that are not initialized, the **Initialize ISE** option (greyed-out here) is active and must be executed to initialize and format the ISE and its DataPacs before the ISE can be configured and used.

Reboot ISE Storage System

To reboot an ISE Storage System:

1. Select the ISE from the top horizontal navigation bar.

2. Right-click and select **ISE Storage System**.
3. Click **Reboot**.
The **Reboot ISE Storage System** pop-up appears.
4. Click **OK**.
A confirmation dialog appears.
5. Confirm by clicking **Yes**.

Note. After performing a reboot operation, click **Reconnect** in the **ISE Properties** tab to reload the ISE Storage System information.

Change ISE Password

The change ISE Password option is used to change the Administrator password.

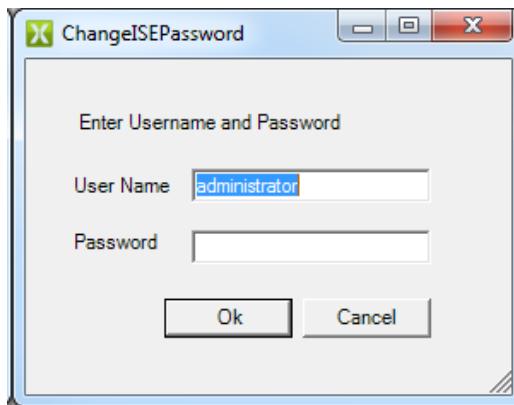


Figure 129. Change ISE Administrator Password

Shut Down ISE Storage System

To shut down an ISE Storage System:

1. Select the ISE from the top horizontal navigation bar.
2. Right-click and select **ISE Storage System**.
3. Click **Shutdown**.

The **Shutdown ISE Storage System** pop-up appears.

4. Click **OK**.
- A confirmation dialog appears.

5. Confirm the shutdown by clicking **Yes**.

The selected ISE Storage System disappears from the ISE Storage System.

Enable Data Encryption

Refer to the *ISE User Guide* for detailed information about data encryption.

To enable data encryption on supported DataPacs:

1. Click the **Enable/Disable ISE Encryption** button in the Operations banner.

Note. By default, Encryption status is disabled.

2. On the */SEEncryptionOperation* dialog, type a Passkey, confirm the Passkey, and then click **Enable** to enable data encryption.

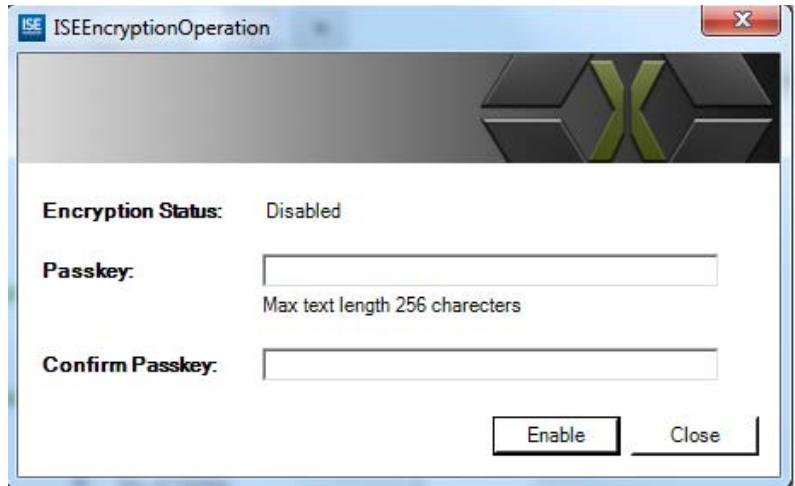


Figure 130. ISEncryptionOperation

A pop-up appears.

3. Click **Yes** on this pop-up to complete the enabling of data encryption.

The user is responsible for retaining the encryption passkey. This cannot be retrieved or reset by X-IO. Click the agreement below to continue.

WARNING: If the passkey is lost, the data **CANNOT** be retrieved.

Disable Encryption

Follow the steps below to disable encryption.

To enable data encryption on supported DataPacs:

1. Click the **Enable/Disable ISE Encryption** button in the Operations banner.

Note. By default, Encryption status is enabled

2. On the */SEEncryptionOperation* dialog, type the Passkey provided when encryption was enabled, and then click **Disable**.

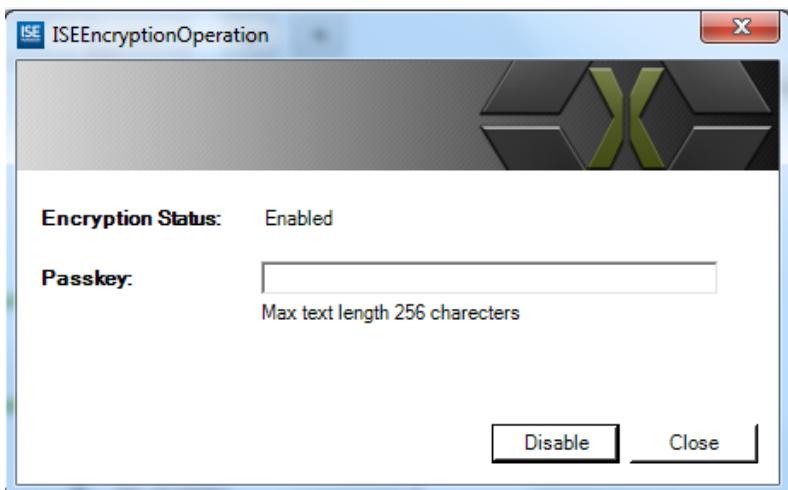


Figure 131. Disabled

3. Click **OK** on the Modify ISE Encryption dialog to confirm disabling of data encryption.

Change Encryption Passkey

Note. Data encryption must be enabled in order to change the passkey.

Note. Both MRCs must be operational to change the encryption passkey.

Follow the steps below to change the encryption passkey.

1. Click **Change Encryption Passkey** in the Operations banner.
2. In the *Change Encryption Passkey* dialog, type the Old Passkey.



Figure 132. Change Encryption Passkey

3. Type the New Passkey.
4. Confirm the new Passkey.
5. Click **Change Passkey**.
6. Click **OK** on the Change Encryption ISE Passkey pop-up that appears.

WARNING: The user is responsible for retaining the new passkey. This **CANNOT** be retrieved by X-IO.

Unlock Encryption ISE

If data encryption has been enabled by the user, and the ISE sustains a power loss or shutdown, the user is required to enter the passkey after the ISE has powered back up. User operations will be rejected until the passkey has been entered. Once the passkey has been entered, the ISE will complete the power-up process.

Note. When locked, ISE DataPacs appear failed and uninitialized in the dashboard and physical view. This is because the power-up process is not complete until the DataPacs are unlocked.

Follow the steps below to unlock an encryption ISE.

1. Click **Unlock Encryption ISE** in the Operations banner.



Figure 133. UnlockEncryptionISE

2. Type the Passkey.
3. Click **Unlock Encryption ISE**.
4. Click **OK** on the *Unlock Encryption ISE* pop-up.
5. Click **Refresh Selected System** to update the ISE health status.

Add, Modify, and Remove Host Clients

This section describes how to add, modify, and remove host clients.

Add Host Client

The **Add Host Client** option is used to create hosts for each World Wide Name (WWN) associated with an ISE Storage System. Hosts must be created to permit the mapping of servers in Server View. When creating hosts, do not include colons (:) in a WWN. Ensure that the WWN is valid, because **Create Host Client** does not verify WWNs.

This option is used to add host clients for both World Wide Names (WWN) in the ISE Storage System. After adding a host client, the host client appears under the **Un-mapped Initiators**, making the client available for mapping in Server View. While adding hosts, do not include colons (:) in WWNs.

Note. Ensure that the WWN entered is valid, because the Create Host Client function does not validate the WWN information.

To add a host client from **Physical View**:

1. Select an ISE from the **SAN System** drop-down list.

The *Create Host Client* dialog appears as shown below.

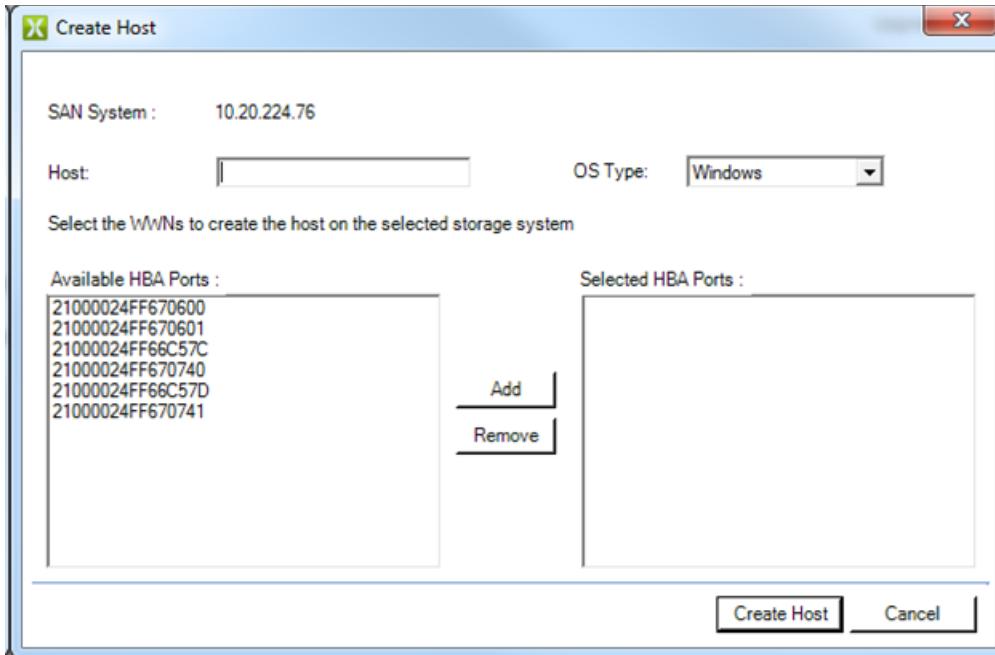


Figure 134. Create Host Client

2. Enter the name of the host in the **Host Name** field.
3. Select the OS type for the new host client.
4. Select the WWNs to be added for the new host client.
5. Click **Add**.
6. When all WWNs for the specified host are added, click **Create Host**.

Modify Host Client

The **Modify Host Client** option is used to edit the name and OS type and add or remove World Wide Name (WWN) from the host.

To modify a host client from **Physical View**:

1. Select an ISE from the **SAN System** drop-down list, and then navigate to the hosts tab.
2. Select and edit the host properties, and add or remove World Wide Name (WWN).
3. Click **Modify Host**.

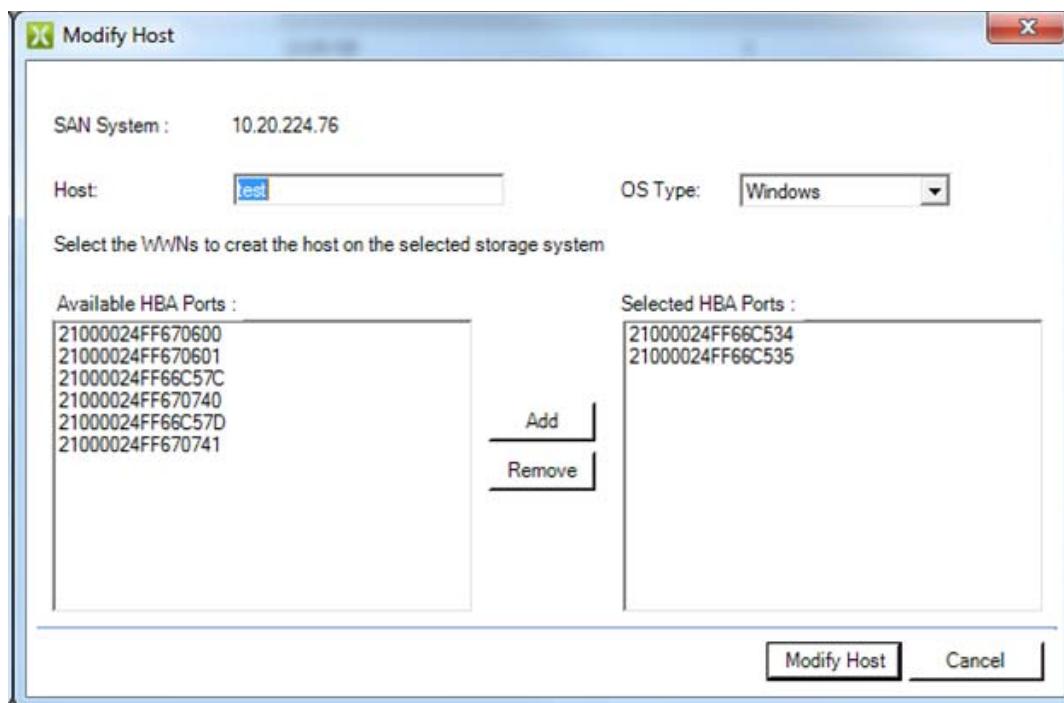


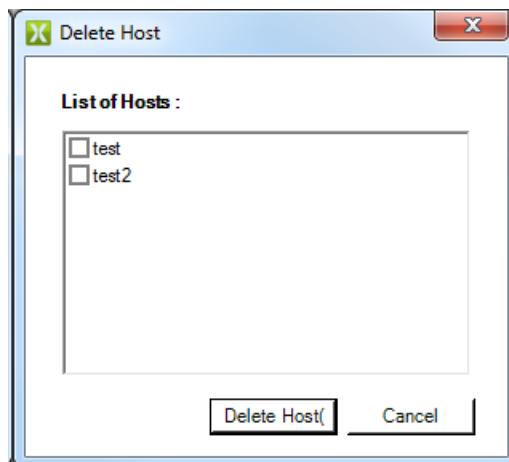
Figure 135. Modify Host Client

Remove Host Client

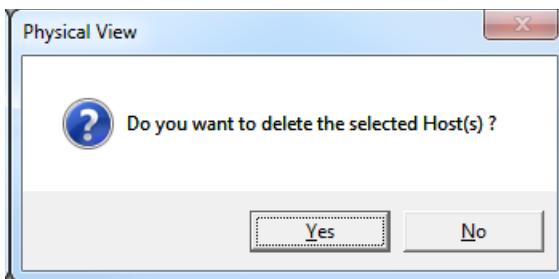
The **Remove Host Client** option is used to delete host clients from the SAN group.

To remove an existing host client:

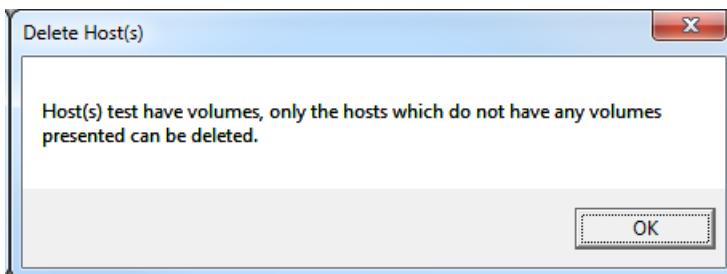
1. Navigate to the Physical view and select the Hosts tab.
2. Select an ISE.
3. Select the host to delete.



4. Click **Delete Host**.
5. Click **Yes** on the pop-up that appears.



If attempting to delete hosts with clients presented to them, the following pop-up appears.



6. Click **OK**.

Refresh Selected System

The **Refresh Selected System** option is used to retrieve updated information for the selected storage system.

To request updated information for any storage system:

1. Right-click a storage system.
2. Select **Refresh Selected System**.

Refresh SAN Group

The **Refresh SAN Group** option is used to retrieve updated information for all the storage systems in the group.

To request updated information for all storage systems:

1. Right-click a SAN group.
2. Click **Refresh SAN Group**.

Properties

Using the **Properties** action, some ISE Storage System properties are available to view and modify. These properties include ISE Name, Status, MRC IP addresses, Fibre Channel port speed, contact information, UPS mode, and Wake-On-LAN mode.

To view or modify properties:

1. Select the ISE Storage System from the top horizontal navigation bar.
2. Right-click and select **ISE Storage System**.
3. Click **Properties**.

The properties are displayed in a pop-up as shown below.

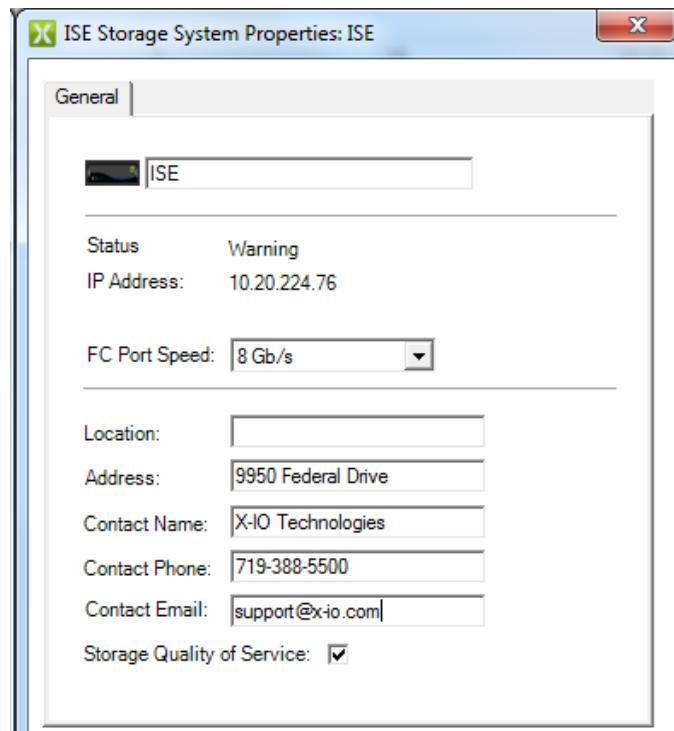


Figure 136. ISE Properties

Save Physical View Report

To save the Physical View Report:

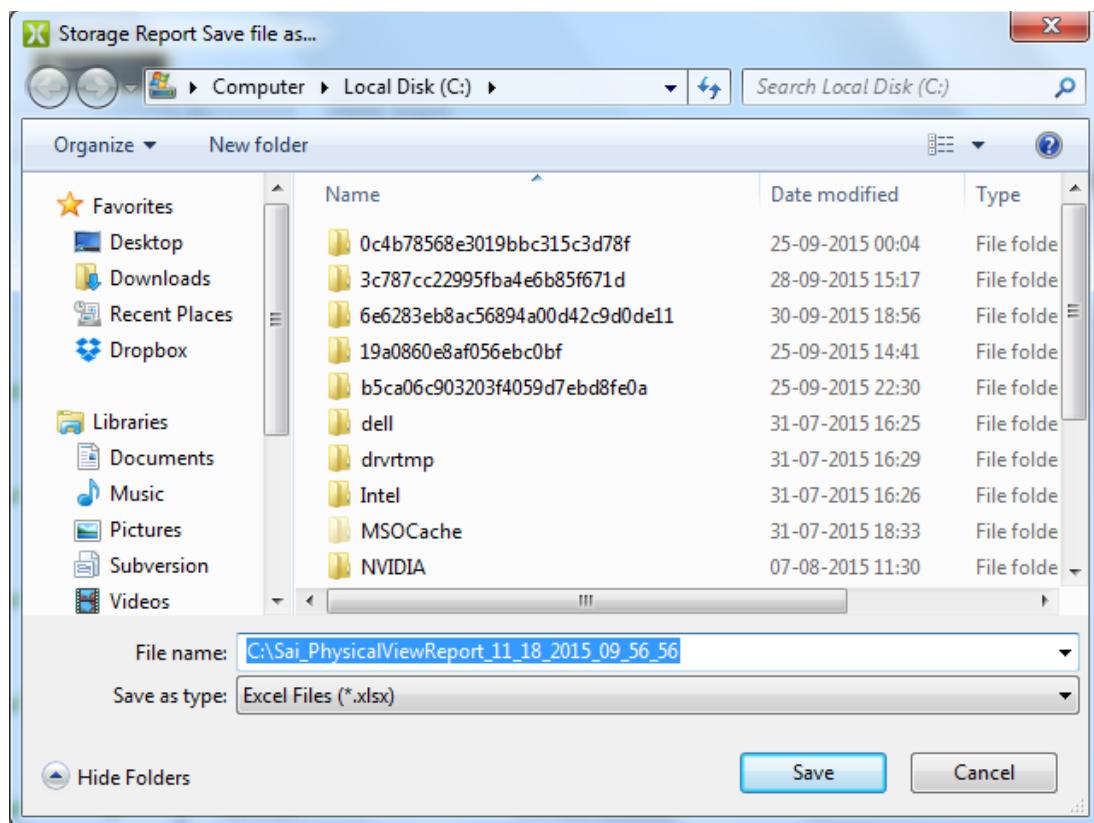


Figure 137. Storage Report Save file as...

Telemetry/E-mail Notification

This chapter introduces the ISE Manager Suite **Telemetry/Email Notification View** and explains ActiveWatch subscriptions in detail.

The optional ISE Analyzer Software Service executes on an appliance, providing a single point for viewing real-time status, configuration, and performance data from multiple ISEs. The ISE Analyzer Software Service consists of a dedicated server running a Web-based application that collects and displays the following types of data:

- General Updates: This data contains extensive information about the ISE, including the state of FRUs, performance data, volume status, and configuration.
- Telemetry data: This data contains SMART logs, CEL files, and system logs.
- Alerts: These are notifications of specific events site-selected to track and notify a monitoring destination.

The ISE Analyzer Software Service works in conjunction with ActiveWatch by monitoring ActiveWatch data in real time. ActiveWatch collects daily performance data that is automatically sent to X-IO Customer Support through secure web service calls and sends system alerts to X-IO Customer Support to expedite issue resolution.

Using the Telemetry Operations tab in Telemetry/Email Notification View, subscriptions can be configured for the ISE Storage System.

All storage systems that are added to the group are displayed in the top horizontal navigation bar. If an ISE is selected in the ActiveWatch main view, all the existing subscriptions are displayed.

ActiveWatch supports viewing, modifying existing subscriptions, and adding new subscriptions for ISE Storage Systems.

To view the existing subscriptions, select the storage system in the top horizontal navigation bar.

Subscription

The subscription option is used to identify the address of the **ISE Analyzer Software** service managed by X-IO Storage or the locally installed ISE Analyzer Software Service to receive **General Update** files, **Telemetry** files, and alerts.

ID	Subscription St...	SSL	Interval (minut...	Start Time (hh...	Last Sent	Proxy	Proxy Address	Proxy Username	Proxy Pass
10.64.118.60:8083	Enabled	Disabled	1440	1:5	Never Sent	disabled	notset	notset	notset
10.64.142.28:443	Enabled	Enabled	1440	1:5	Never Sent	disabled	notset	notset	notset

ID	Subscription St...	SSL	Interval (minut...	Start Time (hh...	Last S	Proxy	Proxy Address	Proxy Username	Proxy Pass
207.250.72.239:443	Disabled	Enabled	1440	1:5	Never Sent	disabled	notset	notset	notset

Figure 138. Telemetry/Email Notification View—Telemetry Operations

Storage-Specific Subscriptions

The following functions are common to ISE Storage Systems.

- **Add** subscription
- **Modify** subscription
- **Delete** subscription

Add Subscription

The **Add Subscription** function is used to add a subscription for **Alerts**, **General Updates**, and **Telemetry** for selected ISE Storage Systems.

To add a subscription:

1. Right-click a storage system.
2. Select **Add Subscription**.

The **Add Subscription** dialog appears as shown below.

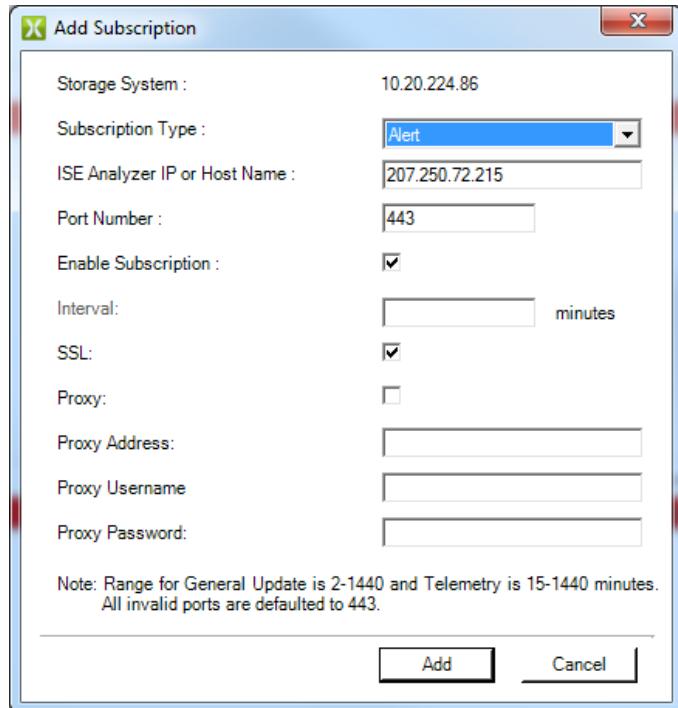


Figure 139. Telemetry/Email Notification View—Telemetry Operations Add Subscription

3. From the **Subscription Type** drop-down, select **Alerts**, **General Updates**, or **Telemetry**.
4. Enter the IP address or DNS name of the ISE Analyzer in the **ISE Analyzer IP/Host Name** box.
5. The default Port Number is 443. This is the port managed by the ISE Analyzer Software Service. If a different port is to be used, enter the port number. If an invalid port number is entered, the ISE Storage System uses the default port number (that is, 443).
6. The **Enable Subscription** is selected by default; un-check this option to disable the subscription.
7. SSL must be enabled for port 443 and it must be disabled for port 80. For other ports, SSL can be either enabled or disabled.
8. The Interval value must be configured for **General Updates** and **Telemetry**. Once configured, both the **General Updates** and **Telemetry** information is sent to the ISE Analyzer IP/Host Name identified above.
9. Click **Add**.
10. Click **OK** on the *Add Subscription Confirmed* pop-up that appears.

Modify Subscription

Alert, **General Updates**, and **Telemetry** subscription configurations can be modified using the **Modify** function. Only the subscription type section selected for modification is enabled for modification, and the other two sections are disabled.

To modify a subscription:

1. Select an ISE.
2. Click **Modify Subscription**.

The *Modify Subscription* dialog appears as shown below.

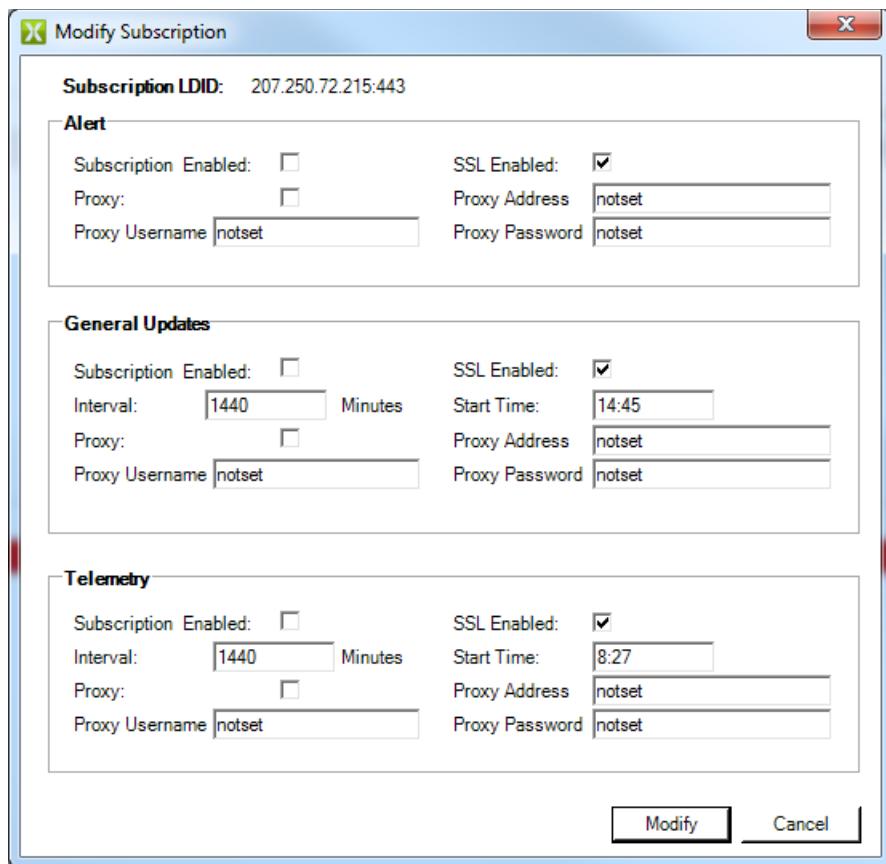


Figure 140. Modify Subscription

3. Make the required changes.
4. Click **OK**.

Delete Subscription

To delete a telemetry subscription:

1. Select a telemetry subscription.
2. Click **Delete Subscription** in the Action pane.

The *Delete Subscription* dialog appears as shown below.

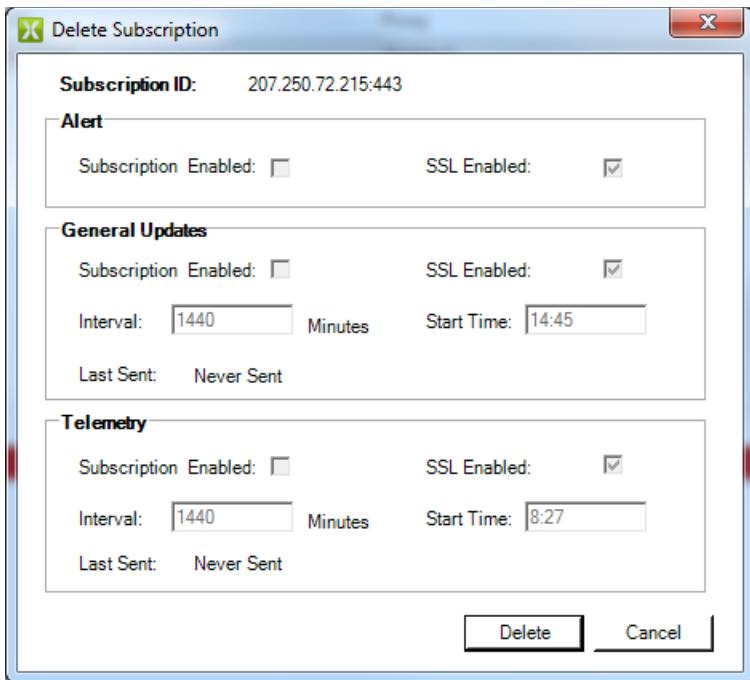


Figure 141. Delete Subscription

3. Click **Delete**.

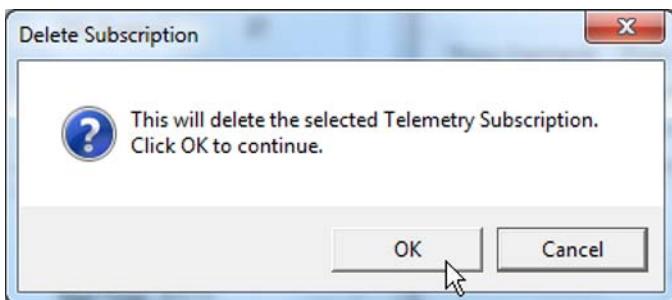


Figure 142. Delete Subscription

4. To complete the deletion, click **OK** on the confirmation pop-up.

Group-Wide Subscription

The following options are available at a Group-Wide level and are applicable to all the storage systems in the group.

- **Add subscription**
- **Delete Subscription**

Create Group-Wide Subscription

To add a group-level subscription:

1. Click **Create Subscriptions Group-Wide** under **Group-Wide Settings** in the top horizontal navigation bar.

The *Add Group-Wide Subscription* dialog appears as shown below.

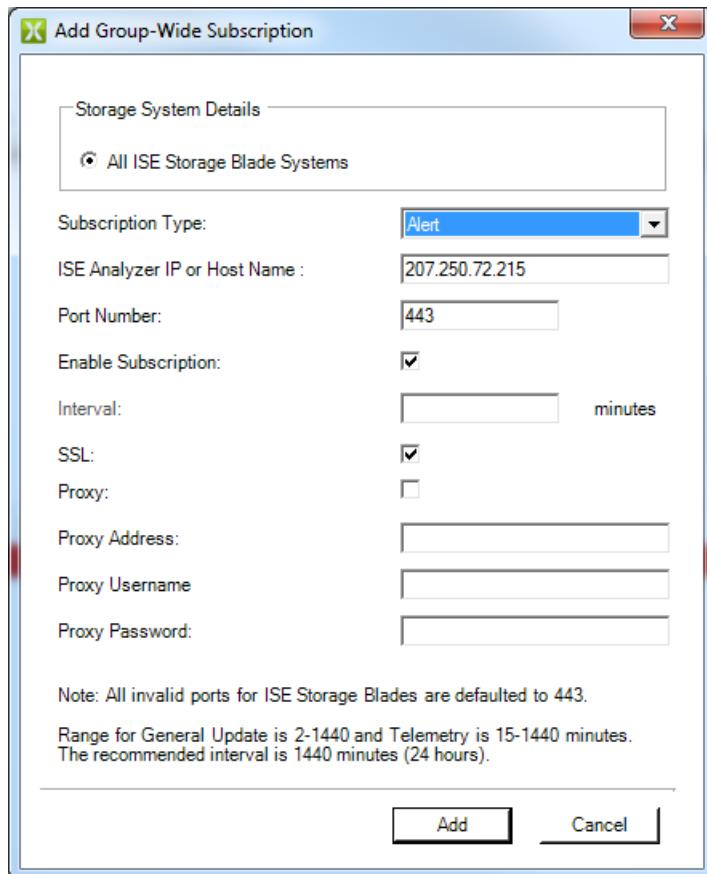


Figure 143. Add Group-Wide Subscriptions

2. In the **Subscription Type** drop-down, select **Alerts**, **General Updates**, or **Telemetry**.
3. Enter the IP address or DNS name of the ISE Analyzer in the **ISE Analyzer IP/Host Name** box.
4. The default Port Number is 443. This is the port managed by the ISE Analyzer Software Service. If a different port is to be used, enter the port number. If an invalid port number is entered, the ISE Storage System uses the default port number (that is, 443).
5. The **Enable Subscription** check box is selected by default; un-check this item to disable the subscription.
6. The Interval value must be configured for **General Updates** and **Telemetry**. When configured, both the **General Updates** and **Telemetry** information are sent to the ISE Analyzer IP/Host Name identified above.
7. Select the **SSL** check box.
8. Click **Proxy** and enter the proxy data as necessary.
9. Click **Add** in the confirmation pop-up that appears.
10. Click **OK** and the add subscription is complete.

Delete Group-Wide Subscription

The **Delete Subscriptions** option is used to delete all selected subscriptions from all the storage systems in the group.

To delete a subscription at a Group-Wide level:

1. Click **Delete Subscriptions** under the **Group-Wide Settings** in the **Actions** pane.

The *Delete Group-Wide Subscriptions* dialog appears as shown below.

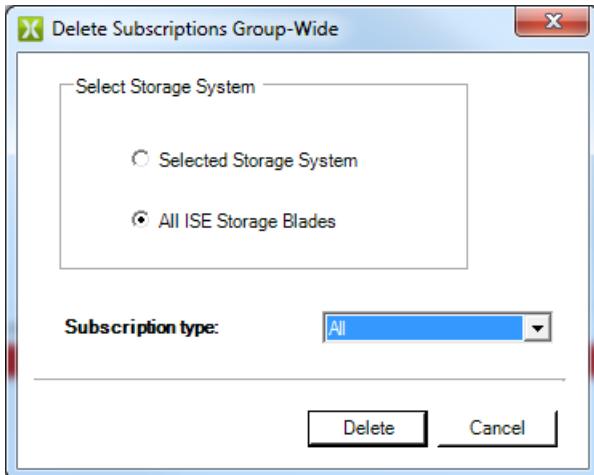


Figure 144. Delete SAN Group Subscriptions

2. Select one of the options from the **Select Storage System** box.
 - **Selected Storage System**
 - **All ISE Storage Systems**
3. Select the subscription type from the drop-down.
4. Click **Delete**.
A confirmation dialog appears.
5. Click **OK**.

Default ActiveWatch Settings

ISE comes with a set of default settings of ActiveWatch Subscription. These settings can be restored with the following actions.

Restore Default Settings

Clicking the **Restore Default Settings** button restores the default ActiveWatch Subscriptions settings on the selected ISE.

Create Default Subscription

Clicking the **Create Default Subscription** button creates a new subscription with the default settings. This option does not remove the new subscriptions created by the user.

Email Notification Operations

The X-IO ISE Manager Email Alerts Service receives events from X-IO storage systems that are managed by ISE Manager and sends email notifications to specified users. The X-IO ISE Manager Email Alerts Service is installed as part of the ISE Manager Suite.

To send email alerts, the outgoing mail server must be configured and users must be added.

All storage systems that are added to the group are displayed in the top horizontal navigation bar. When an ISE is selected in the top horizontal navigation bar, its severity settings and all existing users are displayed.

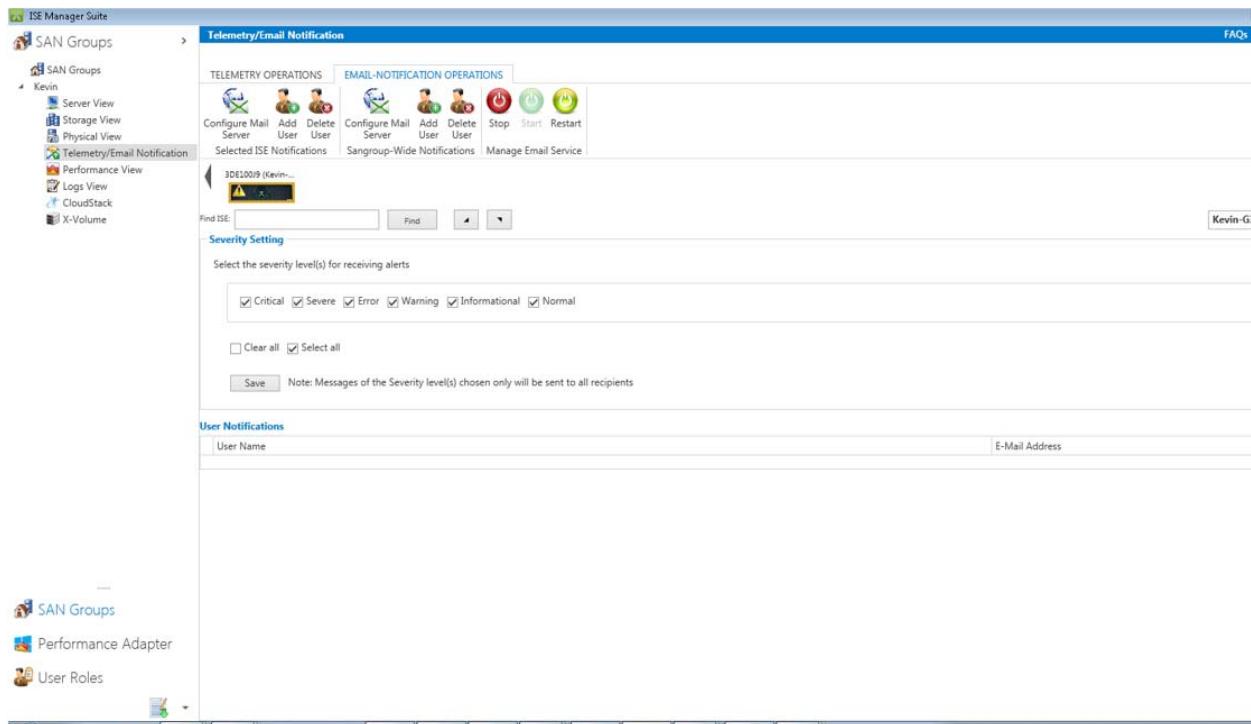


Figure 145. Telemetry-Email Notifications View

Selected ISE Notifications

The following functions are common to ISE Storage Systems.

- Configuring Mail Server
- Adding Users
- Deleting Users
- Set Severity Level

SAN Group-wide Operations

The following options are available at a Group-Wide level and are applicable to all the storage systems currently in the group.

- Configuring Mail server
- Adding Users
- Deleting Users

Note. If a new ISE is added to the SAN group after users are set up, the user e-mail configuration on that ISE needs to be added manually.

Configuring Mail Server

The Configuring Mail server function is used to set mail server information to send notification to users for selected ISE Storage Systems.

To set the Mail server:

1. Select **Configuring Mail server**.

The *Mail Server Configuration* dialog appears as shown below.

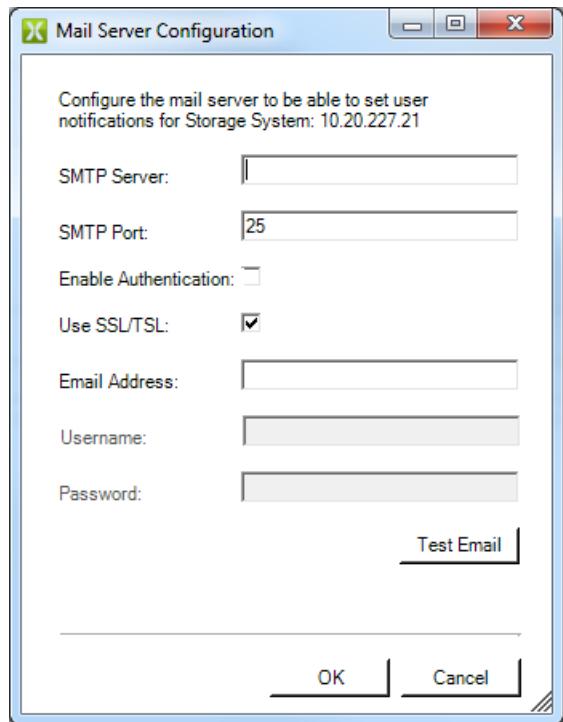


Figure 146. Mail Server Configuration

2. Enter the SMTP server IP address and port.
3. If the mail server needs to log in to your mail server to be able to send messages:
 - Click **Enable Authentication**.
 - Enter the username and password of your mail server.
4. To ensure that the messages can be received, click the **Test Email** button.

You will be notified that a test message is being sent.

Telemetry settings will need to be reconfigured when an ISE is moved from one SAN group to another.

Adding Users

The Add User function is used to add a user to receive the alerts from selected ISE Storage Systems.

To add users:

1. Select **Add User**.

The *Add User* dialog appears as shown below.

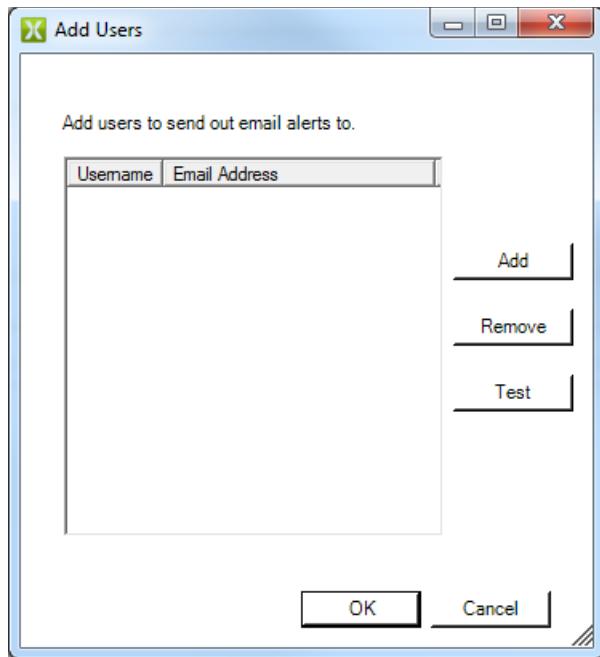


Figure 147. Add Users

2. Click **Add User** to add a user to receive the alerts.
3. Enter the user's name and the e-mail address to which alerts will be sent.
4. Click **OK**.
5. To remove a user, select the user in the users list and then click **Remove**.
6. Click the **Test** button to ensure that the users can receive email alerts. A test mail will be sent to each user specified in the list.
7. Click **OK**.

Deleting Users

The Delete User Function is used to remove the user from user notifications list.

1. Select the storage system.
2. Select the users from the user notifications list.
3. Click **Delete User**.

The selected users are deleted.

Severity Level

There are six severity levels

- Critical
- Severe
- Error
- Warning
- Informational
- Normal

User can select the severity levels for receiving the e-mail alerts. Only the alerts with the selected severity level will be sent to users.

To set the severity level

1. Select the storage system.
2. Select the severity levels.
3. Click **Save**.

Performance View

This chapter introduces the ISE Manager Suite **Performance View** and explains its operations in detail.

Introduction

The **Performance View** option provides I/O performance metrics for ISE Storage Systems, Volumes, and Hosts. These metrics are available only for ISE Storage Systems. The Performance View metrics include the following information:

- Kilobytes per second—expressed as KB/s
- Total I/O per second—expressed as IO
- Read I/O per second—expressed as Read IO/s
- Write I/O per second—expressed as Write IO/s
- Total KB per second—expressed as KB/s
- Read KB per second—expressed as Read KB/s
- Write KB per second—expressed as Write KB/s
- Queue depth—expressed as Queue Depth
- Read latency—expressed as Read Latency (ms)
- Write latency—expressed as Write Latency (ms)
- Read latency Max—expressed as Read Latency Max (ms)
- Write latency Max—expressed as Write Latency Max (ms)
- Read Percent—expressed as Read%
- Average bytes per I/O—expressed as Avg Bytes/IO

The **Performance View** window consists of the following tabs:

- **SYSTEM INFORMATION** tab provides the statistics for selected ISE storage systems
- **VOLUME** tab provides statistics for all volumes in the selected storage system
- **HOST** tab provides the statistics for all hosts in the selected storage system
- **VOLUMES WITH STORAGE QUALITY OF SERVICE MODE** tab provides the details of Quality of Service mode, IOPs Max, IOPs Min, and IOPs Burst for all Volumes in the selected storage system

System Storage View

To view the ISE Storage System system metrics:

1. Select an ISE in the top horizontal navigation bar.
2. Click the **System Information** tab.

The **System Information** displays the metrics for the selected ISE.

A graphical representation of Read and Write (KB/s), I/O per second for MRC 1 and MRC 2 as shown below.

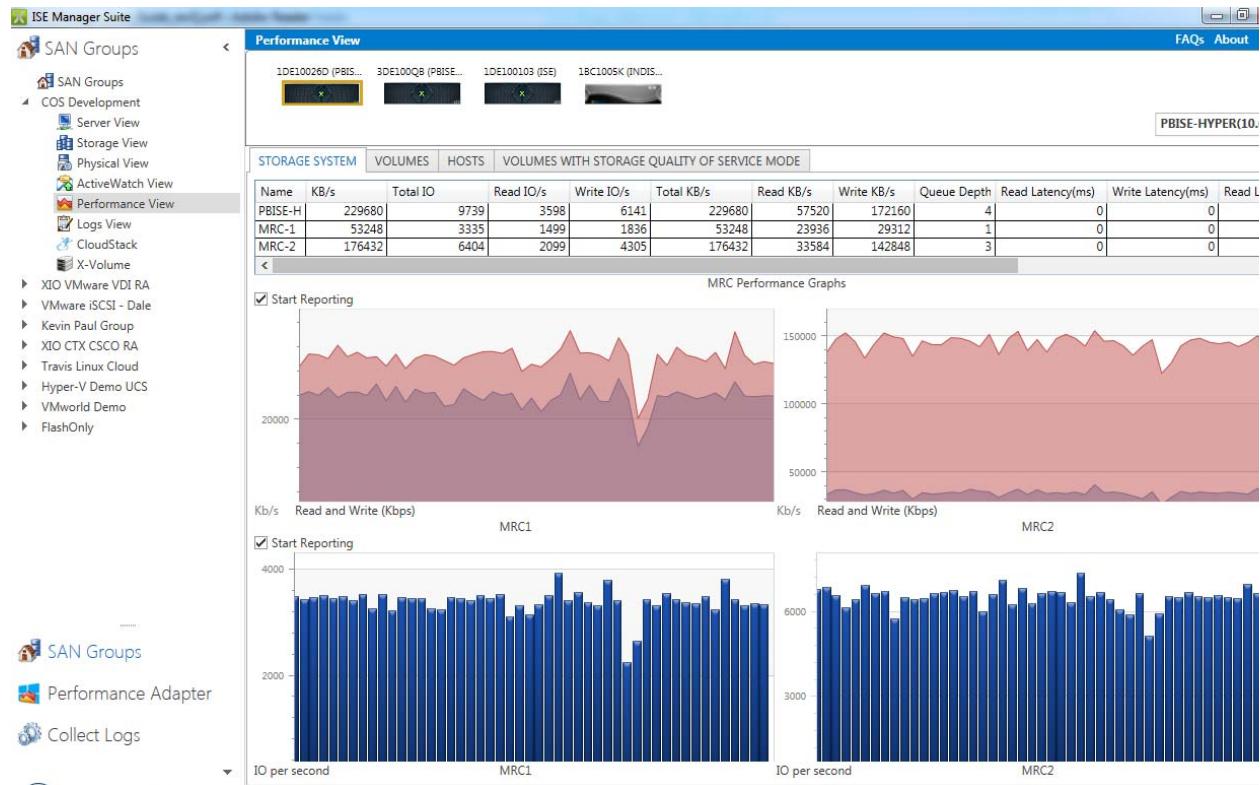


Figure 148. Performance View—Storage

3. Right-click on any MRC graph and choose the desired option.

Moving the top slider to the right exposes the hidden portion of the performance statistics as shown in the following figure.

Volumes

To view the statistics of all the volumes in an ISE Storage System:

1. Select an ISE from the top horizontal navigation bar.

2. Click **Volumes** tab.

ISE Storage System Volumes	Storage Quality of Service Mode	IOPS Max	IOPS Min	IOPS Burst
OS	Enabled	0	0	0
X-Volume1	Disabled	0	0	0
SMP12test	Enabled	0	0	0
Win2K8_Vol1	Enabled	0	0	0
A1_2	Enabled	0	0	0
TESTFFFF	Enabled	0	0	0
B1	Enabled	0	0	0
Test-RG	Enabled	0	0	0
B1_2	Enabled	0	0	0
B1_3	Enabled	0	0	0
QoSTBD-1	Enabled	100	10	0
Data-23 host - do not delete	Enabled	0	0	0
data -22 host- do not delete	Enabled	0	0	0
QoSTBD4-1	Disabled	1000	100	0
QoSTBD2	Enabled	0	0	0
QoSTBD5	Enabled	1000	100	0
QoSTBD6	Enabled	0	0	0
QoSTBD7	Enabled	100	10	0
bb	Enabled	0	0	0
X1	Enabled	0	0	0
X1_1	Enabled	0	0	0
X1_2	Enabled	0	0	0
X1_3	Enabled	0	0	0
X1_4	Enabled	0	0	0
X1_5	Enabled	0	0	0
SampleTest1	Enabled	0	0	0
SampleTest2	Disabled	0	0	0
RDMTEST	Enabled	0	0	0
mstest-1	Disabled	0	0	0
1	Enabled	0	0	0
TEST-BNN	Enabled	0	0	0
TEST-CADp	Enabled	0	0	0

Figure 149. Performance View—Volumes

Hosts

To view the statistics of all the hosts in a selected storage system:

1. Select an ISE from the top horizontal navigation bar.

2. Click **Hosts** tab.

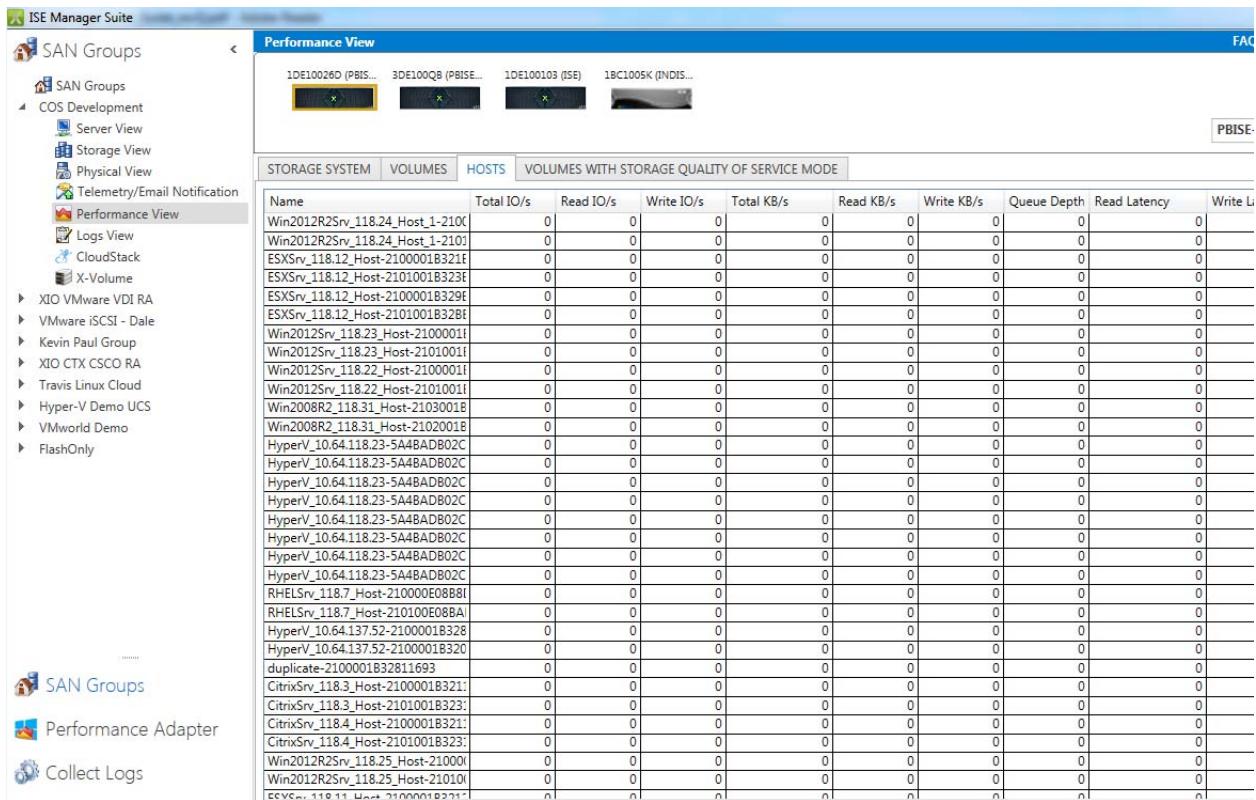


Figure 150. Performance View—Hosts

Volumes with Storage Quality of Service Mode

To view the QoS details of all the volumes in an ISE Storage System:

1. Select an ISE from the top horizontal navigation bar.
2. Click the **Volumes With Storage Quality Of Service Mode** tab.

The screenshot shows the ISE Manager Suite interface with the 'Performance View' selected in the left sidebar. The main window displays a table titled 'VOLUMES WITH STORAGE QUALITY OF SERVICE MODE'. The table has columns for 'ISE Storage System Volumes', 'Storage Quality of Service Mode', 'IOPs Max', 'IOPs Min', and 'IOPS Burst'. The 'Storage Quality of Service Mode' column shows various settings like 'Enabled', 'Disabled', and '1000'. The 'IOPs Max' and 'IOPs Min' columns show values such as 0, 100, and 1000. The 'IOPS Burst' column shows values like 0 and 100. The table lists numerous volumes, including 'OS', 'X-Volume1', 'SMP12Test', 'Win2K8_Vol1', 'A1_2', 'TESTFFFF', 'B1', 'Test-RG', 'B1_2', 'B1_3', 'QoSSTBD-1', 'Data-23 host - do not delete', 'data -22 host- do not delete', 'QoSSTBD4-1', 'QoSSTBD2', 'QoSSTBD5', 'QoSSTBD6', 'QoSSTBD7', 'bb', 'X1', 'X1_1', 'X1_2', 'X1_3', 'X1_4', 'X1_5', 'SampleTest1', 'SampleTest2', 'RDMTEST', 'mstest-1', '1', 'TEST-BNN', and 'TEST-CADp'. The top of the window shows four icons: '1DE10026D (PBIS...)', '3DE100QB (PBISE...)', '1DE100103 (ISE)', and '1BC1005K (INDIS...)'.

ISE Storage System Volumes	Storage Quality of Service Mode	IOPs Max	IOPs Min	IOPS Burst
OS	Enabled	0	0	0
X-Volume1	Disabled	0	0	0
SMP12Test	Enabled	0	0	0
Win2K8_Vol1	Enabled	0	0	0
A1_2	Enabled	0	0	0
TESTFFFF	Enabled	0	0	0
B1	Enabled	0	0	0
Test-RG	Enabled	0	0	0
B1_2	Enabled	0	0	0
B1_3	Enabled	0	0	0
QoSSTBD-1	Enabled	100	10	10
Data-23 host - do not delete	Enabled	0	0	0
data -22 host- do not delete	Enabled	0	0	0
QoSSTBD4-1	Disabled	1000	100	100
QoSSTBD2	Enabled	0	0	0
QoSSTBD5	Enabled	1000	100	100
QoSSTBD6	Enabled	0	0	0
QoSSTBD7	Enabled	100	10	10
bb	Enabled	0	0	0
X1	Enabled	0	0	0
X1_1	Enabled	0	0	0
X1_2	Enabled	0	0	0
X1_3	Enabled	0	0	0
X1_4	Enabled	0	0	0
X1_5	Enabled	0	0	0
SampleTest1	Enabled	0	0	0
SampleTest2	Disabled	0	0	0
RDMTEST	Enabled	0	0	0
mstest-1	Disabled	0	0	0
1	Enabled	0	0	0
TEST-BNN	Enabled	0	0	0
TEST-CADp	Enabled	0	0	0

Figure 151. Performance View—Volumes with Storage Quality of Service Mode

Logs View

This chapter introduces the ISE Manager Suite Logs View. Log data is categorized into Management, General, and Event logs. To view the ISE SAN management logs, select an ISE Storage System. The logs are displayed under three different tabs: **Management**, **General**, and **Events**.

Management Logs

The **Management** logs are displayed in reverse chronological order. They can be grouped by **Service** or **Severity**.

The following figure shows a list of management logs for the selected ISE.

The screenshot shows the ISE Manager Suite interface with the 'Logs View' window open. The left sidebar shows navigation options like SAN Groups, COS Development, Server View, Storage View, Physical View, Telemetry/Email Notification, Performance View, and Logs View (which is currently selected). The main 'Logs View' window displays three storage systems: 1DE10026D (ISE), 3DE100QB (PBISE...), and 1DE100103 (ISE). Below this, there are two tabs: 'MANAGEMENT LOGS' (selected) and 'EVENTS'. A table lists management logs from September 6, 2015, at 09:50:55 pm. The table columns are Date, Time, Service, Severity, and Message. All entries show a 'Warning' severity and point to 'EventService' failing to connect to DataPac 2 due to MgmtEvent Type 1453.

Date	Time	Service	Severity	Message
09-06-2015	09:50:55 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.118.60:8083 - failure on data transfer: Failed to connect - couldn't connect Event which failed to send is: 09-Jun-2015 09:50:55 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:36:36 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.142.28:443 - failure on data transfer: Failed to connect - couldn't connect ti Event which failed to send is: 09-Jun-2015 09:35:53 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:36:14 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.118.60:8083 - failure on data transfer: Failed to connect - couldn't connect Event which failed to send is: 09-Jun-2015 09:35:53 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:21:34 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.142.28:443 - failure on data transfer: Failed to connect - couldn't connect ti Event which failed to send is: 09-Jun-2015 09:20:52 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:21:13 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.118.60:8083 - failure on data transfer: Failed to connect - couldn't connect Event which failed to send is: 09-Jun-2015 09:20:52 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:06:11 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.118.60:8083 - failure on data transfer: Failed to connect - couldn't connect Event which failed to send is: 09-Jun-2015 09:05:50 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	09:05:50 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.118.60:8083 - failure on data transfer: Failed to connect - couldn't connect Event which failed to send is: 09-Jun-2015 09:05:50 pm, Description: Periodic Hea Health: 125, (Data is redundant) DataPac 2 Health: 0]
09-06-2015	08:51:21 pm	EventService	Warning	MgmtEvent - Type:1453, Component: EventService - MGMT Alert failed to send t 10.64.142.28:443 - failure on data transfer: Failed to connect - couldn't connect ti

Figure 152. Logs—Management

Event Logs

The following is a sample screen of **Events** logs for the selected ISE grouped by component with the ISE list expanded.

The screenshot shows the ISE Manager Suite interface with the 'Logs View' tab selected. On the left, a navigation tree is expanded under 'ISE Development', showing 'Logs View' as the active item. The main area displays a grid of event logs. The columns are 'Date', 'Time', 'Component', and 'Message'. The 'Component' column consistently shows 'CCS'. The 'Message' column contains detailed log entries for each event, such as 'CEL Event - Type: 232, Component: CCS, Class: 8, Sequence Num: 0.5f.86 - A Volume has been unpres host. Vol GUID: 6001F9310007800003C0000200000000, Vol Index: 26, Host Index: 5, Status: 00000000'. There are 18 rows of events listed, spanning from 08-06-2015 at 02:27:25 am to 02-06-2015 at 12:12:57 am. A 'Refresh' button is located at the top right of the log grid.

Date	Time	Component	Message
08-06-2015	02:27:25 am	CCS	CEL Event - Type: 232, Component: CCS, Class: 8, Sequence Num: 0.5f.86 - A Volume has been unpres host. Vol GUID: 6001F9310007800003C0000200000000, Vol Index: 26, Host Index: 5, Status: 00000000 .
08-06-2015	02:27:25 am	CCS	CEL Event - Type: 232, Component: CCS, Class: 8, Sequence Num: 0.5f.85 - A Volume has been unpres host. Vol GUID: 6001F9310007800003C0000200000000, Vol Index: 26, Host Index: 4, Status: 00000000 .
08-06-2015	02:27:25 am	CCS	CEL Event - Type: 234, Component: CCS, Class: 8, Sequence Num: 0.5f.84 - The attributes of a Host ha Host Index: 5, Status: 00000000 - Success
08-06-2015	02:27:25 am	CCS	CEL Event - Type: 234, Component: CCS, Class: 8, Sequence Num: 0.5f.83 - The attributes of a Host ha Host Index: 4, Status: 00000000 - Success
08-06-2015	02:22:02 am	CCS	CEL Event - Type: 232, Component: CCS, Class: 8, Sequence Num: 0.5f.5e - A Volume has been unpres host. Vol GUID: 6001F9310007800003CA000200000000, Vol Index: 36, Host Index: 5, Status: 00000000 .
08-06-2015	02:22:02 am	CCS	CEL Event - Type: 232, Component: CCS, Class: 8, Sequence Num: 0.5f.5d - A Volume has been unpres host. Vol GUID: 6001F9310007800003CA000200000000, Vol Index: 36, Host Index: 4, Status: 00000000 .
08-06-2015	02:22:02 am	CCS	CEL Event - Type: 234, Component: CCS, Class: 8, Sequence Num: 0.5f.5c - The attributes of a Host ha Host Index: 5, Status: 00000000 - Success
08-06-2015	02:22:02 am	CCS	CEL Event - Type: 234, Component: CCS, Class: 8, Sequence Num: 0.5f.5b - The attributes of a Host ha Host Index: 4, Status: 00000000 - Success
04-06-2015	11:38:15 pm	CCS	CEL Event - Type: 81, Component: CCS, Class: 1, Sequence Num: 0.59.7d - A Volume has been created 6001F9310007800003D4000200000000, Volume Index: 44, Post Diagnostics: 2e, RAID Type 1, Pool ID: 1 Mode: 0, Volume Size: 1 GB, Unit Master: 0, Affinity: HDD, IOPS Min/Max/Burst: 0/0/0, Status: 0 - Succes
02-06-2015	07:19:41 am	CCS	CEL Event - Type: 236, Component: CCS, Class: 8, Sequence Num: 0.53.ed - A Host HBA entry has bee Index: 22, Status: 00000000 - Success
02-06-2015	07:17:32 am	CCS	CEL Event - Type: 236, Component: CCS, Class: 8, Sequence Num: 0.53.ec - A Host HBA entry has bee Index: 24, Status: 00000000 - Success
02-06-2015	12:17:32 am	CCS	CEL Event - Type: 236, Component: CCS, Class: 8, Sequence Num: 0.53.eb - A Host HBA entry has bee Index: 21, Status: 00000000 - Success
02-06-2015	12:12:58 am	CCS	CEL Event - Type: 236, Component: CCS, Class: 8, Sequence Num: 0.53.d6 - A Host HBA entry has bee Index: 23, Status: 00000000 - Success
02-06-2015	12:12:57 am	CCS	CEL Event - Type: 236, Component: CCS, Class: 8, Sequence Num: 0.53.d5 - A Host HBA entry has bee

Figure 153. Logs—Events

CloudStack Management from ISE Manager

ISE Manager Suite allows management of CloudStack servers that have attached ISE.

Add Management Server

To add the CloudStack management server in ISE Manager:

1. Click the Cloud node, ensuring that the ISE (which is connected to the host of CloudStack) is fetched.
2. Enter the Service URL of the CloudStack (for example, <http://10.64.138.37:8080/client/api>).
3. Enter the API Key and the Secret Key of the user whose authentication you want to log in to.
4. Click **Add**.

Note. The API Key and Secret Key can be found in the accounts section of the Management Server UI.

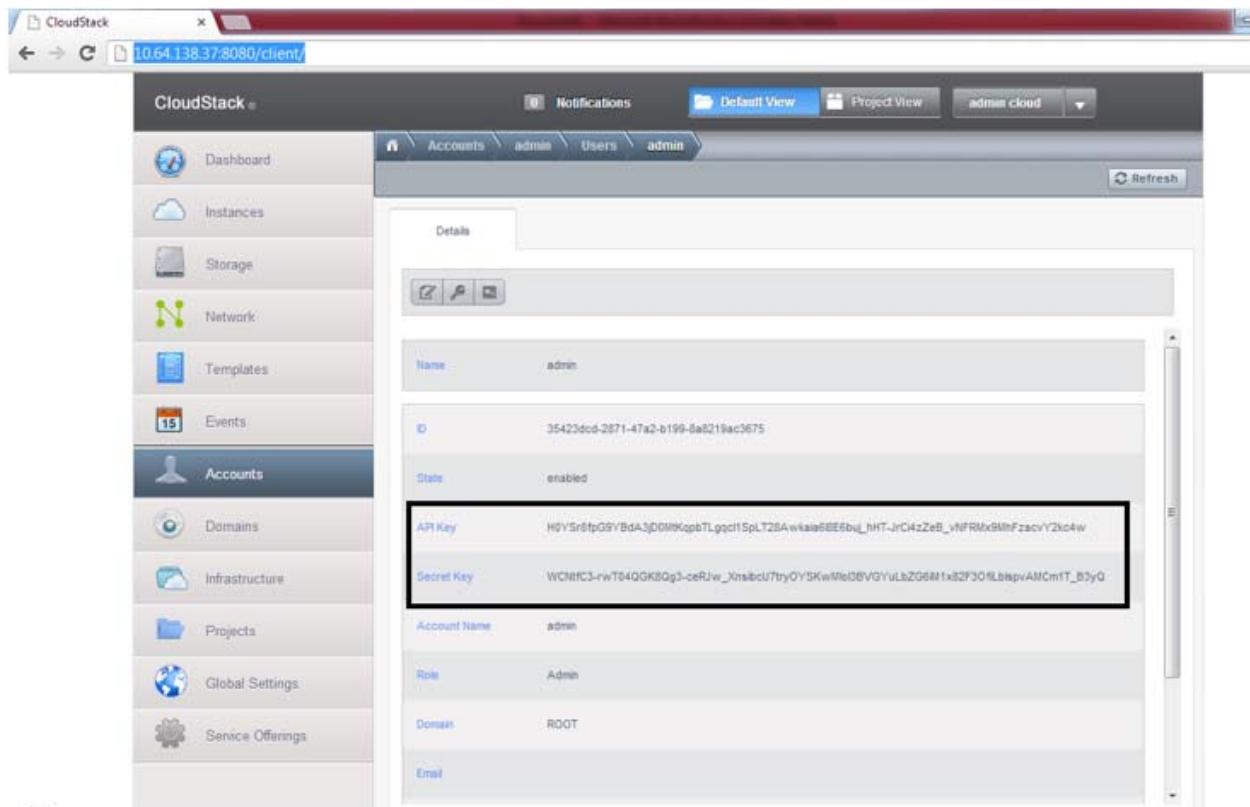


Figure 154. API Key and Secret Key

View Details of the Added Management Server

1. On the left side of the window, click the hyperlink created for the newly added CloudStack Management Server.

The screenshot shows the CloudStack Management Servers interface. On the left, there is a list of management servers with one entry: "http://10.64.138.37:8080/client/api". On the right, a detailed view of the selected server is shown. The "Add CloudStack Management Server" button is at the top. Below it, the server's details are listed:

Management Service URL	:	http://10.64.138.37:8080/client/
API Key	:	38Awkaias6l8E6buJ_hHT-JrCi4zZeB_vNFRMx9MhFza
Secret Key	:	0YSKwMlel3BVGYuLbZG6IM1x82F3OfiLbIspvAMCn

Below the details, a summary of fetched resources is provided with green checkmarks:

- Storage Pools fetched: 6
- Volumes fetched: 4
- Disk Offerings fetched: 4
- Host(s), Pod(s), Cluster(s) fetched.

At the bottom right are "Clear" and "OK" buttons.

Figure 155. CloudStack

Add Primary Storage on the Management Server with Existing SR on Added Host

This option allows the users to add an existing Storage Repository on Xen as primary storage on CloudStack Management Server.

1. Click **Add Primary Storage**.
2. Select the Management Server, Zone, Pod, and Cluster.
3. Enter the name for the primary storage.
4. Enter the label for the SR that is already created.
5. Click **Add**.

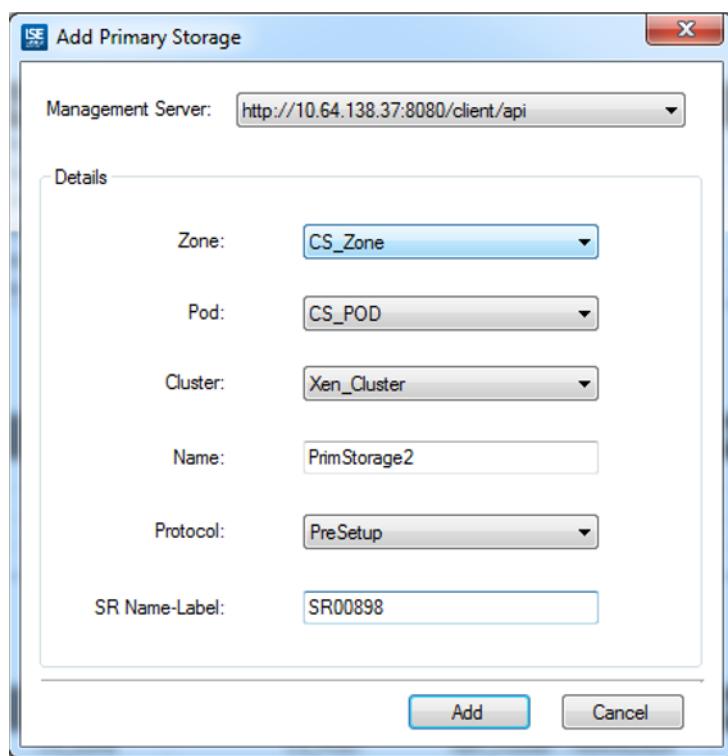


Figure 156. Add Primary Storage

Create Primary Storage by Creating Xen Storage Repository

This option allows the user to create a Storage Repository on Xen Server and then add that repository as the Primary Storage in CloudStack Management Server.

1. Click **Xen Storage Repo**.
2. Enter the details of the hypervisor on which the SR needs to be created.

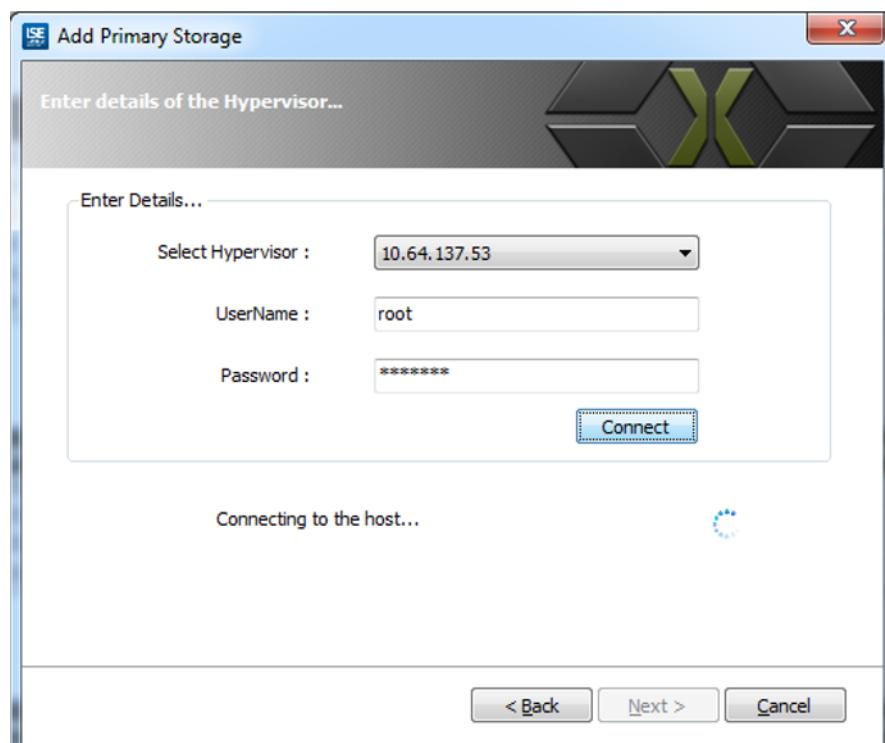


Figure 157. Connecting to the host...

3. Enter the PS, SR names as required.
4. Enter the disk size.
5. Select the RAID type and the ISE storage pool on which the volume needs to be created.

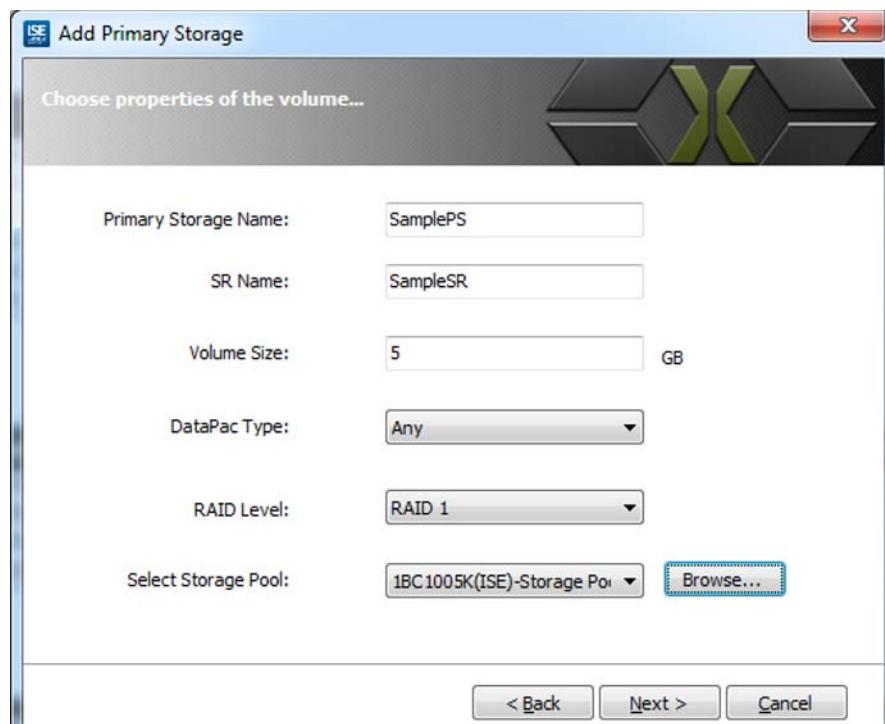


Figure 158. Choose properties of the volume...

6. Click **Next**.

7. Select the host client corresponding to the Xen Server (CloudStack host).
8. Click **Next**.

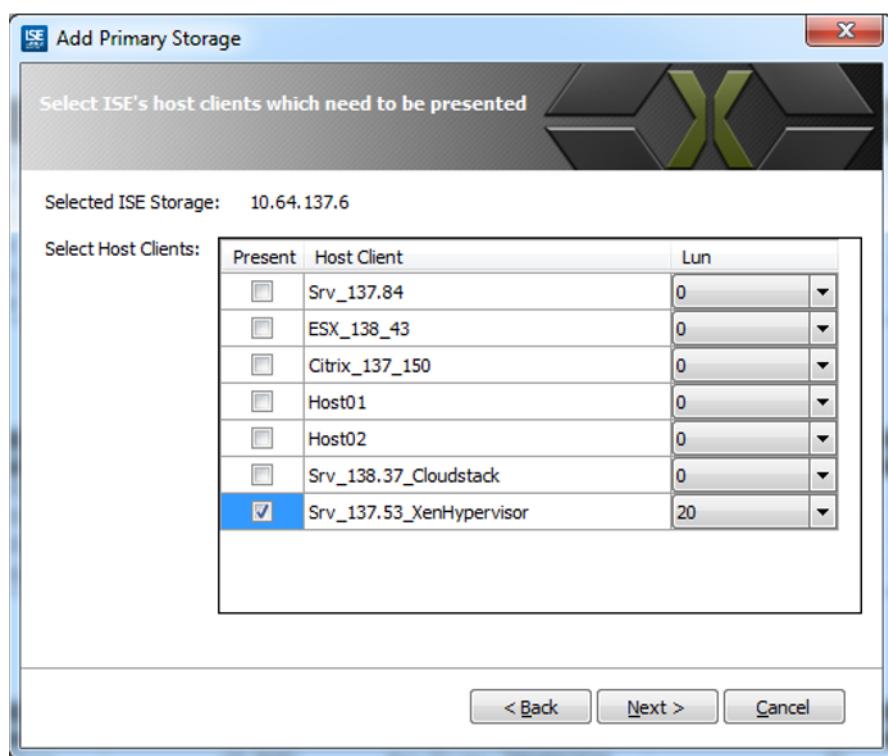


Figure 159. Select ISE's host clients which need to be presented

9. Confirm the details.
10. Click **Next**.

The status of the operations performed will be updated on the screen.

X-Volume

X-Volume is a host-based solution that significantly improves the performance and provides scalability of multiple ISE LUNs. X-Volumes can be created from ISE LUNs within a given DataPac or a DataPac pair from the same ISE unit or different DataPacs from different ISE units. To summarize, X-Volume supports Striped (RAID 0) and spanning across various ISE LUNs, both inter-ISE and intra-ISE (across ISE clouds).

The X-Volume is a system bus device that provides services to the Microsoft Windows operating system at the disk level. X-Volume supports all disk features of the Microsoft Windows operating system. This support includes the dynamic expand and shrink features of Microsoft Disk services. These X-Volumes can be seamlessly transferred from one Microsoft Windows host to another Microsoft Windows host (for example, X-Volume can be transferred from a Microsoft Windows Server 2012 to a Microsoft Windows Server 2012 R2).

The X-Volume supports striping (RAID 0) and spanning. The following diagram provides a high-level overview of the X-Volume.

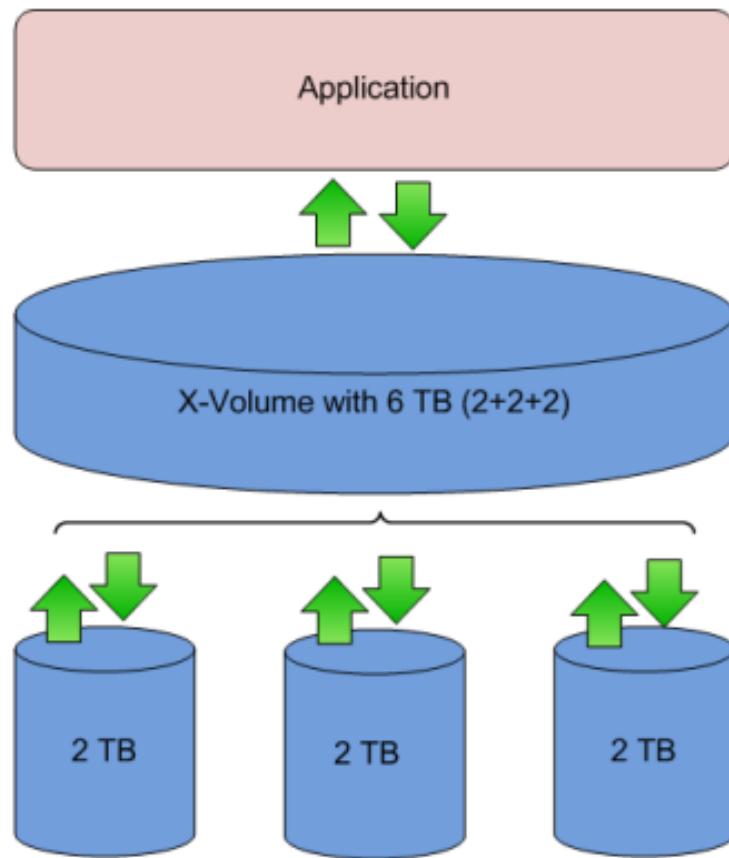


Figure 160. X-Volume Overview

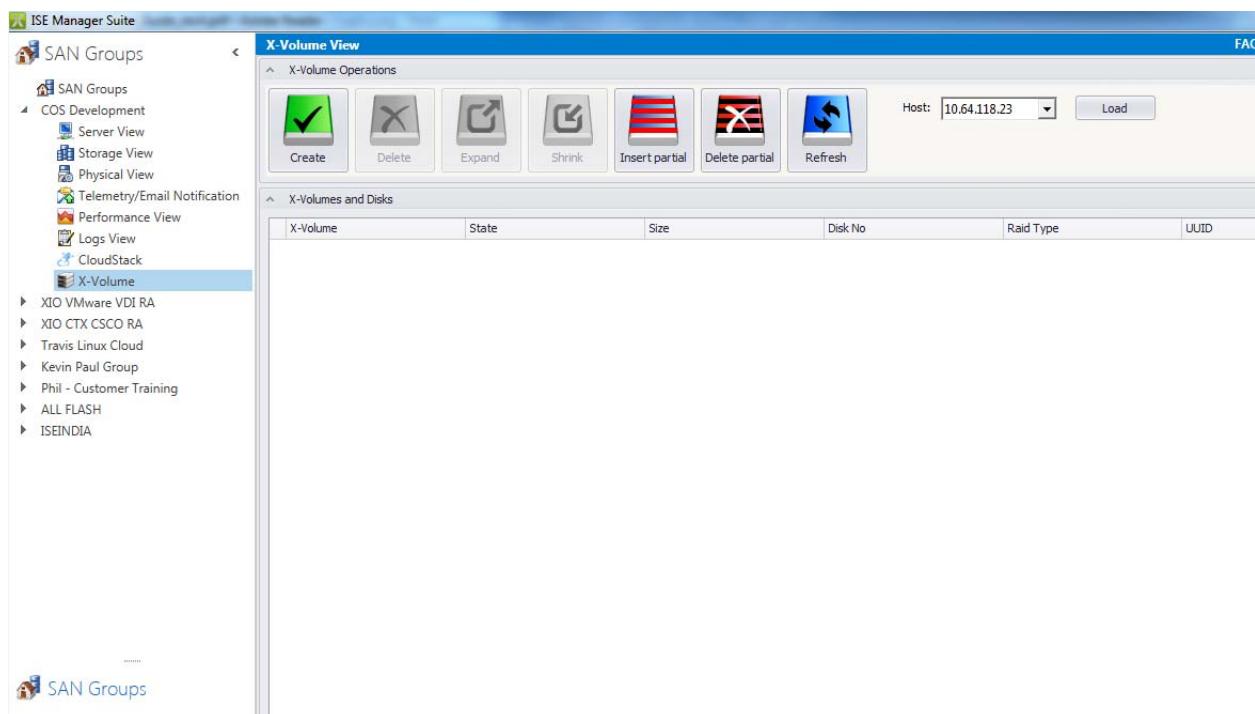


Figure 161. X-Volume Operations

Create X-Volume

The X-Volume can be a striped (RAID 0) X-Volume or a spanned X-Volume. Any disk must meet the following criteria to be part of an X-Volume:

- An X-IO ISE Model 1400 or ISE Model 2400 Multi-Path disk
- Not part of an existing X-Volume
- Not an X-Volume disk (X-Volumes cannot be created on existing X-Volume disks)
- Not a Boot From SAN (BFS) disk
- Online in disk management
- Not write-protected

During the re-boot or removal of ISE LUN (disk), X-Volume uses the LUN unique identifier to identify its member ISE LUNs.

Create Striped X-Volume (RAID 0)

To create a striped X-Volume, click the **Create** icon and select those volumes to be added to an X-Volume.

When creating a striped X-Volume, it is recommended that all member ISE LUNs be of the same size. If the sizes are not identical, the minimum size of all member ISE LUNs is applied to all member LUNs. This results in unused storage for those ISE LUNs that are larger than the minimum size. For example, creating an X-Volume with two ISE LUNs of one Terabyte and one ISE LUN of two Terabytes results in an X-Volume of three Terabytes. This leaves one unusable Terabyte in the third ISE LUN.

Create Spanned X-Volume

To create a spanned X-Volume, click the **Create** icon and select those sequential volumes to be strung together in an X-Volume.

Notes:

- [1] To verify the successful expansion of an X-Volume, use Disk Management.
- [2] When creating a Striped X-Volume, it is recommended that all member ISE LUNs be of the same size. If the sizes are not identical, the minimum size of all member ISE LUNs is applied to all member LUNs. This results in unused storage for those ISE LUNs that are larger than the minimum size.
- [3] When a striped X-Volume is expanded, re-striping is not performed. Instead, a new RAID-0 striped group is created using new ISE LUNs and then the striped group is concatenated at the end of the existing X-Volume.
- [4] ISE-3 is not supported for X-Volume creation.

I/O performance of the striped (RAID 0) group that contains more ISE LUNs from different DataPacs or ISE is better when compared with the striped (RAID 0) group that contains fewer ISE LUNs from different DataPacs or ISEs.

Delete X-Volume

To delete an X-Volume, click the **Delete** icon and select X-Volume for deletion.

Expand X-Volume

To expand an X-Volume, click the **Expand** icon and select those volumes to be added to the identified X-Volume.

Shrink X-Volume

To reduce the size of an X-Volume, click the **Shrink** icon and select those volumes to be removed from the identified X-Volume.

Shrinking of X-Volume allows removal of ISE LUNs from the end. Any number of ISE LUNs that are part of an X-Volume can be removed from the X-Volume with the following restrictions:

- The X-Volume must be in ONLINE state before performing a Shrink operation.
- The number of ISE LUNs left after shrinking X-Volume cannot be less than two.
- The ISE LUNs allowed to be removed from X-Volume must be chosen from the end. The request to remove ISE LUN from the middle is not allowed.
- A formatted X-Volume cannot be shrunk smaller than the cumulative size of all the partitions available on it. First, the shrinking of the volume should be performed manually from Disk Management in order to create enough free space at the end. Only ISE LUNs that are not part of a partition in the formatted X-Volume are allowed to be removed to ensure data integrity.
- In the case of Striped (RAID 0) X-Volume, the shrink operation removes the Striped (RAID 0) groups from previous expansions. The shrink operation is successful only if all the disks of the group are specified.

Partial X-Volume Operations

An X-Volume with one or more member ISE LUNs missing is Incomplete. In this state the X-Volume is available only for read operations.

During the host boot-up, any member ISE LUN that is missing its X-Volume cannot be created on the host automatically. This state of an X-Volume is referred to as a partial X-Volume. For example, a six Terabyte X-Volume is created using three ISE LUNs from three different ISE Storage Systems. One ISE becomes inaccessible, and the server is rebooted. In this case there are two options to address this issue:

1. Present a six Terabyte partial X-Volume manually to the server, or
2. Delete the six Terabyte partial X-Volume manually from the server.

Insert Partial

To present a partial X-Volume, click the **Insert partial** icon and select the X-Volume to insert.

Delete Partial

To remove an X-Volume, click the **Delete** icon and select the X-Volume to delete.

Performance Adapter

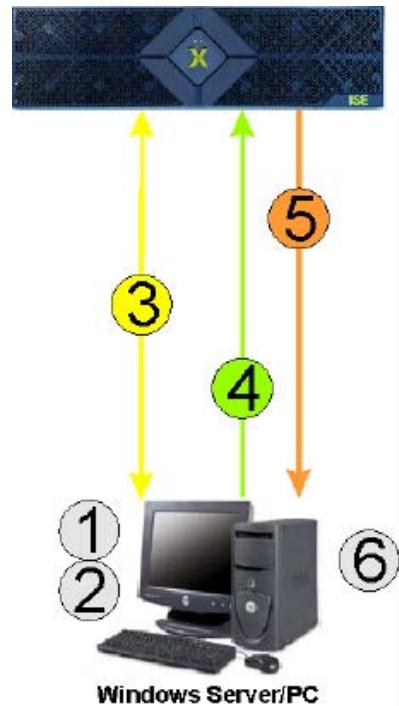
This section introduces the ISE Manager Suite **Performance Adapter** and explains the options in detail.

The X-IO ISE Performance Adapter for Windows Perfmon application is a light-weight application that uses the CorteX interface of the ISE systems to record detailed performance information from ISE systems. This application uses the Microsoft Windows Perfmon service as the data collection and capture mechanism for performance data from the X-IO ISE systems.

Through the use of Windows Perfmon, performance data can be viewed in real time from the ISE systems or saved in any Windows Perfmon format for analysis at a later time. Administrators and others can use Windows Perfmon to monitor ISE system performance in the same fashion as they would other Windows Perfmon counters.

1. ISE Manager Suite ensures that the ISE Perfmon objects exist on the local Windows operating system.
2. ISE Manager Suite reads the ISE IP connection information from the configuration file.
3. Perfmon HTTP connects to each ISE and obtains all ISE names. If any duplicate ISE names are encountered, the serial number is used as the name.
4. ISE Manager Suite makes an HTTP request to the performance page of an ISE.
5. The ISE returns an XML page with the performance information.
6. ISE Manager Suite parses the XML performance data and populates the local performance data fields on the Windows server/PC.
7. The actions described in 5 through 7 are repeated for each ISE monitored.

Note. See the diagram to the right, where the operating system environment is a real or virtual Windows Server 2008 (32-bit and 64-bit) and .Net (as specified in the release notes).



The following diagram shows the communication paths for the Windows server/PC and an ISE system.

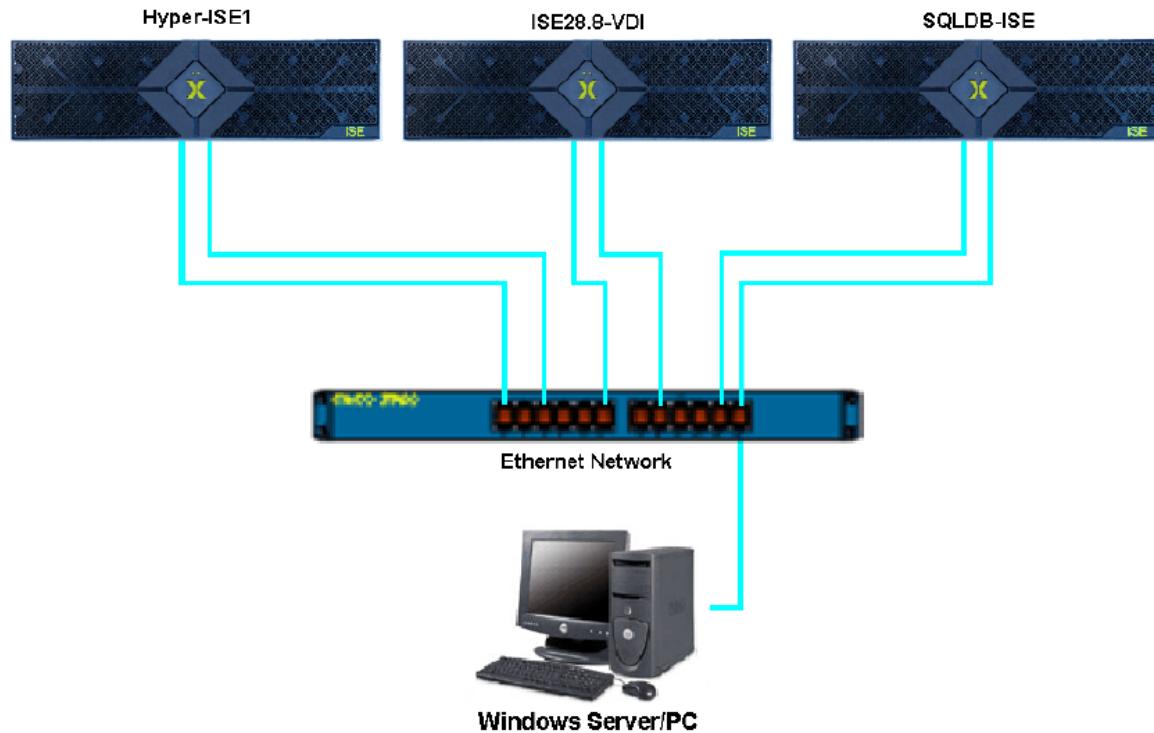


Figure 162. Perfmon Communication Paths

Notes:

- [1] Hyper_ISE1, S/N ABCDEFGH, MRC-0 192.168.1.1, MRC-1 192.168.1.2
- [2] ISE28.8-VDI, S/N 12345678, MRC-0 192.168.1.11, MRC-1 192.168.1.12
- [3] SQLDB-ISE, S/N 88888888, MRC-0 192.168.1.21, MRC-1 192.168.1.22

Performance Adapter View

While the Performance View of ISE Manager Suite provides real-time viewing of various ISE system performance metrics, a method of recording this data and advanced visualization may be required in some ISE environments. To satisfy this need, ISE Manager Suite leverages the functionality of the well-known Windows Performance Monitor application. Microsoft has included Windows Performance Monitor as part of all base Windows operation systems going back to System Monitor with Windows NT. The Performance Monitor application is a common method for viewing performance of all Microsoft applications (Exchange, IIS, AD, SQL) and the operating system itself.

The ISE Performance Adapter for Windows Performance monitor simply extends the functionality of Performance Monitor (like any Microsoft application) to view and record performance metrics. Administrators use Performance Monitor as they do any other Microsoft application. This significantly reduces the learning curve required to create and view advanced performance metrics for ISE environments.

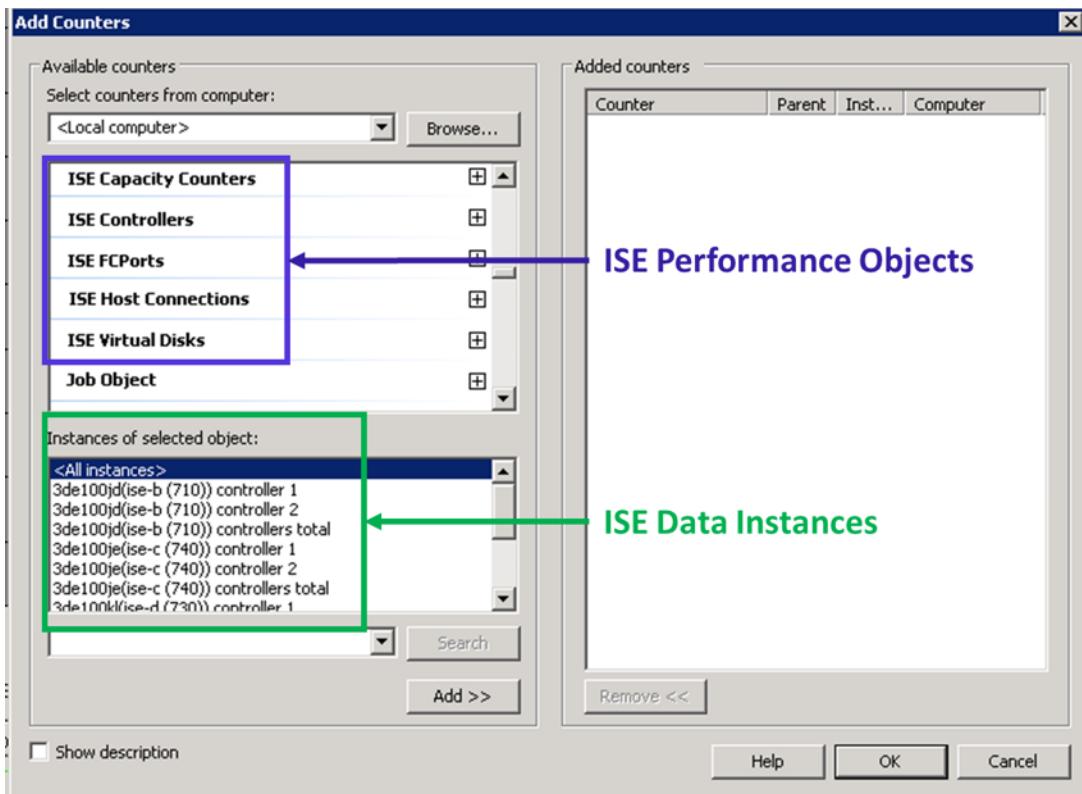
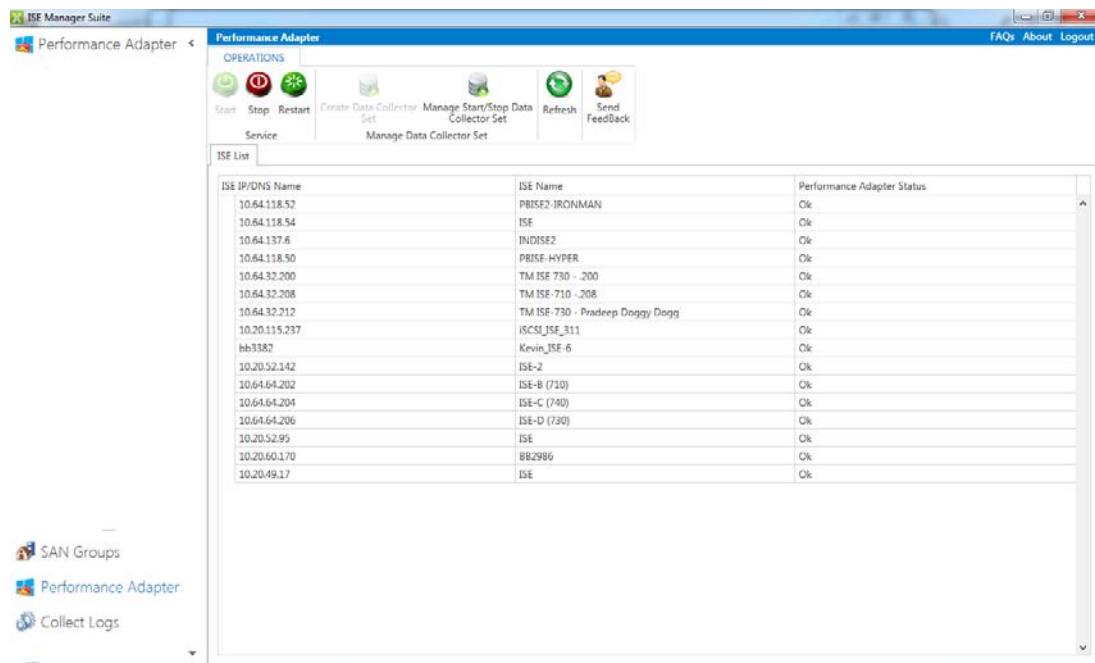


Figure 163. ISE Performance Objects and ISE Data Instances

To launch the Performance Adapter Management pane, click **Performance Adapter** in the ISE Manager Suite left pane option.

Performance monitoring is done on all ISE systems that are in the SAN Groups as shown in the following figure.

**Figure 164. Performance Monitoring**

The following options are part of the Performance Adapter view:

- Start Adapter
- Stop Adapter
- Restart Adapter
- Create Data Collector Set
- Manage Start/Stop Data Collector Set

Each ISE entry includes the IP address, user name, ISE serial number and name, and status. If new ISEs are not displayed after they are added to ISE Manager Suite for management, the Performance adapter should be refreshed and restarted.

Defining a Data Collector Set

The Windows Performance Monitor provides detailed logging functions. Perfmon has a great deal of functionality and options for recording performance data that makes it ideal for filtering and recording the amount of performance data ISE systems report. Some of the advantages of the data recording functions in Perfmon include:

- Data can be recorded in a variety of formats:
 - Windows Binary File (*.blg)
 - Comma Separated File (*.csv)
 - Tab Separated File (*.tsv)
 - SQL Database (Requires SQL Server)

Note. Relog.exe is included with all Microsoft OSs for filtering and transforming the above data formats.

- Data can be recorded over any sample period the user requires, though the size of the file and resolution of the data vary.
 - Small sample periods can generate an enormous amount of data but provide fine-grained resolution that can be essential when troubleshooting performance issues. Perfmon averages all of the values that it sees over the configured monitoring interval, and that is the value recorded. Increasing the monitoring interval may not have much effect on the reported data if the values do not vary greatly

during the monitoring interval. However, if there are significantly high values (spikes in relation to the other observed values) during the monitoring interval, these are masked by the other lower values that are included in the average value calculation. When planning sample periods, below are two general guidelines followed by ISE Engineering:

- When looking for a performance bottle-neck, high fidelity of the data is required to observe the “transient” values essential in determining the behavior of the system under stress. Smaller and smaller values yield higher resolutions. When performance benchmark testing in the Colorado Springs labs, sample sizes of 5 seconds are common.
- When doing extended performance monitoring, longer sample resolutions can be acceptable as the baseline of the environment is already known. To a certain extent this will mask extreme spikes in the data, and a balance between data resolution and log file growth rate should be determined. Common sample periods are on the order of 1 min to 1 hour, and these are usually dictated by the number of ISEs included in the data collector.
- Auto-increment logging directories and names for storing data (log file management)
 - Data collectors can create ever-increasing amounts of log files as time progresses, and Perfmon has a rich environment for naming the files as they are created. Time stamps (date/time/custom), generation numbers, and naming pre-fixes are available to customize the naming of the files for something that makes sense to the administrator. Naming can affect not only the log file name but also the directory structure created to store these files. Careful planning of the recording structure of the various data collectors can make searching (and finding) data much easier.

Manage Data Collector Set

As part of the installation, ISE Manager Suite creates several default data collectors. These collectors were created from common collections used when performing ISE benchmarking or performance analysis of customer's environment. Customization of these collectors greatly increases the value of performance data collected from the ISE environment. Not all of the data reported with ISE Perfmon is necessary in regular day-to-day monitoring of ISE systems, but it is included for deeper understanding of different ISE system component performance.

To get started:

1. When first using ISE Manager Suite, click **Create Data Collector Set**.

Note. The Create Data Collector Set option will be greyed out on subsequent instantiations of the Adapter, which will indicate that Manage Start/Stop Data Collector Set is the next step.

2. Click **Start/Stop Data Collector Set** to define the data collectors.

4x Data collectors are created as part of the ISE Manager Suite installation:

1. Automated-ISE 2-day resolution Circ-1—config
2. Automated-ISE 2-day resolution Circ-2—config
3. Automated-ISE High Resolution Collection—config
4. Automated-ISE Long Term Trend Capture—config

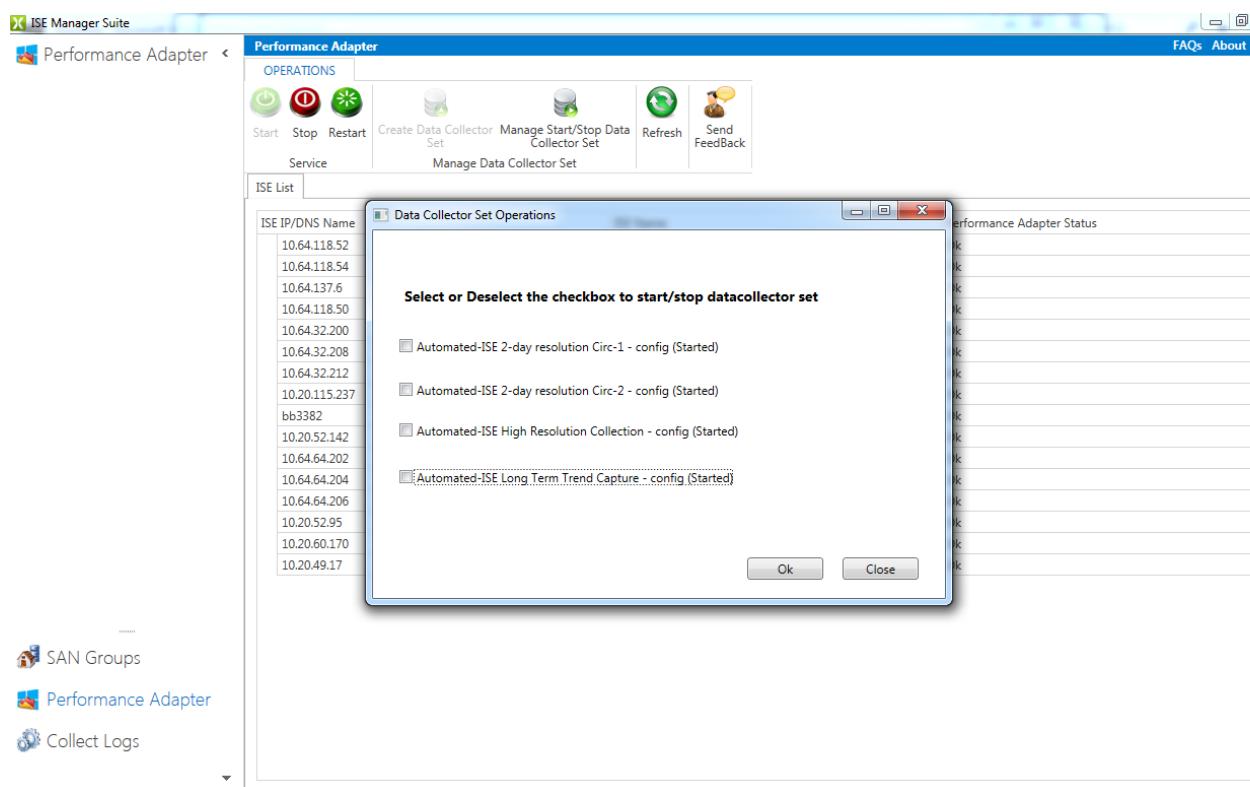


Figure 165. Data Collector Set Operations

The table below summarizes the data included with, the monitoring interval of, and the duration of the ISE Manager-created Data Collector sets. Customization of these data collectors significantly increases the value of the performance data collected. Removing unwanted data for day-to-day monitoring, focusing on data required for troubleshooting, adjusting the duration of the collection, and other customization significantly increase the value of the performance data recorded from the ISE systems.

Performance Counters							
Data Collector Sets	ISE Capacity Counters	ISE Controllers Counters	ISE FCPorts	ISE Host Connections Counters	ISE Virtual Disks Counters	Interval	Duration of Collection
Automated-ISE 2-day resolution Circ-1 - config	X	X	X	X	X	10 minutes	2 days
Automated-ISE 2-day resolution Circ-2 - config	X	X	X	X	X	10 minutes	2 days
Automated-ISE High Resolution Collection - config	X	X	X	X	X	2 seconds	500MB log file max
Automated-ISE Long Term Trend Capture - config	X	X	X	X	X	1 hour	4 weeks

Notes

Counters will be collected on all the ISEs that were displayed after launching Performance Adapter.

The 2-day Circular Data Collectors are identical, so one can be stopped if needed and the other one can keep collecting.

Data Collectors must be stopped before copying log files for analysis. Stopping the data collector causes the file to become consistent (like a database). Failure to stop the collector before copying the file will result in a corrupted copy and will not function for analysis.

To stop the Data Collectors, uncheck the appropriate collectors.

It is often advantageous to increase the maximum file size of the “Automated-ISE High Resolution Collection – config” to something in the 1-2GB range or to change a time frame (single day, week, etc.). This collector can generate a large amount of data quickly with increasing numbers of ISEs, and removing unwanted data can slow the growth of the log file.

To customize the counters from the options provided, see “Windows Performance View” on page 152.

Gathering the Log Files

The Data Collection log files are located in `C:\PerfLogs\Automated-ISE Performance Collection`. Microsoft Perfmon does not delete the files, and over time this folder can grow and consume unnecessary capacity. Enabling compression on the folders where the data collectors are storing data can greatly increase the amount of performance data that can be stored with minimal impact to the Server OS where ISE Manager Suite is running. It is also advisable to periodically delete unneeded log files, even with compression enabled, as the required capacity can be large over time (Months-Quarters-Years).

Windows Binary Performance files (*.blg) compress very well ($\approx 80\%$ and more) when using Windows compression to create a *.zip file. This can reduce a large file to the point of being practical for transmission over e-mail. The Data Collectors must be stopped to make the file consistent before creating a *.zip of the file. Failure to get the file in a consistent state will render the data unusable for analysis.

AutoStart Feature of Pre-Made Data Collectors

Performance collection needs to be consistent, and ISE Manager Suite will monitor the default created data collectors to ensure they are running. This is most often an issue when server patching/rebooting, as Perfmon data collectors have no method to ensure they are running by default when a server boots. When enabled, ISE Manager Suite continually monitors the status of the default created Data Collectors to check whether they are running. If it finds any of them (or only collectors specified, see below) in the “off” state, it will restart the collector. This causes the generation numbers to increment (if used) on all of the collectors restarted.

Restart-on-Reboot of other administrator-created data collectors can be accomplished by creating a *.bat file (with the `logman` command to start the collector) and using Task Scheduler to run the file at system start. This restarts the collector only on system re-boot and will ensure that collectors start after (for example) “Patch Tuesday.”

Note. Data Collectors must not be writing to a file if they are being copied to another location. This is similar to a database file, as the file must be brought into a consistent state before it can be copied somewhere else.

Use the Manage Start/Stop Data Collector Set function to select the ISE counters. The Data collection will begin automatically.

Note. When ISE Manager Suite is monitoring the Performance collections, they cannot be stopped from the Windows Performance Monitor application as ISE Manager will restart them immediately. This causes the generation counters to be incremented (if used) upon restart. When copying performance log files for analysis, data collection on the file must be stopped to get the file in a consistent state. Simply copying the file (without stopping the data collector) will corrupt the file and make data extraction impossible.

Windows Performance View

Windows Performance Monitor provides a rich interface for visualizing ISE performance data. Administrators configure views as they would for any other Microsoft application that leverages the Performance Monitor framework. Below is an example performance view of a single ISE, looking at Total Throughput, IOPS, and Read/Write Latencies, with other metrics included but not graphed.

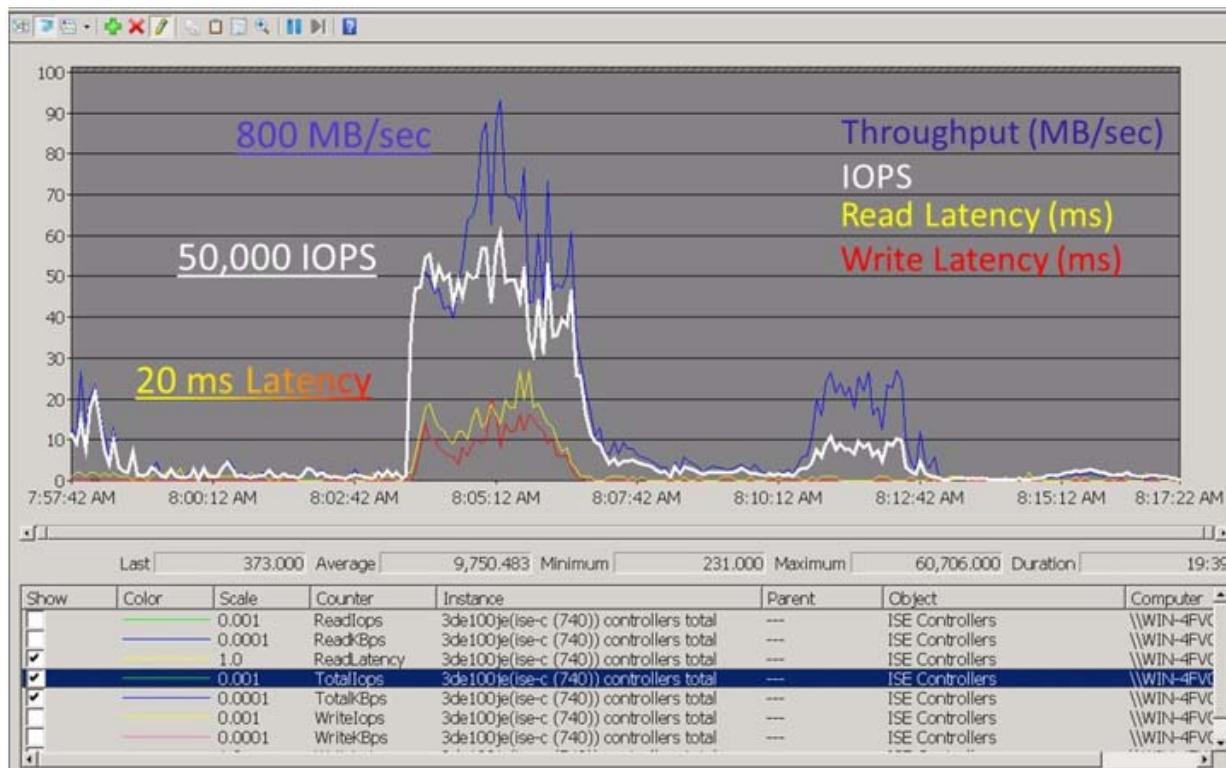


Figure 166. Windows Performance View

Performance Counters

The ISE Performance Adapter for Windows Perfmon exposes a number of performance counters to the end user to aid in identifying potential bottlenecks in their environment. These counters are grouped together into logical units that enable users to view the performance of any ISE from multiple perspectives.

ISE Capacity Counters

These counters report on the capacity of ISE systems from a RAW (Before RAID, after sparing), RAID1, and RAID5 viewpoint. These counters are included to give administrators a method to record any capacity changes to ISE systems. These values change only as LUNs are created/deleted from ISE systems, and long sample periods (days-weeks-months) may be acceptable in environments where change is infrequent. The values below are reported in Gigabytes (GB).

Total Capacity (RAW)—Total ISE system capacity (after sparing) available for allocation for LUNs.

Used Space (RAW)—Total ISE system capacity that has been allocated for ISE LUNs.

FreeSpace (RAW)—RAW capacity (after sparing) available for creating LUNs

RAID1 Free Space—Free space available if all free capacity was allocated in a RAID1 fashion.

RAID1 Used Space—Used capacity by RAID1 ISE LUNs.

RAID5 Free Space—Free space available if all free capacity was allocated in a RAID1 fashion.

ISE Controllers

The ISE Controllers group focuses on performance from the perspective of the ISE controllers (Managed Reliability Controllers, MRCs). An individual MRC or both MRCs can be selected to present for any given ISE system. The granularity of this counter group is limited to the entire MRC; that is, it is not possible to gather data for a specific port on an MRC from this group. Performance data focused on a specific MRC port is provided by the ISE Fibre Channel Ports group. Monitoring the ISE Controllers shows both MRC states for a given ISE, whether both MRCs are actively serving I/O to the hosts or a given controller is offline for an upgrade or service event.

ISE Fibre Channel Ports

The ISE Fibre Channel group focuses on performance from the perspective of specific Fibre Channel ports on a given ISE controller (MRC). The ISE Fibre Channel group provides performance monitoring of a specific port on a specific ISE and, when compared to the other ports on the same MRC, shows the load distribution across the ports.

Note. The ISE Fibre Channel group applies only to ISE-2 and ISE 7 Series ISEs since the ISE-1 has only one Fibre Channel port per MRC and the controller data and the Fibre Channel port data would be identical.

ISE Host Connections

The ISE Host Connections group focuses on performance from the perspective of specific HBA WWNs. Each host (server/PC) connected to an ISE has one or more WWNs. For a given host, named Test1, for example, with two HBAs assigned in the ISE management tools, Test1 shows up twice in Windows Perfmon. The first is Test1 HBA-1 and the second is Test1 HBA-2. These counters make it possible to measure the load and performance each HBA port delivers to the ISE system regardless of how many volumes are presented to that host (server/PC).

ISE Virtual Disks

The ISE Virtual Disks group focuses on performance from the perspective of that workload placed on a given virtual disk by all hosts where it is presented.

Note. Any given virtual disk can have numerous host presentations.

Windows Performance Monitor Information

<http://technet.microsoft.com/en-us/library/cc749249.aspx>

Collect Logs

This chapter introduces the ISE Manager Suite **Collect Logs** view and its options in detail. The following operations are performed in Collect Logs view.

Introduction

The Collect Logs View permits the collecting of logs for all the attached ISE storage systems and ISE Manager Suite. The view includes the options for collecting ETF logs and Crash Dumps for selected ISE storage systems.

To open the Collect Logs View:

1. Click **Collect Logs** in the left navigation pane.
2. Click **Collect Logs** as shown below.

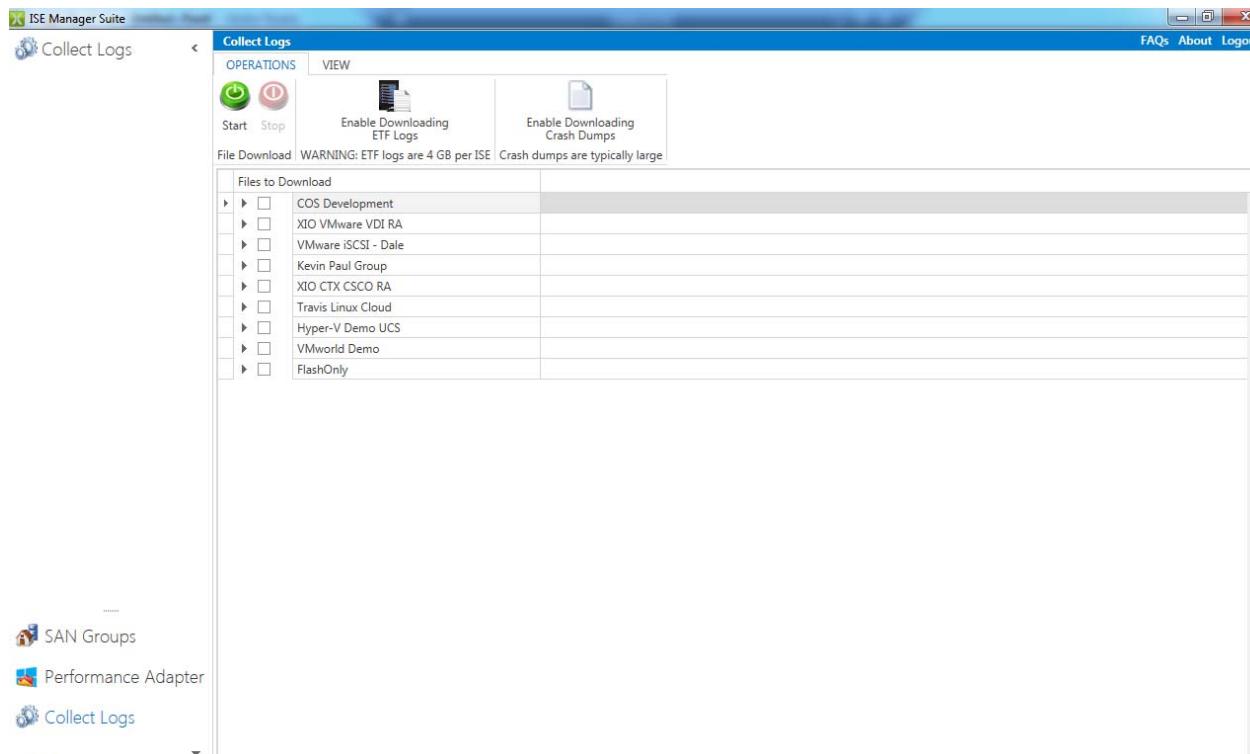
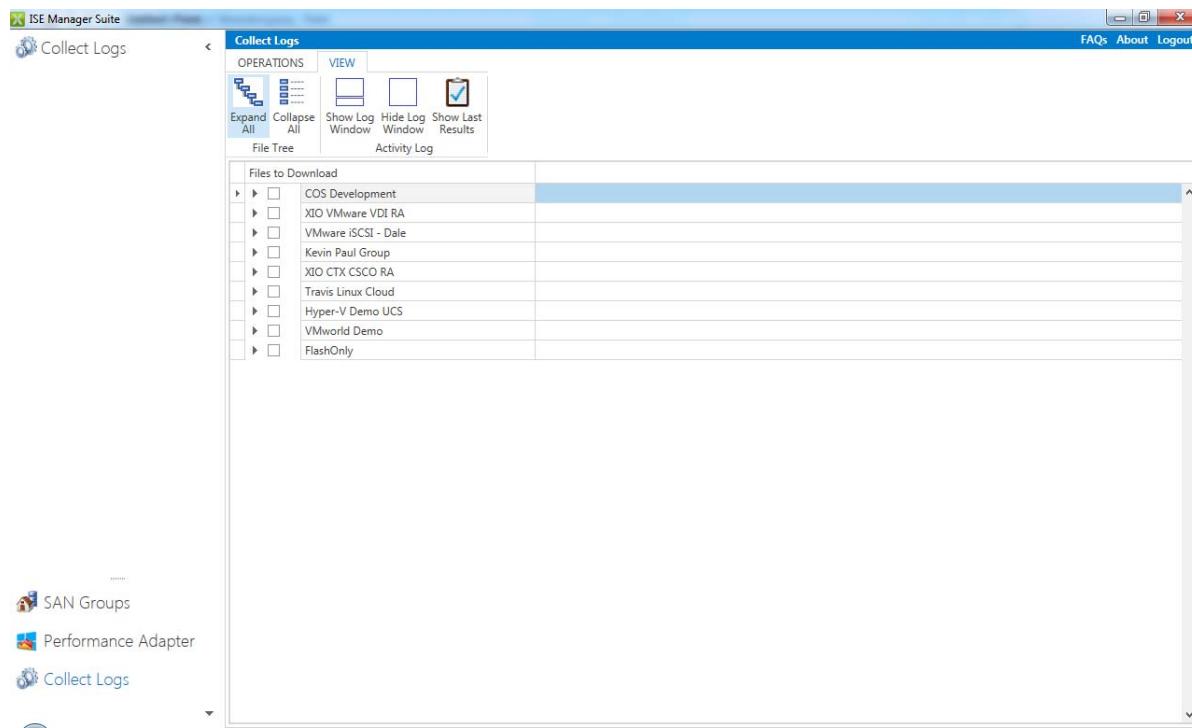
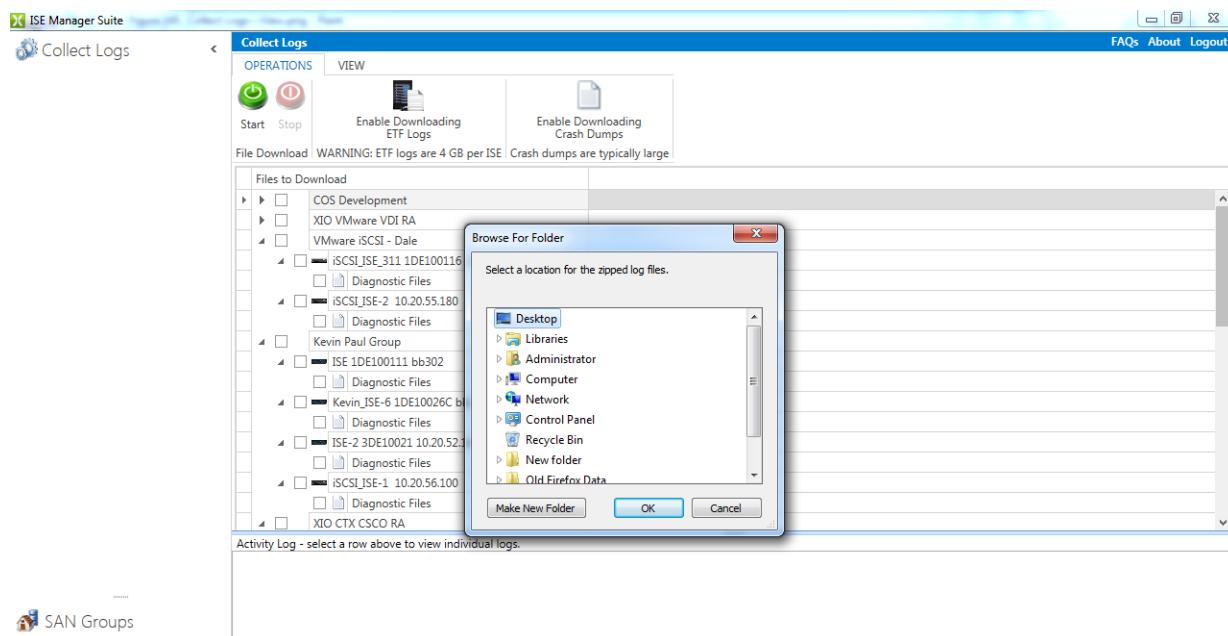


Figure 167. Collect Logs—Options

3. To view the ISE Storage Systems in each SAN Group, click **Expand All** in View as shown below.

**Figure 168. Collect Logs View**

4. Click **Enable Downloading ETF Logs** for selecting and downloading ETF logs per ISE Storage System.
5. Click **Enable Downloading Crash Dumps** for selecting and downloading Crash Dumps per ISE Storage System.
6. Select the ISE Storage Systems for downloading/collecting logs.
7. Click **Start** to start the log collection. This opens a browse dialog for selecting the location for zipped log files.

**Figure 169. Collect Logs Start**

8. To view the operation status, click **Show Log Window of Activity Log in View**.

When the log collection operation completes, a pop-up appears with the .zip file details as shown below.

9. Click **OK** to close the pop-up.

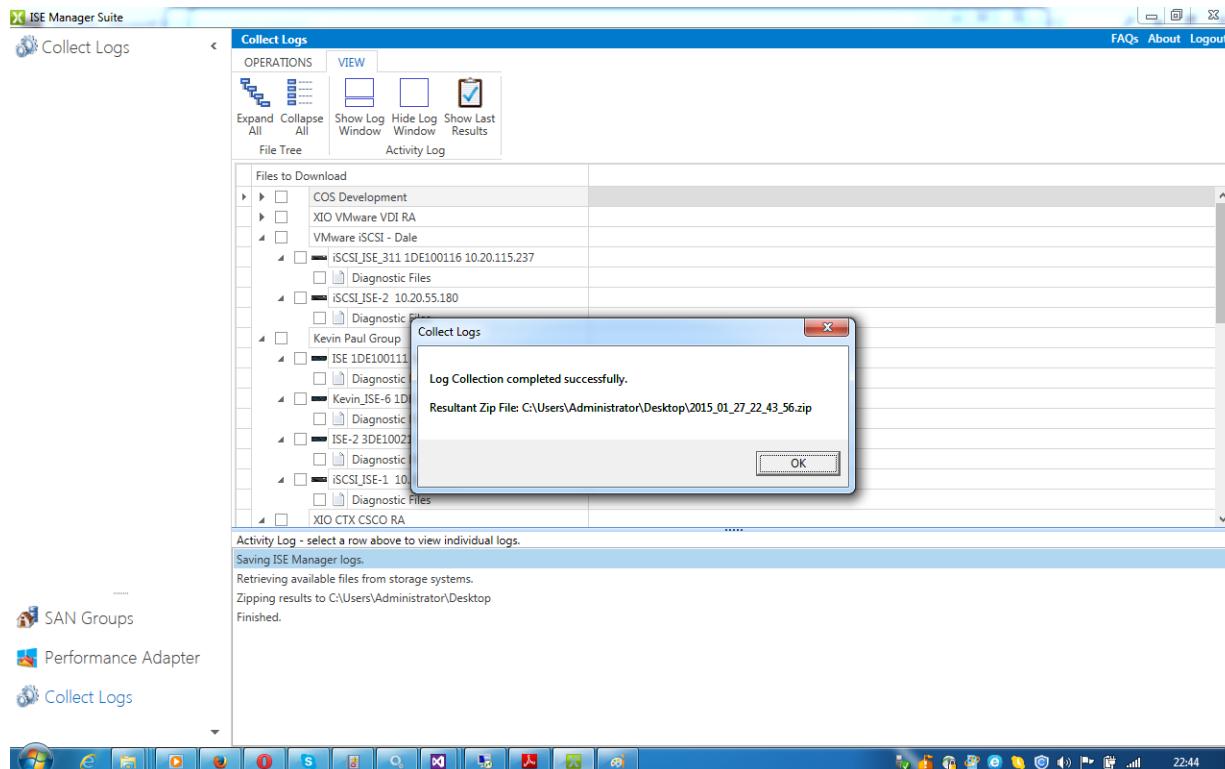


Figure 170. Report generating

10. Result information about the last collected logs can be retrieved by clicking **Show Last Results**.

Appendix A: Storage Pool Algorithm

During volume creation, ISE Manager Suite uses the following algorithm to select the optimal ISE to be used. Each ISE is verified against the below criteria and is:

- Rejected if any one these criteria are not met
- Accepted when all the criteria are met

ISE selection criteria:

1. **Duplicate name verification:** The volume name must be unique within the given ISE.
2. **DataPac type verification:** The specified DataPac type must match.
3. **RAID capacity verification:** There must be sufficient available free space.
4. **Free space verification:** When two or more pools in a given ISE must have sufficient space, free space verification ensures that the best DataPac with highest capacity is used.
5. **Volume count:** Selects the ISE with minimum volume count (i.e., the ISE with the least number of volumes).
6. **WWN verification for volume creation:** Ensures that the server selected is mapped on the chosen ISE.



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