HITACHI
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Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager

v01.10.0

User's Guide for Storage Systems

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MK-92SCOM008-10

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Preface

This document describes how to use the Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager software management packs for compute systems.

This preface includes the following information:

- Intended Audience
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Note

The use of *Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager for Storage Systems* and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems Corporation.

Intended Audience

This document is intended for system administrators, Hitachi Ltd. representatives, and authorized service providers who are involved in installing, configuring, and operating the Hitachi Storage System, Compute System and Switch families.

Readers of this document should be familiar with the following:

- Enterprise storage arrays and their basic functions.
- Hitachi Unified Storage (HUS), Virtual Storage Platform (VSP), Hitachi Unified Storage VM (HUS VM), Virtual Storage Platform G1000 (VSP G1000), Virtual Storage Platform Gx00 (VSP Gx00), Hitachi Virtual Storage Platform Fx00 (VSP Fx00), and Virtual Storage Platform G1500 (VSP G1500) and Virtual Storage Platform F1500 (VSP F1500) storage arrays.
- Hitachi NAS Platform (HNAS).
- Microsoft System Center Operations Manager.

Product Version

This document revision applies to Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager version v01.10.0 or later.

Release Notes

Release notes are on the documentation CD. Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Referenced Documents

Hitachi Infrastructure Adapter for Microsoft® System Center Operations Managerdocuments:

Hitachi Storage Adapter for Microsoft Windows PowerShell® User's Guide, MK-99DF8228-19

Hitachi Data Systems Portal, http://portal.hds.com

Related Documents

Documents related to this product:

Hitachi documents:

- *Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager Consolidated Installer User's Guide*, MK-92SCOM010
- *Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager User's Guide for Compute Systems*, MK-92SCOM009
- *Hitachi NAS Platform Storage Systems Administration,* MK-92HNAS013
- *Hitachi Storage Navigator Modular 2 Advanced Settings User's Guide*, MK-97DF8039
- *Hitachi Storage Adapter for Microsoft® Windows PowerShell User's Guide*, MK-99DF8228, MK-09DF8201
- *Hitachi Virtual Storage Platform Provisioning Guide for Open Systems*, MK-90RD7022
- *Hitachi Virtual Storage Platform Hitachi Storage Navigator User Guide*, MK-90RD7027
- *Hitachi Unified Storage VM Block Module Provisioning Guide*, MK-92HM7012
- *Hitachi Unified Storage VM Block Module Hitachi Storage Navigator User Guide*, MK-92HM7016
- *Hitachi Virtual Storage Platform G1000 Provisioning Guide for Open Systems*, MK-92RD8014
- *Hitachi Virtual Storage Platform G1000 Global-Active Device User Guide*, MK-92RD8072
- *Hitachi Virtual Storage Platform G1000 Hitachi Universal Volume Manager User Guide*, MK-92RD8024
- *Provisioning Guide for Hitachi Virtual Storage Platform Gx00 and Fx00 Models*, MK-94HM8014
- *Hitachi Virtual Storage Platform System Administrator Guide*, MK-94HM8016
- *Hitachi Command Control Interface User and Reference Guide*, MK-90RD7010
- *Hitachi Command Suite User Guide*, MK-90HC172

Hitachi Data Systems Portal, http://portal.hds.com

Microsoft documents:

- *Microsoft® technical documentation for System Center Operations Manager*

Document Conventions

This document uses the following typographic conventions:

Convention	Description
Bold	• Indicates text in a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK. • Indicates emphasized words in list items.
Italic	• Indicates a document title or emphasized words in text. • Indicates a variable, which is a placeholder for actual text you enter or text provided by the system. Example: `pairdisplay -g` *`group`* (For exceptions to this convention, see angled brackets.)
`screen/code (monospace)`	Indicates text displayed on screen or text that you enter. Example: `# pairdisplay -g oradb`
<> angled brackets	• Indicates variables in the following scenarios: Variables are not clearly separated from the surrounding text or from other variables. Example: `Status-<`*`report-name`*`><`*`file-version`*`>.csv` • Variables in headings.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can select a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must select either a or b.
| vertical bar	Indicates a choice between two or more options or arguments. Examples: [a | b] indicates that you can select a, b, or nothing. { a | b } indicates that you must select either a or b.
_ (underlined text)	Default value

This document uses the following iconographic conventions to draw attention to information:

	Label	Definition
	Note	Calls attention to important and/or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (for example, disruptive operations).
	WARNING	Warns the user of severe conditions and/or consequences (for example, destructive operations).

Convention for Storage Capacity Values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical Capacity Unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1{,}000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1{,}000^3$ bytes
1 terabyte (TB)	1,000 GB or $1{,}000^4$ bytes
1 petabyte (PB)	1,000 TB or $1{,}000^5$ bytes
1 exabyte (EB)	1,000 PB or $1{,}000^6$ bytes

Logical storage capacity values (e.g., logical device capacity) are calculated based on the following values:

Logical Capacity Unit	Value
1 block	512 bytes
1 cylinder	Mainframe: 870 KB Open-systems: • OPEN-V: 960 KB • Others: 720 KB
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or $1{,}024^2$ bytes
1 GB	1,024 MB or $1{,}024^3$ bytes
1 TB	1,024 GB or $1{,}024^4$ bytes
1 PB	1,024 TB or $1{,}024^5$ bytes
1 EB	1,024 PB or $1{,}024^6$ bytes

Getting Help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. To reach us, please visit the support Web site for current telephone numbers and other contact information: http://www.hds.com/services/support/. If you purchased this product from an authorized HDS reseller, contact that reseller for support.

Before calling the Hitachi Data Systems Support Center, please provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The exact content of any error message(s) displayed on the host system(s).

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title, number, and revision level (for example, -07), and refer to specific section(s) and paragraph(s) whenever possible. All comments become the property of Hitachi Data Systems Corporation.

Thank you!

1

Introduction

The System Center Operations Manager (SCOM) is a performance, health and state monitoring product for Microsoft Windows operating systems.

The Hitachi Storage Adapter for Microsoft® System Center Operations Manager is the storage-oriented subset of the Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager. It enables Hitachi storage device configuration, health and alert information to appear in the SCOM console.

The status of registered devices is displayed in the **Hitachi Storage Systems** folder in the directory tree shown in the Monitoring pane of the operation console.

- **Controller** displays storage device controllers.
- **Controller Port** displays storage device controller ports.
- **Drive** displays hard drives attached to Modular and Enterprise storage arrays, and SDs (system drives) visible to HNAS devices.
- **EVS** displays HNAS EVS and Unified HNAS module objects.
- **File Server Node** displays HNAS and Unified HNAS module nodes.
- **File System** displays HNAS and Unified HNAS module filesystems.
- **Link Aggregation** displays HNAS and Unified HNAS module aggregated Ethernet ports (e.g. ag1).
- **Link Aggregation Port** displays the individual Ethernet ports constituent to HNAS and Unified HNAS module port aggregation objects (e.g. ge1).
- **Logical Unit** displays LUs and LDEVs on Modular and Enterprise storage arrays, respectively.
- **Quorum Device** displays HNAS cluster quorum devices.
- **Storage Pool** displays RAID groups and similar objects on Modular and Enterprise arrays, and HNAS storage pools.
- **Subsystem** displays high-level information for each storage device.

The management pack provides the following storage performance object views in Monitoring pane of the Operations Console (under **Hitachi Storage Systems 3.11 > Performance**):

- **Controller Port Performance** displays controller port performance data for monitored HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 storage subsystems.
- **HDP Pool Performance** displays HDP pool performance data for monitored HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 storage subsystems.
- **Logical Unit Performance** displays logical unit performance data for monitored HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 storage subsystems.
- **RAID Group Performance** displays RAID group performance data for monitored HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 storage subsystems.

The management pack provides the following storage replication object views in the Monitoring pane of the Operations Console (under **Hitachi Storage Systems 3.11 > Storage Replication**).

- **HNAS Snapshot** displays snapshots for monitored HNAS and Unified NAS module file servers.
- **Remote Storage Replication** displays remote storage replication information for monitored storage devices.
- **Storage Replication** displays storage replication information for monitored storage devices.

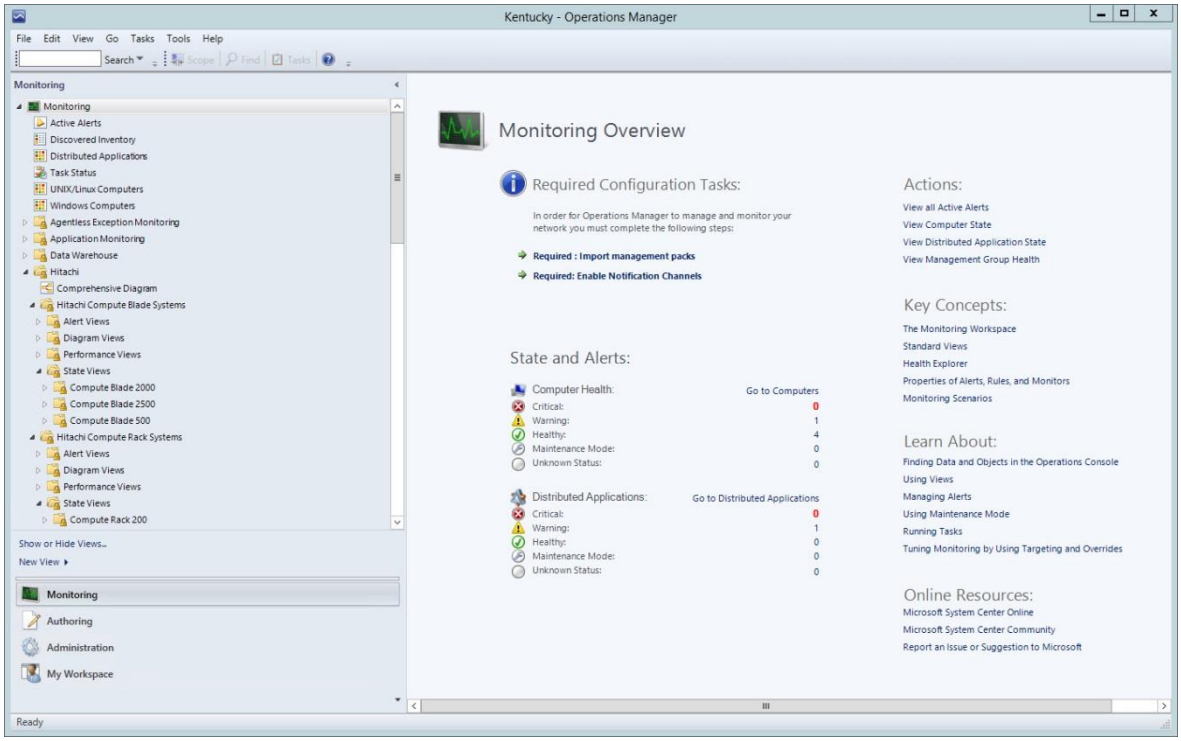
Storage alerts are displayed under **Hitachi Storage Systems Alerts**.

- **Alerts** displays alerts collected from HUS, VSP, HUS VM, VSP G1000, VSP Gx00, and VSP Fx00 storage subsystems; HNAS or Unified NAS Module subsystems are not supported
- **Connector Alerts** displays alerts when HSCS (the SCOM adapter Windows service) stops running.
- **SNMP Alerts** displays alerts when SCOM receives SNMP traps directly from HUS VM, HNAS, Unified NAS module, VSP, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 arrays.

2

Setup and Configuration

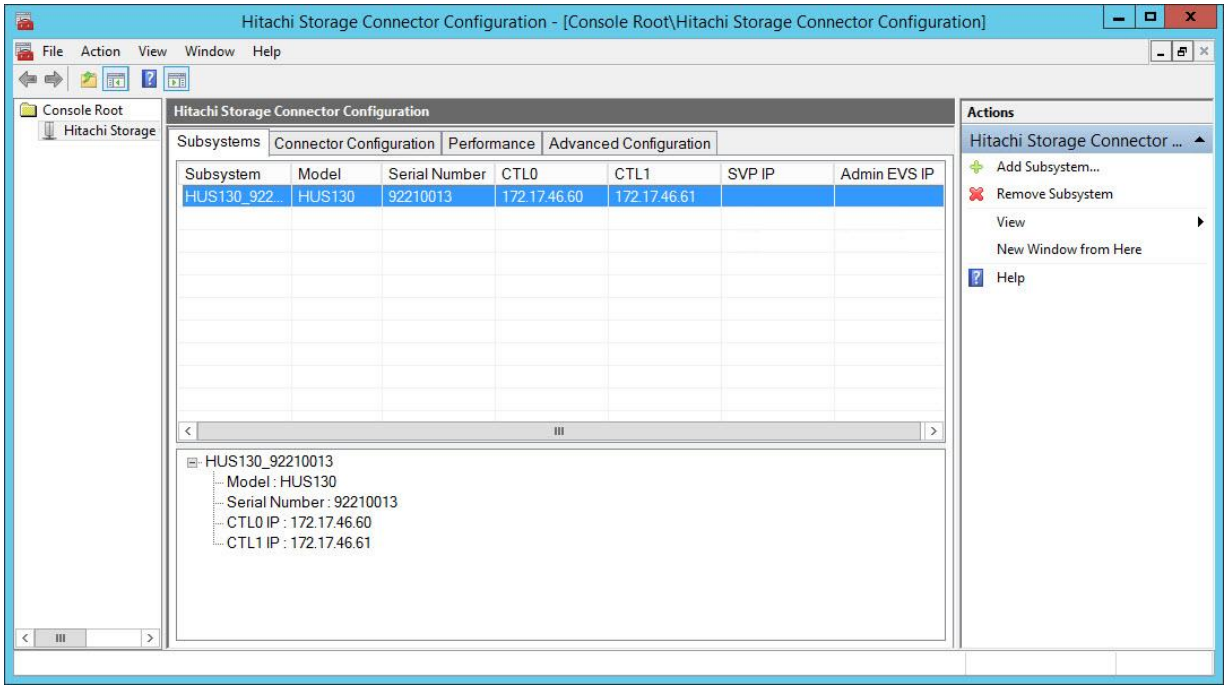
The Hitachi Storage Adapter for Microsoft® System Center Operations Manager view appears in the Monitoring view of the SCOM console.



Adding a subsystem

1. Open the Microsoft Management Console (MMC) from the Windows from the Windows **Start** menu.

   Select: **All Programs > Hitachi > Hitachi Storage Management Pack for SCOM > Hitachi Storage Connector Configuration**.



Important

Support for monitoring global storage virtualization Virtual DKCs must be enabled prior to configuring the SCOM adapter to monitor them.

To enable this support:

1. Stop the Connector service.
2. Using a text editor, open the *HiScomConnectorService.exe.config* file from the installation directory.
3. Find the following line:

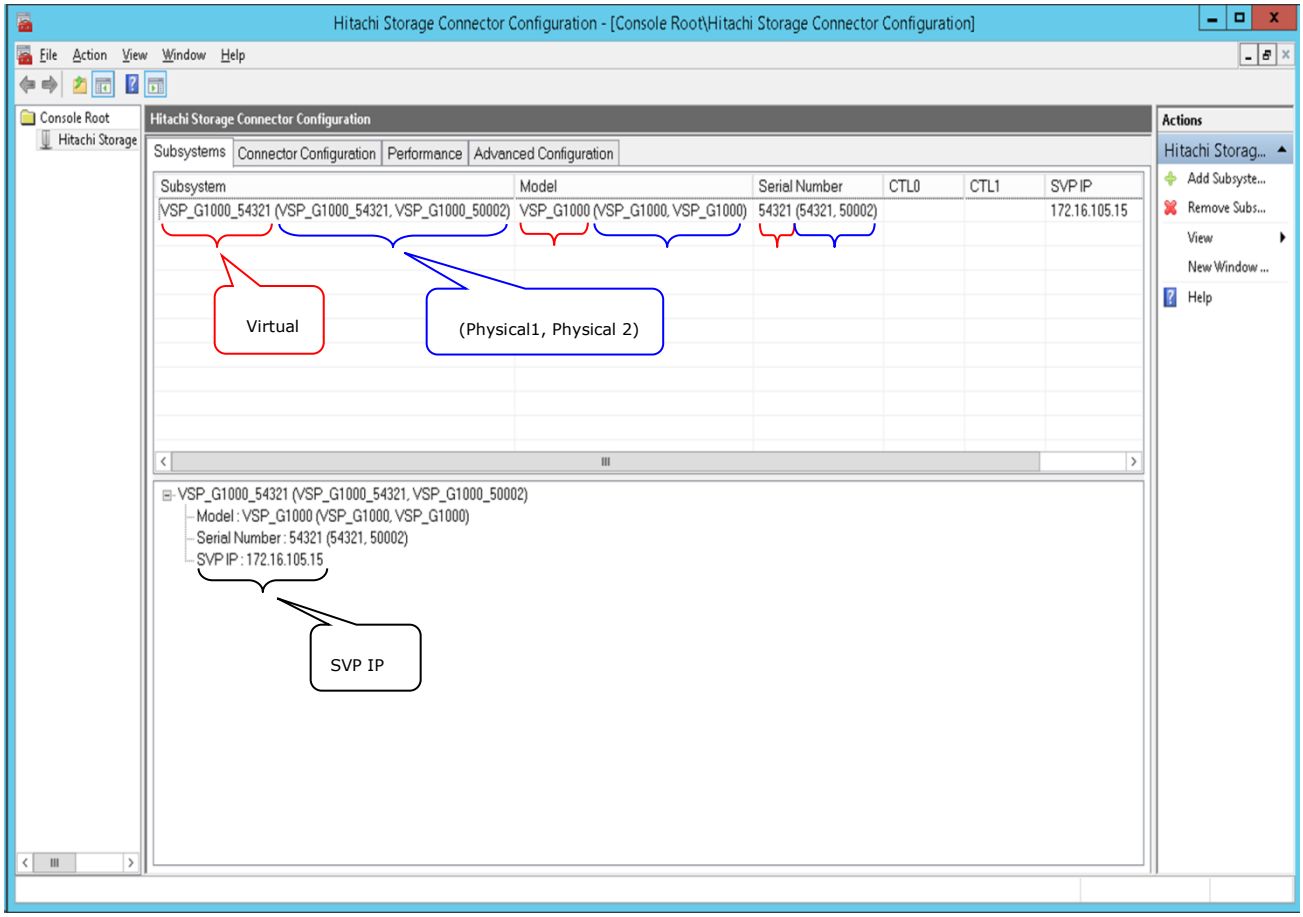
   <add key="VirtualStorageSupportMode" value="false" />
4. Change the value from “false” to “true”.

   <add key="VirtualStorageSupportMode" value="true" />

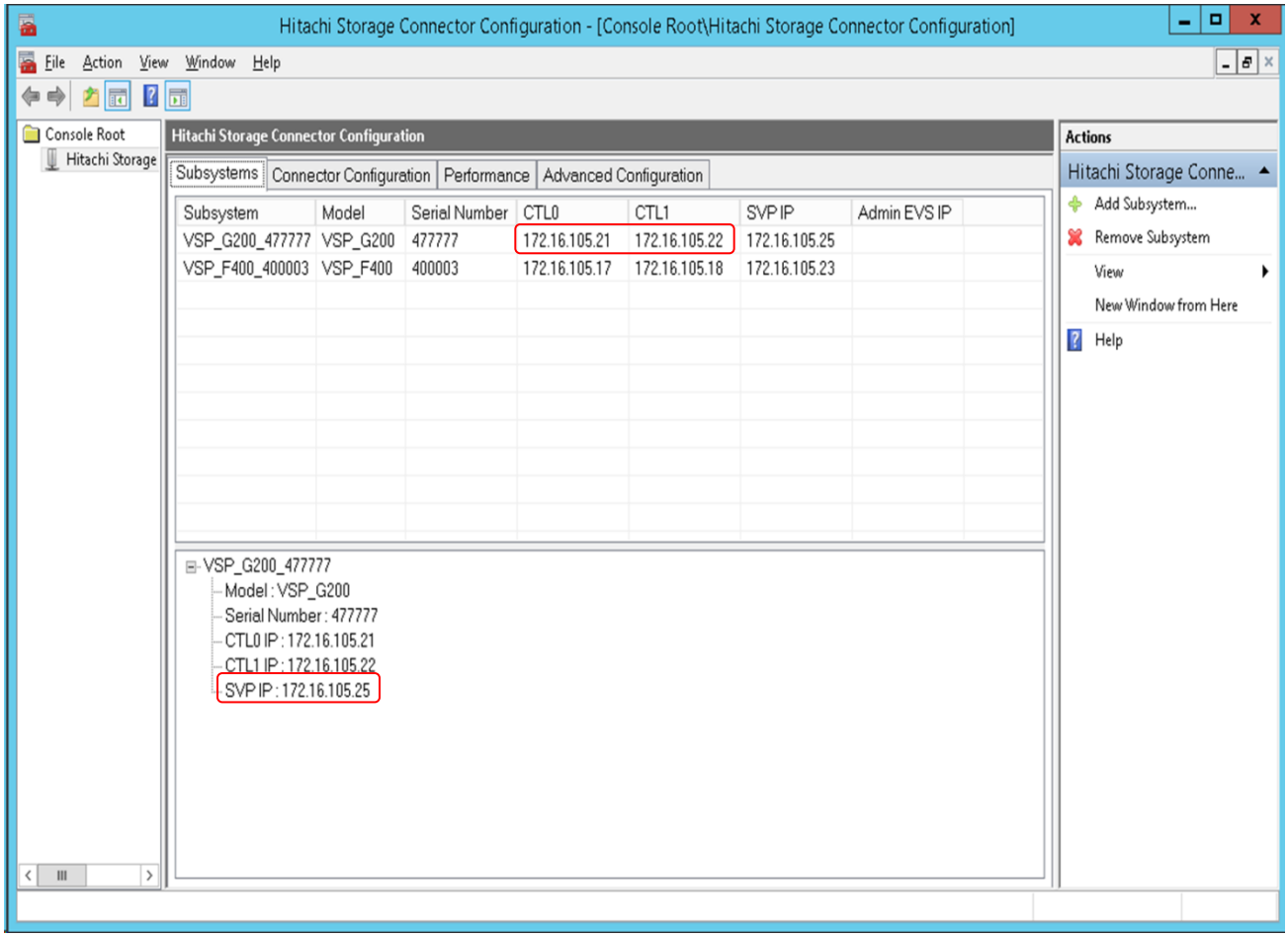
Global storage virtualization Virtual DKCs can be monitored by adding VSP G1000 arrays, VSP Gx00, VSP Fx00, VSP G1500, or VSP F1500 arrays, and entering the serial numbers which correspond to the Virtual DKCs. The screenshot below shows how this looks.

The Virtual DKC information specified when registering the storage system is displayed in Subsystem, Model and Serial Number columns. The Physical DKC(s) upon which the Virtual DKC resides are displayed in parentheses.

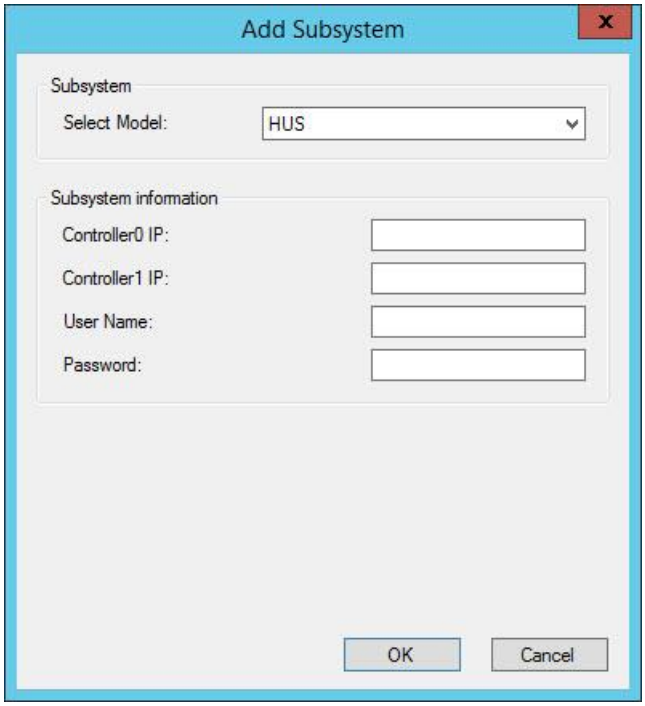
Virtual DKCs configured across multiple Physical DKCs are displayed in this format: Virtual DKC (Physical DKC1, Physical DKC2). There is a 1:N correlation between Virtual DKCs and Physical DKCs.


Hitachi Storage Connector Configuration - [Console Root\Hitachi Storage Connector Configuration]
File Action View Window Help
Console Root
Hitachi Storage
Hitachi Storage Connector Configuration
Subsystems
Connector Configuration
Performance
Advanced Configuration
Subsystem
Model
Serial Number
CTL0
CTL1
SVP IP
VSP_G1000_54321 (VSP_G1000_54321, VSP_G1000_50002)
VSP_G1000 (VSP_G1000, VSP_G1000)
54321 (54321, 50002)
172.16.105.15
Virtual
(Physical1, Physical 2)
VSP_G1000_54321 (VSP_G1000_54321, VSP_G1000_50002)
Model : VSP_G1000 (VSP_G1000, VSP_G1000)
Serial Number : 54321 (54321, 50002)
SVP IP : 172.16.105.15
SVP IP
Actions
Hitachi Storag...
Add Subsyste...
Remove Subs...
View
New Window ...
Help

When VSP Gx00 or VSP Fx00 arrays are being used, the Controller 0 IP field corresponds to Controller 1 of the array, while the Controller 1 IP field corresponds to Controller 2.



2. In the **Actions** pane of the console, click **Add subsystem**.

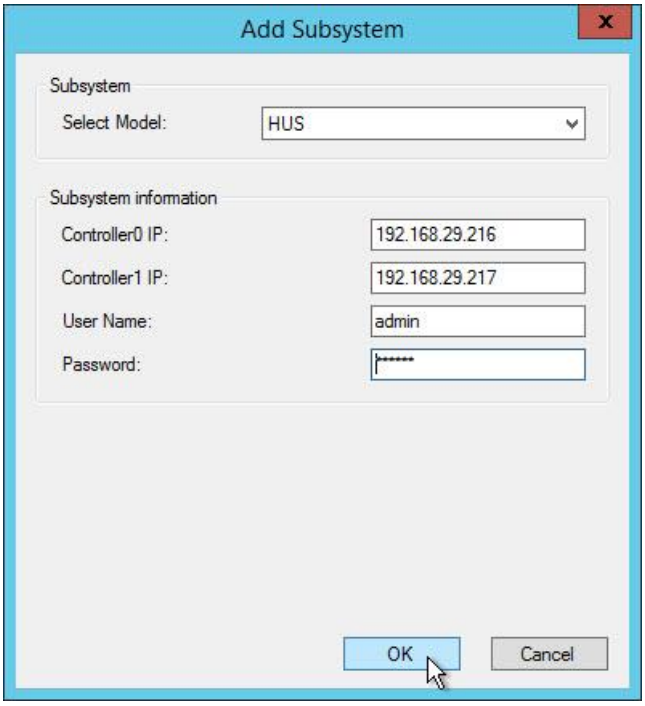


Notes

1. If the credentials used to access a subsystem change after the subsystem has been added, the current subsystem information may stop appearing in the SCOM console. To change the credentials used by the Hitachi SCOM Management Pack, remove and re-add the subsystem configuration.
2. When adding any authenticated storage subsystem, the account must have resource View or Modify permission.
3. After migrating a physical VSP array to a VSP G1000 Virtual DKC, it is necessary to remove the VSP monitoring configuration from this MMC snap-in for this adapter and re-add it.
4. When entering a username and password, enter between 1 and 256 alphanumeric characters, including the following special characters: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ \ [ ] ^ _ ' ` { | } ~

3. From the Subsystem **Select Model** list, select the subsystem you want to add.

- Adding an HUS subsystem:
  a. Select **HUS** from the **Select Model** list.



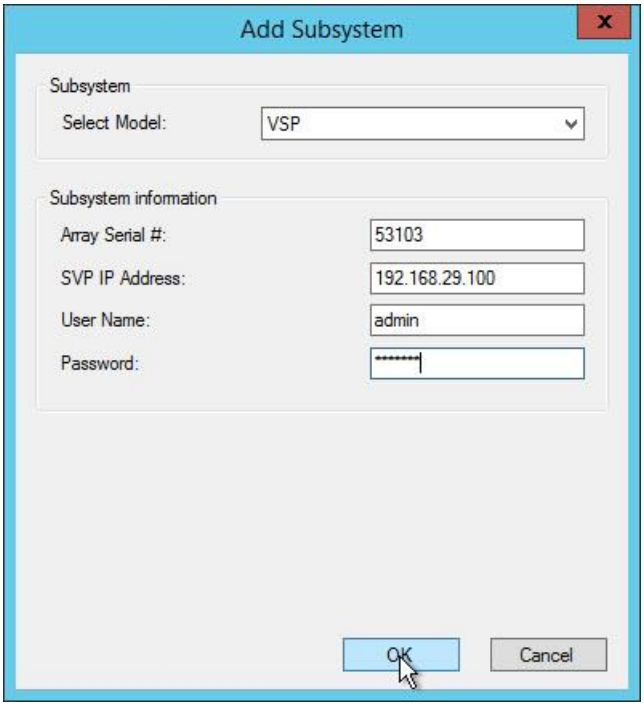
b. In **Controller0 IP** and **Controller1 IP**, enter the IP addresses for the system you are adding.

c. If the array is configured to use authentication, enter the credentials into the **User Name** and **Password** fields.

d. Click **OK**.

- Adding a VSP/HUS VM/VSP G1000/VSP G1500/VSP F1500 subsystem:

  a. Select a model from the **Select Model** list.



  b. In **Array Serial #**, enter the serial number for the system you are adding.

  c. In **SVP IP Address**, enter the server IP address.

  d. If the array is configured to use authentication, enter the credentials into the **User Name** and **Password** fields.

  e. Click **OK**.

Notes

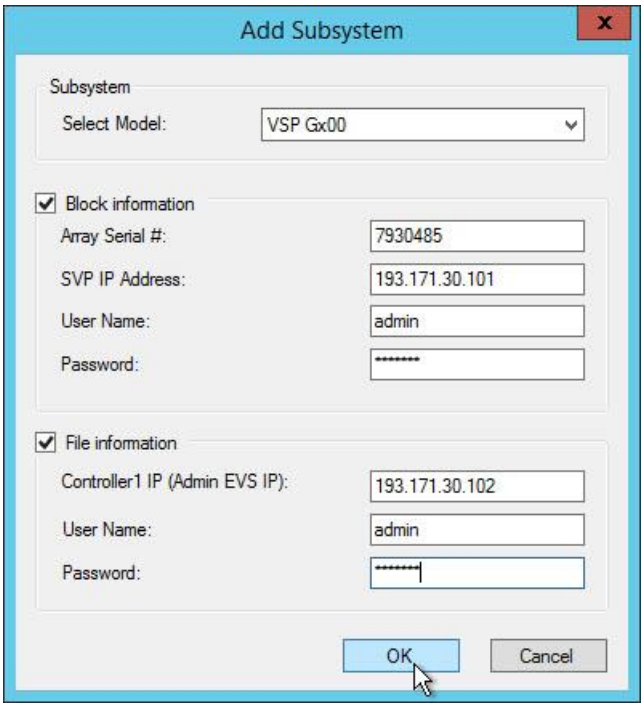
1. An array command device must be mapped to the SCOM adapter host, and the Command Control Interface (CCI) software must be installed before registering Enterprise family storage arrays. After installing the CCI software, you must restart both the Connector service and the SCOM adapter's MMC snap-in; otherwise, registration will fail.
2. In some environments, additional SCOM adapter configuration may be required to monitor Enterprise family storage arrays. See *Monitoring Enterprise Arrays* more information.
3. To monitor a global storage virtualization Virtual DKC, enter the serial number for the Virtual DKC when registering the storage system. When registering Virtual DKCs, SVP alert monitoring is not supported.
4. If you upgrade a VSP G1000 subsystem while it is operating to a VSP G1500, the display for the VSP G1000 subsystem will appear as UNKNOWN. Remove any VSP G1000 subsystem(s) that appear as UNKNOWN, then add the VSP G1500 subsystem.

Caution

When monitoring Thin Image pair snapshot groups and cascade types, only users with permission to access all resource groups can add storage systems.

- Adding a VSP Gx00/VSP Fx00 subsystem:

  a. Select a model from the **Select Model** list.



  b. (*Optional*) Enter block information (select the checkbox to activate).
     - In **Array Serial #**, enter the serial number for the system you are adding.
     - In **SVP IP Address**, enter the server IP address.
     - If the array is configured to use authentication, enter the credentials into the **User Name** and **Password** fields.

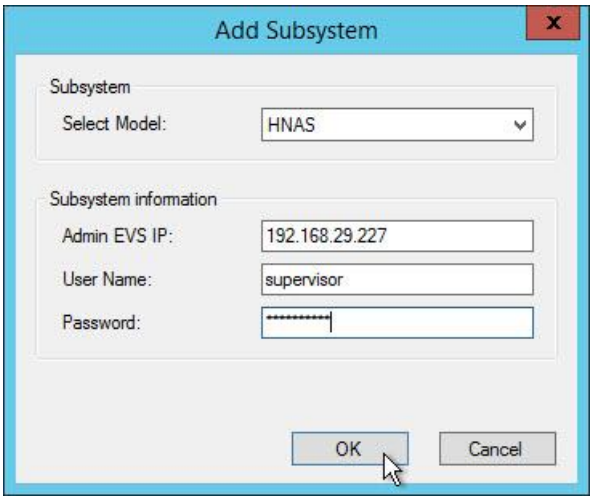
  c. (*Optional*) Enter file information (select the checkbox to activate).
     - In **Controller1 IP (Admin EVS IP)**, enter the IP address for the system you are adding.
     - If the array is configured to use authentication, enter the credentials into the **User Name** and **Password** fields.

  d. Click **OK**.

If you are entering block information, in the File Information fields, enter the Unified HNAS for the subsystem you entered in the block information.

- Adding an HNAS subsystem:

  a. Select **HNAS** from the **Select** Model list.



  b. In **Admin EVS IP**, enter the IP address for the HNAS Admin services enterprise virtual server (EVS).

  c. If the array is configured to use authentication, enter the credentials into the **User Name** and **Password** fields.

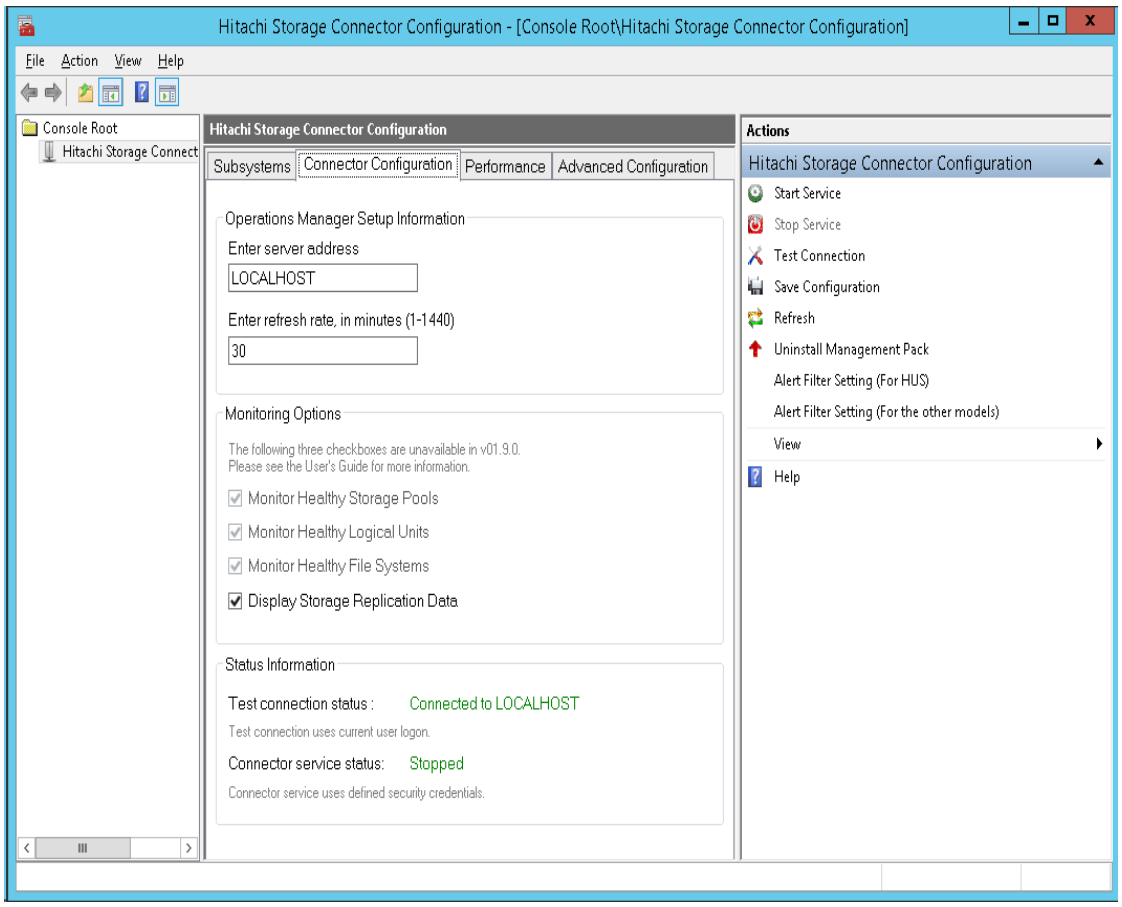
  d. Click **OK**.

Notes

1. The IP address entered for **Admin EVS IP** should correspond to the an HNAS Admin services EVS.
2. This adapter should be installed on a computer that has TCP/IP connectivity with the HNAS Admin services EVS. This adapter depends on being able to log in to the Admin services EVS with ssh.
3. If HNAS registration fails despite having used the Admin services EVS IP address, use an SSH client to confirm that it is possible to login to the Admin services EVS from the computer on which the this adapter is installed.

Configuring the Hitachi Storage Connector

The Connector Configuration tab of the Hitachi Storage Connector Configuration console is where you enter the configuration settings for the storage connector service.



Note
Any time you enter or modify the configuration settings, you must stop and restart the storage connector service.

1. Open the Hitachi Storage Connector from the Windows Start menu.

   Select: **All Programs > Hitachi > Hitachi Storage Management Pack for SCOM > Hitachi Storage Connector Configuration**.

Note

The account used to start the MMC console must be a member of the Administrators group on the computer(s) running SCOM and the Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager. See *Account permissions for installing and using the Hitachi Infrastructure Adapter for SCOM* in the *Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager Consolidated Installer User's Guide*.

2. Click the **Configuration** tab.

3. Enter the Operation Manager Setup Information

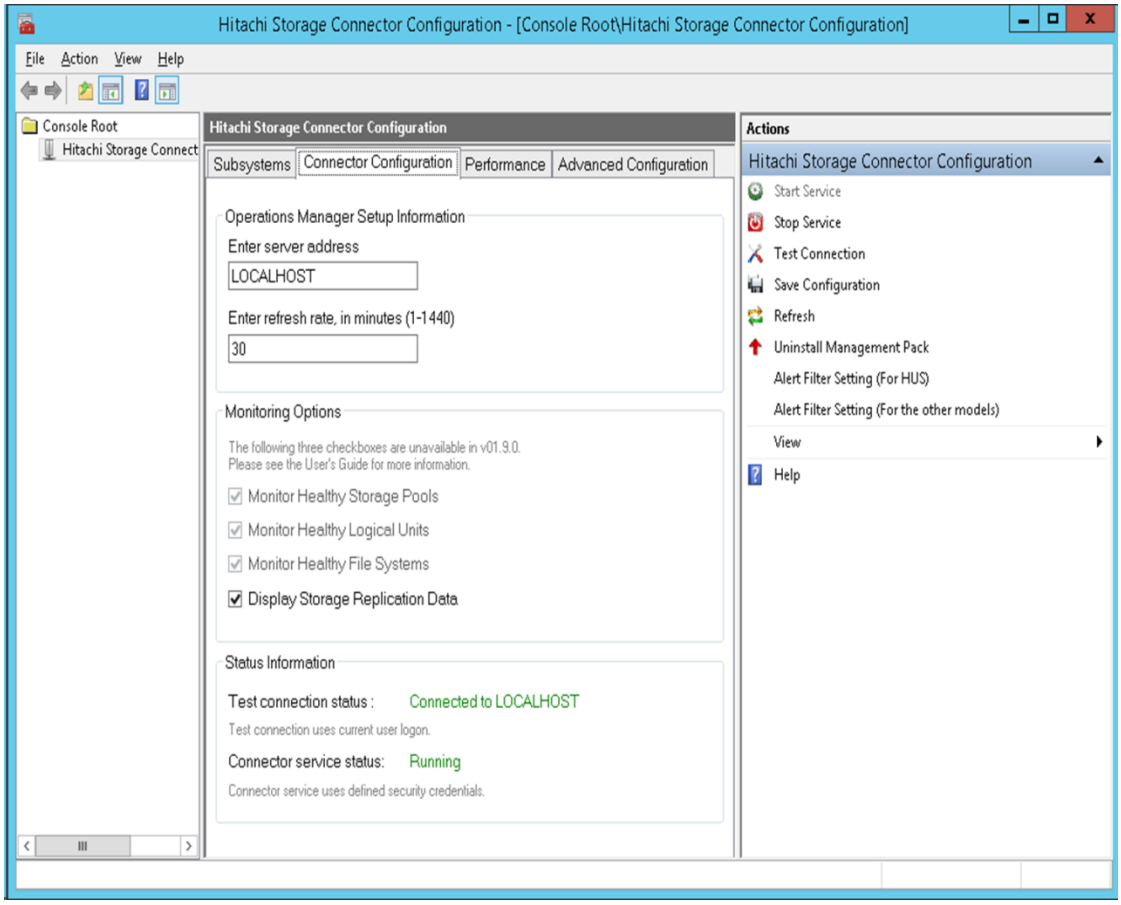
   a. For the server address, enter LOCALHOST if the SCOM server is local. Or, enter the IP address or hostname if the SCOM server is remote.

   b. Enter a refresh rate for the data collection interval. The default refresh rate is 30 minutes.

   c. In the **Actions** pane, click **Save Configuration**.

4. Start the storage connector service.

   In the **Actions** pane, click **Start Service**. The connector service status changes from **Not Running** to **Starting** to Running. The status of the storage connector service is displayed on the Connector Configuration tab and it is updated automatically every 30 seconds.



Notes

1. The first storage connector service started installs the Hitachi Storage Management Pack for Microsoft SCOM and the connector settings on the SCOM server.
2. For the storage connector service to start, the System Center Data Access service on the SCOM server must be running.

5. (Optional) Test the connection between the storage adapter for SCOM and the SCOM server.

   In the **Actions** pane, click **Test Connection**. A message is displayed notifying you that the operation manager is or is not connected. The connection status is also displayed on the Connector Configuration tab.

6. Save the configuration settings.

   In the **Actions** pane, click **Save Configuration**.

Verifying management pack installation on the SCOM server

The Administration view of the Microsoft System Center Operations Manager 2012 or 2016 console is where you verify that the current version of the management packs have been installed on the SCOM server.

1. Open the Operations Console from the Windows Start menu.

   Select either:

   All Programs > Microsoft System Center 2012 > Operations Console

   All Programs > Microsoft System Center 2016 > Operations Console

2. Click **Administration** to display the Administration view.
3. Select **Management Packs** to display the list of installed management packs.
4. Verify that the installed version of the **Hitachi Storage Systems** management pack is the current version.

Note

While uninstalling this adapter, the installer does not remove the management pack and the connector settings from SCOM. To remove the management pack and settings, in the **Administration** view of the Operations Console, select the management pack to be uninstalled; then, from the **Actions** pane, click **Delete**.

Accessing the Hitachi Storage PowerShell Console

The Hitachi Storage Adapter for Microsoft Windows PowerShell® enables Hitachi storage administrators to extend Microsoft Windows PowerShell® with cmdlets that perform Hitachi storage device operations.

A link named **PowerShell Console** is added to SCOM to conveniently start the PowerShell adapter. You must install the Hitachi Storage Adapter for Microsoft Windows PowerShell before this link will function.

The **PowerShell Console** link appears in the SCOM Console **Actions** pane under Hitachi Storage Subsystems Tasks, as shown:

The **PowerShell Console** link appears in the Subsystem, HDP Pool, Storage Pool, RAID Group, Drive, Controller, Controller Port and Logical Unit state views and the monitored components alert views.

For more information see *Hitachi Storage Adapter for Microsoft Windows PowerShell® User's Guide, MK-99DF8228-19*.

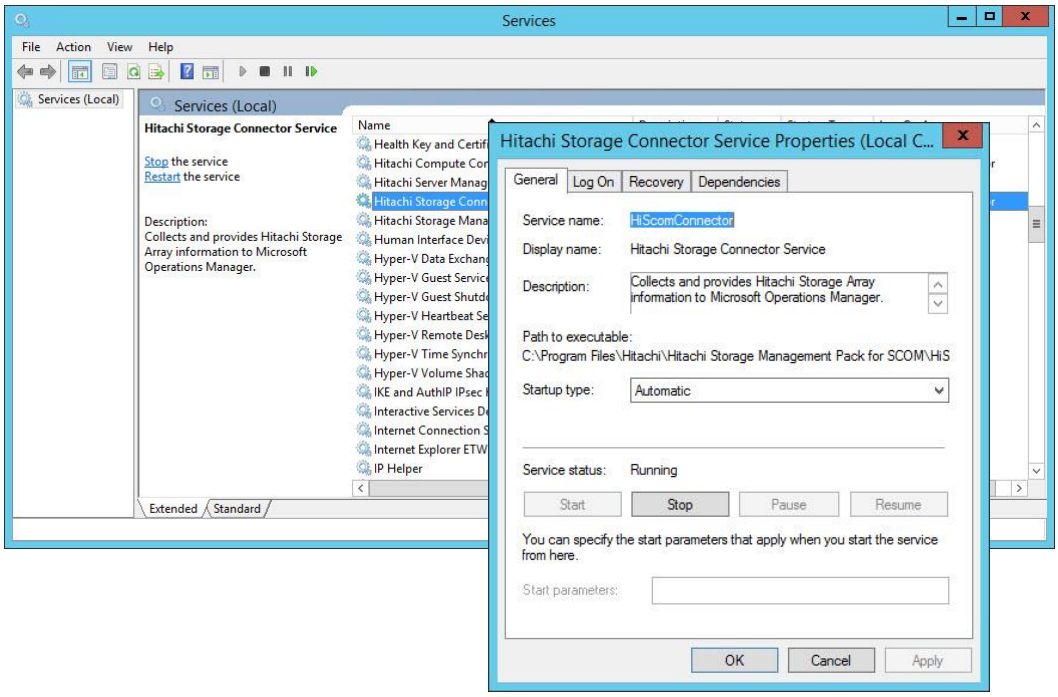
Accessing Hitachi Storage Connector Service Properties

The Services console of the Windows Control Panel is where you view the properties of the Hitachi Storage Connector Configuration service.

1. Open the Services console from the Windows Start menu.

   Select: **Control Panel > Administrative Tools > Services**

2. Right-click on **Hitachi Storage Connector Service**, then select Properties from the Action menu.



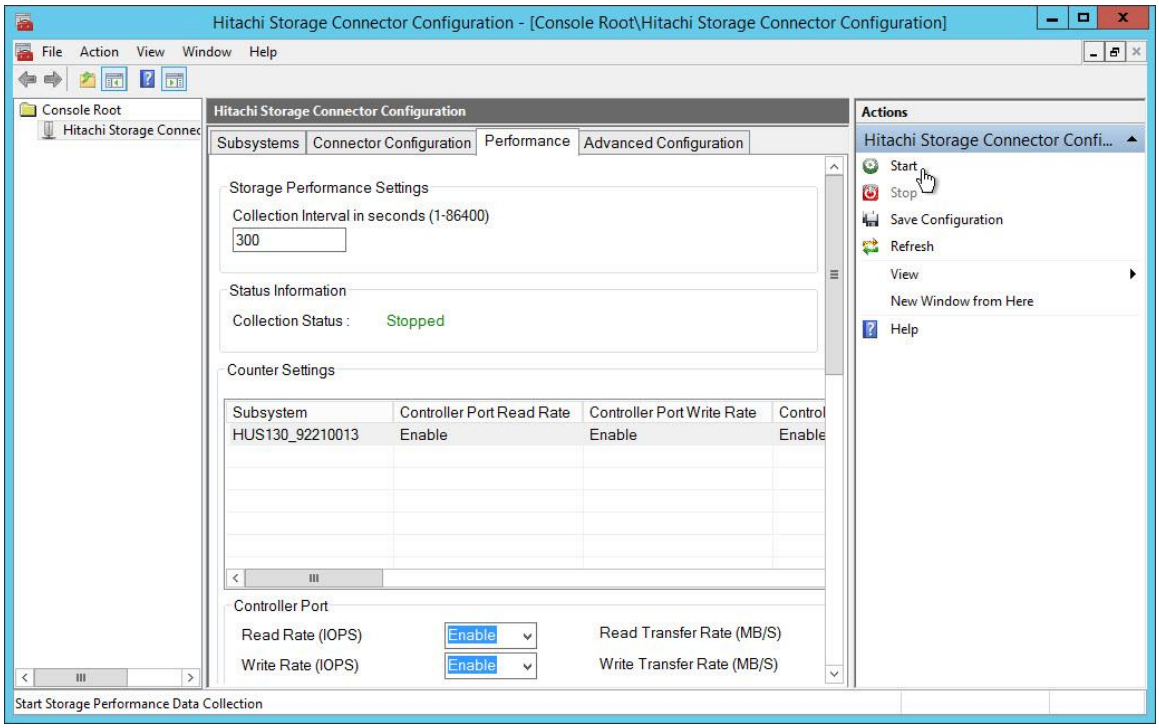
Configuring Performance Monitoring

These steps configure the SCOM adapter to display Hitachi device performance information in the SCOM console.

1. Enable Performance Monitoring for HUS subsystems.
   a. Open the Hitachi Storage Navigator Modular 2 Web application.
   b. Go to **Performance > Monitoring** screen.
   c. Enable the following performance measurement items:

- Port Information
- RAID Group, DP Pool and Logical Unit Information

2. Enable Performance Monitoring for VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 subsystems.
   a. Open the Hitachi Storage Navigator instance that corresponds to the storage device being configured.
   b. Go to the **Performance Monitor** screen.
   c. Click **Edit Monitoring Switch**.
   d. Click **Enable**.
   e. Click **Finish**.
3. Enable SCOM Adapter Performance Monitoring.
   a. Open the Hitachi Storage Connector Configuration console.
   b. Select the **Connector Configuration** tab and click **Start Service** to start the storage connector service.
   c. Select the **Performance** tab, enter a performance data collection interval.
   d. Click **Save Configuration**. The default interval is 300 seconds.
   e. Click **Start** to start performance monitoring.



Note

The Collection Status value is refreshed every 30 seconds.

Supporting Maintenance Mode

When a monitored object is put into Maintenance mode, all of its constituent objects are also put into Maintenance mode.

For example, if Storage Pool 1-12 contains LDEV 00:00:22 and LDEV 00:00:23, when Storage Pool 1-12 is put into Maintenance mode, LDEV 00:00:22 and LDEV 00:00:23 are also put into Maintenance mode.

Objects in Maintenance mode are changed to the **Not monitored** state from the current state (which could be **Healthy**, **Warning** or **Critical**).

When a monitored object is in Maintenance mode, the Connector Windows service does not send WMI events to update their health states.

When monitored objects are brought out of Maintenance mode, their health state is set to **Healthy** regardless of the state they were in before being put into Maintenance mode. The Connector Windows service subsequently resumes sending WMI events to update their health states.

When monitored objects are in Maintenance mode, no alerts are generated or resolved.

Monitoring SNMP Trap Alerts

Enterprise family arrays (VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500, HNAS, and Unified NAS module) can use SNMP (Simple Network Management Protocol) to report hardware and environmental events. You can configure the subsystems and SCOM to display these events as alerts in the Monitoring pane of the SCOM console.

Notes

1. While it is possible to monitor SNMP traps while the Connector process is running, the Connector is not strictly required for this feature to work. To monitor SNMP traps without running the Connector, manually import the Hitachi.Storage.VSP.Alerts.mp Management Pack into SCOM, then follow the configuration steps shown in this section.
2. It is not possible to monitor SNMP traps from global storage virtualization Virtual DKCs.
3. SNMP versions v1/v2c are supported, but v3 is not because it is not supported by SCOM itself.

To use this feature, the array must be configured to send events to the SCOM host, and SCOM must be configured to receive them.

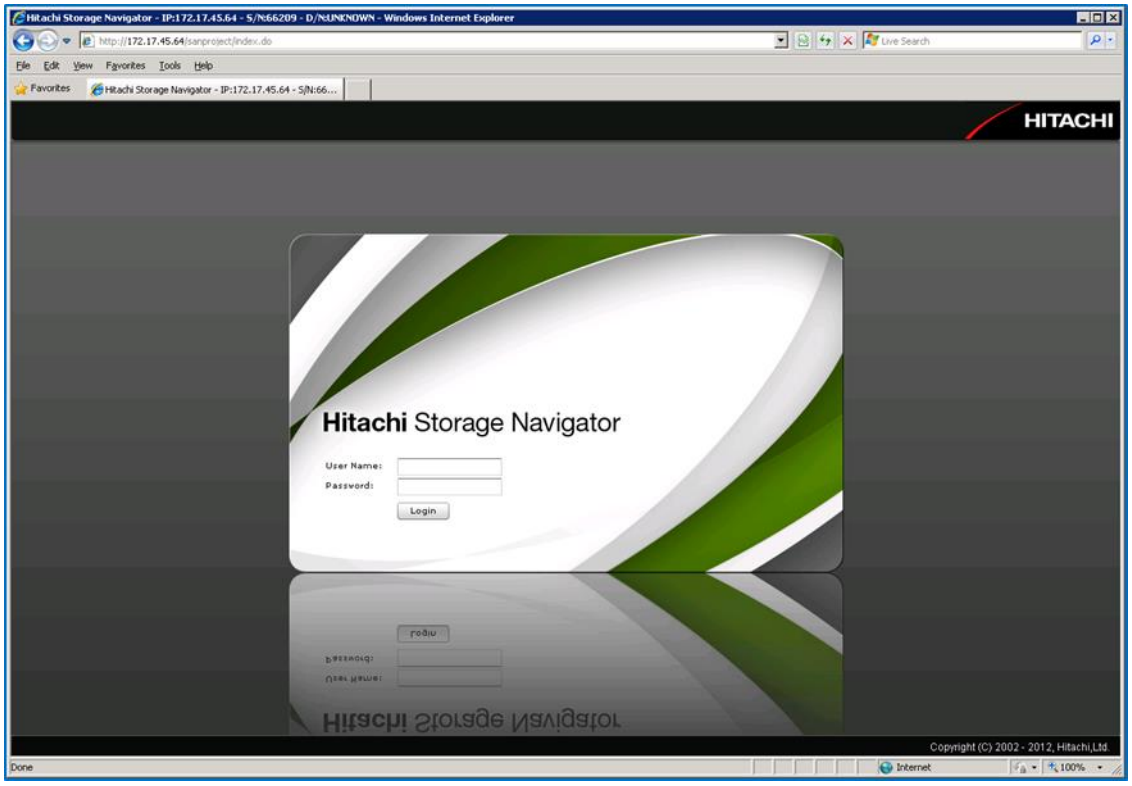
SCOM monitors Hitachi arrays as SNMP network devices. SNMP trap alerts are generated by SNMP traps sent by the subsystems.

Configuring a VSP subsystem to send SNMP traps to SCOM

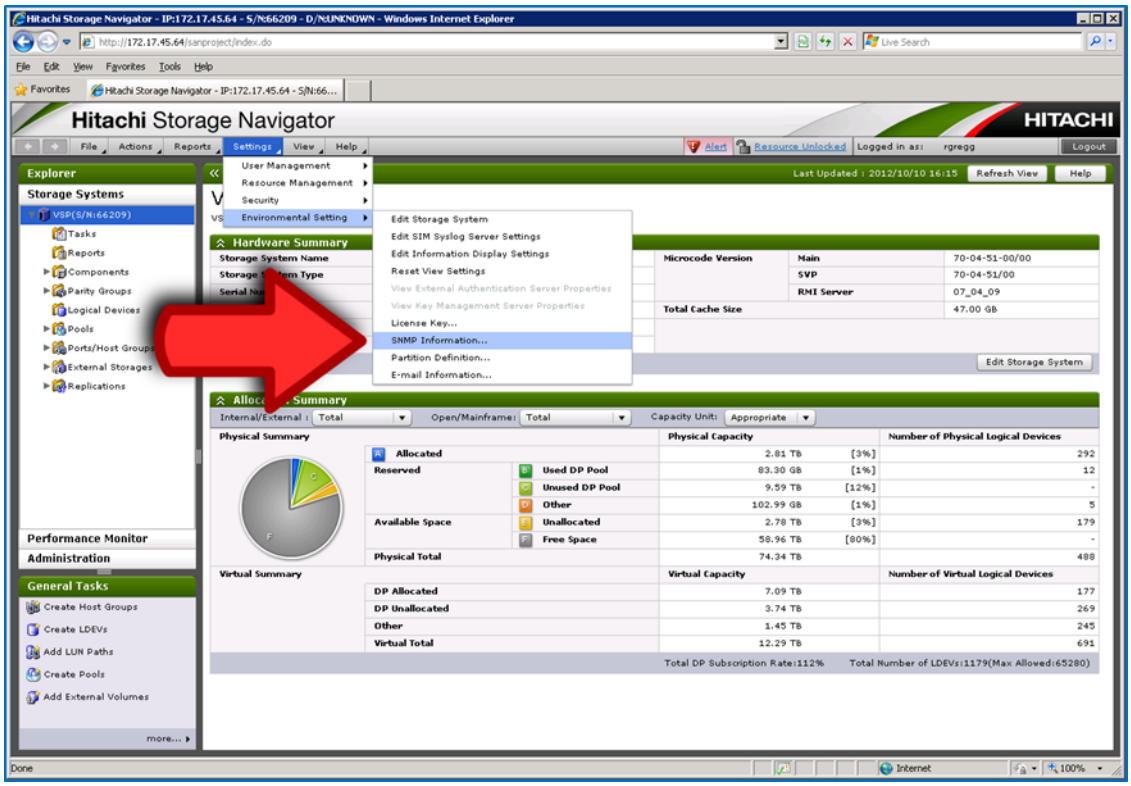
Note

The images shown in the procedure below are of an original VSP subsystem; however, the steps are similar for configuring VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 subsystems.

1. Open a Web browser and enter the IP address of the management network interface for the VSP subsystem. Ensure the web browser you are using allows popup windows. You will see the Hitachi Storage Navigator login screen.

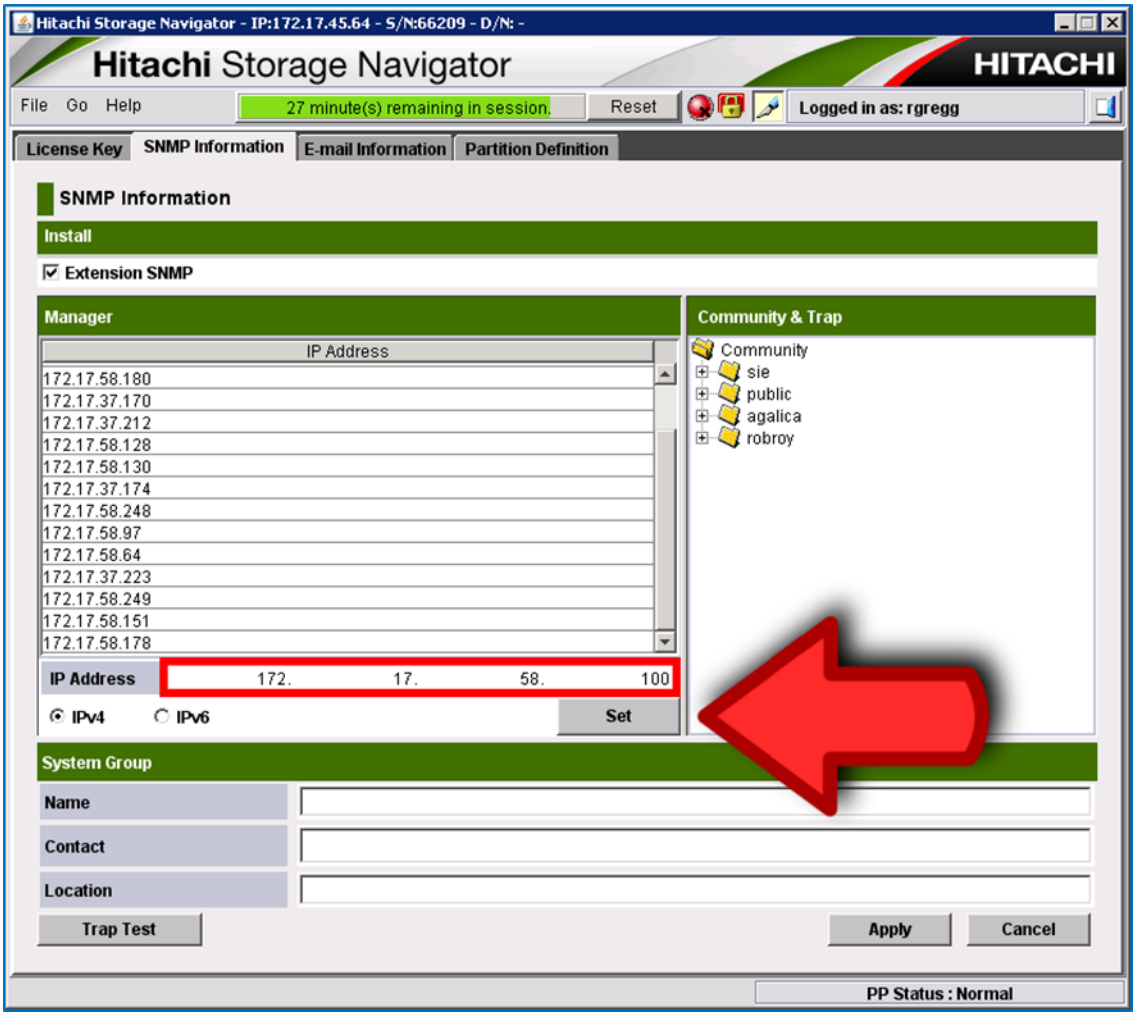


2. Login, then select **Settings > Environmental Setting > SNMP Information**.

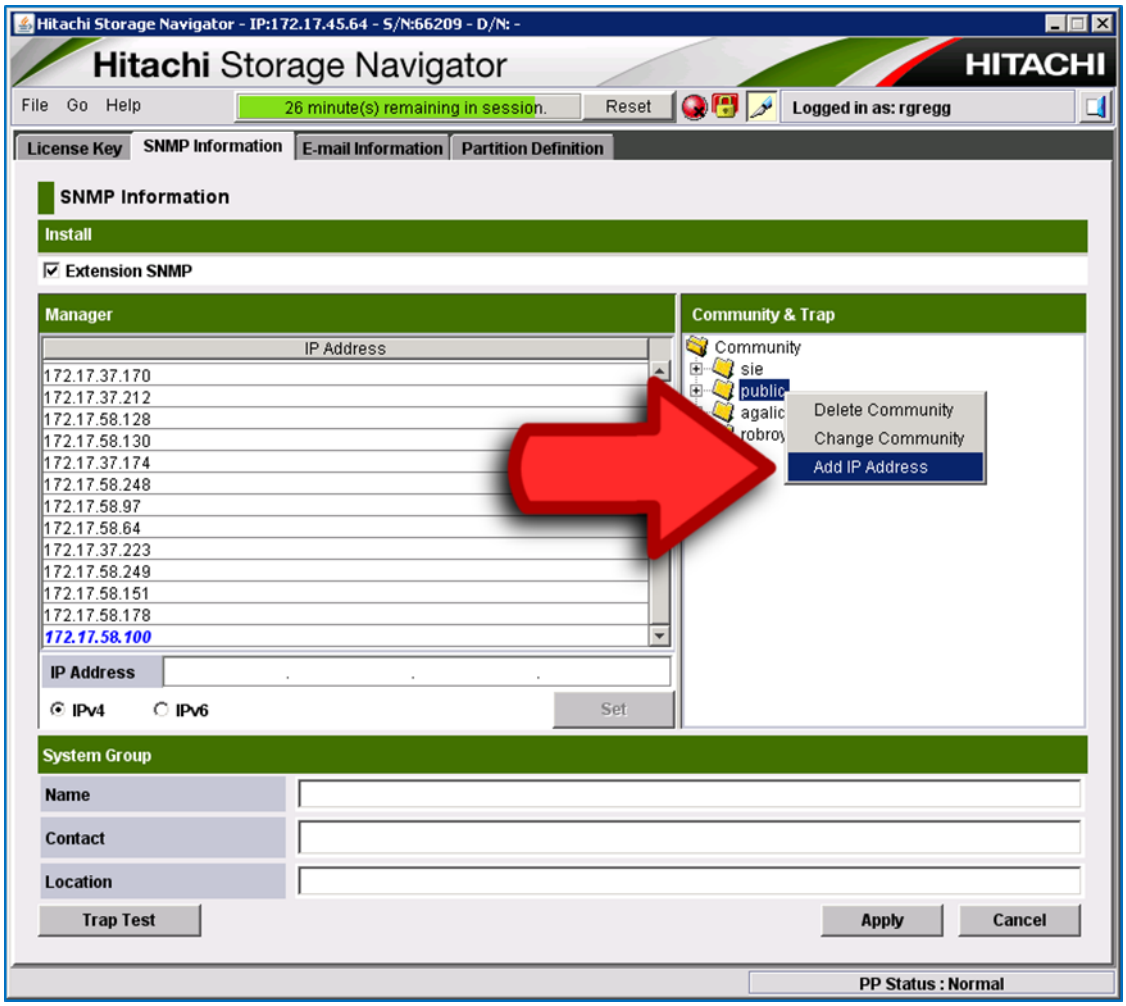


3. A new window appears. Enter modify mode to make the configuration changes.

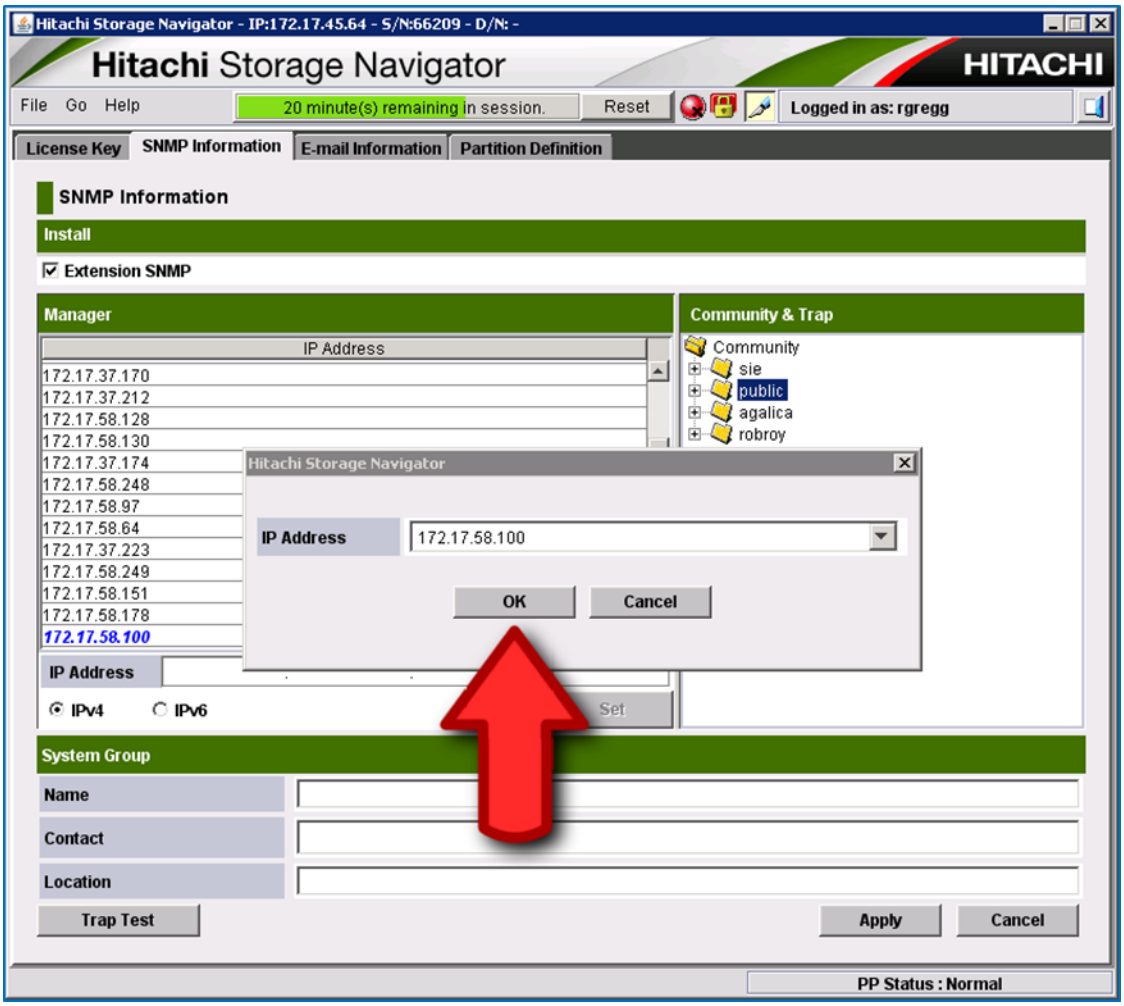
4. Enter the IP address for the SCOM host; click **Set**. In this example, the SCOM host IP address is 172.17.58.100.


Hitachi Storage Navigator - IP:172.17.45.64 - S/N:66209 - D/N: -
Hitachi Storage Navigator
HITACHI
File Go Help
27 minute(s) remaining in session.
Reset
Logged in as: rgregg
License Key
SNMP Information
E-mail Information
Partition Definition
SNMP Information
Install
Extension SNMP
Manager
IP Address
172.17.58.180
172.17.37.170
172.17.37.212
172.17.58.128
172.17.58.130
172.17.37.174
172.17.58.248
172.17.58.97
172.17.58.64
172.17.37.223
172.17.58.249
172.17.58.151
172.17.58.178
IP Address
172. 17. 58. 100
IPv4
IPv6
Set
Community & Trap
Community
sie
public
agalica
robroy
System Group
Name
Contact
Location
Trap Test
Apply
Cancel
PP Status : Normal

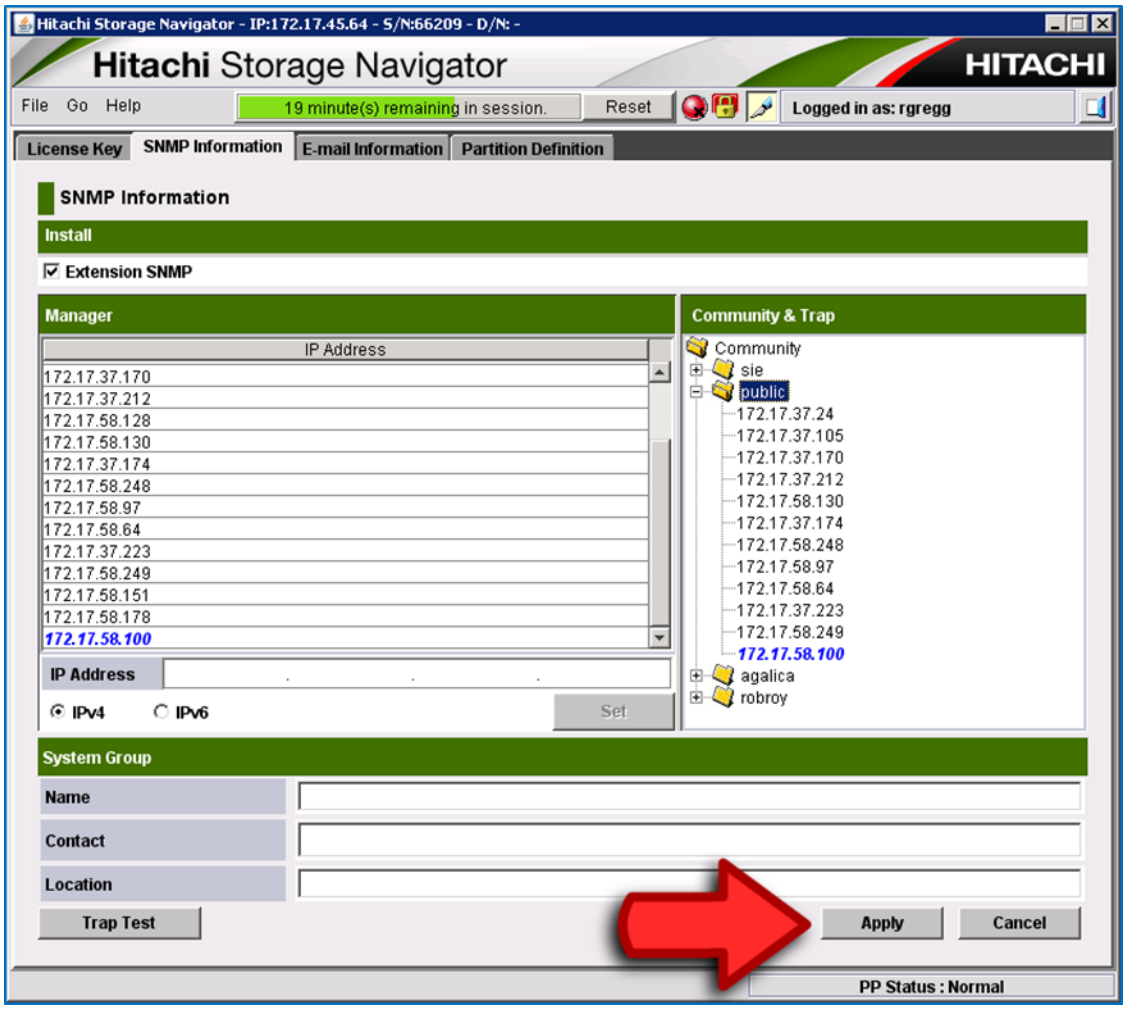
5. Right-click on the community string you would like to use, and select **Add IP Address**.



6. Enter the IP address for your SCOM host; click **OK**.



7. Click **Apply** to finalize the configuration.

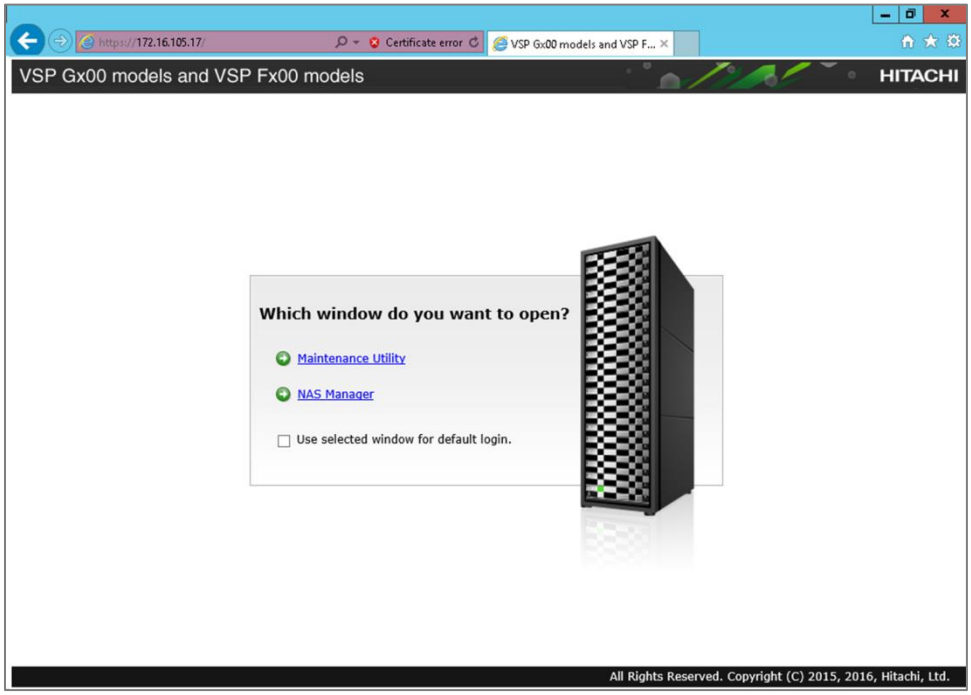


Note

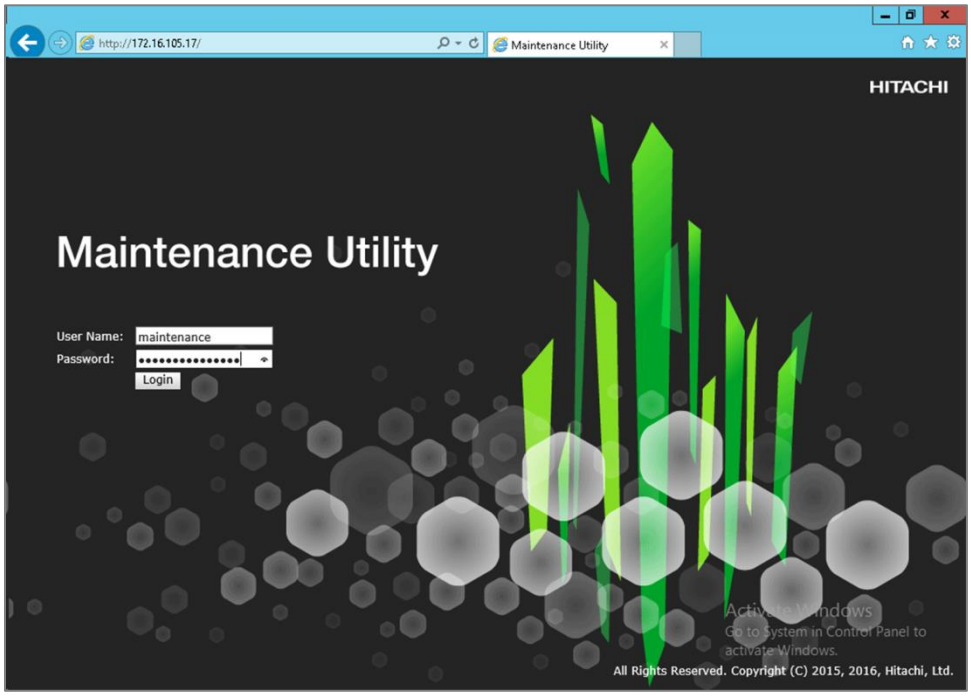
Do not set the SNMP version to v3 for a storage system.

Configuring VSP Gx00/VSP Fx00/Unified NAS Module subsystems to send SNMP traps to SCOM

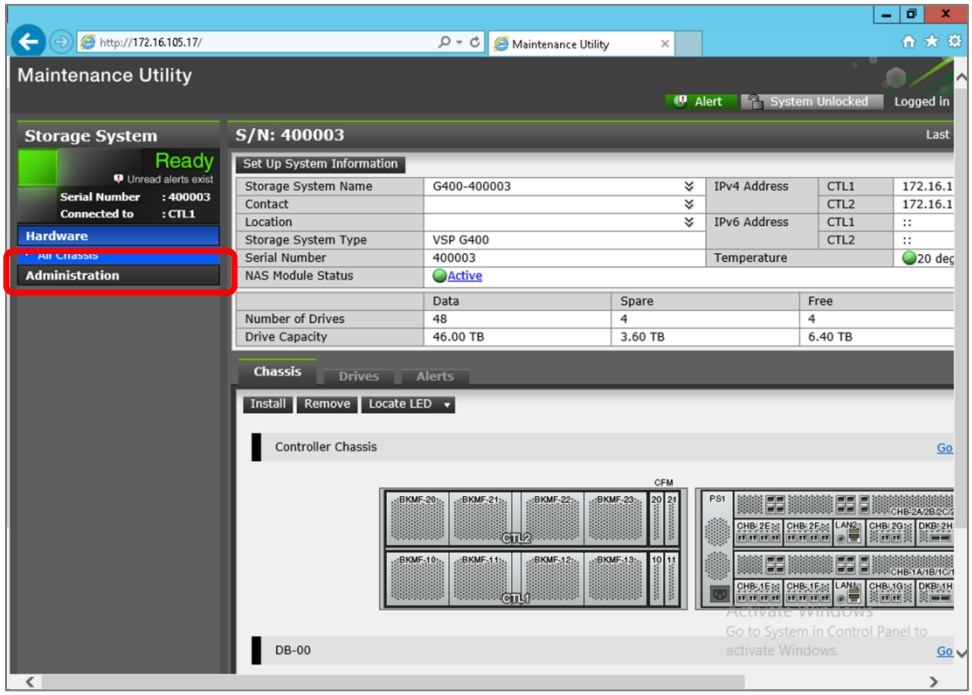
1. Open a web browser, connect to the Controller(GUM), then open the **Maintenance Utility**.



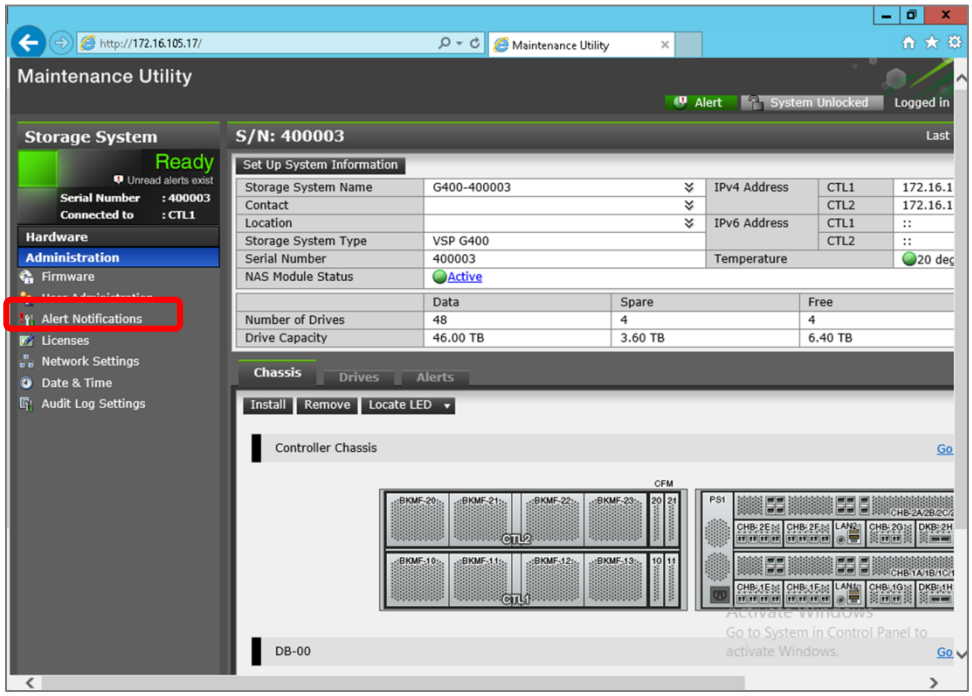
2. Enter a username and password; click **Login**.



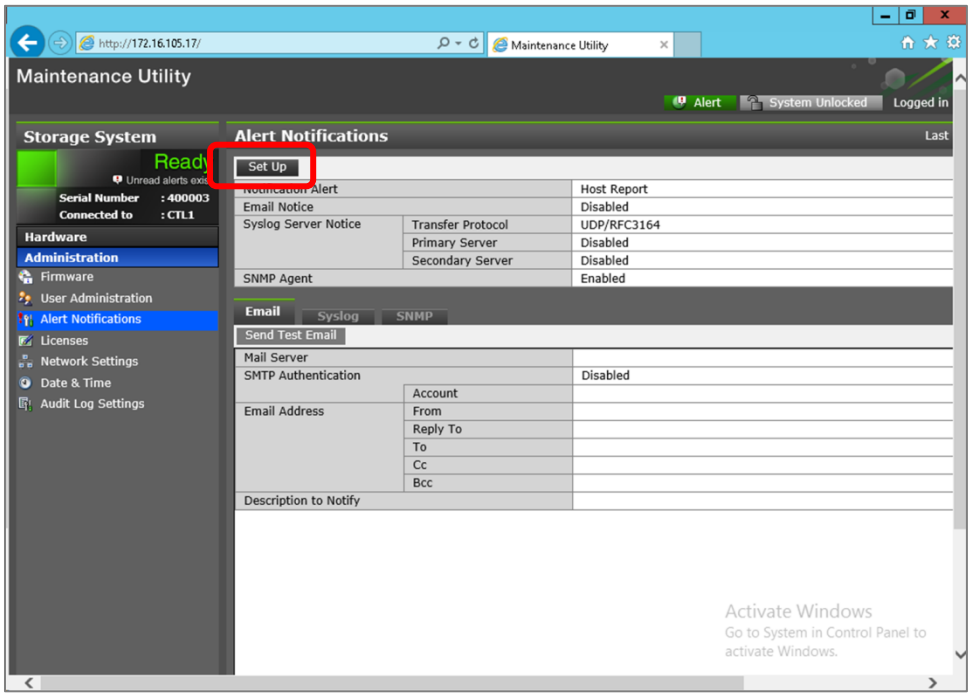
3. Click **Administration**.



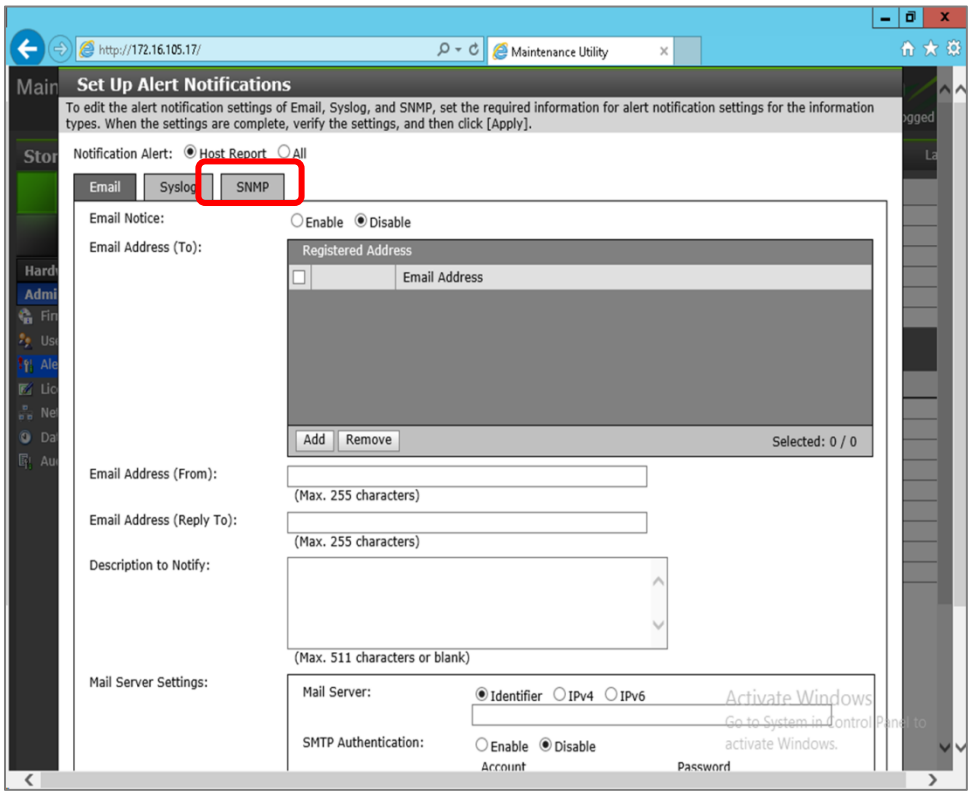
4. Click **Alert Notifications**.



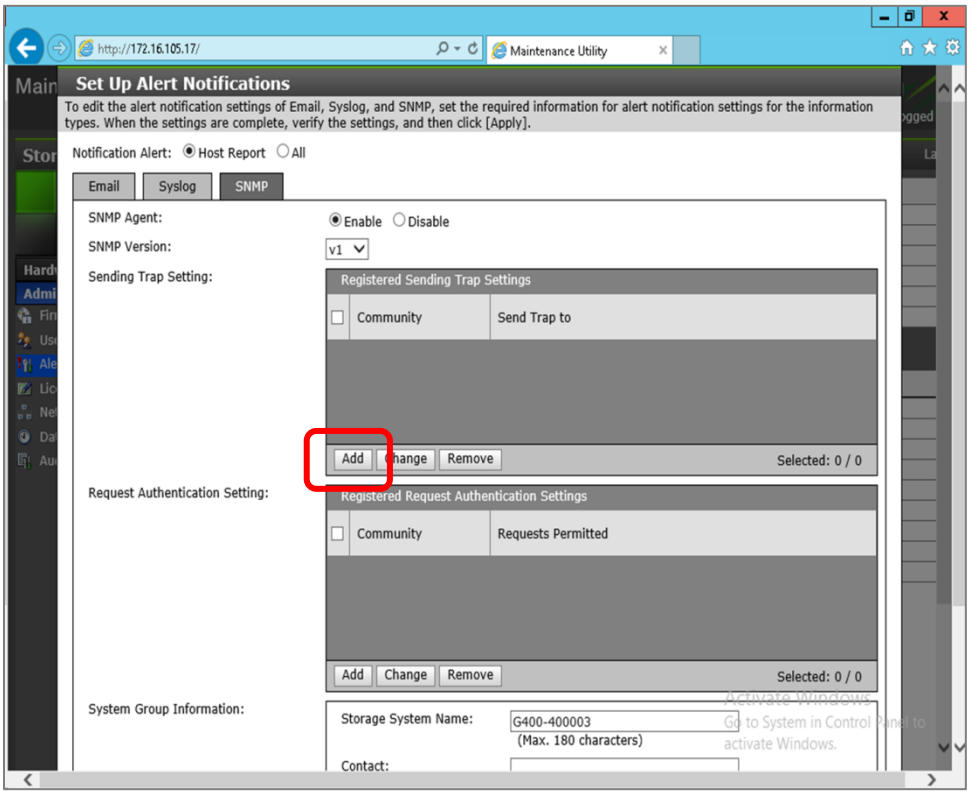
5. Click **Set Up**.



6. Click **SNMP**.



7. In the **Registered Sending Trap Settings** pane, click **Add**.



Note

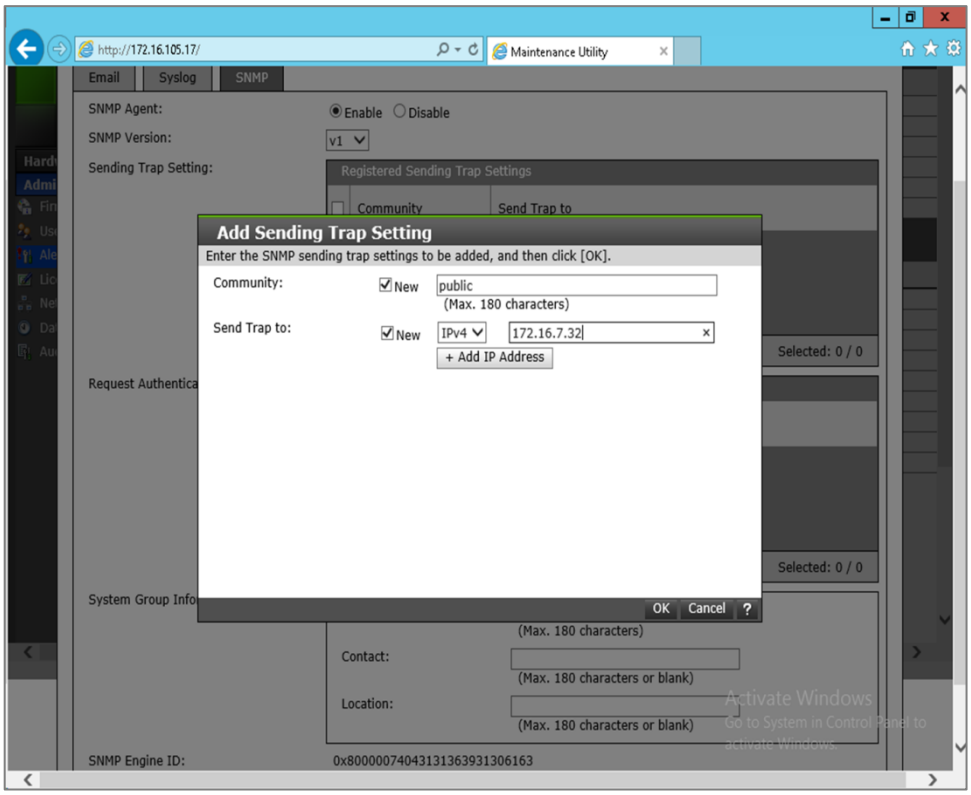
Do not set the SNMP version to v3. Setting the SNMP version to v1 or v2 is OK.

8. Enter the Sending Trap Settings:

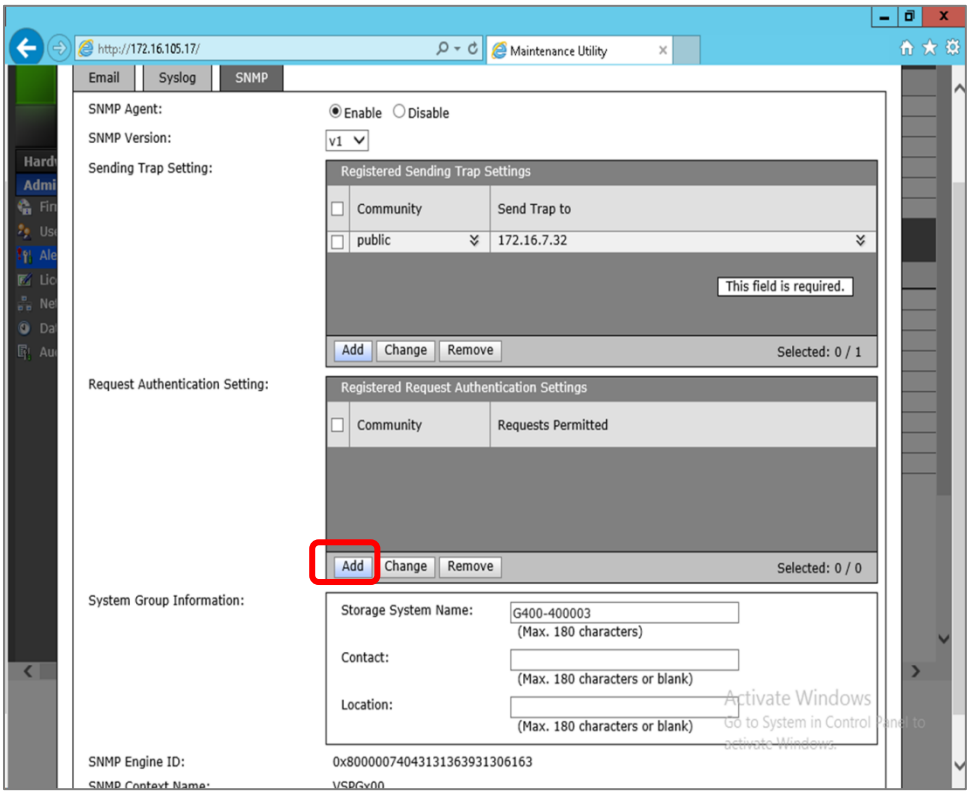
   a. Enter a community. Check **New**, then enter a community name. Enter **public**, if not provided with a specific name.

   b. Enter an IP address. Check **New**, then enter the IP address for the SCOM server where the traps are to be sent.

   c. Click **OK**.



9. In the **Registered Request Authentication Settings** pane, click **Add**.

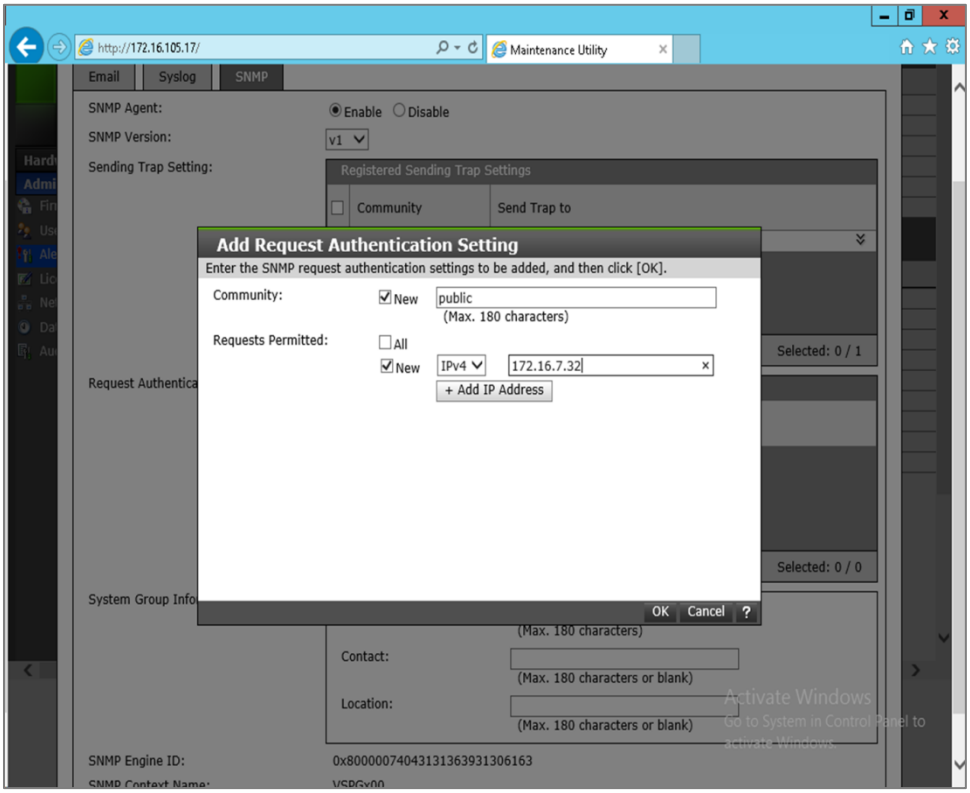


10. Enter the Request Authentication Settings:

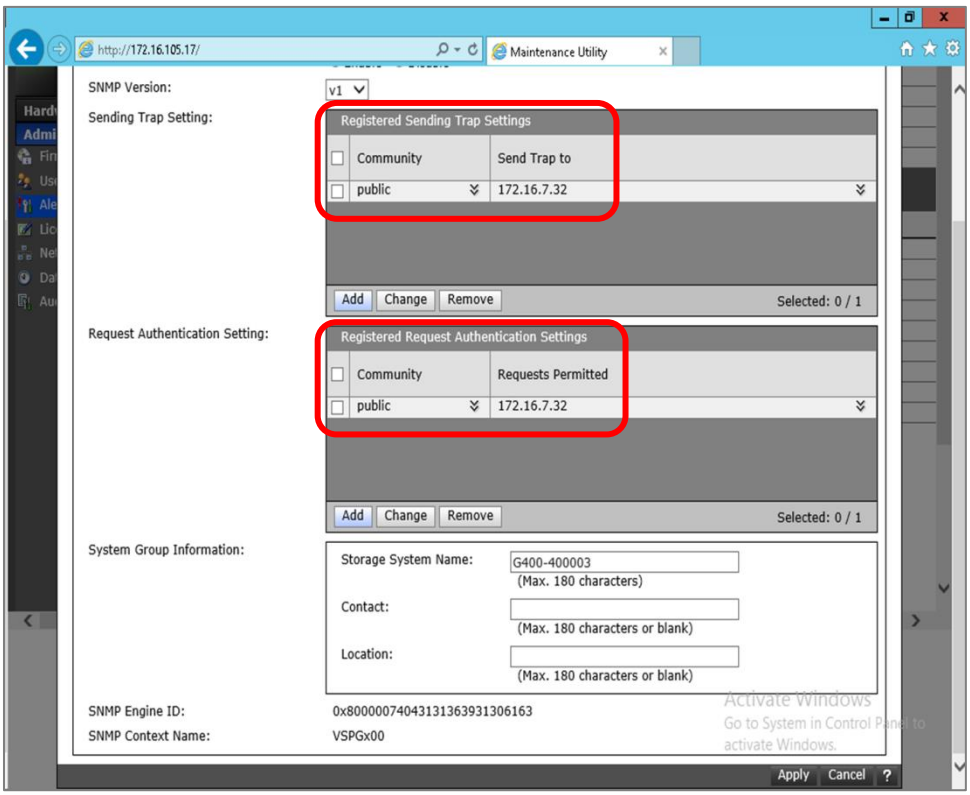
   a. Enter a community. Check **New**, then enter a community name. Enter **public**, if not provided with a specific name.

   b. For **Requests Permitted**, check **New**, then enter the IP address for the SCOM server where the traps are to be sent.

   c. Click **OK**.

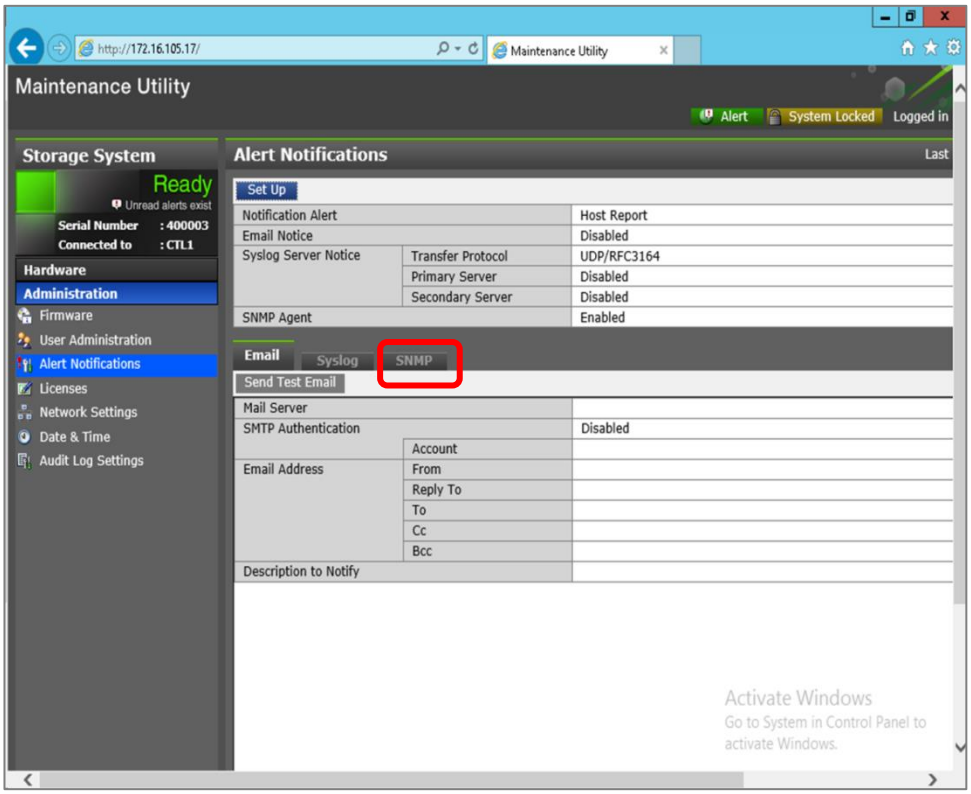


11. Verify the community name and IP address for the SCOM server appear in the **Registered Sending Trap Settings** pane and **Registered Request Authentication Settings** pane.

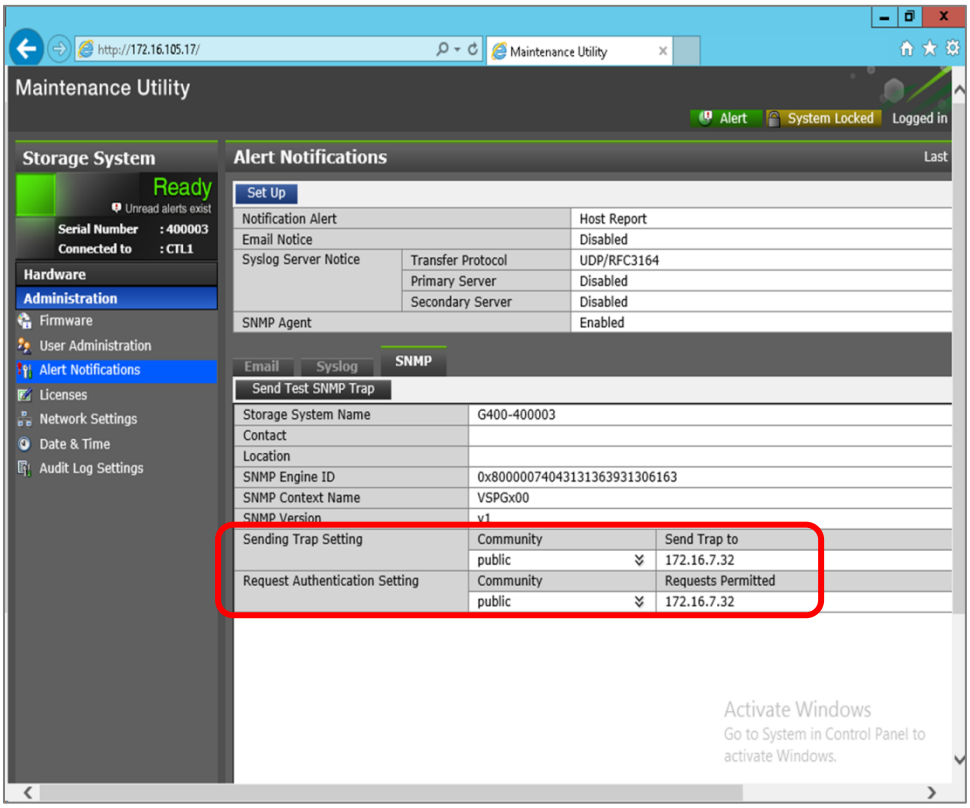


12. Click **Apply;** click **OK** to close the confirmation dialog.

13. Click the **SNMP** tab.

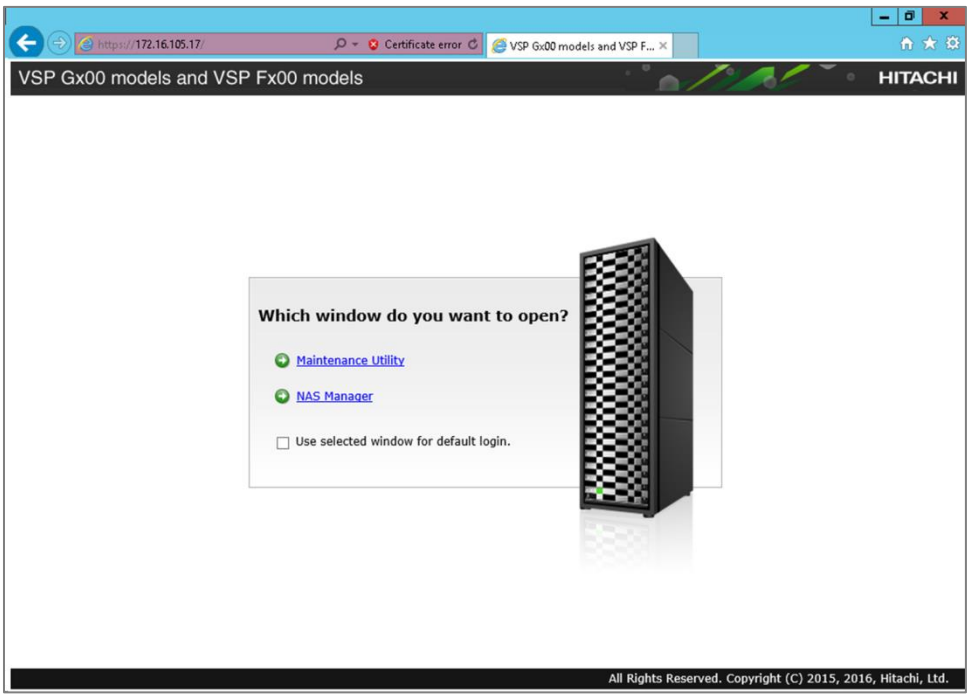


14. Verify the settings appear as set above.

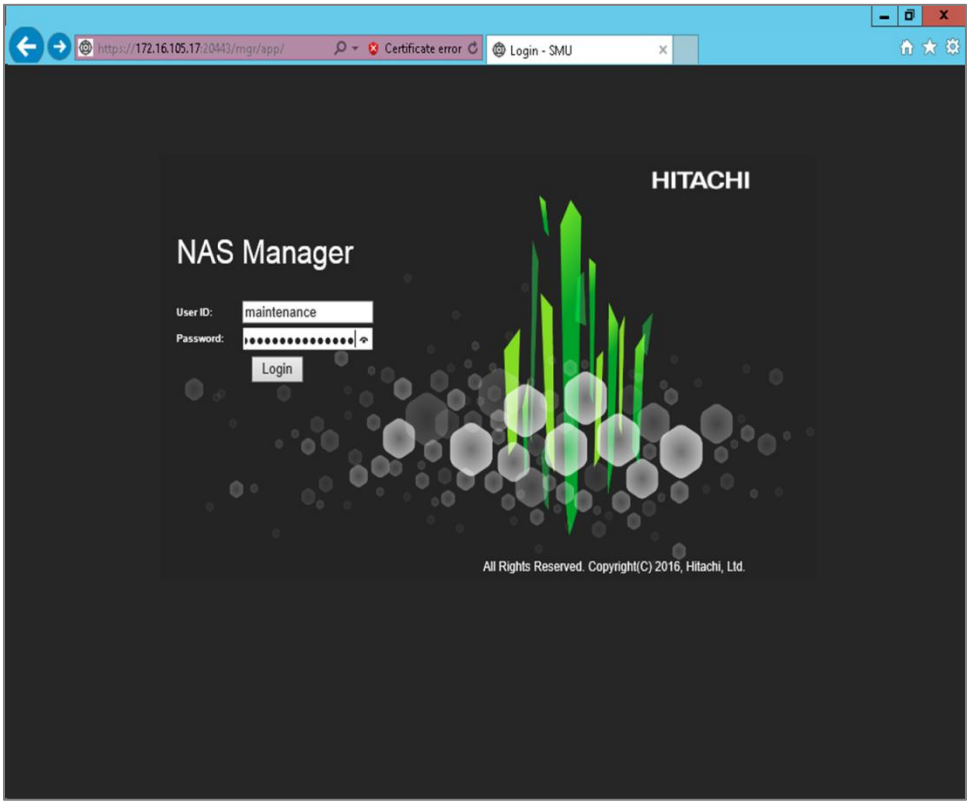


15. Return to the Controller (GUM) webpage.

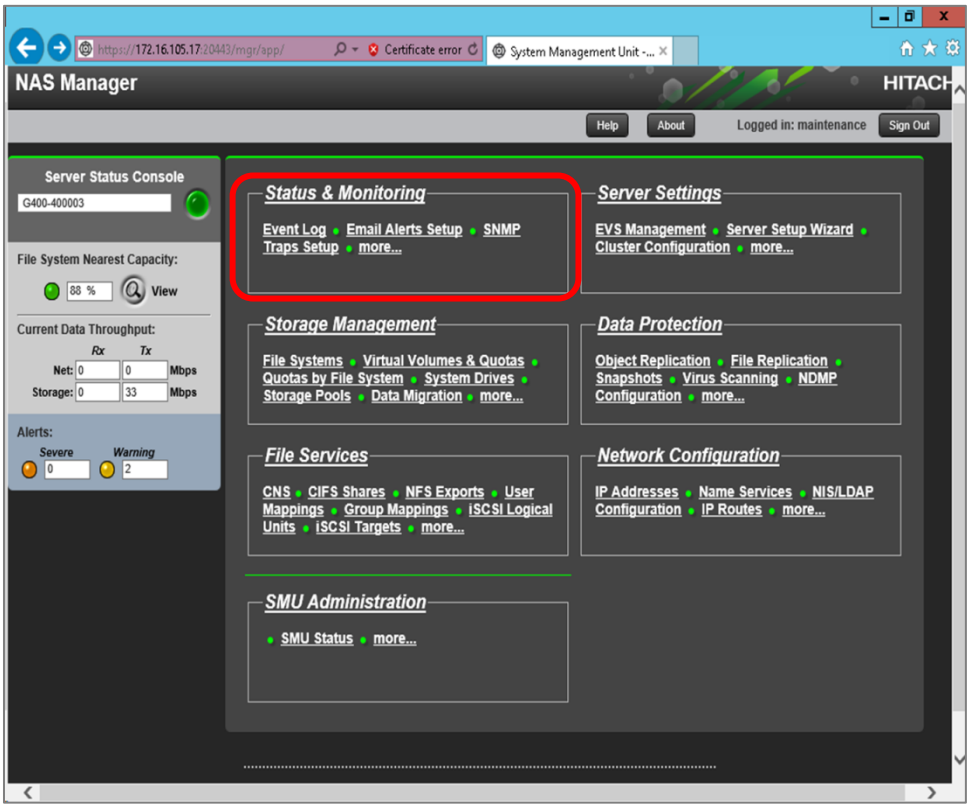
16. Open the **NAS Manager**.



17. Enter a username and password; click **Login**.



18. In the **Status & Monitoring** pane, click **SNMP Traps Setup**.



19. Enter the SNMP trap settings.

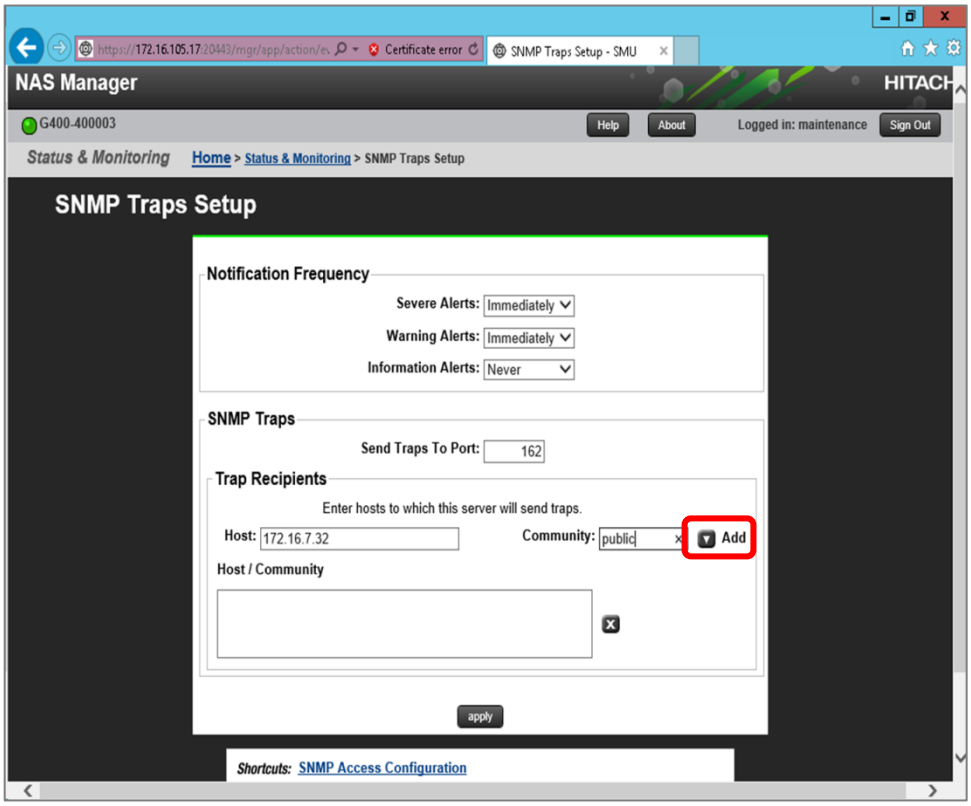
   a. Notification Frequency

      - **Server Alerts**: Immediately
      - **Warning Alerts**: Immediately

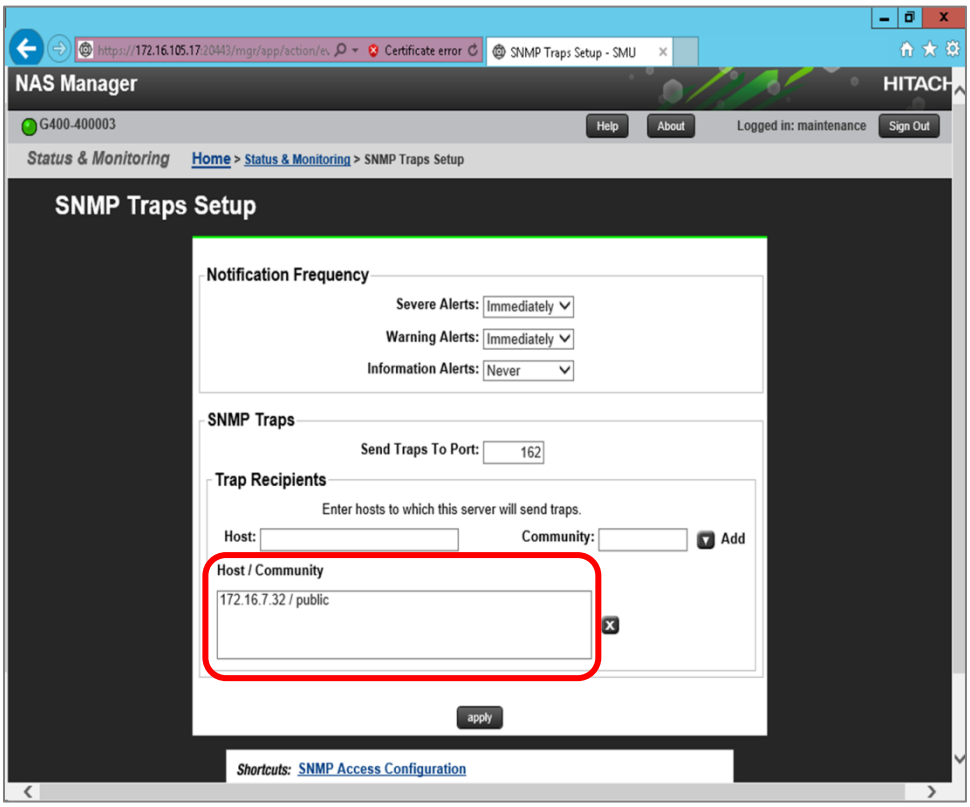
   b. Trap Recipients

      - **Host**: enter the IP address of the SCOM server.
      - **Community**: enter **`public`**, if not provided with a specific name.

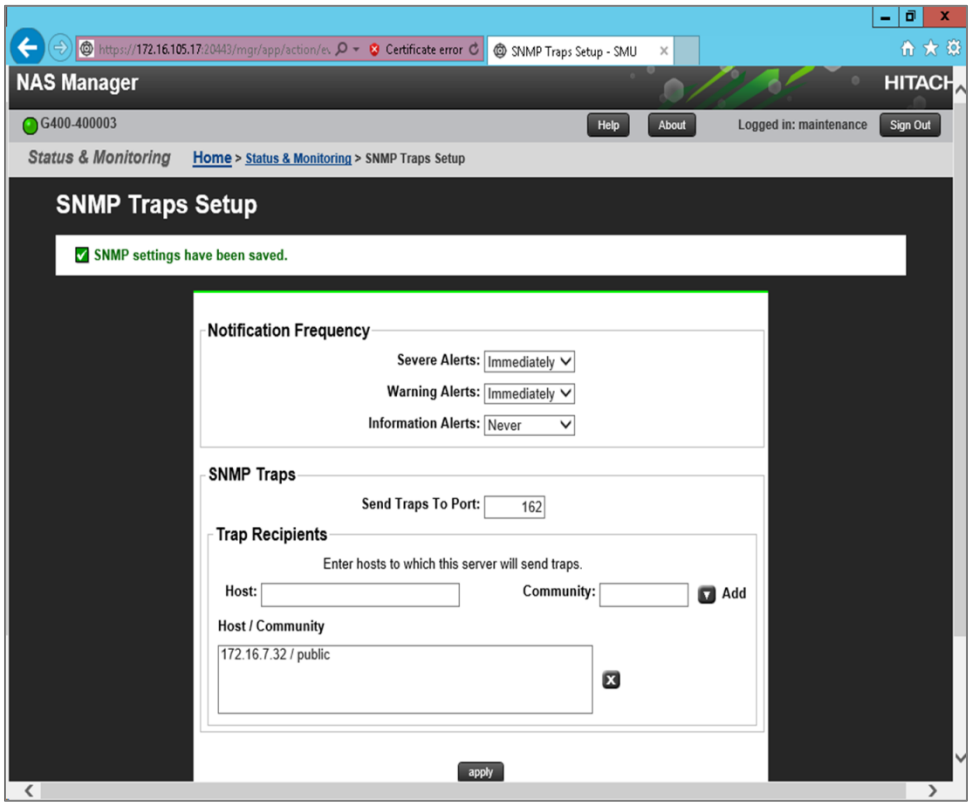
   c. Click **Add**.



20. Verify the host and community settings have been added to the **Host/Community** pane; click **Apply**.

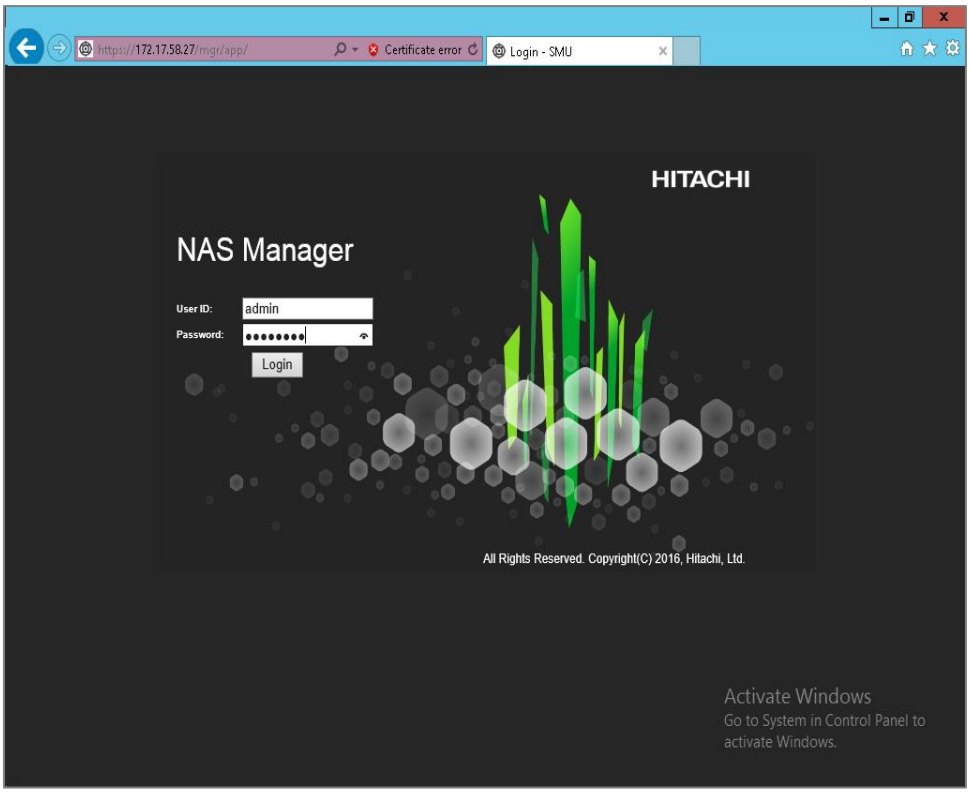


21. Verify the confirmation message that the SNMP settings have been saved.

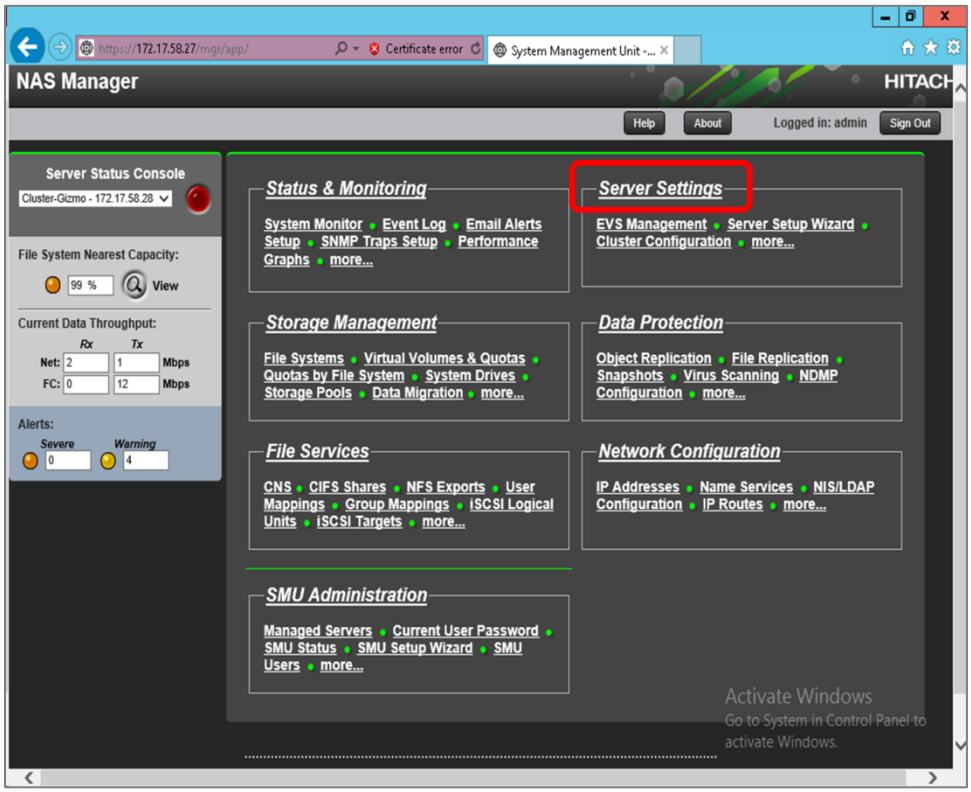


Configuring an HNAS subsystem to send SNMP traps to SCOM

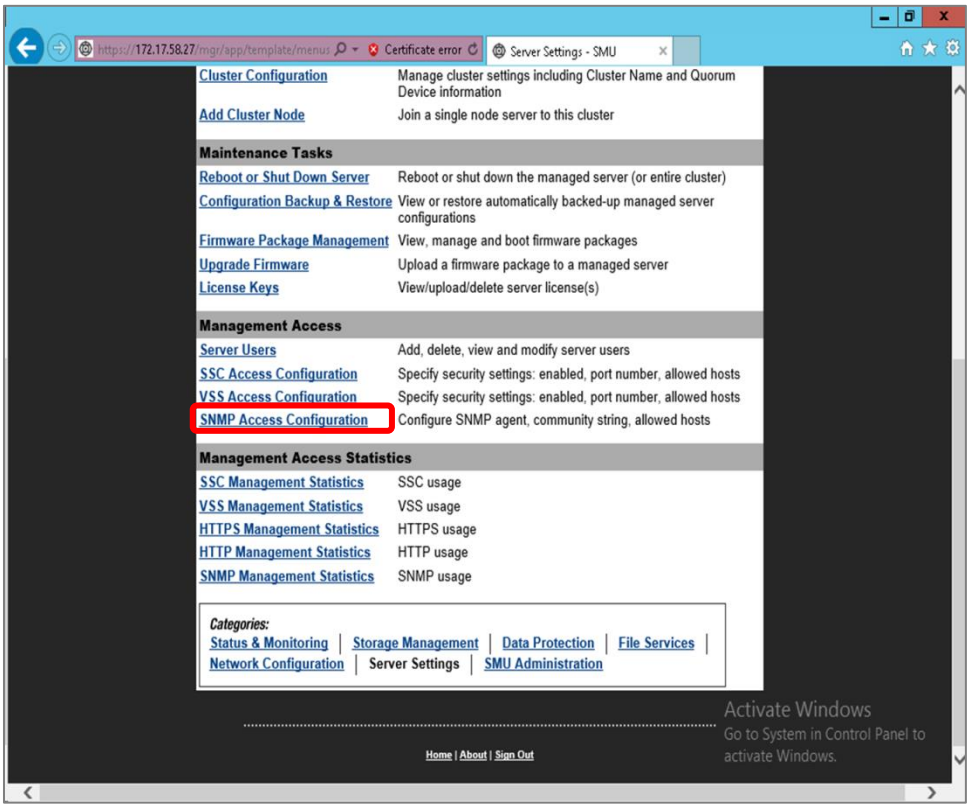
1. Open a web browser, then connect to the SMU.
2. Enter a username and password; click **Login**..



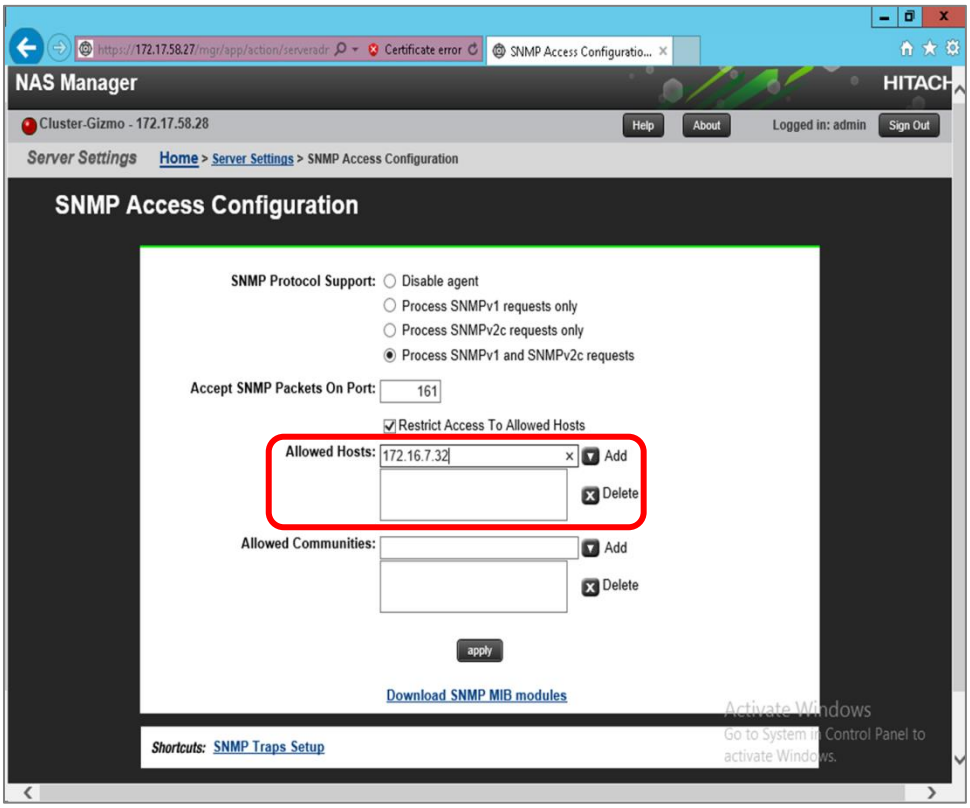
3. Click **Server Settings**.



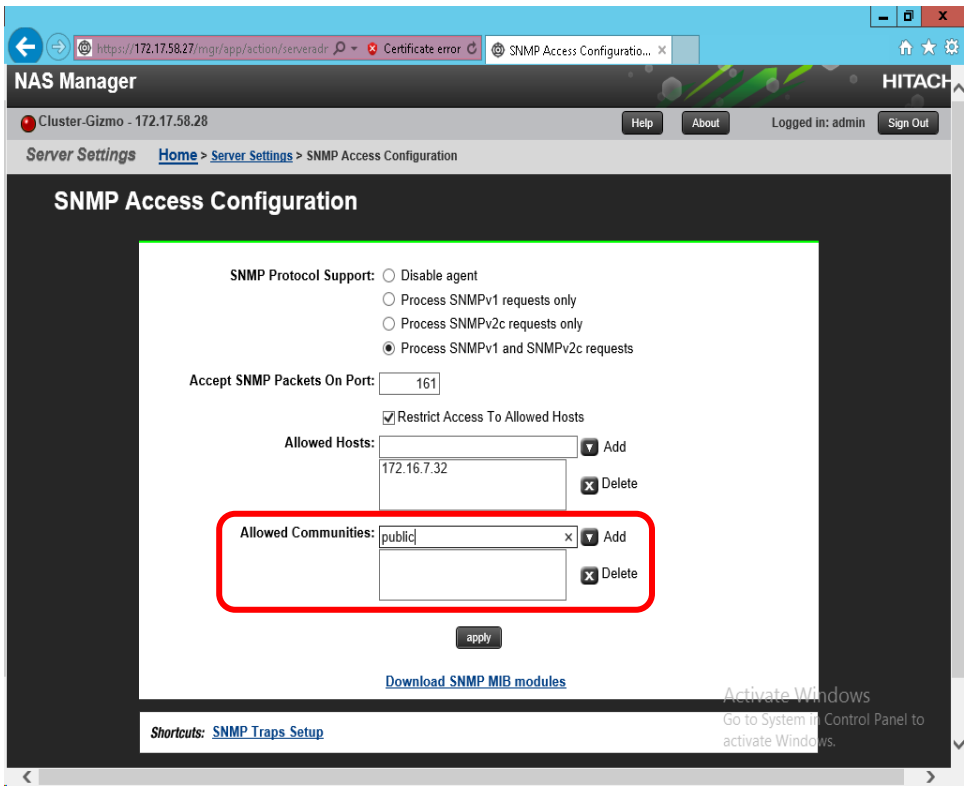
4. Scroll down to **Management Access**; open **SNMP Access Configuration**.



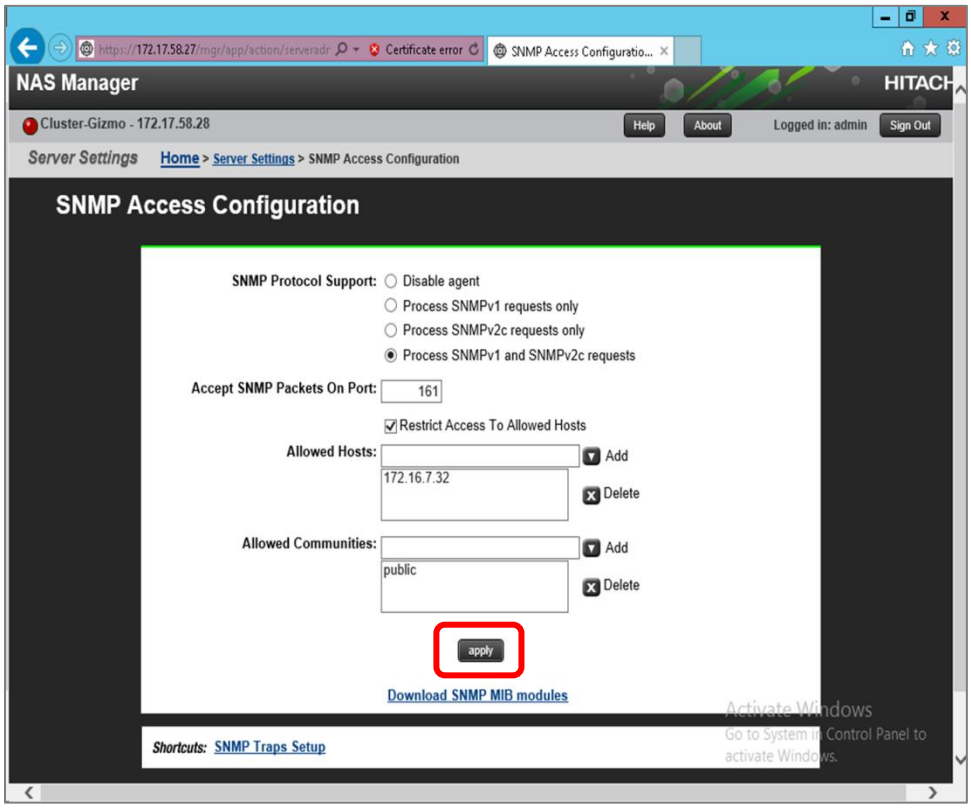
5. In **Allowed Hosts**, enter the IP address for the SCOM server; click **Add**. The IP address appears in the pane below.



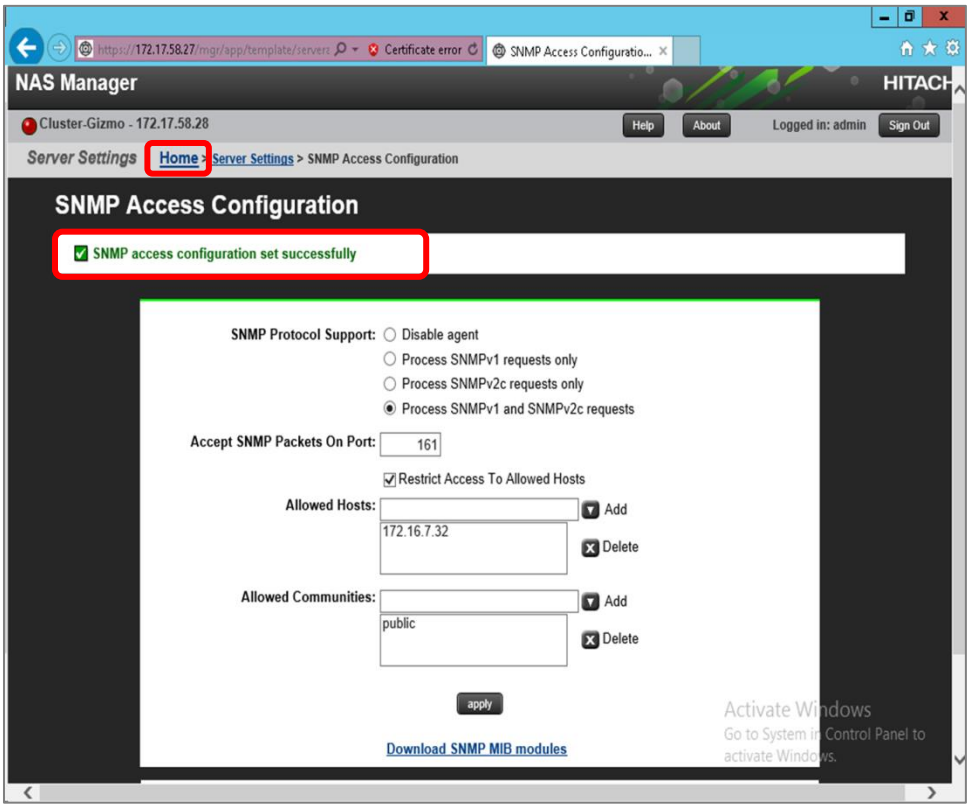
6. In **Allowed Communities**, enter the community name. Enter **public**, if not provided with a specific name. Click **Add**. The community name appears in the pane below.



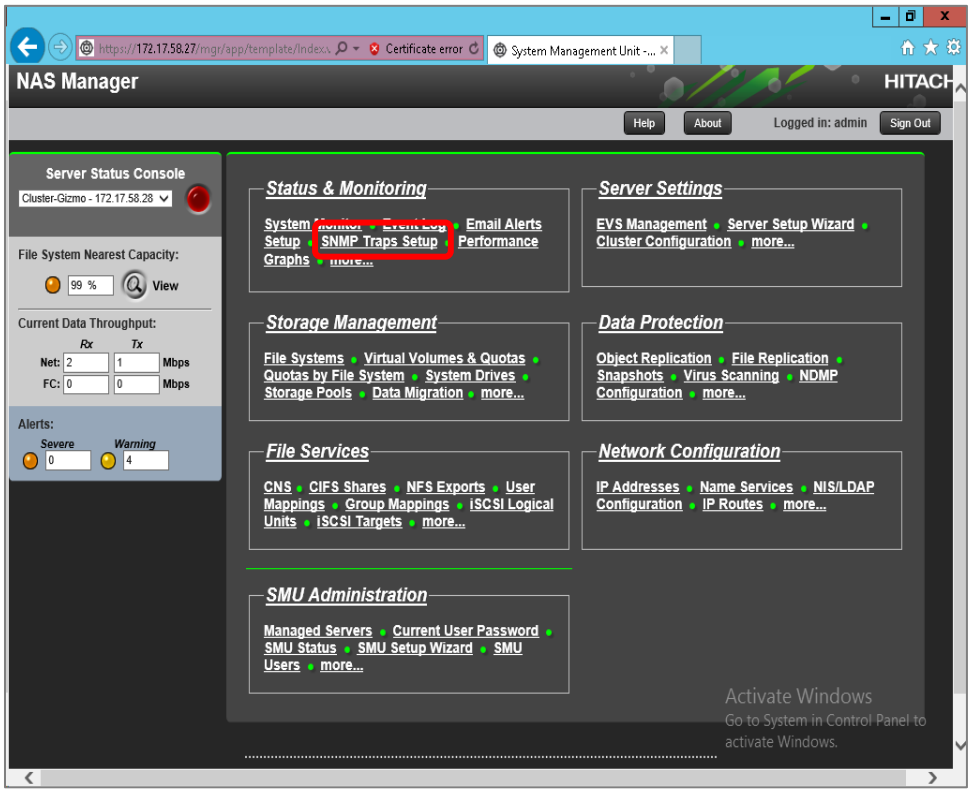
7. Verify that the IP address and community name are correct; click **Apply**.



8. Verify the confirmation message that the SNMP settings have been saved, then click **Home** to return to the home page.



9. In the **Status & Monitoring** pane, click **SNMP Traps Setup**.



10. Enter the SNMP trap settings.

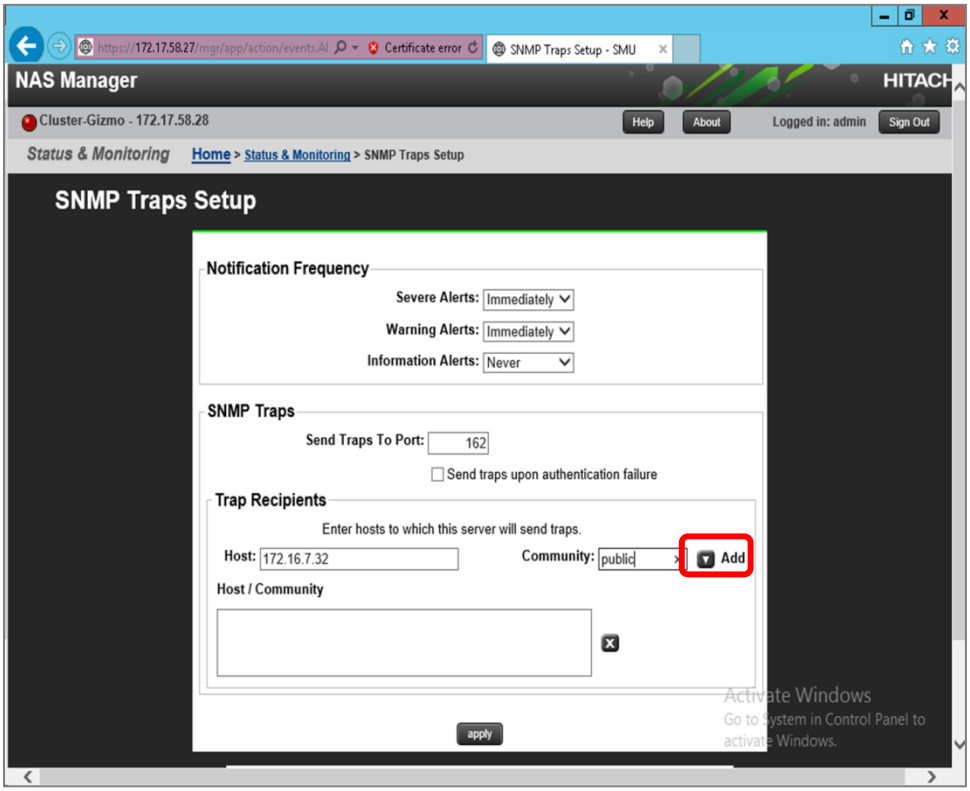
   a. Notification Frequency

      - **Server Alerts**: Immediately
      - **Warning Alerts**: Immediately

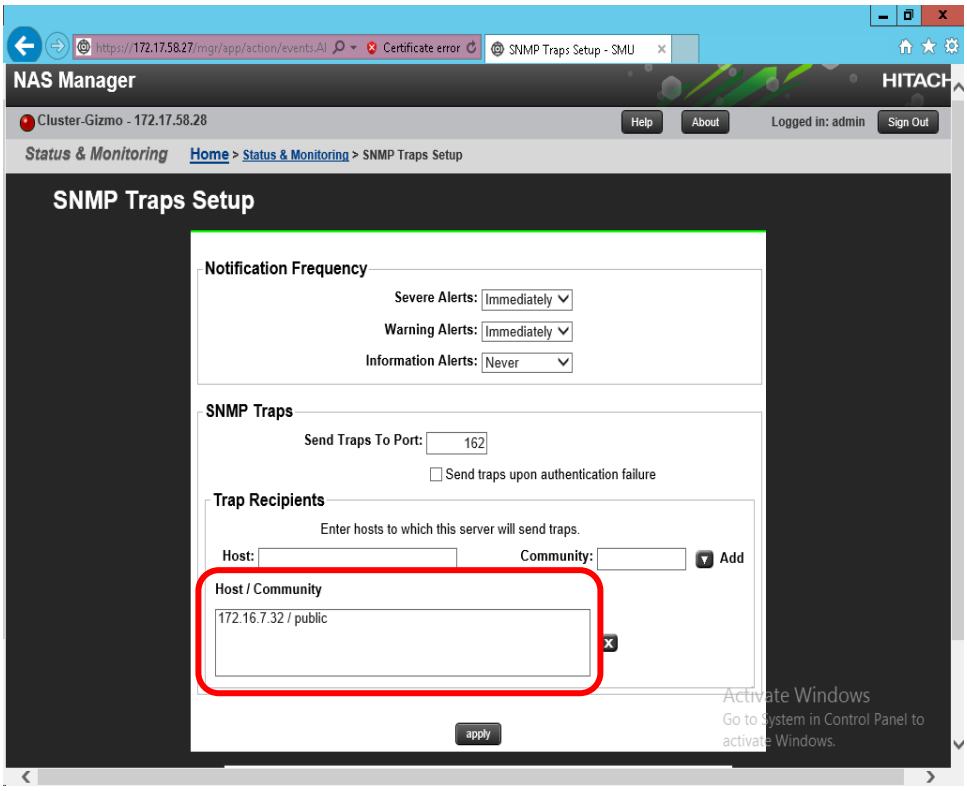
   b. Trap Recipients

      - **Host**: enter the IP address of the SCOM server.
      - **Community**: enter **public**, if not provided with a specific name.

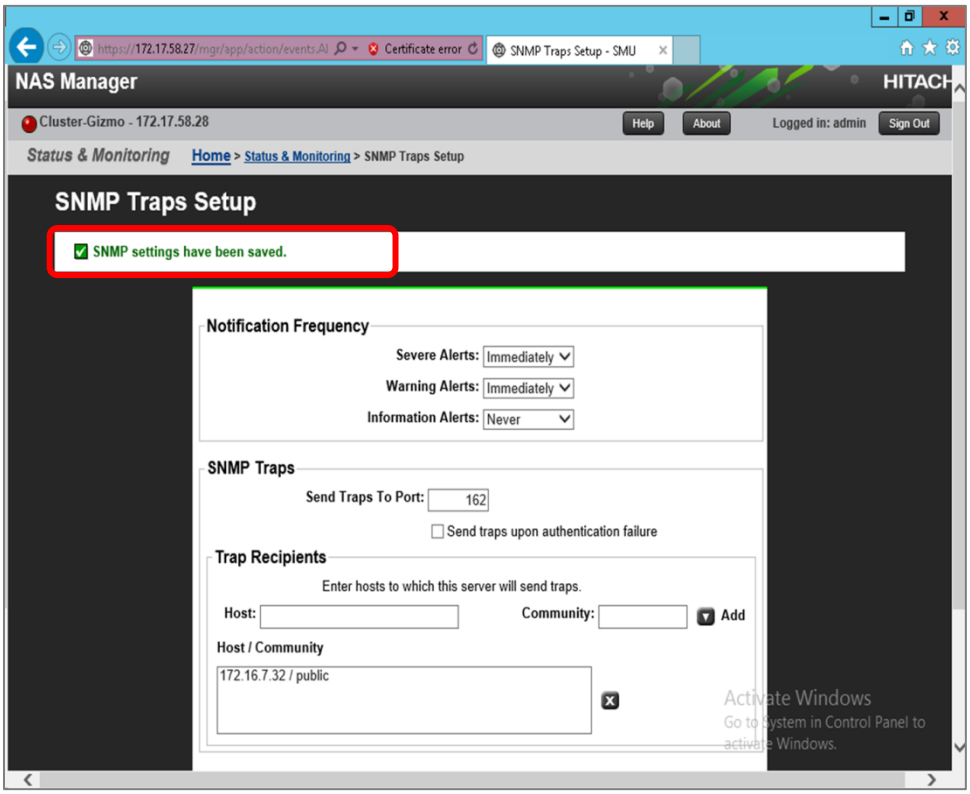
   c. Click **Add**.



11. Verify the host and community settings have been added to the **Host/Community** pane; click **Apply**.



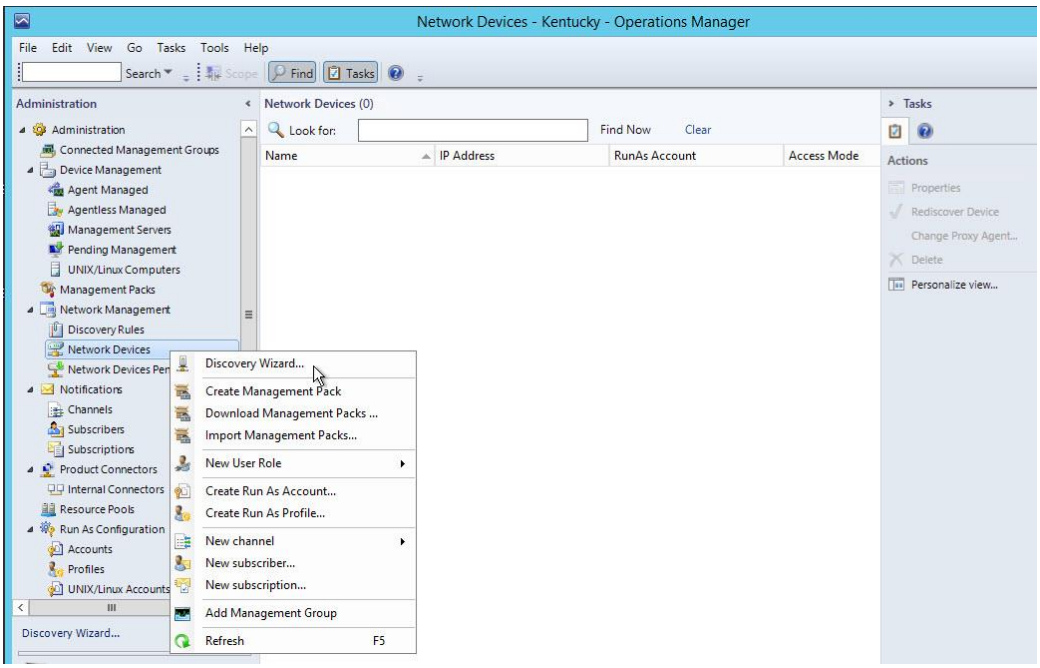
12. Verify the confirmation message that the SNMP settings have been saved.



Configuring SCOM to receive SNMP traps from a storage system

1. Stop and disable the SNMP Trap Windows service on the computer running SCOM; the SNMP Trap service may prevent traps from being directly received by SCOM.

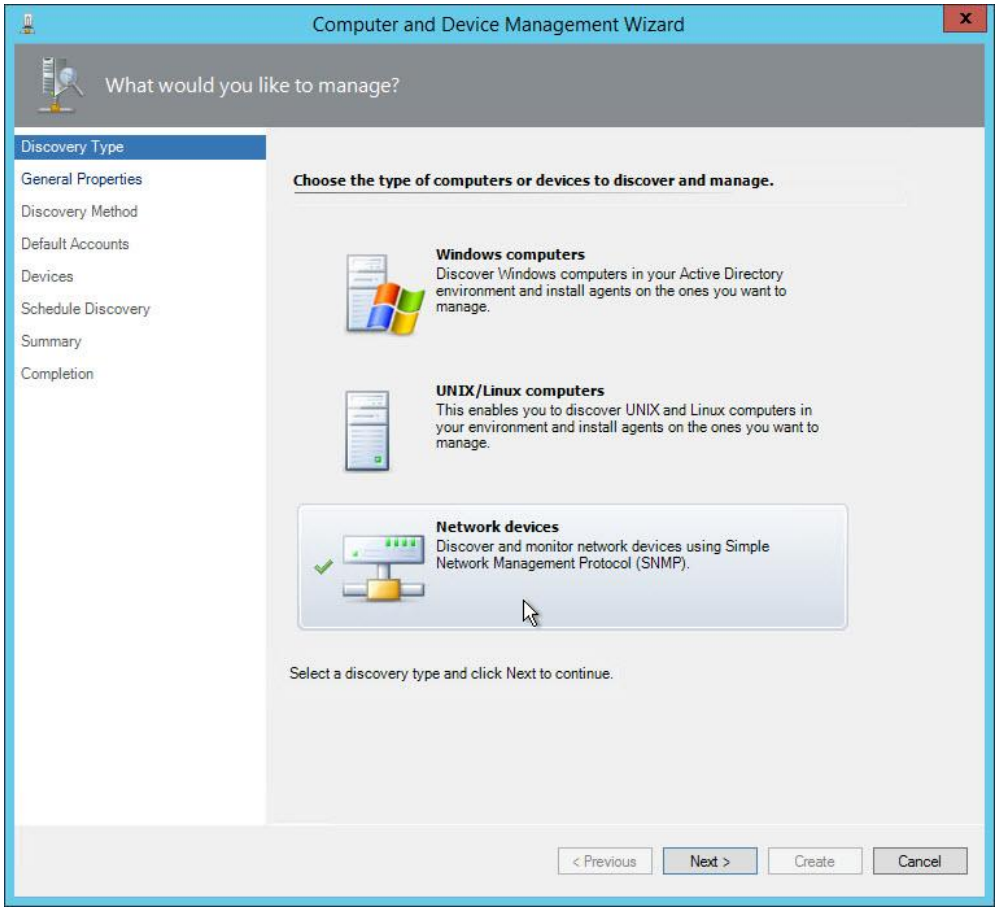
2. From the SCOM Administration screen, expand **Network Management**, then right-click on **Network Devices**; from the Action menu, select **Discovery Wizard**.



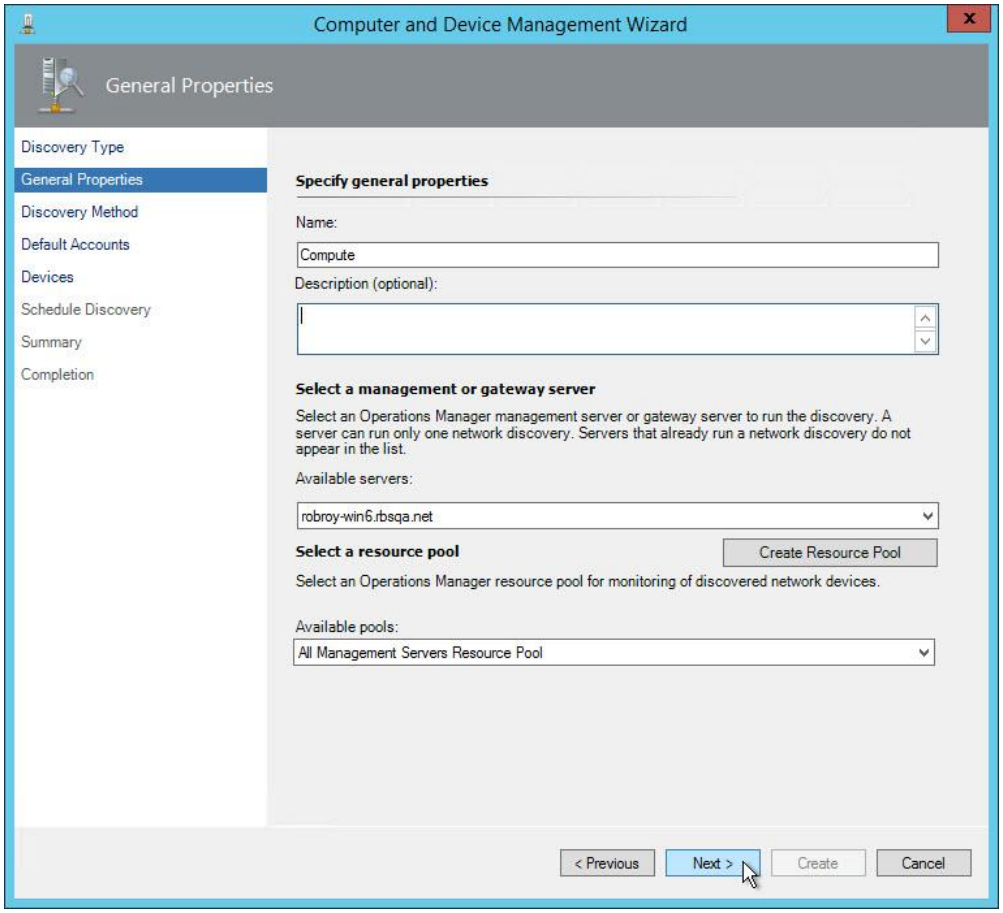
3. Click **Network devices**.

Notes

1. The Controller must be registered on the SCOM because SNMP traps from Unified NAS module subsystems are sent through the Controller (GUM).
2. Since Unified NAS module and Controller form a dual system, both must be registered on the SCOM.



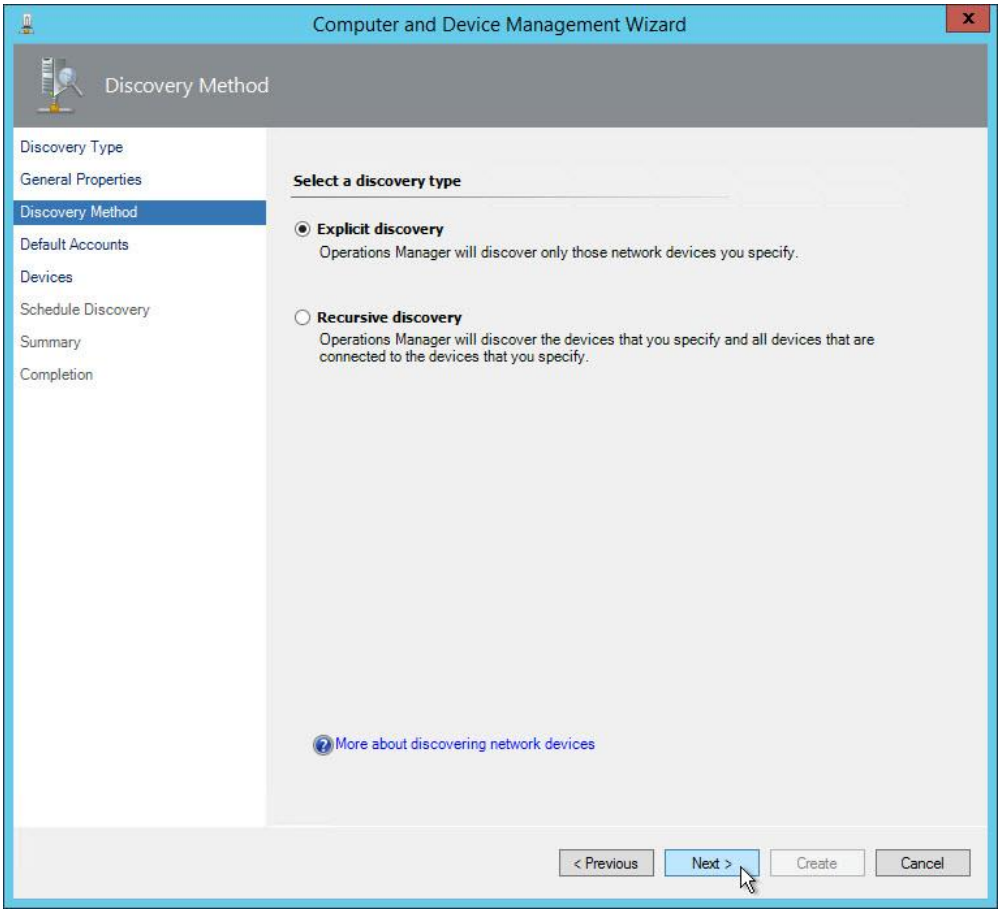
4. On the Discovery Method screen:
   a. Enter an arbitrary name in **Name** field.
   b. Select the SCOM server being used from the **Available servers** field.
   c. Select a resource pool from the **Available pools** field. If you are not sure about which resource pool to select, accept the default *All Management Servers Resource Pool* value.
   d. Click **Next**.



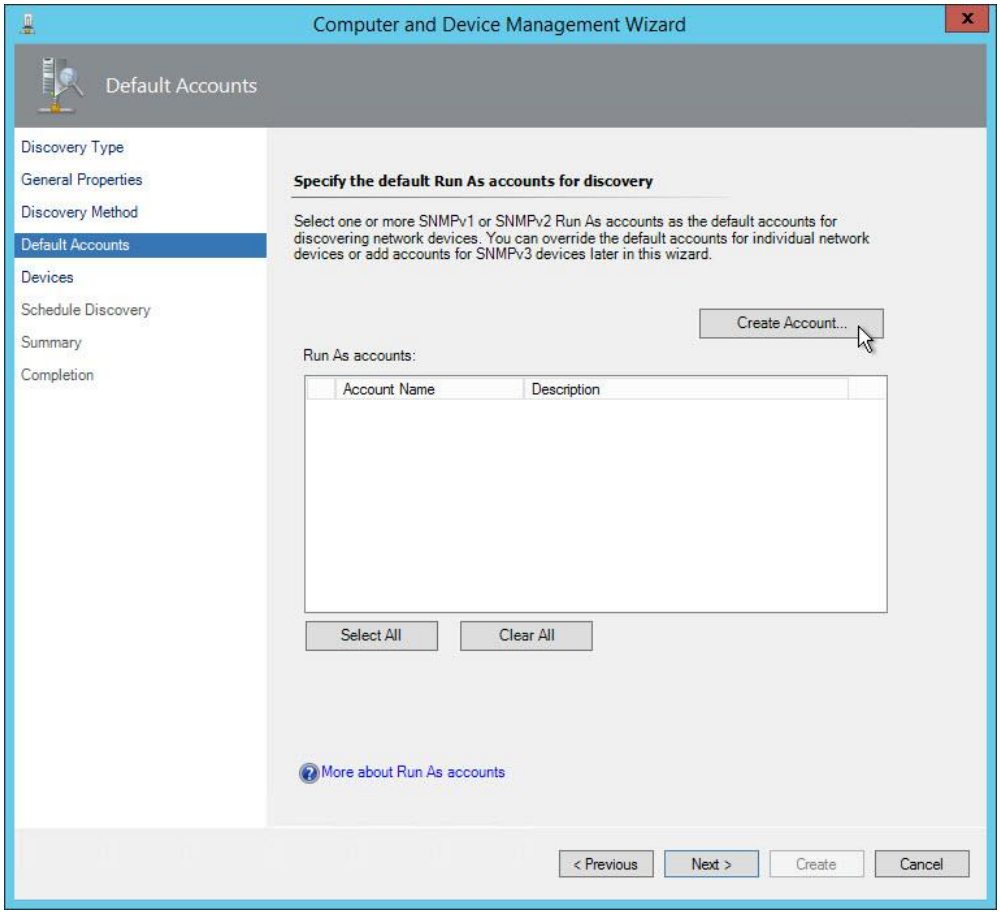
Note

Since Hitachi arrays use SNMP v1 for sending traps, SCOM must be configured to use SNMP *v1 or v2*. If SCOM is configured to use a different SNMP version, the traps for the array will not appear in the SCOM.

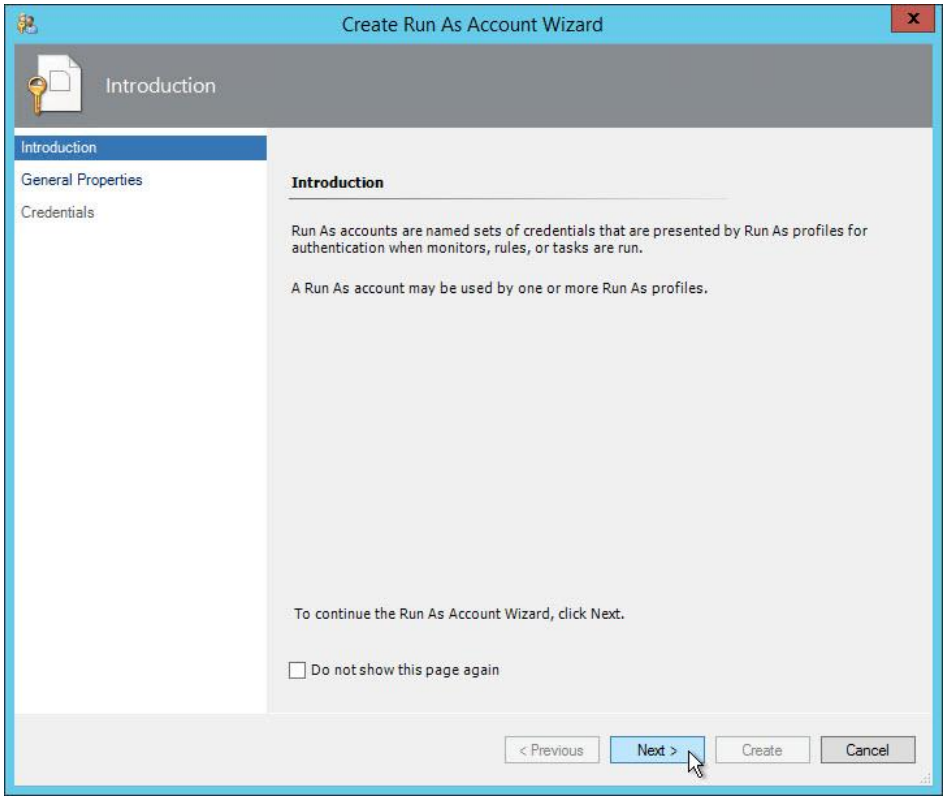
5. On the **Discovery Method** screen, choose **Explicit discovery**, then click **Next**.


Computer and Device Management Wizard
Discovery Method
Discovery Type
General Properties
Discovery Method
Default Accounts
Devices
Schedule Discovery
Summary
Completion
Select a discovery type
Explicit discovery
Operations Manager will discover only those network devices you specify.
Recursive discovery
Operations Manager will discover the devices that you specify and all devices that are connected to the devices that you specify.
More about discovering network devices
< Previous
Next >
Create
Cancel

6. On the **Default Accounts** screen, click **Create Account**:

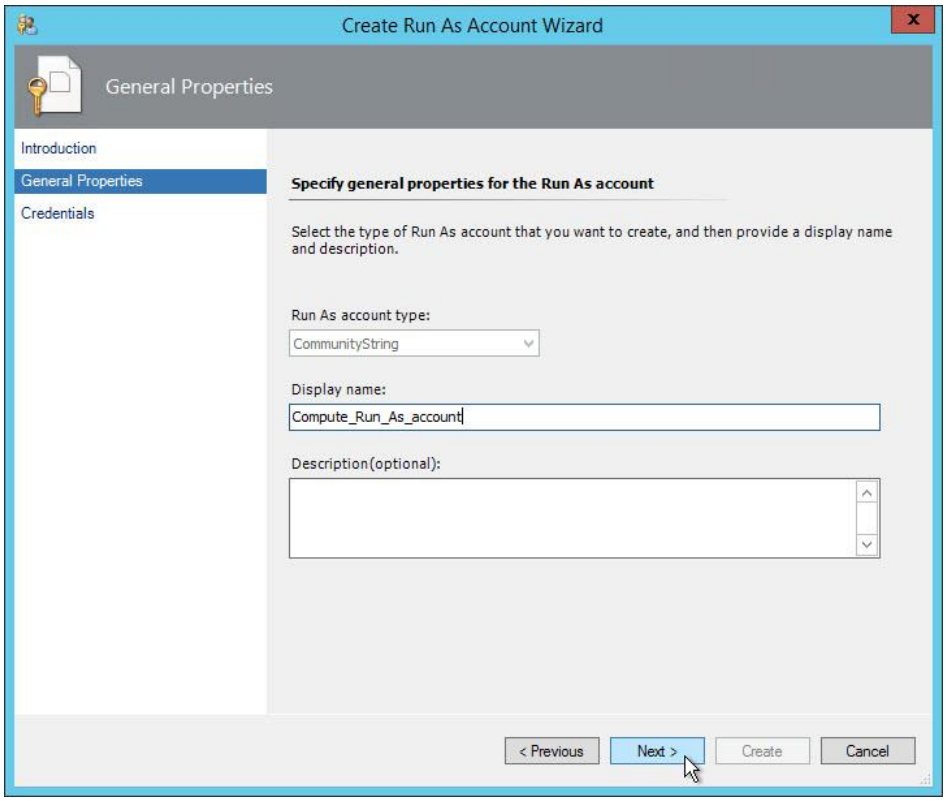


7. On the **Introduction** screen, click **Next**:

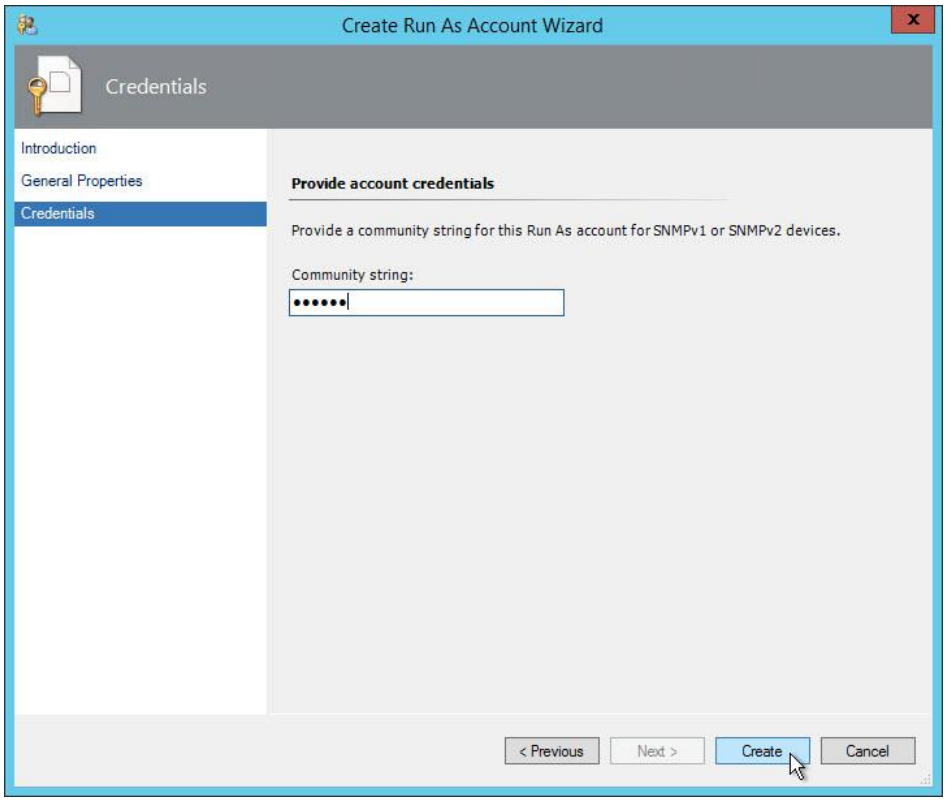


8. On the **General Properties** screen:

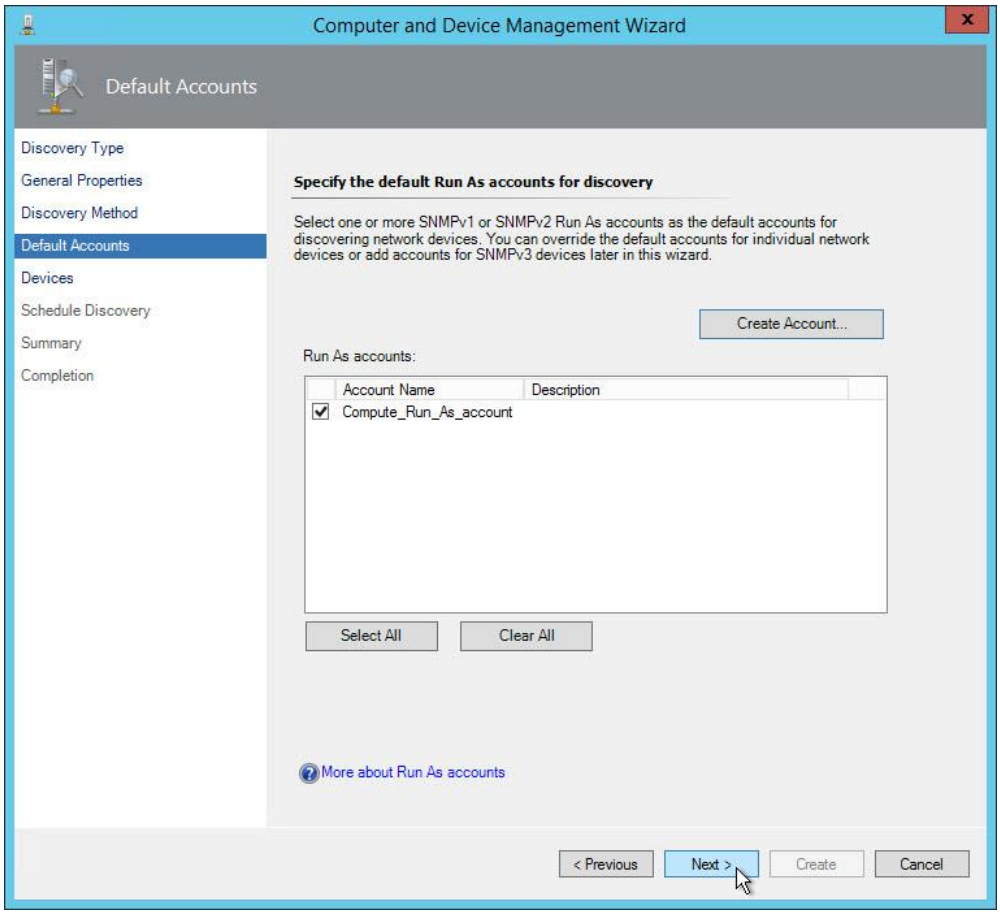
Enter an arbitrary name in the **Display Name** field, then click **Next**.



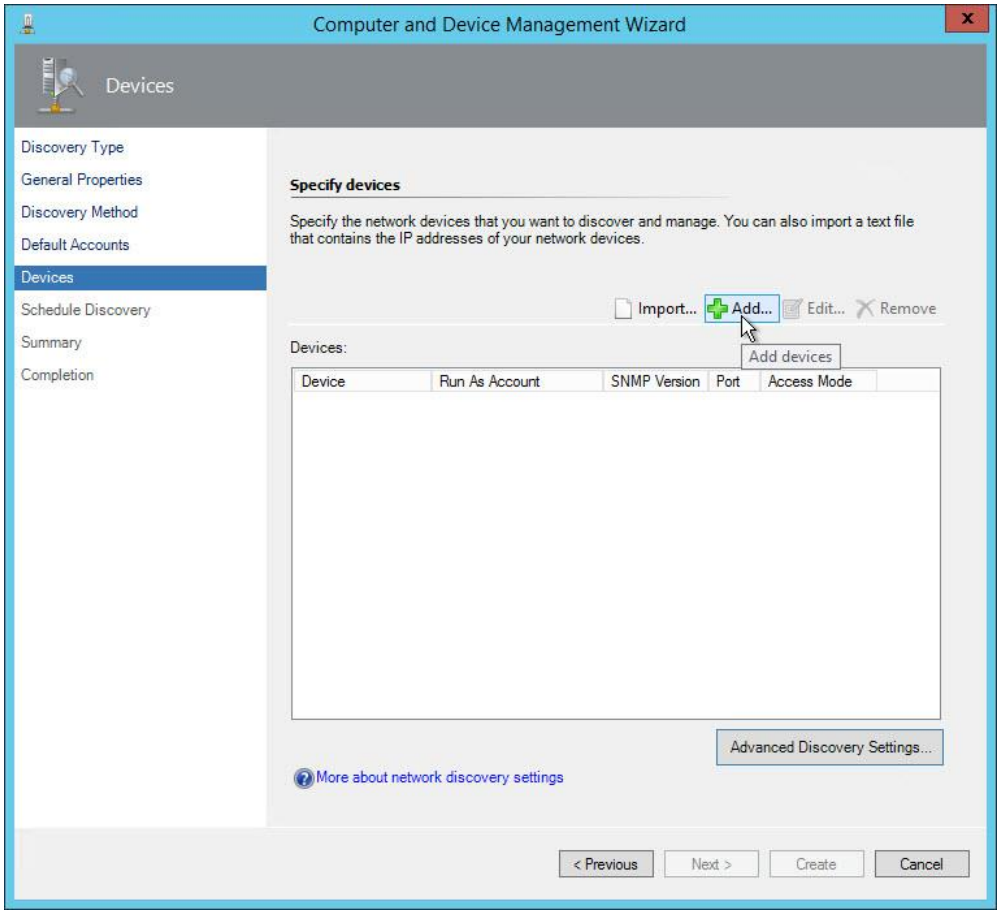
9. On the **Credentials** screen,
   a. Enter the SNMP Community string configured on the storage array.
   b. Click **Create**.



10. On the **Default Accounts** screen:
    a. Select the **Run As** account just created.
    b. Click **Next**.



11. On the **Devices** screen, click **Add**.



12. On the **Add a Device** screen:

    a. Enter the IP address of the management interface for the array in the **Name or IP address** field.

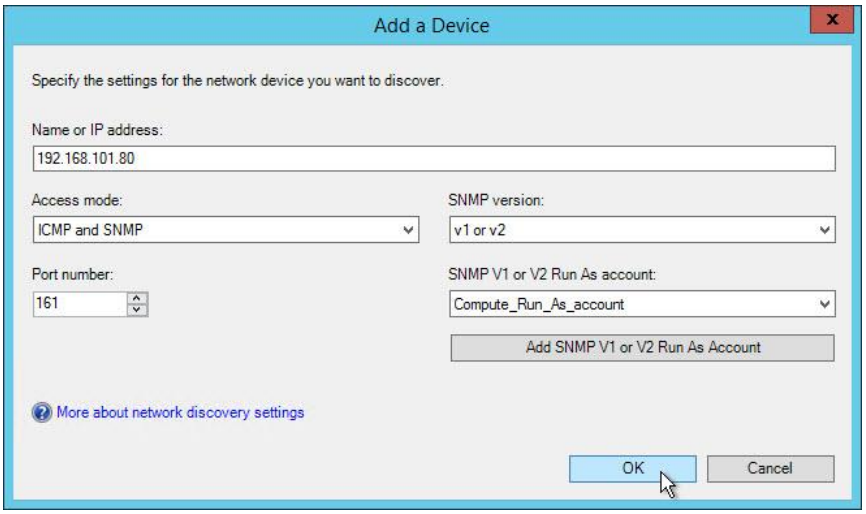
    > **Note**
    > For VSP, VSP G1000, and VSP G1500/F1500 arrays, use the IP address of the SVP—yet for VSP Gx00 and VSP Fx00 arrays, use one of its controller IP addresses instead.

    b. Select **ICMP and SNMP** from the **Access mode** field.

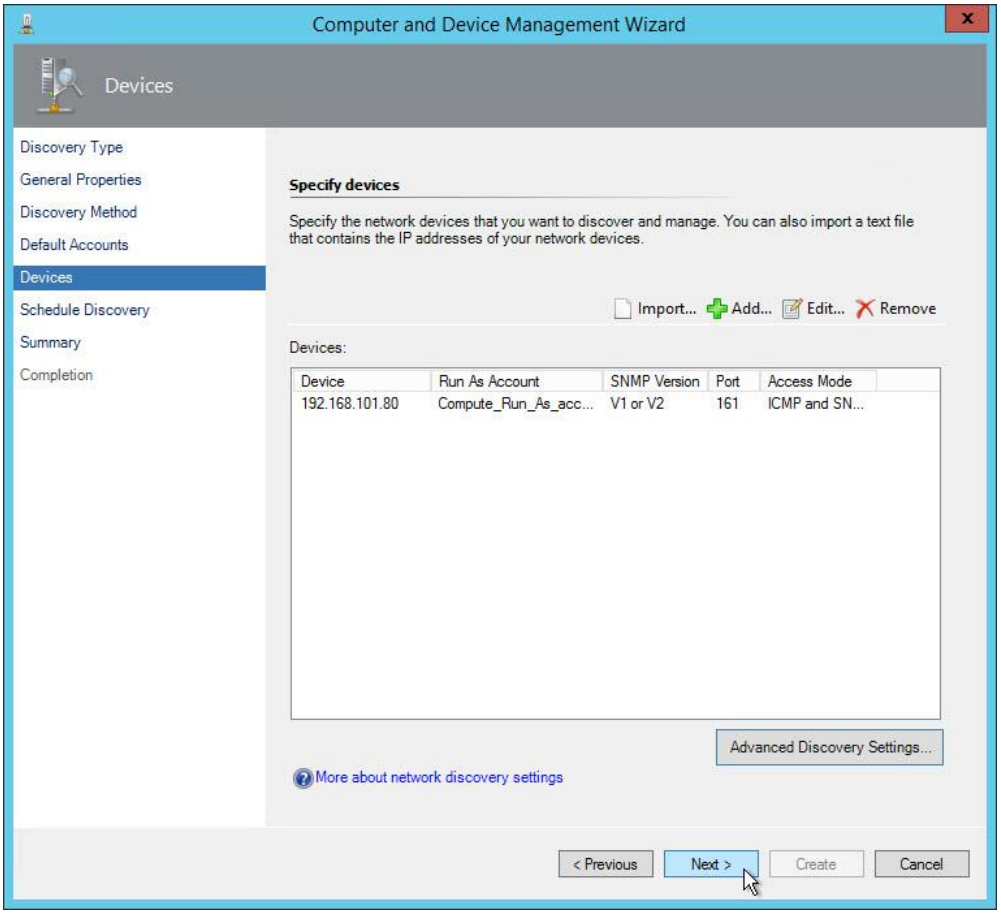
    c. Select **v1 or v2** from the **SNMP version** field.

    d. Enter the SNMP port number in the **Port number** field.

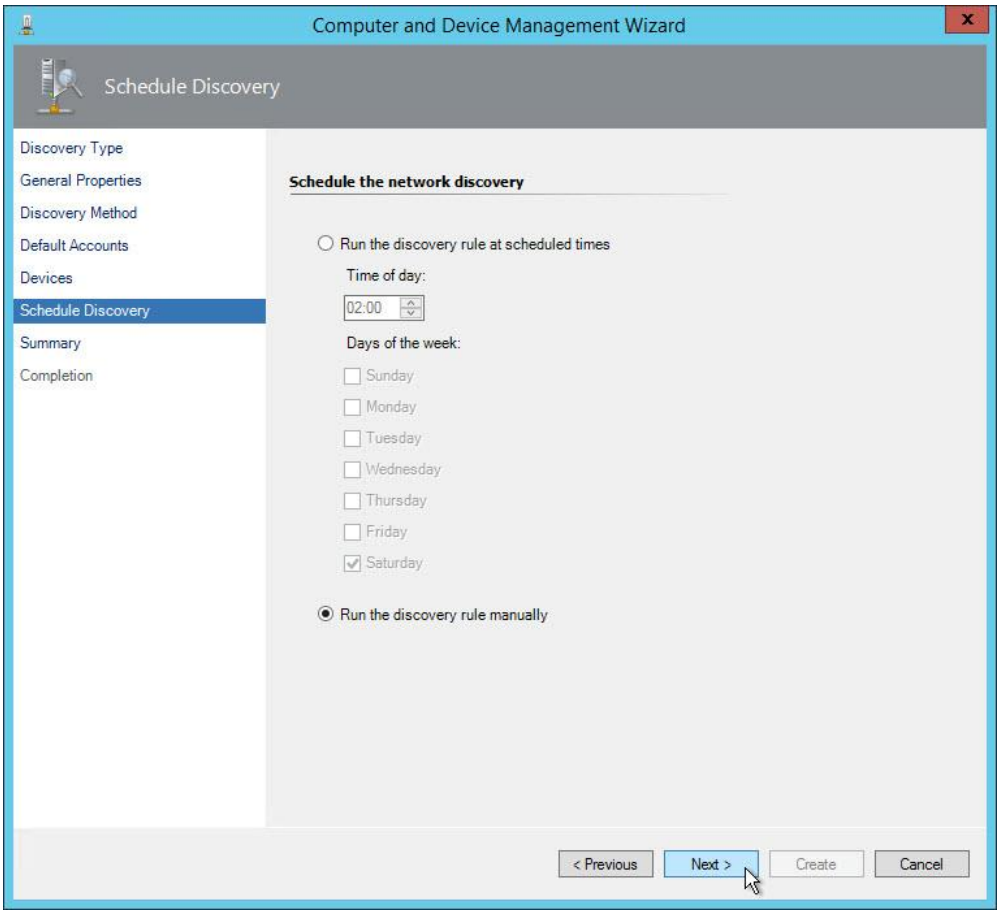
    e. Select the account created in Step 7 from the **SNMP V1 or V2 Run As account** field.



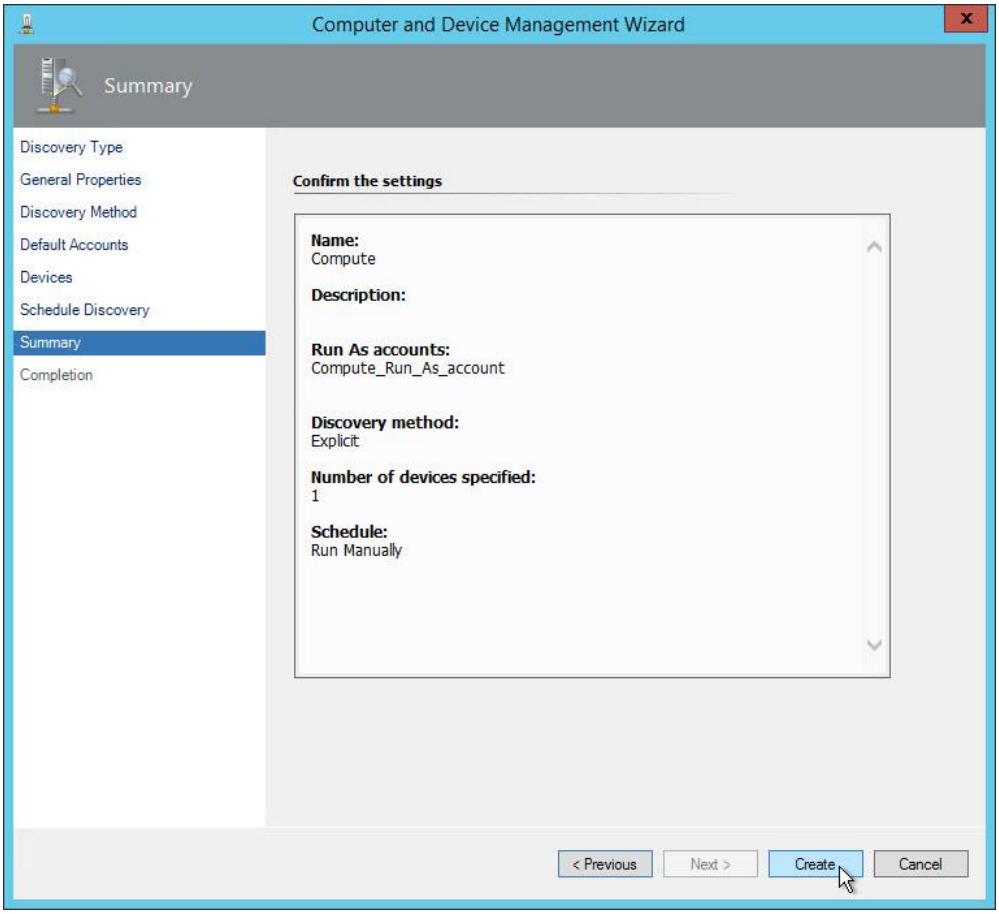
13. On the **Devices** screen, click **Next**.



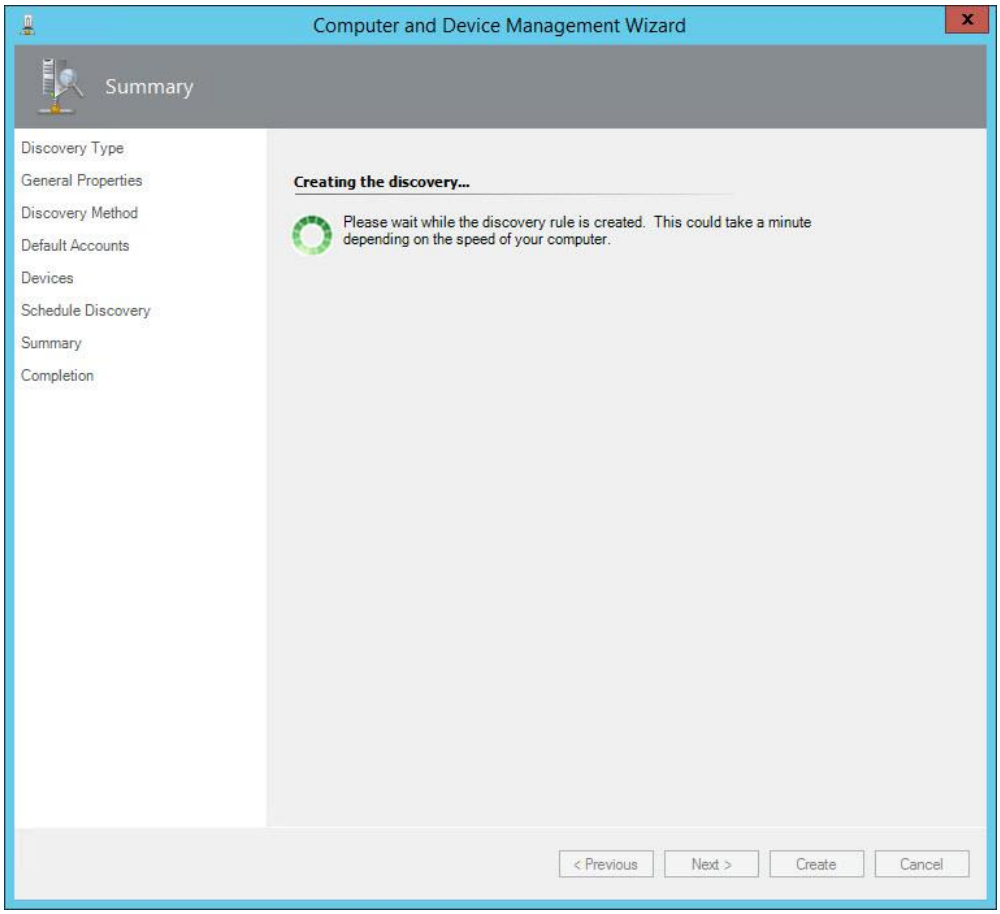
14. On the **Schedule Discovery** screen:
    a. Select **Run the discovery rule manually**.
    b. Click **Next**.



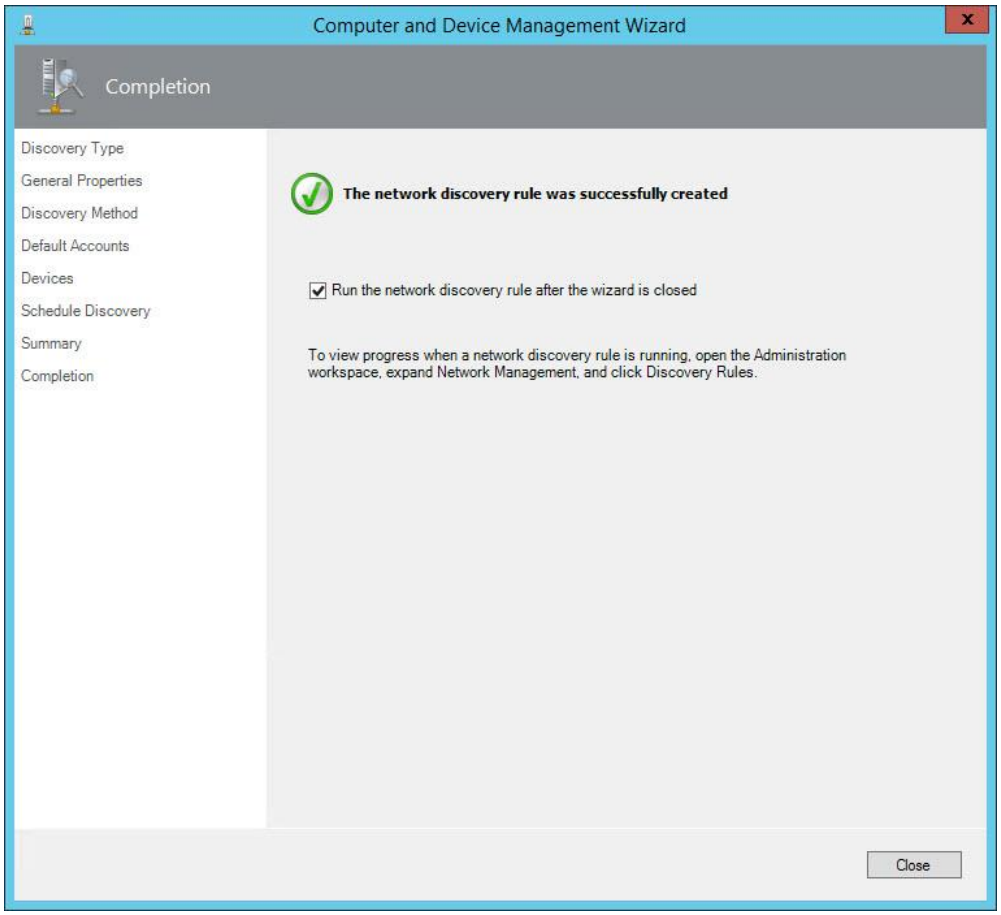
15. On the **Summary** screen, click **Create**.



This screen is displayed while a discovery rule is created. This may take several minutes to complete.



16. When the **Completion** screen appears:
    a. Click the checkbox next to **Run the network discovery rule after the wizard** is closed.
    b. Click **Close**.
    c. Click **Finish**.

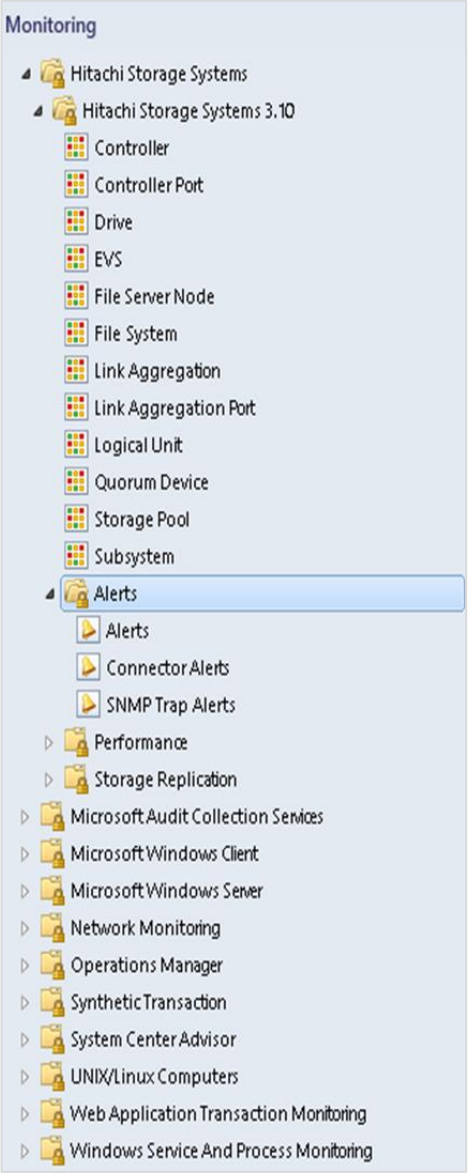


Monitoring SNMP Trap Alerts

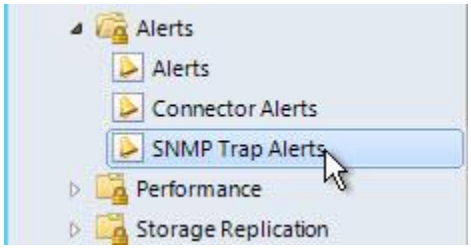
Note

SNMP traps from VSP Gx00 and VSP Fx00 arrays may appear in the SCOM console with unexpected source values. Instead of the IP address of the VSP Gx00 or VSP Fx00 controller which sent the trap, the source may have an appearance similar to *pw126255000015.9.panda-world.ne.jp*.

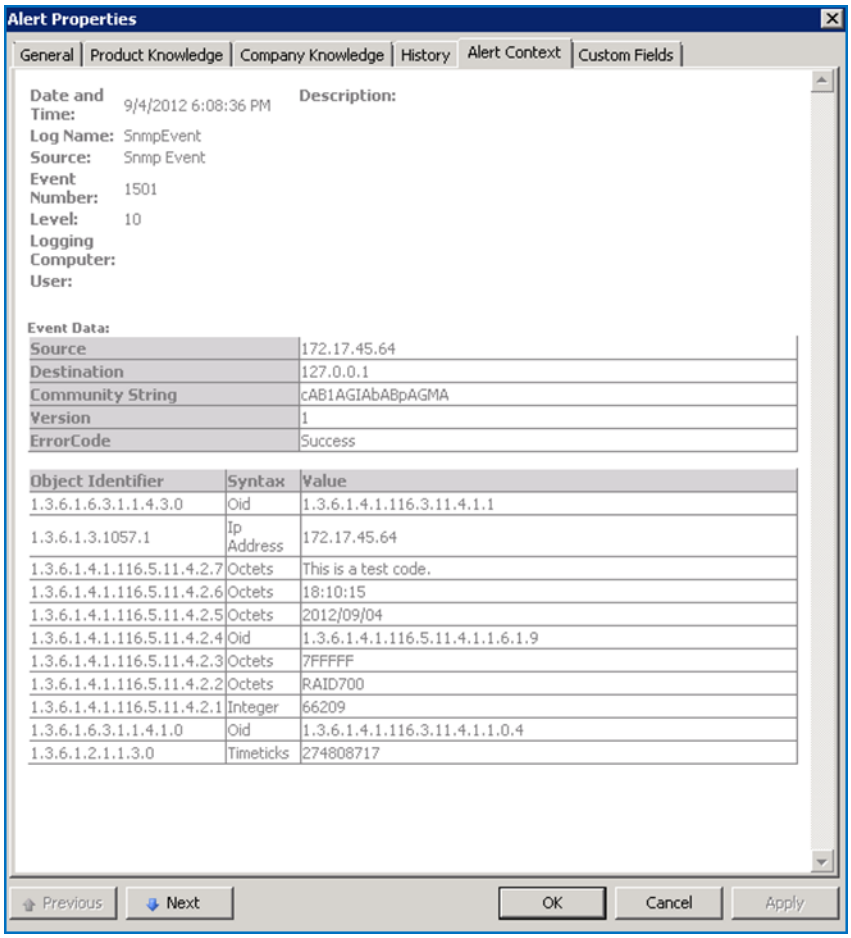
1. Open the SCOM Monitoring screen.
2. Select the **Hitachi Storage Systems Alerts** folder.



3. Select **SNMP Trap Alerts**. All SNMP-based SNMP trap alerts received by SCOM appear in the center pane.



4. To view details for an SNMP trap alert, right-click on the alert, then select **Properties**, and **Alert Context**.



The contents of the alert properties window are described in the following table.

Model	Trap	OID	Alert	Severity
HUS VM/VSP/VSP G1000/VSP G1500/VSP F1500	RaidEventUserService	.1.3.6.1.4.1.116.3.11.4.1.1.0.4	Hitachi Storage VSP Service Alerts	Critical

Model	Trap	OID	Alert	Severity
HUS VM/VSP/VSP G1000/ VSP G1500/VSP F1500	RaidEventModerateService	.1.3.6.1.4.1.116.3.11.4.1.1.0.3	Hitachi Storage VSP Moderate Alerts	Critical
HUS VM/VSP/VSP G1000/ VSP G1500/VSP F1500	RaidEventSeriousService	.1.3.6.1.4.1.116.3.11.4.1.1.0.2	Hitachi Storage VSP Serious Alerts	Critical
HUS VM/VSP/VSP G1000/ VSP G1500/VSP F1500	RaidEventAcuteService	.1.3.6.1.4.1.116.3.11.4.1.1.0.1	Hitachi Storage VSP Acute Alerts	Critical
VSP Gx00/VSP Fx00	RaidEventUserService	1.3.6.1.4.1.116.5.11.4.1.1.0.4	Hitachi Storage VSP Service Alerts	Critical
VSP Gx00/VSP Fx00	RaidEventModerateService	1.3.6.1.4.1.116.5.11.4.1.1.0.3	Hitachi Storage VSP Moderate Alerts	Critical
VSP Gx00/VSP Fx00	RaidEventSeriousService	1.3.6.1.4.1.116.5.11.4.1.1.0.2	Hitachi Storage VSP Serious Alerts	Critical
VSP Gx00/VSP Fx00	RaidEventAcuteService	1.3.6.1.4.1.116.5.11.4.1.1.0.1	Hitachi Storage VSP Acute Alerts	Critical
HNAS/Unified NAS module (VSP Gx00/VSP Fx00)	NAS Specific Trap	1.3.6.1.4.1.11096.6.1.1.0.0	NAS Event Alerts	Critical

Alerts Filtering

It is possible to filter out specific SVP alerts, after which they will no longer be monitored.

The filtering specifications used depend on which type of alert is being filtered: Trap or Server.

Note
This function does not apply to SNMP-based alerts.

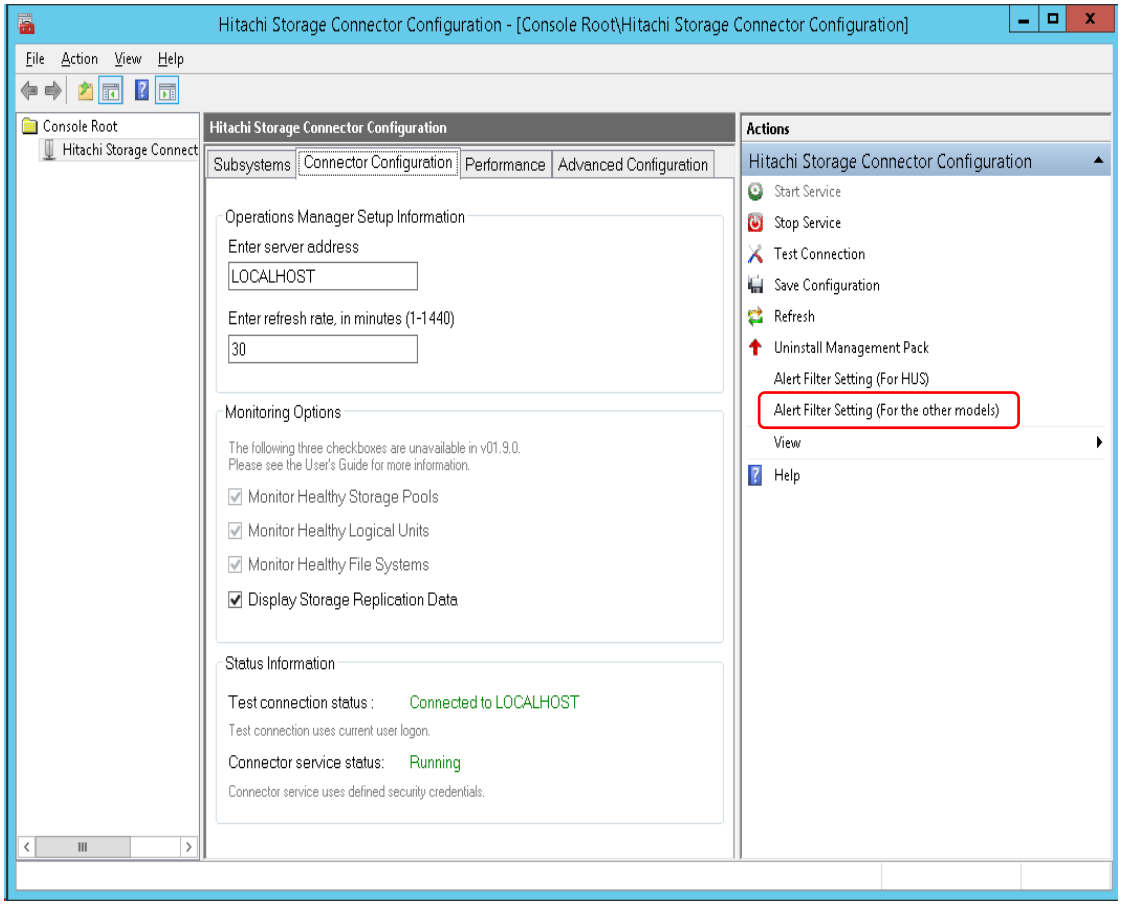
Alert Filter Setting (For HUS)

Once SIM codes have been added to this filtering screen, alerts corresponding to them will not be monitored.

This setting pertains to alerts with a Type value of **Trap**.

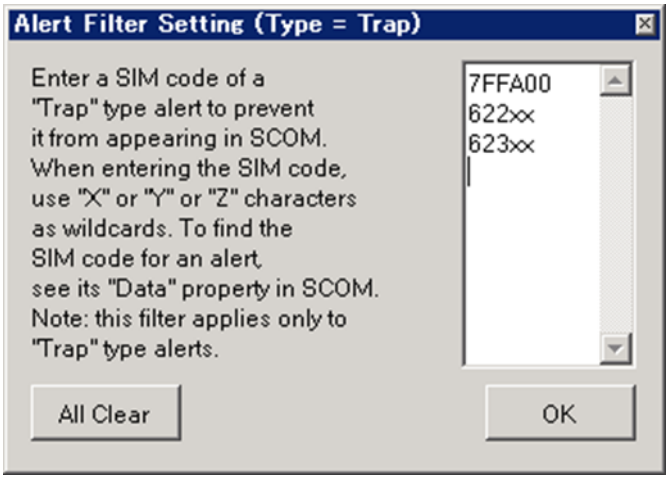
Note
This function does not apply to HUS, HUS VM, VSP G1000, VSP Gx00/Fx00, and VSP G1500/F1500 arrays.

1. Open Hitachi Storage Connector Configuration.
2. Click Connector Configuration.
3. Click Alert Filter Setting (Type = For the other models) displayed in the **Action** pane.



4. Enter one or more SIM codes to prevent the alerts associated with them from appearing in SCOM.

   "X" or "Y" or "Z" can be used as wild cards.



5. Click **OK**.

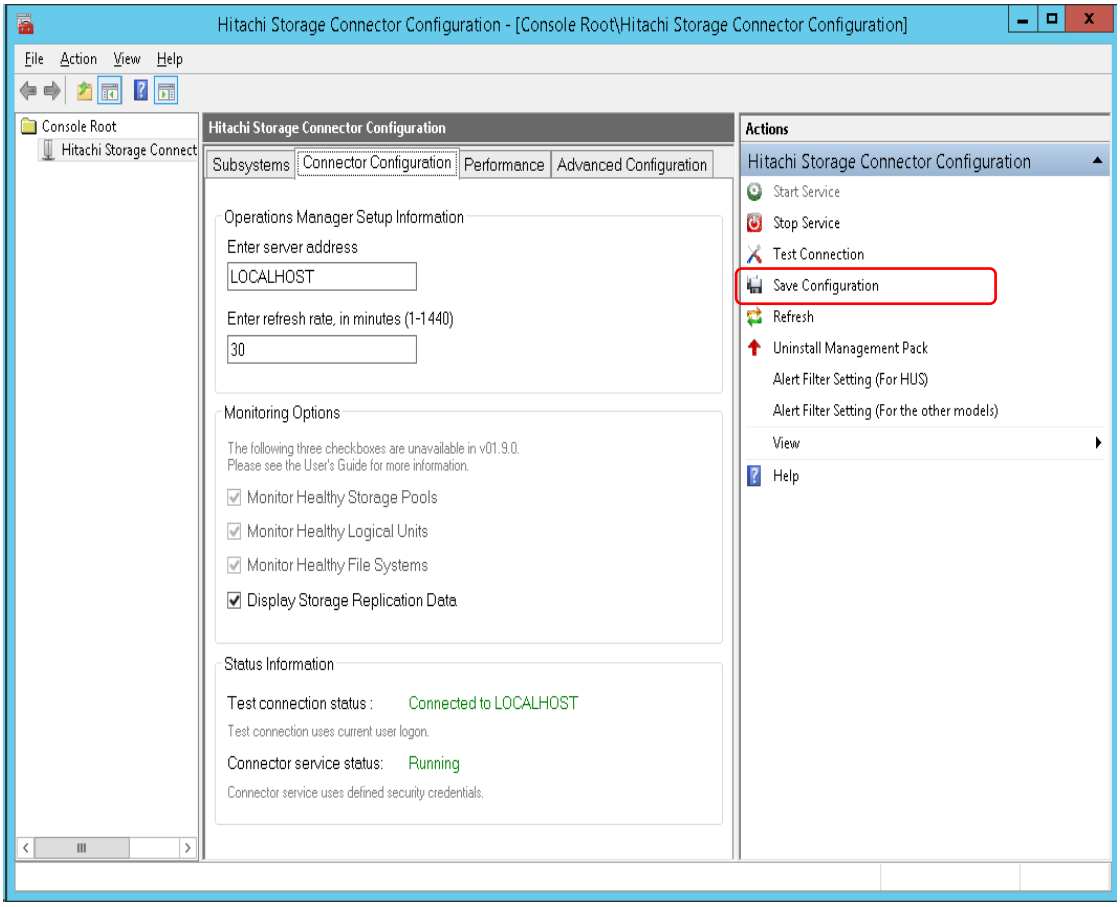
6. Restart the Connector service.

Setting Monitored Component Filtering

Monitored component filtering allows healthy components to be excluded from the SCOM display. By displaying only problematic components, the volume of data maintained in SCOM can be significantly reduced.

By default, all subsystem components are monitored.

1. Open Hitachi Storage Connector Configuration.
2. Click **Connector Configuration**.
3. To exclude a component category, uncheck the checkbox for the category. When a category is unchecked, the corresponding monitored components which are in a healthy state will not be displayed in SCOM. Monitoring options to disable include: Display Storage Replication Data
4. Click **Save Configuration**.



Though monitoring may be configured to omit healthy components from the SCOM console, Hitachi Storage Connector Service continues to monitor all components. If a healthy component changes to a warning or critical state, the component will be displayed in SCOM, and an alert will be generated.

When the state of the component returns to healthy, it will be removed from the SCOM display and its corresponding alert will automatically be resolved.

Monitoring Enterprise Arrays

This information pertains to monitoring Enterprise family arrays (including VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500) with v01.7.0 and later of this software.

Prior to the v01.7.0 SCOM adapter, it was only necessary to map a storage array command device to the SCOM adapter host to monitor performance information. Since v01.7.0, a command device is also required for regular monitoring, even when performance information is not being collected.

In addition to mapping a command device, CCI must also be installed on the SCOM adapter host. It is not necessary to configure CCI after installing it. The SCOM adapter will configure the CCI automatically when you add a storage array monitoring configuration.

When it becomes necessary for either the Connector service for the SCOM adapter or the MMC snap-in to connect to the storage array, a CCI HORCM instance is created automatically. Since the SCOM adapter may be configured to monitor multiple Enterprise family arrays, and since both the Connector and the MMC snap-in may need to simultaneously collect information from each monitored array, the HORCM instance numbers are chosen from a range of allowed values.

The default HORCM instance number range is [1000-1099], inclusive.

Under some conditions, it may be necessary to change the range of HORCM instance numbers used by the SCOM adapter. These conditions include:

- When pre-existing CCI installations are active on the same computer

  When a pre-existing CCI installation on the same computer is already using one or more HORCM instance numbers which fall within the range of the SCOM adapter, it may be necessary to adjust the SCOM adapter range to avoid a HORCM instance number conflict.

- When a single hypervisor hosts multiple SCOM adapter instances

  When a hypervisor (such as VMware ESXi or Microsoft Hyper-V) hosts VMs running guest operating systems, and the SCOM adapter instances have been installed in more than one of these guest operating systems, it may be necessary to configure each SCOM adapter instance to use its own, separate HORCM instance number range.

For example, if three SCOM adapter instances exist in this kind of environment, the first could use HORCM range [1000-1099], the second could use [1100-1199], and the third could use [1200-1299].

If two or more SCOM adapter instances attempt to use the same HORCM range, or even ranges which overlap at all, it is possible for I/O errors to occur when either the Connector service or the MMC snap-in attempts to collect information from the array.

To configure a non-default HORCM instance number range:

1. Stop the Connector service (if running), and close the MMC snap-in (if open).
2. Using a text editor, open the *HiScomConnectorService.exe.config* file from the installation directory.
3. Find the two lines which contain keywords **MinHORCMInstance** and **MaxHORCMInstance**. By default, these lines will look similar to this:

```
<add key="MinHORCMInstance" value="1000" />
<add key="MaxHORCMInstance" value="1099" />
```

4. Edit these two lines to establish a non-default range. For instance, to configure a range of [1100-1199], inclusive, change the lines to look like this:

```
<add key="MinHORCMInstance" value="1100" />
<add key="MaxHORCMInstance" value="1199" />
```

5. Save the *HiScomConnectorService.exe.config* file, and close the text editor.

The new HORCM instance number range will be used the next time you start the Connector service for the SCOM adapter and the MMC snap-in,.

Some HORCM instance number ranges are reserved. Valid non-default ranges are [100-400], [500-600], [700-800] and [1000-2047], all inclusive. Either a complete range or a range subset, such as [1100-1199], may be used.

3

Monitoring Views

This chapter provides instructions for performing subsystem viewing operations with Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager.

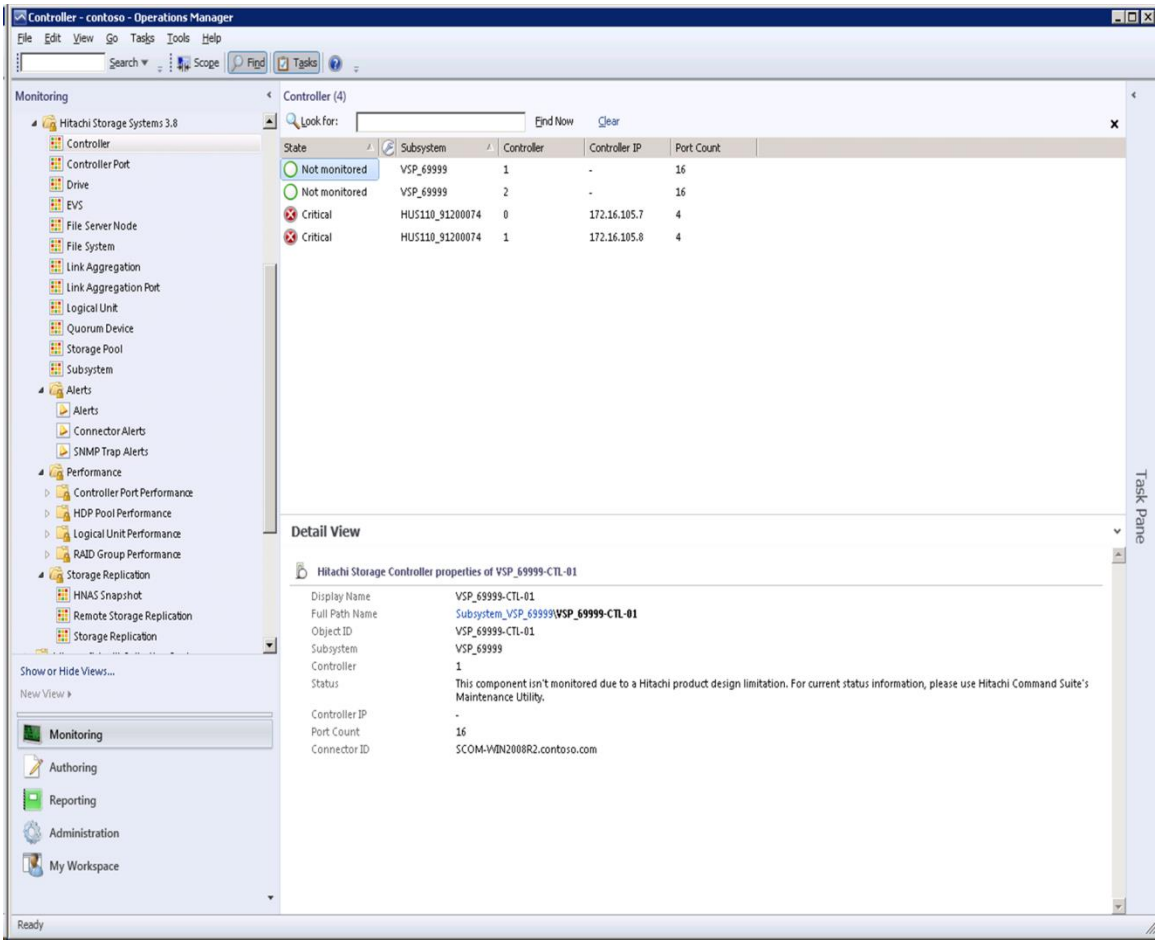
To switch between displaying and not displaying items, right click **Personalize View** in each view.

Controller View

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

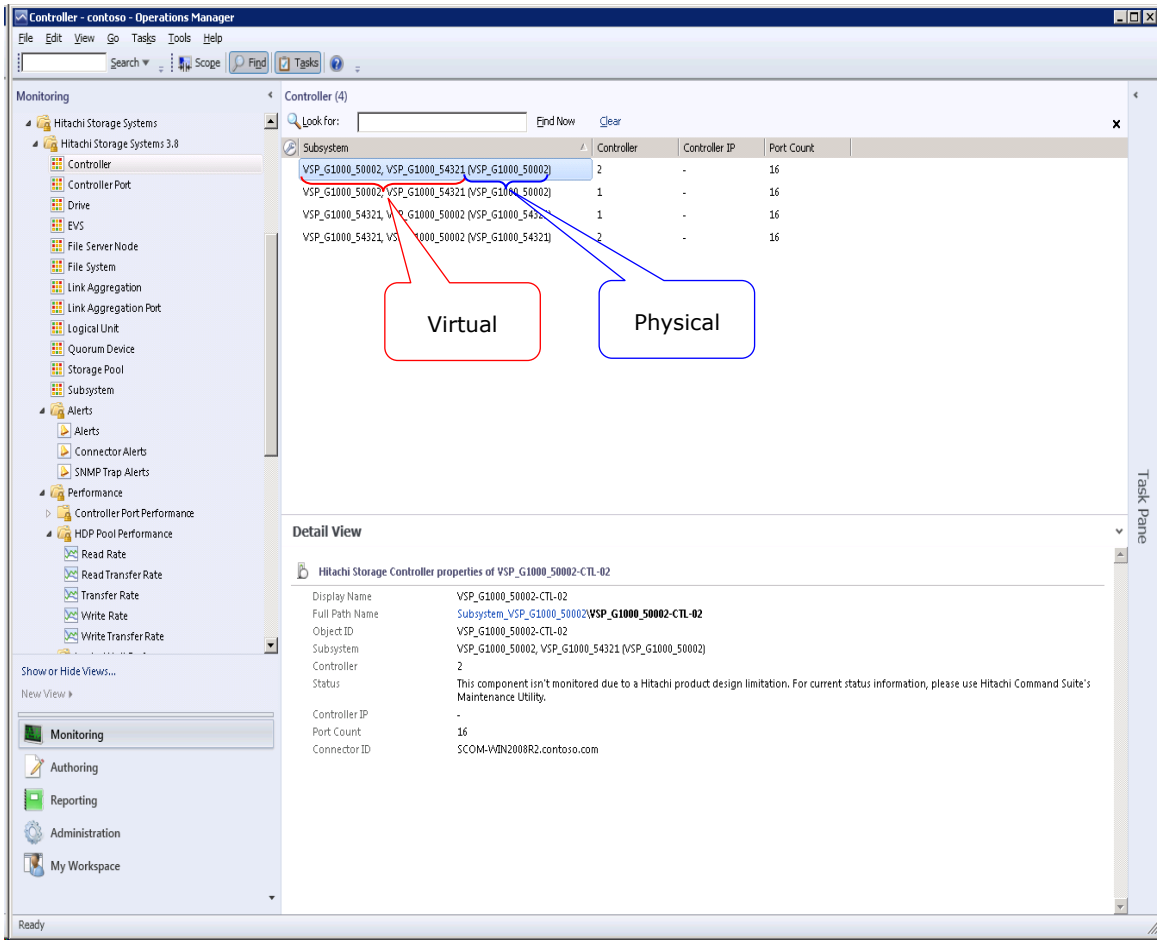
Access the **Controller** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Controller**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem field displays values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parentheses to the right of the Virtual DKC information, such as Virtual DKC (Physical DKC). If the target Virtual DKC shares the same Physical DKC with other Virtual DKCs, duplicate Physical DKCs are eliminated and displayed as Virtual DKC1, Virtual DKC2, … (Physical DKC). There is an *n*:1 correlation between Virtual DKCs and Physical DKCs.



The Controller view contains the following columns and definitions.

Field	Description
State	Health state of Controller The Not Monitored state is perpetually displayed for these components for the following storage subsystems: VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500[2].
Maintenance Mode	N/A
Subsystem[1]	Name of the subsystem
Controller	The controller number of the subsystem controller
Controller IP	The controller IP address of the subsystem controller
Port Count	The total number of ports for that given subsystem controller

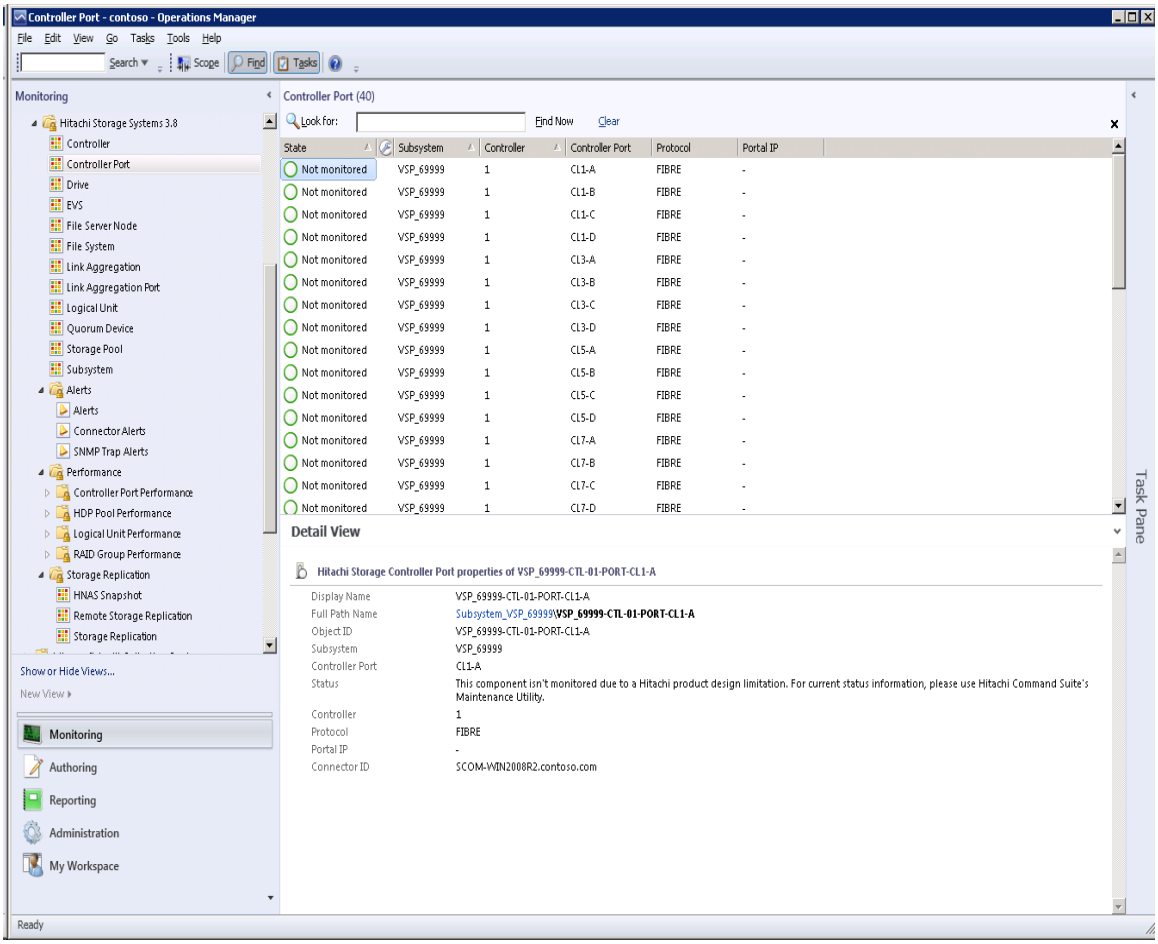
Field	Description
	Notes 1. With global storage virtualization, Virtual DKC configurations. This field will resemble Virtual DKC (Physical DKC). 2. Displayed as Not Monitored since software version 1.5.0.

Controller Port View

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Controller Port** view from the **Monitoring** pane of the Operations Manager console.

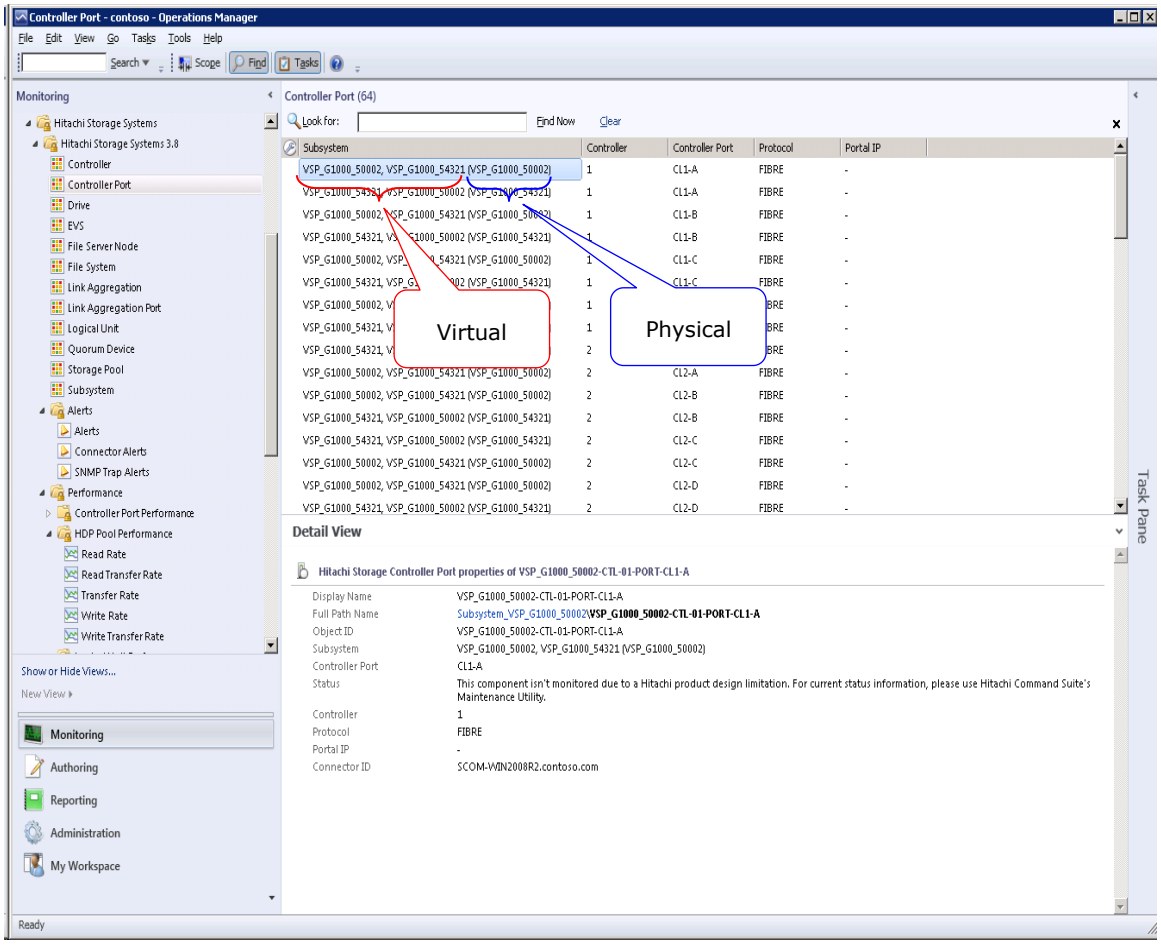
- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Controller Port**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem field displays values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC

information is shown in parentheses to the right of the Virtual DKC information, such as **Virtual DKC (Physical DKC)**. If the target Virtual DKC shares the same Physical DKC with other Virtual DKCs, duplicate Physical DKCs are eliminated and displayed as Virtual DKC1, Virtual DKC2, … (Physical DKC). There is an *n*:1 correlation between Virtual DKCs and Physical DKCs.



The Controller Port view contains the following columns and definitions:

Field	Description
State	Availability state of Controller Port The Not Monitored state is perpetually displayed for these components for the following storage subsystems: VSP, HUS VM, VSP G1000, VSP Gx00, and VSP Fx00, VSP G1500, and VSP F1500[2].
Maintenance Mode	N/A
Subsystem*1	Name of the subsystem
Controller	The controller number of the subsystem controller
Controller Port	Name of the controller port
Protocol	Possible values: ▪ Fibre or iSCSI ▪ NAS Platform (User LU) or NAS Platform (System LU)

Field	Description
Portal IP	The IP address of the controller port

Notes

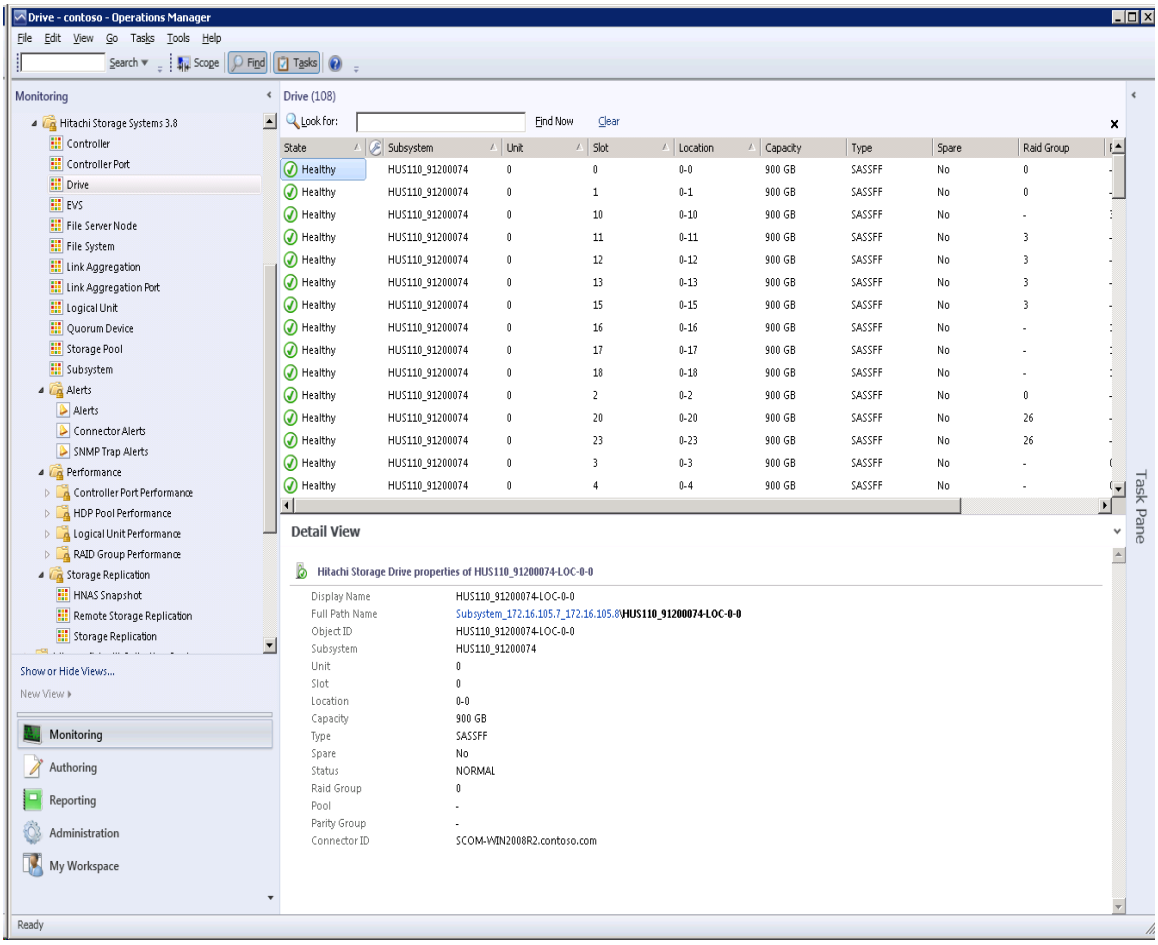
1. With global storage virtualization Virtual DKC configurations, this field will resemble **Virtual DKC (Physical DKC)**.
2. Displayed as Not Monitored since software version 1.5.0.

Drive View

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500, and HNAS

Access the Drive view from the **Monitoring** pane of the Operations Manager console.

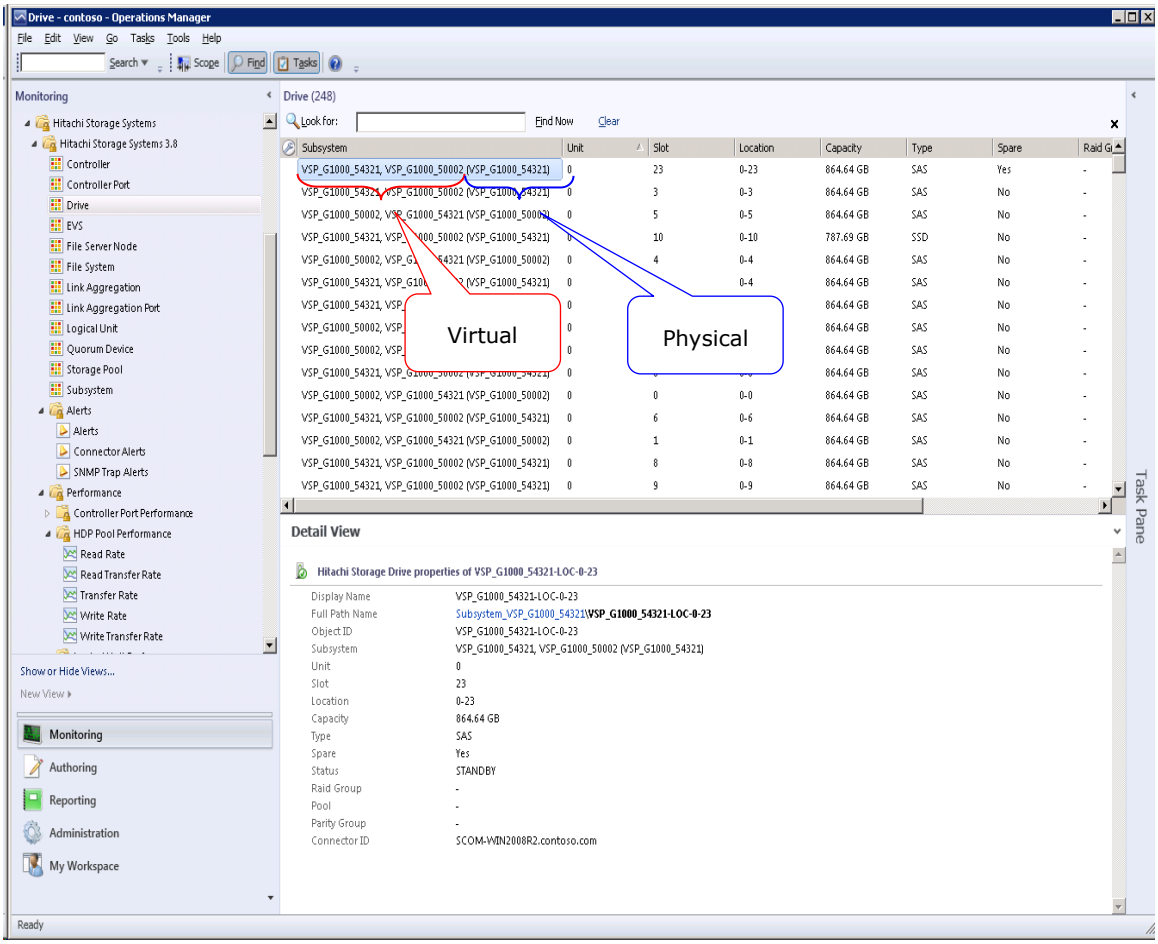
- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Drive**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem field displays values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC

information is shown in parenthesis to the right of the Virtual DKC information, such as **Virtual DKC (Physical DKC)**. If the target Virtual DKC shares the same Physical DKC with other Virtual DKCs, duplicate Physical DKCs are eliminated and displayed as Virtual DKC1, Virtual DKC2, … (Physical DKC). There is an *n*:1 correlation between Virtual DKCs and Physical DKCs.



The Drive view contains the following columns and definitions.

Field	Description
State	Monitored Drive State – Healthy, Warning or Critical
Maintenance Mode	N/A
Subsystem[1]	Name of the subsystem
Unit	The unit location number of the drive inside the subsystem This field is blank for VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500.
Slot	The slot number of the drive inside the subsystem This field is blank for VSP, HUS VM, VSP G1000,VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500.

Field	Description
Capacity	The total physical capacity of the drive. For VSP/VSP Gx00/HUS VM/VSP Fx00 storage systems, the value displayed indicates the capacity that can actually be used.
Type	Possible drive types are SATA, SAS, SSD, and FMD
Spare	True if the drive is a spare, false if drive is in use
RAID Group	The RAID Group number the drive belongs to
HDP Pool	The HDP Pool number the drive belongs to
Location	Location of the disk drive
Parity Group	VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500: Parity Group ID

Note

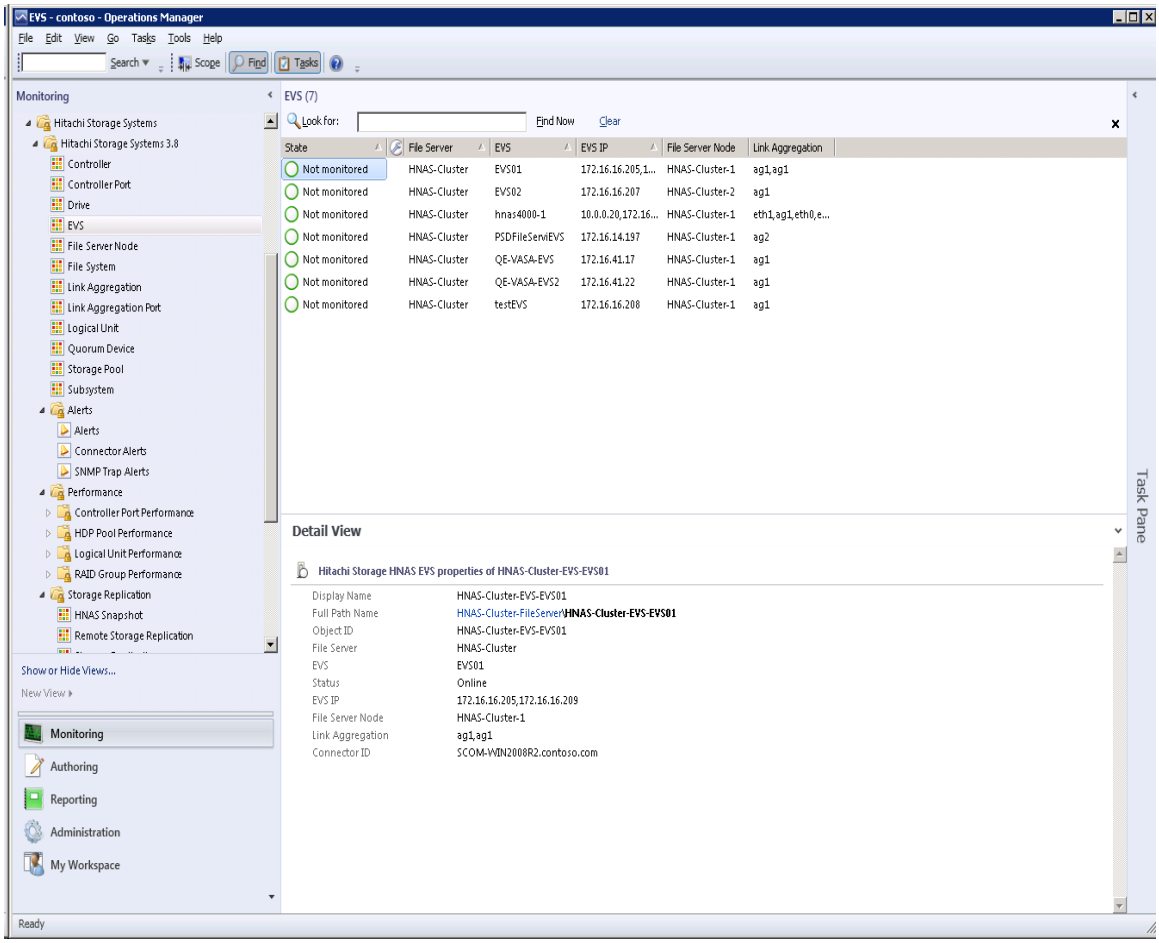
With global storage virtualization Virtual DKC configurations, this field will resemble **Virtual DKC (Physical DKC)**.

EVS View

HNAS, Unified NAS Module

Access the **EVS** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > EVS**



The EVS view contains the following columns and definitions.

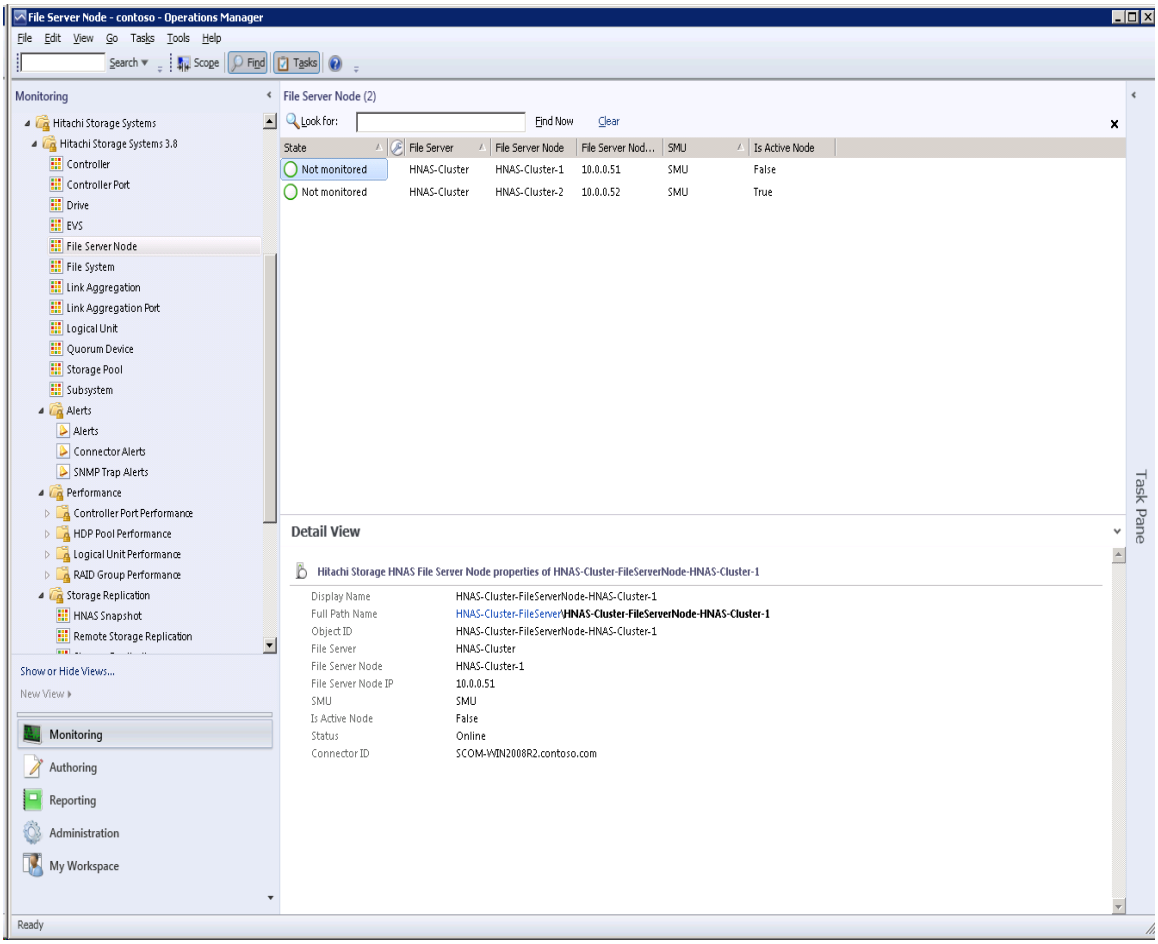
Field	Description
State	Health state of EVS
Maintenance Mode	N/A
File Server	File server name
EVS	EVS
EVS IP	EVS IP
File Server Node	File server node name
Link Aggregation	Port/Link Aggregation name

File Server Node View

HNAS, Unified NAS Module

Access the **File Server Node** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > File Server Node**



The File Server Node View contains the following columns and definitions.

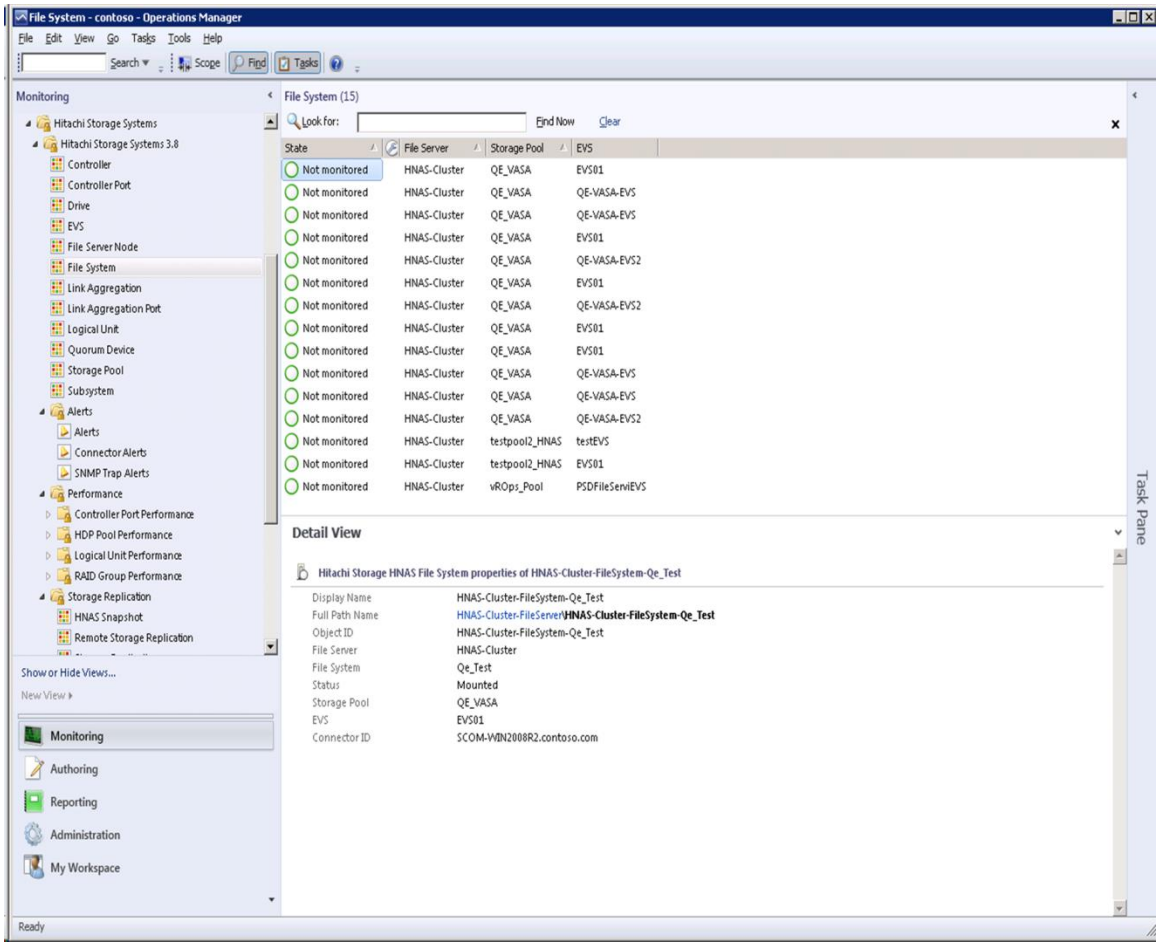
Field	Description
State	Health state of File Server Node
Maintenance Mode	N/A
File Server	File server name
File Server Node	File server node name
File Server Node IP	File server node IP address
SMU	SMU name
Is Active Node	Is active node

File System View

HNAS, Unified NAS Module

Access the **File System** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > File System**



The File System View contains the following columns and definitions.

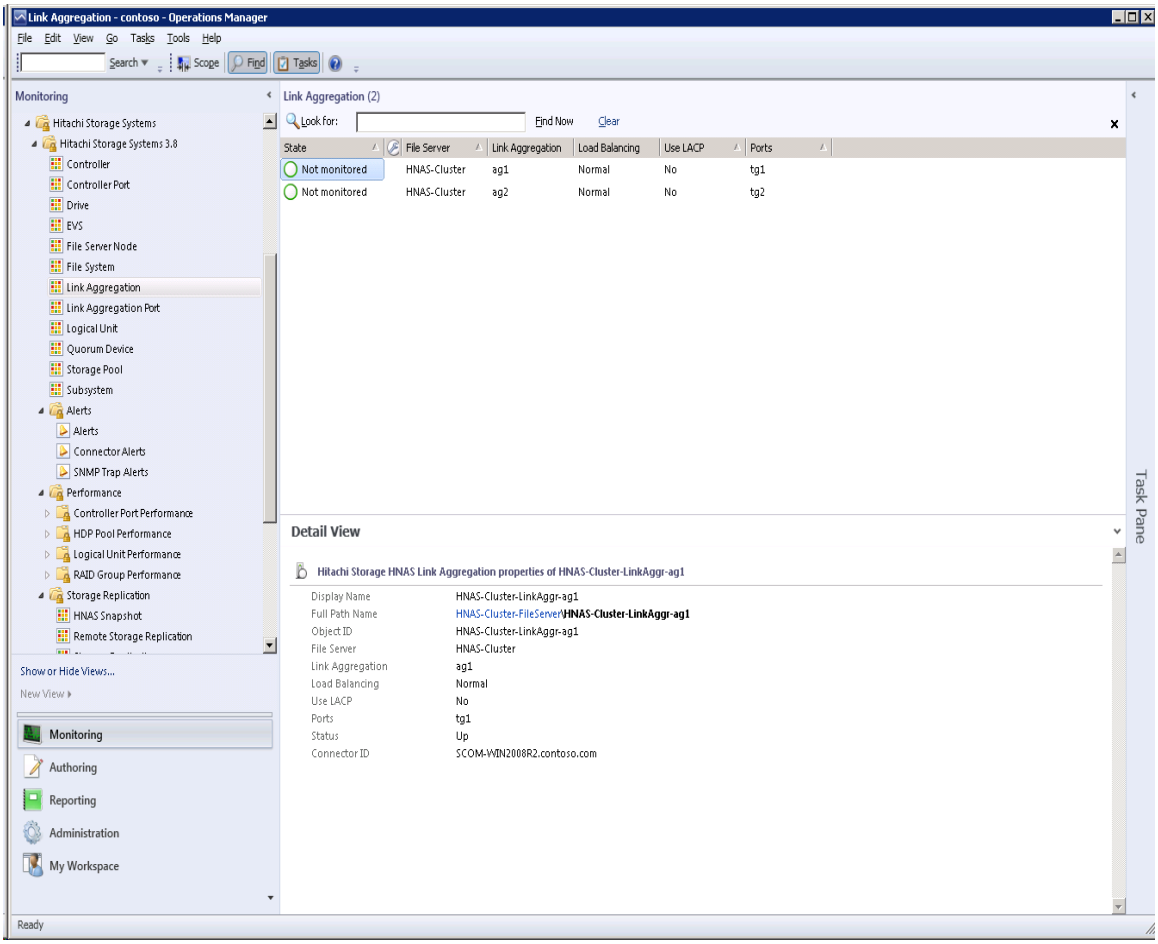
Field	Description
State	Health state of File System
Maintenance Mode	N/A
File Server	File server name
File System	File system name
Storage Pool	Storage Pool
EVS	EVS name

Link Aggregation View

HNAS, Unified NAS Module

Access the **Link Aggregation** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Link Aggregation**



The Link Aggregation view contains the following columns and definitions.

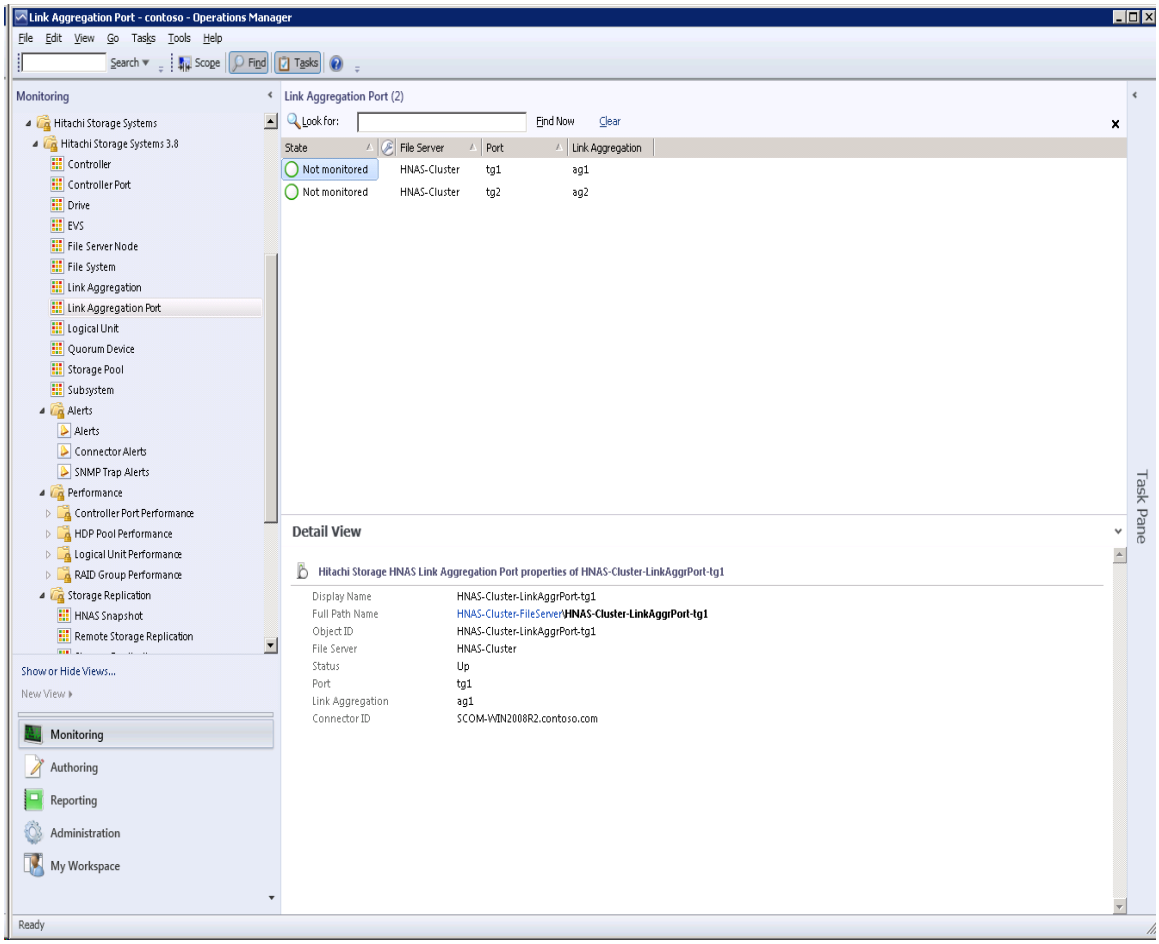
Field	Description
State	Health state of Link Aggregation object
Maintenance Mode	N/A
Subsystem	File server name
Link Aggregation	Name
Load Balancing	Load balancing value: Normal or Round Robin
Use LACP	Value: Yes or No
Ports	Ethernet ports separated by commas

Link Aggregation Port View

HNAS, Unified NAS Module

Access the **Link Aggregation Port** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Link Aggregation Port**



The Link Aggregation Port view contains the following columns and definitions.

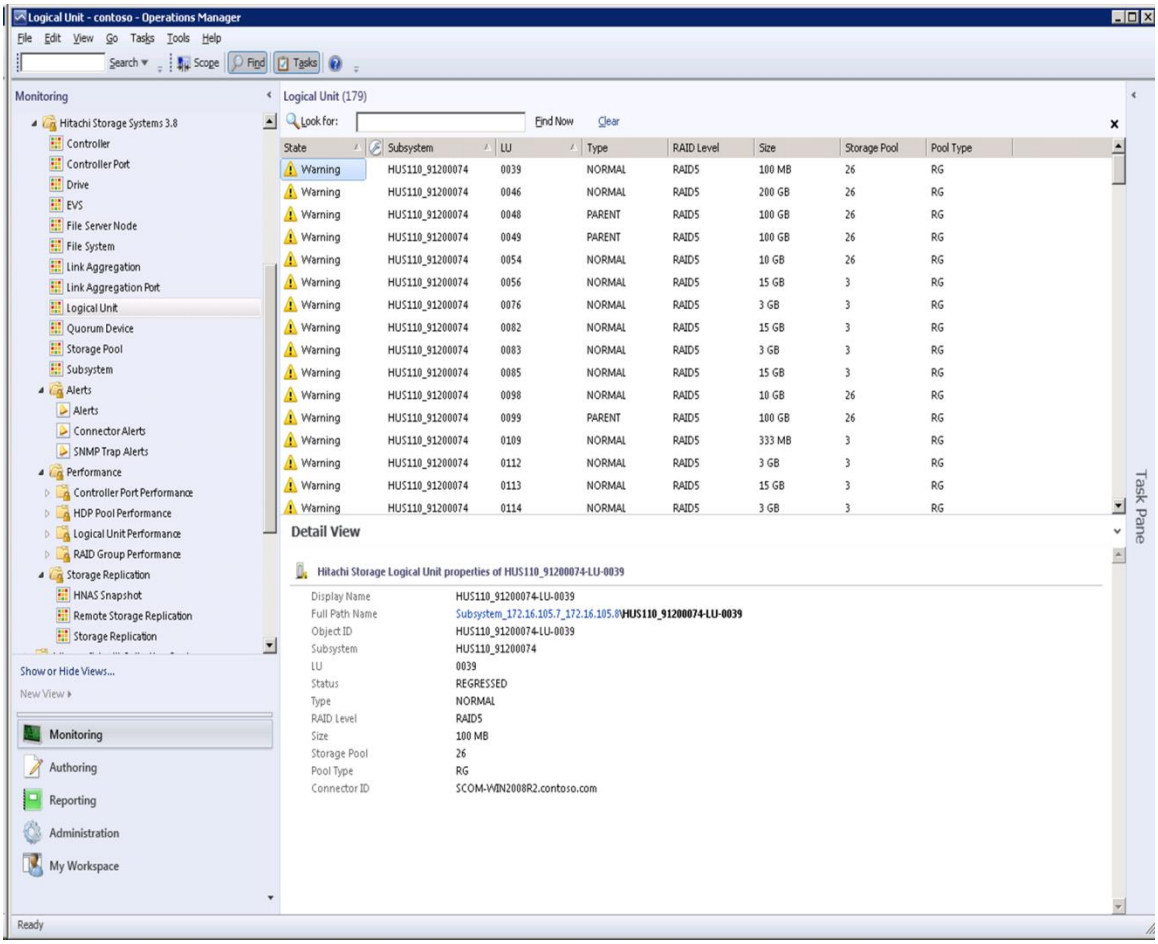
Property	Description
State	Health state of Link Aggregation Port
Maintenance Mode	N/A
File Server	File server name
Port	Ethernet port name
Link Aggregation	Link aggregation name (if available)

Logical Unit View

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Logical Unit** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Logical Unit**

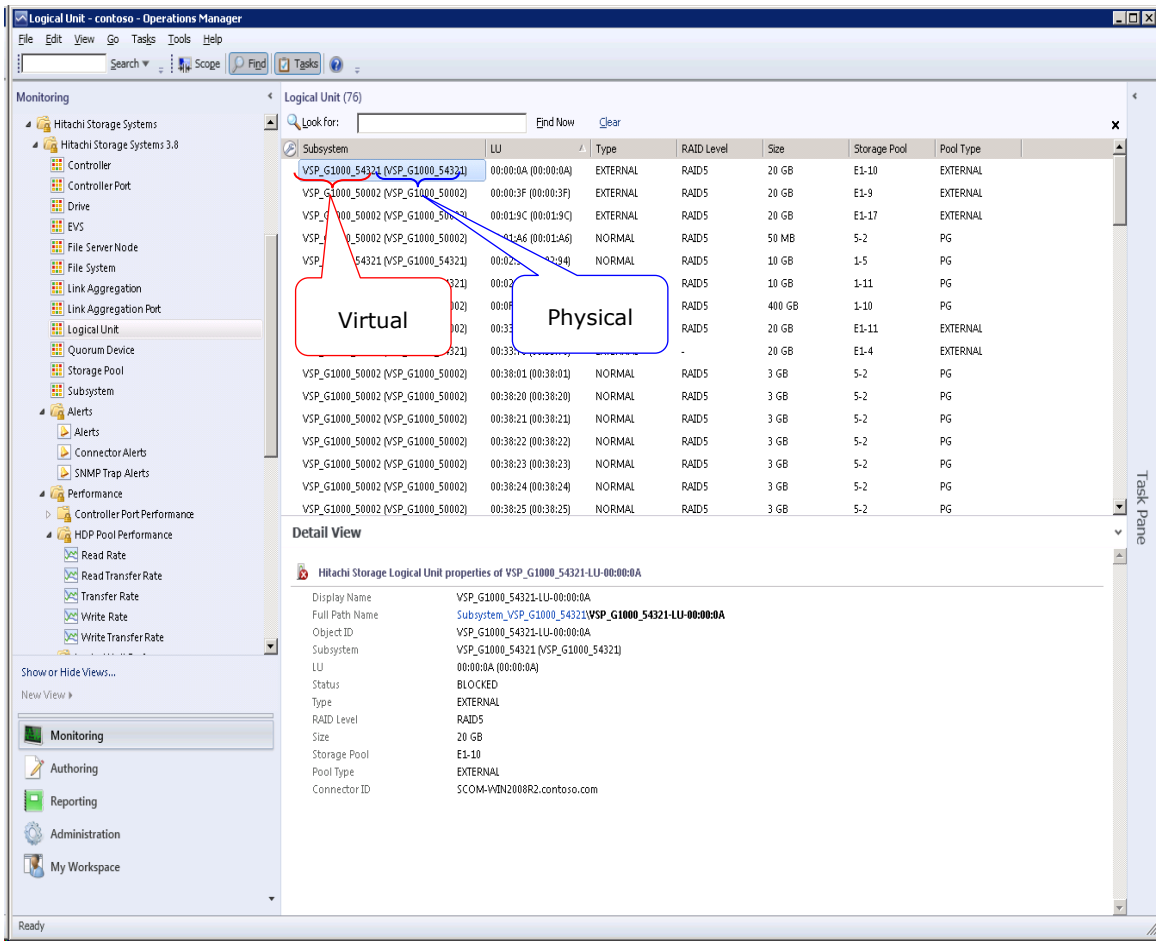


With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem and LU fields display values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parentheses to the right of the Virtual DKC information, such as **Virtual DKC (Physical DKC)**. If a Virtual DKC resides upon multiple Physical DKCs, each Physical DKC is listed within parentheses.

The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.



The Logical Unit view contains the following columns and definitions:

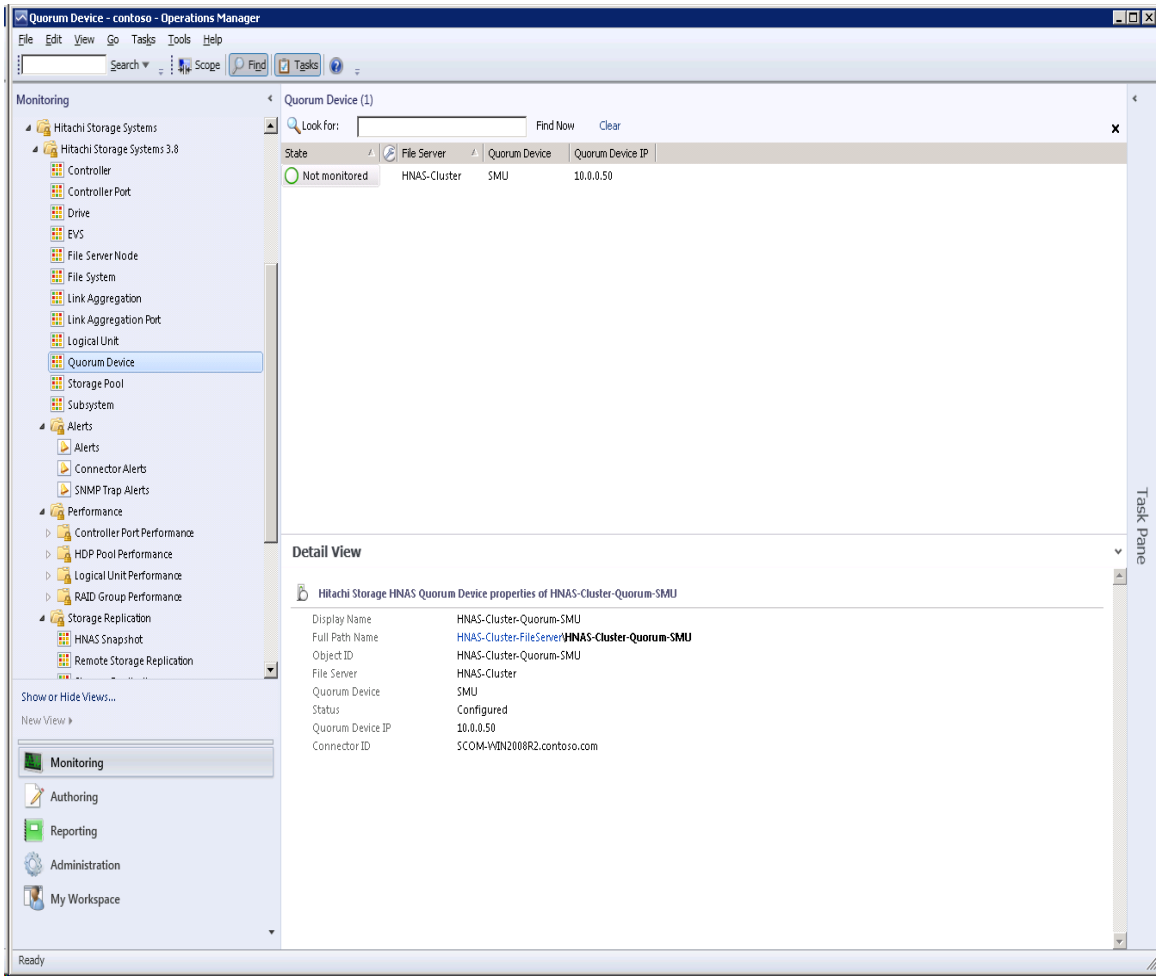
Field	Description
State	Health state of Logical Unit
Maintenance Mode	N/A
Subsystem[1]	Name of the subsystem
LU[1]	LU number
Type	Possible LU types: ▪ Single, Parent, or V-VOL ▪ NAS Platform (User LU) or NAS Platform (System LU)
RAID Level	Possible RAID Levels are 0, 1, 5, 6 or 10
Size	Total available capacity of the LU
Storage Pool	Storage pool
Pool Type	Pool Type: RG, HDP, HDT, HRT, COW or Parity Group
Note With global storage virtualization DKC configurations, this field will resemble **Virtual DKC (Physical DKC)**.	

Quorum Device View

HNAS, Unified NAS Module

Access the **Quorum Device** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Quorum Device**



The Quorum Device view contains the following columns and definitions.

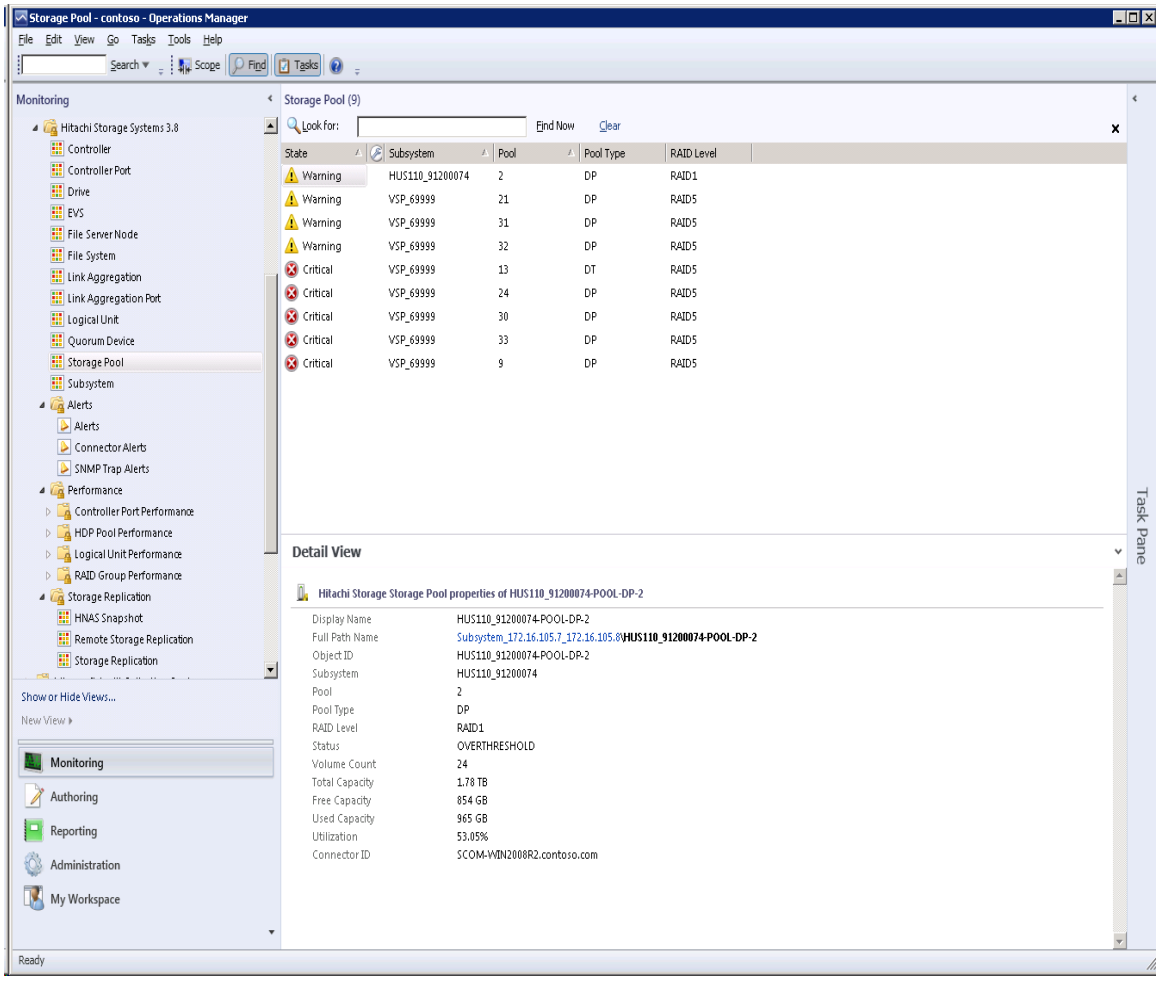
Field	Description
State	Health state of Quorum Device
Maintenance Mode	N/A
File Server	File server name
Quorum Device	Quorum Device name
Quorum Device IP	Quorum Device IP

Storage Pool View

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500, and HNAS

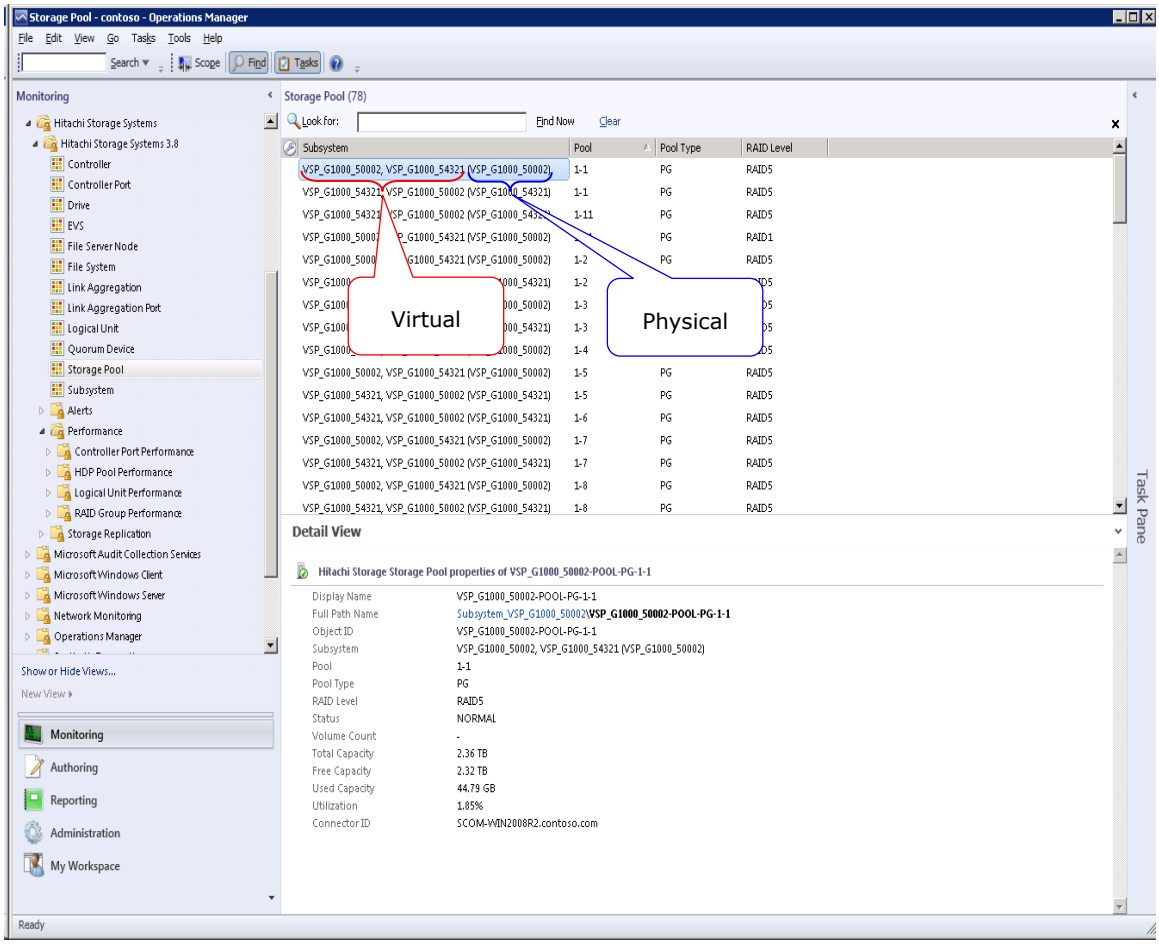
Access the **Storage Pool** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Storage Pool**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem field displays values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parenthesis to the right of the Virtual DKC information, such as **Virtual DKC (Physical DKC)**. If the target Virtual DKC shares the same Physical DKC with other Virtual DKCs, duplicate Physical DKCs are eliminated and displayed as Virtual DKC1, Virtual DKC2, … (Physical DKC). There is an *n*:1 correlation between Virtual DKCs and Physical DKCs.



The Storage Pool view contains the following columns and definitions.

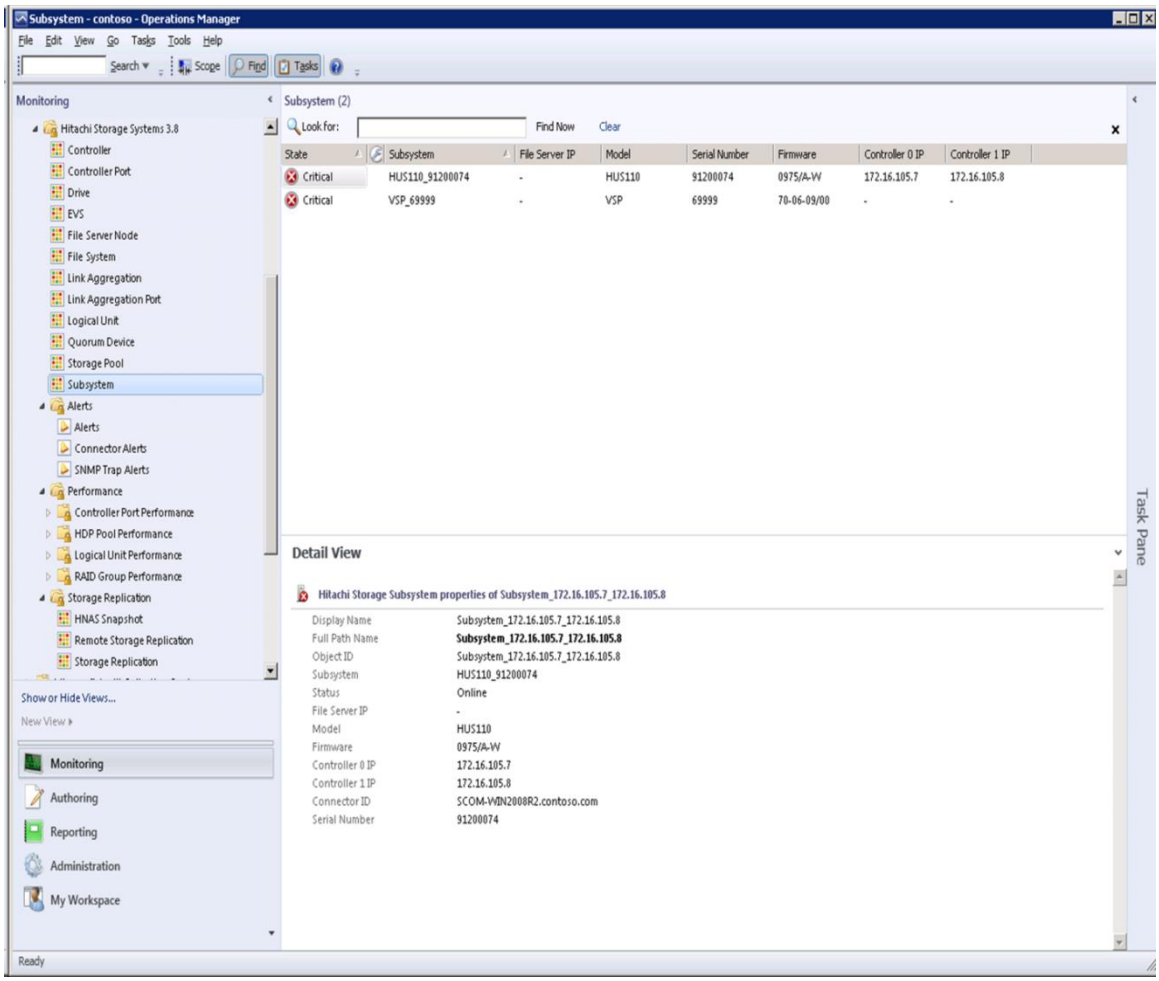
Field	Description
State	Storage pool health: Healthy, Warning or Critical
Maintenance Mode	N/A
Subsystem[1]	Name of the subsystem
Pool	Subsystem pool number
Pool Type	Pool type: DP , DT, RT, COW, RG , PG, MJNL, RJNL, INITJNL, EMPTYJNL, MJNL_RJNL_UR, MJNL_UR, RJNL_UR, INITJNL_MF, HDP_MF
RAID Level	Possible RAID levels are RAID0, RAID1, RAID5, RAID6, or RAID10.

> **Note**
> With global storage virtualization Virtual DKC configurations, this field will resemble **Virtual DKC (Physical DKC)**.

Subsystem View

Access the **Subsystem** view from the **Monitoring** pane of the Operations Manager console.

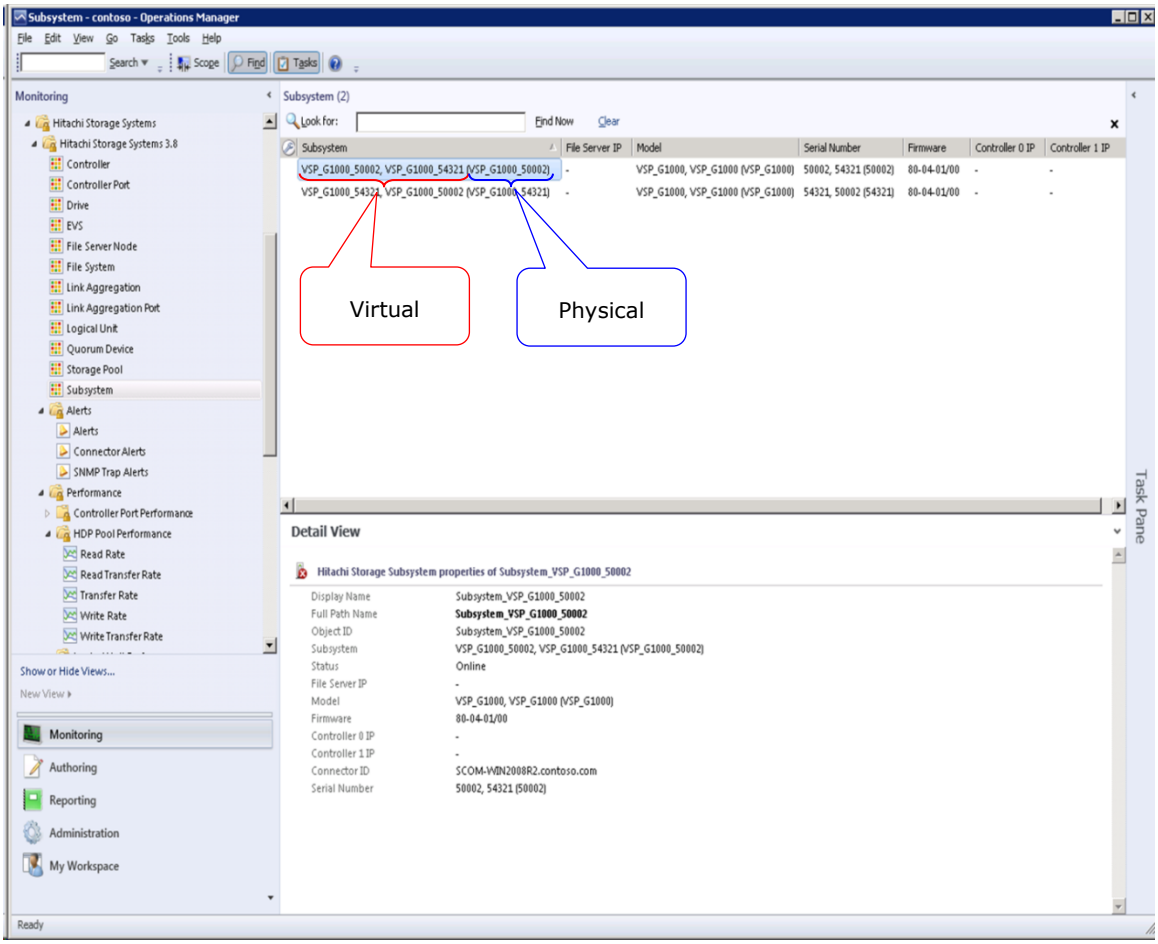
- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Subsystem**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem, Model and Serial Number fields display values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parenthesis to the right of information for the Virtual DKC, such as Virtual DKC (Physical DKC). If the target Virtual DKC shares the same Physical DKC with other Virtual DKCs, duplicate Physical DKCs are

eliminated and displayed as Virtual DKC1, Virtual DKC2, … (Physical DKC). There is an *n*:1 correlation between Virtual DKCs and Physical DKCs.



The Subsystem view contains the following columns and definitions:

Field	Description
State	Availability State of Subsystem
Maintenance Mode	N/A
Subsystem[1]	Name of the Subsystem
File Server IP	HNAS IP Address
Model[1]	Model of the HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500, HNAS (Unified NAS module only) storage device
Serial Number[1]	Subsystem Serial Number
Firmware	Microcode level of the storage array
Controller 0 IP[2]	Subsystem Controller 0 IP address
Controller 1 IP[2]	Subsystem Controller 1 IP address

Notes

1. With global storage virtualization Virtual DKC configurations, this field will resemble Virtual DKC (Physical DKC).
2. When VSP Gx00 and Fx00 arrays are being used, the Controller 0 IP field corresponds to Controller 1 for the array, while the Controller 1 IP field corresponds to Controller 2.

Controller Port Performance

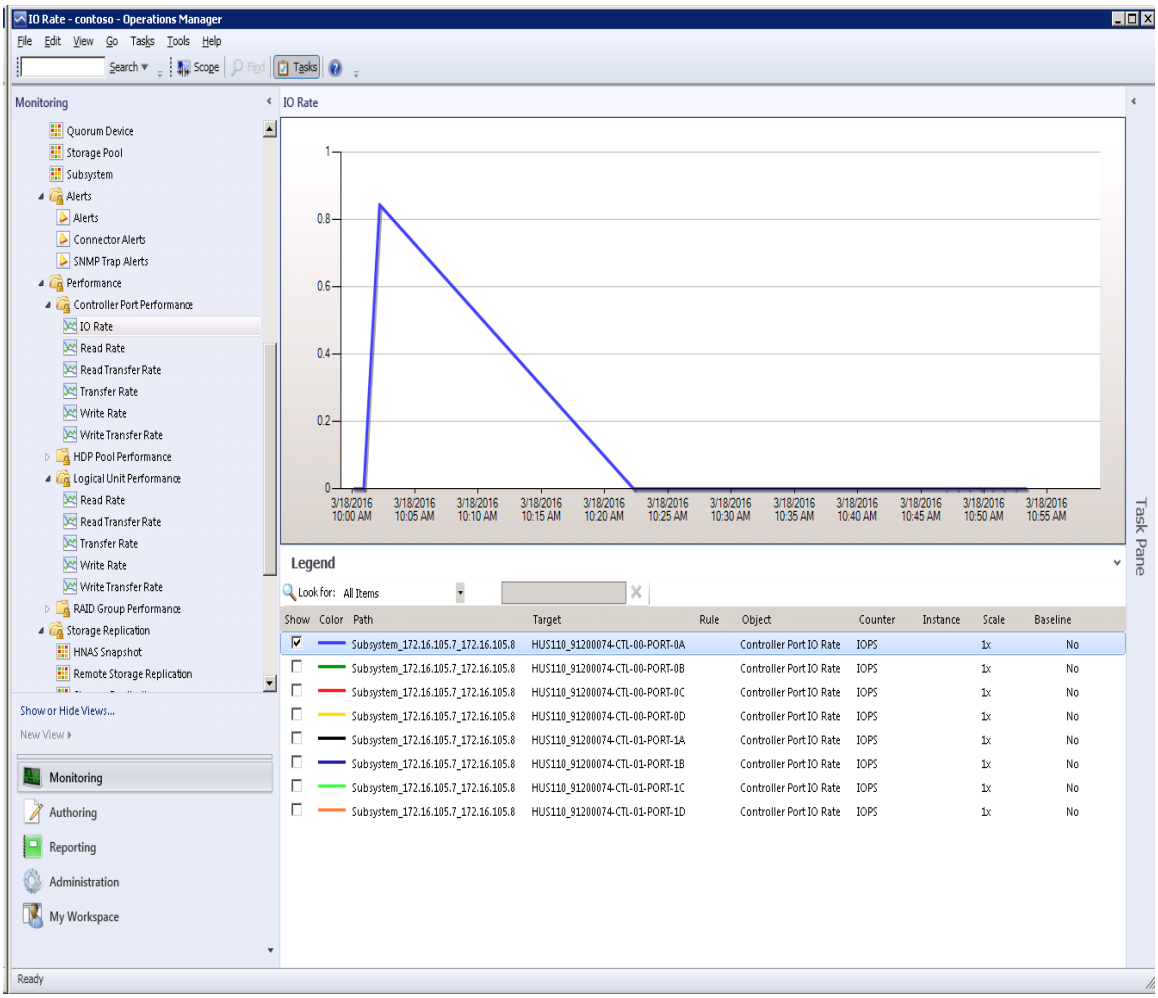
HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Controller Port Performance** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Performance > Controller Port Performance**

You can choose from the following performance views:

- **IO Rate**
- **Read Rate (HUS only)**
- **Read Transfer Rate (HUS only)**
- **Transfer Rate**
- **Write Rate (HUS only)**
- **Write Transfer Rate (HUS only)**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

HDP Pool Performance

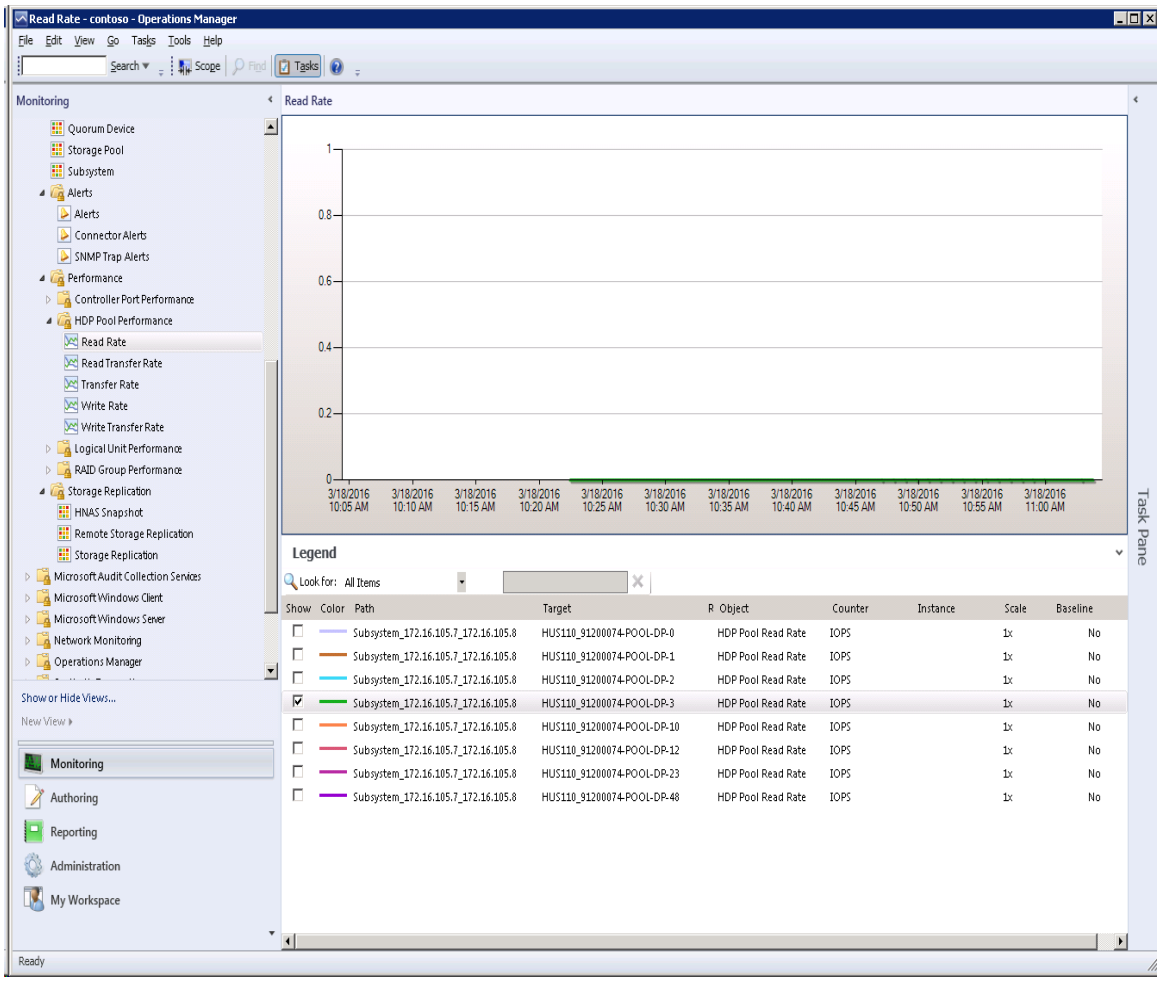
HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **HDP Pool Performance** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Performance > HDP Pool Performance**

You can choose from the following performance views:

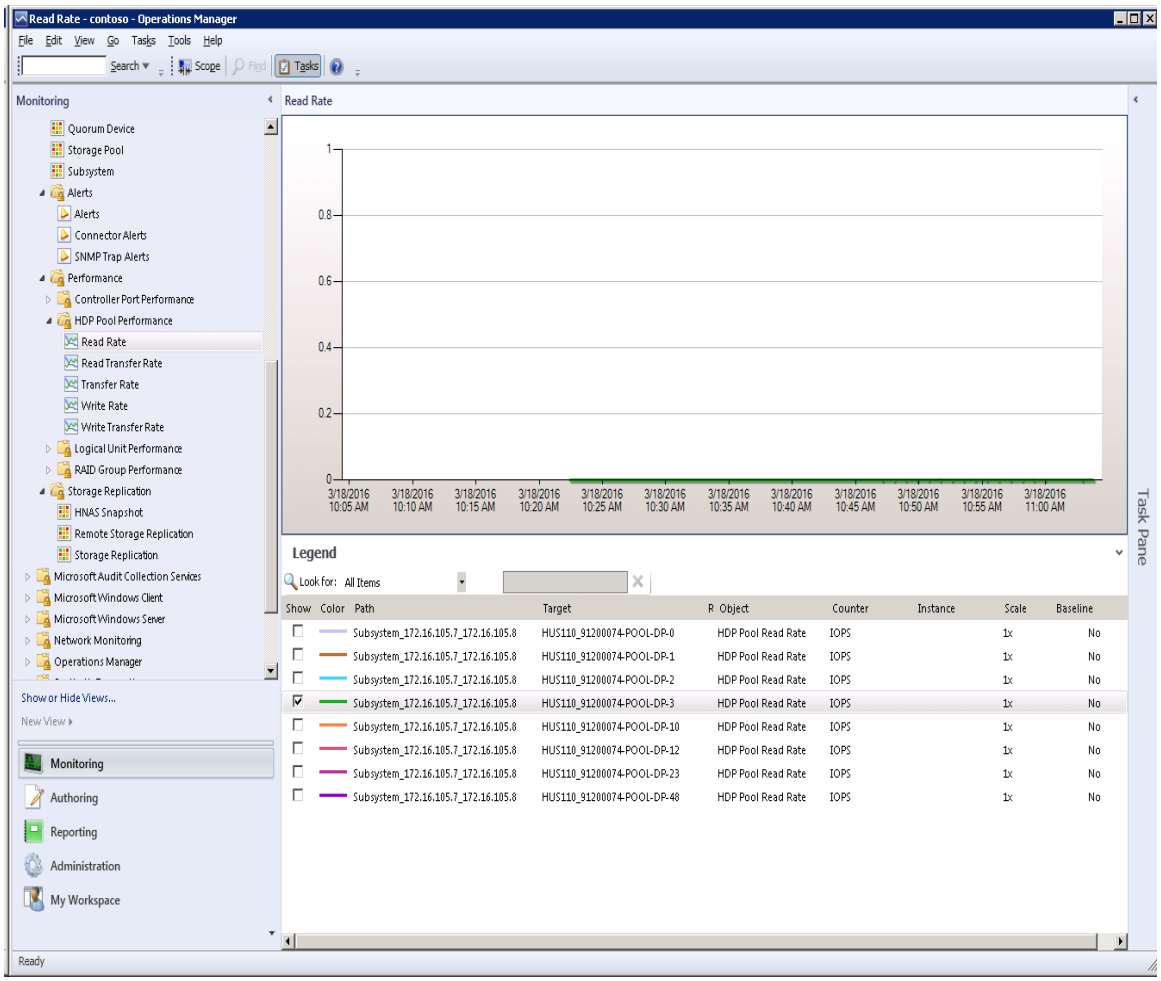
- **Read Rate**
- **Read Transfer Rate**
- **Transfer Rate**
- **Write Rate**
- **Write Transfer Rate**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.



Logical Unit Performance

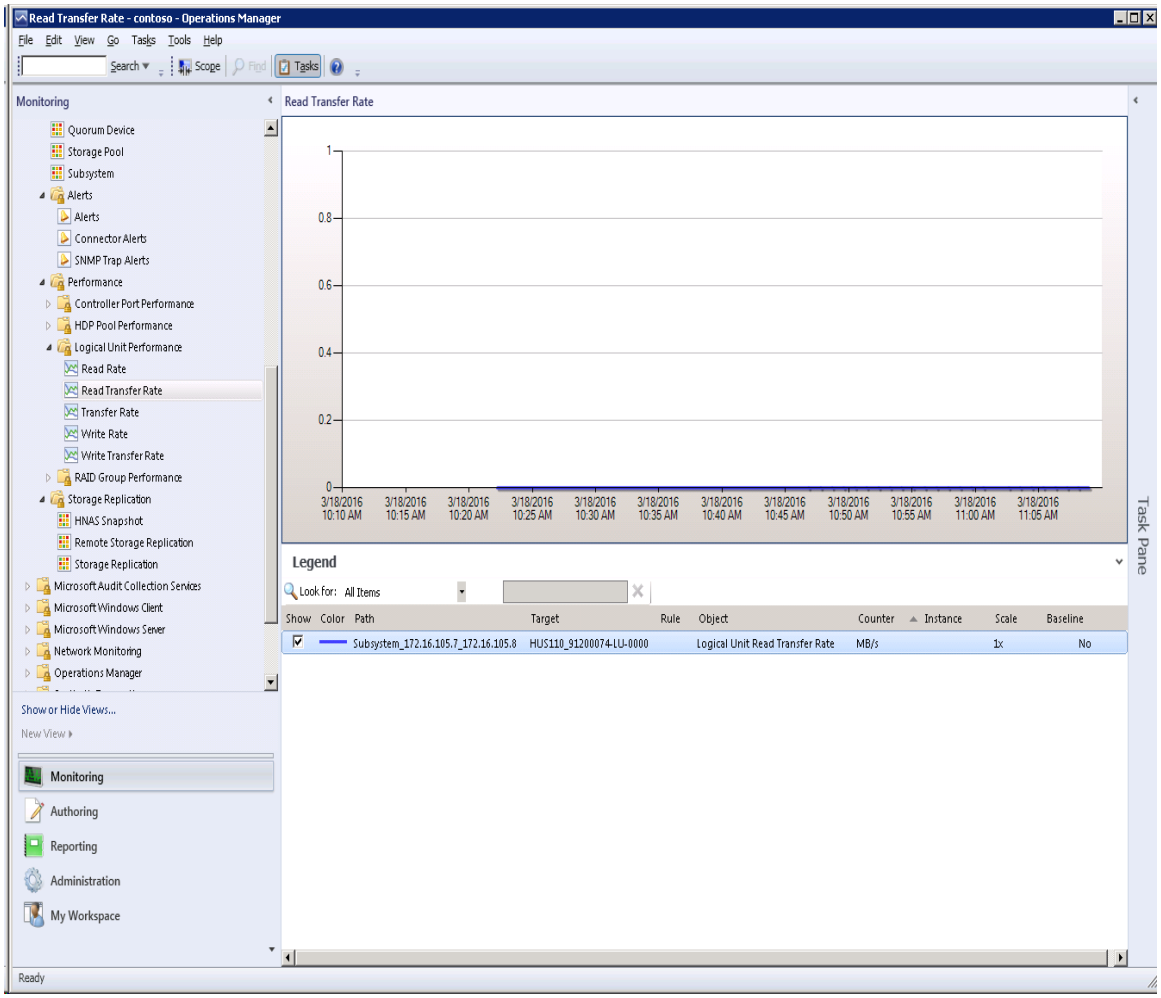
HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Logical Unit Performance** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Performance > Logical Unit Performance**

You can choose from the following performance views:

- **Read Rate**
- **Read Transfer Rate**
- **Transfer Rate**
- **Write Rate**
- **Write Transfer Rate**



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.

RAID Group Performance

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access **RAID Group Performance** view from the **Monitoring** pane of the Operations Manager console.

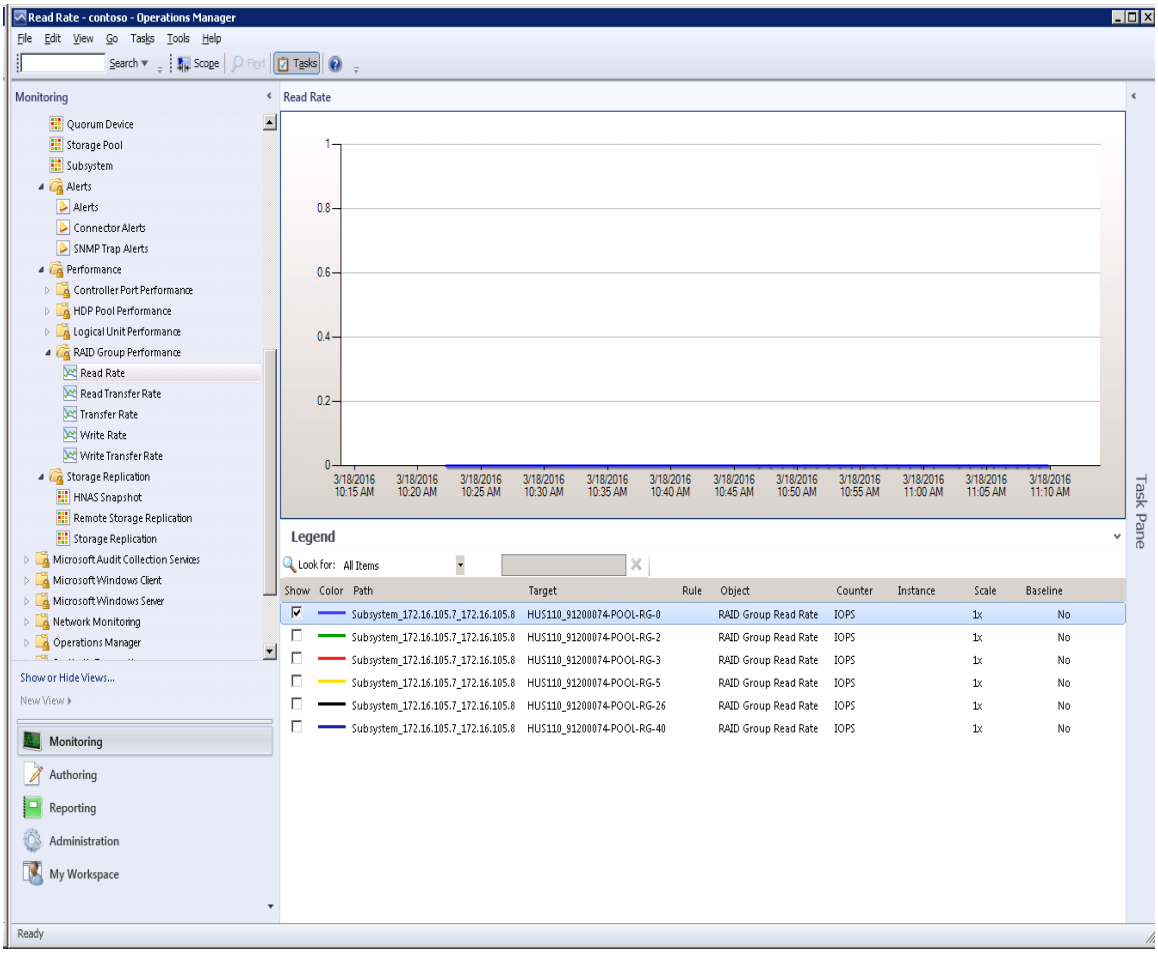
- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Performance > RAID Group Performance**

You can choose from the following performance views:

- **Read Rate**
- **Read Transfer Rate**
- **Transfer Rate**
- **Write Rate**
- **Write Transfer Rate**

Note

PG performance values may not be properly acquired for VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500 sub-systems if pool configuration elements are included in the RAID group.



With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.

HNAS Snapshot

HNAS/Unified HNAS

Access the **HNAS Snapshot** view from the **Monitoring** pane of the Operations Manager console.

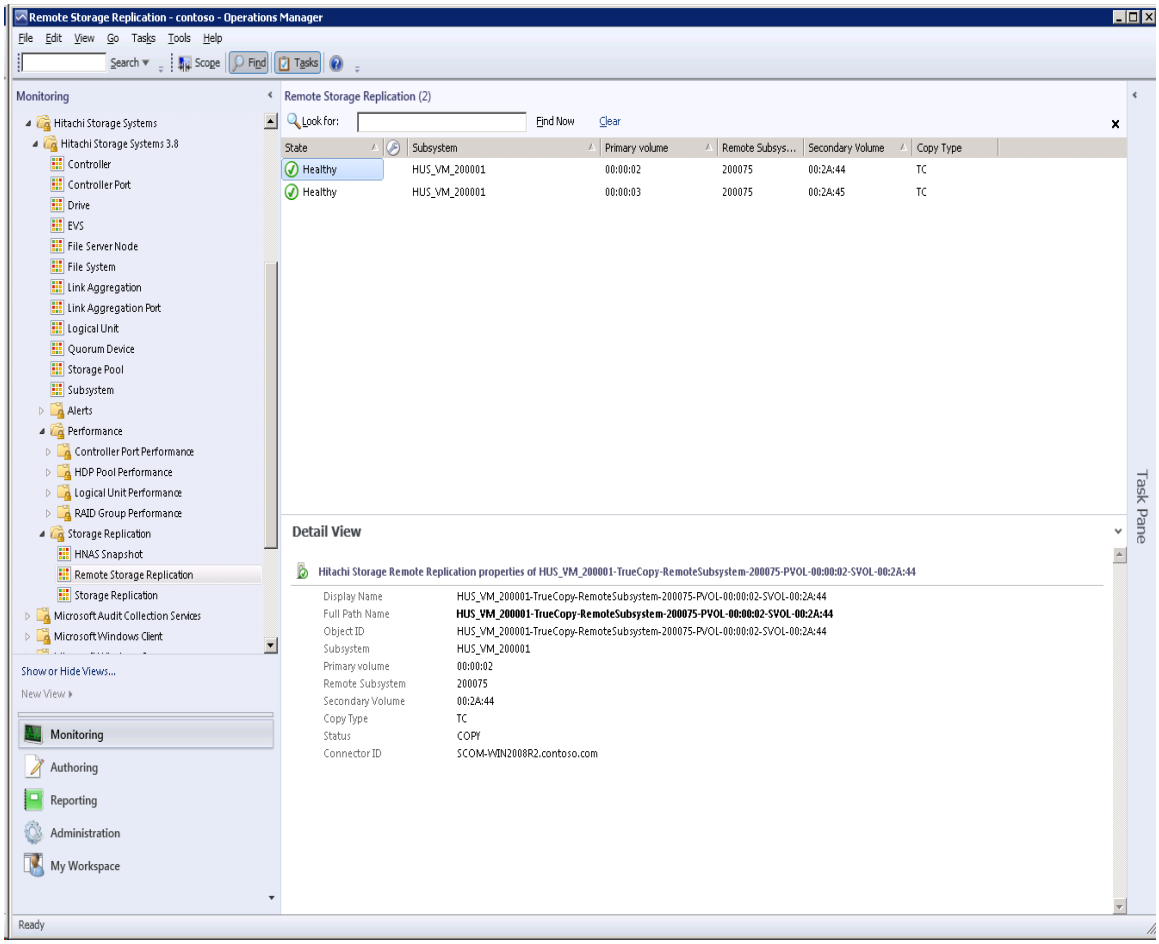
- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Storage Replication > HNAS Snapshot**

Remote Storage Replication

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Remote Storage Replication** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11> Storage Replication > Remote Storage Replication**

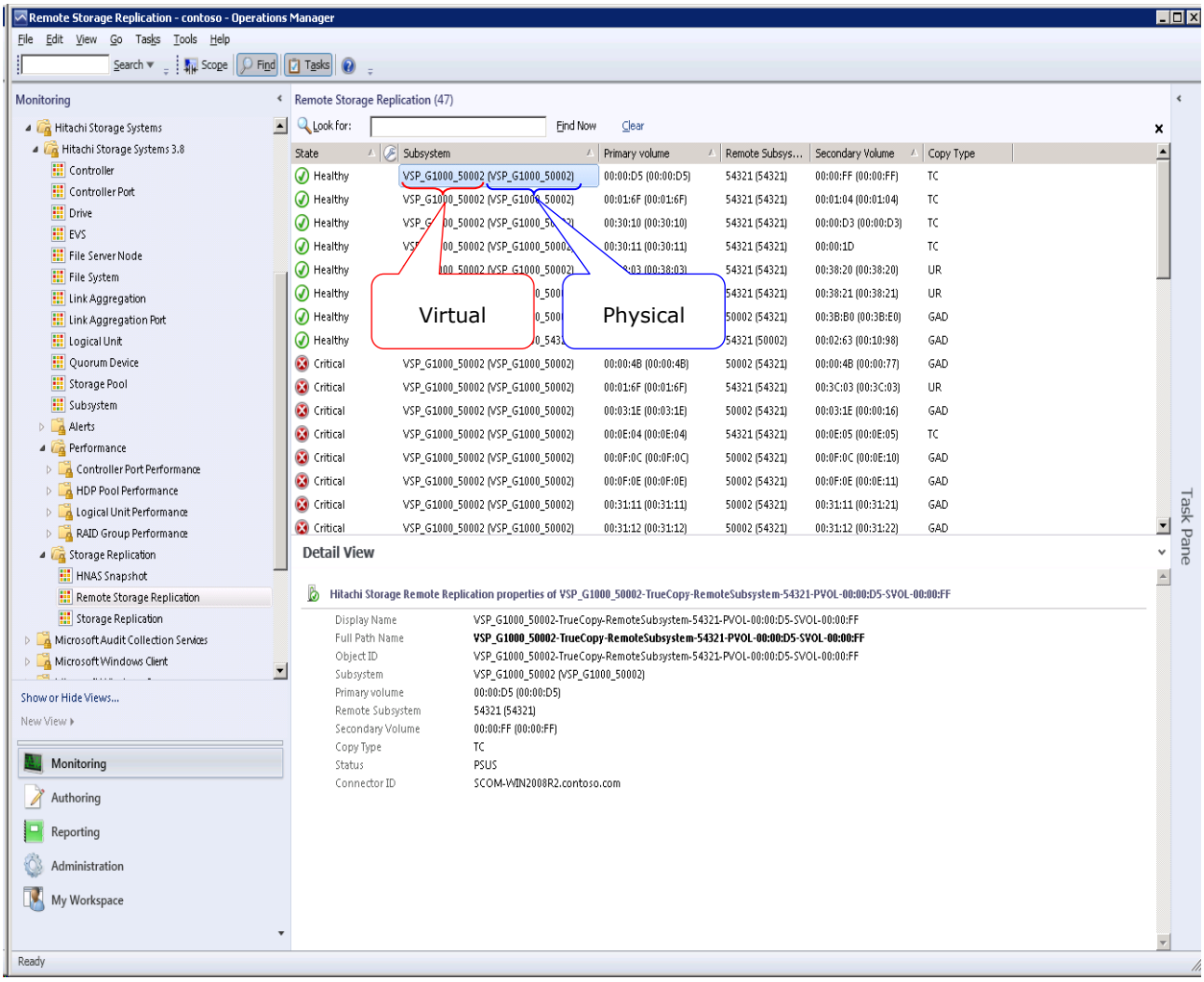


With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed. GAD pairs, if any, are displayed in this view.

The Subsystem, Primary Volume, Remote Subsystem and Secondary Volume fields display values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parenthesis to the right of the Virtual DKCs, such as **Virtual DKC (Physical DKC)**. If a Virtual DKC resides upon multiple Physical DKCs, each Physical DKC is listed within parentheses like **Virtual DKC (Physical DKC1, Physical DKC2)**.

The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.

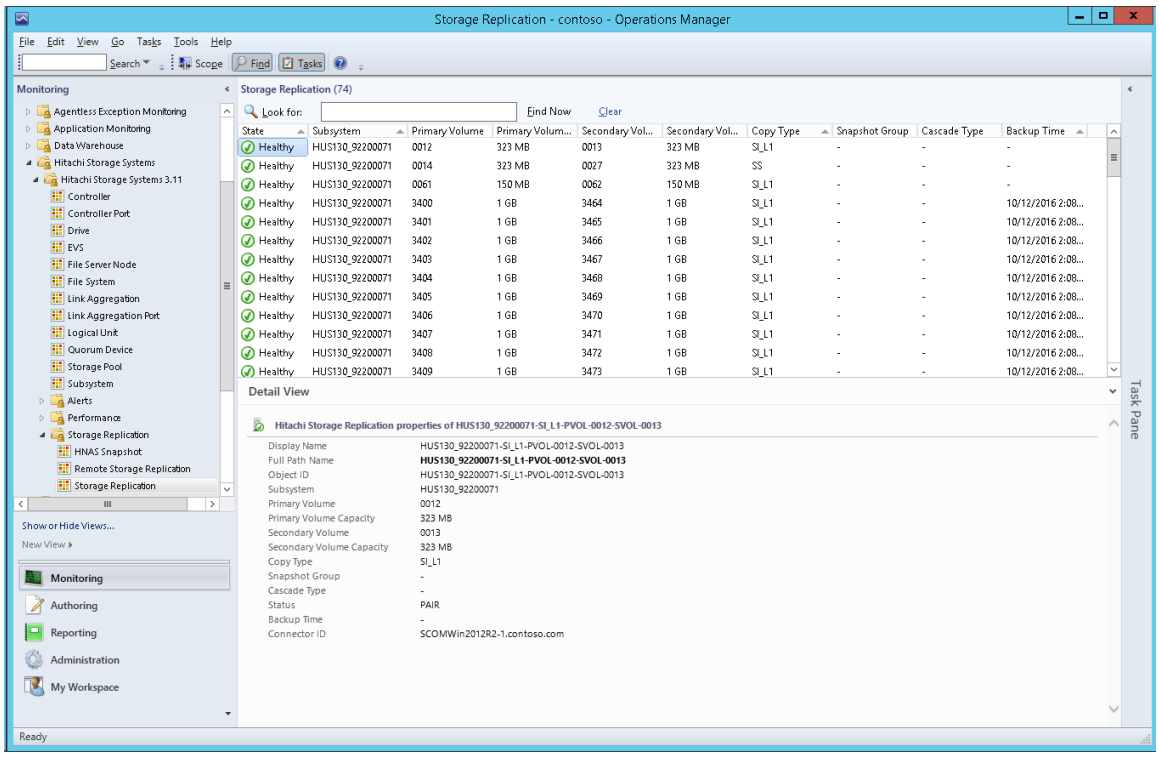


Storage Replication

HUS, VSP, HUS VM, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, and VSP F1500

Access the **Storage Replication** view from the **Monitoring** pane of the Operations Manager console.

- **Hitachi Storage Systems > Hitachi Storage Systems 3.11 > Storage Replication > Storage Replication**



Caution

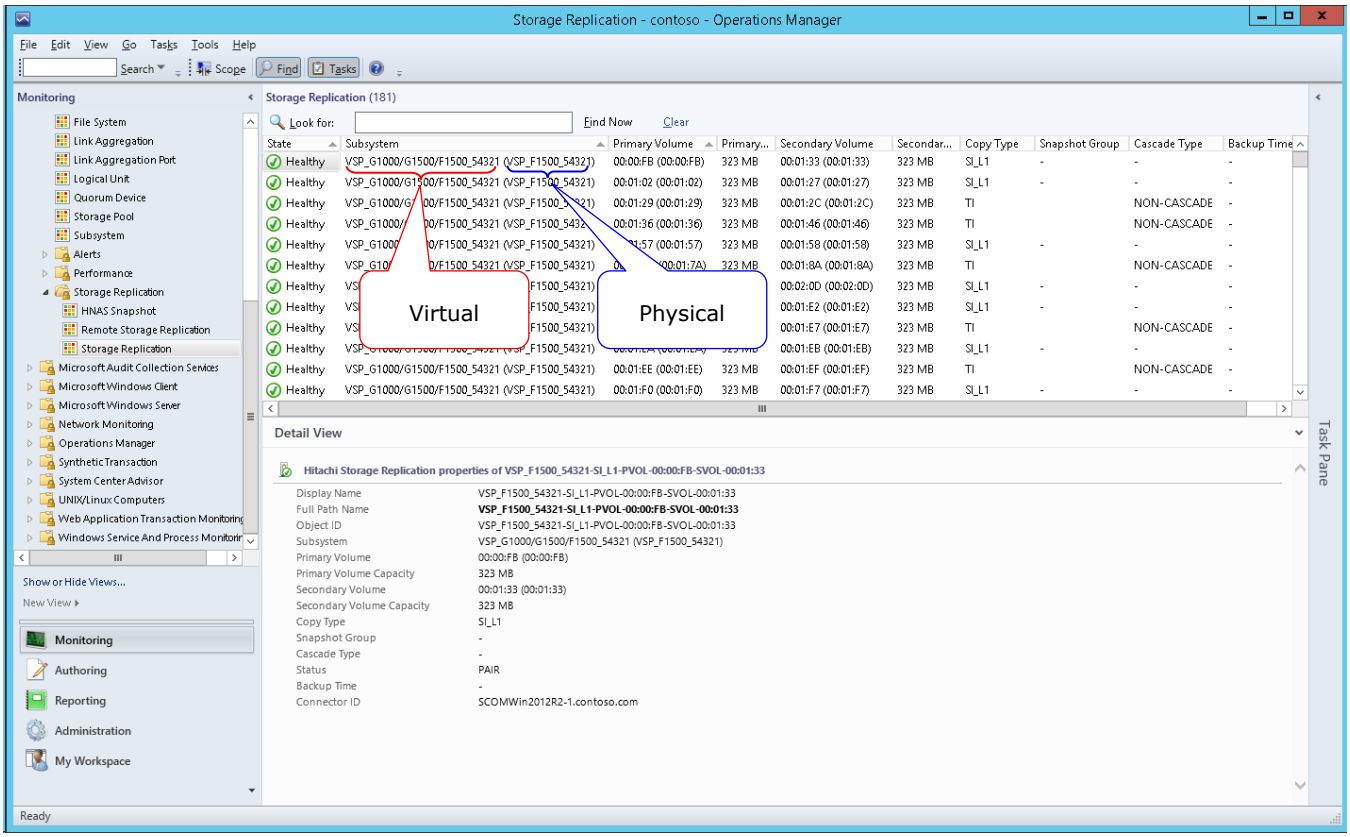
When monitoring Thin Image pair snapshot groups and cascade types, only users with permission to access all resource groups can add storage systems.

With global storage virtualization Virtual DKC configurations, information pertaining to the Physical DKCs upon which the Virtual DKC resides is displayed.

The Subsystem, Primary Volume and Secondary Volume fields display values which reflect the association between the Virtual DKC and the Physical DKCs upon which it resides. The Physical DKC information is shown in parentheses to the right of the Virtual DKC information, such as Virtual DKC (Physical DKC). If a Virtual DKC resides upon multiple Physical DKCs, each Physical DKC is listed within parenthesis like Virtual DKC (Physical DKC1, Physical DKC2).

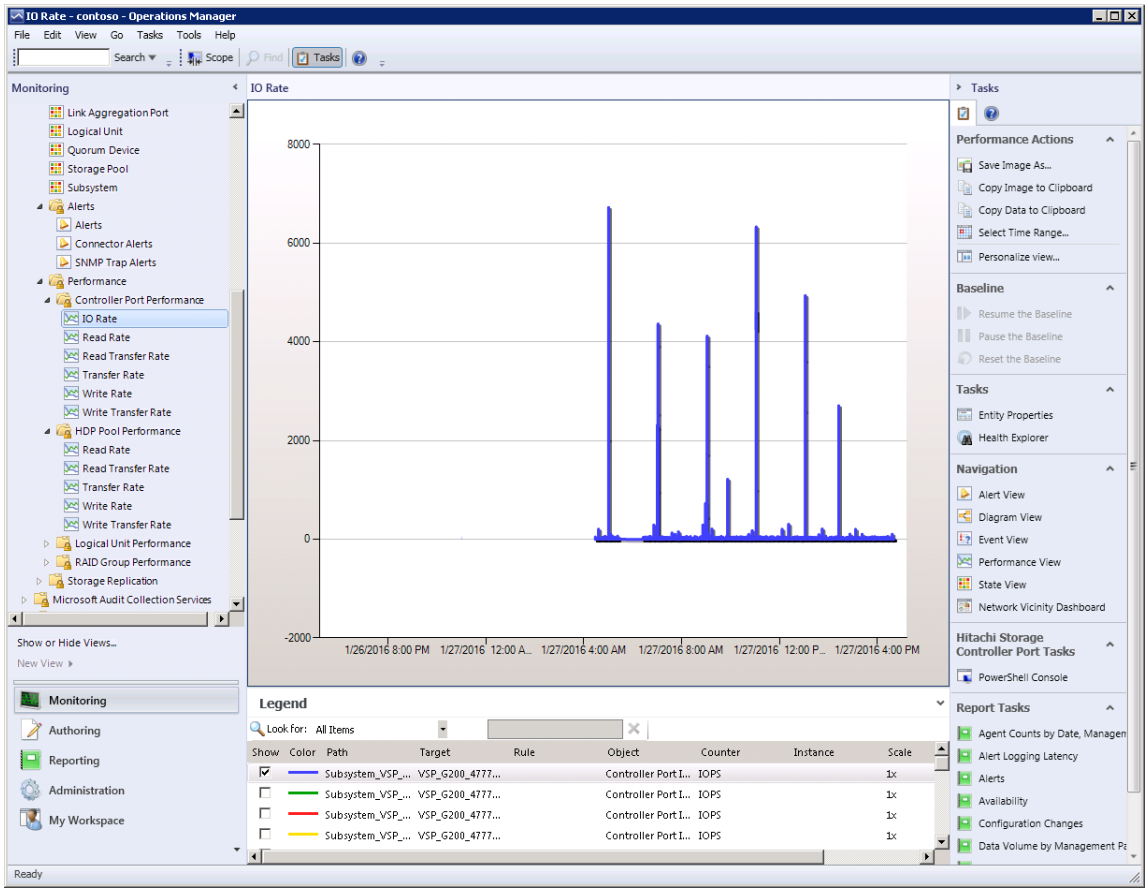
The LUs which correspond to all of the Physical DKCs upon which a Virtual DKC resides are displayed without the elimination of duplicates.

There is a 1:*n* correlation between Virtual DKCs and Physical DKCs.



Performance Collection

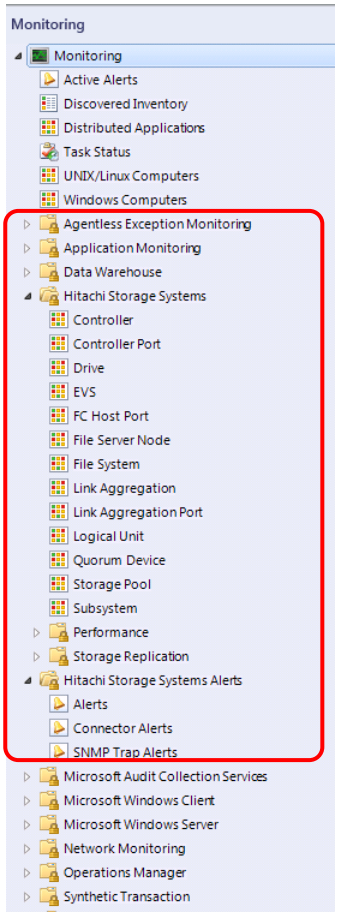
Performance collection enables you to store accumulated performance information for storage devices and then display that information in graph form in the Performance view. This chapter describes how to set up performance collection and display it in the Performance view. It also describes how to optimize settings for additional functions of the Hitachi Infrastructure Adapter for Microsoft® System Center Operations Manager.



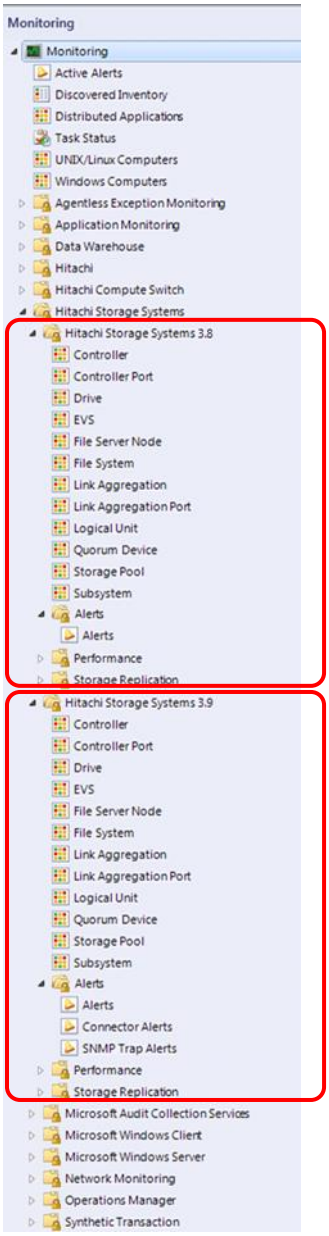
Changes to the Monitoring directory tree

In prior versions of the software, whenever a management pack was upgraded, the old management pack was replaced with the new one; however, in the current version of the software older management packs can be kept even though a newer version of a management pack is installed. This enables performance information to be retained from version to version. The directory tree in the Monitoring pane has been rearranged to show sub-directories at the management pack version level. The Alerts view directory is now one level higher.

Monitoring tree in v1.6.0



Monitoring tree in v1.7.0 and later



Limitations

There are some limitations regarding performance collection.

Installation to the environment with an old version

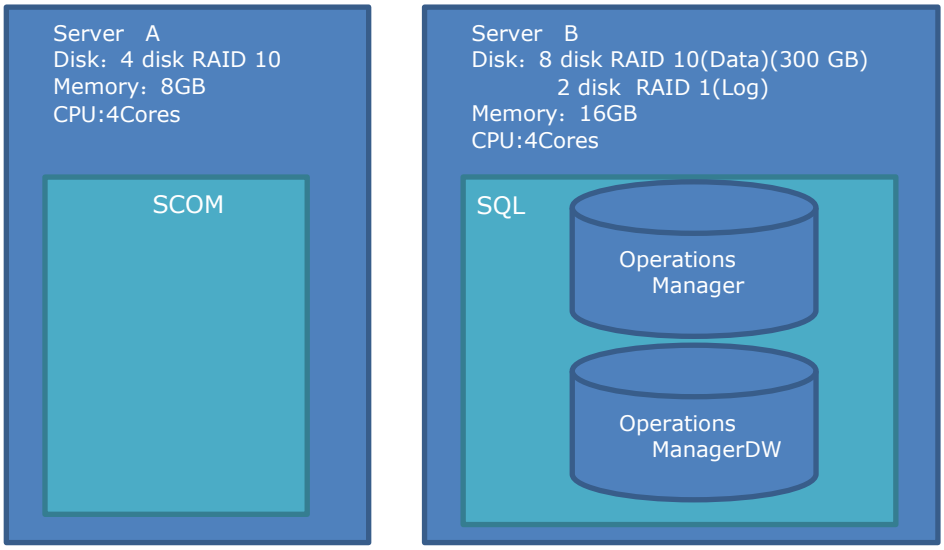
When installing the current version of the software, you must first uninstall the v01.6.0 or earlier version.

SCOM and SQL Server Performance Requirements

The SCOM server and SQL server must both be high performance in order to collect storage performance information because the memory that both require increases as the amount of collected performance information increases. The SCOM and SQL Server themselves require a minimum of 8GB of memory, even if there is only one device collecting performance information for all the LUs and even if it is disabled. Since a single device can contain many LUs, a large amount of memory is required to collect all of the performance information and display it in graph form.

When you collect performance information for an LU in a device where many LUs have been created, depending on the hardware performance of the server on which the SCOM and SQL Server are installed, you can set up a counter for performance collection and thus narrow the Target Logical Unit.

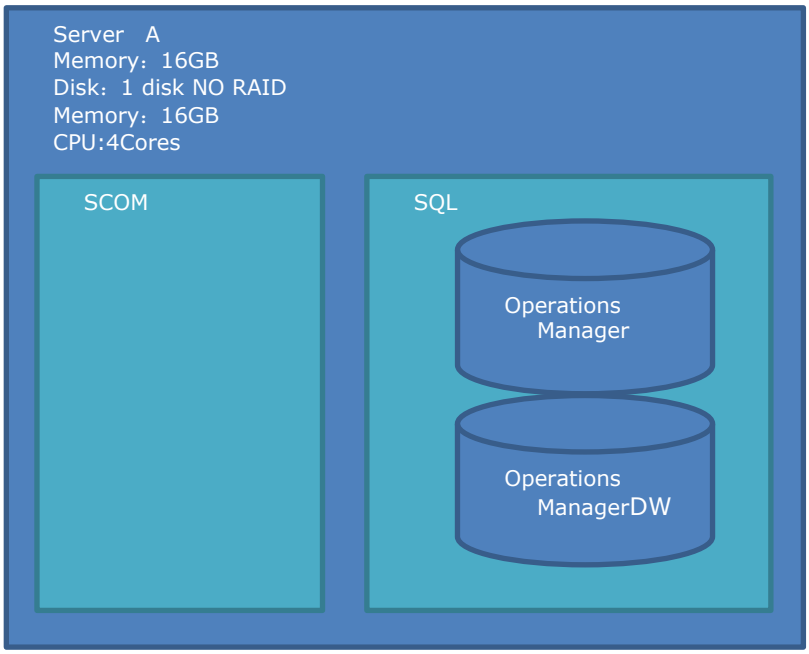
Because such large amounts of memory are required and because a high-speed disk is required to write the large amounts of performance information to the disk, use the Microsoft Operations Manager Sizing Helper Tool to calculate the actual hardware you will need. Make your calculations using the equivalency of one Windows computer per Logical Unit targeted for performance collection.



Example configuration of 500 LUs targeted for performance collection

If you install SCOM and SQL on the same server and run on an independent HDD, limit the number of Logical Units targeted for performance collection to about 100 units at most.

Collecting performance information from a large number of LUs will overload writing to the SCOM and SQL disk. Loading up on the SCOM and SQL queue will deplete memory and may cause SCOM to crash.



Example configuration of 100 LUs targeted for performance collection

Performance Collection Settings

Setting up performance collection is a two-step procedure: setting the target items for performance collection, and optimizing the amount of performance data to be collected.

Setting targets

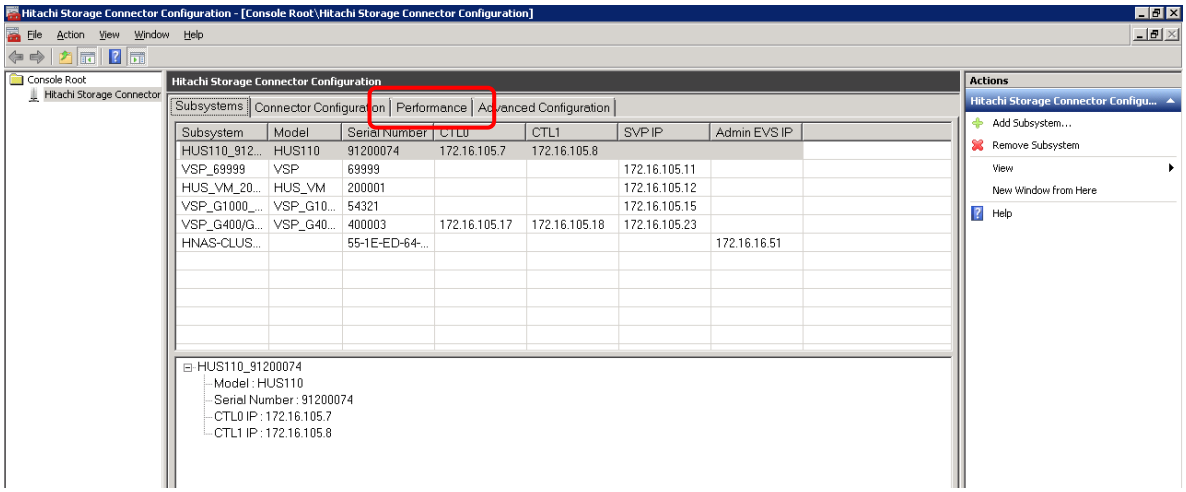
You can control how much performance information is collected through the combination of devices and performance information items. The default settings enable collection of all performance information except Logical Unit.

Note
The settings for HNAS cannot be changed. HNAS does not support collection of performance information.

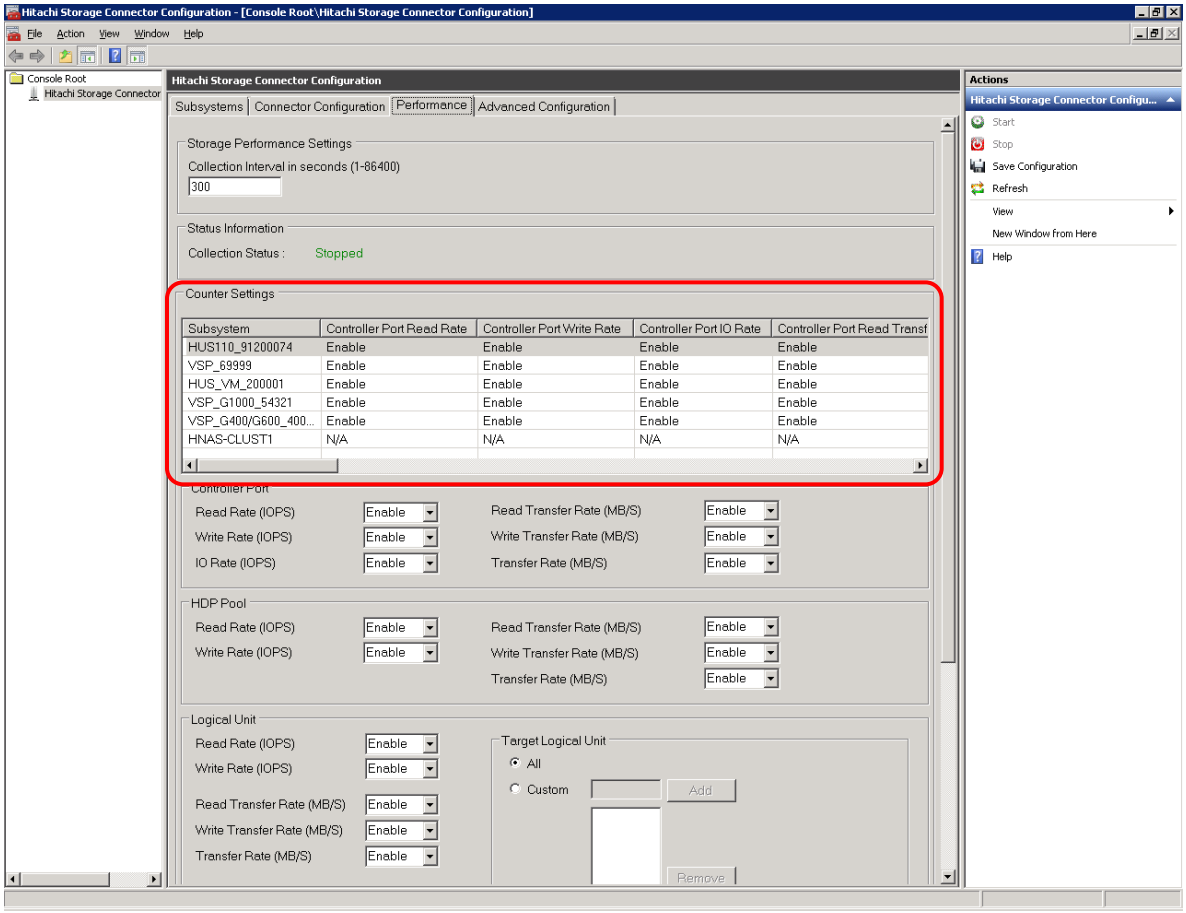
As the number of performance collection items increases, the amount of data being written to the SCOM and SQL server database also increases; however, you can economize the drive by disabling any performance collection items you do not need by using the **Custom** setting to narrow the collection target.

Setting Procedure

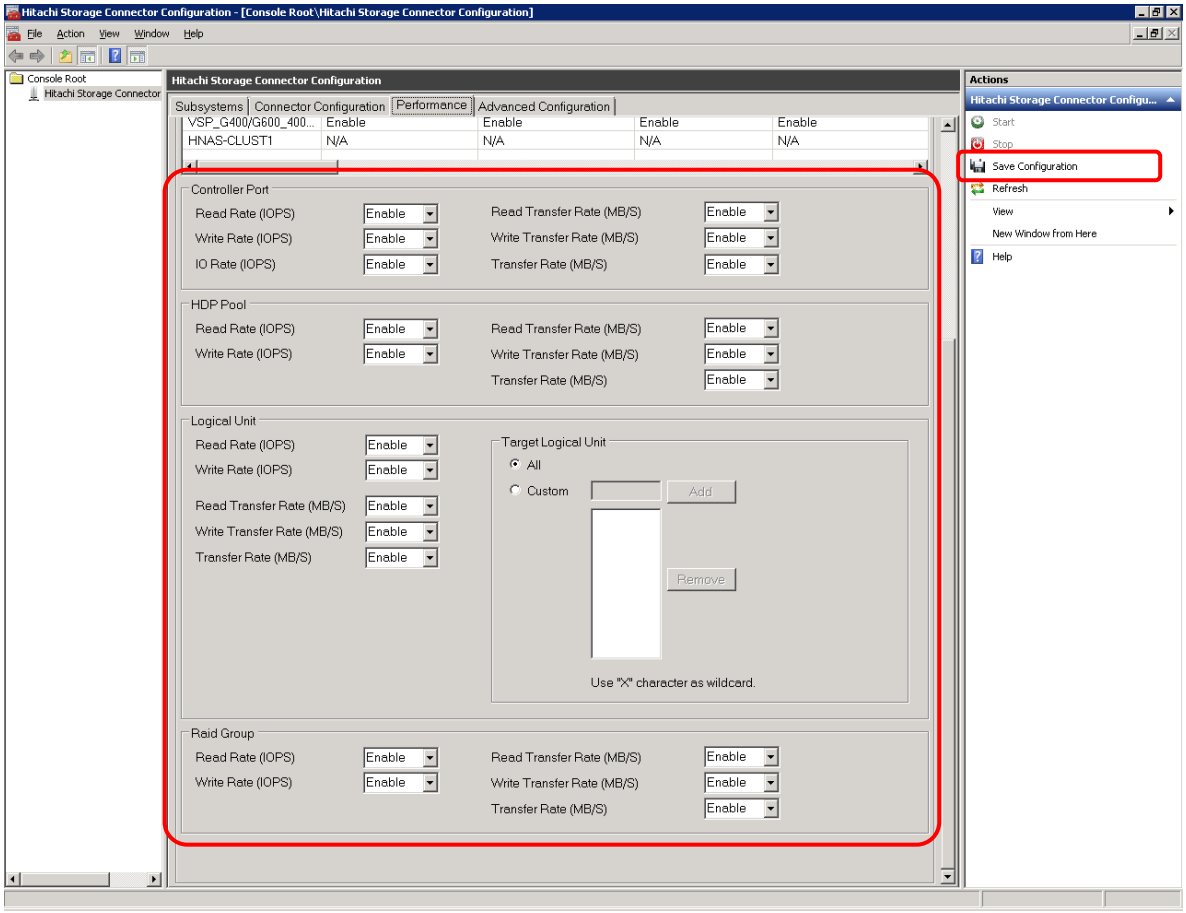
1. In the Hitachi Storage Connector Configuration console, click the **Performance** tab.



2. From the **Counter Settings** pane, select a subsystem.



3. Change the setting to **Disable** for any performance information item you do not want to collect.



Note
For any Logical Unit numbers set in the Target Logical Unit pane, set the physical LDEV numbers (physical LDEV IDs).

4. Save the configuration.

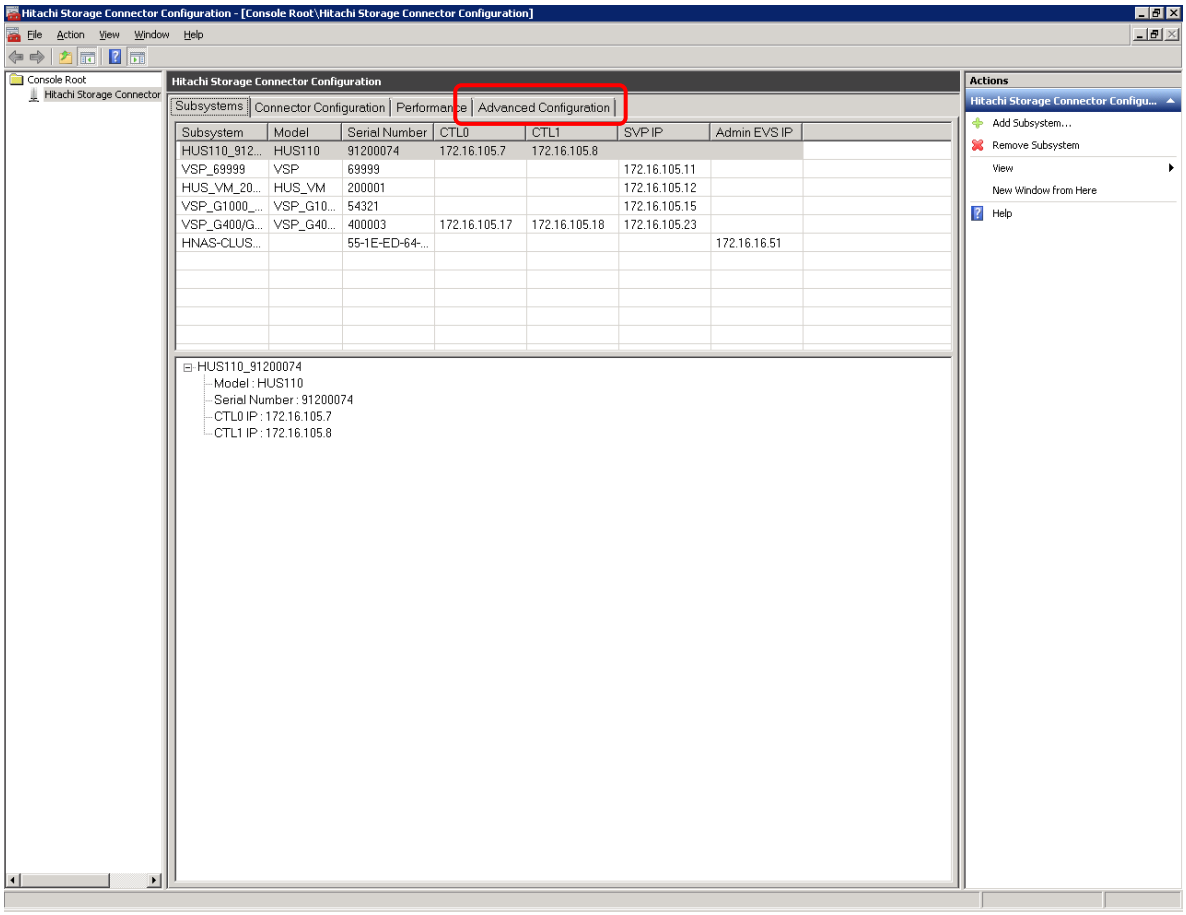
   In the **Actions** pane, click **Save Configuration**.

Optimizing collection precision

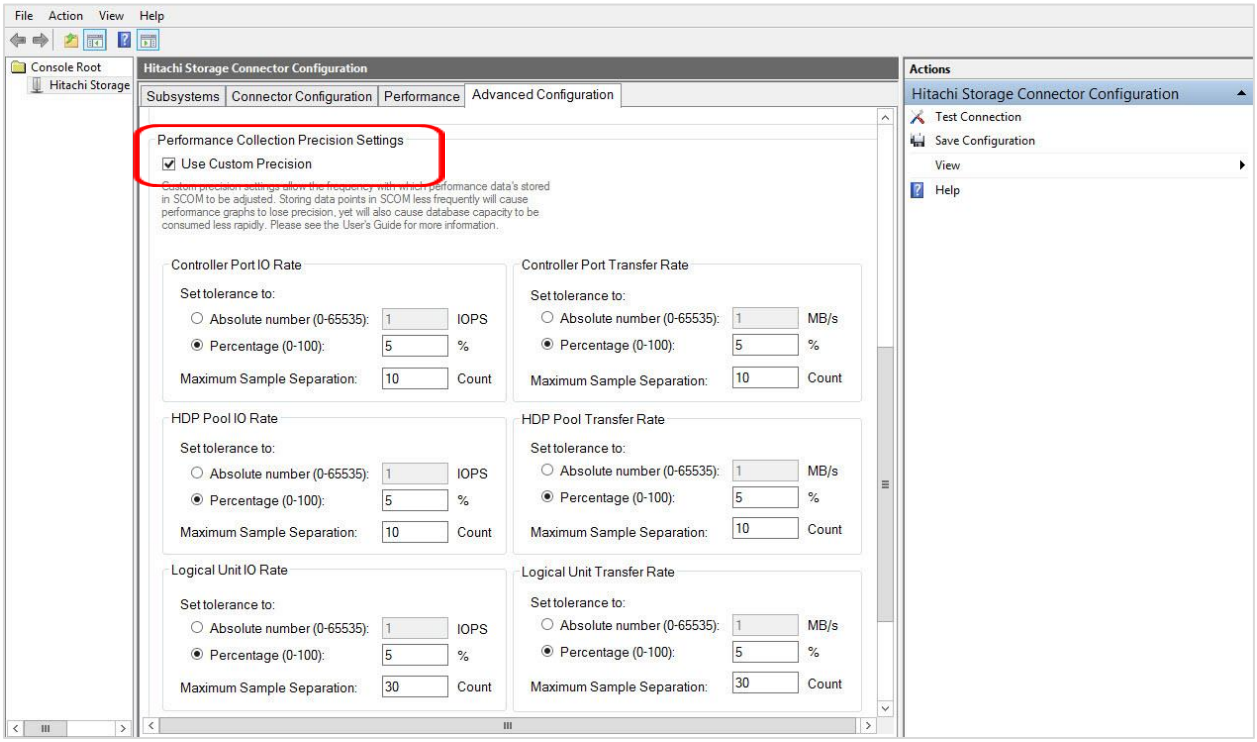
You can optimize the precision of the amount performance information collected; by lowering the precision, you can economize a drive.

Setting procedure

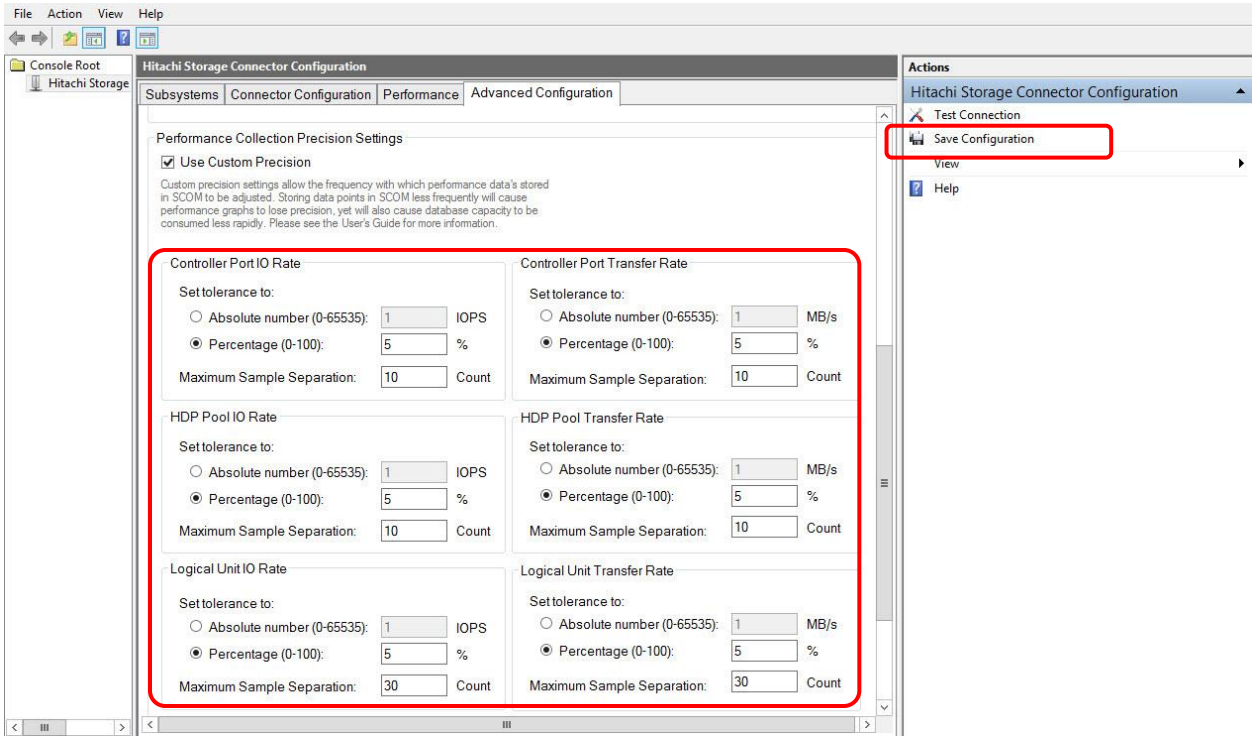
1. In the Hitachi Storage Connector Configuration console, click the **Advanced Configuration**.



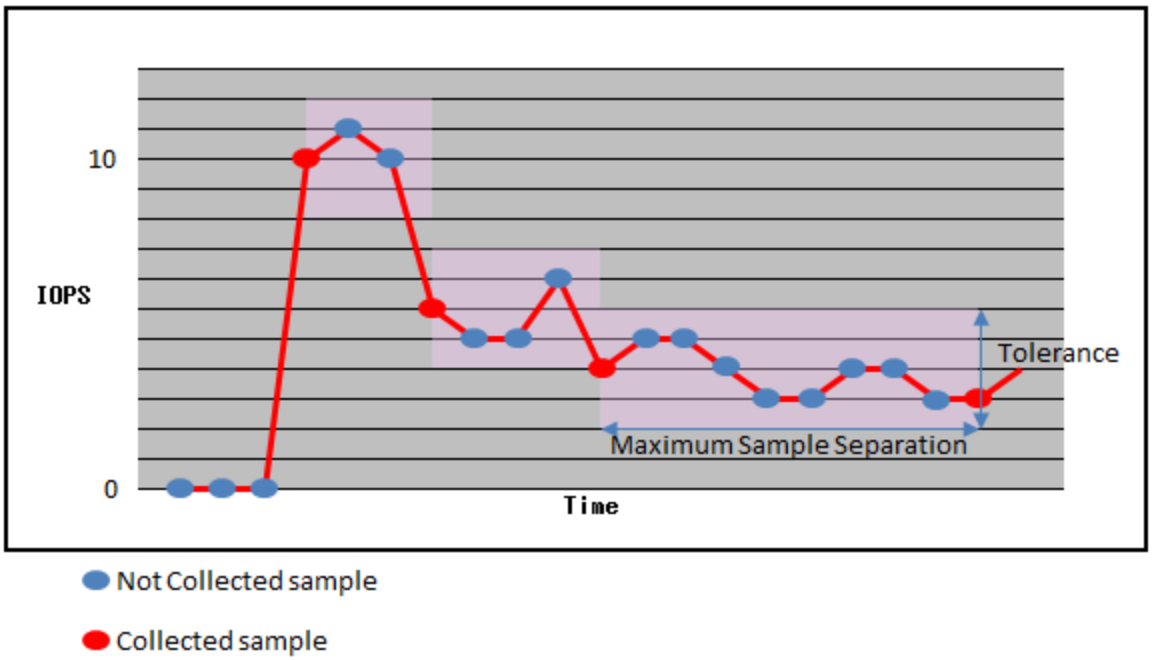
2. In the **Performance Collection Precision Settings** pane, check the **Use Custom Precision** option.



3. For each of the performance collection items, modify the level of precision by adjusting the tolerance and maximum sample separation counts. See the table below for the optimization parameters. When done, click **Save Configuration**.



Optimization Parameter	Description
Tolerance	Specifies the maximum value of the variation to skip storing in the database. When the difference with the previously stored value is smaller than the current value, the value is not stored in the database. The larger the tolerance value, the lower the precision and less data is stored in the database.
Maximum Sample Separation	Specifies the maximum continuous interval that storing of performance information to the database can be skipped. The larger the interval, the lower the precision and less data is stored in the database; however, as the interval increases, more time is required to plot the latest value on the graph.



Viewing Performance graphs

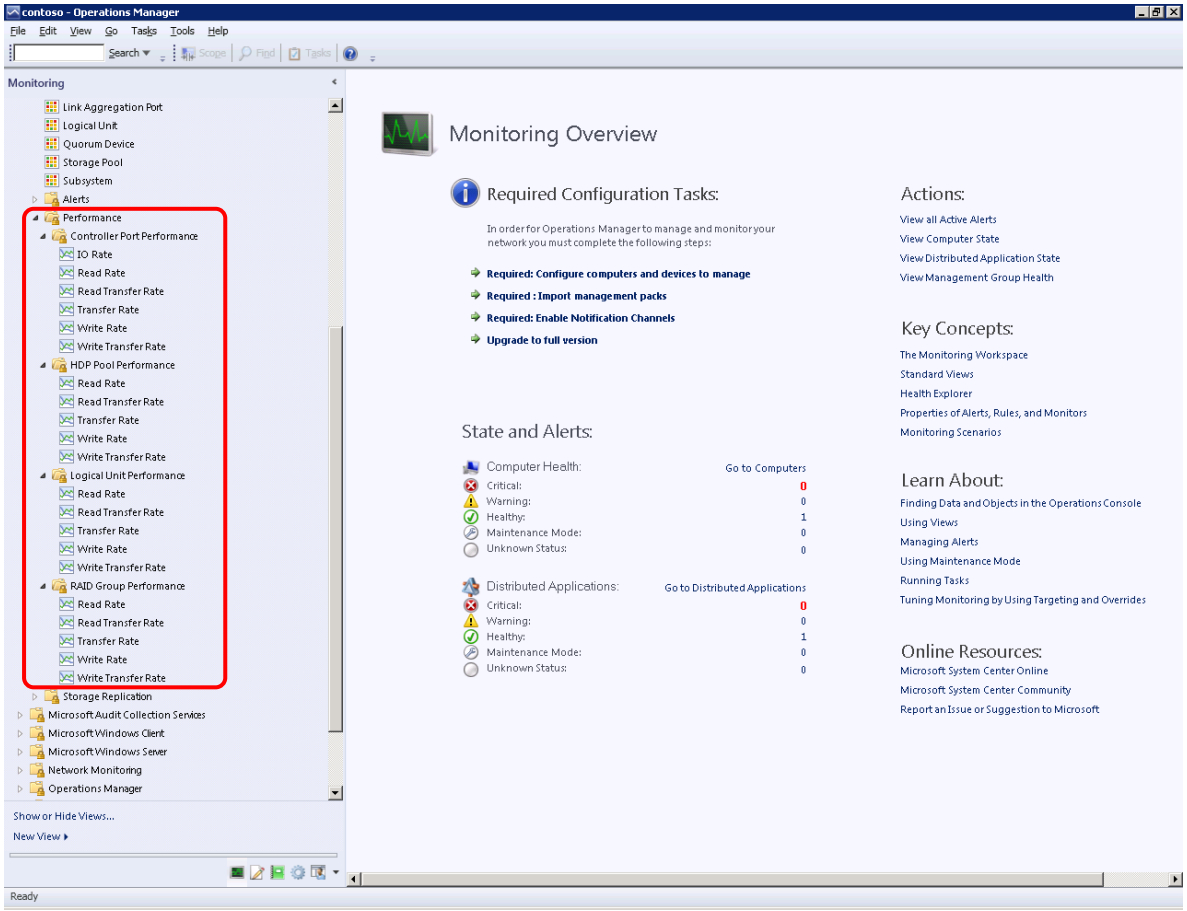
After you start collecting performance information, you can view graphs of the information in the SCOM console Monitoring directory tree either directly from the tree or from within a State view.

Viewing graphs from the Monitoring directory tree

View a performance graph by selecting the item you want to view from the **Performance** folder in the Monitoring directory tree.

In the Monitoring pane of the SCOM console, select,

Hitachi Storage Systems >Hitachi Storage Systems 3.11 > Performance



Notes

The Performance information listed below is supported only by the subsystems indicated in parentheses.

- Controller Port Performance -> Read Rate View (HUS only)
- Controller Port Performance -> Write Rate View (HUS only)
- Controller Port Performance -> IO Rate View (HUS, HUS VM, VSP, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500)
- Controller Port Performance -> Read Transfer Rate View (HUS only)
- Controller Port Performance -> Write Transfer Rate View (HUS only)
- Controller Port Performance -> Transfer Rate View (HUS, HUS VM, VSP, VSP G1000, VSP Gx00, VSP Fx00, VSP G1500, VSP F1500)

Viewing graphs from within a State view

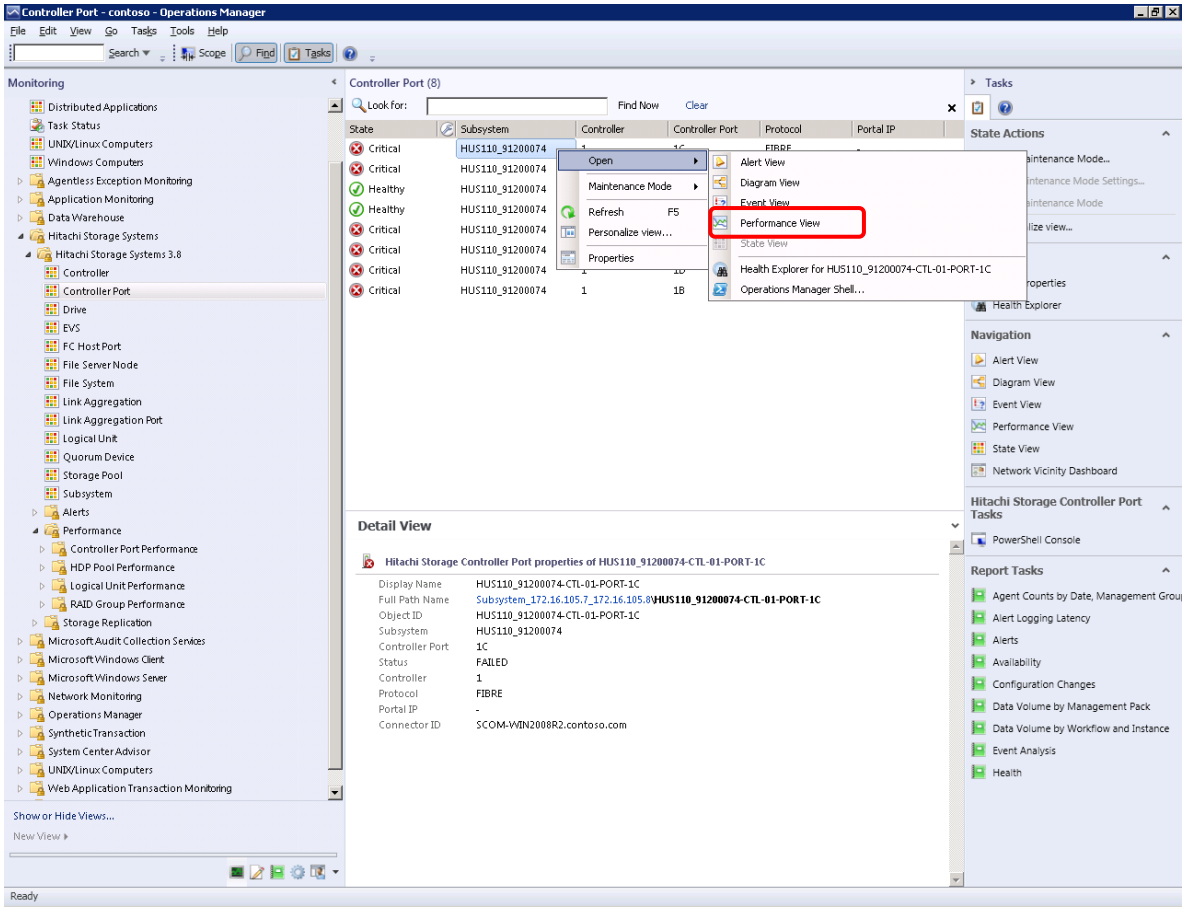
You can display Performance views for selected storage devices from within the State view. This narrows the displayed results to the components for the selected storage devices only. You can display performance for the State views listed below.

- Controller
- Controller Port
- Storage Pool (where pool type is DP, DT or DT (Active Flash), PG or RG only)
- Logical Unit

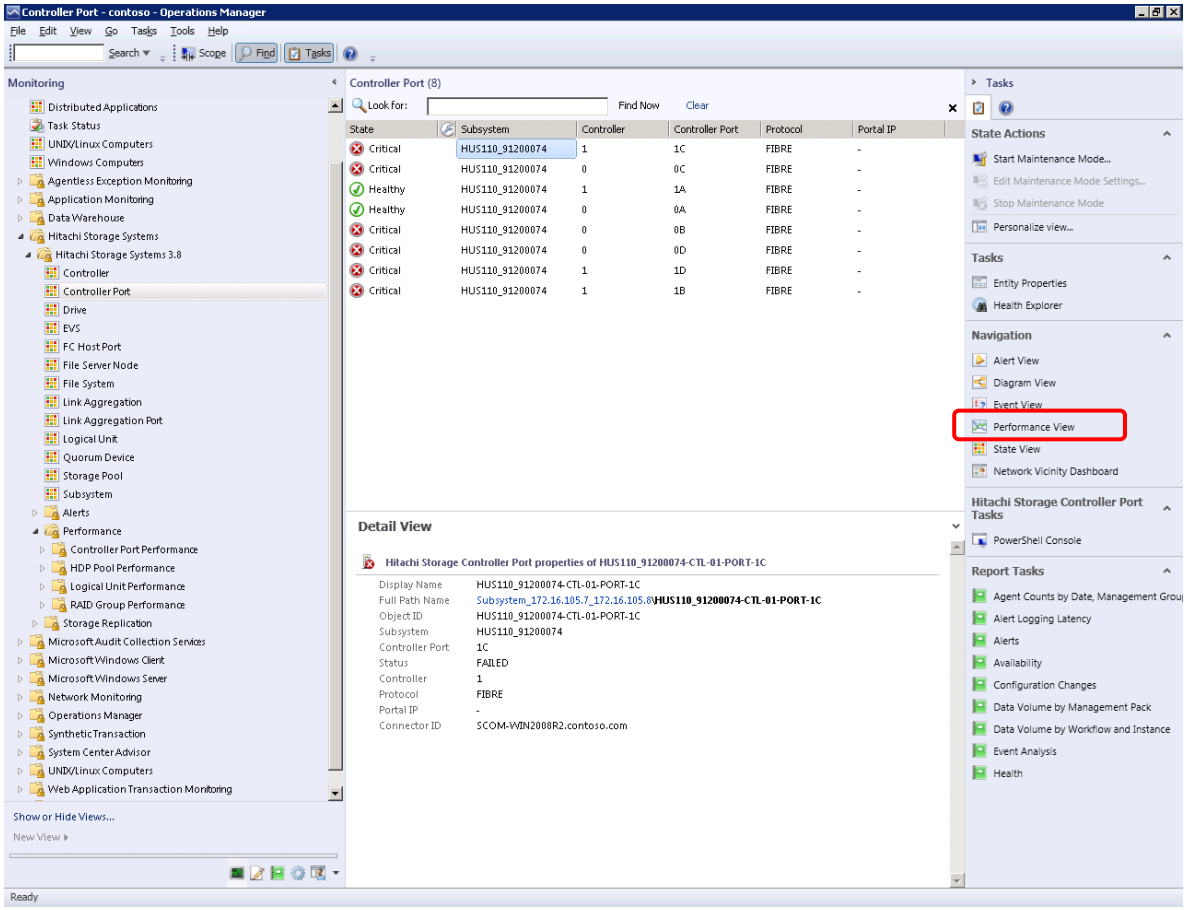
Performance graphs cannot be displayed for State views other than those listed above because the connected performance information does not exist.

With a State view open, you can open a **Performance** view in two ways.

1. Right-click on a subsystem, then select **Open > Performance View**.



2. Select a subsystem, then in the Navigation pane, click **Performance View**.



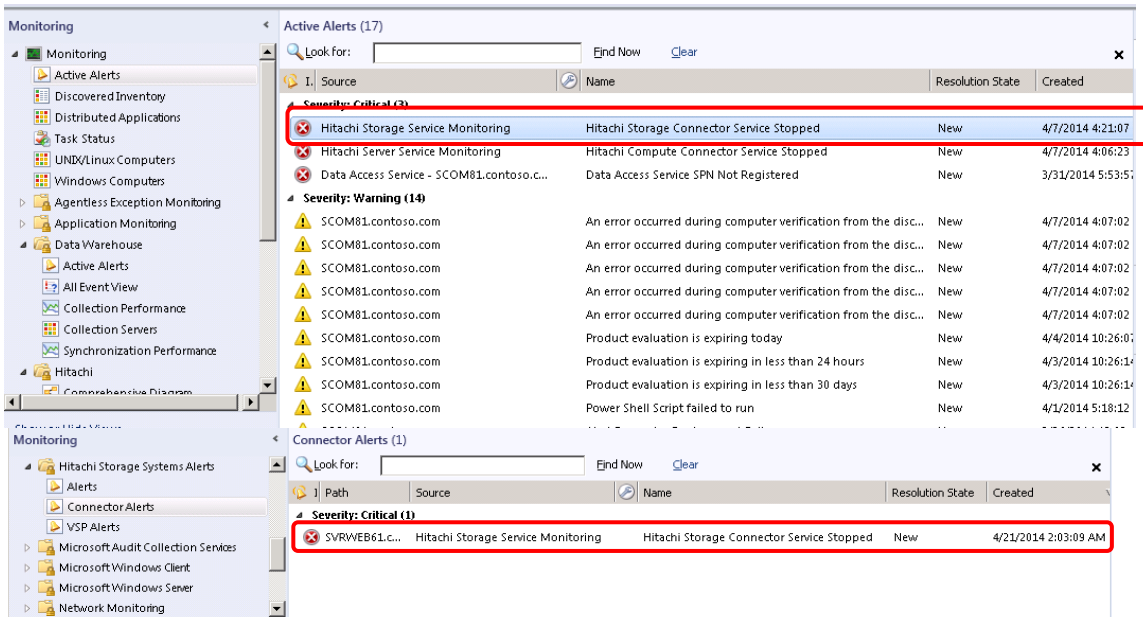
Hitachi Storage Service Monitoring

This chapter provides instructions for performing Hitachi Storage Connector Service monitoring with Hitachi Storage Adapter for Microsoft® System Center Operations Manager.

Monitoring Setting Procedure

By executing the following procedure with SCOM, the operation status of Hitachi Storage Connector Service can be monitored. The operation status can be checked in **Monitoring > Active Alerts**, or **Monitoring > Hitachi Storage Systems Alerts > Connector Alerts**.

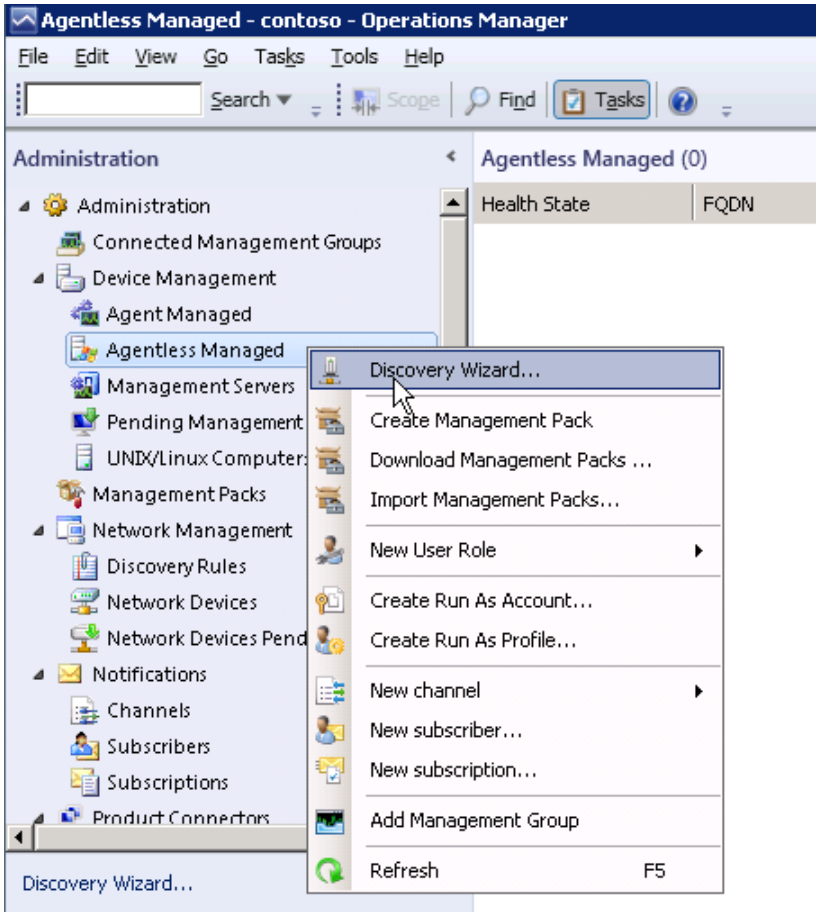
A "New" resolution state indicates that Hitachi Storage Connector Service stopped running. When this happens, SCOM will appear as follows:



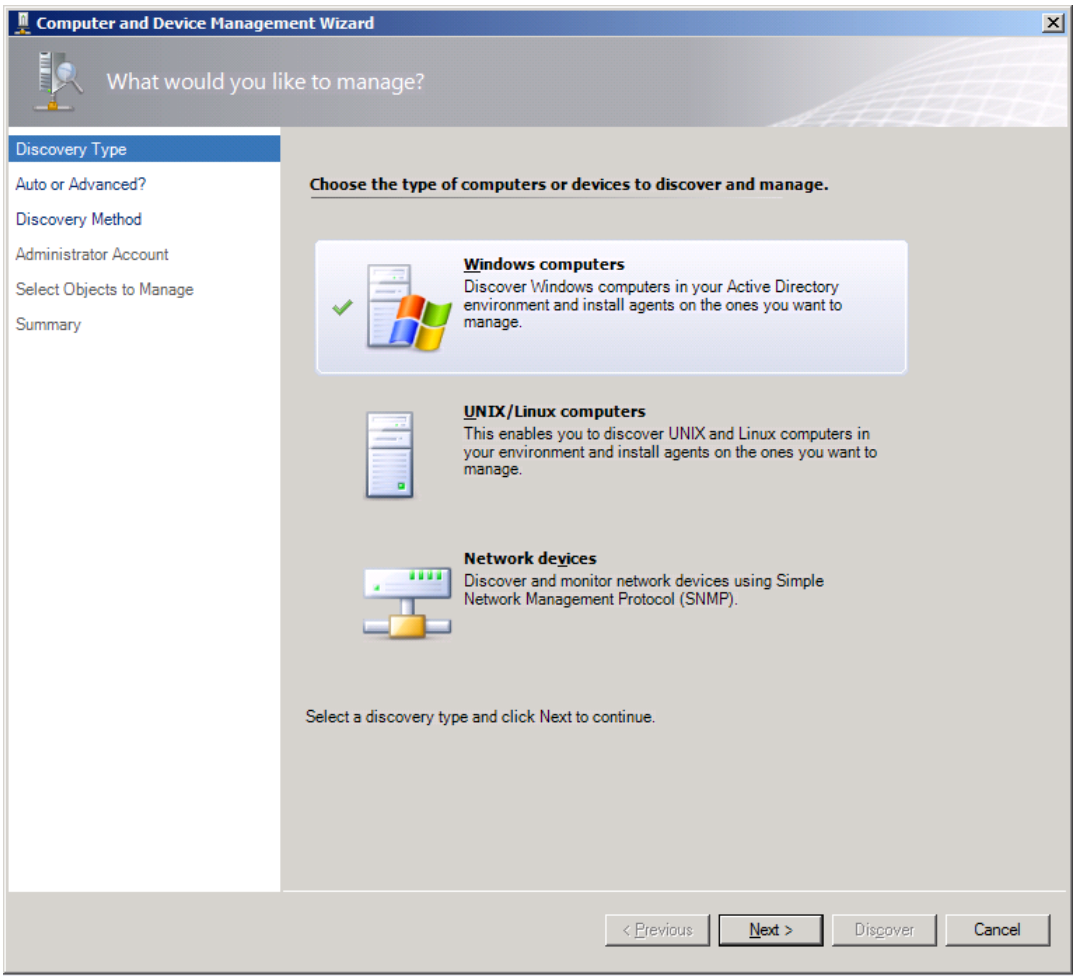
Network Discovery

If the Hitachi Storage Connector Service and SCOM are running on different servers, execute the following procedure.

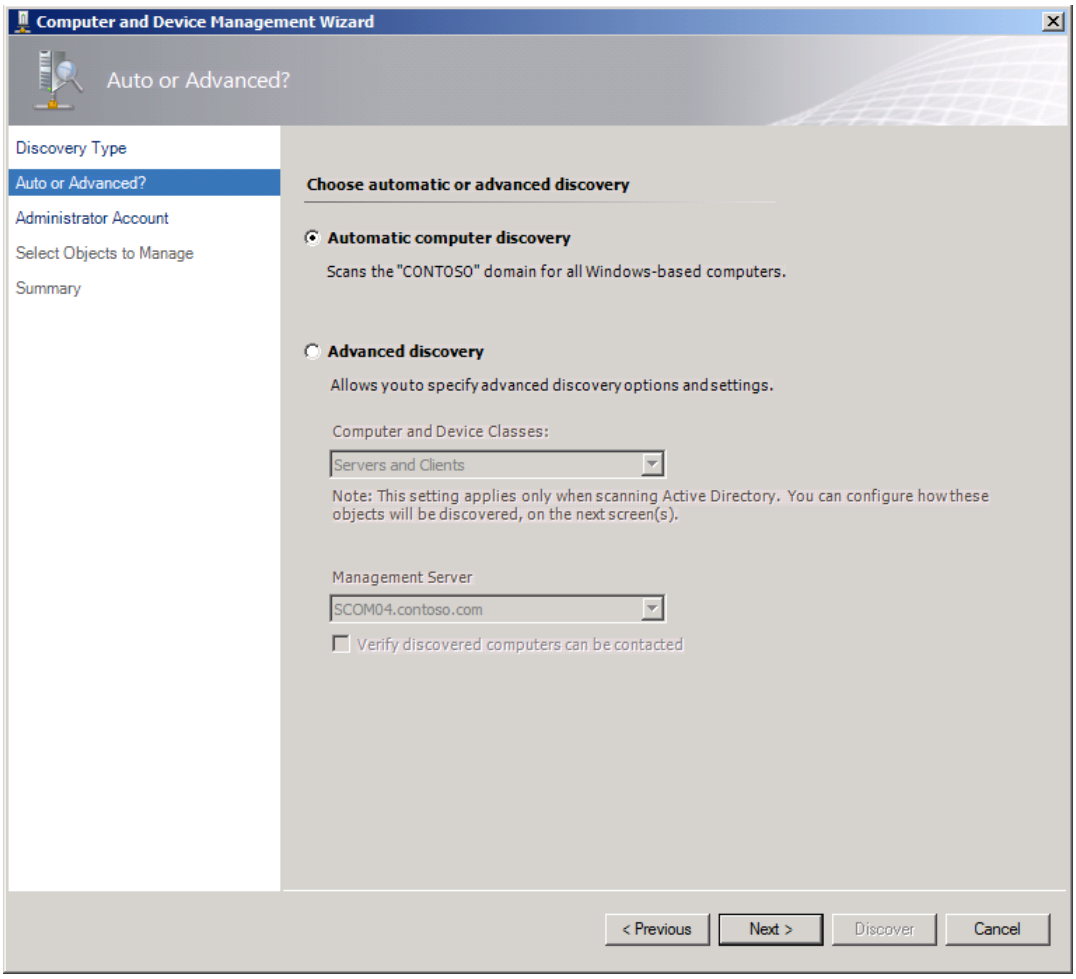
1. From the SCOM Administration screen, select **Device Management**, **Agentless Managed**. Right-click on **Agentless Managed**, and select **Discovery Wizard**.



2. Select **Windows computers**.

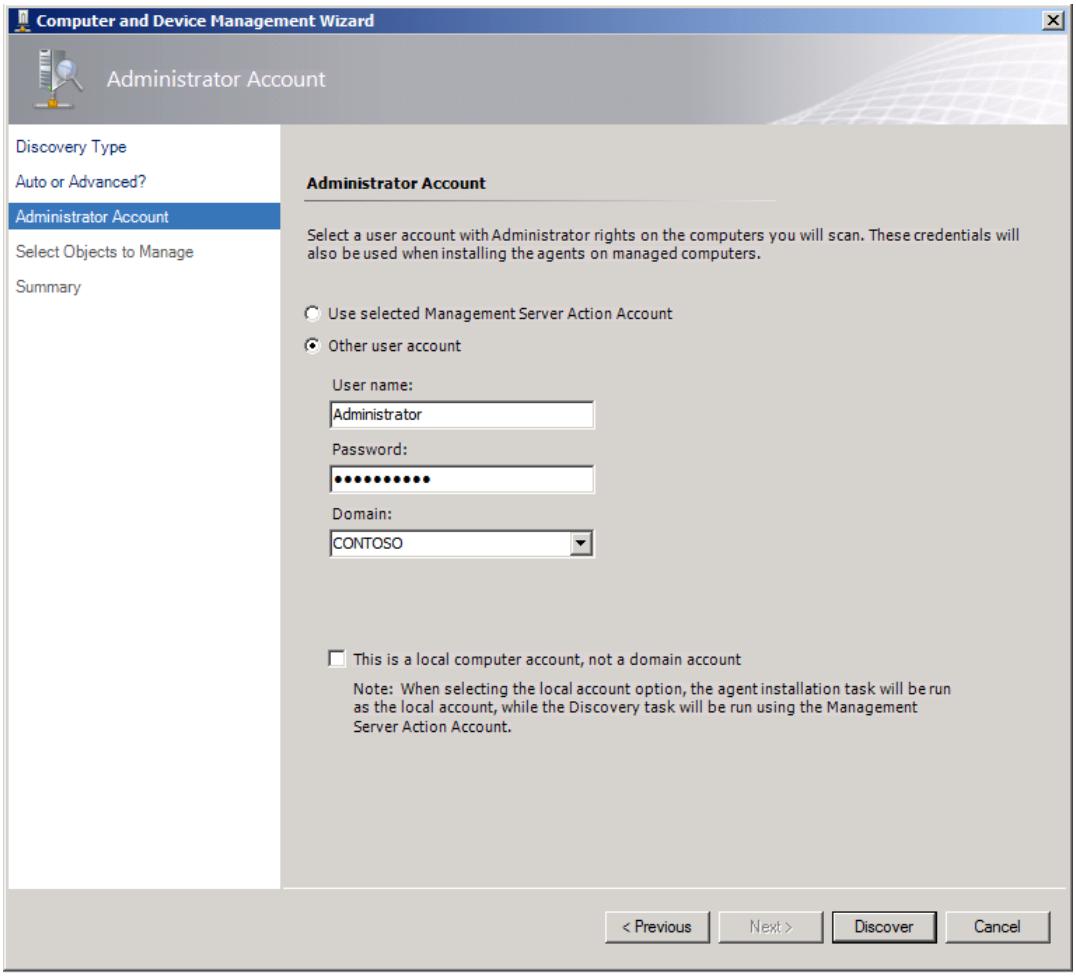


3. Select **Automatic computer discovery**.



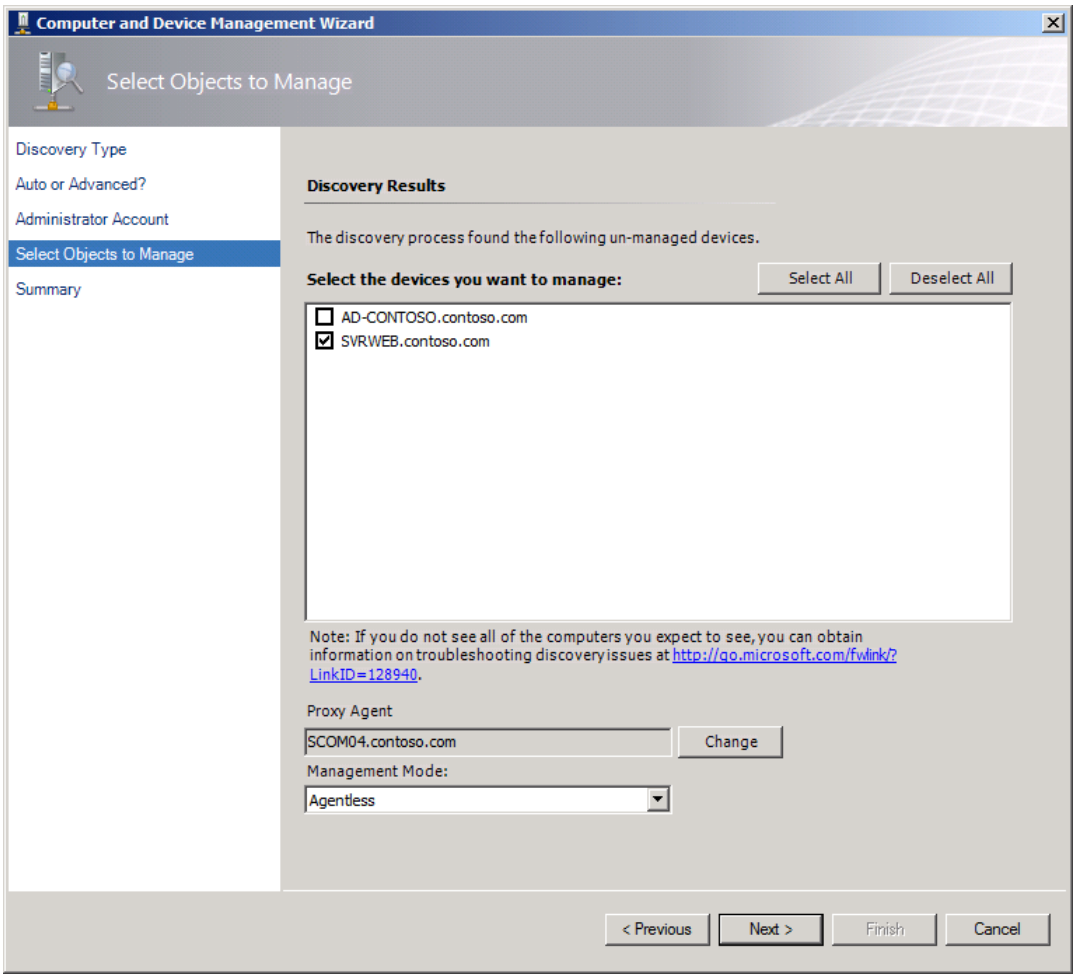
4. Select **Other user account**.

   Enter an account with domain Administrator rights on the computers you will scan; click **Discover**.

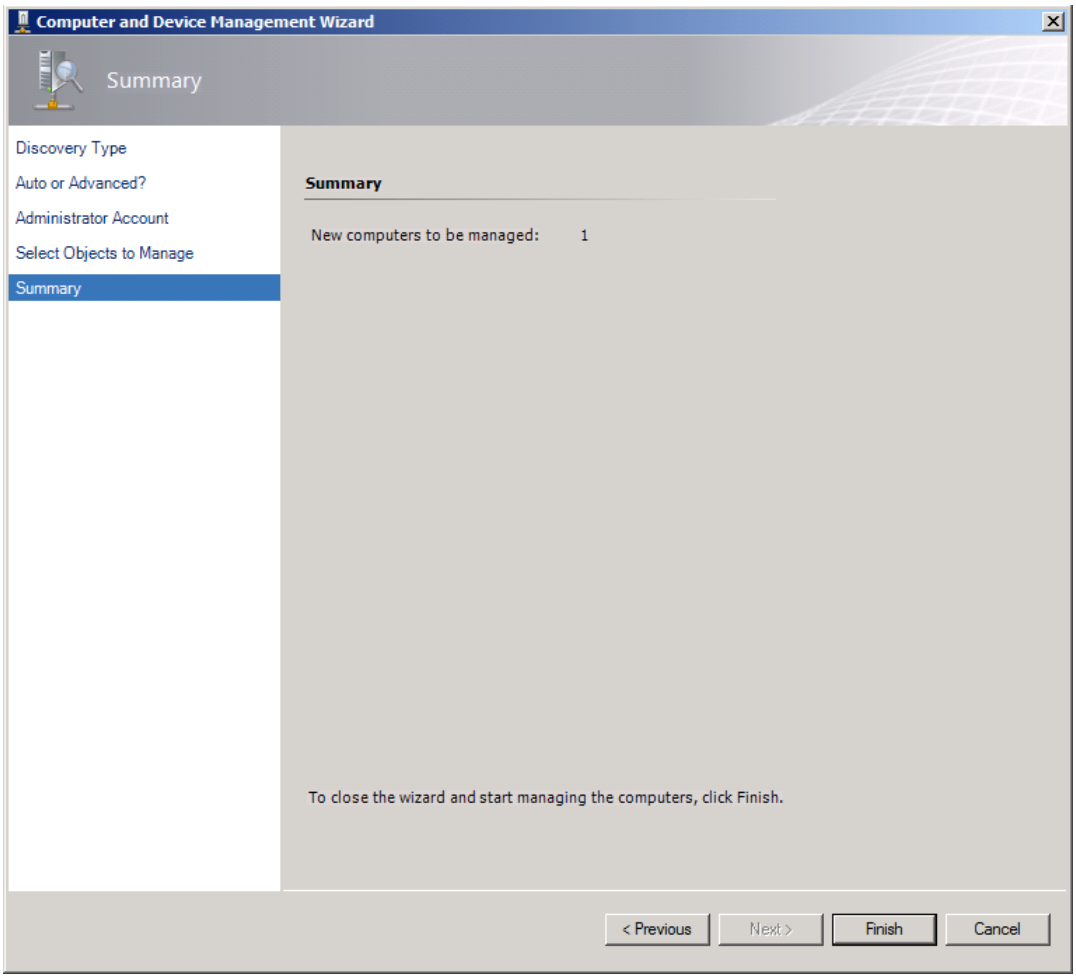


5. Select the devices you want to manage.

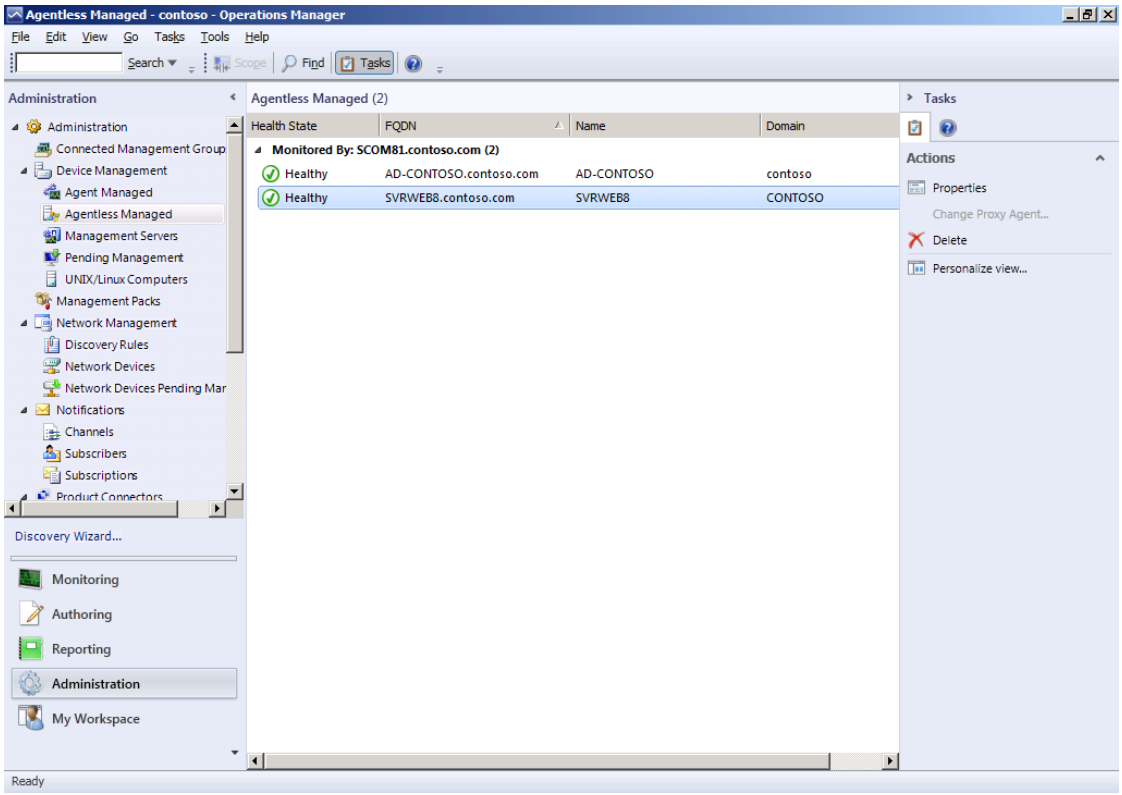
   Select **Agentless** in **Management Mode**, and click **Next**.



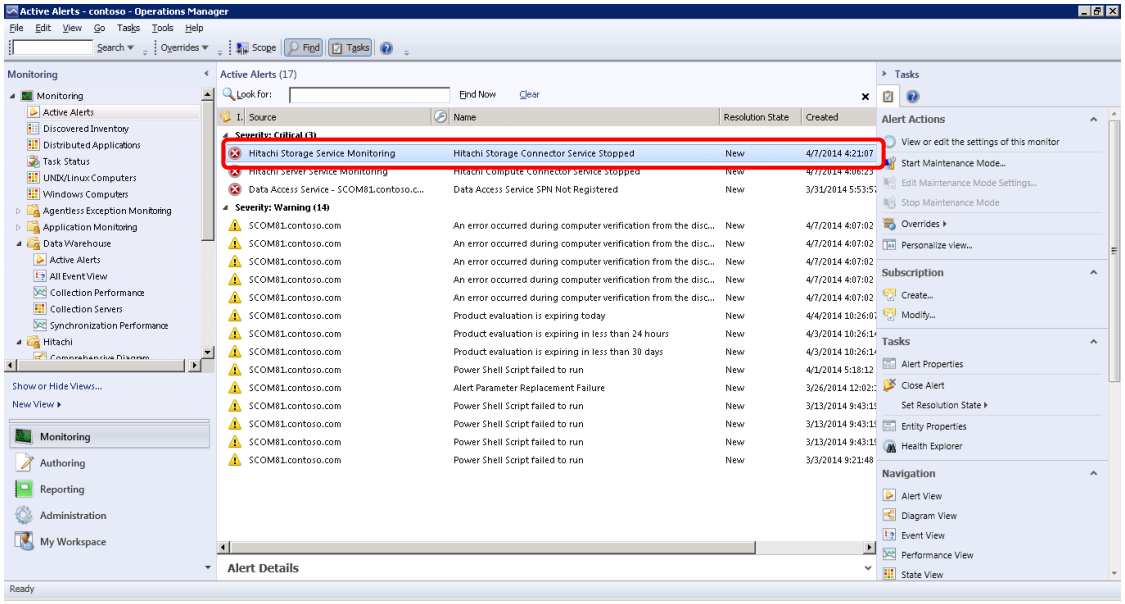
6. Click **Finish**.

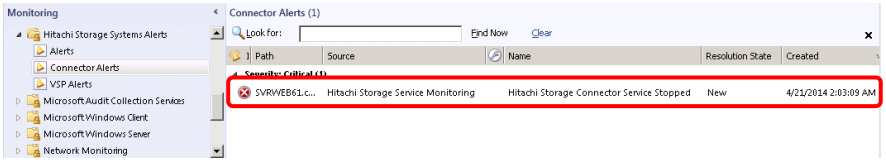


7. The operation's status can be checked by selecting **Administration > Device Management > Agentless Managed**.



8. If the Connector service stops, SCOM will display an alert in **Monitoring > Active Alerts.** These alerts can also be viewed in **Monitoring > Hitachi Storage Systems Alerts > Connector Alerts**.





Glossary

This chapter defines the special terms, acronyms, and abbreviations used in this document. Click the desired letter below to display the glossary entries that start with that letter.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

B

BIOS

Basic Input Output System

BMC

Baseboard Management Controller

C

CCI

Hitachi Command Control Interface

CLI

Command Line Interface

CPU

Central Processing Unit

D

DNS

Domain Name System

E

EFI

Extensible Firmware Interface

EVS

Enterprise Virtual Server

F

FC

Fibre Channel

FRU

Field Replaceable Unit

G

GUI

Graphical User Interface

GUID

Globally Unique Identifier

H

HORCM

Hitachi Open Remote Copy Manager

I

ICMP

Internet Control Message Protocol

IP

Internet Protocol

IP Address

Internet Protocol Address

L

LAN

Local Area Network

LED

Light Emitting Diode

LOM

Lights Out Management—a remote server management system

LP

Logical Partitioning

LUN

Logical Unit Number

M

Management

Management includes discovery, initialization, configuration, provisioning, health and performance monitoring, alarms and alerts, and other system management functions.

Management IP address

IP address assigned to the management LAN for the external connection. Management IP address is used to manage the device.

MIB

Management Information Base

MMC

Microsoft Management Console

MP

Management Pack

O

OID

Object Identifier

P

PCI Card

PCI Card mounted on Motherboard

R

RPM

Rotations Per Minute

S

SCOM

System Center Operations Manager

SMASH

A standard server hardware management interface

SNMP

Simple Network Management Protocol

W

WMI

Windows Management Instrumentation

WS-Management

A Web service for device management

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