



**Violin SCOM Management Pack  
Operations Guide  
For Release MP 1.0.0**

---

## LEGAL NOTICE

Copyright © 2010-2013 Violin Memory, Inc. All rights reserved.

Violin Memory, Violin Technologies, Violin, vSHARE, vCACHE, Flash Forward, and Violin and Design are trademarks, registered trademarks or service marks of Violin Memory, Inc. (“Violin”) in the United States and other countries.

All other brands, product names, company names, trademarks, and service marks are the properties of their respective owners.

This document and the associated software product are protected by copyright and international treaties, and are distributed under license from Violin, including restrictions on their use, copying, redistribution and reverse engineering. Unless otherwise agreed by Violin in writing, Violin’s standard end user license agreement shall apply, which may be reviewed at [www.violin-memory.com/legal](http://www.violin-memory.com/legal). No part of this document may be reproduced, adapted or translated without prior written permission of Violin, except as permitted under applicable copyright law. The associated software product may include, access or otherwise operate, interface or be delivered with third party software or other applications or copyrighted materials, which are copyrighted and licensed by Violin suppliers. Such third party materials and licenses are identified in this document and/or at [www.violin-memory.com/legal](http://www.violin-memory.com/legal).

Violin assumes no responsibility for any typographical, technical or other error or omission in this document. Violin reserves the right to periodically change the information contained in this document, but Violin makes no commitment to provide any such changes, updates, enhancements or other additions in a timely manner or at all.

The only warranties for Violin products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. THIS DOCUMENT (INCLUDING ANY EXAMPLES AND OTHER INFORMATION CONTAINED HEREIN) IS MADE AVAILABLE “AS IS” WITHOUT REPRESENTATION OR WARRANTY OF ANY KIND. VIOLIN MAKES NO REPRESENTATION OR WARRANTY IN THIS DOCUMENT REGARDING ANY ASSOCIATED SOFTWARE OR ANY OTHER VIOLIN OR THIRD PARTY HARDWARE, SOFTWARE OR OTHER PRODUCTS OR SERVICES REFERENCED HEREIN. TO THE FULLEST EXTENT PERMITTED BY LAW, VIOLIN (FOR ITSELF AND ITS LICENSORS AND OTHER THIRD PARTIES IDENTIFIED HEREIN) HEREBY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, WITH RESPECT TO THE FOREGOING, INCLUDING WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF TITLE, NON-INFRINGEMENT, QUIET ENJOYMENT, ACCURACY, INTEGRATION, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

IN NO EVENT SHALL VIOLIN (OR ITS LICENSORS OR ANY OTHER THIRD PARTY IDENTIFIED HEREIN) BE LIABLE CONCERNING ANY USE OF THIS DOCUMENT, REGARDLESS OF THE FORM OF ANY CLAIM OR ACTION (WHETHER IN CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE), FOR ANY DIRECT, INDIRECT, PUNITIVE, INCIDENTAL, RELIANCE, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, ANY LOSS OF DATA, LOSS OR INTERRUPTION OF USE, COST OF PROCURING SUBSTITUTE TECHNOLOGIES, GOODS OR SERVICES, OR LOSS OF BUSINESS, REVENUES, PROFITS OR GOODWILL, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Violin Memory, Inc.  
685 Clyde Avenue  
Mountain View, CA 94043  
USA

# Table of Contents

---

<b>Preface</b> .....	<b>1</b>
<b>CHAPTER 1. Violin SCOM Management Pack Overview</b> .....	<b>5</b>
About the Violin SCOM Management Pack .....	5
Monitored Objects Created by the Violin MP .....	6
Health Rollup Structure .....	7
Monitoring Examples .....	9
Monitoring VIMM Temperature .....	9
Monitoring Target Port State .....	9
Monitoring Memory Array State .....	9
Monitoring LUN State .....	10
Monitoring Memory Array Free Space Percentage .....	10
SCOM System Requirements .....	10
<b>CHAPTER 2. Installing the Violin SCOM Management Pack</b> .....	<b>11</b>
Importing the Violin Management Pack File .....	11
Setting Up a Monitoring Wizard .....	14
The Violin MP Discovery Process .....	17
Enabling the Agent Proxy Setting .....	17
<b>APPENDIX A. Management Pack Contents</b> .....	<b>19</b>
Violin Storage 6000 Watcher Node Discovery .....	19
Violin Storage 6000 Array Discovery .....	20
Violin Storage 6000 LUN Discovery .....	20
Violin Storage 6000 VIMM Discovery .....	20
Violin Storage 6000 Target Ports Discovery .....	21
Unit Monitors .....	22
Rules .....	22



# Preface

---

This preface outlines the organization of this book, describes document conventions, and provides information about additional resources.

- [Intended Audience](#) on page 1
- [Document Organization](#) on page 1
- [Reference Documents](#) on page 2
- [Document Conventions](#) on page 2
- [Contacting Violin Memory](#) on page 4

## Intended Audience

This guide is intended for experienced systems administrators. Violin Memory assumes that you are experienced in managing high-performance storage systems.

Contact Violin Memory Customer Support for any assistance with installing and servicing this system. See [Contacting Violin Memory](#) on page 4 for contact information.

## Document Organization

This guide is organized into the following sections:

- [Chapter 1, Violin SCOM Management Pack Overview](#)—Provides an introduction to the functions of the Violin Management Pack (MP) for Microsoft System Center Operations Manager (SCOM) and how it fits into a SCOM configuration.
- [Chapter 2, Installing the Violin SCOM Management Pack](#)—Contains the procedures for importing the Management Pack into SCOM and initiating monitoring of a Violin cluster.

- [Appendix A, Management Pack Contents](#)—Describes the object types, rules, and unit monitors created by the Violin MP.

## Reference Documents

In addition to this guide, the following Violin Memory documents comprise the documentation suite that will assist you with setting up, using and servicing Violin Memory products. These guides are available for download from the Violin Memory Support site at <http://www.violin-memory.com/support/>

This document...	Provides this information...
Release Notes	This document describes the new features, resolved issues, known limitations and software upgrade instructions for the current release.
<i>Violin 6000 Series Memory Array Installation Guide</i>	This guide provides instructions for installing the Violin 6000 Series Memory Array in an equipment rack and completing the system setup and configuration.
<i>Violin 6000 Series Memory Array User's Guide</i>	This guide provides instructions for managing, monitoring, and maintaining the Violin 6000 Series Memory Array using the Violin Web interface and Command Line Interface (CLI).

### Reference Documents

## Document Conventions

### Safety Icons

The table below summarizes warning, caution, and note icons used in this document and includes sample text.

#### Safety Icons

Icon	Sample Text
<b>WARNING!</b>	<b>WARNING!</b> Only authorized, qualified, and trained personnel should attempt to work on this equipment.

### Safety Icons (Continued)

Icon	Sample Text
<b>Caution:</b>	<b>Caution:</b> Follow the listed safety precautions when working on the Violin device.
<b>Note:</b>	<b>Note:</b> Read through this entire chapter and plan your installation according to your location before installing the equipment. The following procedures and the order in which they appear are general installation guidelines only.

## Typographical Conventions

The following typographic conventions are used in this guide:

Format	Meaning
<b>Bold</b>	Command names.
<i>Italic</i>	Provides emphasis and identifies document titles.
<code>Courier</code>	Examples and output.
<b>Courier bold</b>	Input you must type exactly as shown.
<code>&lt;Courier&gt;</code>	Information for which you must supply a value.
[ ]	Optional command parameters are enclosed within square brackets.
	Separates a set of command choices from which only one may be chosen.
{ }	Required command parameters that must be specified are enclosed within curly brackets.

### Typographical Conventions

## Security

Violin Memory, Inc., cannot be responsible for unauthorized use of equipment and will not make allowance or credit for unauthorized use or access.

---

## Contacting Violin Memory

To obtain additional information or technical support for Violin Memory products, contact us at:

Phone: 1-855-VIOLIN-5 (1-855-846-5465)

International: +1 650-396-1500 Extension 3

Web site: <http://www.violin-memory.com>

Email: [support@vmem.com](mailto:support@vmem.com)

When contacting Violin Memory Customer Support, please have the following information available:

- Model and serial number of the system for which you are requesting support.
- Software version.
- A brief description of the problem.



# CHAPTER 1 Violin SCOM Management Pack Overview

---

This chapter provides an introduction to the Violin SCOM Management Pack. It contains the following sections:

- [About the Violin SCOM Management Pack](#) on page 5
- [Monitored Objects Created by the Violin MP](#) on page 6
- [Monitoring Examples](#) on page 9
- [SCOM System Requirements](#) on page 10

## About the Violin SCOM Management Pack

Microsoft System Center Operations Manager (SCOM) is software that lets administrators monitor various kinds of computer systems from a central server. SCOM works by installing agents on the remote systems to be monitored. The agents report back data about performance, health, and alert status of the monitored systems.

A Management Pack (MP) is an expansion module for SCOM that allows agents to report information about specific systems to the central SCOM server. The *Violin SCOM Management Pack* (Violin MP) configures an agent to discover Violin devices in your network, defines Violin-specific objects to monitor, and generates alerts that can be viewed in the SCOM Alerts View.

Figure 1.1 illustrates a how a SCOM server monitors a Violin cluster. A Violin cluster consists of one or more Violin 6000 Series Memory Arrays.

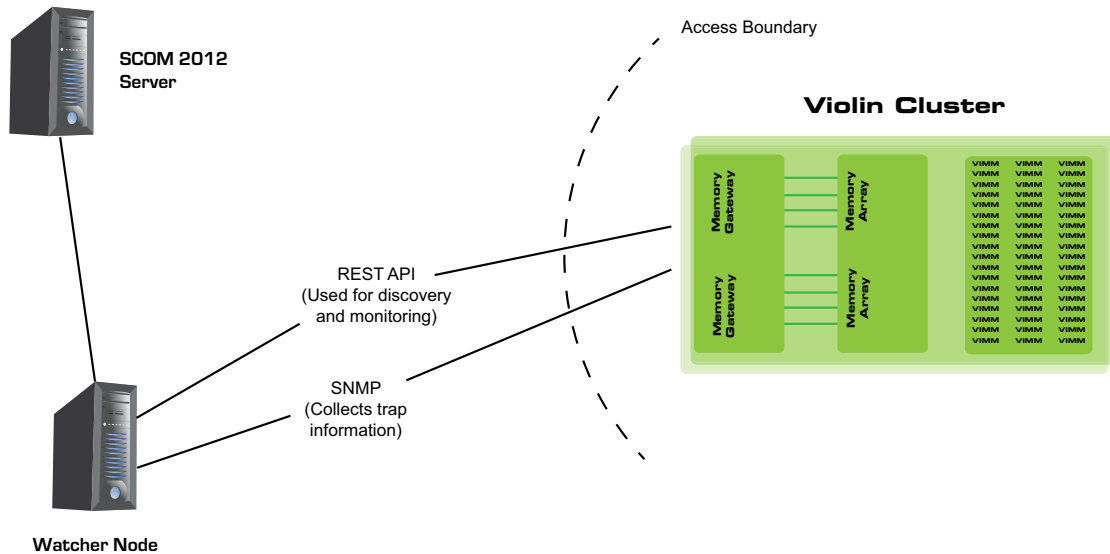


Figure 1.1 SCOM Server Monitoring a Violin Cluster

The SCOM server monitors a Violin cluster via a watcher node. The watcher node runs the agent that retrieves information about availability, security, and performance on the Violin cluster. When you initiate monitoring for the Violin cluster in SCOM, the watcher node discovers the devices in the cluster and creates objects to monitor.

SCOM evaluates the state of the monitored objects based on rules defined in the MP. Object states can be *Healthy*, *Warning*, or *Critical*. SCOM can generate alerts based on the state of the objects and display information in the SCOM Alerts View that describes the issue and provides possible solutions.

The watcher node can be located outside the network where the Violin cluster is located, provided that the watcher node has a VPN connection to the Violin cluster.

## Monitored Objects Created by the Violin MP

To use the Violin MP, you import the MP file into SCOM and run the Violin MP Monitoring Wizard, where you specify information about the Violin cluster you want to monitor. The wizard creates the following objects for the Violin cluster:

- Violin Storage 6000 Watcher Node
- Violin Storage 6000 Memory Array
- Violin Storage 6000 VIMM
- Violin Storage 6000 LUN
- Violin Storage 6000 Target Port
- SNMP Traps

---

The watcher node collects information from the Violin cluster using either the REST API or SNMP. Initial discovery of Violin cluster objects, and monitoring the state of the objects is done using the REST API. The SNMP protocol is used to collect trap data from the Violin cluster. To access the trap data, you set a Run As account for SNMP in the Monitoring Wizard and specify a SNMP community string for the cluster.

## Health Rollup Structure

The Health rollup mechanism in SCOM allows the health state of one object to be affected by the health of another object. Figure 1.2 shows how the health states of objects roll up in the Violin MP.

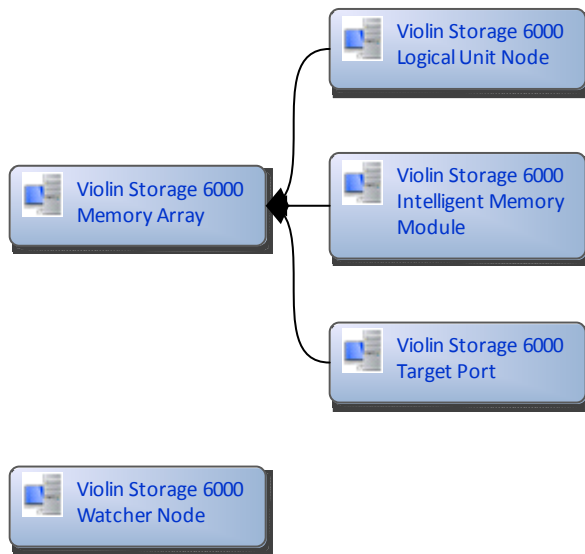


Figure 1.2 Health Rollup Structure for Violin MP Objects

Alerts for the Violin Storage 6000 Memory Array object are based on the data collected for the LUN, VIMM, and Target Port sub-objects. In the SCOM Alerts View, alarms displayed for the Violin Storage 6000 Memory Array object reflect the worst-level alarm for any of its sub-objects, as illustrated in Figure 1.3.

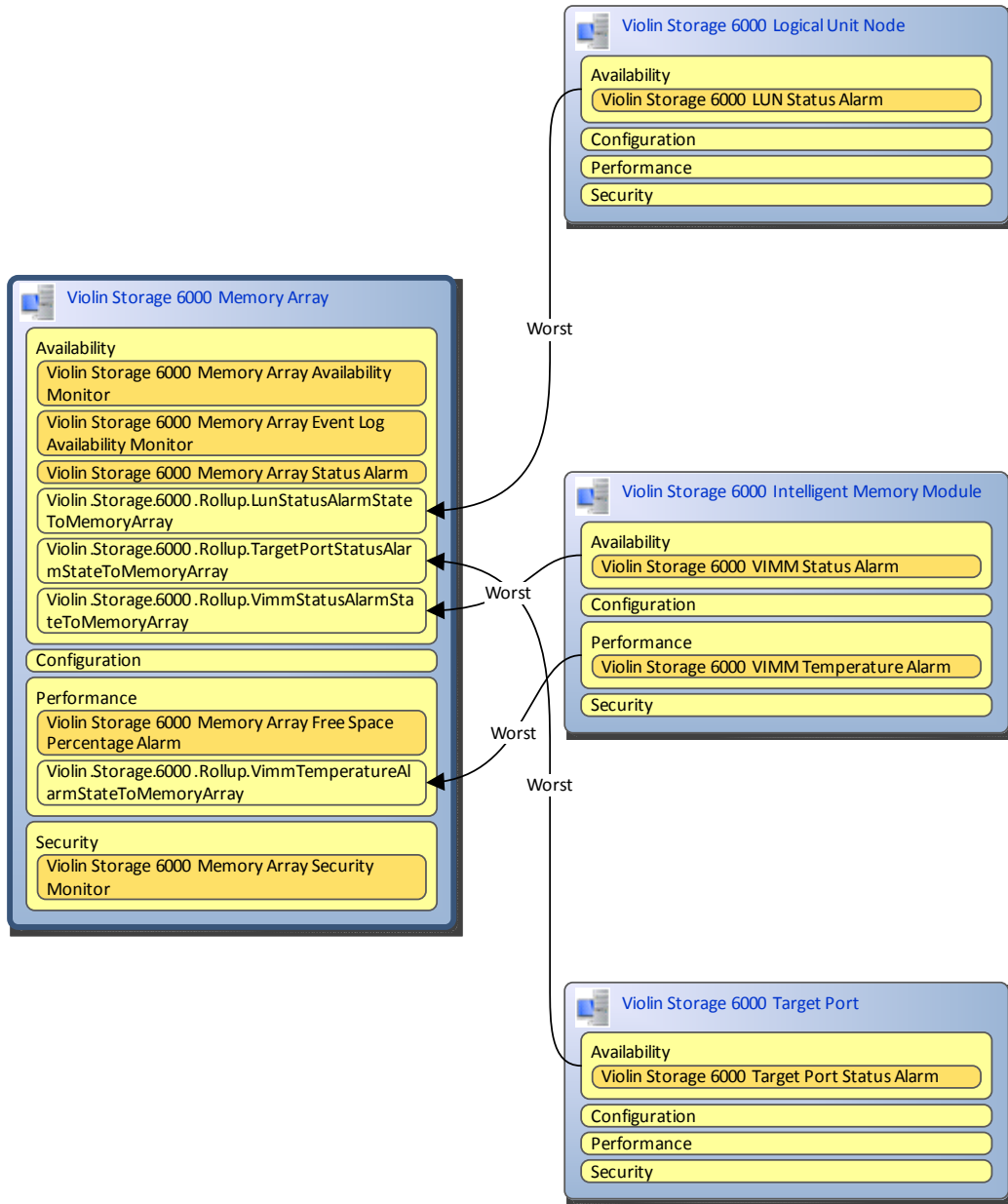


Figure 1.3 How Alarms for the Memory Array Object Reflect the Worst Sub-object Alarm

---

## Monitoring Examples

The following are some examples of how SCOM monitors a Violin cluster using objects defined by the Violin MP.

### Monitoring VIMM Temperature

1. The agent checks the default state of the VIMM Temperature Monitor.

The default thresholds for the monitor are:

- Less than 75 degrees – Healthy state
- From 75 degrees to 80 degrees – Warning state
- over 80 degrees - Critical state

The default state of the monitor is Healthy.

2. If the VIMM temperature rises to 76 degrees, the monitor state becomes Warning.
3. If the VIMM temperature rises to 81 degrees, the monitor state becomes Critical, and an alert appears in the SCOM Alerts View.

### Monitoring Target Port State

1. The agent checks the default state of the Target Port State Monitor.

Default mapping between Target Port states and monitor states is:

- Online – Healthy
- Unknown, Not Supported, Unconfigured – Warning
- Failover Failed, Failover, Lost, Dead – Critical

The default state of the monitor is Healthy.

2. If one or more Target Ports on a Violin Memory Gateway change state to Unknown, Not Supported, or Unconfigured, the monitor state becomes Warning.
3. If one or more Target Ports change state to Failover Failed, Failover, Lost, or Dead, the monitor state becomes Critical, and an alert appears in the SCOM Alerts View.

### Monitoring Memory Array State

1. The agent checks the default state of Memory Array State Monitor.

Default mapping between Memory Array states and monitor states is:

- Online – Healthy
- Unknown, Onlining – Warning
- Offline, Error, Removed, Disabled – Critical

The default state of the monitor is Healthy.

2. If a Violin Memory Gateway media device (Memory Array) changes state to Unknown or Onlining, the monitor state becomes Warning.

- 
3. If a Violin Memory Gateway media device (Memory Array) changes state to Offline, Error, Removed, or Disabled, the monitor state becomes Critical, and an alert appears in the SCOM Alerts View.

## Monitoring LUN State

1. The agent checks the default state of LUN Monitor.  
If a LUN is available, the monitor state is Healthy; if not, then the monitor state is Critical.
2. If the LUN state changes to unavailable, the monitor state becomes Critical, and an alert appears in the SCOM Alerts View.

## Monitoring Memory Array Free Space Percentage

1. The agent checks the default state of Memory Array Free Space Percentage Monitor.  
Default mapping between Free Space Percentage and monitor states is:
  - Greater than or equal to 7% – Healthy
  - Greater than or equal to 5% and less than 7% – Warning
  - Less than 5% – CriticalThe default state of the monitor is Healthy.
2. If Memory Array free space is reduced to 6%, the monitor state becomes Warning.
3. If Memory Array free space is reduced to 4%, the monitor state becomes Critical, and an alert appears in the SCOM Alerts View.

## SCOM System Requirements

The following are the requirements for installing the Violin MP:

- SCOM 2012 SP1 must be installed on the SCOM server.  
See [this Microsoft document](#) for SCOM server-related prerequisites. There are no required management packs that are prerequisite to importing the Violin Management Pack into SCOM.
- Requirements for the SCOM agent:
  - .NET 4
  - PowerShell 2.0 and 3.0
  - REST API credentials
  - SNMP community string
  - You must enable the Agent Proxy setting for all agents that are installed on the watcher node. See [Enabling the Agent Proxy Setting](#) on page 17.

## CHAPTER 2 Installing the Violin SCOM Management Pack

---

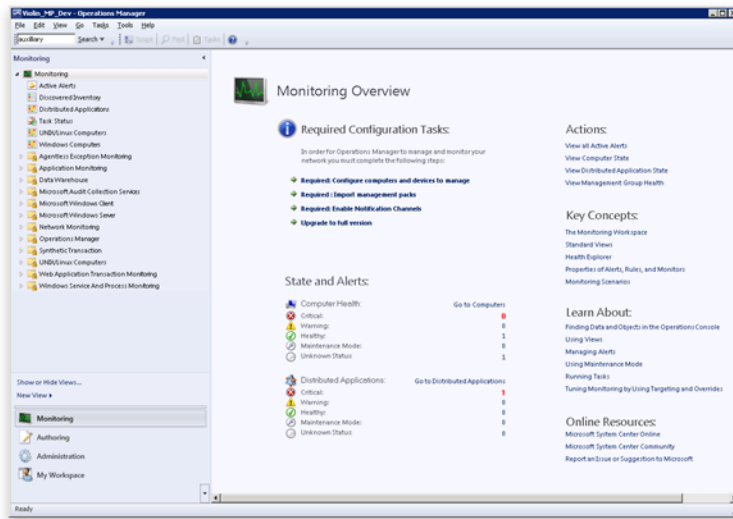
This chapter contains the installation procedure for the Violin MP for SCOM. The installation procedure consists of the following tasks:

- [Importing the Violin Management Pack File](#) on page 11
- [Setting Up a Monitoring Wizard](#) on page 14
- [Enabling the Agent Proxy Setting](#) on page 17

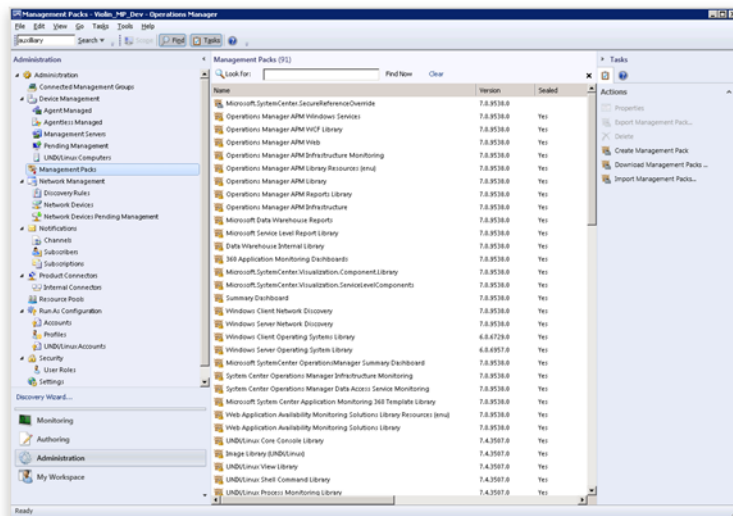
### Importing the Violin Management Pack File

To start monitoring a Violin cluster, import the Violin management pack file into SCOM.

1. Copy the Violin Storage MP file (`Violin.6000.mpb`) to a network location or local drive accessible from the SCOM 2012 Management Server.
2. Open the SCOM 2012 Operations Console.

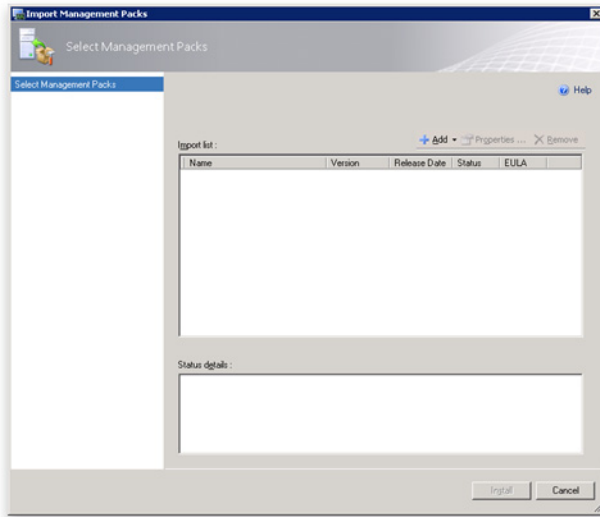


3. Click the **Administration** view, then double-click **Management Packs**.

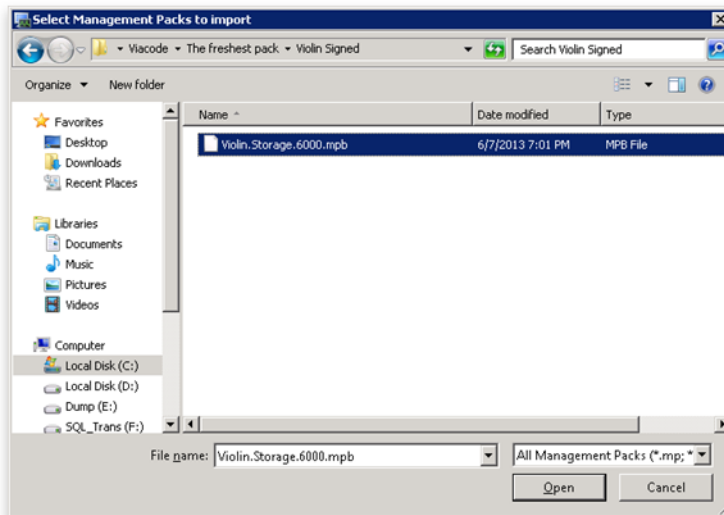


4. Under **Tasks** in the right pane, click **Import Management Packs** to start the Import Management Pack wizard.

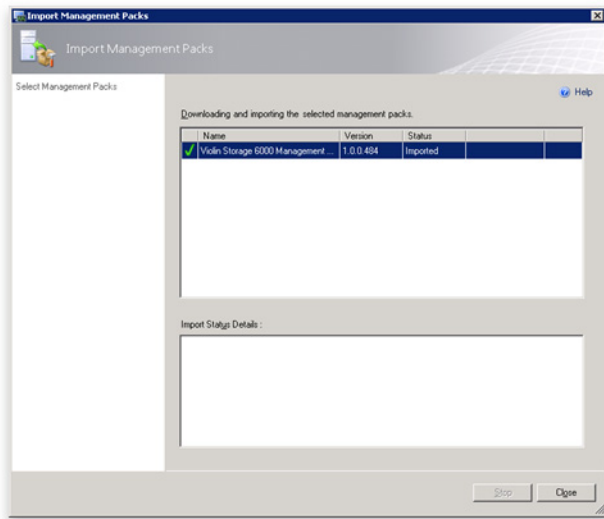




5. Click the **+Add** box and select **Add from disk**; click **No** if you are asked to check for dependencies to search the Online Catalog.
6. Navigate to the location where you copied the `Violin.Storage.6000.mpb` file, select the file, then click **Open**:



7. Click **Install** to import the MP file.
8. Once the MP import process completes, click **Close**.



---

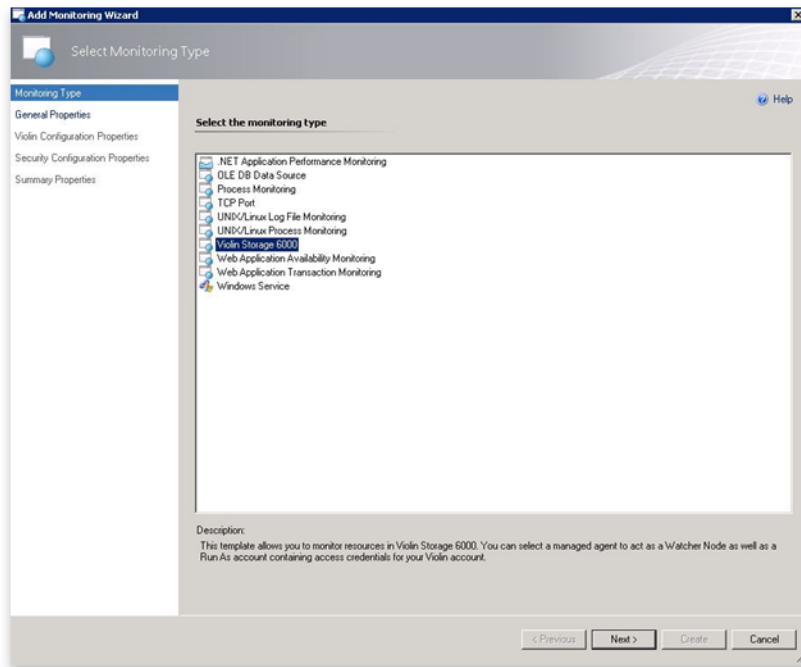
**Note:** For additional details about importing a management pack, see the Microsoft document, [How to Import a Management Pack in Operations Manager 2012](#).

---

## Setting Up a Monitoring Wizard

After you import the Violin MP file into SCOM, you run the Violin Monitoring Wizard, where you specify the Violin clusters to be monitored by SCOM. The wizard creates a minimal set of objects that subsequently trigger the discovery of the rest of the object hierarchy. The wizard also lets you specify the credentials that will be used to access the REST API and SNMP traps.

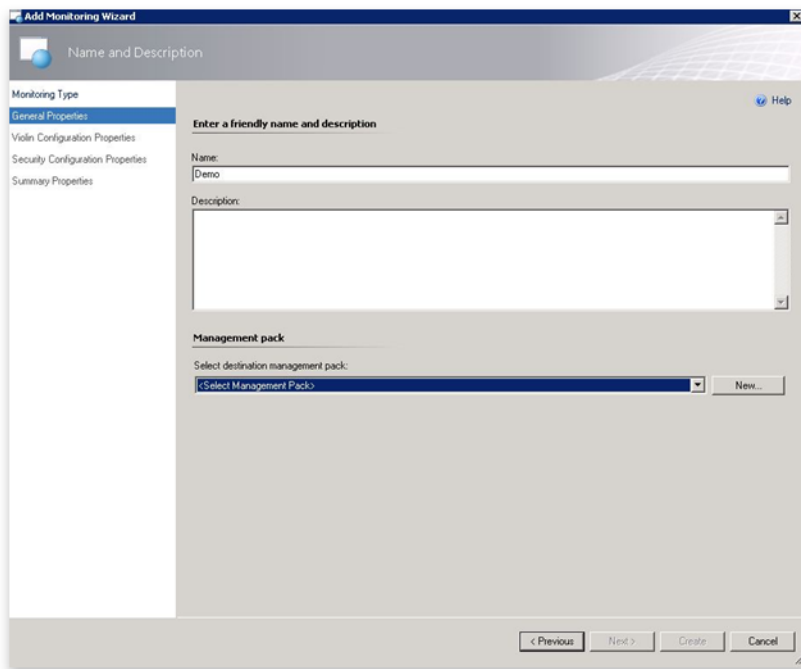
1. Click the **Authoring** view, then expand **Management Pack Templates**.
2. Click **Add Monitoring Wizard**, and select **Violin Storage 6000** as the monitoring type.



3. Click **Next** to continue.

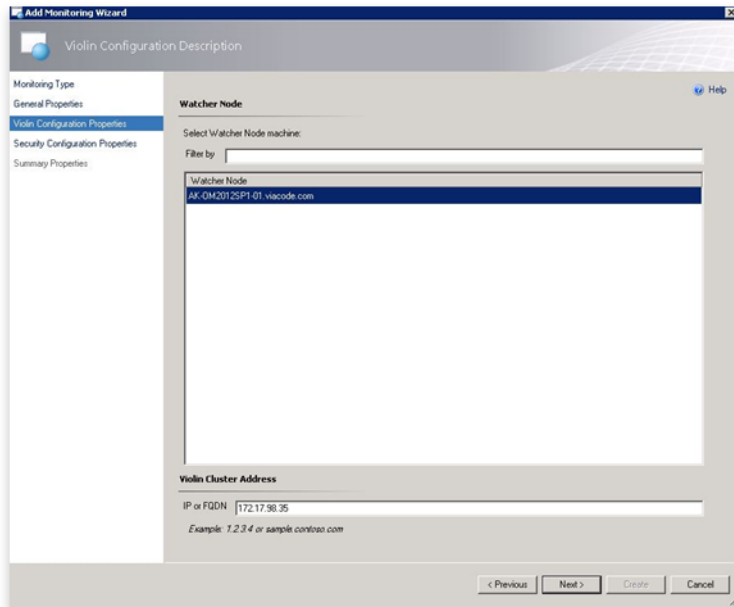
4. Enter the name and description of the Violin Cluster to be monitored. Under **Management pack**, either create a new destination MP by clicking **New**, or select an existing MP from the list.

If you click **New**, enter the MP name in the Name field and fill in the optional version and description fields, click **Next**, then click **Create from the Knowledge Article dialog**.

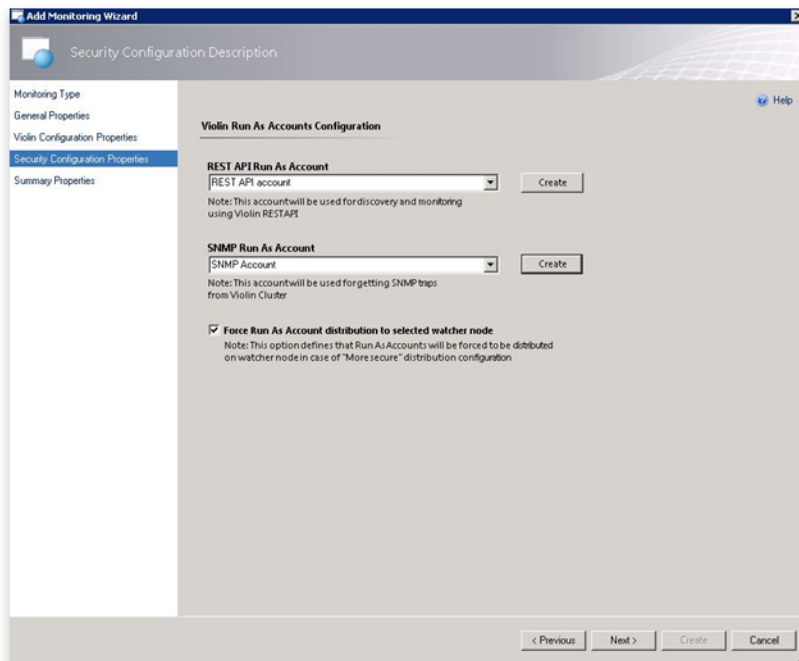


5. Click **Next** to continue.

6. Select **Watcher Node**, and enter the IP address of the Violin Cluster in the **IP or FQDN** field. Use the Violin Memory Gateway (MG) cluster address for when setting up MG monitoring.



7. Click **Next** to continue.
8. In the **REST API Run As Account** and **SNMP Run As Account** fields, select the appropriate accounts; otherwise click **Create** to create new Run As accounts.  
For the REST API Run As account, select a user that has admin privileges on the Violin Cluster. For information about creating Run As Accounts, see the Microsoft document, [How to Create a Run As Account](#).



- 
9. Click **Next** to continue.
  10. Click **Create** to complete the wizard.

---

**Note:** The specified IP address or FQDN of the Violin Cluster will be used for the SNMP Network Device address to show SNMP Events from all MG nodes, except the MG itself.

---

## The Violin MP Discovery Process

Once the Violin Monitoring Wizard completes, the Violin MP Discovery process begins. There are two stages in the Violin MP Discovery process:

1. The following objects are created for the Violin Cluster:
  - **Watcher Node** – this object is not visible to the user. It contains addresses of all endpoints of a particular Violin Cluster, including properties such as the supported SNMP version.
  - **Memory Array** – Initially, no properties are filled for this object, because no REST API calls have been made yet.
2. A number of discovery workflows are executed to call the REST API for detailed information about the remaining objects in the Violin Cluster.

## Enabling the Agent Proxy Setting

You must enable the Agent Proxy setting on all agents that are installed on the watcher node.

1. In the Operations console, click the **Administration** button.
2. In the Administrator pane, click **Agent Managed**.
3. Double-click an agent in the list.
4. On the Security tab, select **Allow this agent to act as a proxy and discover managed objects on other computers**.



# APPENDIX A Management Pack Contents

---

This appendix describes the object types, rules, and unit monitors created by the Violin MP in SCOM to monitor components of a Violin Cluster. All of the objects are discovered automatically with specific default delays. You can modify the overridable parameters to change the delays.

---

**Note:** If you are using connectors, you can disable the monitor and enable its corresponding rule to enable alerts without changing health status.

---

## Violin Storage 6000 Watcher Node Discovery

**Target:** Violin Storage 6000 Watcher Node

**Enabled:** Yes

**Run as Profile:** Default

**Discovered Classes:** Violin Storage 6000 Memory Array

### Overridable Parameters

Parameter Name	Default Value
IntervalSeconds	14400
TimeoutSeconds	500

---

## Violin Storage 6000 Array Discovery

**Target:** Violin Storage 6000 Memory Array

**Enabled:** Yes

**Run as Profile:** Default

**Discovered Classes:** Violin Storage 6000 Memory Array

### Overridable Parameters

Parameter Name	Default Value
IntervalSeconds	14400
TimeoutSeconds	500

## Violin Storage 6000 LUN Discovery

**Target:** Violin Storage 6000 Memory Array

**Enabled:** Yes

**Run as Profile:** Default

**Discovered Classes:** Violin Storage 6000 Logical Unit Number

### Overridable Parameters

Parameter Name	Default Value
IntervalSeconds	14400
TimeoutSeconds	500

## Violin Storage 6000 VIMM Discovery

**Target:** Violin Storage 6000 Memory Array

**Enabled:** Yes

**Run as Profile:** Default

**Discovered Classes:** Violin Storage 6000 Intelligent Memory Module



---

## Overridable Parameters

Parameter Name	Default Value
IntervalSeconds	14400
TimeoutSeconds	500

## Violin Storage 6000 Target Ports Discovery

**Target:** Violin Storage 6000 Memory Array

**Enabled:** Yes

**Run as Profile:** Default

**Discovered Classes:** Violin Storage 6000 Target Port

## Overridable Parameters

Parameter Name	Default Value
IntervalSeconds	14400
TimeoutSeconds	500

## Unit Monitors

Name	Enabled?	Target Class	Alert Message	Description
Violin Storage 6000 LUN Status Alarm	Y	Violin Storage 6000 Logical Unit Number	Violin Storage 6000 LUN status Alert	Availability monitor for LUN objects
Violin Storage 6000 Memory Array Availability Monitor	Y	Violin Storage 6000 Memory Array	Violin Storage 6000 Memory Array REST API Availability Alert	Availability monitor for the REST API
Violin Storage 6000 Memory Array Free Space Percentage Alarm	Y	Violin Storage 6000 Memory Array	Violin Storage 6000 Memory Array Free Space Percentage Alert	Free space monitor for Memory Array objects
Violin Storage 6000 Memory Array Security Monitor	Y	Violin Storage 6000 Memory Array	Violin Storage 6000 Memory Array Run As Account Alert	Availability monitor for Run As accounts
Violin Storage 6000 Memory Array Status Alarm	Y	Violin Storage 6000 Memory Array	Violin Storage 6000 Memory Array status Alert	Availability monitor for Memory Array objects
Violin Storage 6000 Target Port Status Alarm	Y	Violin Storage 6000 Target Port	Violin Storage 6000 Target Port status Alert	Availability monitor for Target Port objects
Violin Storage 6000 VIMM Status Alarm	Y	Violin Storage 6000 Intelligent Memory Module	Violin Storage 6000 VIMM status Alert	Availability monitor for VIMM objects
Violin Storage 6000 VIMM Temperature Alarm	Y	Violin Storage 6000 Intelligent Memory Module	Violin Storage 6000 Temperature Alert	Temperature monitor for VIMM objects

Table A.1 Unit Monitors

## Rules

Name	Enabled?	Target Class	Description
Violin Storage 6000 SNMP Trap Event Generation Rule	Y	Node	Collects SNMP Traps from network devices
Violin Storage 6000 LUN Performance Metrics Data Collection Rule	Y	Violin Storage 6000 Logical Unit Number	Collects performance data for LUNs
Violin Storage 6000 Memory Array Performance Metrics Data Collection Rule	Y	Violin Storage 6000 Memory Array	Collects performance data for the Memory Array

Table A.2 Rules

---

Name	Enabled?	Target Class	Description
Violin Storage 6000 Target Port Performance Metrics Data Collection Rule	Y	Violin Storage 6000 Target Port	Collects performance data for Target Ports
Violin Storage 6000 VIMM Performance Metrics Data Collection Rule	Y	Violin Storage 6000 Intelligent Memory Module	Collects performance data for VIMMs
Violin Storage 6000 System Event Log Rule	Y	Watcher Node	Checks Event Log for specific errors

**Table A.2 Rules**

