

Application Virtualization Management Pack Guide for Operations Manager 2007

Microsoft Corporation

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Contents

[Application Virtualization 4.5 Management Pack Guide 5](#_Toc204416265)

[Introduction to the Application Virtualization 4.5 Management Pack 5](#_Toc204416266)

[Supported Configurations 5](#_Toc204416267)

[Getting Started 6](#_Toc204416268)

[Before You Import the Management Pack 6](#_Toc204416269)

[Files in This Management Pack 6](#_Toc204416270)

[Recommended Additional Management Packs 6](#_Toc204416271)

[How to Import the Application Virtualization 4.5 Management Pack 6](#_Toc204416272)

[Create a New Management Pack for Customizations 7](#_Toc204416273)

[Understanding Management Pack Operations 7](#_Toc204416274)

[Objects the Management Pack Discovers 7](#_Toc204416275)

[Key Monitoring Scenarios 8](#_Toc204416276)

[Placing Monitored Objects in Maintenance Mode 13](#_Toc204416277)

[Appendix: Monitors and Overrides for Management Packs 13](#_Toc204416278)

[How to View Management Pack Details 13](#_Toc204416279)

[How to Display Monitors for a Management Pack 14](#_Toc204416280)

[How to Display Overrides for a Management Pack 14](#_Toc204416281)

[How to Display All Management Pack Rules 14](#_Toc204416282)

Application Virtualization 4.5 Management Pack Guide

The Application Virtualization 4.5 Management Pack is designed to maximize Application Virtualization Server availability for handling Application Virtualization Client requests. The Application Virtualization Server health status uses the following color codes:

* Green indicates that the server is running without non-recoverable errors.
* Yellow indicates that one of the components is not functioning correctly. The overall functionality of the server is degraded, but the server is still available.
* Red indicates that the server is not available and that it cannot provide key services or it cannot communicate with external service dependencies.

Health status change is triggered when an Application Virtualization Server logs a tracked error or warning to the local System Event Log under the Application Virtualization heading. More than 60 unique errors are tracked, and these errors are mapped to information about how to fix or further troubleshoot the issue.

Introduction to the Application Virtualization 4.5 Management Pack

The Application Virtualization 4.5 Management Pack enables IT professionals to monitor the servers, applications, services, and components in their system to support the Application Virtualization environment.

Document Version

This guide was written based on the 4.5.0.0 version of the Application Virtualization 4.5 Management Pack.

Getting the Latest Management Pack and Documentation

You can find the Application Virtualization 4.5 Management Pack in the [System Center Operations Manager 2007 Catalog](http://go.microsoft.com/fwlink/?LinkId=82105) (http://go.microsoft.com/fwlink/?LinkId=82105).

Supported Configurations

The Application Virtualization 4.5 Management Pack for Operations Manager 2007 supports Application Virtualization 4.5 services installed on 32-bit or 64-bit versions of Windows Server 2003 or Windows Server 2008.

Getting Started

This section describes the actions you should take before you import the Management Pack, any steps you should take after you import the Management Pack, and information about customizations.

Before You Import the Management Pack

Before you import the Application Virtualization 4.5 Management Pack, please delete any previous installations of the Management Pack. By deleting any previous installations of the Application Virtualization 4.5 Management Pack, you can ensure that the installations do not conflict.

Files in This Management Pack

To monitor Application Virtualization 4.5, you must first download the Application Virtualization 4.5 Management Pack from the Management Pack Catalog, located at <http://go.microsoft.com/fwlink/?LinkId=82105>. The Application Virtualization 4.5 Management Pack includes the following files:

 Microsoft.AppVirtualization.Server.45.mp

 Microsoft Application Virtualization 4.5 Management Pack Guide.doc

Recommended Additional Management Packs

Application Virtualization 4.5 Management Pack users might also want to monitor the underlying Operating System, SQL Server, and Internet Information Server for the most comprehensive monitoring solution. Download the latest version of the associated Management Packs from the Management Pack Catalog, located at <http://go.microsoft.com/fwlink/?LinkId=82105>.

How to Import the Application Virtualization 4.5 Management Pack

For instructions about importing a Management Pack, see [How to Import a Management Pack in Operations Manager 2007](http://go.microsoft.com/fwlink/?LinkID=98348) (http://go.microsoft.com/fwlink/?LinkID=98348).

Operations Manager 2007 should automatically discover Application Virtualization (App-V) servers after you import the Management Pack and add them to the Operations Console.

Create a New Management Pack for Customizations

Most vendor Management Packs are sealed so that you cannot change any of the original settings in the Management Pack file. However, you can create customizations, such as overrides or new monitoring objects, and save them to a different Management Pack. By default, Operations Manager 2007 saves all customizations to the default Management Pack. As a best practice, you should instead create a separate Management Pack for each sealed Management Pack you want to customize.

Creating a new Management Pack for storing overrides has the following advantages:

 It simplifies the process of exporting customizations that were created in your test and pre-production environments to your production environment. For example, instead of exporting a default Management Pack that contains customizations from multiple Management Packs, you can export just the Management Pack that contains customizations of a single Management Pack.

 It allows you to delete the original Management Pack without first needing to delete the default Management Pack. A Management Pack that contains customizations is dependent on the original Management Pack. This dependency requires you to delete the Management Pack with customizations before you can delete the original Management Pack. If all of your customizations are saved to the default Management Pack, you must delete the default Management Pack before you can delete an original Management Pack.

 It is easier to track and update customizations to individual Management Packs.

For more information about sealed and unsealed Management Packs, see [Management Pack Formats](http://go.microsoft.com/fwlink/?LinkId=108355) (http://go.microsoft.com/fwlink/?LinkId=108355). For more information about Management Pack customizations and the default Management Pack, see [About Management Packs in Operations Manager 2007](http://go.microsoft.com/fwlink/?LinkId=108356) (http://go.microsoft.com/fwlink/?LinkId=108356).

Security Considerations

You might need to customize your Management Pack. Certain accounts cannot be run in a low-privilege environment or must have minimum permissions. The Application Virtualization 4.5 Management Pack tasks require that the agent action account has administrative user rights.

Low-Privilege Environments

The following Management Pack tasks cannot be run using a low-privilege account. These tasks require that the Action Account have the following Admin user rights on the agent computer:

* Start the Application Virtualization Server Service
* Stop the Application Virtualization Server Service

Computer Groups

You can delegate authority to a precise level with user roles. For more information about user roles, in the Operations Manager 2007 Help, see “[About User Roles in Operations Manager 2007](http://go.microsoft.com/fwlink/?LinkId=108357)” (http://go.microsoft.com/fwlink/?LinkId=108357).

**Note**   No computer groups are automatically created when the Application Virtualization 4.5 Management Pack is imported.

Understanding Management Pack Operations

The Application Virtualization 4.5 Management Pack allows the monitoring of a variety of deployment scenarios that help ensure full monitoring capabilities for the Application Virtualization 4.5 services and infrastructure.

Objects the Management Pack Discovers

The Application Virtualization 4.5 Management Pack discovers the object types described in the following table. Not all of the objects are automatically discovered. Use overrides to discover those that are not discovered automatically. For information about discovering objects, in Operations Manager 2007 Help, see [Object Discoveries in Operations Manager 2007](http://go.microsoft.com/fwlink/?LinkId=108505) (http://go.microsoft.com/fwlink/?LinkId=108505).

|  |  |
| --- | --- |
| Object Type | Discovered Automatically |
| Application Virtualization Management Server | Yes |
| Application Virtualization Streaming Server | Yes |

Use the following procedure to enable automatic discovery. The procedure uses SQL 2005 Agent Job as an example.

To use an override to change the setting for automatic discovery

|  |
| --- |
| 1. In the **Authoring** pane, expand Management Pack Objects, and then click Object Discoveries.  2. On the Operations Manager toolbar, click Scope, and then filter the objects that appear in the details pane to include only SQL Server objects.  3. In the Operations Manager toolbar, use the Scope button to filter the list of objects, and then click SQL Server Agent Job.  4. On the Operations Manager toolbar, click Overrides, click Override the Object Discovery, and then click For all objects of type: SQL 2005 Agent.  5. In the Overrides Properties dialog box, click the Override box for the Enabled parameter.  6. Under Management Pack, click New to create an unsealed version of the Management Pack, and then click OK. |

After you change the override setting, the object type will be automatically discovered and will appear in the **Monitoring** pane under SQL Server.

Key Monitoring Scenarios

The following table lists the key monitoring scenarios included in the Application Virtualization 4.5 Management Pack. All of the scenarios are accomplished by monitoring events logged to the NT Event Log.

| **Scenario** | **Description** |
| --- | --- |
| Application Virtualization Service Availability | * Monitor availability of the necessary processes that indicate that Application Virtualization Server is running |
| Monitor connectivity errors with external Application Virtualization dependent services SQL and Active Directory Domain Services | * Monitor basic interaction with external services |
| Monitor the general health state of the Application Virtualization Server | * Monitor the Application Virtualization Server events that are logged * Monitor the memory usage of the App-V systems * Monitor various App-V Server–specific configurations * Monitor App-V systems security specifications |

# State Monitoring Definitions

To satisfy the health monitoring scenario requirements, the Management Pack tracks the state of the computers based on the definitions provided in the following table:

**Table 2 Health Monitoring Definitions for the Management Server Role**

| State | Health Indicators |
| --- | --- |
| Green | Server is running with no non-recoverable errors.  Server can communicate with external services within expected response time. |
| Yellow | One of the components is down or not functioning correctly, and the overall functionality of the server is degraded but still available.  Non-recoverable non-fatal errors that require manual intervention. |
| Red | Server is down.  Server cannot provide its services.  Server cannot communicate with external services that it depends on.  Server is not receiving expected responses from external services. |

**Table 3 Health Monitoring Definitions for the Streaming Server Role**

| State | Health Indicators |
| --- | --- |
| Green | Server is running with no non-recoverable errors.  SFT files are accessible. |
| Yellow | Recoverable failures to read and stream SFT files. |
| Red | Service is unavailable.  Service is deemed inoperable or function is severely impaired. |

On the Management Server, the following aspects of the management entities will be monitored as described in the following tables. All but the Data Store Access Aspect will also be monitored on the Streaming Server:

**Table 4 Management Entity Monitoring Definitions for Server Status**

| State | Management Entity Indicators |
| --- | --- |
| Green | Server successfully started.  No error events. |
| Yellow | File cache exceeded warning level. |
| Red | Server is down.  Unable to start core processes.  File cache is full. |

**Table 5 Management Entity Monitoring Definitions for Data Store Access**

| State | Management Entity Indicators |
| --- | --- |
| Green | Server successfully started.  No error events. |
| Yellow | N/A |
| Red | Connection to data store failed.  Data Access Objects not initialized.  Failure to read data from the data store. |

**Table 6 Management Entity Monitoring Definitions for Content Data Access**

| State | Management Entity Indicators |
| --- | --- |
| Green | Server successfully started.  No error events. |
| Yellow | Recoverable issues accessing/reading files.  Nonvalid SFT file.  Package information in the data store does not match Content folder. |
| Red | Receiving 10 yellow alerts within 10 minutes. |

**Table 7 Management Entity Monitoring Definitions for Security**

| State | Management Entity Indicators |
| --- | --- |
| Green | Green by default. |
| Yellow | 10 Authentication and/or authorization failures within 10 minutes. |
| Red | Failed to verify the certification.  Failed to accept a secure connection. |

**Table 8 Management Entity Monitoring Definitions for Client Request Handling**

| State | Management Entity Indicators |
| --- | --- |
| Green | Green by default. |
| Yellow | Error while interacting with socket.  Received nonvalid request.  Nonvalid attribute value.  Failed to respond.  Nonvalid response. |
| Red | Failed to dispatch request to core process.  The maximum number of connections was reached.  Attempt made to re-open the CacheManager. |

**Table 9 Management Entity Monitoring Definitions for Application Licensing**

| State | Management Entity Indicators |
| --- | --- |
| Green | Green by default. |
| Yellow | License not available. |
| Red | N/A |

**Table 10 Management Entity Monitoring Definitions for Configuration**

| State | Management Entity Indicators |
| --- | --- |
| Green | Server successfully started. |
| Yellow | Non-fatal errors that do not interrupt the service. |
| Red | Fatal errors in configuration that will interrupt the service. |

For a comprehensive solution, you can supplement the Application Virtualization Management Pack with Management Packs specific for the other external systems that Application Virtualization depends on, such as Active Directory Domain Services, Windows operating systems, SQL, and IIS.

# Tasks

Tasks provide tools for the administrators to manage Application Virtualization Server to respond to changes in the health state. The Management Pack provides the tasks described in the following table.

**Table 11 Management Pack Tasks**

| Tasks | Description |
| --- | --- |
| Start the Application Virtualization Server Service | Enables administrators to start the services on the selected Application Virtualization Management or Streaming Server. This is a simple interface to the NET START command. |
| Stop the Application Virtualization Server Service | Enables administrators to stop the services on the selected Application Virtualization Management or Streaming Server. This is a simple interface to the NET STOP command. |

Placing Monitored Objects in Maintenance Mode

When a monitored object, such as a computer or distributed application, goes offline for maintenance, Operations Manager 2007 detects that no agent heartbeat is being received and, as a result, might generate numerous alerts and notifications. To prevent alerts and notifications, place the monitored object into maintenance mode. In maintenance mode, alerts, notifications, rules, monitors, automatic responses, state changes, and new alerts are suppressed at the agent.

For general instructions about placing a monitored object in maintenance mode, see [How to Put a Monitored Object into Maintenance Mode in Operations Manager 2007](http://go.microsoft.com/fwlink/?LinkId=108358) (http://go.microsoft.com/fwlink/?LinkId=108358).

Appendix: Monitors and Overrides for Management Packs

This section provides detailed procedures and scripts that enable you to display rules and other information about the Management Packs you import.

How to View Management Pack Details

For more information about a monitor and the associated override values, see the knowledge for the monitor.

To view knowledge for a monitor

|  |
| --- |
| 1. In the Operations Console, click the Authoring button.  2. Expand Management Pack Objects, and then click Monitors.  3. In the **Monitors** pane, expand the targets until you reach the monitor level. Alternatively, you can use the Search box to find a particular monitor.  4. Click the monitor, and in the **Monitors** pane, click View knowledge.  5. Click the Product Knowledge tab. |

How to Display Monitors for a Management Pack

To display a list of outputs for a Management Pack's monitors and overrides using the Command Shell, use the following procedure.

To display monitors for a Management Pack

|  |
| --- |
| 1. In the Command Shell, type the following command:  get-monitor -managementPack name.mp | export-csv filename  2. A .csv file is created. The .csv file can be opened in Microsoft Excel.  Note  In Excel, you might be required to specify that the .csv file is a text file. |

For example, the following command retrieves data for the monitors associated with one of the core Management Packs:

get-monitor -managementPack System.Health.Library.mp | export-csv "C:\monitors.csv"

How to Display Overrides for a Management Pack

To display overrides for a Management Pack use the following procedure.

To display overrides for a Management Pack

|  |
| --- |
| 1. In the Command Shell, type the following command:  get-override -managementPack name.mp | export-csv filename  2. A .csv file is created. The .csv file can be opened in Excel.  Note  In Excel, you might be required to specify that the .csv file is a text file. |

For example, the following command displays the overrides for one of the core Management Packs:

get-override -managementPack Microsoft.SystemCenter.OperationsManager.Internal.mp | export-csv "c:\overrides.csv"

How to Display All Management Pack Rules

Use the following procedure to display a list of rules for the Management Packs that you imported. The list of rules can be viewed in Excel.

To display Management Pack rules

|  |
| --- |
| 1. In your management server, click Programs, and then click System Center.  2. Click Command Shell.  3. In the Command Shell window, type the following command:  get-rule | select-object @{Name="MP";Expression={ foreach-object {$\_.GetManagementPack().DisplayName }}},DisplayName | sort-object -property MP | export-csv "c:\rules.csv"  4. A .csv file is created. The .csv file can be opened in Excel.  Note  In Excel, you might be required to specify that the .csv file is a text file. |