
Management Guide

NetIQ® AppManager® for VMware vSphere

July 2019

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About this Book and the Library

The NetIQ AppManager product (AppManager) is a comprehensive solution for managing, diagnosing, and analyzing performance, availability, and health for a broad spectrum of operating environments, applications, services, and server hardware.

AppManager provides system administrators with a central, easy-to-use console to view critical server and application resources across the enterprise. With AppManager, administrative staff can monitor computer and application resources, check for potential problems, initiate responsive actions, automate routine tasks, and gather performance data for real-time and historical reporting and analysis.

Intended Audience

This guide provides information for individuals responsible for installing an AppManager module and monitoring specific applications with AppManager.

Other Information in the Library

The library provides the following information resources:

Installation Guide for AppManager

Provides complete information about AppManager pre-installation requirements and step-by-step installation procedures for all AppManager components.

User Guide for AppManager Control Center

Provides complete information about managing groups of computers, including running jobs, responding to events, creating reports, and working with Control Center. A separate guide is available for the AppManager Operator Console.

Administrator Guide for AppManager

Provides information about maintaining an AppManager management site, managing security, using scripts to handle AppManager tasks, and leveraging advanced configuration options.

Upgrade and Migration Guide for AppManager

Provides complete information about how to upgrade from a previous version of AppManager.

Management guides

Provide information about installing and monitoring specific applications with AppManager.

Help

Provides context-sensitive information and step-by-step guidance for common tasks, as well as definitions for each field on each window.

The AppManager library is available in Adobe Acrobat (PDF) format from the [AppManager Documentation](#) page of the NetIQ Web site.

About NetIQ Corporation

We are a global, enterprise software company, with a focus on the three persistent challenges in your environment: Change, complexity and risk—and how we can help you control them.

Our Viewpoint

Adapting to change and managing complexity and risk are nothing new

In fact, of all the challenges you face, these are perhaps the most prominent variables that deny you the control you need to securely measure, monitor, and manage your physical, virtual, and cloud computing environments.

Enabling critical business services, better and faster

We believe that providing as much control as possible to IT organizations is the only way to enable timelier and cost effective delivery of services. Persistent pressures like change and complexity will only continue to increase as organizations continue to change and the technologies needed to manage them become inherently more complex.

Our Philosophy

Selling intelligent solutions, not just software

In order to provide reliable control, we first make sure we understand the real-world scenarios in which IT organizations like yours operate — day in and day out. That's the only way we can develop practical, intelligent IT solutions that successfully yield proven, measurable results. And that's so much more rewarding than simply selling software.

Driving your success is our passion

We place your success at the heart of how we do business. From product inception to deployment, we understand that you need IT solutions that work well and integrate seamlessly with your existing investments; you need ongoing support and training post-deployment; and you need someone that is truly easy to work with — for a change. Ultimately, when you succeed, we all succeed.

Our Solutions

- ◆ Identity & Access Governance
- ◆ Access Management
- ◆ Security Management
- ◆ Systems & Application Management
- ◆ Workload Management
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1 Introducing AppManager for VMware vSphere

AppManager for VMware vSphere provides a set of Knowledge Scripts designed to give you a comprehensive view of how vSphere performs in your environment. This module monitors resources through vCenter to ensure that the most basic components of your vSphere environment function correctly.

You can use AppManager for VMware vSphere to monitor the following:

- ◆ Addition or removal of hosts and or virtual machines from vCenter
- ◆ Configuration changes to hosts and virtual machines in vCenter
- ◆ Virtual machine operations occurring across clusters and datacenters
- ◆ Migration of virtual machines to different hosts or a move to different datastores or resource pools
- ◆ Host and virtual machine uptime, or the amount of time since the last reboot
- ◆ Host and virtual machine CPU usage, CPU ready time, CPU wait time, and CPU used
- ◆ Host and virtual machine memory usage, memory consumed, and memory balloon
- ◆ Host and virtual machine disk reads and writes
- ◆ Host and virtual machine network data received and transmitted
- ◆ Triggered, acknowledged, and cleared alarms raised in vCenter, which you can filter by alarm name
- ◆ Events raised in vCenter, which you can filter by vCenter entity type, user name, and event description
- ◆ Task failures in vCenter, which you can filter by vCenter entity type, task name, and task user name
- ◆ Changes in the ESX or ESXi hardware, which you can monitor with the Alarms Knowledge Script
- ◆ Changes in the connection status of hosts and virtual machines to vCenter
- ◆ vCenter Server services
- ◆ vCenter CPU usage and memory usage
- ◆ Changes in the power status of virtual machines
- ◆ The number and size of all virtual machine snapshots, as well as the age of virtual machine snapshots and reverted snapshots
- ◆ The VMware Tools status of virtual machines
- ◆ Resource pool and cluster CPU usage, memory usage, memory swap used, and memory balloon
- ◆ Host disk latency, physical device latency, kernel disk latency, and queue latency

You can set thresholds to indicate the boundaries of optimal performance and configure AppManager to raise events when thresholds are exceeded.

In addition to monitoring, you can use the VirtualCenter Knowledge Scripts to collect performance data for use in reports. AppManager for VMware vSphere lets you generate reports that range in scope from minute-by-minute values to monthly values over a period of years. The reports range from evaluating a narrow window of performance data to illustrating trends to aid in capacity planning.

You can now use the `Discovery_VirtualCenter` script to create exclusion lists of hosts and virtual machines (VMs) that you do not want to display in the AppManager for VMware vSphere TreeView. You can raise an event if the discovery process does not find excluded objects. The Discovery script also now lets you discover and monitor virtual appliances, or vApps.

2 Installing AppManager for VMware vSphere

This chapter provides installation instructions and describes system requirements for AppManager for VMware vSphere.

This chapter assumes you have AppManager installed. For more information about installing AppManager or about AppManager system requirements, see the *Installation Guide for AppManager*, which is available on the [AppManager Documentation](#) page.

2.1 System Requirements

For the latest information about supported software versions and the availability of module updates, visit the [AppManager Supported Products](#) page. Unless noted otherwise, this module supports all updates, hotfixes, and service packs for the releases listed below.

AppManager for VMware vSphere has the following system requirements:

Software/Hardware	Version
NetIQ AppManager installed on the AppManager repository (QDB) computers, on the vCenter servers you want to monitor (AppManager agents), and on all console computer	<p>AppManager 8.0 Service Pack 2 (8.0.2), 8.0.3, 8.2, 9.1, 9.2, 9.5, or later, or AppManager 7.0.4.</p> <p>The following hotfixes are required for AppManager 8.0 Service Pack 2 or later:</p> <ul style="list-style-type: none">◆ AppManager Control Center hotfix 7010374 or later, which includes Delta Discovery updates that improve the functionality of the VirtualCenter_Inventory Knowledge Script.◆ AppManager Operator Console hotfix 7007055 or later, which includes Delta Discovery updates that improve the functionality of the VirtualCenter_Inventory Knowledge Script.◆ AppManager Repository (QDB) hotfix 7010373 or later, which improves data collection performance and reliability related to large-scale environment support in all Knowledge Scripts for this module, and enables the Host and Datastore Knowledge Scripts to monitor more objects in a job.◆ AppManager Windows Agent hotfix 7010515 or later, which includes Delta Discovery updates that improve the functionality of the VirtualCenter_Inventory Knowledge Script. <p>The following hotfixes are required for AppManager 7.0.4:</p> <ul style="list-style-type: none">◆ AppManager Repository (QDB) hotfix 7010372 or later, which improves data collection performance and reliability related to large-scale environment support in all Knowledge Scripts for this module.◆ AppManager Management Server hotfix 7005108 or later. <p>The following hotfixes might be required for AppManager 7.0.4, depending on your environment:</p> <ul style="list-style-type: none">◆ If you are monitoring more than 100 hosts or more than 100 datastores with monitoring policies, an AppManager Control Center hotfix and an Operator Console hotfix are required. Contact NetIQ Technical Support to download these hotfixes.◆ If you need to support computers running Windows Server 2008, AppManager Windows Agent hotfix 71704 or later is required. <p>Important You must install all hotfixes before installing this release of the module. For more information about hotfixes, see the AppManager Suite Hotfixes page, or contact NetIQ Technical Support.</p>

Software/Hardware	Version
Microsoft Windows operating system on the agent or proxy agent computer	One of the following: <ul style="list-style-type: none"> ◆ Windows Server 2019 ◆ Windows Server 2016 ◆ Windows Server 2012 ◆ Windows Server 2008 R2 ◆ Windows Server 2008 (32-bit or 64-bit) ◆ Windows Server 2003 R2 (32-bit or 64-bit)
AppManager for Microsoft Windows module installed on repository, agent, and console computers	8.0.80.0 or later. For more information, see the AppManager Module Upgrades & Trials page.
Microsoft .NET Framework on the agent or proxy agent computer	4.5 or later
VMware vSphere and vCenter	VMware vSphere 6.7, 6.5, 6.0, 5.5, 5.1, or 5.0
vCenter Server Appliance (vCSA)	6.7 (proxy discovery support)
Microsoft SQL Server Native Client 11.0 (for TLS 1.2 support)	11.3.6538.0 or later NOTE: The SQL Server Native client can be installed from this Microsoft download link .

NOTE: If you want TLS 1.2 support and are running AppManager 9.1 or 9.2, then you are required to perform some additional steps. To know about the steps, see the [article](#).

2.2 Scalability Considerations

Consider the following recommendations before deploying AppManager for VMware vSphere:

- ◆ When running AppManager for VMware vSphere on AppManager 8 or higher, use the Delta Discovery feature in Control Center to run discovery on a schedule to more quickly detect changes in your vCenter environment. NetIQ Corporation recommends that you do not run the Discovery_VirtualCenter script more than once an hour.
- ◆ Use an AppManager agent computer that meets the following minimum requirements:
 - ◆ Dual Core/Dual vCPU 2.4 GHz (or higher)
 - ◆ 2 GB RAM, in addition to the RAM needed for vCenter if the agent is installed on the vCenter server
- ◆ If you are monitoring over 100 virtual machines or more than 50 hosts, install one of the following hotfixes to enable the module to collect a higher volume of data more reliably:
 - ◆ AppManager QDB hotfix 7010373 for AppManager 8.0 Service Pack 2
 - ◆ AppManager QDB hotfix 7010372 for AppManager 7.x

For more information about hotfixes, see the [AppManager Suite Hotfixes](#) page.

In addition to installing one of the above hotfixes, you should also update the PIOC (persistent IOC) file setting on the management server and update the mapqueue setting on the agent.

To update the PIOC file setting on the management server:

1. Navigate to the following location in the Registry Editor for the management server:
On 32-bit machine:
HKEY_LOCAL_MACHINE\SOFTWARE\NetIQ\AppManager\4.0\NetIQms\Config.
On 64-bit machine:
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\NetIQ\AppManager\4.0\NetIQms\Config.
2. Set the PIOC Data Map File Size MB key to 150 MB and restart the management server.

To update the mapqueue setting on the agent:

1. Navigate to the following location in the Registry Editor for the agent:
On 32-bit machine:
HKEY_LOCAL_MACHINE\SOFTWARE\NetIQ\AppManager\4.0\AgtShared.
On 64-bit machine:
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\NetIQ\AppManager\4.0\AgtShared.
 2. Set the DataCacheQueSize key to 500000 hexadecimal value and restart the NetIQmc service and the NetIQccm service.
- ◆ This module might create a high number of events and data points for large virtual environments. If you monitor more than 100 virtual machines with multiple Knowledge Scripts, the number of data points and events might cause delays in other AppManager components. Specifically, the SQL server process on the QDB and the Operator Console process can consume high amounts of CPU until all information is inserted into the QDB and displayed in the Operator Console. Once the information is processed, CPU consumption will go down.
 - ◆ Follow these Knowledge Script suggestions:
 - ◆ Use Knowledge Script Groups (KSGs) to define collections of Knowledge Scripts you want to use to monitor the environment. For more information, see [Section 4.38, "Recommended Knowledge Script Groups,"](#) on page 135.
 - ◆ Run the KSG before running individual Knowledge Scripts.
 - ◆ Do not discover virtual machine details.
 - ◆ Use monitoring policies to allow the monitoring jobs to be automatically updated when changes in the environment, such as a new virtual machine, are discovered.

NOTE: A monitoring policy is applied on the agent and runs an AppManager job for each Knowledge Script in the KSG. A monitoring policy may apply to many objects, and in the largest environments may not work for configuring AppManager. For assistance with configuring Knowledge Scripts and Knowledge Script Groups in a large environment, contact [NetIQ Technical Support](#).

- ◆ When running ad hoc jobs, organize the environment to allow a subset of objects, such as virtual machines in a resource pool, to be monitored with a single job. For example, run the ESX or ESXi host monitoring Knowledge Scripts on the cluster instead of running them individually on each ESX or ESXi host.
- ◆ Ad hoc jobs do not automatically update when changes in the environment, such as a new virtual machine, are discovered. You must manually update a job to reflect changes to the environment.
- ◆ Stagger the start time of jobs, especially jobs that monitor virtual machines, so they do not all start at the same time. Do this by specifying a daily schedule with a frequency of X minutes with a different start time for each job. For example, to monitor every 5 minutes,

specify a daily schedule with a frequency of 5 minutes starting at 12:00:00 for the first job, 12:01:00 for the second job, and so on. Do not specify a schedule of *regular intervals every 5 minutes*.

- ◆ Under vCenter Management Server Configuration, in the Select Statistics Collection Settings dialog box, set the Statistics Level to 2, which is required for latency metrics. Higher settings increase the number of metrics returned and will slow the performance of monitoring jobs.
- ◆ Consider the following when collecting data and raising events:
 - ◆ Schedule jobs that monitor virtual machines to start during off-peak hours, such as in the evening or on the weekend.
 - ◆ Avoid frequent stops and restarts of virtual machine jobs, for example automatically restarting monitoring policies.
 - ◆ The Knowledge Scripts for virtual machines ([VmCPUUsage](#), [VmDiskIO](#), [VmMemoryUsage](#), and [VmNetworkIO](#)) perform complex queries of vCenter the first time they run (the first iteration of the job). The information from these queries is stored and used by the job on all subsequent iterations. Therefore, the first iteration may take a long time to execute, depending on how many virtual machines you have. You may experience temporary delays for data and event collection.
 - ◆ The AppManager for VMware vSphere module can collect a large amount of data and can raise many events, depending on the number of virtual machines you are monitoring. Contact Technical Support for assistance in setting up your AppManager management server cache files.

2.3 Preinstallation Considerations

As a part of installing AppManager for VMware vSphere, you install an agent with the module. You can install the module in one of the following locations:

- ◆ On the vCenter server
- ◆ On a Windows computer that serves as a proxy agent computer

A proxy agent remotely monitors the vCenter Server. Using a proxy agent computer can help avoid any possible performance issues the agent might cause if installed on the vCenter Server.

NOTE: If you have been monitoring a particular vCenter server with a proxy agent computer, and want to change to a different vCenter server, first delete the original vCenter server from the TreeView. If you try to run a Knowledge Script on both objects, errors will occur.

If your AppManager agent is monitoring vCenter remotely (in proxy mode) and you run the `VirtualCenter_Alarms`, `VirtualCenter_Events`, or `VirtualCenter_Tasks` Knowledge Scripts, any other VMware Knowledge Script jobs that try to connect to vCenter will get delayed for long periods of time. For example, the `VirtualCenter_HostCPUUsage` Knowledge Script will take a long time to query CPU performance metrics if the Alarms, Events, or Tasks scripts are running and the AppManager agent is in proxy mode. To avoid long delays when running other VMware Knowledge Scripts, you should only run the Alarms, Events, or Tasks scripts if your AppManager agent is running on the vCenter server, and not in proxy mode.

If you want to run the Alarms, Events, or Tasks scripts in proxy mode, configure the .NET machine configuration file, `machine.config`, to avoid the delays described above. You can find the `machine.config` file in the `%runtime install path%\config` directory on the proxy agent computer.

To configure the .NET machine configuration file on a proxy agent computer:

- 1 Add the following lines of code to the `machine.config` XML file:

```
<configuration>
  <system.net>
    <connectionManagement>
      <add address = "*" maxconnection = "X" />
    </connectionManagement>
  </system.net>
</configuration>
```

Where *X* is the largest number of concurrent jobs you will ever need to run on the proxy agent.

- 2 If the `<connectionManagement>` tag is already present, ensure the `<add address` line is added to the XML file.
- 3 Save and close the `machine.config` file.

NOTE: The changes you made might not take effect immediately, but you can reboot the proxy agent computer to speed up this process.

2.4 Installing the Module

Run the module installer on the vCenter servers you want to monitor (agents) to install the agent components, and run the module installer on all console computers to install the Help and console extensions.

Access the `AM70-VMWare-8.x.x.0.msi` module installer from the `AM70_VMWare_8.x.x.0` self-extracting installation package on the [AppManager Module Upgrades & Trials](#) page.

For Windows environments where User Account Control (UAC) is enabled, install the module using an account with administrative privileges. Use one of the following methods:

- ♦ Log in to the server using the account named Administrator. Then, run the module installer `VirtualCenter.msi` file from a command prompt or by double-clicking it.
- ♦ Log in to the server as a user with administrative privileges and run the module installer `VirtualCenter.msi` file as an administrator from a command prompt. To open a command-prompt window at the administrative level, right-click a command-prompt icon or a Windows menu item and select **Run as administrator**.

You can install the Knowledge Scripts and the Analysis Center reports into local or remote AppManager repositories (QDBs). The module installer installs Knowledge Scripts for each module directly into the QDB instead of installing the scripts in the `\AppManager\qdb\kp` folder as in previous releases of AppManager.

2.4.1 Manually Installing the Module

You can install the module manually, or you can use Control Center to deploy the module on a remote computer where an agent is installed. For more information, see [Section 2.5, "Deploying the Module with Control Center," on page 18](#). However, if you do use Control Center to deploy the module, Control Center only installs the *agent* components of the module. The module installer installs the QDB and console components as well as the agent components on the agent computer.

NOTE: If you are upgrading from version 8.0 of this module, you will need to perform the installation steps in a specific order to make sure the Knowledge Scripts get updated correctly. For more information, see [Section 2.4.2, “Upgrading from Version 8.0 of the Module,” on page 17.](#)

To install the module manually:

- 1 Double-click the module installer `.msi` file.
- 2 Accept the license agreement.
- 3 Review the results of the pre-installation check. You can expect one of the following three scenarios:
 - ♦ **No AppManager agent is present:** In this scenario, the pre-installation check fails, and the installer does not install agent components.
 - ♦ **An AppManager agent is present, but some other prerequisite fails:** In this scenario, the default is to not install agent components because of one or more missing prerequisites. However, you can override the default by selecting **Install agent component locally**. A missing application server for this particular module often causes this scenario. For example, installing the AppManager for Microsoft SharePoint module requires the presence of a Microsoft SharePoint server on the selected computer.
 - ♦ **All prerequisites are met:** In this scenario, the installer installs the agent components.
- 4 To install the Knowledge Scripts into the QDB and to install the Analysis Center reports into the Analysis Center Configuration Database:
 - 4a Select **Install Knowledge Scripts** to install the repository components, including the Knowledge Scripts, object types, and SQL stored procedures.
 - 4b Select **Install report package** to install the Analysis Center reports.
 - 4c Specify the SQL Server name of the server hosting the QDB, as well as the case-sensitive QDB name.
 - 4d Specify the SQL Server name of the server hosting the Analysis Center Configuration Database.
- 5 Install this module to all QDBs, and for Control Center environments, install the module to the primary QDB last.
- 6 Run the module installer on all console computers to install the Help and console extensions.
- 7 Run the module installer on the VMware vSphere computers you want to monitor (agents) to install the agent components.
- 8 Configure VMware vCenter credentials in AppManager Security Manager. For more information, see [Section 2.7, “Configuring vCenter Connection Credentials,” on page 19.](#)
- 9 If you have not discovered VMware vSphere resources, run the `Discovery_VirtualCenter` Knowledge Script on all agent computers where you installed the module. For more information, see [Section 2.8, “Discovering VMware vSphere Resources,” on page 21.](#)
- 10 To get the updates provided in this release, upgrade any running Knowledge Script jobs. For more information, see [Section 2.10, “Upgrading Knowledge Script Jobs,” on page 25.](#)

2.4.2 Upgrading from Version 8.0 of the Module

If you are upgrading from the previous release, version 8.0, you need to perform additional steps to make sure the Knowledge Scripts get updated correctly for version 8.1 of the module.

To upgrade from version 8.0 when the QDB and the agent are on separate computers:

- 1 Manually install the 8.1 module on the QDB. For more information, see [Section 2.4.1, “Manually Installing the Module,” on page 16.](#)
- 2 Propagate the Knowledge Script changes into Knowledge Script Groups, monitoring policies, and ad hoc jobs. For more information, see [Section 2.10, “Upgrading Knowledge Script Jobs,” on page 25.](#)
- 3 Manually install the 8.1 module on the agent machine.

To upgrade from version 8.0 when the QDB and the agent are on the same computer:

- 1 Stop all ad hoc and monitoring policy jobs.
- 2 Manually install the 8.1 module on the computer to install the Knowledge Scripts as well as the managed object. For more information, see [Section 2.4.1, “Manually Installing the Module,” on page 16.](#)
- 3 Propagate the Knowledge Script changes into Knowledge Script Groups, monitoring policies, and ad hoc jobs. For more information, see [Section 2.10, “Upgrading Knowledge Script Jobs,” on page 25.](#)
- 4 Start any jobs you stopped at the beginning of this procedure.

2.5 Deploying the Module with Control Center

You can use Control Center to deploy the module on a remote computer where an agent is installed. This topic briefly describes the steps involved in deploying a module and provides instructions for checking in the module installation package. For more information, see the *Control Center User Guide for AppManager*, which is available on the [AppManager Documentation](#) page.

2.5.1 Deployment Overview

This section describes the tasks required to deploy the module on an agent computer.

To deploy the module on an agent computer:

- 1 Verify the default deployment credentials.
- 2 Check in an installation package. For more information, see [Section 2.5.2, “Checking In the Installation Package,” on page 18.](#)
- 3 Configure an email address to receive notification of a deployment.
- 4 Create a deployment rule or modify an out-of-the-box deployment rule.
- 5 Approve the deployment task.
- 6 View the results.

2.5.2 Checking In the Installation Package

You must check in the installation package, `AM70-VMware-8.x.x.0.xml`, before you can deploy the module on an agent computer.

To check in a module installation package:

- 1 Log on to Control Center using an account that is a member of a user group with deployment permissions.

- 2 Navigate to the Deployment tab (for AppManager 8.x or later) or Administration tab (for AppManager 7.x).
- 3 In the Deployment folder, select **Packages**.
- 4 On the Tasks pane, click **Check in Deployment Packages** (for AppManager 8.x or later) or **Check in Packages** (for AppManager 7.x).
- 5 Navigate to the folder where you saved `AM70-VMware-8.x.x.0.xml` and select the file.
- 6 Click **Open**. The Deployment Package Check in dialog displays the status of the package check in.
- 7 To get the updates provided in this release, upgrade any running Knowledge Script jobs. For more information, see [Section 2.10, "Upgrading Knowledge Script Jobs," on page 25](#).

2.6 Silently Installing the Module

To silently (without user intervention) install a module using the default settings, run the following command from the folder in which you saved the module installer:

```
msiexec.exe /i "AM70-VMware-8.x.x.0.msi" /qn
```

where `x.x` is the actual version number of the module installer.

To create a log file that describes the operations of the module installer, add the following flag to the command noted above:

```
/L* "AM70-VMware-8.x.x.0.msi.log"
```

The log file is created in the directory in which you saved the module installer.

NOTE: To perform a silent install on an AppManager agent running Windows Server 2008 R2 or Windows Server 2012, open a command prompt at the administrative level and select **Run as administrator** before you run the silent install command listed above.

To silently install the module on a remote AppManager repository, you can use Windows authentication or SQL authentication.

Windows authentication:

```
AM70-VMware-8.x.x.0.msi /qn MO_B_QDBINSTALL=1 MO_B_SQLSVR_WINAUTH=1  
MO_SQLSVR_NAME=SQLServerName MO_QDBNAME=AM-RepositoryName
```

SQL authentication:

```
AM70-VMware-8.x.x.0.msi /qn MO_B_QDBINSTALL=1 MO_B_SQLSVR_WINAUTH=0  
MO_SQLSVR_USER=SQLLogin MO_SQLSVR_PWD=SQL LoginPassword  
MO_SQLSVR_NAME=SQLServerName MO_QDBNAME=AM-RepositoryName
```

2.7 Configuring vCenter Connection Credentials

For each VMware vCenter server that you want to monitor, configure the vCenter credentials in AppManager Security Manager before you run the Knowledge Script.

2.7.1 Configuring Account Permissions

Set the following permissions, at minimum, for the vCenter account that you configure in Security Manager:

- ◆ Read-only, the default permission to run all the Knowledge Scripts.
- ◆ Security Profile and Firewall, to run the Knowledge Scripts.
- ◆ Power On, Power Off, Suspend, and Reset, to run the Knowledge Scripts.

Use a role you define with vCenter Server to grant these permissions to the account. Use an existing role, such as a role with administrative permissions, or create a new role. For more information about roles, see the VMware vCenter documentation.

2.7.2 Adding Connection Credentials

Configuring VMware vCenter credentials provides the agent or the proxy agent with the account information needed to run Knowledge Scripts on the vCenter Server. Add these credentials to AppManager Security Manager.

On the Custom tab in Security Manager, complete the following fields:

Field	Description
Label	VirtualCenter
Sub-label	IP address or computer name of the AppManager agent computer as shown in the Operator Console
Value 1	<p>Web service HTTPS port information as follows:</p> <ul style="list-style-type: none">◆ To specify this information for a proxy agent, provide the IP address where you have installed vCenter and then the Web service HTTPS port. Use a colon (:) to separate the IP address and the port. For example, 100.99.110.9:443. You can also type the computer name where you installed vCenter instead of the IP address.◆ To specify this information for an agent installed locally on the vCenter server, type the vCenter Web service HTTPS port number. <p>Note The port you use for this value might not be the same as the port used by the Web client. If you are using vSphere 5.1 and later, look in the following location to determine which port to use:</p> <ol style="list-style-type: none">1. In the vSphere Web Client, select vCenter in the left pane.2. Under Inventory Lists, select vCenter Servers.3. Select the relevant vCenter server.4. On the Manage tab, select Settings > Advanced Settings.5. In the key named <i>VirtualCenter.VimApiUrl</i>, the port number you should use for this Security Manager entry is located after the colon (:) in the URL.
Value 2	User name for the account that has permissions to access vCenter. You can type the user name with the domain name, such as <code>Domain\User name</code> . The user specified in this field can be a local user or a domain user.
Value 3	Password for the user name identified in the Value 2 field.

Field	Description
Extended application support	Required field. Encrypts the user name and password in Security Manager.

NOTE

- ♦ Each vCenter job now checks Security Manager credentials with *every* job iteration, instead of checking on just the first iteration as in past releases of this module. As a result, if you update your vCenter Security Manager settings, you will need to start a new job on the agent monitoring vCenter to make sure your credentials get sent to the agent. Each currently running job will then pick up your updated Security Manager credentials from the agent's local repository on that job's next iteration.
 - ♦ If you use a fully qualified domain name (FQDN) to identify the agent with the VMware module installed, add the FQDN as the Value 1 field in Security Manager. If the FQDN is long, encryption might not work when that string gets encrypted. To work around this situation, use the IP address for the agent instead of the FQDN.
-

2.8 Discovering VMware vSphere Resources

Use the `Discovery_VirtualCenter Knowledge Script` to discover VMware vSphere resources. Run the script on vCenter servers and agent computers that can monitor vCenter.

To ensure that this module can support large vSphere environments, the `Discovery_VirtualCenter` script generates delta discovery events itself instead of relying on the agent to generate delta discovery events. As a result, you should not enable the **Full** discovery option found on the **Discovery** tab in Control Center for this script. If you enable full discovery, the discovery process might fail for large environments, and the script might not discover many of the objects in the TreeView.

Performing a discovery of a large VMware deployment can be a resource-intensive process that might cause performance-related events in AppManager and console unresponsiveness until discovery is completed.

You can use the parameters under *Detailed object settings* to filter the number of resource objects and resource object details that are discovered, such as CPU, memory, network, and disk details. Filtering these objects will reduce the time and resources required for performing discovery. However, limiting the number of discovered objects also limits the Knowledge Script jobs you can run. For example, if you disable the `Discover datastores?` parameter, you cannot run the `DataStoreUsage Knowledge Script`, because no datastore objects get discovered.

You can also use the `Discovery_VirtualCenter` script to create exclusion lists for hosts and virtual machines (VMs) you do not wish to display in the TreeView. Any objects you exclude will be removed from the TreeView after you run discovery.

Virtual machines will not be discovered if the `Discovery_VirtualCenter` job is running while the virtual machines are being deployed from a template.

NOTE: This module does not support the use of a pipe character ("`|`") in the name of a virtual machine, host, cluster, datastore, resource pool, or other resource object. If a pipe character is present in a resource object name, such as `Test|machine`, the VMware vSphere Knowledge Scripts will not be able to monitor that object, nor will the scripts be able to monitor a collection of virtual machines containing that resource object.

By default, this script is set to run **once**. However, if you are using the [Inventory Knowledge Script](#) to monitor changes in hosts, virtual machines, and container objects (such as clusters, folders, datacenters, resource pools, and vApps), NetIQ Corporation recommends you run the `Discovery_VirtualCenter` script **once a day** during off-peak hours. Running `Discovery_VirtualCenter` on a daily basis ensures that the module updates objects (such as datastores and datastore clusters) that are not monitored by the `Inventory` script in the `TreeView`.

Set the parameters on the `Values` tab as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Event severity if Discovery job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Discovery job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Raise event if Discovery succeeds?	Select Yes to raise an event if discovery succeeds in finding VMware vSphere resources. The default is Yes.
Event severity if Discovery succeeds	Set the event severity level, from 1 to 40, to indicate the importance of an event in which discovery succeeds in finding VMware vSphere resources. The default is 25.
Raise event if excluded objects not found?	Select Yes to raise an event if the objects you listed in the <i>Hosts to exclude</i> and the <i>Virtual machines to exclude</i> parameters were not found during the discovery process. The default is Yes.
Event severity if excluded objects not found?	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the objects you listed in the exclusion list were not found during the discovery process. The default is 15.
Raise event if Discovery fails?	Select Yes to raise an event if discovery fails to find VMware vSphere resources. The default is Yes.
Event severity if Discovery fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which discovery fails to find VMware resources. The default is 5.
Discover vCenter	
Detailed object settings	
Discover datastores?	Select Yes to discover datastore objects. Disable this parameter to reduce the number of objects that are discovered. The default is Yes. NOTE: If you disable this parameter, you cannot run the <code>VirtualCenter_DataStoreUsage</code> Knowledge Script, because no datastore objects are discovered.
Discover cluster details?	Select Yes to discover cluster details. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.

Description	How to Set It
Discover resource pool details?	Select Yes to discover resource pool details. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.
Discover hosts?	<p>Select Yes to discover hosts. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.</p> <p>NOTE: If you disable this parameter, you cannot run the following Knowledge Scripts, because no virtual machine objects are discovered:</p> <ul style="list-style-type: none"> ◆ VirtualCenter_HostConnected ◆ VirtualCenter_HostCPUUsage ◆ VirtualCenter_HostDataStoreUsage ◆ VirtualCenter_HostDiskIO ◆ VirtualCenter_HostDiskTotalLatency ◆ VirtualCenter_HostMemoryUsage ◆ VirtualCenter_HostNetworkIO ◆ VirtualCenter_HostUptime
Discover host details?	<p>Select Yes to discover host details. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.</p> <p>NOTE: If you select Yes for this parameter, but do not select Yes for the <i>Discover hosts?</i> parameter, AppManager will raise an error event stating that detailed object settings are mismatched.</p>
Hosts to exclude (comma-separated)	<p>List any hosts you do not wish to display in the AppManager for VMware vSphere TreeView. The asterisk (*) and (?) are acceptable wildcards. Separate multiple names with a comma, without any spaces.</p> <p>Creating an exclusion list like this can prove useful if you have two hosts co-located underneath a single vCenter server. A single VMware module discovery will discover <i>both</i> hosts, and this module will monitor them together as one environment. As a result, you cannot use monitoring policies on just one of the hosts unless you list the host or hosts you want to exclude.</p>
Full path to file containing list of hosts to exclude	Provide the path to a location on the agent computer or the UNC path that contains the file with the list of hosts you want to exclude.
Discover vApps?	Select Yes to discover pre-built software solutions called virtual appliances, or vApps. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.
Discover vApp details?	<p>Select Yes to discover vApp details. Disable this parameter to reduce the number of resource object details that are discovered. The default is Yes.</p> <p>Note If you select Yes for this parameter, but do not select Yes for the <i>Discover vApps?</i> parameter, AppManager will raise an error event stating that detailed object settings are mismatched.</p>

Description	How to Set It
Discover virtual machines?	<p>Select Yes to discover virtual machine objects. Disable this parameter to reduce the number of objects that are discovered. The default is Yes.</p> <p>NOTE: If you disable this parameter, you cannot run the following Knowledge Scripts, because no virtual machine objects are discovered:</p> <ul style="list-style-type: none"> ◆ VirtualCenter_VmConnected ◆ VirtualCenter_VmCPUUsage ◆ VirtualCenter_VmDiskIO ◆ VirtualCenter_VmDiskUsage ◆ VirtualCenter_VmMemoryUsage ◆ VirtualCenter_VmNetworkIO ◆ VirtualCenter_VmPowerStatus ◆ VirtualCenter_VmToolsStatus ◆ VirtualCenter_VmUptime
Discover virtual machine details?	<p>Select Yes to discover virtual machine details. Disable this parameter to reduce the number of resource object details that are discovered. The default is unselected.</p> <p>Note If you select Yes for this parameter, but do not select Yes for the <i>Discover virtual machines?</i> parameter, AppManager will raise an error event stating that detailed object settings are mismatched.</p>
Discover virtual machine templates?	<p>Select Yes to discover virtual machine templates and add them to the TreeView. NetIQ Corporation recommends that you leave this option unselected, because virtual machine templates do not contain any performance metrics. As a result, the discovered templates will always return zero values, which will prevent accurate reporting.</p> <p>NOTE: To discover virtual machine templates, you must also select Yes for the <i>Discover virtual machines?</i> parameter.</p>
Virtual machines to exclude (comma separated)	<p>List any virtual machines you do not wish to display in the AppManager for VMware vSphere TreeView. The asterisk (*) and (?) are acceptable wildcards. Separate multiple names with a comma, without any spaces.</p> <p>Creating an exclusion list like this can prove useful if you have two virtual machines co-located underneath a single vCenter server. A single VMware module discovery will discover <i>both</i> entities, and this module will monitor them together as one environment. As a result, you cannot use monitoring policies on just one of the virtual machines unless you list the virtual machine or machines you want to exclude.</p>
Full path to file containing list of virtual machines to exclude	<p>Provide the path to a location on the agent computer or the UNC path that contains the file with the list of virtual machines you want to exclude.</p>

2.9 Discovering VMware vCenter Server Appliance (vCSA)

VMware vCenter Server Appliance works in a Linux based environment, which requires you to comply with the following prerequisites:

- ◆ Install AppManager for VMware on Windows environment.
- ◆ Ensure your Windows environment is in the same network of vCSA and is accessible.
- ◆ Use a browser to access the vCSA and vCenter web URL. The vCSA and vCenter web URLs are - `https://<VCSA:servername>:5480/` and `https://<VCSA:servername>:443/` respectively. The vCSA server could be either a host name or an IP address.

For rest other discovery-related information, see [Section 2.8, “Discovering VMware vSphere Resources,” on page 21](#).

2.10 Upgrading Knowledge Script Jobs

If you are using AppManager 8.x or later, the module upgrade process now *retains* any changes you might have made to the parameter settings for the Knowledge Scripts in the previous version of this module. Before AppManager 8.x, the module upgrade process *overwrote* any settings you might have made, changing the settings back to the module defaults.

As a result, if this module includes any changes to the default values for any Knowledge Script parameter, the module upgrade process ignores those changes and retains all parameter values that you updated. Unless you review the management guide or the online Help for that Knowledge Script, you will not know about any changes to default parameter values that came with this release.

You can push the changes for updated scripts to running Knowledge Script jobs in one of the following ways:

- ◆ Use the AMAdmin_UpgradeJobs Knowledge Script.
- ◆ Use the Properties Propagation feature.

2.10.1 Running AMAdmin_UpgradeJobs

The AMAdmin_UpgradeJobs Knowledge Script can push changes to running Knowledge Script jobs. Your AppManager repository (QDB) must be at version 7.0 or later. Upgrading jobs to use the most recent script version allows the jobs to take advantage of the latest script logic while maintaining existing parameter values for the job.

For more information, see the **Help** for the AMAdmin_UpgradeJobs Knowledge Script.

2.10.2 Propagating Knowledge Script Changes

You can propagate script changes to jobs that are running and to Knowledge Script Groups, including recommended Knowledge Script Groups and renamed Knowledge Scripts.

Before propagating script changes, verify that the script parameters are set to your specifications. You might need to appropriately set new parameters for your environment or application.

If you are not using AppManager 8.x or later, customized script parameters might have reverted to default parameters during the installation of the module.

You can choose to propagate only properties (specified in the Schedule and Values tabs), only the script (which is the logic of the Knowledge Script), or both. Unless you know specifically that changes affect only the script logic, you should propagate both properties and the script.

For more information about propagating Knowledge Script changes, see the “Running Monitoring Jobs” chapter of the *Operator Console User Guide for AppManager*.

2.10.3 Propagating Changes to Ad Hoc Jobs or Knowledge Script Groups

You can propagate the properties and the logic (script) of a Knowledge Script to ad hoc jobs started by that Knowledge Script. Corresponding jobs are stopped and restarted with the Knowledge Script changes.

You can also propagate the properties and logic of a Knowledge Script to corresponding Knowledge Script Group members. After you propagate script changes to Knowledge Script Group members, you can propagate the updated Knowledge Script Group members to associated running jobs. Any monitoring jobs started by a Knowledge Script Group member are restarted with the job properties of the Knowledge Script Group member.

To propagate changes to ad hoc Knowledge Script jobs or Knowledge Script Groups:

- 1 In the Knowledge Script view, select the Knowledge Script or Knowledge Script Group for which you want to propagate changes.
- 2 Right-click the script or group and select **Properties propagation > Ad Hoc Jobs**.
- 3 Select the components of the Knowledge Script that you want to propagate to associated ad hoc jobs or groups and click **OK**:

Select	To propagate
Script	The logic of the Knowledge Script.
Properties	Values from the Knowledge Script Schedule and Values tabs, such as schedule, monitoring values, actions, and advanced options. If you are using AppManager 8.x or later, the module upgrade process now <i>retains</i> any changes you might have made to the parameter settings for the Knowledge Scripts in the previous version of this module.

3 Reporting with Analysis Center

NetIQ Analysis Center imports raw data from multiple AppManager repositories, transforms that data into useful information about the computing infrastructure that supports your business, and publishes that information as reports.

Analysis Center ships with operational and service-level reports designed specifically for VMware. With these reports, you can capture and distribute vital information, such as CPU, memory, and datastore usage, as well as network I/O over time.

To change the default values of reports, use the **Parameters** section of the Properties tab in the Report Properties pane. Use the Context tab to filter the data. For example, to display the results for specific hosts, use the **Group** menu in the Context tab to report on the hosts you select.

3.1 System Requirements for Analysis Center Reports

VMware vCenter Supplemental Reports for Analysis Center has the following system requirements:

- ♦ Analysis Center version 3.2 or later
- ♦ AppManager for VMware vSphere version 7.8 or later

3.2 Installing the Report Package

You can install the Analysis Center reports for this module to either local or remote databases. You need to install the reports only once per database.

To install the report package:

- 1 Launch the module installer, `AM70-VMWare-8.x.x.0.msi`.
- 2 From the Knowledge Script and Report Package Installation Options page of the installation wizard, select **Install report package**.
- 3 In the SQL Server name\instance field, specify the SQL Server name of the server hosting the Analysis Center Configuration Database.
- 4 In the Analysis Center configuration database name field, type the name of the configuration database and click **Next**.
- 5 Select either Windows or SQL Server authentication and click **Next**.
- 6 When the installer finishes, launch the Analysis Center console.

3.3 Reviewing VMware vCenter Supplemental Reports

The report package contains `.xml` files to update Analysis Center with new report templates. You can use these templates to create reports. The report templates consist of the five categories of reports: Dashboards, Hosts, vCenter (formerly known as Virtual Center), VMs, and Virtualization Candidates.

Access the Dashboard reports from the Analysis Center Console Enterprise pane in the **Reports** menu. Select **AppManager**, click **Dashboards**, and expand the **vCenter** folder.

Access the Hosts, vCenter, and VMs reports from the Analysis Center Console Enterprise pane in the **Reports** menu. Select **AppManager**, click **Application Specific**, and expand the **vCenter** folder.

NOTE: You can migrate any older reports saved in the Virtual Center folder to the vCenter folder and delete the Virtual Center folder, if you want.

Access Datastore reports from the Analysis Center Console Enterprise pane in the **Reports** menu. Select **AppManager**, click **Application Specific**, then click **vCenter**, and expand the **Datastores** folder.

Access the Virtualization Candidates reports from the Enterprise pane in the Reports menu. Select **AppManager** and expand the **Virtualization Candidates** folder.

NOTE: You can migrate any older reports saved in the Virtualization Candidates folder within the AppManager Templates folder to the Virtualization Candidates folder within the AppManager folder and delete the empty folder, if you want.

For more information about generating reports in Analysis Center, see the *User Guide for Analysis Center*.

3.3.1 Dashboard Reports

The vCenter folder under Dashboards includes six *dashboards*, which are each a single view of multiple reports that have already been run. Each report in a dashboard is displayed as a full row of charts.

The dashboards and the reports they include are listed as follows:

- ◆ Datastore Top-Bottom Datastore Usage Dashboard
 - ◆ [Top N Datastores by Datastore Free Space](#)
 - ◆ [Top N Datastores by Datastore Utilization](#)
- ◆ Datastore Usage Dashboard
 - ◆ [Average Datastore Free Space by Datastore Over Time](#)
 - ◆ [Average Datastore Utilization by Datastore Over Time](#)
 - ◆ [Datastore Usage Overview](#)
- ◆ Host Performance Dashboard
 - ◆ [Average CPU Utilization by Host Over Time](#)
 - ◆ [Average Disk IO by Host Over Time](#)
 - ◆ [Average Memory Utilization by Host Over Time](#)
 - ◆ [Average Network IO by Host Over Time](#)
- ◆ Host Total Overview Dashboard
 - ◆ [Host Datastore Latency Performance Overview](#)
 - ◆ [Host Datastore Disk Operation Performance Overview](#)
 - ◆ [Host Datastore Free Space Overview](#)
 - ◆ [Host Datastore Utilization Overview](#)
 - ◆ [Host Performance Overview](#)

- ◆ Host Storage Performance Dashboard
 - ◆ [Average Datastore Latency by Host Over Time](#)
 - ◆ [Average Disk Operation by Host Over Time](#)
 - ◆ [Average Disk IO by Host Over Time](#)
- ◆ VM Performance Dashboard
 - ◆ [Average CPU Utilization by VM Over Time](#)
 - ◆ [Average Disk IO by VM Over Time](#)
 - ◆ [Average Logical Disk Usage by VM Over Time](#)
 - ◆ [Average Memory Utilization by VM Over Time](#)
 - ◆ [Average Network IO by VM Over Time](#)

Datastore Reports

The Datastore report folder provides the following types of reports:

- ◆ Average Datastore over time
- ◆ Bottom N Datastores by Datastore free space and utilization
- ◆ Top N Datastores by Datastore free space and utilization

This category includes the following reports:

Report	Description
Average Datastore Free Space by Datastore Over Time	This report lists Datastore free space for the Datastores you select over a specified period. The VirtualCenter_DatastoreUsage Knowledge Script collects the amount of free space in GB or MB for any given Datastore.
Average Datastore Utilization by Datastore Over Time	This report lists the percentage of Datastore utilization for the Datastores you select over a specified period. The VirtualCenter_DatastoreUsage Knowledge Script collects the percentage of Datastore utilization for any given Datastore.
Bottom N Datastores by Datastore Free Space	This report lists the specified number of Datastores with the least amount of free space for the Datastore. The VirtualCenter_DatastoreUsage Knowledge Script collects the amount of free space in GB or MB for any given Datastore.
Bottom N Datastores by Datastore Utilization	This report lists the specified number of Datastores with the lowest percentage of utilization for the Datastore. The VirtualCenter_DatastoreUsage Knowledge Script collects the percentage of Datastore that is being used for any given Datastore.
Datastore Usage Overview	This report lists the Datastore free space and datastore utilization for all Datastores.
Top N Datastores by Datastore Free Space	This report lists the specified number of Datastores with the highest amount of free space for the Datastore. The VirtualCenter_DatastoreUsage Knowledge Script collects the amount of free space that is in use in GB or MB for any given Datastore.
Top N Datastores by Datastore Utilization	This report lists the specified number of Datastores with the highest percentage of utilization for the Datastore. The VirtualCenter_DatastoreUsage Knowledge Script collects the percentage of Datastore that is being used for any given Datastore.

Host Reports

The Hosts report folder provides the following types of reports:

- ◆ Bottom N reports for all hosts
- ◆ Top N reports for all hosts
- ◆ Performance reports examining and comparing the average performance data that is CPU utilization over time
- ◆ Comparison reports to compare AppManager data over different periods and over different hosts (ESX or ESXi Servers)
- ◆ Host performance overview reports

This category includes the following reports:

Report	Description
Average CPU Utilization by Host Over Time	This report lists the average host CPU utilization for the hosts you select over a specified period. The VirtualCenter_HostCPUUsage Knowledge Script collects data about CPU usage for any given host.
Average Datastore by Host Over Time	This report lists the average Datastore utilization and/or free space for the hosts you select over a specified period. The VirtualCenter_HostDataStoreUsage Knowledge Script collects data about Datastore utilization and free space for any given host.
Average Datastore Latency by Host Over Time	This report lists the average disk command latency, disk read latency, or disk write latency for the hosts you select over a specified period. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects data about disk command latency, disk read latency, and disk write latency for any given host.
Average Disk Operation by Host Over Time	This report lists the average disk commands, disk command aborts, or disk bus resets for the hosts you select over a specified period. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects data about disk commands, disk command aborts, or disk bus resets for any given host.
Average Disk IO by Host Over Time	This report lists the average disk I/O for the hosts you select over a specified period. The VirtualCenter_HostDiskIO Knowledge Script collects data about disk read and writes for any given host.
Average Memory Utilization by Host Over Time	This report lists the average memory active, memory balloon, memory granted, memory overhead, memory reserved capacity, memory shared, memory shared common, memory state, memory swap in, memory swap in rate, memory swap out, memory swap out rate, memory swap used, memory unreserved, memory utilization, memory usage by vmkernel and memory zero for the hosts you select and the period you specify. The VirtualCenter_HostMemoryUsage Knowledge Script collects data for performance metrics for any given host.
Average Network IO by Host Over Time	This report lists the average network I/O for the hosts you select over a specified period. The VirtualCenter_HostNetworkIO Knowledge Script collects data about network data received and transmitted for any given host.

Report	Description
Bottom N Hosts by Datastore Free Space	This report lists the specified number of hosts with the least the amount of Datastore free space available. The VirtualCenter_HostDataStoreUsage Knowledge Script collects Host Datastore Free Space data for any given host in MB. By default, the Bottom N Hosts by Datastore Free Space report uses this data stream. The smaller the amount of Datastore free space available, the fewer the virtual machines and snapshots that the host supports. A host that runs out of free space causes instability of the host and the virtual machines that the host supports.
Bottom N Hosts by Datastore Used	This report lists the specified number of hosts with the lowest percentage of Datastore used. The VirtualCenter_HostDataStoreUsage Knowledge Script collects Host Percent Datastore data for any given host. By default, the Bottom N Hosts by Datastore Used report uses this data stream. The higher the percentage of free space used, the fewer the virtual machines and snapshots that the host can support. A host that runs out of free space causes instability of the host and the virtual machines that the host supports.
Bottom N Hosts by Datastore Latency	This report lists the specified number of hosts with the lowest values for Datastore latency based on the metric selected. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects disk command latency, disk read latency, and disk write latency data in milliseconds for any given host.
Bottom N Hosts by Disk Operation	This report lists the specified number of hosts with the lowest values based on the disk operation metric selected. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects data about disk commands, disk commands aborted, and bus resets for any given host.
Bottom N Hosts by Disk Reads	This report lists the specified number of hosts with the lowest number of disk reads in MB per second. The VirtualCenter_HostDiskIO Knowledge Script collects Host Disk Read for any given host. By default, the Bottom N Hosts by Disk Reads report uses this data stream. A host with a high disk I/O disk reads, relative to the I/O of the disk subsystem indicates that the host is disk bound. This reduces the overall performance of the host and the virtual machines that the host supports.
Bottom N Hosts by Disk Writes	This report lists the specified number of hosts with the lowest number of disk writes in MB per second. The VirtualCenter_HostDiskIO Knowledge Script collects Host Disk Write data for any given host. By default, the Bottom N Hosts by Disk Writes report uses this data stream. A host with a high disk I/O disk writes relative to the I/O of the disk subsystem indicates that the host is disk bound. This reduces the overall performance of the host and the virtual machines that the host supports.
Bottom N Hosts by Memory Utilization	This report lists the specified number of hosts with the lowest percentage of memory utilization. The VirtualCenter_HostMemoryUsage Knowledge Script collects the Host Memory Usage data for any given host. By default, the Bottom N Hosts by Memory Utilization report uses this data stream. A host with a high memory utilization indicates that there are too many virtual machines on the host and that memory is overcommitted. This reduces the overall performance of the host and the virtual machines that the host supports.

Report	Description
Bottom N Hosts by Network Reads	<p>This report lists the specified number of hosts with the lowest number of network data received in Mbits per second. The VirtualCenter_HostNetworkIO Knowledge Script collects Host Network Read data for any given host. By default, the Bottom N Hosts by Network Reads report uses this data stream. A host with high I/O network data received relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates more network traffic than the host can support. This will reduce the overall network performance of the host and the virtual machines that the host supports.</p>
Bottom N Hosts by Network Writes	<p>This report lists the specified number of hosts with the lowest number of network data transmitted in Mbits per second. The VirtualCenter_HostNetworkIO Knowledge Script collects Host Network Write data for any given host. By default, the Bottom N Hosts by Network Writes report uses this data stream. A host with high I/O network data transmitted relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates more network traffic than the host can support. This will reduce the overall network performance of the host and the virtual machines that the host supports.</p>
Bottom N Hosts by Processor Utilization	<p>This report lists the specified number of hosts with the lowest average percentage of processor utilization for the host. The VirtualCenter_HostCPUUsage Knowledge Script collects Host CPU Usage data for any given host. By default, the Bottom N Hosts by Processor Utilization report uses this data stream. A host with high processor utilization indicates that the host processors are oversubscribed. This results in poor performance and causes instability to the host and the virtual machines that the host supports.</p>
Compare Host CPU Utilization Over Time	<p>This report compares the CPU utilization of the hosts over time. The VirtualCenter_HostCPUUsage Knowledge Script collects the Collect average CPU data for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare Host Datastore Free Space Over Time	<p>This report compares the Datastore free space of the hosts over time. The VirtualCenter_HostDataStoreUsage Knowledge Script collects the Collect data for free space data for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month

Report	Description
Compare Host Datastore Utilization Over Time	<p>This report compares the Datastore utilization of the hosts over time. The VirtualCenter_HostDataStoreUsage Knowledge Script collects the Collect data for percentage used for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare Host Disk Reads Over Time	<p>This report compares the disk reads of the hosts over time. The VirtualCenter_HostDiskIO Knowledge Script collects the Collect data for disk reads for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare Host Disk Writes Over Time	<p>This report compares the disk writes of the hosts over time. The VirtualCenter_HostDataDiskIO Knowledge Script collects the Collect data for disk writes for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare Host Memory Utilization Over Time	<p>This report compares the memory active, memory balloon, memory granted, memory overhead, memory reserved capacity, memory shared, memory shared common, memory state, memory swap in, memory swap in rate, memory swap out, memory swap out rate, memory swap used, memory unreserved, memory utilization, memory usage by VM kernel, and memory zero of the hosts over time. The VirtualCenter_HostMemoryUsage Knowledge Script collects the Collect memory utilization data for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month

Report	Description
Compare Host Network Reads Over Time	<p>This report compares the network data received of the hosts over time. The VirtualCenter_HostNetworkIO Knowledge Script collects the Collect data for network data received for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare Host Network Writes Over Time	<p>This report compares the network data transmitted of the hosts over time. The VirtualCenter_HostNetworkIO Knowledge Script collects the Collect data for network data transmitted for any given host. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Host Datastore Disk Operation Performance Overview	<p>This report lists the disk commands, disk commands aborted, and disk bus resets for a host. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects host disk latency performance metrics for any given host.</p>
Host Datastore Free Space Overview	<p>This report lists the datastore free space for a host. The VirtualCenter_HostDataStoreUsage Knowledge Script collects data about Datastore free space for any given host.</p>
Host Datastore Latency Performance Overview	<p>This report lists the disk command latency, disk read latency, and disk write latency for a host. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects host disk latency performance metrics for any given host.</p>
Host Datastore Utilization Overview	<p>This report lists the datastore utilization for a host. The VirtualCenter_HostDataStoreUsage Knowledge Script collects data about percentage of Datastore used and Datastore free space in MB for any given host.</p>
Host Performance Overview	<p>This report lists the following metrics for a host: processor utilization (overall), memory utilization, disk reads, disk writes, network data received, and network data transmitted. The VirtualCenter_HostCPUUsage, VirtualCenter_HostMemoryUsage, VirtualCenter_HostDiskIO, and VirtualCenter_HostNetworkIO Knowledge Scripts collect performance metrics for any given host.</p>
Top N Hosts by Datastore Free Space	<p>This report lists the specified number of hosts with the highest amount of Datastore free space available. The VirtualCenter_HostDataStoreUsage Knowledge Script collects Host Datastore free space data in MB for any given host. By default, the Top N Hosts by Datastore Free Space report uses this data stream. The smaller the amount of Datastore free space available, the fewer the virtual machines and snapshots that the host supports. A host that runs out of free space causes instability of the host and the virtual machines that the host supports.</p>
Top N Hosts by Datastore Latency	<p>This report lists the specified number of hosts with the highest values for the Datastore latency metric selected. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects disk command latency, disk read latency, and disk write latency data in milliseconds for any given host.</p>

Report	Description
Top N Hosts by Datastore Used	This report lists the specified number of hosts with the highest percentage of Datastore used. The VirtualCenter_HostDataStoreUsage Knowledge Script collects the Host Datastore Percent Used data for any given host. By default, the Top N Hosts by Datastore Used report uses this data stream. The higher the percentage of free space used, the fewer the virtual machines and snapshots that the host can support. A host that runs out of free space causes instability of the host and the virtual machines that the host supports.
Top N Hosts by Disk Operation	This report lists the specified number of hosts with the highest values for disk operation based on the metric selected. The VirtualCenter_HostDiskTotalLatency Knowledge Script collects data about disk commands, disk commands aborted, and bus resets for any given host.
Top N Hosts by Disk Reads	This report lists the specified number of hosts with the highest number of disk reads in MB per second. The VirtualCenter_HostDiskIO Knowledge Script collects the Host Disk Reads data for any given host. By default, the Top N Hosts by Disk Reads report uses this data stream. A host with a high disk I/O disk reads relative to the I/O of the disk subsystem indicates that the host is disk bound. This reduces the overall performance of the host and the virtual machines that the host supports.
Top N Hosts by Disk Writes	This report lists the specified number of hosts with the highest number of disk writes in MB per second. The VirtualCenter_HostDiskIO Knowledge Script collects the Host Disk Writes data for any given host. By default, the Top N Hosts by Disk Writes report uses this data stream. A host with a high disk I/O disk writes relative to the I/O of the disk subsystem indicates that the host is disk bound. This reduces the overall performance of the host and the virtual machines that the host supports.
Top N Hosts by Memory Utilization	This report lists the specified number of hosts with the highest percentage of memory utilization. The VirtualCenter_HostMemoryUsage Knowledge Script collects the Host Memory Usage data for any given host. By default, the Top N Hosts by Memory Utilization report uses this data stream. A host with a high memory utilization indicates too many virtual machines on the host and that memory is overcommitted. This reduces the overall performance of the host and the virtual machines that the host supports.
Top N Hosts by Network Reads	This report lists the specified number of hosts with the highest number of network data received in Mbits per second. The VirtualCenter_HostNetworkIO Knowledge Script collects the Host Network Reads data for any given host. By default, the Top N Hosts by Network Reads report uses this data stream. A host with high I/O network data received relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates more network traffic than the host can support. This will reduce the overall network performance of the host and the virtual machines that the host supports.
Top N Hosts by Network Writes	This report lists the specified number of hosts with the highest number of network data transmitted in Mbits per second. The VirtualCenter_HostNetworkIO Knowledge Script collects the Host Network Writes data for any given host. By default, the Top N Hosts by Network Writes report uses this data stream. A host with high I/O network data transmitted relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates more network traffic than the host can support. This will reduce the overall network performance of the host and the virtual machines that the host supports.

Report	Description
Top N Hosts by Processor Utilization	This report lists the specified number of hosts with the highest average percentage of processor utilization for the host. The VirtualCenter_HostCPUUsage Knowledge Script collects the Host CPU Usage data for any given host. By default, the Bottom N Hosts by Processor Utilization report uses this data stream. A host with high processor utilization indicates that the host processors are oversubscribed. This results in poor performance and causes instability to the host and the virtual machines that the host supports.

vCenter Reports

The vCenter report folder provides the following types of reports:

- ◆ Performance reports for examining and comparing the average performance data, such as CPU utilization over time
- ◆ Comparison reports to compare AppManager data over different periods and over different vCenter servers

This category includes the following reports:

Report	Description
vCenter Average CPU Utilization Over Time	This report lists the CPU utilization of the vCenter server over a specified period. The VirtualCenter_VirtualCenterCPUUsage Knowledge Script collects data about virtual machine usage in MHz.
vCenter Average Memory Utilization Over Time	This report lists the memory utilization of the vCenter server over a specified period. The VirtualCenter_VirtualCenterMemoryUsage Knowledge Script collects data about vCenter memory utilization.
vCenter Compare CPU Utilization Over Time	This report compares the CPU utilization of the vCenter over time. The VirtualCenter_VirtualCenterCPUUsage Knowledge Script collects data about CPU usage. The report compares the following date ranges: <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
vCenter Compare Memory Over Time	This report compares the memory utilization of the vCenter over time. The VirtualCenter_VirtualCenterMemoryUsage Knowledge Script collects data about vCenter memory utilization. The report compares the following date ranges: <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month

Virtual Machine Reports

The VMs report folder provides the following types of reports:

- ◆ Performance reports for examining and comparing the average performance data that is CPU utilization over time
- ◆ Comparison reports to compare AppManager data over different periods and over different virtual machines
- ◆ Virtual machine performance overview

This category includes the following report templates:

Report	Description
Average CPU Utilization by VM Over Time	This report lists the average CPU utilization for the virtual machines over a specified period. The VirtualCenter_VmCPUUsage Knowledge Script collects data about CPU utilization in MHz for any given virtual machine.
Average Disk IO by VM Over Time	This report lists the average disk I/O for the virtual machines you select over a specified period. The VirtualCenter_VmDiskIO Knowledge Script collects data about disk reads and writes for any given virtual machine.
Average Logical Disk Usage by VM Over Time	This report lists the average logical disk usage for the virtual machines you select over a specified period. The VirtualCenter_VmDiskUsage Knowledge Script collects data about logical disk usage in percent or MB for any given virtual machine.
Average Memory Utilization by VM Over Time	This report lists the average memory active, memory balloon, memory consumed, memory granted, memory overhead, memory shared, memory state, memory swap in, memory swap in rate, memory swap out, memory swap out rate, memory utilization, memory zero for the virtual machines you select over a specified period. The VirtualCenter_VmMemoryUsage Knowledge Script collects data for memory performance metrics for any given virtual machine.
Average Network IO by VM Over Time	This report lists the average network I/O for the virtual machines you select over a specified period. The VirtualCenter_VmNetworkIO Knowledge Script collects data about network data received and writes for any given virtual machine.
Bottom N VMs by Disk Reads	This report lists the specified number of virtual machines with the lowest number of disk reads in MB per second. The VirtualCenter_VmDiskIO Knowledge Script collects the VM disk reads data for any given virtual machine. By default, the Bottom N VMs by Disk Reads report uses this data stream. A virtual machine with high I/O disk reads relative to the I/O of the disk subsystem indicates that the virtual machine is using a disproportionate amount of the host disk I/O. This will reduce the overall performance of the host and the virtual machines that the host supports.
Bottom N VMs by Disk Writes	This report lists the specified number of virtual machines with the lowest number of disk writes in MB per second. The VirtualCenter_VmDiskIO Knowledge Script collects the VM disk writes data for any given virtual machine. By default, the Bottom N VMs by Disk Writes report uses this data stream. A virtual machine with high I/O disk writes relative to the I/O of the disk subsystem indicates that the virtual machine is using a disproportionate amount of the host disk I/O. This will reduce the overall performance of the host and the virtual machines that the host supports.

Report	Description
Bottom N VMs by Memory Utilization	<p>This report lists the specified number of virtual machines with the lowest percentage of memory utilization. The VirtualCenter_VmMemoryUsage Knowledge Script collects the VM Memory Usage data for any given virtual machine. By default, the Bottom N VMs by Memory Utilization report uses this data stream. A virtual machine with high memory utilization indicates that the virtual machine does not have enough memory allocated to it, which reduces the overall performance of the virtual machine.</p>
Bottom N VMs by Network Reads	<p>This report lists the specified number of virtual machines with the lowest number of network data received in Mbits per second. The VirtualCenter_VmNetworkIO Knowledge Script collects the VM Network Reads data for any given virtual machine. By default, the Bottom N VMs by Network Reads uses this data stream. A virtual machine with high I/O network data received relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates that the virtual machine is using a disproportionate amount of the host network I/O. This reduces the overall network performance of the host and the virtual machines that the host supports.</p>
Bottom N VMs by Network Writes	<p>This report lists specified number of virtual machines with the lowest number of network data transmitted in Mbits per second. The VirtualCenter_VmNetworkIO Knowledge Script collects the VM Network Writes data for any given virtual machine. By default, the Bottom N VMs by Network Writes uses this data stream. A virtual machine with high I/O network data transmitted relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates that the VM is using a disproportionate amount of the host network I/O. This reduces the overall network performance of the host and the VMs that the host supports.</p>
Bottom N VMs by Overall Processor Utilization	<p>This report lists the specified number of virtual machines with the lowest average overall percentage of processor utilization for the virtual machine. The VirtualCenter_VmCPUUsage Knowledge Script collects the Collect average CPU data for any given virtual machine. A virtual machine with a high processor utilization indicates that the virtual machine processors are oversubscribed leading to poor performance and/or instability of the host and the virtual machines that the host supports.</p>
Bottom N VMs by Processor Utilization	<p>This report lists the specified number of virtual machines with the lowest average percentage of processor utilization for the virtual machine. The VirtualCenter_VmCPUUsage Knowledge Script collects the Collect average CPU data for any given virtual machine. A virtual machine with a high processor utilization indicates that the virtual machine processors are oversubscribed leading to poor performance and/or instability of the host and the virtual machines that the host supports.</p>
Compare VM CPU Utilization Over Time	<p>This report compares the CPU utilization of the virtual machines over time. The VirtualCenter_VmCPUUsage Knowledge Script collects the Collect average CPU data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month

Report	Description
Compare VM Disk Reads Over Time	<p>This report compares the disk reads in MB/sec of the virtual machines. The VirtualCenter_VmDiskIO Knowledge Script collects the Collect data for disk I/O data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare VM Disk Writes Over Time	<p>This report compares the disk writes in MB/sec of the virtual machines. The VirtualCenter_VmDiskIO Knowledge Script collects the Collect data for disk I/O data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare VM Memory Utilization Over Time	<p>This report compares the memory active, memory balloon, memory consumed, memory granted, memory overhead, memory shared, memory state, memory swap in, memory swap in rate, memory swap out, memory swap out rate, memory utilization, memory zero of the virtual machines over time. The VirtualCenter_VmMemoryusage Knowledge Script collects the Collect data for memory usage data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Compare VM Network Reads Over Time	<p>This report compares the network data received in Mbits/sec of the virtual machines. The VirtualCenter_VmNetworkIO Knowledge Script collects the Collect data for network data received and writes data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month

Report	Description
Compare VM Network Writes Over Time	<p>This report compares the network data transmitted in Mbits/sec of the virtual machines. The VirtualCenter_VmNetworkIO Knowledge Script collects the Collect data for network data received and writes data for any given virtual machine. The report compares the following date ranges:</p> <ul style="list-style-type: none"> ◆ Today ◆ Yesterday ◆ This month ◆ Last month
Top N VMs by Disk Reads	<p>This report lists the specified number of virtual machines with the highest number of disk reads in MB per second. The VirtualCenter_VmDiskIO Knowledge Script collects the VM Disk Reads data for any given virtual machine. By default, the Top N VMs by Disk Reads report uses this data stream. A virtual machine with high I/O disk reads relative to the I/O of the disk subsystem indicates that the virtual machine is using a disproportionate amount of the host disk I/O. This will reduce the overall performance of the host and the virtual machines that the host supports.</p>
Top N VMs by Disk Writes	<p>This report lists the specified number of virtual machines with the highest number of disk writes in MB per second. The VirtualCenter_VmDiskIO Knowledge Script collects the VM disk writes data for any given virtual machine. By default, the Top N VMs by Disk Writes report uses this data stream. A virtual machine with high I/O disk writes relative to the I/O of the disk subsystem indicates that the virtual machine is using a disproportionate amount of the host disk I/O. This will reduce the overall performance of the host and the virtual machines that the host supports.</p>
Top N VMs by Memory Utilization	<p>This report lists the specified number of virtual machines with the highest percentage of memory utilization. The VirtualCenter_VmMemoryUsage Knowledge Script collects the VM Memory Usage data for any given virtual machine. By default, the Top N VMs by Memory Utilization report uses this data stream. A virtual machine with high memory utilization indicates that the virtual machine does not have enough memory allocated to it, which reduces the overall performance of the virtual machine.</p>
Top N VMs by Network Reads	<p>This report lists the specified number of virtual machines with the highest number of network data received in Mbits per second. The VirtualCenter_VmNetworkIO Knowledge Script collects the VM Network Reads data for any given virtual machine. By default, the Top N VMs by Network Reads report uses this data stream. A virtual machine with high I/O network data received relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates that the virtual machine is using a disproportionate amount of the host network I/O. This can reduce the overall network performance of the host and the virtual machines that the host supports.</p>
Top N VMs by Network writes	<p>This report lists the specified number of virtual machines with the highest number of network data transmitted in Mbits per second. The VirtualCenter_VmNetworkIO Knowledge Script collects the VM Network Writes data for any given virtual machine. By default, the Top N VMs by Network Writes report uses this data stream. A virtual machine with high I/O network data received relative to the network throughput (for example, Gigabit Ethernet supports 1000 Mbits per second) indicates that the virtual machine is using a disproportionate amount of the host network I/O. This can reduce the overall network performance of the host and the virtual machines that the host supports.</p>

Report	Description
Top N VMs by Overall Processor Utilization	This report lists the specified number of virtual machines with the highest average overall percentage of processor utilization for the virtual machine. The VirtualCenter_VmCPUUsage Knowledge Script collects the Collect average CPU data for any given virtual machine. A virtual machine with a high processor utilization indicates that the virtual machine processors are oversubscribed leading to poor performance and/or instability of the host and the virtual machines that the host supports.
Top N VMs by Processor Utilization	This report lists the specified number of virtual machines with the highest percentage of processor utilization for the virtual machine. The VirtualCenter_VmCPUUsage Knowledge Script collects the Collect average CPU data for any given virtual machine. A virtual machine with a high processor utilization indicates that the virtual machine processors are oversubscribed leading to poor performance and/or instability of the host and the virtual machines that the host supports.
VM Performance Overview	This report lists the following metrics for any given virtual machine: processor utilization (overall), CPU ready (overall), memory utilization, memory balloon, disk reads, disk writes, network data received, network data transmitted. The VirtualCenter_VmCPUUsage, VirtualCenter_VmMemoryUsage, VirtualCenter_VmDiskIO, and VirtualCenter_VmNetworkIO Knowledge Scripts collect data for memory usage performance metrics for any given virtual machine.
VMware Tools Status	This report displays a count of the virtual machines in each of the VMware Tools status values: Tools Not Installed, Tools Not Running, Tools Old, Tools OK, Tools Not Running on Powered-off Virtual Machines, Tools Blacklisted, Tools Supported and New, Tools Too New, Tools Not Current and Not Supported", and Tools not managed. The VirtualCenter_VmToolsStatus Knowledge Script collects the current status of VMware Tools for any given virtual machine.
VMware Tools Status by VM	This report lists the status of VMware Tools for a selected group of virtual machines. The VirtualCenter_VmToolsStatus Knowledge Script collects the current status of VMware Tools for any given virtual machine.

Virtualization Candidates Reports

The Virtualization Candidates report folder provides report templates for helping you determine whether your system is a candidate for virtualization. Virtualization provides many benefits such as ease of recovery, simpler maintenance, and the ability to snapshot a virtual machine at various states and revert to a state if needed.

Each Virtualization Candidates report lets you evaluate your system against the following Key Performance Indicators (KPI):

- ◆ Host Network Reads
- ◆ Host Network Writes
- ◆ Resource pool Memory Utilization (%)
- ◆ Resource pool Memory Balloon
- ◆ Resource pool Overall Processor Utilization

Each report returns a column for each KPI and another for candidate status, which is either “Yes - a good candidate” or “No - not a good candidate.”

Before running a Virtualization Candidates report, run the AppManager Knowledge Scripts that supply the data that you will select from the Metric context in Analysis Center. The scripts in the NT category of scripts (for monitoring the Windows operating system) can supply the data you need. The following Knowledge Scripts provide data for the corresponding metrics in the Virtualization Reports:

Knowledge Script	Metric
NT_CpuLoaded	% Overall Processor Utilization
NT_NetworkBusy	% Network Utilization
NT_LogicalDiskIO	Logical Disk Reads/Second
NT_LogicalDiskIO	Logical Disk Writes/Second
NT_TopMemoryProcs	Top Processes Consuming Memory (KB)

NOTE: Knowledge Scripts from proxy-based AppManager modules, such as AppManager for Network Devices and AppManager for SNMP, do not provide data that is meaningful from a virtualization candidate perspective. Ensure you run Knowledge Scripts from agent-based modules, modules in which the AppManager agent is installed directly on the computer being monitored.

Report Name	Description
Virtualization KPI Candidate - Good	This report helps you determine whether a selected computer is a good candidate for virtualization.
Virtualization KPI Candidate - Investigate Further	This report provides more information about a computer's possible virtualization candidacy. It shows whether a computer's metrics fall within a range that may indicate candidacy.
Virtualization KPI Candidate - Missing Data	Use this report to determine which computers in your system are not good candidates for virtualization because data for one or more of the KPIs is not available. Review the Missing Data column in the report to see which computers did not provide one or more of the KPIs.

4

VMware vSphere Knowledge Scripts

AppManager provides the following Knowledge Scripts for monitoring VMware vSphere, vCenter, VMware ESX or ESXi Server hosts, VMware datastores, and VMware virtual machines, also called guests. The scripts can also monitor vCenter alarms, events, and task failures.

From the Knowledge Script view of Control Center, you can access more information about any NetIQ-supported Knowledge Script by selecting it and clicking **Help**. In the Operator Console, click any Knowledge Script in the Knowledge Script pane and press **F1**.

Knowledge Script	What It Does
Alarms	Monitors vCenter alert and warning alarms and raises AppManager events when those vCenter alarms get triggered, acknowledged, or cleared.
ClusterCPUUsage	Monitors the CPU usage of the cluster.
ClusterMemUsage	Monitors memory usage, memory swap used, and memory balloon for a cluster.
ClusterStatus	Monitors the configuration status of the cluster.
Configuration	Use this Knowledge Script to generate an inventory of all hosts and virtual machines for the selected vCenter as well as configuration details for each.
ConfigureHostTraffic	Enables an SNMP firewall port for a given host.
DatastoreUsage	Monitors the usage and free space of datastores.
Events	Monitors vCenter error, warning, and informational events, and raises AppManager events when those vCenter events occur.
HostConnected	Monitors changes in the connection status of hosts to vCenter. For example, this script monitors whether the host is visible to vCenter.
HostCPUUsage	Monitors the percentage of host CPU usage and CPU used.
HostDataStoreUsage	Monitors the usage and free space of each datastore connected to a host.
HostDiskIO	Monitors disk reads/writes and total disk I/O for a host.
HostDiskTotalLatency	Monitors the total latency of all disks connected to a host.
HostMemoryUsage	Monitors memory usage, memory swap used, and memory balloon for a host.
HostNetworkIO	Monitors network data received/transmitted for a host.
HostUptime	Monitors time elapsed since last system startup for a host.

Knowledge Script	What It Does
Inventory	Monitors if hosts and virtual machines are added or removed from vCenter, tracks configuration changes to hosts and VMs in vCenter, and monitors hosts and VMs that migrate to different hosts or move to different datastores or resource pools.
ResourcePoolCPUUsage	Monitors the CPU usage of the resource pool.
ResourcePoolMemUsage	Monitors memory usage and memory balloon for the resource pool.
ResourcePoolStatus	Monitors the overall status of the Resource pool.
ServiceHealthCheck	Monitors vCenter Server services.
Tasks	Raises AppManager events when monitored vCenter task failures occur.
VirtualCenterCPUUsage	Monitors the CPU usage of the vCenter process and the CPU usage on the computer hosting vCenter.
VirtualCenterMemoryUsage	Monitors memory usage of the vCenter process and total memory usage on the computer hosting vCenter.
VirtualMachineInventory	Monitors virtual machines that are added, removed, renamed, moved, or migrated within vCenter. NetIQ Corporation recommends you use the Inventory Knowledge Script instead of this script for inventory monitoring.
VmConnected	Monitors changes in the connection status of virtual machines to vCenter.
VmCPUUsage	Monitors CPU usage, CPU ready, CPU wait, and CPU used for a virtual machine.
VmDiskIO	Monitors disk reads/writes for a virtual machine.
VmDiskUsage	Monitors logical disk usage for a virtual machine.
VmMemoryUsage	Monitors over a dozen memory metrics for a virtual machine, including memory active, memory balloon, memory consumed, memory granted, memory overhead, and more.
VmNetworkIO	Monitors network transmits/receives for a virtual machine.
VmOperations	Monitors the number of virtual machine operations that are occurring across clusters and datacenters.
VmPowerStatus	Monitors changes in the power status of virtual machines.
VmSnapshotUsage	Monitors the number and size of all virtual machine snapshots, as well as the age of virtual machine snapshots and reverted snapshots.
VmToolsStatus	Monitors the VMware Tools status of virtual machines.
VmUptime	Monitors time elapsed since last system startup for a virtual machine.
Recommended Knowledge Script Groups	Performs essential monitoring of your vCenter environment.

4.1 Alarms

Use this Knowledge Script to monitor vCenter *alarms*, which are actions that are triggered when a condition or set of conditions occurs within vCenter. A default set of alarms is defined for vCenter, but vCenter administrators can also define custom alarms.

This script raises an event when monitored vCenter alarms are triggered, acknowledged, and cleared. You can also raise events for currently triggered alarms. You can filter the vCenter alarms by alarm type and alarm name. Use the Objects tab to define the resources you want to monitor.

NOTE: VMware vCenter 4.1 or earlier does not support the ability to generate events when a vCenter alert or warning alarm is acknowledged or cleared.

A list of VirtualCenter_Alarms events with the same short event message will not display individual event details. By default, AppManager collapses event details based on the object and the short event message. If the short event message is the same for a series of events, the list of events will collapse. To view the individual event details, disable event collapsing for that specific Alarms job.

In addition, you can use the VirtualCenter_Alarms Knowledge Script to monitor changes to your ESX and ESXi hardware. For more information, see [Section 4.2, “Using the Alarms Script to Monitor ESX and ESXi Hardware,” on page 48.](#)

Each event report shows the following information:

- ◆ Target
- ◆ Category
- ◆ Description
- ◆ User name
- ◆ Time on vCenter when the alarm occurred

NOTE: The first time you run this script, you may experience a short delay before actual monitoring begins. This delay is caused by the various initialization processes that must be carried out by the Alarms script.

4.1.1 Resource Objects

Run the Discovery_VirtualCenter Knowledge Script on the objects you want to monitor before running this Knowledge Script. You can also monitor objects that the Discovery_VirtualCenter Knowledge Script does *not* discover, such as distributed virtual port groups and distributed virtual switches.

You can run this script on the following resource objects:

- ◆ vCenter server
- ◆ Clusters
- ◆ Datacenters
- ◆ Datastores
- ◆ Hosts
- ◆ Resource pools
- ◆ Virtual appliances (vApps)
- ◆ Virtual machines

- ◆ Folders (you can only monitor the folder objects found under the Host & Clusters parent folder in the TreeView pane)
- ◆ Distributed virtual port groups (not displayed in the TreeView pane)
- ◆ Distributed virtual switches (not displayed in the TreeView pane)
- ◆ Network (not displayed in the TreeView pane)
- ◆ VMware distributed virtual switch (not displayed in the TreeView pane)

4.1.2 Default Schedule

The default interval for this script is **Asynchronous**. After you start the Knowledge Script, its job status appears as **Running**.

4.1.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Event severity when AppManager fails to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager cannot log in to vCenter. The default is 5.
Event severity when Alarms job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Alarms job fails. The default is 5.
Event severity when filter settings contain conflicts	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the filter settings contain conflicts. The default is 15.
Event severity when Alarms job has delayed start	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Alarms job does not start when it is expected to start. The default is 25.
Additional Settings	
Event Details	
Event detail format	Select HTML Table or Plain Text as the format for the detail in an event message. The default is HTML Table.
Monitor vCenter Alarms	
Event Notification	
Raise events when host is in maintenance mode?	If you want to suppress the alarms while the host is in maintenance mode, then deselect this checkbox. The default is selected.
Alert Alarms	
Raise event if vCenter alert alarm is triggered?	Set to Yes to raise an event if a vCenter alert alarm that matches your criteria is triggered. The default is Yes.
Event severity when vCenter alert alarm is triggered	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter alert alarm is triggered. The default is 5.

Parameter	How to Set It
Raise event if vCenter alert alarm is acknowledged?	Set to Yes to raise an event if a vCenter alert alarm that matches your criteria is acknowledged. The default is unselected.
Event severity when vCenter alert alarm is acknowledged	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter alert alarm is acknowledged. The default is 25.
Raise event if vCenter alert alarm is cleared?	Set to Yes to raise an event if a vCenter alert alarm that matches your criteria is cleared. The default is unselected.
Event severity when vCenter alert alarm is cleared	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter alert alarm is cleared. The default is 25.
Raise events for currently triggered vCenter alert alarms	Set to Yes to raise events for vCenter alert alarms that are in a triggered state when this job first starts. The default is unselected.
Event severity for currently triggered vCenter alert alarms	Set the event severity level, from 1 to 40, to indicate the importance of events for vCenter alert alarms that are in a triggered state when this job first starts. The default is 5.
Alarm name	<p>If you want to raise events on specific alarms, provide the names of the vCenter alarms you want to monitor. AppManager raises an event when an alarm matching your type, name, and status criteria is triggered. If you do not enter an alarm name, AppManager raises events for all alert alarms.</p> <p>The asterisk (*) and (?) are acceptable wildcards. Separate multiple names with a comma, without any spaces. This parameter is not case-sensitive.</p> <p>NOTE: You must enter at least a * for this script to run. Do not leave this parameter blank.</p>
Also raise events on unassociated TreeView objects?	<p>Select Yes to raise an event for unassociated objects in the TreeView pane. The default is unselected.</p> <p>NOTE: To monitor a datastore cluster object, select Yes for this parameter.</p>
Warning Alarms	
Raise event if vCenter warning alarm is triggered?	Set to Yes to raise an event if a vCenter warning alarm that matches your criteria is triggered. The default is Yes.
Event severity when vCenter warning alarm is triggered	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter warning alarm is triggered. The default is 15.
Raise event if vCenter warning alarm is acknowledged?	Set to Yes to raise an event if a vCenter warning alarm that matches your criteria is acknowledged. The default is unselected.
Event severity when vCenter warning alarm is acknowledged	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter warning alarm is acknowledged. The default is 25.
Raise event if vCenter warning alarm is cleared?	Set to Yes to raise an event if a vCenter warning alarm that matches your criteria is cleared. The default is unselected.
Event severity when vCenter warning alarm is cleared	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter warning alarm is cleared. The default is 25.

Parameter	How to Set It
Raise events for currently triggered vCenter warning alarms	Set to Yes to raise events for vCenter warning alarms that are in a triggered state when this job first starts. The default is unselected.
Event severity for currently triggered vCenter warning alarms	Set the event severity level, from 1 to 40, to indicate the importance of events for warning alarms that are in a triggered state when this job first starts. The default is 15.
Alarm name	<p>If you want to raise events on specific alarms, provide the names of the vCenter alarms you want to monitor. AppManager raises an event when an alarm matching your type, name, and status criteria is triggered. If you do not enter an alarm name, AppManager raises events for all warning alarms.</p> <p>The asterisk (*) and (?) are acceptable wildcards. Separate multiple names with a comma, without any spaces. This parameter is not case-sensitive.</p> <p>NOTE: You must enter at least a * for this script to run. Do not leave this parameter blank.</p>
Also raise events on unassociated TreeView objects?	<p>Select Yes to raise an event for unassociated objects in the TreeView pane. The default is unselected.</p> <p>NOTE: To monitor a datastore cluster object, select Yes for this parameter.</p>

4.2 Using the Alarms Script to Monitor ESX and ESXi Hardware

You can use the VirtualCenter_Alarms Knowledge Script to monitor state changes in your ESX or ESXi hardware, such as when a fan in a group of fans is close to overheating. Before you can monitor your hardware with the Alarms script, you need to create the hardware alarms in vCenter.

System requirements for monitoring ESX and ESXi hardware:

- ♦ At minimum, VMware vSphere 4.0
- ♦ At minimum, ESX 3.5, Update 4, or ESXi 4.0

To create a custom alarm in vCenter:

- 1 In vCenter, locate the ESX or ESXi server you want to monitor in the left pane.
- 2 On the Hardware Status tab, identify the hardware element you want to monitor, such as a fan group.
- 3 On the Alarms tab, verify that the **Definitions** view is selected.
- 4 Right-click anywhere on the Alarms tab and select **New Alarm**.
- 5 In the Alarm Settings dialog box, type an alarm name, such as `All Fans - Status Yellow`.

NOTE: Make a note of this name, as you will need to type this name into the VirtualCenter_Alarms Knowledge Script in AppManager when you run the VirtualCenter_Alarms script.

- 6 Type a short description of the alarm, such as `Alarm triggered when any Host's fan has a status of Yellow`.

- 7 From the Monitor list, select **Hosts**.
- 8 Select **Monitor for specific events occurring on this object**.
- 9 Verify that **Enable this alarm** is checked.
- 10 On the Triggers tab, click **Add**.
- 11 From the Event list, select the relevant event type, such as **Hardware Health Changed**.
- 12 From the Status list, select the relevant alarm status, such as **Alert or Warning**.
- 13 In the Conditions field, click **Advanced**.
- 14 In the Trigger Conditions dialog box, specify the different Argument > Operator > Value combinations that must be present to set off the alarm. For example, **newgroup > equal to > Fan** and **newState > equal to > Yellow**.

NOTE: The newGroup argument represents the sensor being monitored, such as Fan or Voltage. The newState argument represents the current state of the sensor in the newGroup argument.

- 15 Click **OK** to close the Trigger Conditions dialog box.
- 16 Click **OK** to close the Alarms Settings dialog box. The custom alarm is now set up in vCenter, and you can start monitoring that alarm with AppManager.

To set up the Alarms script to monitor the new custom alarm in vCenter:

- 1 In AppManager, run the VirtualCenter_Alarms Knowledge Script on the vCenter object you want to monitor for ESX or ESXi hardware alarms.
- 2 Click the **Values** tab.
- 3 **If you set up a vCenter alert alarm in the previous procedure**, type the alert alarm name, such as `All Fans - Status Yellow`, into the *Alarm name* parameter under the *Raise event if vCenter alert alarm is triggered?* parameter.
- 4 **If you set up a vCenter warning alarm in the previous procedure**, type the warning alarm name, such as `All Fans - Status Red`, into the *Alarm name* parameter under the *Raise event if vCenter warning alarm is triggered?* parameter.
- 5 Select **Yes** for the relevant *Raise event* parameter.
- 6 Set the severity level in the relevant *Event severity* parameter.
- 7 Click **OK** to run the script.

NOTE: Closing the AppManager Alarms event will not clear the alarm event in vCenter, and closing the vCenter alarm will not clear the AppManager Alarms event.

4.3 ClusterCPUUsage

Use this Knowledge Script to monitor the CPU usage of the cluster. This script raises an event if CPU usage exceeds the threshold you set. In addition, this script generates data streams for CPU usage. This script monitors and collects data for the following performance metrics:

- ♦ CPU usage as a percentage: the sum of actively used CPU of all virtual machines in the cluster, as a percentage of the total available CPU.
- ♦ CPU usage in MHz: the sum of actively used CPU of all virtual machines in the cluster, in megahertz.

NOTE: The VirtualCenter_ClusterCPUUsage Knowledge Script does not return valid values for VMware vSphere 4.0. When you run the this Knowledge Script, the values returned do not match the values displayed in the Advanced Performance Charts in the vSphere client. This issue does not occur with versions of VMware vSphere later than version 4.0.

4.3.1 Prerequisite

To enable the Knowledge Script to collect accurate CPU usage data, set the following **Statistics Collection Intervals** appropriately in the vCenter Management Server Configuration:

- ♦ **Collection Frequency:** The interval duration in vCenter must be less than or equal to the AppManager job interval schedule. For example, if you run the VirtualCenter_ClusterCPUUsage Knowledge Script at 15-minute intervals, the interval duration in vCenter must be less than or equal to 15 minutes.

For more information about setting the Interval Duration and Statistics Level in vCenter, see the VMware Virtual Infrastructure 3 documentation.

4.3.2 Resource Object

vSphere cluster

4.3.3 Default Schedule

By default, this script runs every **15 minutes**.

4.3.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when percent CPU usage exceeds the threshold?	Select Yes to raise an event if the percentage of CPU usage exceeds the threshold you set. The default is unselected.
Event severity when percent CPU usage exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of the CPU usage exceeds the threshold. The default is 15.
Raise event when CPU usage in MHz exceeds the threshold?	Select Yes to raise an event if CPU usage in MHz exceeds the threshold you set. The default is Yes.
Event severity when CPU usage in MHz exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU usage in MHz exceeds the threshold. The default is 15.
Raise event when CPU metrics are not available?	Select Yes to raise an event if the CPU metrics are not available. The default is Yes.
Event severity when CPU metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.

Parameter	How to Set It
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when the ClusterCPUUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ClusterCPUUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for percent CPU usage?	Select Yes to collect data about the percentage of CPU usage for charts and reports. The default is unselected.
Collect data for CPU usage in MHz?	Select Yes to collect CPU usage data in MHz for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for CPU usage	Specify the maximum amount of CPU usage that can occur before an event is raised. The default is 80 percent.
Maximum threshold for CPU usage	Specify the maximum amount of CPU usage that can occur before an event is raised. The default is 800 MHz.

4.4 ClusterMemUsage

Use this Knowledge Script to monitor the memory usage of the cluster. This script raises an event when a monitored value exceeds the threshold you set. This script monitors and collects data for the following performance metrics:

- ◆ Memory active: the amount of host machine memory used by all powered-on virtual machines in the cluster. A cluster's consumed memory consists of virtual machine consumed memory and overhead memory. It does not include host-specific overhead memory, such as memory used by the service console or VMkernel.
- ◆ Memory balloon: the amount of memory allocated by the virtual machine memory control driver, which is installed with VMware Tools.
- ◆ Memory granted: the amount of memory (in kilobytes) that has been allocated to virtual machines running on all hosts in the cluster.
- ◆ Memory swap used: the sum of the memory swapped by the powered-on virtual machines on all hosts in the cluster.
- ◆ Memory usage: the amount of total configured memory available for use.

4.4.1 Prerequisite

To enable the Knowledge Script to collect accurate memory related data, set the following **Statistics Collection Intervals** appropriately in the vCenter Management Server Configuration:

- ♦ **Collection Frequency:** The interval duration in vCenter must be less than or equal to the AppManager job interval schedule. For example, if you run the VirtualCenter_ClusterMemUsage Knowledge Script at 15-minute intervals, the interval duration in vCenter must be less than or equal to 15 minutes.

For more information about setting the Interval Duration and Statistics Level in vCenter, see the VMware Virtual Infrastructure 3 documentation.

4.4.2 Resource Object

vSphere cluster

4.4.3 Default Schedule

By default, this script runs every **15 minutes**.

4.4.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when memory active exceeds the threshold?	Select Yes to raise an event when memory active exceeds the threshold you set. The default is unselected.
Event severity when memory active exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory active exceeds the threshold. The default is 15.
Raise event when memory balloon used exceeds the threshold?	Select Yes to raise an event when memory balloon used exceeds the threshold you set. The default is Yes.
Event severity when memory balloon used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory balloon used exceeds the threshold. The default is 15.
Raise event when memory granted exceeds the threshold?	Select Yes to raise an event when memory granted exceeds the threshold you set. The default is unselected.
Event severity when memory granted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory granted exceeds the threshold. The default is 15.
Raise event when memory swap used exceeds the threshold?	Select Yes to raise an event when memory swap used exceeds the threshold you set. The default is Yes.
Event severity when memory swap used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory swap used exceeds the threshold. The default is 15.

Parameter	How to Set It
Raise event when memory usage exceeds the threshold?	Select Yes to raise an event when memory usage exceeds the threshold you set. The default is Yes.
Event severity when memory usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory usage exceeds the threshold. The default is 15.
Raise event when memory metrics are not available?	Select Yes to raise an event if the memory metrics are not available. The default is Yes.
Event severity when memory metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ClusterMemUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ClusterMemUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for memory active?	Select Yes to collect cluster memory usage data for charts and reports. The default is unselected. NOTE: Because VMware permits over-allocation of resources, it is possible for data collection to return cluster memory usage data points in excess of 100 percent.
Collect data for memory balloon used?	Select Yes to collect cluster memory balloon used data for charts and reports. The default is unselected. NOTE: Because VMware permits over-allocation of resources, it is possible for data collection to return cluster memory balloon data points in excess of 100 percent.
Collect data for memory granted?	Select Yes to collect cluster memory granted data for charts and reports. The default is unselected.
Collect data for memory swap used?	Select Yes to collect cluster memory swap data for charts and reports. The default is unselected. NOTE: Because VMware permits over-allocation of resources, it is possible for data collection to return cluster memory swap data points in excess of 100 percent.
Collect data for memory usage?	Select Yes to collect cluster memory usage data for charts and reports. The default is unselected. NOTE: Because VMware permits over-allocation of resources, it is possible for data collection to return cluster memory usage data points in excess of 100 percent.
Monitoring	

Parameter	How to Set It
Maximum threshold for memory active	Specify the maximum percentage of cluster memory active that can occur before an event is raised. The default is 20 percent.
Maximum threshold for memory usage	Specify the maximum percentage of cluster memory usage that can occur before an event is raised. The default is 80 percent.
Maximum threshold for memory balloon used	Specify the maximum percentage of cluster memory balloon that can occur before an event is raised. The default is 20 percent.
Maximum threshold for memory granted	Specify the maximum percentage of cluster memory granted that can occur before an event is raised. The default is 1024 megabytes.
Maximum threshold for memory swap used	Specify the maximum percentage of cluster memory swap used that can occur before an event is raised. The default is 20 percent.

4.5 ClusterStatus

Use this Knowledge Script to monitor the configuration status of the cluster. This script raises an event if the state of the cluster changes to one of the following states:

- ◆ Inconsistent - The number of virtual machines powered on exceeds the requirements of strict failover. The current failover capacity is smaller than the configured failover capacity, and can no longer guarantee failover for the specified number of hosts, but it continues performing failover. If a host fails, VMware first fails over the virtual machines of one host in order of priority, and then fails over the virtual machines of the second host in order of priority, and so on.
- ◆ Overcommitted - When capacity is removed from the cluster, such as when a host fails or is removed, and there are no longer enough resources to support all requirements.
- ◆ Undercommitted - Available resources can meet all reservations and support all running virtual machines. In addition, at least one host has enough resources to run.

This script generates data streams for undercommitted state, overcommitted state, and inconsistent state.

4.5.1 Resource Object

vSphere cluster

4.5.2 Default Schedule

By default, this script runs every **15 minutes**.

4.5.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	

Parameter	How to Set It
Raise event when cluster state changes?	Select Yes to raise an event if the state of the cluster changes. The default is Yes.
Event severity when cluster state is inconsistent	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the cluster state changes to inconsistent. The default is 5.
Event severity when cluster state is overcommitted	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the cluster state changes to overcommitted. The default is 15.
Event severity when cluster state is undercommitted	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the cluster state changes to undercommitted. The default is 25.
Raise event when status information is not available?	Select Yes to raise an event if the status information is not available. The default is unselected.
Event severity when status information is not available.	Set the event severity level, from 1 to 40, to indicate the importance of an event in which status information is not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ClusterStatus job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ClusterStatus job fails unexpectedly. The default is 5.
Data Collection	
Collect data for status change?	Select Yes to collect data about cluster status for charts and reports. The default is unselected. NOTE: If enabled, data collection returns the following data: 100 for undercommitted state, 50 for overcommitted state, and 0 for inconsistent state.

4.6 Configuration

Use this Knowledge Script to generate an inventory of all hosts and virtual machines for the selected vSphere environment as well as configuration details for each host and virtual machine.

NOTE

- ◆ This script may take more than an hour to run on environments with more than 500 virtual machines.
- ◆ This script may take significantly longer to run on a proxy agent versus a non-proxy agent.

Each host report shows the following information:

General information

- ◆ Type
- ◆ Version
- ◆ Build
- ◆ System manufacturer
- ◆ System model
- ◆ Number of processors and resources of each (in GHz)
- ◆ Processor type
- ◆ Total CPU resources (in GHz)
- ◆ Memory (in megabytes)
- ◆ Number of virtual machines
- ◆ If VMotion is enabled or disabled
- ◆ Date and time the system was booted
- ◆ System date and time
- ◆ Uptime

Processor information

- ◆ Processor type
- ◆ Processor speed
- ◆ Number of processor sockets
- ◆ Number of cores per socket
- ◆ Number of logical processors
- ◆ If hyperthreading is enabled or disabled

Memory information

- ◆ Total RAM (in megabytes)
- ◆ RAM in use by virtual machines
- ◆ Service console RAM (in megabytes)

Storage information

- ◆ Number of datastores
- ◆ Table of device, capacity (in gigabytes), free space (in gigabytes), and type
- ◆ Table of adapters, device, host bus adapter, type, and SAN identifier
- ◆ Table of physical adapters, device, speed, vSwitch, and WOL support
- ◆ Table of virtual switches, configured ports, and available ports

Virtual machine and template information

- ◆ Table of virtual machines, state, uptime, CPU count, memory (in megabytes), guest OS, and notes
- ◆ Table of templates, CPU count, memory (in megabytes), guest OS, and notes

For each virtual machine, the report shows the following information:

General information

- ◆ DNS name
- ◆ Guest operating system
- ◆ Template
- ◆ State
- ◆ Uptime
- ◆ Host machine
- ◆ VMware tools status
- ◆ VMware tools version
- ◆ Number of snapshots

CPU information

- ◆ Number of CPUs
- ◆ CPU reservation (in MHz)

Memory information

- ◆ Memory (in megabytes)
- ◆ Memory reservation (in megabytes)

Disk information

- ◆ Table of disks, their type, and their size (in gigabytes)

Network information

- ◆ Table of network interface cards, VLAN, emulation, IP address, and MAC address

4.6.1 Resource Object

vCenter

4.6.2 Default Schedule

By default, this script runs **once**.

4.6.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when configuration files successfully generated?	Select Yes to raise an event if the configuration files were successfully generated. The default is Yes.
Event severity when configuration files successfully generated	Set the event severity level, from 1 to 40, to indicate the importance of an event in which configuration files are generated successfully. The default is 25.

Parameter	How to Set It
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when Configuration job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Configuration job fails unexpectedly. The default is 5.
Knowledge Script Settings	
Full path to output folder for result files	Provide the path to a location on the agent computer in which to save the configuration. The default path is C:\ProgramFiles\NetIQ\Temp\NetIQ_Debug\VMware. NOTE: This script raises an error event if you use any of the following characters in the path for this parameter: / * " < > ?
Report file name	Provide a file name for the report. The default name is default.html

4.7 ConfigureHostTraffic

Use this Knowledge Script to enable firewalls on host ESX servers to allow SNMP traffic. This script raises an event if the operation succeeds or fails. This Knowledge Script replaces the VirtualCenter_EnableSNMPTraffic Knowledge Script.

4.7.1 Prerequisite

Enable the **Security Profile and Firewall** permission to run this Knowledge Script.

For more information, see [Section 2.7, “Configuring vCenter Connection Credentials,” on page 19](#).

4.7.2 Resource Object

vSphere ESX or ESXi host

4.7.3 Default Schedule

By default, this script runs **once**.

4.7.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	

Parameter	How to Set It
Raise event when host does not support firewall configuration?	Select Yes to raise an event when a host does not support firewall configuration. The default is Yes.
Event severity when host does not support firewall configuration	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host does not support firewall configuration. The default is 15.
Event severity when host server no longer connected to VirtualCenter	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the selected host server has been removed from vCenter. The default is 35.
Event severity when failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ConfigureHostTraffic job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ConfigureHostTraffic job fails unexpectedly. The default is 5.
Host inbound traffic settings	
Enable SNMP traffic?	Select Yes to raise an event when the SNMP inbound traffic is enabled successfully. The default is Yes.
Event severity when SNMP inbound traffic enabled successfully	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the SNMP inbound traffic is enabled successfully. The default is 25.
Event severity when SNMP inbound traffic is already enabled	Set the event severity level, from 1 to 40, to indicate the importance of an event in which inbound traffic is already enabled. The default is 35.
Event severity when SNMP inbound traffic failed to be enabled	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the SNMP inbound traffic failed to be enabled. The default is 5.

4.8 DatastoreUsage

Use this Knowledge Script to monitor the usage and free space of datastores. This script raises an event if the amount of available free space falls below threshold and percentage of datastore used exceeds the threshold. In addition, this script generates data streams for gigabytes or megabytes of available free space and for the percentage of datastore used.

4.8.1 Resource Object

vSphere datastore

4.8.2 Default Schedule

By default, this script runs every **three hours**.

4.8.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when free space falls below the threshold?	Select Yes to raise an event if the amount of available datastore free space falls below the threshold you set. The default is Yes.
Event severity when available free space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of available datastore free space falls below the threshold. The default is 15.
Raise event when datastore percentage used exceeds the threshold?	Select Yes to raise an event if the percentage of datastore used exceeds the threshold you set. The default is Yes.
Event severity when percentage used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance an event in which the percentage of datastore used exceeds the threshold. The default is 15.
Raise event when datastore usage metrics are not available?	Select Yes to raise an event when datastore usage metrics are not available. The default is unselected.
Event severity when datastore usage metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which datastore usage metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve datastore metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when DataStoreUsage job fails unexpectedly	Set the severity level, from 1 to 40, to indicate the importance of an event in which the DataStoreUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for free space?	Select Yes to collect data about the amount of free space for charts and reports. The default is unselected.
Collect data for percentage used?	Select Yes to collect data about the percentage of datastore used for charts and reports. The default is unselected.
Monitoring	
Monitor Datastore Free Space	
Minimum threshold for datastore free space	Specify the minimum amount of datastore free space that must be available to prevent an event from being raised. The default is 500. Use the <i>Select datastore free space unit</i> parameter to select GBytes or MBytes as the unit of measure for free space.
Select datastore free space unit	Select whether to measure the amount of datastore free space in GBytes or MBytes . The default is GBytes.

Parameter	How to Set It
Maximum threshold for datastore space percentage used	Specify the maximum percentage of datastore that can be used before an event is raised. The default is 90%.

4.9 Events

Use this Knowledge Script to monitor events reported by vCenter Server, such as when a user powers off a virtual machine. You can filter the events by vCenter entity type, user name, and event description.

This Knowledge Script raises an event based on these filters. Use the Objects tab to define the resources you want to monitor. This script monitors all error and warning type events by default.

A list of VirtualCenter_Events events with the same short event message will not display individual event details. By default, AppManager collapses event details based on the object and the short event message. If the short event message is the same for a series of events, the list of events will collapse. To view the individual event details, disable event collapsing for that specific Events job.

WARNING: This Knowledge Script can potentially raise an excessive number of AppManager events, as well as unassociated events for objects not discovered in the AppManager TreeView pane. Use the filtering parameters in this script, such as event description and entity type, to limit the number of events monitored by the script and prevent a flood of irrelevant vCenter events.

Each event report shows the following information:

- ◆ Target
- ◆ Category
- ◆ Description
- ◆ User name
- ◆ Time on the vCenter Server when the event occurred

NOTE: The first time you run this script, you may experience a short delay before actual monitoring begins. This delay is caused by the various initialization processes that must be carried out by the Events script.

4.9.1 Resource Objects

Run the Discovery_VirtualCenter Knowledge Script on the objects you want to monitor before running this Knowledge Script. You can also monitor objects that the Discovery_VirtualCenter Knowledge Script does *not* discover, such as distributed virtual port groups and distributed virtual switches.

You can run this script on the following resource objects:

- ◆ vCenter server
- ◆ Clusters
- ◆ Datacenters
- ◆ Datastores (you cannot monitor folders under the Datastore object)
- ◆ Hosts
- ◆ Resource pools

- ♦ Virtual appliances (vApps)
- ♦ Virtual machines
- ♦ Folders (you can only monitor the folder objects found under the Host & Clusters parent folder in the TreeView pane)
- ♦ Distributed virtual port groups (not displayed in the TreeView pane)
- ♦ Distributed virtual switches (not displayed in the TreeView pane)
- ♦ Network (not displayed in the TreeView pane)
- ♦ VMware distributed virtual switch (not displayed in the TreeView pane)

4.9.2 Default Schedule

The default interval for this script is **Asynchronous**.

4.9.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in. The default is 5.
Event severity when Events job fails unexpectedly	Set the severity level, from 1 to 40, to indicate the importance of an event in which AppManager fails unexpectedly. The default is 5.
Event severity when filter settings contain conflicts	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the filter settings contain conflicts. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor vCenter Events	
Event Notification	
Raise event if vCenter “error” event is detected?	Select Yes to raise an event if an “error” event is detected. The default is Yes.
Event severity if vCenter “error” event is detected	Set the severity level, from 1 to 40, to indicate the importance of an event in which a vCenter “error” is detected. The default is 5.
Select vCenter entity type(s)	Click Browse [...] to select the vCenter entity types you want to monitor. The default settings include these entity types: Cluster, Datacenter, Datastore, Folder, Host, ResourcePool, vApp, VirtualMachine. NOTE: To monitor a datastore cluster object, select vCenter for this parameter.

Parameter	How to Set It
User	<p>If you want to raise events only for a specific user, provide the name of the vCenter user you want to monitor. If you do not enter a user name, AppManager raises events related to all users. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Use the regular expression \s* to filter only empty values. Do not leave this parameter blank.</p>
Event description	<p>If you want to raise events that include specific text, provide text the event description must contain to be monitored. If you do not provide text, AppManager raises events regardless of text. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Use the regular expression \s* to filter only empty values. Do not leave this parameter blank.</p>
Raise event if vCenter “warning” event is detected?	<p>Select Yes to raise an event if a vCenter “warning” event is detected. The default is Yes.</p>
Event severity when vCenter “warning” event is detected	<p>Set the severity level, from 1 to 40, to indicate the importance of an event in which a vCenter “warning” is detected. The default is 15.</p>
Select vCenter entity type(s)	<p>Click Browse [...] to select the vCenter entity types you want to monitor. The default settings include these entity types: Cluster, Datacenter, Datastore, Folder, Host, ResourcePool, vApp, VirtualMachine.</p> <p>NOTE: To monitor a datastore cluster object, select vCenter for this parameter.</p>
User	<p>If you want to raise events only for a specific user, provide the name of the vCenter user you want to monitor. If you do not enter a user name, AppManager raises events related to all users. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Use the regular expression \s* to filter only empty values. Do not leave this parameter blank.</p>
Event description	<p>If you want to raise events only that include specific text, provide text the event description must contain to be monitored. If you do not provide text, AppManager raises events regardless of text. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Use the regular expression \s* to filter only empty values. Do not leave this parameter blank.</p>
Raise event if vCenter “info” event is detected?	<p>Select Yes to raise an event if a vCenter “info” event is detected. The default is unselected.</p>

Parameter	How to Set It
Event severity when vCenter "info" event is detected	Set the severity level, from 1 to 40, to indicate the importance of an event in which a vCenter "info" event is detected. The default is 25.
Select vCenter entity type	Click Browse [...] to select the vCenter entity types you want to monitor. The default settings include these entity types: Cluster, Datacenter, Datastore, Folder, Host, ResourcePool, vApp, VirtualMachine. NOTE: To monitor a datastore cluster object, select vCenter for this parameter.
User	If you want to raise events only for a specific user, provide the name of the vCenter user you want to monitor. If you do not enter a user name, AppManager raises events related to all users. This parameter is not case-sensitive. The asterisk (*) and (?) are acceptable wildcards. NOTE: You must enter at least a * for this script to run. Use the regular expression <code>\s*</code> to filter only empty values. Do not leave this parameter blank.
Event description	If you want to raise events only that include specific text, provide text the event description must contain to be monitored. If you do not provide text, AppManager raises events regardless of text. This parameter is not case-sensitive. The asterisk (*) and (?) are acceptable wildcards. NOTE: You must enter at least a * for this script to run. Use the regular expression <code>\s*</code> to filter only empty values. Do not leave this parameter blank.
Data Collection	NOTE: This script can only collect data for those event categories for which you have selected Yes for the relevant <i>Raise event for...</i> parameter. For example, if you want to collect data for error events, you must select Yes for the <i>Raise event if vCenter "error" event is detected?</i> parameter.
Default time interval to collect data	Specify a default time interval for collecting data for charts and reports. The default is 5 minutes.
Collect data for error events?	Select Yes to collect data about error events for charts and reports. The default is Yes.
Collect data for warning events?	Select Yes to collect data about warning events for charts and reports. The default is unselected.
Collect data for info events?	Select Yes to collect data about informational events for charts and reports. The default is unselected.

4.10 HostConnected

Use this Knowledge Script to monitor changes in the connection status of hosts to vCenter, such as when a host is connected to the vCenter server or when a host goes into maintenance mode from normal mode.

This script raises an event if a host is disconnected or reconnected, or if a host goes into or comes out of maintenance mode. This script will not generate host disconnect or reconnect events while the host is in maintenance mode.

4.10.1 Resource Object

vSphere ESX or ESXi host

4.10.2 Default Schedule

By default, this script runs every **15 minutes**.

4.10.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when status information is not available?	Select Yes to raise an event when information about the host's connection status is not available. The default is unselected.
Event severity when status information is not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which information about the host's connection status is not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostConnected job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostConnected job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Connection Status	
Event Notification	

Parameter	How to Set It
Raise event when host enters disconnected state?	Select Yes to raise an event when a host enters a disconnected state. The default is Yes. NOTE: The script will not generate disconnect events if the host is in maintenance mode.
Event severity when host enters disconnected state	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host enters a disconnected state. The default is 15.
Raise event when host is in maintenance mode?	Select Yes to raise an event when a connected host goes into maintenance mode. The default is Yes.
Event severity when host in maintenance mode	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host goes into maintenance mode. The default is 15.
Raise event when host is out of maintenance mode?	Select Yes to raise an event when a connected host comes out of maintenance mode. The default is Yes.
Event severity when host out of maintenance mode	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host comes out of maintenance mode. The default is 15.
Raise event when host enters connected state?	Select Yes to raise an event when a host enters a connected state. The default is Yes. NOTE: The script will not generate reconnect events if the host is in maintenance mode.
Event severity when host enters connected state	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host enters a connected state. The default is 25.
Data Collection	
Collect data for host availability?	Select Yes to collect host availability data for charts and reports. When enabled, data collection returns 100 when a host is available and 0 when a host is unavailable. The default is unselected.
Collect data for host connectivity?	Select Yes to collect host connectivity data for charts and reports. When enabled, data collection returns 100 when a host is connected and 0 when a host is not connected. The default is unselected.

4.11 HostCPUUsage

Use this Knowledge Script to monitor host CPU usage and CPU used. This script raises an event if CPU usage exceeds the threshold you set. This script monitors the following metrics:

- ◆ CPU reserved capacity - Total CPU capacity reserved by the virtual machines.
- ◆ CPU usage - Actively used CPU of the host, as a percentage of the total available CPU reserved by virtual machines running on this host.
- ◆ CPU usage in MHz - Total amount of CPU used, in MHz, during the interval.
- ◆ CPU used - Sum of the actively used CPU of all powered on virtual machines on a host.

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
 - ◆ In rare situations, queries to the ESX or ESXi host might fail with timeouts because the ESX or ESXi host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX or ESXi host.
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4.11.1 Resource Object

vSphere ESX or ESXi host

4.11.2 Default Schedule

By default, this script runs every **15 minutes**.

4.11.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when CPU metrics are not available?	Select Yes to raise an event when CPU metrics are not available. The default is Yes.
Event severity when CPU metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostCPUUsage job fails unexpectedly	Set the severity level, from 1 to 40, to indicate the importance of an event in which the HostCPUUsage job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor CPU Reserved Capacity	
Event Notification	
Raise event when CPU reserved capacity exceeds the threshold?	Select Yes to raise an event when CPU reserved capacity exceeds the threshold you set. The default is unselected.

Parameter	How to Set It
Threshold -- Maximum CPU reserved capacity	Specify the maximum CPU reserved capacity that can occur before an event is raised. The default is 80 percent.
Event severity when CPU reserved capacity exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU reserved capacity exceeds the threshold. The default is 15.
Data Collection	
Collect data for CPU reserved capacity?	Select Yes to collect data about CPU reserved capacity for charts and reports. The default is unselected.
Monitor CPU Usage	
Event Notification	
Raise event when CPU usage in MHz exceeds the threshold?	Select Yes to raise an event when CPU usage in MHz exceeds the threshold you set. The default is Yes.
Threshold -- Maximum CPU usage in MHz	Specify the maximum CPU usage in MHz that can occur before an event is raised. The default is 2000 MHz.
Event severity when CPU usage in MHz exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU usage in MHz exceeds the threshold. The default is 15.
Raise event when percent CPU usage exceeds the threshold?	Select Yes to raise an event when the percentage of CPU usage exceeds the threshold you set. The default is Yes.
Threshold -- Maximum percent CPU usage	Specify the maximum percentage of CPU usage that can occur before an event is raised. The default is 80 percent.
Event severity when percent CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of CPU usage exceeds the threshold. The default is 15.
Raise event when percent individual CPU usage exceeds the threshold?	Select Yes to raise an event when the percentage of individual CPU usage exceeds the threshold you set. The default is Yes.
Threshold -- Maximum individual CPU usage	Specify the maximum percentage of individual CPU usage that can occur before an event is raised. The default is 80 percent.
Event severity when individual CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of individual CPU usage exceeds the threshold. The default is 15.
Data Collection	
Collect data for CPU usage in MHz?	Select Yes to collect data about CPU usage in MHz for charts and reports. The default is unselected.
Collect data for average CPU usage as percent?	Select Yes to collect data about the average CPU usage as a percentage for charts and reports. The default is unselected.
Collect data for individual CPU usage as percent?	Select Yes to collect data about usage for individual CPUs as a percentage for charts and reports. The default is unselected.
Monitor CPU Used	
Event Notification	
Raise event when CPU used exceeds the threshold?	Select Yes to raise an event when CPU used exceeds the threshold you set. The default is Yes.

Parameter	How to Set It
Threshold -- Maximum CPU used	Specify the maximum CPU used that can occur before an event is raised. The default is 80 percent.
Event severity when CPU used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU used exceeds the threshold. The default is 15.
Raise event when individual CPU used exceeds the threshold?	Select Yes to raise an event when the individual CPU used exceeds the threshold you set. The default is Yes.
Threshold -- Maximum individual CPU used	Specify the maximum individual CPU used that can occur before an event is raised. The default is 80 percent.
Event severity when individual CPU used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the individual CPU used exceeds the threshold. The default is 15.
Data Collection	
Collect data for average CPU used?	Select Yes to collect data about average CPU used for charts and reports. The default is unselected.
Collect data for individual CPU used?	Select Yes to collect data about individual CPU used for charts and reports. The default is unselected.

4.12 HostDataStoreUsage

Use this Knowledge Script to monitor the datastore usage of all datastores connected to a host. This script raises an event when the percentage of available datastore free space falls below the threshold or when the percentage of used datastore free space exceeds the threshold.

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
- ◆ In rare situations, queries to the ESX or ESXi host might fail with timeouts because the ESX or ESXi host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX or ESXi host.

4.12.1 Resource Object

vSphere ESX or ESXi host

4.12.2 Default Schedule

By default, this script runs every **three hours**.

4.12.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when available free space falls below the threshold?	Select Yes to raise an event if the amount of datastore free space falls below the threshold you set. The default is Yes.
Event severity when available free space falls below the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of available free space falls below the threshold. The default is 15.
Raise event when the percentage of used Datastore exceeds the threshold	Select Yes to raise an event if the percentage of used datastore exceeds the threshold you set. The default is Yes.
Event severity when percentage of used Datastore exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of used datastore exceeds the threshold. The default is 15.
Raise event when datastore metrics are not available?	Select Yes to raise an event if datastore metrics are not available. The default is unselected.
Event severity when datastore metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which datastore metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostDataStoreUsage job fails unexpectedly	Set the severity level, from 1 to 40, to indicate the importance of an event in which the HostDataStoreUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for free space?	Select Yes to collect data about available datastore free space for charts and reports. The default is unselected.
Collect data for percentage used?	Select Yes to collect data about the percentage of used datastore for charts and reports. The default is unselected.
Monitoring	
Minimum threshold for available datastore free space (MB)	Specify the minimum amount of datastore free space that must be available to prevent an event from being raised. The default is 500 megabytes.
Maximum threshold for datastore percentage used (%)	Specify the maximum amount of datastore that can be used before an event is raised. The default is 90%.

4.13 HostDiskIO

Use this Knowledge Script to monitor disk reads/writes for a host. This script raises an event if the amount of reads/writes in megabytes per second exceeds the threshold you set. This script monitors and collects data for the following performance metrics:

- ◆ Disk read rate - Rate at which data is read from each LUN (logical unit number) on the host
- ◆ Disk write rate - Rate at which data is written to each LUN (logical unit number) on the host
- ◆ Total disk I/O

This script generates a pair of data streams for each disk that is configured on a host.

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
 - ◆ In rare situations, queries to the ESX host might fail with timeouts because the ESX host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX host.
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4.13.1 Resource Object

vSphere ESX or ESXi host

4.13.2 Default Schedule

By default, this script runs every **15 minutes**.

4.13.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when total disk IO exceeds the threshold?	Select Yes to raise an event when total disk IO exceeds the threshold you set. The default is unselected.
Event severity when total disk IO exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which total disk IO exceeds the threshold. The default is 15.
Raise event when disk reads exceed the threshold?	Select Yes to raise an event if the amount of disk reads exceeds the threshold you set. The default is Yes.
Event severity when disk reads exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of disk reads exceeds the threshold. The default is 15.
Raise event when disk writes exceed the threshold?	Select Yes to raise an event if the amount of disk writes exceeds the threshold you set. The default is Yes.

Parameter	How to Set It
Event severity when disk writes exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of disk writes exceeds the threshold. The default is 15.
Raise event when disk IO metrics are not available	Select Yes to raise an event if the disk IO metrics are not available. The default is Yes.
Event severity when disk IO metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the disk IO metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostDiskIO job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostDiskIO job fails unexpectedly. The default is 5.
Data Collection	
Collect data for total disk IO?	Select Yes to collect data for charts and reports. When enabled, data collection returns the amount of total disk IO. The default is unselected.
Collect data for disk reads?	Select Yes to collect data for charts and reports. When enabled, data collection returns the amount of disk reads. The default is unselected.
Collect data for individual disk reads?	Select Yes to collect data for charts and reports. When enabled, data collection returns the amount of individual disk reads. The default is unselected.
Collect data for disk writes?	Select Yes to collect data for charts and reports. When enabled, data collection returns the amount of disk writes in megabytes per second. The default is unselected.
Collect data for individual disk writes?	Select Yes to collect data for charts and reports. When enabled, data collection returns the amount of individual disk writes in megabytes per second. The default is unselected.
Monitoring	
Maximum threshold for total disk IO (MBytes/sec)	Specify the maximum amount of total disk IO that can occur before an event is raised. The default is 20 megabytes per second.
Maximum threshold for disk reads (MBytes/sec)	Specify the maximum amount of disk reads that can occur before an event is raised. The default is 2 megabytes per second.
Maximum threshold for disk writes (MBytes/sec)	Specify the maximum amount of disk writes that can occur before an event is raised. The default is 2 megabytes per second.

4.14 HostDiskTotalLatency

Use this Knowledge Script to monitor the total latency of all disks connected to a host. This script monitors and collects data for the following disk latency performance metrics:

- ◆ Disk command latency: Average amount of time taken during the collection interval to process a SCSI (Small Computer System Interface) command.
- ◆ Disk read latency: Average amount of time taken during the collection interval to process a SCSI read command.
- ◆ Disk write latency: Average amount of time taken during the collection interval to process a SCSI write command.
- ◆ Physical device command latency: Average amount of time, in milliseconds, to complete a SCSI command from the physical device.
- ◆ Physical device read latency: Average amount of time, in milliseconds, to complete read from the physical device.
- ◆ Physical device write latency: Average amount of time, in milliseconds, to write to the physical device.
- ◆ Kernel disk command latency: Average amount of time, in milliseconds, spent by VMkernel processing each SCSI command.
- ◆ Kernel disk read latency: Average amount of time, in milliseconds, spent by VMkernel processing each SCSI read command.
- ◆ Kernel disk write latency: Average amount of time, in milliseconds, spent by VMkernel processing each SCSI write command.
- ◆ Queue command latency: Average amount of time spent in the VMkernel queue, per SCSI command, during the collection interval.
- ◆ Queue read latency: Average amount of time taken during the collection interval per SCSI read command in the VMkernel queue.
- ◆ Queue write latency: Average amount time taken during the collection interval per SCSI write command in the VMkernel queue.
- ◆ Commands: Number of SCSI commands issued during the collection interval.
- ◆ Aborted commands: Number of SCSI commands aborted during the collection interval.
- ◆ Bus resets: Number of SCSI bus reset commands issued during the collection interval.

NOTE

- ◆ When a host goes into maintenance mode all host scripts, except for the `VirtualCenter_HostConnected` Knowledge Script, suppress events and data.
- ◆ In rare situations, queries to the ESX host might fail with timeouts because the ESX host stops responding. This issue affects all `VirtualCenter_Host*` Knowledge Scripts. You can work around this issue by restarting the management service on the ESX host.
- ◆ If you do any of the following, rescan the host bus adapters (HBAs) to ensure the vCenter inventory is up-to-date:
 - ◆ Make changes to storage disks or logical unit numbers (LUNs) available to your ESX system
 - ◆ Make changes to storage adapters

- ◆ Create a new datastore or remove an existing one
- ◆ Reconfigure an existing datastore, for example when you add a new extent

After completing the rescan, restart the HostDiskTotalLatency job or wait 24 hours for it to repopulate its storage adapter cache.

4.14.1 Resource Object

vSphere ESX or ESXi host

4.14.2 Default Schedule

By default, this script runs **Every 15 minutes**.

4.14.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when latency metrics are not available?	Select Yes to raise an event when latency metrics are not available. The default is unselected.
Event severity when latency metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which latency metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to get metrics. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in. The default is 5.
Event severity when HostDiskTotalLatency job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostDiskTotalLatency job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Disk Latency	
Event Notification	
Raise event if disk command latency exceeds the threshold?	Select Yes to raise an event if disk command latency exceeds the threshold you set. The default is Yes.
Threshold -- Maximum disk command latency	Specify the maximum disk command latency that can occur before an event is raised. The default is 10 milliseconds.

Parameter	How to Set It
Event severity when disk command latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk command latency exceeds the threshold. The default is 15.
Raise event if disk read latency exceeds the threshold?	Select Yes to raise an event if disk read latency exceeds the threshold you set. The default is Yes.
Threshold -- Maximum disk read latency	Specify the maximum disk read latency that can occur before an event is raised. The default is 10 milliseconds.
Event severity when disk read latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk read latency exceeds the threshold. The default is 15.
Raise event if disk write latency exceeds the threshold?	Select Yes to raise an event if disk write latency exceeds the threshold you set. The default is Yes.
Threshold -- Maximum disk write latency	Specify the maximum disk write latency that can occur before an event is raised. The default is 10 milliseconds.
Event severity when disk write latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk write latency exceeds the threshold. The default is 15.
Data Collection	
Collect data for disk command latency?	Select Yes to collect disk command latency data for charts and reports. The default is unselected.
Collect data for disk read latency?	Select Yes to collect disk read latency data for charts and reports. The default is unselected.
Collect data for disk write latency?	Select Yes to collect disk write latency data for charts and reports. The default is unselected.
Monitor Physical Device Latency	
Event Notification	
Raise event if physical device command latency exceeds the threshold?	Select Yes to raise an event if physical device command latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum physical device command latency	Specify the maximum physical device command latency that can occur before an event is raised. The default is 15 milliseconds.
Event severity when physical device command latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which physical device command latency exceeds the threshold. The default is 15.
Raise event if physical device read latency exceeds the threshold?	Select Yes to raise an event if physical device read latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum physical device read latency	Specify the maximum physical device read latency that can occur before an event is raised. The default is 10 milliseconds.
Event severity when physical device read latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which physical device read latency exceeds the threshold. The default is 15.
Raise event if physical device write latency exceeds the threshold?	Select Yes to raise an event if physical device write latency exceeds the threshold you set. The default is Yes.

Parameter	How to Set It
Threshold- Maximum physical device write latency	Specify the maximum physical device write latency that can occur before an event is raised. The default is 10 milliseconds.
Event severity when physical device write latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which physical device write latency exceeds the threshold. The default is 15.
Data Collection	
Collect data for physical device command latency?	Select Yes to collect physical device command latency data for charts and reports. The default is unselected.
Collect data for physical device read latency?	Select Yes to collect physical device read latency data for charts and reports. The default is unselected.
Collect data for physical device write latency?	Select Yes to collect physical device write latency data for charts and reports. The default is unselected.
Monitor Kernel Disk Latency	
Event Notification	
Raise event if kernel disk command latency exceeds the threshold?	Select Yes to raise an event if kernel disk command latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum kernel disk command latency	Specify the maximum kernel disk command latency that can occur before an event is raised. The default is 4 milliseconds.
Event severity when kernel disk command latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which kernel disk command latency exceeds the threshold. The default is 15.
Raise event if kernel disk read latency exceeds the threshold?	Select Yes to raise an event if kernel disk read latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum kernel disk read latency	Specify the maximum kernel disk read latency that can occur before an event is raised. The default is 2 milliseconds.
Event severity when kernel disk read latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which kernel disk read latency exceeds the threshold. The default is 15.
Raise event if kernel disk write latency exceeds the threshold?	Select Yes to raise an event if kernel disk write latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum kernel disk write latency	Specify the maximum kernel disk write latency that can occur before an event is raised. The default is 2 milliseconds.
Event severity when kernel disk write latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which kernel disk write latency exceeds the threshold. The default is 15.
Data Collection	
Collect data for kernel disk command latency?	Select Yes to collect kernel disk command latency data for charts and reports. The default is unselected.
Collect data for kernel disk read latency?	Select Yes to collect kernel disk read latency data for charts and reports. The default is unselected.
Collect data for kernel disk write latency?	Select Yes to collect kernel disk write latency data for charts and reports. The default is unselected.

Parameter	How to Set It
Monitor Queue Latency	
Event Notification	
Raise event if queue command latency exceeds the threshold?	Select Yes to raise an event if queue command latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum queue command latency	Specify the maximum queue command latency that can occur before an event is raised. The default is 0 milliseconds.
Event severity when queue command latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which queue command latency exceeds the threshold. The default is 15.
Raise event if queue read latency exceeds the threshold?	Select Yes to raise an event if queue read latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum queue read latency	Specify the maximum queue read latency that can occur before an event is raised. The default is 0 milliseconds.
Event severity when queue read latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which queue read latency exceeds the threshold. The default is 15.
Raise event if queue write latency exceeds the threshold?	Select Yes to raise an event if queue write latency exceeds the threshold you set. The default is Yes.
Threshold- Maximum queue write latency	Specify the maximum queue write latency that can occur before an event is raised. The default is 0 milliseconds.
Event severity when queue write latency exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which queue write latency exceeds the threshold. The default is 15.
Data Collection	
Collect data for queue command latency?	Select Yes to collect queue command latency data for charts and reports. The default is unselected.
Collect data for queue read latency?	Select Yes to collect queue read latency data for charts and reports. The default is unselected.
Collect data for queue write latency?	Select Yes to collect queue write latency data for charts and reports. The default is unselected.
Monitor Commands	
Event Notification	
Raise event if commands exceeds the threshold?	Select Yes to raise an event if the number of SCSI commands issued during the collection interval exceeds the threshold you set. The default is unselected.
Threshold -- Maximum commands	Specify the maximum number of SCSI commands that can occur before an event is raised. The default is 15000.
Event severity when commands exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of SCSI commands exceeds the threshold. The default is 15.
Raise event if aborted commands exceeds the threshold?	Select Yes to raise an event if the number SCSI commands aborted during the collection interval exceeds the threshold you set. The default is unselected.

Parameter	How to Set It
Threshold -- Maximum aborted commands	Specify the maximum number of SCSI commands that can be aborted before an event is raised. The default is 10.
Event severity if aborted commands exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of aborted SCSI commands exceeds the threshold. The default is 15.
Data Collection	
Collect data for commands?	Select Yes to collect commands data for charts and reports. The default is unselected.
Collect data for aborted commands?	Select Yes to collect aborted commands data for charts and reports. The default is unselected.
Monitor Bus Resets	
Event Notification	
Raise event if bus resets exceeds the threshold?	Select Yes to raise an event if the number of bus resets exceeds the threshold you set. The default is unselected.
Threshold -- Maximum bus resets	Specify the maximum number of bus resets that can occur before an event is raised. The default is 10.
Event severity when bus resets exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which bus resets exceed the threshold. The default is 15.
Data Collection	
Collect data for bus resets?	Select Yes to collect data for bus resets for charts and reports. The default is unselected.

4.15 HostMemoryUsage

Use this Knowledge Script to monitor the following memory metrics for a host:

- ♦ Memory active - Sum of active memory for all powered-on virtual machines plus vSphere services (such as COS, vpxa) on the host.
- ♦ Memory balloon - Sum of memory balloon of all powered-on virtual machines and vSphere services on the host. If the balloon target value is greater than the balloon value, the VMkernel inflates the balloon, causing more virtual machine memory to be reclaimed. If the balloon target value is less than the balloon value, the VMkernel deflates the balloon, which allows the virtual machine to consume additional memory if needed.
- ♦ Memory granted - Sum of granted memory for all powered-on virtual machines, plus machine memory for vSphere services on the host.
- ♦ Memory overhead - Total of all overhead memory for powered-on virtual machines, plus the overhead of running vSphere services on the host.
- ♦ Memory reserved - Amount of memory (in kilobytes) that has been reserved, in particular for resource pools and virtual machines.

- ◆ Memory shared - Sum of shared memory for all powered-on virtual machines, plus amount for vSphere services on the host. The host's shared memory may be larger than the amount of machine memory if memory is overcommitted (the aggregate virtual machine configured memory is much greater than machine memory). The value of this statistic reflects how effective transparent page sharing and memory over-commitment are for saving machine memory.
- ◆ Memory shared common - Amount of machine memory that is shared by all powered-on virtual machines and vSphere services on the host. Subtract this metric from the shared metric to gauge how much machine memory is saved due to sharing.
- ◆ Memory state - Amount of free machine memory on the host. The VMkernel has four free-memory thresholds that affect memory reclamation:
 - ◆ 0 (high) Free memory \geq 6% of machine memory minus Service Console memory
 - ◆ 1 (soft) 4%
 - ◆ 2 (hard) 2%
 - ◆ 3 (low) 1%
 - ◆ 0 (high) and 1 (soft): Swapping is favored over ballooning
 - ◆ 2 (hard) and 3 (low): Ballooning is favored over swapping
- ◆ Memory swap in - Sum of swap in values for all powered-on virtual machines on the host.
- ◆ Memory swap in rate - Rate at which memory is swapped from disk into active memory.
- ◆ Memory swap out - Sum of swap out memory from all powered-on virtual machines on the host.
- ◆ Memory swap out rate - Rate at which memory is being swapped from active memory to disk during the current interval. This counter applies to virtual machines and is generally more useful than the swap out counter to determine if the virtual machine is running slow due to swapping, especially when looking at real-time statistics.
- ◆ Memory swap used - Sum of the memory swapped by all powered-on virtual machines on the host.
- ◆ Memory unreserved - Amount of memory that is unreserved. Memory reservation not used by the Service Console, VMkernel, vSphere services and other powered-on virtual machines user-specified memory reservations and overhead memory. This statistic is no longer relevant to virtual machine admission control, as reservations are now handled through resource pools.
- ◆ Memory usage - Percentage of available machine memory usage:
- ◆ Memory zero - Sum of zero memory for all powered-on virtual machines, plus vSphere services on the host.

This script raises an event if a monitored metric exceeds the threshold you set.

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
 - ◆ In rare situations, queries to the ESX or ESXi host might fail with timeouts because the ESX or ESXi host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX or ESXi host.
-

4.15.1 Resource Object

vSphere ESX or ESXi host

4.15.2 Default Schedule

By default, this script runs every **15 minutes**.

4.15.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when memory metrics are not available?	Select Yes to raise an event when memory metrics are not available. The default is Yes.
Event severity when memory metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostMemoryUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostMemoryUsage job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Memory Active	
Event Notification	
Raise event when memory active exceeds the threshold?	Select Yes to raise an event when the memory active exceeds the threshold you set. The default is unselected.
Threshold -- Maximum memory active	Specify the maximum threshold for memory active that can be reached before an event is raised. The default is 20 percent.
Event severity when memory active exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when the active memory exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory active?	Select Yes to collect data about memory active for charts and reports. The default is unselected.
Monitoring Memory Balloon	
Event Notification	

Parameter	How to Set It
Raise an event when memory balloon exceeds the threshold?	Select Yes to raise an event when host memory balloon exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory balloon	Specify the maximum threshold for memory balloon that can be reached before an event is raised. The default is 2 percent.
Event severity when memory balloon exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory balloon exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory balloon?	Select Yes to collect data about host memory balloon for charts and reports. The default is unselected.
Monitor Memory Granted	
Event Notification	
Raise event when memory granted exceeds the threshold?	Select Yes to raise an event when the amount of memory granted exceeds the threshold you set. The default is unselected.
Threshold -- Maximum memory granted	Specify the maximum threshold for memory granted that can be reached before an event is raised. The default is 80 percent.
Event severity when memory granted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory granted exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory granted?	Select Yes to collect data about memory granted for charts and reports. The default is unselected.
Monitor Memory Overhead	
Event Notification	
Raise event when memory overhead exceeds the threshold?	Select Yes to raise an event when the amount of memory overhead exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory overhead	Specify the maximum threshold for memory overhead that can be reached before an event is raised. The default is 512 megabytes.
Event severity when memory overhead exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory overhead exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory overhead?	Select Yes to collect data about memory overhead for charts and reports. The default is unselected.
Memory Reserved Capacity	
Event Notification	
Raise event when memory reserved capacity exceeds the threshold?	Select Yes to raise an event when memory reserved capacity exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory reserved capacity	Specify the maximum threshold for memory reserved capacity that can be reached before an event is raised. The default is 80 percent.

Parameter	How to Set It
Event severity when memory reserved capacity exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory reserved capacity exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory reserved capacity?	Select Yes to collect data about memory reserved capacity for charts and reports. The default is unselected.
Monitor Memory Shared	
Event Notification	
Raise event when memory shared falls below the threshold?	Select Yes to raise an event when memory shared falls below the threshold you set. The default is unselected.
Threshold -- Minimum for memory shared	Specify the minimum threshold for memory shared that can be reached before an event is raised. The default is 512 megabytes.
Event severity when memory shared falls below the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory shared falls below the threshold. The default is 15.
Data Collection	
Collect data for memory shared?	Select Yes to collect data about memory shared for charts and reports. The default is unselected.
Monitor Memory Shared Common	
Event Notification	
Raise event when memory shared common falls below the threshold?	Select Yes to raise an event when memory shared common falls below the threshold you set. The default is unselected.
Threshold -- Minimum for memory shared common	Specify the minimum threshold for memory shared common that can be reached before an event is raised. The default is 256 megabytes.
Event severity when memory shared common falls below the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory shared common falls below the threshold. The default is 15.
Data Collection	
Collect data for memory shared common?	Select Yes to collect data about memory shared common for charts and reports. The default is unselected.
Monitor Memory State	
Event Notification	
Raise event when memory state is hard?	Select Yes to raise an event when memory state is hard. The default is unselected.
Event severity when memory state is hard	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is hard. The default is 10.
Raise event when memory state is high?	Select Yes to raise an event when memory state is high. The default is unselected.
Event severity when memory state is high	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is high. The default is 25.

Parameter	How to Set It
Raise event when memory state is low?	Select Yes to raise an event when memory state is low. The default is unselected.
Event severity when memory state is low	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is low. The default is 5.
Raise event when memory state is soft?	Select Yes to raise an event when memory state is soft. The default is unselected.
Event severity when memory state is soft	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is soft. The default is 15.
Data Collection	
Collect data for memory state?	Select Yes to collect data about memory state for charts and reports. The default is unselected.
Monitor Memory Swap In	
Event Notification	
Raise event when memory swap in exceeds the threshold?	Select Yes to raise an event when memory swap in exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory swap in rate	Specify the maximum threshold for memory swap in rate that can be reached before an event is raised. The default is 512 megabytes.
Event severity when memory swap in exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory swap in exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap in?	Select Yes to collect data about memory swap in for charts and reports. The default is unselected.
Monitor Memory Swap In Rate	
Event Notification	
Raise event when memory swap in rate exceeds the threshold?	Select Yes to raise an event when memory swap rate in exceeds the threshold you set. The default is Yes.
Threshold -- Maximum for memory swap in rate	Specify the maximum threshold for memory swap in rate that can be reached before an event is raised. The default is 1 megabyte per second.
Event severity when memory swap in rate exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory swap in rate exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap in rate?	Select Yes to collect data about memory swap in rate for charts and reports. The default is unselected.
Monitor Memory Swap Out	
Event Notification	
Raise event when memory swap out exceeds the threshold?	Select Yes to raise an event when memory swap out exceeds the threshold you set. The default is unselected.

Parameter	How to Set It
Threshold -- Maximum for memory swap out	Specify the maximum threshold for memory swap out that can be reached before an event is raised. The default is 256 megabytes.
Event severity when memory swap out exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory swap out exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap out?	Select Yes to collect data about memory swap out for charts and reports. The default is unselected.
Monitor Memory Swap Out Rate	
Event Notification	
Raise event when memory swap out rate exceeds the threshold?	Select Yes to raise an event when memory swap out rate exceeds the threshold you set. The default is Yes.
Threshold -- Maximum for memory swap out rate	Specify the maximum threshold for memory swap out rate that can be reached before an event is raised. The default is 1 megabyte per second.
Event severity when memory swap out rate exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory swap out rate exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap out rate?	Select Yes to collect data about memory swap out rate for charts and reports. The default is unselected.
Monitor Memory Swap Used	
Event Notification	
Raise event when memory swap used exceeds the threshold?	Select Yes to raise an event when memory swap used exceeds the threshold you set. The default is Yes.
Threshold -- Maximum for memory swap used	Specify the maximum threshold for memory swap used that can be reached before an event is raised. The default is 2.
Event severity when memory swap used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory swap used exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap used?	Select Yes to collect data about memory swap used for charts and reports. The default is unselected.
Monitor Memory Unreserved	
Event Notification	
Raise event when memory unreserved exceeds the threshold?	Select Yes to raise an event when memory unreserved exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory unreserved	Specify the maximum threshold for memory unreserved that can be reached before an event is raised. The default is 80 percent.

Parameter	How to Set It
Event severity when memory unreserved exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory unreserved exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory unreserved?	Select Yes to collect data about memory unreserved for charts and reports. The default is unselected.
Monitor Memory Usage	
Event Notification	
Raise event when memory usage exceeds the threshold?	Select Yes to raise an event when memory usage exceeds the threshold you set. The default is Yes.
Threshold -- Maximum for memory usage	Specify the maximum threshold for memory usage that can be reached before an event is raised. The default is 80 percent.
Event severity when memory usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which host memory usage exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory usage?	Select Yes to collect data about memory usage for charts and reports. The default is unselected.
Monitor Memory Usage by VMKernel	
Event Notification	
Raise event when memory usage by VMkernel exceeds the threshold?	Select Yes to raise an event when memory usage by VMkernel exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory usage by VMkernel	Specify the maximum threshold for memory usage by VMkernel that can be reached before an event is raised. The default is 256 megabytes.
Event severity when memory usage by VMkernel exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory usage by VMkernel exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory usage by VMkernel?	Select Yes to collect data about memory usage for VMkernel for charts and reports. The default is unselected.
Monitor Memory Zero	
Event Notification	
Raise event when memory zero exceeds the threshold?	Select Yes to raise an event when memory zero exceeds the threshold you set. The default is unselected.
Threshold - Maximum for memory zero	Specify the maximum threshold for memory zero that can be reached before an event is raised. The default is 20 percent.
Event severity when memory zero exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory zero exceeds the threshold. The default is 15.
Data Collection	

Parameter	How to Set It
Collect data for memory zero?	Select Yes to collect data about memory zero for charts and reports. The default is unselected.

4.16 HostNetworkIO

Use this Knowledge Script to monitor network data received/transmitted for a vSphere host. This script raises an event if the rate of network data received/transmitted exceeds the threshold you set.

- ◆ Network data received - The rate at which data is received across each physical NIC instance on the host
- ◆ Network data transmitted - The rate at which data is written to each LUN (logical unit number) on the host

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
- ◆ In rare situations, queries to the ESX host might fail with timeouts because the ESX host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX host.

4.16.1 Resource Object

vSphere ESX or ESXi host

4.16.2 Default Schedule

By default, this script runs every **15 minutes**.

4.16.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when network data received exceeds the threshold?	Select Yes to raise an event if the rate of network data received exceeds the threshold you set. The default is Yes.
Event severity when network data received exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of network data received exceeds the threshold. The default is 15.
Raise event when individual network data received exceeds the threshold?	Select Yes to raise an event if the rate of individual network data received exceeds the threshold you set. The default is unselected.

Parameter	How to Set It
Event severity when individual network data received exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of individual network data received exceeds the threshold. The default is 15.
Raise event when network data transmitted exceeds the threshold?	Select Yes to raise an event if the rate of network data transmitted exceeds the threshold you set. The default is Yes.
Event severity when network data transmitted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of individual network data transmitted exceeds the threshold. The default is 15.
Raise event when individual network data transmitted exceeds the threshold?	Select Yes to raise an event if the rate of individual network data transmitted exceeds the threshold you set. The default is unselected.
Event severity when individual network data transmitted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of individual network data transmitted exceeds the threshold. The default is 15.
Raise event when network IO metrics are not available?	Select Yes to raise an event if the network IO metrics are not available. The default is Yes.
Event severity when network IO metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the network IO metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostNetworkIO job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostNetworkIO job fails unexpectedly. The default is 5.
Data Collection	
Collect data for network data received?	Select Yes to collect data for charts and reports. When enabled, data collection returns the rate of network data received in megabytes per second. The default is unselected.
Collect data for individual network data received?	Select Yes to collect data for charts and reports. When enabled, data collection returns the rate of individual network data received in megabytes per second. The default is unselected.
Collect data for network data transmitted?	Select Yes to collect data for charts and reports. When enabled, data collection returns the rate of network data transmitted in megabytes per second. The default is unselected.
Collect data for individual network data transmitted?	Select Yes to collect data for charts and reports. When enabled, data collection returns the rate of individual network data transmitted in megabytes per second. The default is unselected.
Monitoring	
Maximum threshold for network data received	Specify the maximum rate of network data received that can occur before an event is raised. The default is 2 megabytes per second.

Parameter	How to Set It
Maximum threshold for individual network data received	Specify the maximum rate of individual network data received that can occur before an event is raised. The default is 2 megabytes per second.
Maximum threshold for network data transmitted	Specify the maximum rate of network data transmitted that can occur before an event is raised. The default is 2 megabytes per second.
Maximum threshold for individual network data transmitted	Specify the maximum rate of individual network data transmitted that can occur before an event is raised. The default is 2 megabytes per second.

4.17 HostUptime

Use this Knowledge Script to monitor host uptime in days. Host uptime is the time elapsed since the last system startup. This script raises an event when a host is rebooted, and it collects data for host uptime.

NOTE

- ◆ When a host goes into maintenance mode all VirtualCenter_Host* Knowledge Scripts, except for the VirtualCenter_HostConnected Knowledge Script, suppress events and data.
- ◆ In rare situations, queries to the ESX or ESXi host might fail with timeouts because the ESX or ESXi host stops responding. This issue affects all VirtualCenter_Host* Knowledge Scripts. You can work around this issue by restarting the management service on the ESX or ESXi host.

4.17.1 Resource Object

vSphere ESX or ESXi host

4.17.2 Default Schedule

By default, this script runs every **5 minutes**.

4.17.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when uptime metrics are not available?	Select Yes to raise an event if uptime metrics are not available. The default is unselected.
Event severity when uptime metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which uptime metrics are not available. The default is 15.

Parameter	How to Set It
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve host uptime status from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when HostUptime job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the HostUptime job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Uptime	
Event Notification	
Raise event if host server reboots?	Select Yes to raise an event if the host server reboots. The default is Yes.
Event severity if host server reboots	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the host server reboots. The default is 15.
Raise event if host reboots while in VMware maintenance mode?	Select Yes to raise an event if the host reboots while in VMware maintenance mode. The default is unselected.
Data Collection	
Collect data for uptime?	Select Yes to collect data for graphs and reports. When enabled, data collection returns a datastream for the host uptime in days. The default is unselected.

4.18 Inventory

Use this Knowledge Script to monitor if hosts and virtual machines are added, moved, or removed from vCenter, track configuration changes to hosts and virtual machines in vCenter, and monitor virtual machines that migrate to different hosts or move to different datastores, resource pools, or virtual appliances.

If an inventory change occurs, you can set the script to run a discovery, which allows the AppManager console to display the most current inventory of virtual machines and hosts in vCenter.

The Inventory script monitors changes in hosts, virtual machines, and container objects such as clusters, folders, datacenters, resource pools, and virtual applications (vApps). To ensure that the module updates objects such as datastores and datastore clusters that are not monitored by the Inventory script in the TreeView, schedule the Discovery_VirtualCenter Knowledge Script to run on a daily basis instead of just once. Running the Inventory script in conjunction with the Discovery_VirtualCenter script set to run daily ensures that the TreeView remains current.

If you are using AppManager 7.x and want to enable the inventory discovery options, use the [VirtualMachineInventory](#) Knowledge Script instead of this script. Because of the asynchronous nature of the VirtualCenter_Inventory script, an Inventory discovery could potentially run every time the script detects that a batch of changes have occurred on a host or virtual machine, which may result in inaccurate monitoring data for an environment that is frequently updated.

With AppManager 7.x, use the [VirtualMachineInventory](#) job to control the discovery options, and let the Inventory job handle event generation:

- ◆ For the Inventory script, set the *Perform a discovery operation if...* parameters to No, and set the *Raise event if...* parameters to Yes as needed.
- ◆ For the [VirtualMachineInventory](#) script, set the *Raise event when virtual machines...* parameters to No, and set the *Rediscover if virtual machines...* parameters to Yes as needed.

NOTE

- ◆ The VirtualCenter_Inventory Knowledge Script is supported on vCenter 4.0 or later.
- ◆ The first time you run this script, you might experience a short delay as the script gathers inventory data for the job. Subsequent jobs will start more quickly after the first VirtualCenter_Inventory job finishes its initial configuration.
- ◆ If you restart vCenter or the vCenter service while you are running the VirtualCenter_Inventory script with one or more of its discovery parameters selected, such as *Perform a discovery operation if a host is added?*, the VirtualCenter_Inventory discovery process will fail.
- ◆ If you are running a VirtualCenter_Inventory job that has discovery enabled, the script might miss some inventory changes because the Inventory job was restarted. Changes will be lost because the cache was cleared. In this situation, after the job restarts, monitoring takes a few minutes to start again. To monitor new changes in the TreeView, use this script as a monitoring policy.

This script monitors host and virtual machine objects, as well as their child objects.

This script monitors the following host details:

- 1 The model, such as PowerEdge R710
- 2 The vendor, such as Dell
- 3 The product name, such as VMware ESXi
- 4 The product version, such as 5.0.0
- 5 The product build, such as 469512
- 6 Whether vMotion is enabled or disabled
- 7 The number of CPUs or CPU cores
- 8 The total speed of the host, in MHz
- 9 The number and size of all physical disks
- 10 The configured memory, in MB
- 11 The number of physical network interface cards, or NICs, including their MAC addresses and drivers

This script monitors the following virtual machine details:

- 1 Guest operating system name, such as Microsoft Windows 2003 Server (32-bit)
- 2 Location of the VM files on the datastore
- 3 Whether or not the VM is a template

- 4 The number of vCPUs
- 5 The configured memory, in MB
- 6 The number, name, size, and type of all vDisks
- 7 The number, name, and MAC address of all vNICs

4.18.1 Resource Objects

- ♦ vCenter servers
- ♦ Hosts
- ♦ Virtual machines

4.18.2 Default Schedule

The default interval for this script is **Asynchronous**. After you start the Knowledge Script, its job status appears as **Running**.

4.18.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when Inventory job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Inventory job fails unexpectedly. The default is 5.
Event severity when filter settings contain conflicts	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the filter settings contain conflicts. The default is 15.
Event severity when Inventory job has delayed start	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Inventory job experiences a delayed start. The default is 25.
Additional Settings	
Raise event if changed object was already removed from vCenter?	Select Yes to raise an event if a changed object was already removed from vCenter. The default is unselected.
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Discovery Options	Important If you are using this module with AppManager 7.x, the following <i>Perform a discovery operation if...</i> parameters should remain unselected. Use the VirtualMachineInventory script to enable discovery options with AppManager 7.x.

Parameter	How to Set It
Host Options	
Perform a discovery operation if a host is added?	Select Yes to run a discovery operation to update the inventory whenever a host is added to vCenter. The default is unselected.
Perform a discovery operation if a host is removed?	Select Yes to run a discovery operation to update the inventory whenever a host is removed from vCenter. The default is unselected.
Perform a discovery operation if host details are changed?	Select Yes to run a discovery operation to update the inventory whenever the details for a host are changed in vCenter. The default is unselected.
Perform a discovery operation if a host is moved?	Select Yes to run a discovery operation to update the inventory whenever a host is moved in vCenter. The default is unselected.
Virtual Machine Options	
Perform a discovery operation if a virtual machine is added?	Select Yes to run a discovery operation to update the inventory whenever a virtual machine is added to vCenter. The default is unselected.
Perform a discovery operation if a virtual machine is removed?	Select Yes to run a discovery operation to update the inventory whenever a virtual machine is removed from vCenter. The default is unselected.
Perform a discovery operation if a virtual machine is renamed?	Select Yes to run a discovery operation to update the inventory whenever a virtual machine is renamed in vCenter. The default is unselected.
Perform a discovery operation if a virtual machine is migrated?	Select Yes to run a discovery operation to update the inventory whenever a virtual machine is migrated in vCenter. The default is unselected.
Perform a discovery operation if a virtual machine is moved?	Select Yes to run a discovery operation to update the inventory whenever a virtual machine is moved in vCenter. The default is unselected.
Perform a discovery operation if virtual machine details are changed?	Select Yes to run a discovery operation to update the inventory whenever the details for a virtual machine, such as increasing memory for a virtual machine, are changed in vCenter. The default is unselected.
Raise event if Discovery succeeds?	Select Yes to raise an event if the discovery operation launched by the Inventory job succeeds. The default is Yes.
Event severity if Discovery succeeds	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the discovery operation launched by the Inventory job succeeds. The default is 25.
Raise event if Discovery fails?	Select Yes to raise an event if the discovery operation launched by the Inventory job fails. The default is Yes.
Event severity if Discovery fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the discovery operation launched by the Inventory job succeeds. The default is 5.
Monitor Hosts	

Parameter	How to Set It
Event Notification	Important If you are using this module with AppManager 7.x and you want to monitor events, use the following event parameters instead of the event parameters in the VirtualMachineInventory script.
Raise event if host is added?	Select Yes to raise an event when a host is added. The default is Yes. NOTE: This script raises an event whenever a host is added, ignoring the options you selected on the Objects tab. In addition, filters do not apply to added hosts.
Event severity when host is added	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host is added. The default is 25.
Raise event if host is removed?	Select Yes to raise an event when a host is removed from vCenter. The default is Yes.
Event severity when host is removed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host is removed from vCenter. The default is 15.
Raise event if host is moved?	Select Yes to raise an event when a host is moved in vCenter. The default is Yes.
Event severity when host is moved	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a host is moved in vCenter. The default is 25.
Raise event if host details change?	Select Yes to raise an event when the details for a host are changed in vCenter. The default is Yes.
Event severity when host details change	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the details for a host are changed in vCenter. The default is 25.
Monitor Virtual Machines	
Event Notification	Important If you are using this module with AppManager 7.x and you want to monitor events, use the following event parameters instead of the event parameters in the VirtualMachineInventory script.
Raise event if virtual machine is added?	Select Yes to raise an event when a virtual machine is added in vCenter. The default is Yes. NOTE: This script raises an event whenever a virtual machine is added, ignoring the options you selected on the Objects tab. In addition, filters do not apply to added virtual machines.
Event severity when virtual machine is added	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is added in vCenter. The default is 25.
Raise event if virtual machine is removed?	Select Yes to raise an event when a virtual machine is removed from vCenter. The default is Yes.
Event severity when virtual machine is removed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is removed from vCenter. The default is 15.
Raise event if virtual machine is renamed?	Select Yes to raise an event when a virtual machine is renamed. The default is Yes.

Parameter	How to Set It
Event severity when virtual machine is renamed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is renamed. The default is 25.
Raise event if virtual machine is moved?	Select Yes to raise an event when a virtual machine is moved in vCenter. The default is Yes.
Event severity when virtual machine is moved	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is moved in vCenter. The default is 25.
Raise event if virtual machine is migrated?	Select Yes to raise an event when a virtual machine is migrated in vCenter. The default is Yes.
Event severity when virtual machine is migrated	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is migrated in vCenter. The default is 25.
Raise event if virtual machine details change?	Select Yes to raise an event when virtual machine details change. The default is Yes.
Event severity when virtual machine details change	Set the event severity level, from 1 to 40, to indicate the importance of an event in which virtual machine details change. The default is 25.

4.19 ResourcePoolCPUUsage

Use this Knowledge Script to monitor CPU usage for the resource pool. This script raises an event when CPU usage exceeds the threshold. In addition, this script generates data streams for CPU usage in MHz. This script monitors and collects data for the following performance metric:

CPU usage - Sum of actively used virtual CPU of all powered on virtual machines in the resource pool.

NOTE: This script will not work with existing ResourcePoolCPUUsage jobs. As a result, you will need to start new ResourcePoolCPUUsage jobs after installing this release.

4.19.1 Prerequisite

To enable the Knowledge Script to collect accurate CPU usage data for a resource pool, set the following **Statistics Collection Intervals** appropriately in the vCenter Management Server Configuration:

- ♦ **Collection Frequency:** The interval duration in vCenter must be less than or equal to the AppManager job interval schedule. For example, if you run the VirtualCenter_ResourcePoolCPUUsage Knowledge Script at 15-minute intervals, the interval duration in vCenter must be less than or equal to 15 minutes.

For more information about setting the Interval Duration and Statistics Level the vCenter, see the VMware Virtual Infrastructure 3 documentation.

4.19.2 Resource Objects

- ♦ vSphere resource pool
- ♦ vSphere virtual appliance (vApp)

4.19.3 Default Schedule

By default, this script runs every **15 minutes**.

4.19.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when CPU usage exceeds the threshold?	Select Yes to raise an event if CPU usage exceeds the threshold you set. The default is Yes.
Event severity when CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU usage exceeds the threshold. The default is 15.
Raise event when CPU metrics are not available?	Select Yes to raise an event if CPU metrics are not available. The default is Yes.
Event severity when CPU metrics are not available?	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ResourcePoolCPUUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ResourcePoolCPUUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for CPU usage?	Select Yes to collect data about CPU usage for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for CPU usage	Specify the maximum amount of CPU usage that can occur before an event is raised. The default is 800 MHz.

4.20 ResourcePoolMemUsage

This script monitors memory metrics for the vSphere resource pool. It raises an event if a monitored metric exceeds the threshold you set. In addition, this script generates a data stream for percentage of memory used and the amount of memory balloon in megabytes per second. This script monitors and collects data for the following performance metrics:

- ♦ Memory active - Sum of active memory for all powered-on virtual machines in the resource pool.
- ♦ Memory balloon - The sum of values for all memory balloon values for all powered-on virtual machines in the resource pool.
- ♦ Memory consumed - Sum of all memory used by all powered-on virtual machines in the resource pool.
- ♦ Memory granted - Sum of all granted memory for all powered-on virtual machines in the resource pool.

NOTE: This script will not work with existing ResourcePoolMemUsage jobs. As a result, you will need to start new ResourcePoolMemUsage jobs after installing this release.

4.20.1 Prerequisite

To enable the Knowledge Script to collect accurate memory related data for a resource pool, set the following **Statistics Collection Intervals** appropriately in the vCenter Management Server Configuration:

- ♦ **Collection Frequency:** The interval duration in vCenter must be less than or equal to the AppManager job interval schedule. For example, if you run the VirtualCenter_ResourcePoolMemUsage Knowledge Script at 15-minute intervals, the interval duration in vCenter must be less than or equal to 15 minutes.

For more information about setting the Interval Duration and Statistics Level in the vCenter, see the VMware Virtual Infrastructure 3 documentation.

4.20.2 Resource Objects

- ♦ vSphere resource pool
- ♦ vSphere virtual appliance (vApp)

4.20.3 Default Schedule

By default, this script runs every **15 minutes**.

4.20.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	

Parameter	How to Set It
Raise event when memory active exceeds the threshold?	Select Yes to raise an event when memory active exceeds the threshold you set. The default is unselected.
Event severity when memory active exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory active exceeds the threshold you set. The default is 15.
Raise event when memory balloon exceeds the threshold?	Select Yes to raise an event when memory balloon exceeds the threshold you set. The default is Yes.
Event severity when memory balloon exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory balloon exceeds the threshold you set. The default is 15.
Raise event when memory consumed exceeds the threshold?	Select Yes to raise an event when memory consumed exceeds the threshold you set. The default is Yes.
Event severity when memory consumed exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory consumed exceeds the threshold you set. The default is 15.
Raise event when memory granted exceeds the threshold?	Select Yes to raise an event when memory granted exceeds the threshold you set. The default is unselected.
Event severity when memory granted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory granted exceeds the threshold you set. The default is 15.
Raise event when memory usage exceeds the threshold?	Select Yes to raise an event when memory usage exceeds the threshold you set. The default is unselected.
Event severity when memory usage exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory usage exceeds the threshold you set. The default is 15.
Raise event when memory metrics are not available?	Select Yes to raise an event if memory metrics are not available. The default is Yes.
Event severity when memory metrics are not available?	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ResourcePoolMemUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ResourcePoolMemUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for memory active?	Select Yes to collect data about memory active for charts and reports. The default is unselected.
Collect data for memory balloon?	Select Yes to collect data about memory balloon for charts and reports. The default is unselected.

Parameter	How to Set It
Collect data for memory consumed?	Select Yes to collect data about memory consumed for charts and reports. The default is unselected.
Collect data for memory granted?	Select Yes to collect data about memory granted for charts and reports. The default is unselected.
Collect data for memory usage?	Select Yes to collect data about memory usage for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for memory active	Specify the maximum amount of memory active that can occur before an event is raised. The default is 1024 MB.
Maximum threshold for memory balloon	Specify the maximum amount of memory balloon that can occur before an event is raised. The default is 100 KB.
Maximum threshold for memory consumed	Specify the maximum amount of memory consumed that can occur before an event is raised. The default is 1024 MB.
Maximum threshold for memory granted	Specify the maximum amount of memory granted that can occur before an event is raised. The default is 1024 MB.
Maximum threshold for memory usage	Specify the maximum amount of memory usage that can occur before an event is raised. The default is 80 percent.

4.21 ResourcePoolStatus

Use this Knowledge Script to monitor the overall status of the resource pool. This script raises an event if the state of the resource pool changes to one of the following states:

- ◆ Inconsistent - One or more nodes in the tree has children whose reservations are greater than the node is configured to support.
- ◆ Overcommitted - The tree is consistent internally, but the root resource pool does not have the capacity to meet the reservation of its children.
- ◆ Undercommitted - Every node has a reservation greater than the sum of the reservations for its children. There is enough capacity at the root to satisfy all of the resources reserved by the children.

NOTE: This script will not work with existing ResourcePoolStatus jobs. As a result, you will need to start new ResourcePoolStatus jobs after installing this release.

4.21.1 Resource Object

- ◆ vSphere resource pool
- ◆ vSphere virtual appliance (vApp)

4.21.2 Default Schedule

By default, this script runs every **15 minutes**.

4.21.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when resource pool state changes?	Select Yes to raise an event if the resource pool state changes to inconsistent, overcommitted, or undercommitted. The default is Yes.
Event severity when resource pool state inconsistent	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the resource pool state changes to inconsistent. The default is 5.
Event severity when resource pool state is overcommitted	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the resource pool state changes to overcommitted. The default is 15.
Event severity when Resource pool state is undercommitted	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the resource pool state changes to undercommitted. The default is 25.
Raise event when resource pool is removed?	Select Yes to raise an event if the resource pool is removed. The default is Yes.
Event severity when resource pool is removed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the resource pool is removed. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when ResourcePoolStatus job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the ResourcePoolStatus job fails unexpectedly. The default is 5.
Data Collection	
Collect data for status change?	Select Yes to collect data about resource pool status for charts and reports. The default is unselected. NOTE: When enabled, data collection returns 100 for undercommitted, 50 for overcommitted, and 0 for inconsistent.

4.22 ServiceHealthCheck

Use this Knowledge Script to monitor vCenter Server services, such as the vCenter Server Heartbeat service, the vCenter Collector service, and the vCenter Server service. This script raises an event if a service is not running. You can set this script to automatically attempt to start services that are not running.

NOTE: When you run this script on a proxy agent computer to remotely monitor vCenter, this script will not monitor the vCenter services or collect any data.

4.22.1 Resource Object

vCenter server

4.22.2 Default Schedule

By default, this script runs every **10 minutes**.

4.22.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Restart VMware Capacity Planner service	Select Yes to automatically start the VMware Capacity Planner service when it is not running. The default is unselected.
Restart VMware License Server service?	Select Yes to automatically start the VMware License Server service when it is not running. The default is unselected.
Restart VMware Mount Service for VirtualCenter service?	Select Yes to automatically start the VMware Mount Service for VirtualCenter service when it is not running. The default is Yes.
Restart VMware Syslog Collector service?	Select Yes to automatically start the VMware Syslog Collector service when it is not running. The default is Yes.
Restart VMware USB Arbitration service?	Select Yes to automatically start the USB Arbitration service when it is not running. The default is unselected.
Restart VMware Update Manager service?	Select Yes to automatically start the Update Manager service when it is not running. The default is Yes.
Restart VMware VirtualCenter Management Webservices service?	Select Yes to automatically start the VMware VirtualCenter Management Webservices service when it is not running. The default is Yes.
Restart VMware vCenter Collector service?	Select Yes to automatically start the VMware vCenter Collector service when it is not running. The default is unselected.
Restart VMware vCenter Converter service?	Select Yes to automatically start the VMware vCenter Converter service when it is not running. The default is Yes.
Restart VMware vCenter Orchestrator Configuration service?	Select Yes to automatically start the VMware Orchestrator Configuration service when it is not running. The default is unselected.
Restart VMware vCenter Server Heartbeat service?	Select Yes to automatically start the VMware vCenter Server Heartbeat service when it is not running. The default is unselected.
Restart VMware vCenter Server service?	Select Yes to automatically start the VMware vCenter Server service when it is not running. The default is Yes.
Restart VMware vSphere Authentication Proxy Adapter service?	Select Yes to automatically start the VMware vSphere Authentication Proxy Adapter service when it is running. The default is unselected.

Parameter	How to Set It
Restart VMware vSphere Authentication Proxy service?	Select Yes to automatically start the VMware vSphere Authentication Proxy service when it is not running. The default is unselected.
Restart VMware vSphere Auto Deploy Waiter service?	Select Yes to automatically start the VMware vSphere Auto Deploy Waiter service when it is not running. The default is Yes.
Restart VMware vSphere Profile-Driven Storage service?	Select Yes to automatically start the VMware vSphere Profile-Driven Storage service when it is not running. The default is unselected.
Restart VMware vSphere Update Manager UFA service?	Select Yes to automatically start the VMware vSphere Update Manager UFA service when it is not running. The default is unselected.
Restart VMwareVCMSDS service?	Select Yes to automatically start the VMwareVCMSDS service when it is not running. The default is Yes.
Restart vCenter Inventory service?	Select Yes to automatically start the vCenter Inventory service when it is not running. The default is unselected.
Restart vSphere ESXi Dump Collector service?	Select Yes to automatically start the vSphere ESXi Dump Collector service when it is not running. The default is unselected.
Restart vSphere Web Client service?	Select Yes to automatically start the vSphere Web Client service when it is not running. The default is unselected.
Event severity when services restarted	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the vCenter Server services are restarted. The default is 25.
Event severity when services not installed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the vCenter Server services are not installed. The default is 25.
Event severity when services not running	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the vCenter Server services are stopped. The default is 15.
Event severity when services unable to start	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the vCenter Server services are not able to start. The default is 5.

4.23 Tasks

Use this Knowledge Script to monitor a set of vCenter tasks. You can filter the tasks by vCenter entity type, task name, and task user name. This script raises an event when monitored task failures are detected. Use the Objects tab to define the resources you want to monitor.

A list of VirtualCenter_Tasks events with the same short event message will not display individual event details. By default, AppManager collapses event details based on the object and the short event message. If the short event message is the same for a series of events, the list of events will collapse. To view the individual event details, disable event collapsing for that specific Tasks job.

In some instances, a new vCenter task might not include data about the inventory entity associated with the task, such as the VM or the datastore. When this occurs, AppManager associates the task with the root vCenter object in the TreeView. To ensure that you receive events about vCenter tasks that do not contain inventory information, select **vCenter** for the *Select vCenter entity type* parameter.

Each event report shows the following information:

- ◆ Task name
- ◆ Target
- ◆ User name
- ◆ Time on the vCenter Server when the task completed
- ◆ Error message

NOTE: The first time you run this script, you may experience a short delay before actual monitoring begins. This delay is caused by the various initialization processes that must be carried out by the Tasks script.

4.23.1 Resource Objects

Run the Discovery_VirtualCenter Knowledge Script on the vSphere components you want to monitor before running this Knowledge Script. You can also monitor objects that the Discovery_VirtualCenter Knowledge Script does *not* discover, such as distributed virtual port groups and distributed virtual switches.

You can run this script on the following resource objects:

- ◆ vCenter server
- ◆ Clusters
- ◆ Datacenters
- ◆ Datastores (you cannot monitor folders under the Datastore object)
- ◆ Hosts
- ◆ Resource pools
- ◆ Virtual appliances (vApps)
- ◆ Virtual machines
- ◆ Folders (you can only monitor the folder objects found under the Host & Clusters parent folder in the TreeView pane)
- ◆ Distributed virtual port groups (not displayed in the TreeView pane)
- ◆ Distributed virtual switches (not displayed in the TreeView pane)
- ◆ Network (not displayed in the TreeView pane)
- ◆ VMware distributed virtual switch (not displayed in the TreeView pane)

4.23.2 Default Schedule

The default interval for this script is **Asynchronous**. After you start the Knowledge Script, its job status appears as **Running**.

4.23.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in. The default is 5.
Event severity when Tasks job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the Tasks job fails unexpectedly. The default is 5.
Event severity when filter settings contain conflicts	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the filter settings contain conflicts. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor vCenter Task Failures	
Event Notification	
Raise event if vCenter task fails?	Select Yes to raise an event if a vCenter "error" event is detected. The default is Yes.
Event severity when vCenter task fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a vCenter task fails. The default is 10.
Select vCenter entity type	<p>Click Browse [...] to select the vCenter entity types you want to monitor. The default is <i>all</i> entity types: Cluster, Datacenter, Datastore, dvSwitchFolder, dvPortGroup, Folder, Host, Network, ResourcePool, vApp, vCenter, VirtualMachine, VMwaredvSwitch.</p> <p>Click Browse [...] to select the vCenter entity types you want to monitor. The default settings include these entity types: Cluster, Datacenter, Datastore, Folder, Host, ResourcePool, VirtualMachine.</p> <p>NOTE: To monitor a datastore cluster object, select vCenter for this parameter.</p>
Task user name	<p>If you want to raise events only for a specific user, provide the name of the vCenter user you want to monitor. If you do not enter a user name, AppManager raises events related to all users. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Do not leave this parameter blank.</p>

Parameter	How to Set It
Task name	<p>If you want to raise events only for a specific task, provide the name of the vCenter task you want to monitor. If you do not enter a task name, AppManager raises events related to all tasks. This parameter is not case-sensitive.</p> <p>The asterisk (*) and (?) are acceptable wildcards.</p> <p>NOTE: You must enter at least a * for this script to run. Do not leave this parameter blank.</p>

4.24 VirtualCenterCPUUsage

Use this Knowledge Script to monitor the CPU usage of the vCenter process and total CPU usage on the computer hosting the vCenter. This script raises an event when CPU usage exceeds the threshold you set. This script monitors and collects data for the following performance metric:

- ◆ CPU usage - Amount of actively used virtual CPU, as a percentage of total available CPU.

NOTE: When you run this script on a proxy agent computer to remotely monitor vCenter, this script will not monitor the vCenter services or collect any data.

4.24.1 Resource Object

vCenter server

4.24.2 Default Schedule

By default, this script runs every **10 minutes**.

4.24.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when VirtualCenter CPU usage exceeds the threshold?	Select Yes to raise an event if vCenter CPU usage exceeds the threshold you set. The default is Yes.
Event severity when VirtualCenter CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU usage for the vCenter process exceeds the threshold. The default is 15.
Raise event when total host CPU usage exceeds the threshold?	Select Yes to raise an event if total CPU usage on the host computer exceeds the threshold you set. The default is Yes.
Event severity when total host CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which total CPU usage on the host computer exceeds the threshold. The default is 15.

Parameter	How to Set It
Event severity when VirtualCenter CPUUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the CPUUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for VirtualCenter CPU usage?	Select Yes to collect data about vCenter CPU usage charts and reports. The default is unselected.
Collect data for total host CPU usage?	Select Yes to collect data about total CPU usage on the host for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for VirtualCenter CPU usage (%)	Specify the maximum amount of CPU usage that can occur for the vCenter process before an event is raised. The default is 60%.
Maximum threshold for total host CPU usage (%)	Specify the maximum amount of CPU usage that can occur on the host computer before an event is raised. The default is 95%.

4.25 VirtualCenterMemoryUsage

Use this Knowledge Script to monitor memory usage of the vCenter process and the total amount of memory being used on the server hosting vCenter. This script raises an event if the memory usage exceeds the threshold you set.

NOTE: When you run this script on a proxy agent computer to remotely monitor the vCenter, this script will not monitor the vCenter services or collect any data.

4.25.1 Resource Object

vCenter server

4.25.2 Default Schedule

By default, this script runs every **10 minutes**.

4.25.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when memory usage exceeds the threshold?	Select Yes to raise an event if the percentage of cluster memory usage exceeds the threshold you set. The default is Yes.
Event severity when memory usage exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory usage exceeds the threshold. The default is 15.

Parameter	How to Set It
Raise event when total host memory usage exceeds the threshold?	Select Yes to raise an event if total memory usage for the host computer exceeds the threshold you set. The default is Yes.
Event severity when total host memory usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which total memory usage for the host computer exceeds the threshold. The default is 15.
Event severity when VirtualCenterMemoryUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VirtualCenterMemoryUsage job fails unexpectedly. The default is 5.
Data Collection	
Collect data for VirtualCenter memory usage?	Select Yes to collect data about vCenter memory usage for charts and reports. The default is unselected.
Collect data for total host memory usage?	Select Yes to collect data about total memory usage on the host computer for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for VirtualCenter memory usage (KB)	Specify the maximum amount of memory usage that can occur for the vCenter process before an event is raised. The default is 20000 kilobytes.
Maximum threshold for total host memory usage (KB)	Specify the maximum amount of memory usage that can occur on the host computer before an event is raised. The default is 20000 kilobytes.

4.26 VirtualMachineInventory

Use this Knowledge Script to monitor hosts and virtual machines that are added, removed, renamed, moved, migrated, or edited in vCenter. This script raises an event when any of the listed actions occurs. In addition, this script can perform a rediscovery when these events occur, which allows the AppManager console to display the most current inventory of hosts and virtual machines in vCenter.

NetIQ Corporation recommends you use the [Inventory](#) Knowledge Script instead of this script for inventory monitoring.

NOTE: In rare situations, queries to the ESX or ESXi host might fail with timeouts because the ESX or ESXi host stops responding. You can work around this issue by restarting the management service on the ESX or ESXi host.

4.26.1 Resource Object

vCenter server

4.26.2 Default Schedule

By default, this script runs every **hour**.

4.26.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	Important If you are using this module with AppManager 8.0, the following <i>Raise event...</i> parameters should be unselected. Use the Inventory Knowledge Script if you want to raise events related to inventory changes with AppManager 8.0.
Raise event when virtual machines added?	Select Yes to raise an event when a virtual machine is added to vCenter. The default is Yes.
Event severity when virtual machines added	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is added to vCenter. The default is 15.
Raise event when virtual machines removed?	Select Yes to raise an event when a virtual machine is removed from vCenter. The default is Yes.
Event severity when virtual machines removed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is removed from vCenter. The default is 15.
Raise event when virtual machines renamed?	Select Yes to raise an event when a virtual machine is renamed. The default is Yes.
Event severity when virtual machines renamed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is renamed. The default is 15.
Raise event when virtual machines moved?	Select Yes to raise an event when a virtual machine is moved within vCenter. The default is unselected.
Event severity when virtual machines moved	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machines is moved within vCenter. The default is 15.
Raise event when virtual machines migrated?	Select Yes to raise an event when a virtual machine is migrated within vCenter. The default is Yes.
Event severity when virtual machines migrated	Set the event severity level, from 1 to 40, to indicate the importance of an event in which virtual machines are migrated within vCenter. The default is 15.
Raise event when rediscovery failed?	Select Yes to raise an event when rediscovery fails. The default is unselected.
Event severity when rediscovery fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which rediscovery fails. The default is 5.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VirtualMachineInventory job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VirtualMachineInventory job fails unexpectedly. The default is 5.

Parameter	How to Set It
Event severity when writing XML to file successful	Set the event severity level, from 1 to 40, to indicate the importance of an event in which writing the XML code to a file succeeds. The default is 25.
Data Collection	
Collect data when virtual machines are added?	Select Yes to collect data about virtual machines that are added to vCenter. The default is unselected.
Collect data when virtual machines are removed?	Select Yes to collect data about virtual machines that are removed from vCenter. The default is unselected.
Collect data when virtual machines are renamed?	Select Yes to collect data about virtual machines that are renamed within vCenter. The default is unselected.
Collect data when virtual machines are moved?	Select Yes to collect data about virtual machines that are moved within vCenter. The default is unselected.
Collect data when virtual machines are migrated?	Select Yes to collect data about virtual machines that are migrated in vCenter. The default is unselected.
Rediscovery Options	Important If you are using this module with AppManager 8.0, select Yes for the following <i>Rediscover</i> parameters. Do not use the discovery parameters in the Inventory Knowledge Script.
Rediscover if virtual machines are added?	Select Yes to perform rediscovery when a virtual machine is added to vCenter. The default is unselected.
Rediscover if virtual machines are removed?	Select Yes to perform rediscovery when a virtual machine is removed from vCenter. The default is unselected.
Rediscover if virtual machines are renamed?	Select Yes to perform rediscovery when a virtual machine is renamed within vCenter. The default is unselected.
Rediscover if virtual machines are moved?	Select Yes to perform rediscovery when a virtual machine is moved within vCenter. The default is unselected.
Rediscover if virtual machines are migrated?	Select Yes to perform rediscovery when a virtual machine is migrated in vCenter. The default is unselected.

4.27 VmConnected

Use this Knowledge Script to monitor changes in the connection status of virtual machines to vCenter. This script raises an event if a virtual machine is disconnected or reconnected.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
- ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.

4.27.1 Resource Object

vSphere virtual machine

4.27.2 Default Schedule

By default, this script runs every day at 15 minute intervals starting at 12:01 AM and ending at 11:59 PM. If you start the job after the scheduled starting time, the script runs at the time of the next scheduled interval. For example, if you start the job at 12:10 AM, it runs for the first time at 12:16 AM.

NOTE: If you are running this script as part of the [Recommended Knowledge Script Groups](#), do not change the schedule. The schedules for the recommended scripts are staggered to lessen the impact on CPU utilization when you run the KSG.

4.27.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when status information is not available?	Select Yes to raise an event when information about the virtual machine's connection status is not available. The default is unselected.
Event severity when status information is not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which information about the virtual machine's connection status is not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmConnected job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmConnected job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Connection Status	
Event Notification	
Raise event when a virtual machine is disconnected	Select Yes to raise an event when a connected virtual machine is disconnected from vCenter. The default is Yes.
Event severity when virtual machine is disconnected	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is disconnected from vCenter. The default is 15.
Raise event when a virtual machine is reconnected	Select Yes to raise an event when a disconnected virtual machine is reconnected to vCenter. The default is Yes.

Parameter	How to Set It
Event severity when virtual machine is reconnected	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is reconnected to vCenter. The default is 15.

4.28 VmCPUUsage

Use this Knowledge Script to monitor the following CPU metrics for a virtual machine:

- ◆ CPU ready - Percentage of time that the virtual machine was ready, but could not get scheduled to run on the physical CPU. CPU ready time is dependent on the number of virtual machines on the host and their CPU loads.
- ◆ CPU system - Amount of time spent on system processes on each virtual CPU in the virtual machine.
- ◆ CPU usage - Amount of actively used virtual CPU, as a percentage of total available CPU. This is the host's view of the CPU usage, not the guest operating system's view. It is the average CPU utilization over all available virtual CPUs in the virtual machine.
- ◆ CPU usage in MHz - Total amount of CPU used, in MHz, during the interval. This is the same value as CPU usage represented in MHz instead of a percentage.
- ◆ CPU used - Total CPU usage. CPU used as a percentage and CPU usage as a percentage are the same value.
- ◆ CPU wait - Amount of CPU time spent in wait state.

This script raises an event if a monitored value exceeds the threshold you set.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
 - ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.
 - ◆ CPU wait is a combined metric that includes CPU idle, CPU wait, and CPU halted. CPU wait is a defect in VMware. NetIQ Corporation is currently researching a solution with VMware (SR #1123183421). AppManager matches the value provided by VMware. For more information about this issue, see the VI SDK Release Notes at <http://www.vmware.com/support/developer/vc-sdk/visdk-2.5.0-200711-releasenotes.html>.
 - ◆ In vCenter version 2.0.2 environments, event and datastream values for the CPU Wait metric correspond to the value of the CPU Idle metric.
-

4.28.1 Resource Object

vSphere virtual machine

4.28.2 Default Schedule

By default, this script runs every day at 15 minute intervals starting at 12:05 AM and ending at 11:59 PM. If you start the job after the scheduled starting time, the script runs at the time of the next scheduled interval. For example, if you start the job at 12:10 AM, it runs for the first time at 12:20 AM.

NOTE: If you are running this script as part of the [Recommended Knowledge Script Groups](#), do not change the schedule. The schedules for the recommended scripts are staggered to lessen the impact on CPU utilization when you run the KSG.

4.28.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Job Failure Notification	
Raise event when CPU metrics are not available?	Select Yes to raise an event if CPU metrics are not available. The default is unselected.
Event severity when CPU metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU metrics are not available. The default is 15.
Event severity when AppManger failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmCPUUsage job fails unexpectedly	Set the severity level, from 1 to 40, to indicate the importance of an event in which the VmCPUUsage job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitoring CPU Ready	
Event Notification	
Raise event when average CPU ready exceeds the threshold?	Select Yes to raise an event when average CPU ready exceeds the threshold you set. The default is Yes.
Threshold -- Maximum average CPU ready	Specify the maximum average CPU ready that can occur before an event is raised. The default is 10 percent.
Event severity when average CPU ready exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU ready exceeds the threshold. The default is 15.
Data Collection	

Parameter	How to Set It
Collect data for average CPU ready?	Select Yes to collect data about average CPU ready for charts and reports. The default is unselected.
Collect data for individual CPU ready?	Select Yes to collect data about individual CPU ready for charts and reports. The default is unselected.
Monitoring CPU System	
Event Notification	
Raise event when average CPU system exceeds the threshold?	Select Yes to raise an event when average CPU system exceeds the threshold you set. The default is unselected.
Threshold -- Maximum average CPU system	Specify the maximum average CPU system that can occur before an event is raised. The default is 20 percent.
Event severity when average CPU system exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU system exceeds the threshold. The default is 15.
Raise event when individual CPU system exceeds the threshold?	Select Yes to raise an event when individual CPU system exceeds the threshold you set. The default is unselected.
Threshold -- Maximum individual CPU system	Specify the maximum individual CPU system that can occur before an event is raised. The default is 20 percent.
Event severity when individual CPU system exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when individual CPU system exceeds the threshold. The default is 15.
Data Collection	
Collect data for average CPU system?	Select Yes to collect data about average CPU system for charts and reports. The default is unselected.
Collect data for individual CPU system?	Select Yes to collect data about individual CPU system for charts and reports. The default is unselected.
Monitoring CPU Usage	
Event Notification	
Raise event when average CPU usage exceeds the threshold?	Select Yes to raise an event when average CPU usage exceeds the threshold you set. The default is Yes.
Threshold -- Maximum average CPU usage	Specify the maximum average CPU usage that can occur before an event is raised. The default is 80 percent.
Event severity when average CPU usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU usage exceeds the threshold. The default is 15.
Data Collection	
Collect data for average CPU usage?	Select Yes to collect data about average CPU usage for charts and reports. The default is unselected.
Collect data for individual CPU usage?	Select Yes to collect data about individual CPU usage for charts and reports. The default is unselected.
Monitoring CPU Usage in MHz	
Event Notification	

Parameter	How to Set It
Raise event when average CPU usage in MHz exceeds the threshold?	Select Yes to raise an event when average CPU usage in MHz exceeds the threshold you set. The default is unselected.
Threshold -- Maximum average CPU usage in MHz	Specify the maximum average CPU usage in MHz that can occur before an event is raised. The default is 2000 MHz.
Event severity when average CPU usage in MHz exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU usage in MHz exceeds the threshold. The default is 15.
Raise event when individual CPU usage in MHz exceeds the threshold?	Select Yes to raise an event when individual CPU usage in MHz exceeds the threshold you set. The default is unselected.
Threshold -- Maximum individual CPU usage in MHz	Specify the maximum individual CPU usage in MHz that can occur before an event is raised. The default is 2000 MHz.
Event severity when individual CPU usage in MHz exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when individual CPU usage in MHz exceeds the threshold. The default is 15.
Data Collection	
Collect data for average CPU usage in MHz?	Select Yes to collect data about average CPU usage in MHz for charts and reports. The default is unselected.
Collect data for individual CPU usage in MHz?	Select Yes to collect data about individual CPU usage in MHz for charts and reports. The default is unselected.
Monitoring CPU Used	
Event Notification	
Raise event when average CPU used exceeds the threshold?	Select Yes to raise an event when average CPU used exceeds the threshold you set. The default is Yes.
Threshold -- Maximum average CPU used	Specify the maximum average CPU used that can occur before an event is raised. The default is 80 percent.
Event severity when average CPU used exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU used exceeds the threshold. The default is 15.
Data Collection	
Collect data for average CPU used?	Select Yes to collect data about average CPU used for charts and reports. The default is unselected.
Collect data for individual CPU used?	Select Yes to collect data about individual CPU used for charts and reports. The default is unselected.
Monitoring CPU Wait	
Event Notification	
Raise event when average CPU wait exceeds the threshold?	Select Yes to raise an event when average CPU wait exceeds the threshold you set. The default is unselected.
Threshold -- Maximum average CPU wait	Specify the maximum average CPU wait that can occur before an event is raised. The default is 10 percent.
Event severity when average CPU wait exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when average CPU wait exceeds the threshold. The default is 15.

Parameter	How to Set It
Data Collection	
Collect data for average CPU wait?	Select Yes to collect data about average CPU wait for charts and reports. The default is unselected.
Collect data for individual CPU wait?	Select Yes to collect data about individual CPU wait for charts and reports. The default is unselected.

4.29 VmDiskIO

Use this Knowledge Script to monitor disk reads/writes for a virtual machine. This script raises an event if the rate of reads/writes exceeds the threshold you set. This script monitors and collects data for the following performance metrics:

- ◆ Disk read rate - Rate at which data is read from each virtual disk on the virtual machine
- ◆ Disk write rate - Rate at which data is written to each virtual disk on the virtual machine
- ◆ Total disk I/O for the virtual disk

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
 - ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.
-

4.29.1 Resource Object

vSphere virtual machine

4.29.2 Default Schedule

By default, this script runs every day at 15 minute intervals starting at 12:07 AM and ending at 11:59 PM. If you start the job after the scheduled starting time, the script runs at the time of the next scheduled interval. For example, if you start the job at 12:10 AM, it runs for the first time at 12:22 AM.

NOTE: If you are running this script as part of the [Recommended Knowledge Script Groups](#), do not change the schedule. The schedules for the recommended scripts are staggered to lessen the impact on CPU utilization when you run the KSG.

4.29.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	

Parameter	How to Set It
Raise event when total disk IO exceeds the threshold?	Select Yes to raise an event when total disk IO exceeds the threshold you set. The default is unselected.
Event severity when total disk IO exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which total disk IO exceeds the threshold you set. The default is 15
Raise event when average disk reads exceed the threshold?	Select Yes to raise an event when average disk reads exceed the threshold you set. The default is Yes.
Event severity when average disk reads exceed the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which average disk reads exceed the threshold. The default is 15.
Raise event when disk writes exceed the threshold?	Select Yes to raise an event if the rate of disk writes exceeds the threshold you set. The default is Yes.
Event severity when disk writes exceed the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk writes exceeds the threshold. The default is 15.
Raise event when disk I/O metrics are not available?	Select Yes to raise an event if disk I/O metrics are not available. The default is unselected.
Event severity when disk I/O metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk I/O metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmDiskIO job fails unexpectedly.	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmDiskIO job fails unexpectedly. The default is 5.
Data Collection	
Collect data for total disk IO?	Select Yes to collect data about total disk IO for charts and reports. The default is unselected.
Collect data for average disk reads?	Select Yes to collect data about average disk reads for charts and reports. The default is unselected.
Collect data for average disk writes?	Select Yes to collect data about average disk writes for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for disk IO	Specify the maximum rate at which disk IO can occur before an event is raised. The default is 20 megabytes per second.
Maximum threshold for average disk reads	Specify the maximum rate at which average disk reads can occur before an event is raised. The default is 1 megabyte per second.

Parameter	How to Set It
Maximum threshold for average disk writes	Specify the maximum rate at which average disk writes can occur before an event is raised. The default is 1 megabyte per second.

4.30 VmDiskUsage

Use this Knowledge Script to monitor logical disk usage for a virtual machine. This script raises an event when the disk usage exceeds the threshold you set.

This Knowledge Script cannot monitor the logical disk usage for a virtual machine when the virtual machine's disk is a mounted drive.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
- ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.

4.30.1 Resource Object

vSphere virtual machine

4.30.2 Default Schedule

By default, this script runs every **15 minutes**.

4.30.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when disk metrics are not available?	Select Yes to raise an event when disk metrics are not available. The default is unselected.
Event severity when disk metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which disk metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to get metrics. The default is 15.

Parameter	How to Set It
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in. The default is 5.
Event severity when VMDiskUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VMDiskUsage job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Logical Disk Usage	
Event Notification	
Raise event if logical disk free space falls below the threshold	Select Yes to raise an event when logical disk free space falls below the threshold you set. The default is Yes.
Unit type	Select whether to measure the amount of logical disk free space in Percent , MBytes , or GBytes . The default is MBytes.
Threshold -- Minimum logical disk free space available	Specify the minimum amount of logical disk free space that can be available before an event is raised. The default is 500 MBytes.
Event severity when logical disk free space falls below the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which logical disk available free space falls below the threshold. The default is 15.
Raise event if logical disk space usage exceeds the threshold	Select Yes to raise an event when logical disk space usage exceeds the threshold you set. The default is Yes.
Unit type	Select whether to measure the amount of disk space usage in Percent , MBytes , or GBytes . The default is Percent.
Threshold -- Maximum logical disk space usage	Specify the amount of logical disk space usage that can occur before an event is raised. The default is 80 percent.
Event severity when logical disk space usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which logical disk space usage exceeds the threshold. The default is 15.
Data Collection	
Collect data for logical disk free space?	Select Yes to collect data about logical disk free space for charts and reports. The default is unselected.
Collect data for logical disk space usage?	Select Yes to collect data about logical disk space usage for charts and reports. The default is unselected.

4.31 VmMemoryUsage

Use this Knowledge Script to monitor memory usage for a virtual machine. This script raises an event if a monitored metric exceeds the threshold you set. This script monitors and collects data for the following performance metrics:

- ◆ Memory active - Amount of guest physical memory in use by the virtual machine. This is an estimate provided by the VMkernel and represents the actual amount of memory the virtual machine needs.
- ◆ Memory balloon - Amount of guest physical memory that is currently reclaimed from the virtual machine through ballooning. This is the amount of guest physical memory that has been allocated and pinned by the balloon driver.
- ◆ Memory consumed - Amount of guest physical memory consumed by the virtual machine for guest memory. Consumed memory does not include overhead memory. It includes shared memory and memory that might be reserved, but not actually used.
- ◆ Memory granted - Guest “physical” memory that is mapped to machine memory.
- ◆ Memory overhead - Amount of overhead memory (in kilobytes) required for virtualization of the virtual machine. Excess memory overhead values can indicate virtualization problems.
- ◆ Memory shared - Amount of guest “physical” memory shared with other virtual machines (through the VMkernel’s transparent page-sharing mechanism, a RAM de-duplication technique).
- ◆ Memory state - Amount of free machine memory on the host. The VMkernel has four free-memory thresholds that affect memory reclamation:
 - ◆ 0 (high) Free memory \geq 6% of machine memory minus Service Console memory.
 - ◆ 1 (soft) 4%
 - ◆ 2 (hard) 2%
 - ◆ 3 (low) 1%
 - ◆ 0 (high) and 1 (soft): Swapping is favored over ballooning.
 - ◆ 2 (hard) and 3 (low): Ballooning is favored over swapping.
- ◆ Memory swap in - Total amount of data that has been read into machine memory from the swap file since the virtual machine was powered on.
- ◆ Memory swap in rate - Rate at which memory is swapped from disk into active memory.
- ◆ Memory swap out - Total amount of data that the VMkernel has written to the virtual machine's swap file from machine memory. This statistic refers to VMkernel swapping and not to guest OS swapping.
- ◆ Memory swap out rate - Rate at which memory is being swapped from active memory to disk.
- ◆ Memory usage - Percentage of total configured or available memory usage.
- ◆ Memory zero - Memory (as a percentage) that is zeroed out. This value can indicate that there are virtual machines with more memory allocated to them than they need. By reducing the allocated memory you can increase the total number of running virtual machines, achieving a greater virtual to physical running ratio.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
 - ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.
-

4.31.1 Resource Object

vSphere virtual machine

4.31.2 Default Schedule

By default, this script runs every day at 15 minute intervals starting at 12:03 AM and ending at 11:59 PM. If you start the job after the scheduled starting time, the script runs at the time of the next scheduled interval. For example, if you start the job at 12:10 AM, it runs for the first time at 12:18 AM.

NOTE: If you are running this script as part of the [Recommended Knowledge Script Groups](#), do not change the schedule. The schedules for the recommended scripts are staggered to lessen the impact on CPU utilization when you run the KSG.

4.31.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when memory metrics are not available?	Select Yes to raise an event if memory metrics are not available. The default is unselected.
Event severity when memory metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmMemoryUsage job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmMemoryUsage job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	

Parameter	How to Set It
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitoring Memory Active	
Event Notification	
Raise event when memory active exceeds the threshold?	Select Yes to raise an event when the memory active exceeds the threshold you set. The default is unselected.
Threshold -- Maximum for memory active	Specify the maximum percentage for memory active before an event is raised. The default is 20 percent.
Event severity when memory active exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event when the active memory exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory active?	Select Yes to collect data about memory active for charts and reports. The default is unselected.
Monitor Memory Balloon	
Event Notification	
Raise event when memory balloon exceeds the threshold?	Select Yes to raise an event if the percentage of memory balloon exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory balloon	Specify the maximum percentage for memory balloon before an event is raised. The default is 2 percent.
Event severity when memory balloon exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of memory balloon exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory balloon?	Select Yes to collect data about memory balloon for charts and reports. The default is unselected.
Monitor Memory Consumed	
Event Notification	
Raise event when memory consumed exceeds the threshold?	Select Yes to raise an event if the percentage of memory consumed exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory consumed	Specify the maximum percentage of memory consumed before an event is raised. The default is 80 percent.
Event severity when memory consumed exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of memory consumed exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory consumed?	Select Yes to collect data about memory consumed for charts and reports. The default is unselected.
Monitor Memory Granted	
Event Notification	

Parameter	How to Set It
Raise event when memory granted exceeds the threshold?	Select Yes to raise an event when the amount of memory granted exceeds the threshold you set. The default is unselected.
Threshold -- Maximum memory granted	Specify the maximum amount of memory granted before an event is raised. The default is 1024 megabytes.
Event severity when memory granted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory granted exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory granted?	Select Yes to collect data about memory granted for charts and reports. The default is unselected.
Monitor Memory Overhead	
Event Notification	
Raise event when memory overhead exceeds the threshold?	Select Yes to raise an event when the amount of memory overhead exceeds the threshold you set. The default is unselected.
Threshold --Maximum memory overhead	Specify the maximum amount of memory overhead that can occur before an event is raised. The default is 100 megabytes.
Event severity when memory overhead exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory shared exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory overhead?	Select Yes to collect data about memory overhead for charts and reports. The default is unselected.
Monitor Memory Shared	
Event Notification	
Raise event when memory shared falls below the threshold?	Select Yes to raise an event when the amount of memory shared falls below the threshold you set. The default is unselected.
Threshold --Maximum memory shared	Specify the maximum amount of memory shared that can occur before an event is raised. The default is 50 megabytes.
Event severity when memory shared exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory shared exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory shared?	Select Yes to collect data about memory shared for charts and reports. The default is unselected.
Monitor Memory State	
Event Notification	
Raise event when memory state is hard?	Select Yes to raise an event when the memory state is hard. The default is unselected.

Parameter	How to Set It
Event severity when memory state is hard	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is hard. The default is 10.
Raise event when memory state is high?	Select Yes to raise an event when the memory state is high. The default is unselected.
Event severity when memory state is high	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is high. The default is 25.
Raise event when memory state is low?	Select Yes to raise an event when the memory state is low. The default is unselected.
Event severity when memory state is low	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is low. The default is 5.
Raise event when memory state is soft?	Select Yes to raise an event when memory state is soft. The default is unselected.
Event severity when memory state is soft	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory state is soft. The default is 15.
Data Collection	
Collect data for memory state?	Select Yes to collect data about memory state for charts and reports. The default is unselected.
Monitor Memory Swap In	
Data Collection	
Collect data for memory swap in?	Select Yes to collect data about memory swap in for charts and reports. The default is unselected.
Monitor Memory Swap In Rate	
Event Notification	
Raise event when memory swap in rate exceeds the threshold?	Select Yes to raise an event when the memory swap in rate exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory swap in rate	Specify the maximum memory swap in rate that can occur before an event is raised. The default is 1 megabyte per second.
Event severity when memory swap in rate exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory swap in rate exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap in rate?	Select Yes to collect data about memory swap in rate for charts and reports. The default is unselected.
Monitor Memory Swap Out	
Data Collection	
Collect data for memory swap out?	Select Yes to collect data about memory swap out for charts and reports. The default is unselected.

Parameter	How to Set It
Monitor Memory Swap Out Rate	
Event Notification	
Raise event when memory swap out rate exceeds the threshold?	Select Yes to raise an event when the memory swap out rate exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory swap out rate	Specify the maximum memory swap out rate that can occur before an event is raised. The default is 1 megabyte per second.
Event severity when memory swap out rate exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the memory swap out rate exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory swap out rate?	Select Yes to collect data about memory swap out rate for charts and reports. The default is unselected.
Monitor Memory Usage	
Event Notification	
Raise event when memory usage exceeds the threshold?	Select Yes to raise an event when memory usage exceeds the threshold you set. The default is Yes.
Threshold -- Maximum memory usage	Specify the maximum memory usage that can occur before an event is raised. The default is 80 percent.
Event severity when memory usage exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory usage exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory usage?	Select Yes to collect data about memory usage for charts and reports. The default is unselected.
Monitor Memory Zero	
Event Notification	
Raise event when memory zero exceeds the threshold?	Select Yes to raise an event when memory zero exceeds the threshold you set. The default is unselected.
Threshold -- Maximum memory zero	Specify the maximum memory zero that can occur before an event is raised. The default is 20 percent.
Event severity when memory zero exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which memory zero exceeds the threshold. The default is 15.
Data Collection	
Collect data for memory zero?	Select Yes to collect data about memory zero for charts and reports. The default is unselected.

4.32 VmNetworkIO

Use this Knowledge Script to monitor network data received/transmitted for a virtual machine. This script raises an event if the rate of network received/transmitted exceeds the threshold you set. This script monitors and collects data for the following performance metrics:

- ◆ Network received - The rate at which data is received across the virtual machine's vNIC (virtual network interface controller).
- ◆ Network transmitted (Network I/O) - The rate at which data is transmitted across the virtual machine's vNIC (virtual network interface controller).

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
 - ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.
-

4.32.1 Resource Object

vSphere virtual machine

4.32.2 Default Schedule

By default, this script runs every day at 15 minute intervals starting at 12:09 AM and ending at 11:59 PM. If you start the job after the scheduled starting time, the script runs at the time of the next scheduled interval. For example, if you start the job at 12:10 AM, it runs for the first time at 12:24 AM.

NOTE: If you are running this script as part of the [Recommended Knowledge Script Groups](#), do not change the schedule. The schedules for the recommended scripts are staggered to lessen the impact on CPU utilization when you run the KSG.

4.32.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when network received exceeds the threshold?	Select Yes to raise an event if the rate of network data received exceeds the threshold you set. The default is Yes.
Event severity when network data received exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of network data received exceeds the threshold. The default is 15.
Raise event when individual network data received exceeds the threshold?	Select Yes to raise an event if the rate of individual network data received exceeds the threshold you set. The default is unselected.

Parameter	How to Set It
Event severity when individual network data received exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of individual network data received exceeds the threshold. The default is 15.
Raise event when network data transmitted exceeds the threshold?	Select Yes to raise an event if the rate of network data transmitted exceeds the threshold you set. The default is Yes.
Event severity when network data transmitted exceed the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of network data transmitted exceeds the threshold. The default is 15.
Raise event when individual network data transmitted exceeds the threshold?	Select Yes to raise an event if the rate of individual network data transmitted exceeds the threshold you set. The default is unselected.
Event severity when individual network data transmitted exceeds the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the rate of individual network data received exceed the threshold. The default is 15.
Raise event when network I/O metrics are not available?	Select Yes to raise an event if network I/O metrics are not available. The default is unselected.
Event severity when network I/O metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which network I/O metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmNetworkI/O job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmNetworkIO job fails unexpectedly. The default is 5.
Data Collection	
Collect data for network data received?	Select Yes to collect data about the rate of network data received for charts and reports. The default is unselected.
Collect data for individual network data received?	Select Yes to collect data about the rate of individual network data received for charts and reports. The default is unselected.
Collect data for network writes?	Select Yes to collect data about the rate of network writes for charts and reports. The default is unselected.
Collect data for network individual writes?	Select Yes to collect data about the rate of individual network writes for charts and reports. The default is unselected.
Monitoring	
Maximum threshold for network data received	Specify the maximum rate at which network data received can occur before an event is raised. The default is 1 Mbit per second.
Maximum threshold for individual network data received	Specify the maximum rate at which individual network data received can occur before an event is raised. The default is 1 Mbit per second.

Parameter	How to Set It
Maximum threshold for network writes	Specify the maximum rate at which network writes can occur before an event is raised. The default is 1 Mbit per second.
Maximum threshold for individual network writes	Specify the maximum rate at which individual network writes can occur before an event is raised. The default is 1 Mbit per second.

4.33 VmOperations

Use this Knowledge Script to monitor the number of virtual machine operations that are occurring across clusters and datacenters. You can also use this script to raise events when the number of Storage vMotions or vMotions exceed a specified threshold. This script generates data streams for Storage vMotion operations and vMotion operations.

NOTE: The VirtualCenter_VmOperations Knowledge Script is supported on vCenter 4.0 or later.

4.33.1 Resource Object

vSphere datacenters and clusters

4.33.2 Default Schedule

By default, this script runs every **5 minutes**.

4.33.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when virtual machine operation metrics are not available?	Select Yes to raise an event if virtual machine operation metrics are not available. The default is unselected.
Event severity when virtual machine operation metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which virtual machine operation metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve virtual machine operation status from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmOperations job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmOperations job fails unexpectedly. The default is 5.

Parameter	How to Set It
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Virtual Machine Operations	
Event Notification	
Raise event if Storage vMotions exceed the threshold?	Select Yes to raise an event if the number of Storage vMotions exceeds the threshold you set. The default is unselected.
Threshold -- Maximum Storage vMotions	Specify the maximum number of Storage vMotions that can occur before raising an event. The default is 10.
Event severity when Storage vMotions exceed the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of Storage vMotions exceeds the threshold. The default is 15.
Raise event if vMotions exceed the threshold?	Select Yes to raise an event if the number of vMotions exceeds the threshold you set. The default is unselected.
Threshold -- Maximum vMotions	Specify the maximum number of vMotions that can occur before raising an event. The default is 10.
Event severity when vMotions exceed the threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of vMotions exceeds the threshold. The default is 15.
Data Collection	
Collect data for Storage vMotions?	Select Yes to collect data about Storage vMotions for charts and reports. The default is Yes.
Collect data for vMotions?	Select Yes to collect data about vMotions for charts and reports. The default is Yes.

4.34 VmPowerStatus

Use this Knowledge Script to monitor changes in the power status of virtual machines. This script raises an event if a virtual machine is powered on, powered off, or suspended. Based on these events, you can choose to restart, stop, or resume the monitored virtual machines.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
- ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.

4.34.1 Prerequisite

Enable Power On, Power Off, Suspend, and Restart permissions to run this Knowledge Script. For more information, see [Section 2.10, “Upgrading Knowledge Script Jobs,” on page 25](#).

4.34.2 Resource Object

vSphere virtual machine

4.34.3 Default Schedule

By default, this script runs every **15 minutes**.

4.34.4 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
Event Notification	
Raise event when virtual machine is powered on?	Select Yes to raise an event when a virtual machine is in the “powered on” state. The default is Yes.
Event severity when virtual machine is powered on	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is in the “powered on” state. The default is 15.
Raise event when virtual machine is powered off?	Select Yes to raise an event when a virtual machine is in the “powered off” state. The default is Yes.
Event severity when virtual machine is powered off	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the virtual machine is in the “powered off” state. The default is 15.
Raise event when virtual machine is suspended?	Select Yes to raise an event when a virtual machine is in “suspended” state. The default is Yes.
Event severity when virtual machine is suspended	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a virtual machine is in “suspended” state. The default is 15.
Raise event when status information is not available?	Select Yes to raise an event when information about the virtual machine’s connection status is not available. The default is unselected.
Event severity when status information is not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which information about the virtual machine’s connection status is not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.

Parameter	How to Set It
Event severity when VmPowerStatus job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmPowerStatus job fails unexpectedly. The default is 5.
Actions	
When a powered on event is raised, perform this action	Choose to power off , suspend , or take no action when an event is raised because the virtual machine is in “powered on” state. The default is no action.
When a powered off event is raised, perform this action	Choose to power on or take no action when an event is raised because the virtual machine is in “powered off” state. The default is power on.
When a suspended event is raised, perform this action	Choose to resume or take no action when an event is raised because the virtual machine is in “suspended” state. The default is no action.

4.35 VmSnapshotUsage

Use this Knowledge Script to monitor virtual machine snapshots. This script raises an event when the number of all snapshots, the size of all snapshots, or the age of a snapshot or a reverted snapshot exceed the thresholds you set. This script generates data streams for the number of all snapshots, the size of all snapshots, and the age of a snapshot or a reverted snapshot.

NOTE: This script will not generate events for virtual machines that have a parent host in maintenance mode.

4.35.1 Resource Object

vSphere virtual machine

4.35.2 Default Schedule

By default, this script runs **daily**.

4.35.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Raise event when snapshot metrics are not available?	Select Yes to raise an event if none of your monitored virtual machines contain any snapshots. If even one of your monitored virtual machines has a snapshot, or if some snapshots are deleted, the script will <i>not</i> raise an event. The default is unselected.

Parameter	How to Set It
Event severity when snapshot metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which none of your monitored virtual machines contain any snapshots. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which virtual machine snapshot metrics are not available. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmSnapshotUsage job failed unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmUptime job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Snapshots	
Event Notification	
Raise event if number of snapshots exceeds threshold?	Select Yes to raise an event if the number of snapshots exceeds the threshold you set. The default is Yes.
Threshold -- Maximum number of snapshots	Specify the maximum number of snapshots that can be present before raising an event. The default is 0.
Event severity when number of snapshots exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of snapshots exceeds the threshold. The default is 15.
Raise event if the size of all snapshots exceeds threshold?	Select Yes to raise an event if the size of all snapshots exceeds the threshold you set. The default is unselected.
Threshold -- Maximum size of all snapshots	Specify the maximum size of all snapshots that can exist before raising an event. The default is 10 GB.
Event severity when the size of all snapshots exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the size of all snapshots exceeds the threshold. The default is 15.
Raise event if age of a snapshot exceeds threshold?	Select Yes to raise an event if the time between now and the time when the snapshot was first created exceeds the threshold you set. The default is unselected.
Threshold -- Maximum age of a snapshot	Specify the maximum amount of time that can pass since the creation of a snapshot before raising an event. The default is 30 days.
Event severity when age of a snapshot exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the time between now and time when the snapshot was first created exceeds the threshold. The default is 15.
Raise event if the time since a snapshot was last reverted exceeds threshold?	Select Yes to raise an event if the time since a snapshot was last reverted exceeds the threshold. The default is unselected.

Parameter	How to Set It
Threshold -- Maximum time since a snapshot was last reverted	Specify the maximum amount of time that can pass between now and when a snapshot was last reverted before raising an event. The default is 30 days.
Event severity when the time since a snapshot was last reverted exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the time since a snapshot was last reverted exceeds the threshold. The default is 15.
Data Collection	
Collect data for the number of snapshots?	Select Yes to collect data about the number of all snapshots for charts and reports. The default is unselected.
Collect data for the size of all snapshots?	Select Yes to collect data about the size of all snapshots for charts and reports. The default is unselected.
Collect data for the age of snapshots?	Select Yes to collect data about the age of snapshots for charts and reports. The default is unselected.
Collect data for the age of reverted snapshots?	Select Yes to collect data about the age of reverted snapshots for charts and reports. The default is unselected.

4.36 VmToolsStatus

Use this Knowledge Script to monitor the status of VMware Tools for virtual machines. This script raises an event if VMware Tools have never been installed, are not running, have an outdated version, have a current version, and multiple other status values. The script also generates data streams for VMware Tools status.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
 - ◆ Using this script and other VirtualCenter_Vm* scripts to monitor a large number of virtual machines at the same time might cause the jobs to fail. If the jobs fail on a regular basis, consider running the VirtualCenter_Vm* scripts on fewer virtual machines.
-

4.36.1 Resource Object

vSphere virtual machine

4.36.2 Default Schedule

By default, this script runs every **1 Day**.

4.36.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	
Job Failure Notification	
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve metrics from vCenter. The default is 15.
Event severity when AppManager when failed to log in	Set the event severity level, form 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VMToolsStatus job fails unexpectedly	Set the event severity level, form 1 to 40, to indicate the importance of an event in which the VMToolsStatus job fails unexpectedly. The default is 5.
Raise event when status information is not available?	Select Yes to raise an event when information about the virtual machine's connection status is not available. The default is unselected.
Event severity when status information is not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which information about the virtual machine's connection status is not available. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor VMware Tools Status	
Event Notification	
Running Status	
Raise event when not installed?	Select Yes to raise an event when VM Tools have not been installed on the virtual machine. The default is Yes.
Event severity when not installed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VM Tools have not been installed on the virtual machine. The default is 15.
Raise event when not running?	Select Yes to raise an event when VMware Tools are not running on a virtual machine. The default is Yes.
Event severity when not running	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are not running on a virtual machine. The default is 15.
Raise event when not running on powered-off virtual machine?	Select Yes to raise an event when VMware Tools are not running on a powered-off virtual machine. The default is Yes.
Event severity when not running on powered-off virtual machine	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are not running on a powered-off virtual machine. The default is 5.

Parameter	How to Set It
Version Status	
Raise event when blacklisted and needs immediate upgrade?	Select Yes to raise an event when VMware Tools have been blacklisted and need an immediate upgrade. The default is Yes.
Event severity when blacklisted and needs immediate upgrade	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools have been blacklisted and need an immediate upgrade. The default is 5.
Raise event when not current and not supported?	Select Yes to raise an event when VMware Tools are so old that they are not current and not supported. The default is Yes.
Event severity when not current and not supported	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are not current and not supported. The default is 10.
Raise event when not current but supported?	Select Yes to raise an event when VMware Tools are not current but supported. The default is Yes.
Event severity when not current but supported	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are not current but supported. The default is 15.
Raise event when not managed by VMware?	Select Yes to raise an event when VMware Tools are not managed by VMware. The default is Yes.
Event severity when not managed by VMware	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are not managed by VMware. The default is 15.
Raise event when supported and newer than version on host	Select Yes to raise an event when VMware Tools are supported, but a newer version than the version on the host. The default is Yes.
Event severity when supported and newer than version on host	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are supported, but a newer version than the version on the host. The default is 15.
Raise event when too new to work correctly?	Select Yes to raise an event when VMware Tools are too new to work correctly with this module. The default is Yes.
Event severity when too new to work correctly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which VMware Tools are too new to work correctly with this module. The default is 10.
Data Collection	

Parameter	How to Set It
Collect data for VMware Tools status?	<p>Select Yes to collect VMware Tools status data for charts and reports. The default is unselected.</p> <p>NOTE: If selected, the possible values are:</p> <ul style="list-style-type: none"> ◆ 0: VMware Tools are not installed ◆ 1: VMware Tools are not running ◆ 2: VMware Tools version is old ◆ 3: VMware Tools are okay ◆ 4: VMware Tools are not running on powered-off virtual machines ◆ 5: VMware Tools are blacklisted and need an immediate upgrade ◆ 6: VMware Tools are supported and newer than the version on the host ◆ 7: VMware Tools are too new ◆ 8: VMware Tools are not current and not supported ◆ 9: VMware Tools are not managed by VMware

4.37 VmUptime

Use the VirtualCenter_VmUptime Knowledge Script to monitor virtual machine uptime in days. Virtual machine uptime is the time elapsed since the last system startup. This script raises an event when a virtual machine is rebooted, and it collects data for virtual machine uptime.

NOTE

- ◆ If the parent host of the monitored virtual machine is in maintenance mode, this Knowledge Script will not generate events.
- ◆ The VirtualCenter_VmUptime Knowledge Script is supported on vSphere 5.0 or later.

4.37.1 Resource Object

vSphere virtual machine

4.37.2 Default Schedule

By default, this script runs every **5 minutes**.

4.37.3 Setting Parameter Values

Set the following parameters as needed:

Parameter	How to Set It
General Settings	

Parameter	How to Set It
Job Failure Notification	
Raise event when uptime metrics are not available?	Select Yes to raise an event if virtual machine uptime metrics are not available. The default is unselected.
Event severity when uptime metrics are not available	Set the event severity level, from 1 to 40, to indicate the importance of an event in which uptime metrics are not available. The default is 15.
Event severity when AppManager failed to get metrics	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to retrieve virtual machine uptime status from vCenter. The default is 15.
Event severity when AppManager failed to log in	Set the event severity level, from 1 to 40, to indicate the importance of an event in which AppManager failed to log in to vCenter. The default is 5.
Event severity when VmUptime job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the VmUptime job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select either HTML Table or Plain Text as the format for event detail. The default is HTML Table.
Monitor Uptime	
Event Notification	
Raise event if virtual machine reboots?	Select Yes to raise an event if the virtual machine reboots. The default is Yes.
Event severity when virtual machine reboots	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the virtual machine reboots. The default is 15.
Data Collection	
Collect data for uptime?	Select Yes to collect data for graphs and reports. When enabled, data collection returns a datastream for the virtual machine uptime in days. The default is unselected.

4.38 Recommended Knowledge Script Groups

You can find the VirtualCenter Knowledge Script Groups (KSGs) on the RECOMMENDED tab of the Knowledge Script pane of the Operator Console.

All the scripts in the KSGs have their parameters set to recommended values. To run all of the recommended scripts in a KSG at one time, click the RECOMMENDED tab, and then run the KSG on a VirtualCenter resource.

Run the KSG from the Master view, not the VirtualCenter view. In order to use the Discovery_VMware Knowledge Script in a monitoring policy, the view must include root objects, which are not visible in the VirtualCenter view.

The VirtualCenter KSGs enable a “best practices” usage of AppManager for monitoring your VirtualCenter environment. You can use these KSGs with AppManager monitoring policies. A monitoring policy, which lets you efficiently and consistently monitor all the resources in your environment, uses a set of pre-configured Knowledge Scripts to automatically monitor resources as they appear in the TreeView pane. For more information, see “About Policy-Based Monitoring” in the AppManager Help.

A KSG is composed of a subset of a module’s Knowledge Scripts. The script that belongs to a KSG is a different copy of the original script you access from the VirtualCenter tab. If you modify a script that belongs to a KSG, the parameter settings of the original script in the VirtualCenter tab are not affected.

In some cases, default script parameter settings are different when the script is deployed as part of a KSG, as opposed to when it is deployed alone. The default settings of a script within a group depend on its monitoring purpose within the larger group, and on the intended monitoring scope of that group.

If you modify or remove a script associated with the VirtualCenter KSG and want to restore it to its original form, you can reinstall AppManager for VMware vSphere on the repository computer or check in the appropriate script from the `AppManager\qdb\kp\VirtualCenter` directory.

4.38.1 ClusterMonitor Recommended Knowledge Script Group

The following Knowledge Scripts in the AppManager for VMware vSphere module are members of the ClusterMonitor recommended KSG.

- ◆ [ClusterCPUUsage](#)
- ◆ [ClusterMemUsage](#)
- ◆ [ClusterStatus](#)

4.38.2 HostMonitor Recommended Knowledge Script Group

The following Knowledge Scripts in the AppManager for VMware vSphere module are members of the HostMonitor recommended KSG.

- ◆ [DatastoreUsage](#)
- ◆ [HostConnected](#)
- ◆ [HostCPUUsage](#)
- ◆ [HostDiskIO](#)
- ◆ [HostDiskTotalLatency](#)
- ◆ [HostMemoryUsage](#)
- ◆ [HostNetworkIO](#)

4.38.3 ResourcePoolMonitor Recommended Knowledge Script Group

The following Knowledge Scripts in the AppManager for VMware vSphere module are members of the ResourcePoolMonitor recommended KSG.

- ◆ [ResourcePoolCPUUsage](#)
- ◆ [ResourcePoolMemUsage](#)
- ◆ [ResourcePoolStatus](#)

4.38.4 VirtualCenterMonitor Recommended Knowledge Script Group

The following Knowledge Scripts in the AppManager for VMware vSphere module are members of the VirtualCenterMonitor recommended KSG.

- ◆ [HostConnected](#)
- ◆ [HostCPUUsage](#)
- ◆ [HostMemoryUsage](#)
- ◆ [VmConnected](#)
- ◆ [VmCPUUsage](#)
- ◆ [VmMemoryUsage](#)

4.38.5 VirtualMachineMonitor Recommended Knowledge Script Group

The following Knowledge Scripts in the AppManager for VMware vSphere module are members of the VirtualMachineMonitor recommended KSG.

- ◆ [VmCPUUsage](#)
- ◆ [VmDiskIO](#)
- ◆ [VmDiskUsage](#)
- ◆ [VmMemoryUsage](#)
- ◆ [VmNetworkIO](#)
- ◆ [VmToolsStatus](#)

