Cisco Tidal Enterprise Scheduler VMware Adapter Guide

Version: 6.2.1

May 3, 2016

CONTENTS

CHAPTER

Preface

This guide describes the installation, configuration, and usage of the SSH Adapter with Cisco Tidal Enterprise Scheduler (TES).

Audience

This guide is for administrators who install and configure the SSH Adapter for use with Cisco Tidal Enterprise Scheduler, and who troubleshoot TES installation and requirements issues.

Related Documentation

See the *Cisco Tidal Enterprise Scheduler Documentation Overview* for your release on cisco.com at:

http://www.cisco.com/c/en/us/support/cloud-systems-management/tidal-enterprise-scheduler/products-documentation-roadmaps-list.html

...for a list of all Cisco Tidal Enterprise Scheduler guides.

Note We sometimes update the documentation after original publication. Therefore, you should also review the documentation on Cisco.com for any updates.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html.

Subscribe to What's New in Cisco Product Documentation, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.

Document Change History

The table below provides the revision history for the SSH Adapter Guide.

Version Number	Issue Date	Reason for Change
6.1.0	October 2012	• New Cisco version.
6.2.1	June 2014	• Available in online Help only.
6.2.1 SP2	June 2015	• Configuration provided in the *Cisco Tidal Enterprise Scheduler Installation Guide*; usage provided in online Help only.
6.2.1 SP3	May 2016	• Consolidated all SSH Adapter documentation into one document.

CHAPTER **1**

Introducing the VMware Adapter

This chapter provides an overview of the Cisco Tidal Enterprise Scheduler VMware Adapter and its requirements:

- Overview
- Prerequisites

Overview

Workload automation extends beyond managing the execution of business application tasks to automating the management of the infrastructure that supports these tasks as well. As both services and infrastructure become virtualized through SOA and virtualization technology, the scheduling solution needs to proactively manage the loose coupling between business process and infrastructure.

Host servers often support dozens to hundreds of virtual machines. This creates a challenge for coordinating the availability of hosts through power management, preserving and restoring machine states through snapshots, and configuring servers for specific tasks.

For example, consider a business process that requires a dedicated machine to produce quarterly tax reports with a specific configuration of CPU, memory and applications, but only for a limited period of time four times a year. If this dedicated machine were virtualized using VMware, it could remain powered off until the schedule demanded that it be ready for this process, and only then powered on. Knowing when to power on or power off a machine and/or when to take a snapshot for checkpoint backups is the job of a scheduler. Therefore, the scheduler needs to automate these tasks along with the more typical application tasks.

The Tidal Enterprise Scheduler VMware Adapter connects to its Virtual Infrastructure to provide a new type of job to manage virtual machines and their hosts. The adapter enables you to perform the following tasks:

- Power Management – Power on, suspend or resume, shutdown, and power off virtual machines and their hosts
- Snapshot Management – Capture and restore snapshots on virtual machines
- Host Management – Power host servers up and down, reboot host servers, and move host servers into and out of maintenance
- Configuration Management – Configure CPU, memory, disk, and the network on virtual machines, and migrate virtual machines using VMotion

The adapter also supports events that can be used to automate a response to changes in power state and/or host and guest performance conditions.

Prerequisites

Prior to configuring the VMware Adapter, you must ensure that the following prerequisites have been met:

- VMware VirtualCenter and ESX servers are configured to use HTTPS protocol, if necessary. See Configuring the HTTPS Protocol for how to do this.

- Security certificates for all target servers have been obtained.

- Security certificates for all target servers have been exported to a local directory.

- Security certificates for all target servers have been imported into the Java Keystore.

Software Requirements

Enterprise Scheduler supports the following VMware environment:

- VMware VirtualCenter v3.5, 4.0

- VMware VirtualCenter Server 4.1.0

- VMware ESX Server 4.0, 4.1.0

- VMware ESX Server v3.5 using the Virtual Infrastructure SDK v2.5 or later

- VMware ESXi Server 4.1.0, 5.0, 5.1 U1, 5.5, 6.0

See the *Tidal Enterprise Scheduler Compatibility Guide* for possible updates to VMware version support.

Configuring the VMware Adapter

Overview

The VMware Adapter software is installed as part of a normal installation of Enterprise Scheduler. However, you must perform the following steps to license and configure the adapter before you can run VMware jobs:

- Licensing an Adapter – License the connection(s) to the VMware instance. You cannot define a VMware connection until you have applied the VMware license from Tidal Software.

- Securing the VMware Adapter – Define a VMware Authentication user to authorize a connection to be established to the VMware web server and permit requests to be made on behalf of the authenticated account.

- Configuring the HTTPS Protocol – Configure the HTTPS protocol if used in your environment.

- Configuring the VMware Tools Service – Configure the VMware Tools Service to depend on other required application services, ensuring that the required application services are available.

- Defining a VMware Connection – Define a VMware connection so the master can communicate with the VMware server/host.

See Configuring service.props for information about general and adapter-specific properties that can be set to control things like logging and connection properties.

Licensing an Adapter

Each TES Adapter must be separately licensed. You cannot use an Adapter until you apply the license file. If you purchase the Adapter after the original installation of TES, you will receive a new license file authorizing the use of the Adapter.

You might have a Demo license which is good for 30 days, or you might have a Permanent license. The procedures to install these license files are described below.

To license an Adapter:

Step 1   Stop the master:

Windows:

a.   Click **Start** and select **Programs>TIDAL Software>Scheduler>Master>Service Control Manager**.

b. Verify that the master is displayed in the **Service** list and click on the **Stop** button to stop the master.

UNIX:

Enter **tesm stop**

Step 2 Create the license file:

- For a Permanent license, rename your Permanent license file to *master.lic*.

- For a Demo license, create a file called *demo.lic*, then type the demo code into the *demo.lic* file.

Step 3 Place the file in the **C:\Program File\TIDAL\Scheduler\Master\config** directory.

Step 4 Restart the master:

Windows:

Click **Start** in the Service Control Manager.

UNIX:

Enter **tesm start**

The master will read and apply the license when it starts.

Step 5 To validate that the license was applied, select **Registered License** from **Activities** main menu.

Securing the VMware Adapter

There are two types of users associated with the VMware Adapter, Runtime Users and Schedulers. You maintain definitions for both types of users from the **Users** pane.

- **Runtime Users**

  Runtime users in the context of VMware jobs represent those users and passwords required for HTTPS Authentication. VMware operations require authentication against a valid VMware user as defined by a virtual infrastructure administrator. These user(s) will need to be defined as runtime users.

- **Schedulers**

  Schedulers are those users who will define and/or manage VMware jobs. There are three aspects of a user profile that grant and/or limit access to scheduling jobs that effect VMware:

  – Security policy that grants or denies add, edit, delete and view capabilities for VMware jobs.

  – Authorized runtime user list that grants or denies access to specific HTTPS authentication accounts for use with VMware jobs.

  – Authorized agent list that grants or denies access to specific VMware Adapter connections for use when defining VMware jobs.

Defining Runtime Users

To define a runtime user:

Step 1 From the **Navigator** pane, expand the **Administration** node and select **Runtime Users** to display the defined users.

Step 2 Right-click **Runtime Users** and select **Add Runtime User** from the context menu (*Insert* mode).

-or-

Click the **Add** button 🔃 on the Enterprise Scheduler menu bar.

The **User Definition** dialog displays.

Step 3 Enter the new user name in the **User/Group Name** field.

Step 4 For documentation, enter the Full Name or description associated with this user.

Step 5 In the **Domain** field, select a Windows domain associated with the user account required for authentication, if necessary.

Step 6 To define this user as a runtime user for VMware jobs, click **Add** on the **Passwords** tab.

The **Change Password** dialog displays.

Step 7 Select **VMware** from the **Password Type** list.

Step 8 Enter a password (along with confirmation) in the **Password/Confirm Password** fields.

Only those users with a password specified for VMware will be available for use with VMware jobs. The password might be the same as the one specified for Windows/FTP jobs.

Step 9 Click **OK** to return to the **User Definition** dialog.

The new password record displays on the **Passwords** tab.

Step 10 Click **OK** to add or save the user record in the Enterprise Scheduler database.

> ✎
>
> **Note** For more information about the User Definition dialog, see Users in your *Tidal Enterprise Scheduler User Guide*.

Authorizing Schedulers to Work with VMware Jobs

Defining a Security Policy for VMware Jobs

To define a Security Policy that authorizes access to VMware jobs:

Step 1   From the **Navigator** pane, select **Administration>Security Policies** to display the **Security Policies** pane.

Step 2   Right-click **Security Policies** and select **Add Security Policy** from the context menu. You can also right-click a defined security policy in the **Security Policies** pane and select **Edit Security Policy**.

The **Security Policy Definition** dialog displays.
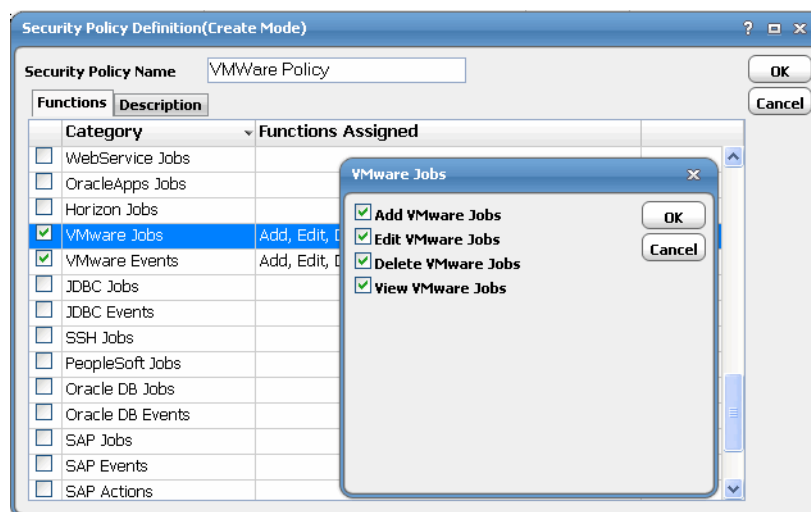
Note   Refer to the *Tidal Enterprise Scheduler User Guide* for a general discussion on setting up security policies that you associate with Scheduler Users.

Step 3   In the **Security Policy Name** field, enter a name for the policy.

Step 4   On the **Functions** page, scroll to the **VMWare Jobs/Events** category, double-click the VMware Job section, then click the check boxes next to the functions that are to be authorized under this policy (**Add**, **Edit**, **Delete** and **View VMWare Jobs/Events**).

Step 5   Click **OK** on the **VMWare Jobs** dialog.

Step 6   Click **OK** to save the policy.

Defining VMware Scheduler Users

To define a Scheduler user to work with VMware jobs:

Step 1   From the **Navigator** pane, expand the **Administration** node and select **Interactive Users** to display the defined users.
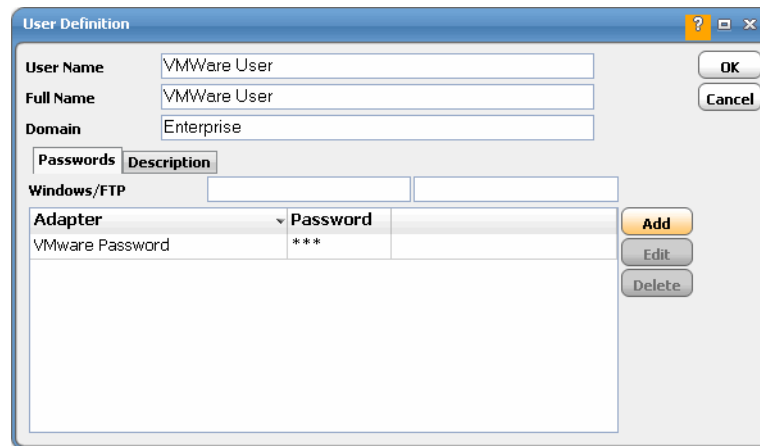
Step 2   Right-click **Interactive Users** and select **Add Interactive User** from the context menu (*Insert* mode). You can also right-click a user in the **Interactive Users** pane and select **Edit Interactive User** from the shortcut menu (*Edit* mode).

The **User Definition** dialog displays.
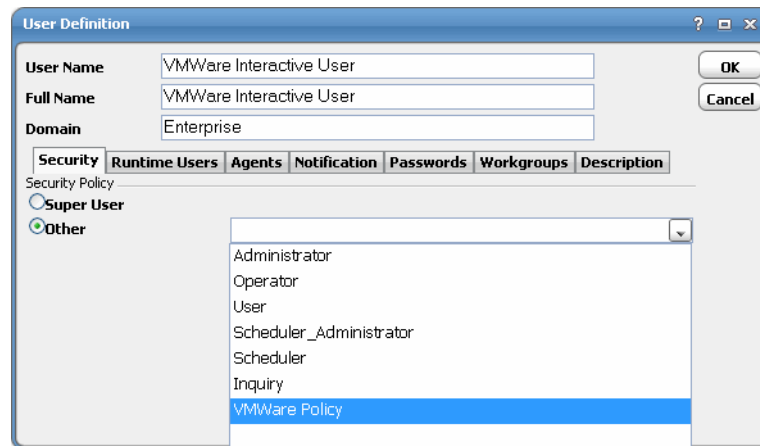
Step 3   If this is a new user definition, enter the new user name in the **User/Group Name** field.

Step 4   For documentation, enter the **Full Name** or description associated with this user.

Step 5   In the **Domain** field, select a Windows domain associated with the user account required for authentication, if necessary.

Step 6   On the **Security** page, select the **Other** option and then select the security policy that includes authorization for VMware jobs.

Step 7   Click the **Runtime Users** tab.
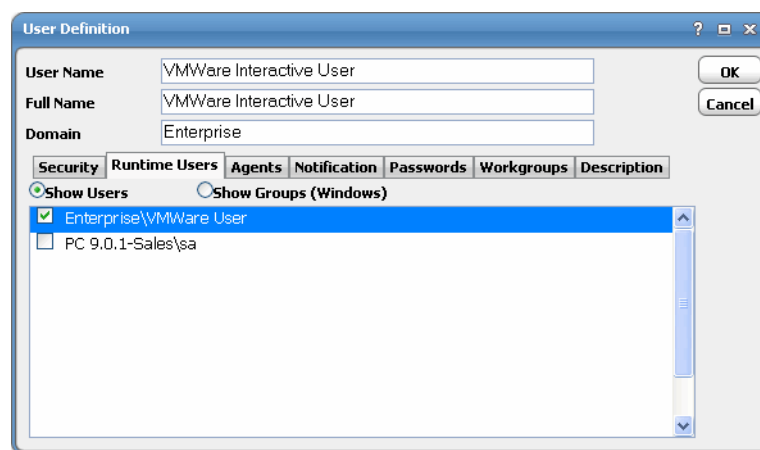
Step 8   Select the VMware users that this scheduling user may use for VMware authentication in VMware jobs.

Step 9   Click the **Agents** tab.

Step 10   Select the check boxes for the VMware connections that this scheduling user can access when scheduling jobs.

Step 11   Click **OK** to save the user definition.

Configuring the HTTPS Protocol

It is recommended that the VMware VirtualCenter and ESX Servers be configured to use HTTPS protocol. The default configuration is HTTPS. If your environment is configured to use HTTP, you can skip this section.

Note   For complete instructions on configuring VMware VirtualCenter and ESX servers to use HTTP or HTTPS protocol, refer to the VMware documentation that ships with the product.

Configuring the VMware VirtualCenter Server

To configure the VirtualCenter server to use HTTPS

Step 1   Open the *vpxd.cfg* file that is located at: **C:\Documents and Settings\All Users\Application Data\VMware\VMware VirtualCenter\vpxd.cfg**.

Step 2   Under the **<proxyDatabase>** tag, modify the **/sdk namespace** in the <http> and <https> sections to switch the redirect from HTTP to HTTPS.

Step 3   Save the configuration and restart the *VirtualCenter* service (click **Start>All Programs>Administration>Services**).

Configuring the ESX Server

To configure ESX servers to use HTTPS

Step 1   Open the *config.xml* file that is located at: **/etc/vmware/hostd/config.xml**.

Step 2   Under the **<proxyDatabase>** tag, modify the **/sdk namespace** in the <http> and <https> sections to switch the redirect from HTTP to HTTPS.

Step 3   Save the configuration and restart the service using "service mgmt-vmware restart".

Obtain Security Certificates

From the Enterprise Scheduler master machine, you must obtain a security certificate for each target server using the Microsoft Internet Explorer Certificate Cache.

Internet Explorer

To obtain target server security certificates

Step 1   Navigate to the ESX Server or VirtualCenter Management Server using the HTTPS protocol:

```
https://servername
```

A **Security Alert** message displays.
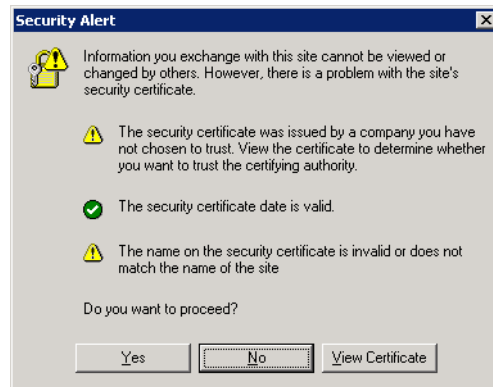
Step 2   Click **View Certificate** to open the **Certificate** dialog.
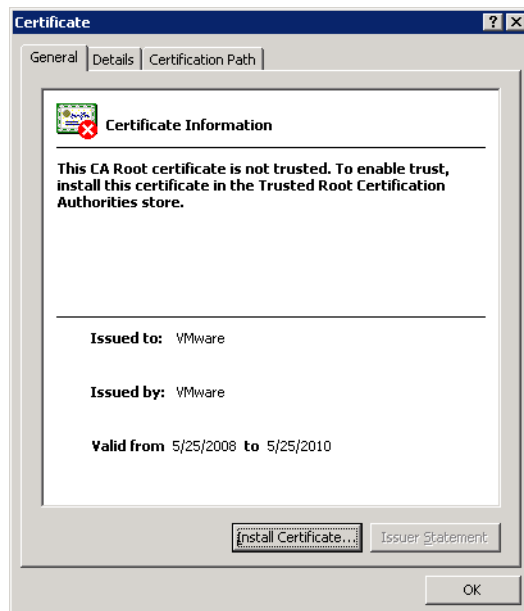
Step 3   Click **Install Certificate**.

Step 4   On the **Certificate Import Wizard Welcome** panel, click **Next**.

Step 5   On the **Certificate Store** panel, use the default option **Automatically select the certificate store based on the type of certificate** and click **Next**.

Step 6   On the **Completing Certificate Import Wizard** panel, click **Finish**.

A **Security Warning** message displays informing you that you are about to install a certificate from a certification authority.

Step 7   Click **Yes** to continue with the certificate installation.

A message stating *The import was successful* displays.

Step 8   Click **OK** to close the message and return to the **Certificate** dialog.

Step 9   Click **OK** on the **Certificate** dialog.

Step 10   On the **Security Alert** message, click **Yes** to continue with the original HTTPS request for the server.

The server (VMware ESX Server 3, VMware VirtualCenter 2) **Welcome** page displays. The certificate has now been installed in Internet Explorer's certificate cache.

Step 11   Repeat the process for each ESX Server and VirtualCenter Management Server that you want to connect to with the VMware Adapter.

Mozilla Firefox

To obtain target server security certificates

Step 1   From the **Tools** menu, select **Options** to display the **Options** dialog.

Step 2   Click **Advanced**, and then select the **Encryptions** tab.

Step 3   Click **View Certificates** to display the **Certificate Manager** dialog.

Step 4   Select the **Servers** tab.
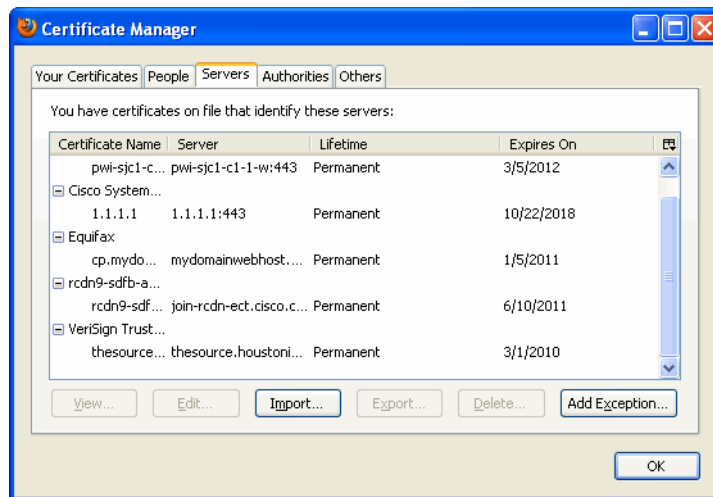
Step 5   Click **Add Exception** to display the **Add Security Exception** dialog.
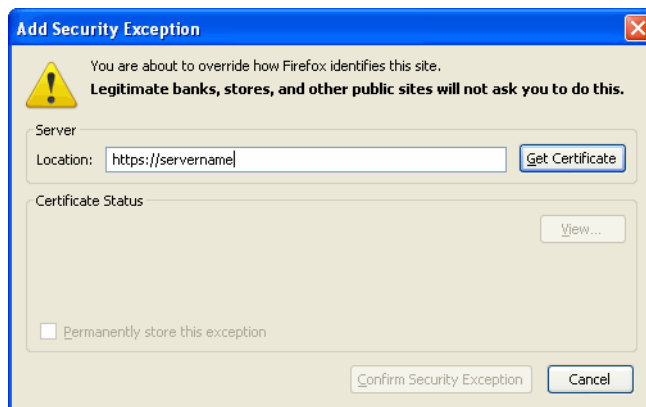
Step 6   Click **Get Certificate**.

Step 7   Click **Confirm Security Exception**.

Export Security Certificates

After you have obtained the security certificates for the target servers, you must export them from the Internet Explorer or Mozilla Firefox cache to a local directory.

Internet Explorer

To export the cached certificates to a local directory

Step 1   On the local computer, create the following directory for the certificates:

    C:\VMware-Certs

✎

Note   You should not change the name of the directory C:\VMware-Certs. Several of the VI SDK batch files assume this path as the location of the keystore and will fail if you do not use this path.

Step 2   In Internet Explorer, select **Tools>Internet Options**.

Step 3   On the **Internet Options** dialog, select the **Content** tab.

Step 4   In the Certificates area, click **Certificates**.

Step 5   On the **Certificates** dialog, select the **Trusted Root Certification Authorities** tab to display the list of trusted certificates. This list should contain the certificates for the target servers that were obtained in the previous procedure (see "Obtain Security Certificates").

Step 6   Scroll through the list of certificates to find the certificates.

   • For an ESX server, the certificate name matches the **DNS name** of the server.

   • For a VirtualCenter server, the certificate name is **VMware**.

Step 7   Perform the following procedure for each target server certificate:

   a.   Select the certificate and click **Export** to launch the Certificate Export Wizard.

   b.   On the **Welcome** panel, click **Next**.

   c.   On the **Export File Format** panel, use the default option **DER encoded binary X.509 (.CER)** and click **Next**.

   d.   On the **File To Export** panel, enter the complete path to the VMware-Certs directory and a unique name for the certificate:

       C:\VMware-Certs\servername.cer

   e.   Click **Next**.

   f.   On the **Completing the Certificate Export Wizard** panel, click **Finish** to complete the export.

       A message stating *The export was successful* displays.

   g.   Click **OK** to close the message box.

Step 8   After all target server certificates have been exported, click **Close** to exit the **Certificates** dialog.

Step 9   Click **OK** to close the **Internet Options** dialog.

Mozilla Firefox

To export the cached certificates to a local directory

Step 1   On the local computer, create the following directory for the certificates:

    C:\VMware-Certs

✎
Note   You should not change the name of the directory C:\VMware-Certs. Several of the VI SDK batch files assume this path as the location of the keystore and will fail if you do not use this path.

Step 2   In Mozilla Firefox, select **Tools>Options**.

Step 3   On the **Options** dialog, select the **Encryptions** tab.

Step 4   Click **View Certificates** to display the **Certificate Manager** dialog.

Step 5   Select the **Servers** tab.

Step 6   Scroll through the list of certificates to find the certificates.

  - For an ESX server, the certificate name matches the **DNS name** of the server.

  - For a VirtualCenter server, the certificate name is **VMware**.

Step 7   Select the certificate and click **Export**.

Step 8   After all target server certificates have been exported, click **Close** to exit the **Certificates** dialog.

Step 9   Click **OK** to close the **Options** dialog.

Import Target Server Certificates into the Java Keystore

You must now import the target server certificates into a local Java keystore.

✎
Note   These instructions assume that a JRE or JDK is in your system PATH.

To import certificates into Java keystore

Step 1   Open a Windows **Command Prompt** window.

Step 2   Change to the directory where the certificates are stored by entering the following command:

    cd c:\VMware-Certs

Step 3   Use the Java keytool utility to import a certificate. The following syntax is used:

    keytool -import -file <certificate-filename> -alias <server-name> -keystore
    vmware.keystore

For example:

    C:\VMware-Certs>keytool -import -file rui.crt -alias sdkpubs01 -keystore
    vmware.keystore

Step 4   When prompted to create a password for the keystore, enter a password at the prompt. The keystore utility displays the certificate information.

Step 5   At the **Trust this certificate? [no]** prompt, type yes and press **Enter**. The certificate is imported into the **vmware.keystore** keystore and the following message displays:

```
Certificate was added to keystore
```

Step 6   Repeat this procedure for each target server.

Step 7   Navigate to the following folder where the Enterprise Scheduler VMware adapter is installed and create a new directory named **config**:

<install dir>\master\services\{49ED3946-6C3C-4165-A09E-B2A723051BDD}\config

Step 8   Create a text file named *service.props* if it doesn't already exist.

Step 9   Open the *service.props* text file and add the following line:

```
Keystore=c:\\VMware-Certs\\vmware.keystore
```

(Note the use of escaped backslashes for Windows directories).

See Configuring service.props for information about general and adapter-specific properties that can be set to control things like logging and connection properties.

Configuring the VMware Tools Service

This section provides instructions for configuring the *VMware Tools* service to wait for required application services before a virtual machine power on job completes. You must configure the service to depend on other required application services, ensuring that the required application services are available when the power on part of the scheduler completes.

To configure the VMware Tools Service, you must first determine which system components are needed by downstream jobs and then add or modify the **DependOnService** key to support these services.

Viewing VMware Tools Service Properties

To view VMware Tools service properties

Step 1   On the machine where VMware is installed, click **Start>Programs>Administrative Tools>Services**.

Step 2   On the **Services** dialog, scroll to the **VMware Tools Service**, right-click and select **Properties**.

Step 3   Click the **Dependencies** tab to view the system components on which the service depends.
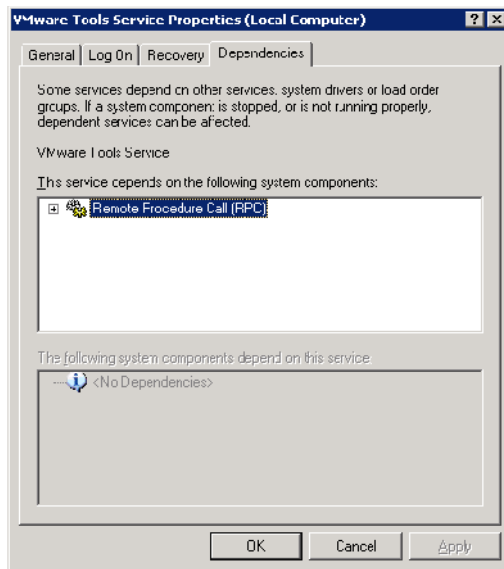
Step 4   Click **OK** to close the dialog.

Adding the DependOnService Key

You use the RegEdit to add or modify the **DependOnService** key to configure the service.

To add or modify the DependOnService key

Step 1   On the machine where VMware is installed, click **Start>Run**.

Step 2   On the **Run** dialog, enter **RegEdit** in the **Open** field and click **OK**.

Step 3   On the **Registry Editor** dialog, navigate to
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\VMTools.

Step 4   Right-click **VMTools** and select **New>Multi-String Value** to add a new key named
DependOnService, if it does not already exist.
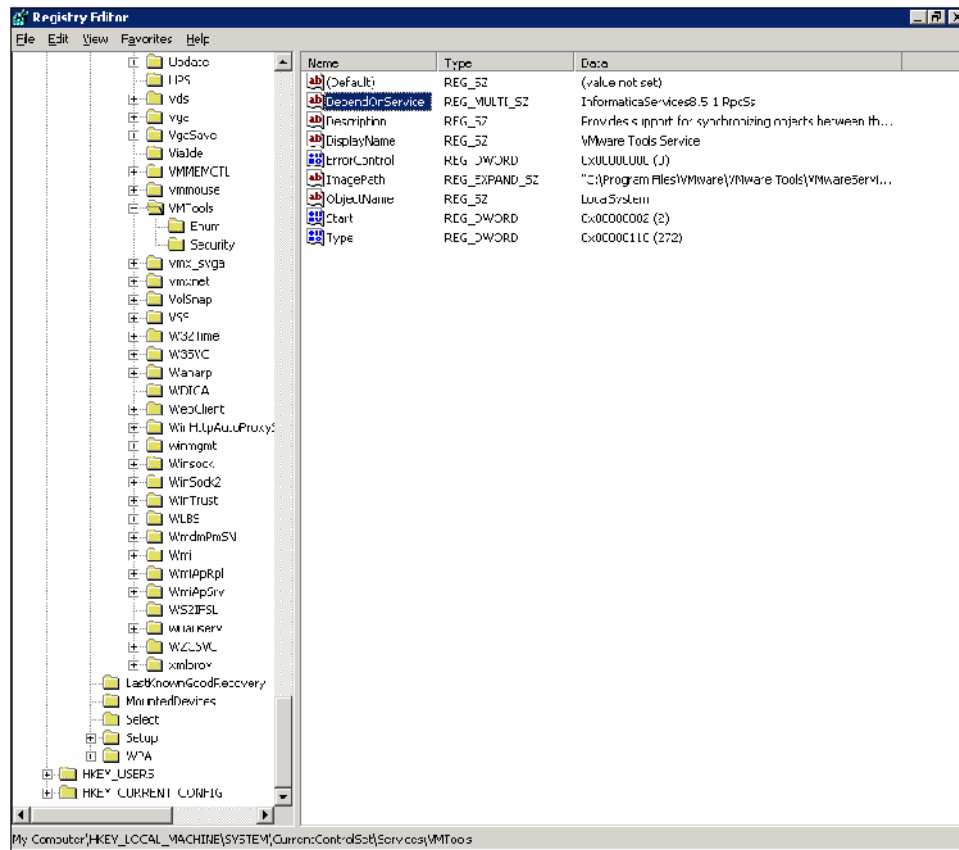
Step 5   Right-click the **DependOnService** key and select **Modify** to open the **Edit Multi-String** dialog.
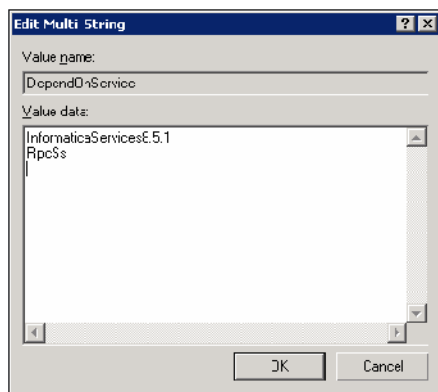
Step 6   In the **Value data** list box, enter the name of the service on which the *VMware Tools* service depends.

Step 7   Click **OK** to close the dialog.

Step 8   Exit the Registry Editor to complete the procedure.

Defining a VMware Connection

You must create a connection to the virtual infrastructure for each target server (VirtualCenter and/or ESX host) before Enterprise Scheduler can run your VMware jobs. These connections also must be licensed before Enterprise Scheduler can use them. A connection is created using the **Connection Definition** dialog.

Adding a VMware Adapter Connection

To add a connection:

Step 1   From the **Navigator** pane, navigate to **Administration>Connections** to display the **Connections** pane.

Step 2   Right-click **Connections** and select **Add Connection>VMware Adapter** from the context menu.

The **VMware Adapter Connection Definition** dialog displays.
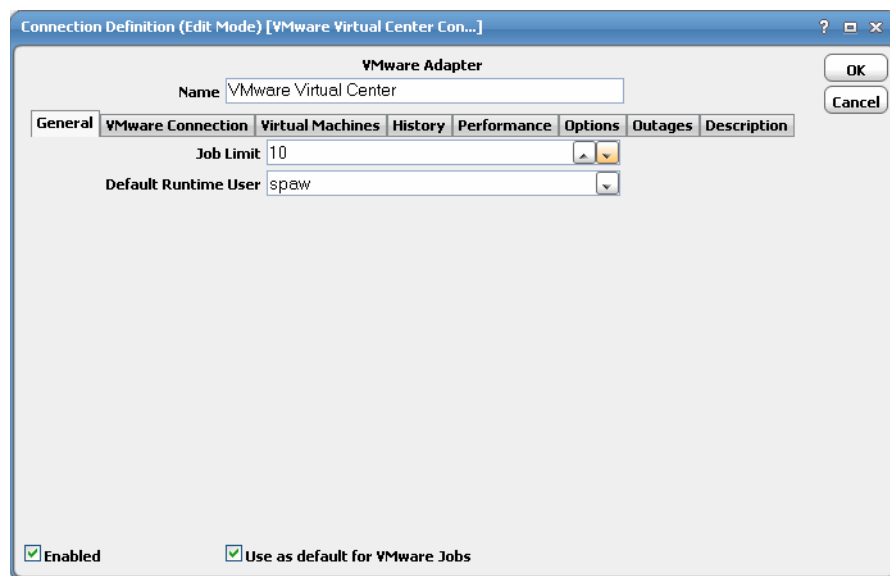
Step 3   On the **General** page, enter a name for the new connection in the **Name** field.

Step 4   In the **Job Limit** field, select the maximum number of concurrent active processes that Enterprise Scheduler should submit to the VMware VirtualCenter and/or ESX host at one time.

Step 5   From the **Default Runtime User** drop-down list, select the name of the default user for VMware jobs. The runtime user is used for HTTPS authentication and VMware uses this to authorize scheduled operations.

Only authorized users that have been defined with VMware passwords display in this list. The selected user is automatically supplied as the runtime user in Enterprise Scheduler VMware job definitions.

Step 6   Click the **VMware Connection** tab.
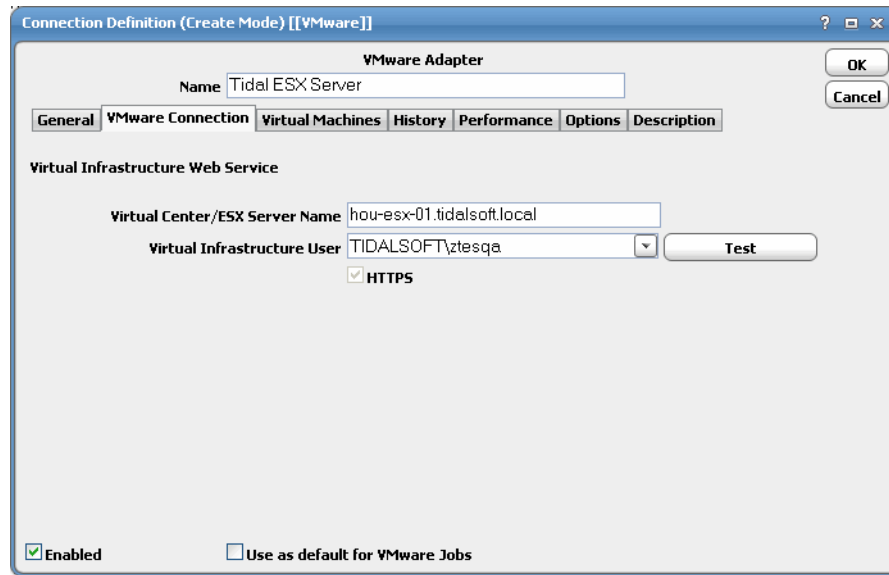
Step 7 In the **VirtualCenter/ESX Server Name** field, enter the name of an ESX Server or VirtualCenter server.

Step 8 In the **Virtual Infrastructure User** field, select a user from the drop-down list who is authorized to connect and monitor host and guest properties.

Step 9 If the virtual infrastructure Web service has been configured for SSL, select the **HTTPS** check box.

Step 10 Click **OK**.

The configured connection displays in the **Connections** pane.

The status light next to the connection indicates whether the Enterprise Scheduler Master is connected to the VMware instance. If the light is green, the VMware instance is connected.

A red light indicates that the master cannot connect to the VMware instance. However, the jobs will not run without a connection to the VMware instance. You can define jobs from the Web client regardless of the connection status.

If the light is red, you can test the connection to determine the problem. Right-click the connection and select **Test** from the shortcut menu. A message displays on the **Test VMware Connection** dialog describing the problem.

Step 11 Click the **Options** tab to configure parameters for this connection.
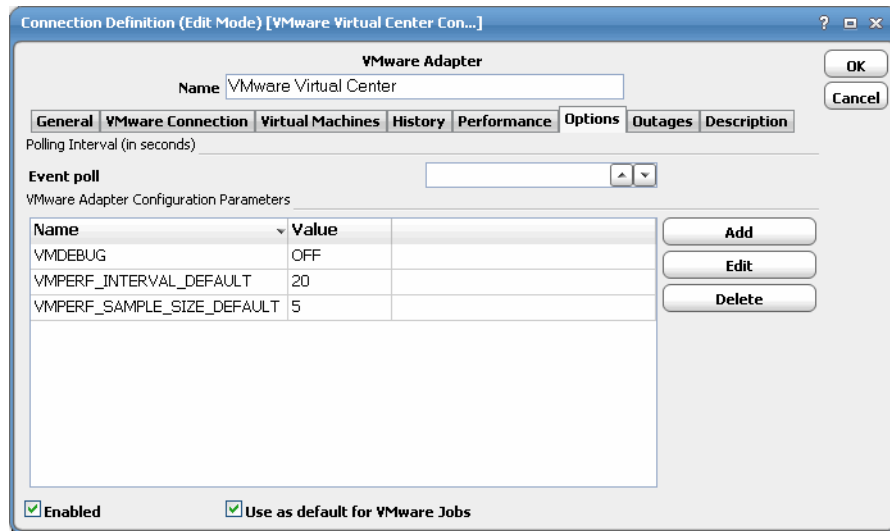
Step 12 In the **Configuration Parameters** section, click **Add** or select a parameter, then click **Edit** to display the **Variable Definition** dialog.
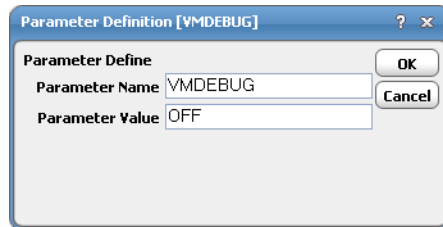
Step 13 Enter a name for the variable or edit the existing name.

Step 14 Enter a new value into the **Value** field or edit the existing value, then click **OK**.

Step 15 Repeat all of the previous steps for each target server.

Viewing the Virtual Machines

Once you have defined the connections for the VMware Adapter (ESX hosts or VirtualCenter server), you can view the virtual machines that are associated with the connection.

To view virtual machines:

Step 1 In the **Connections** pane, right-click a **VMware** connection and select **Edit Connection Definition** from the shortcut menu.

Step 2 On the **VMware Adapter Connection Definition** dialog, click the **Virtual Machines** tab.
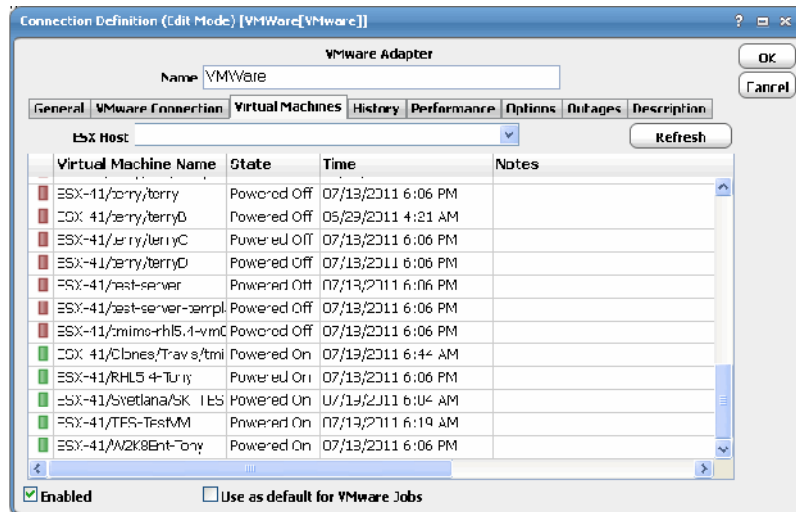
Once you have defined the connections for the VMware Adapter (ESX Servers or VirtualCenter Server), you can view the virtual machines that are associated with the connection on the **Virtual Machines** tab.
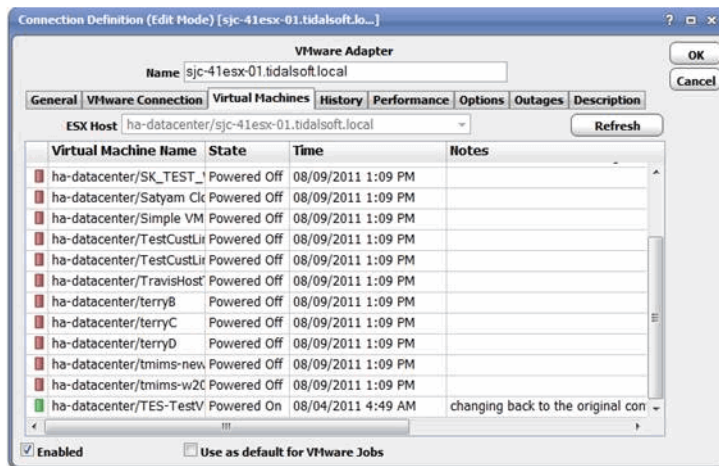
VirtualCenter Server example:
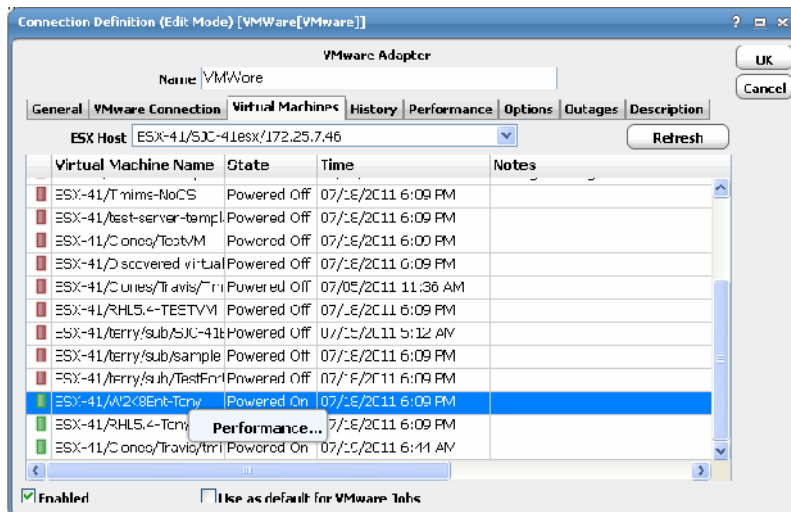
ESX Server example:

Warning   **If you delete a Virtual Machine after inventory information is gathered, the deleted virtual machine still displays in the Virtual Machine tab. Also, the deleted Virtual Machine will be available to create a VMware Job. The jobs executed using the deleted Virtual Machine will fail. To remove the deleted Virtual Machine from the list, you can disable the VMware Connection and then re-enable the connection. This will force the VMware Adapter to gather the inventory information again and the deleted virtual machine will be removed. Before disabling a VMware connection, check for any active VMware jobs that are using this connection. Disabling a VMware Connection having active VMware Jobs may result in Job Activity status of Orphaned. The VMware job in Orphan status will not resume once the VMware connection is enabled. This job will remain in Orphan state.**

Viewing Virtual Machine Performance Data

You can view the performance data for a specific virtual machine from the **Virtual Machines** page. The metrics that display depend on whether the virtual machine is on an ESX connection or VirtualCenter connection. Only a limited set of metrics display for the virtual machines on a VirtualCenter connection.

To view virtual machine performance data

Step 1 On the **Virtual Machines** page of the **Connection Definition** dialog, right-click a virtual machine and select **Performance**.

The **Performance Data** dialog displays for the selected virtual machine.

Step 2 When you have completed viewing the data, exit the dialog and then click **OK** on the **Connection Definition** dialog to close it.

Viewing Events or Tasks for Connection

You can view the events that have occurred or tasks that have been completed on a specific connection using the **History** page on the **Connection Definition** dialog.

To view events or tasks for connection:

Step 1   In the **Connections** pane, right-click a **VMware** connection and select **Edit Connection Definition** from the shortcut menu.

Step 2   On the **VMware Adapter Connection Definition** dialog, click the **History** tab.

The **Events** display by default.
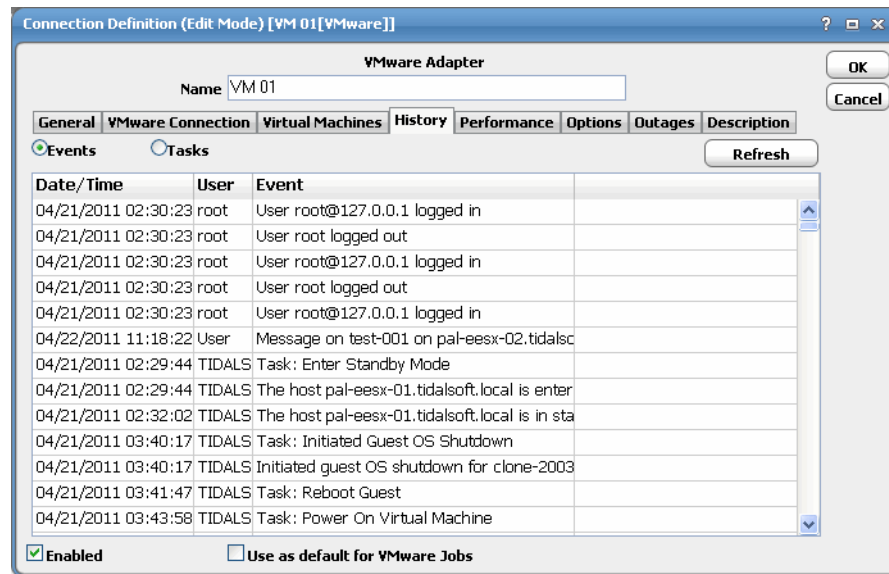
Step 3   Select the **Tasks** option to view the recent tasks that have completed on the server since the connection was first established.
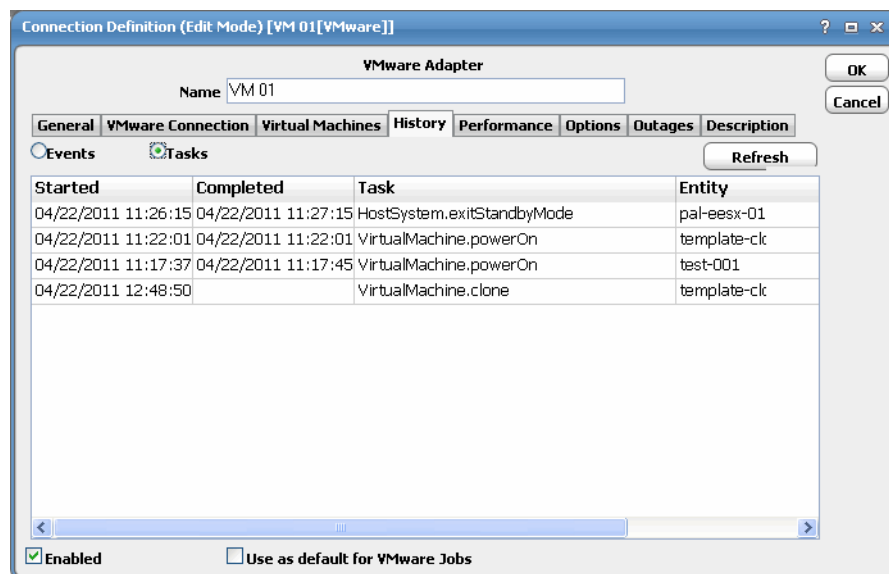
Viewing Host Performance Data

You can view performance metrics for the host servers using the **Performance** page on the **Connection Definition** dialog. The metrics that display depend on whether the selected server is an ESX Server or a VirtualCenter server. Only a limited set of metrics display for a VirtualCenter server.

To view performance metrics for host server:

Step 1   In the **Connections** pane, right-click a **VMware** connection and select **Edit Connection Definition** from the shortcut menu.

Step 2   On the **VMware Adapter Connection Definition** dialog, click the **Performance** tab.

The performance metrics for the server display.

The **Sample Size** field value is the number of data points to be used in determining the minimum, maximum, and average values. The default value is 5. You can change this value and then click **Refresh** to display performance metrics based on the new value.

⚠️
Warning   **If using VMware ESX Server 4.0/4.1.0. The performance sample size auto increments upon clicking Refresh. This happens due to a VMWare API bug in the queryPerf() Method. This method returns performance statistics for the entity. The client can limit the returned information by specifying a list of metrics and a suggested sample size. In case of ESX Server 4.1 or ESX Server 4.0, the results returned by queryPerf() Method contains one extra sample. For example, if the Max Sample size is set to 'X' the results returned by queryPerf() Method contain 'X+1' samples.**

The metrics that display for the VirtualCenter server are aggregated network performance statistics.

By default, the statistics for all ESX Servers that are associated with the Virtual Center display. You view the statistics for a single ESX Server by selecting it from the drop-down list in the **ESX Host** field and clicking **Refresh**.

Step 3   When you have completed viewing performance data, click **OK** to close the dialog.

Configuring VMware Connection Parameters

To configure parameters for this connection:

Step 1 Click the **Options** tab.
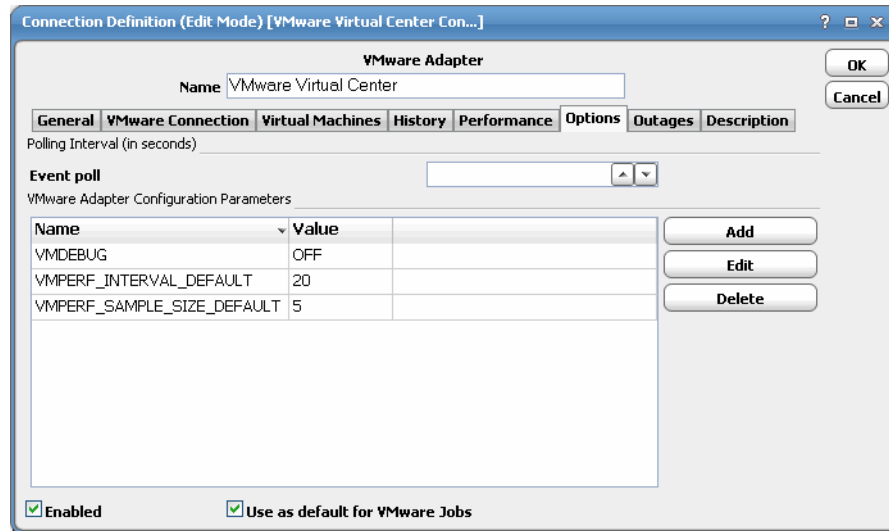
Step 2 In the **Configuration Parameters** section, click **Add** or select a parameter, then click **Edit** to display the **Parameter Definition** dialog.
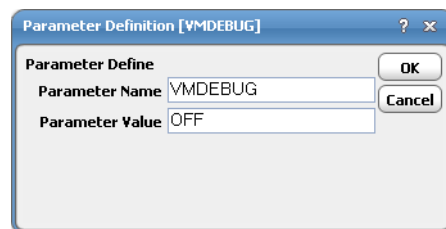
Step 3 Enter a name for the variable or edit the existing name.

Step 4 Enter a new value into the **Value** field or edit the existing value, then click **OK**.

Using the VMware Adapter

Overview

This chapter guides you through using the features of the VMware Adapter in Enterprise Scheduler, including:

- VMware Job Definition
- Monitoring VMware Jobs
- Defining VMware Events
- Working with Virtual Machine Templates
- Controlling Adapter and Agent Jobs

The rest of this section describes VMware job tasks, monitoring VMware jobs, and VMware events.

VMware Job Tasks

Using the VMware Adapter, you can create and schedule jobs in Enterprise Scheduler to perform various types of tasks to help manage your VMware environment, including:

- Power management tasks – Manage the power state of the virtual machines including:
  - Querying the power state of the virtual machines in your environment
  - Powering virtual machines ON and OFF
  - Suspending and resetting virtual machines
  - Rebooting and suspending a guest virtual machine, and putting a guest virtual machine in standby mode
- Snapshot management tasks – Capture and restore snapshots on the virtual machines in your environment
- Host management tasks – Manage the host servers for the virtual machines in your environment, including:
  - Powering host servers up and down
  - Rebooting host servers
  - Moving host servers into maintenance and moving them out of maintenance
- Configuration management tasks – Manage the configuration of the virtual machines in your environment, including:

- Reconfigure CPU, memory, disk space and network connections on the virtual machines
- Migrate virtual machines
- Cloning virtual machines
- Relocating virtual machines
- Upgrade the hardware on the virtual machines
- Install or upgrade tools on the virtual machines

Monitor VMware Jobs

As VMware tasks run as pre-scheduled or event-based jobs, you can monitor these jobs as you would any other job in Enterprise Scheduler. Using a business view to monitor job activity, you can see when the various VMware jobs are active.

You can view details of the job from this view, including the job output and runtime data from the **Job Details** pane. You can also view and override the original job definition from this pane.

VMware Events

The VMware Adapter also enables you to define VMware events based on power state changes or performance thresholds that can be used for alerting or triggering an automated response through new jobs added to the schedule. Any action that is available in Enterprise Scheduler, such as sending email, generating alerts, sending SNMP traps, setting variables and/or adding jobs, are available in response to a VMware event.

VMware Job Definition

This section provides instructions for defining a VMware job in Enterprise Scheduler and descriptions of the various types of tasks that can be included in the jobs.

Defining a VMware Job

You define jobs to perform specific tasks to help manage your virtual environment. The screens that display when defining a job depend on the type of task that is selected. This section describes the basic steps for defining a VMware job. Refer to "Field Descriptions for VMware Tasks" for field descriptions for a specific task.

To define a VMware job:

Step 1   In the **Navigator** pane, select **Definitions>Jobs** to display the **Jobs** pane.

Step 2   Right-click **Jobs** and select **Add>VMware Job** from the context menus.

The **VMware Job Definition** dialog displays.

The **Run** tab is selected by default. You must first specify a name for the job, a valid runtime user who has the appropriate VMware authority for the operation, and the VMware adapter connection that will be used for the job.

Step 3   In the upper portion of the dialog, specify the following information to describe the job:

- **Job Name** – Enter a name that describes the job.

- **Job Class** – If you want to assign a defined job class to this job, select it from the drop-down list. This field is optional.

- **Owner** – Select the user name from the drop-down list for the person who owns this job. The user must have the appropriate VMware authority for the operation.

- **Parent Group** – If this job exists under a parent group, select the name of the parent group from the drop-down list. All properties in the Agent Information section are inherited from its parent job group.

Step 4   Specify the following connection information in the **Agent/Adapter Information** section:

- **Agent/Adapter Name** – Select the VMware adapter connection to be used for this job from the drop-down list. This is the target ESX host where the virtual machine resides or refers to a VirtualCenter connection.

- **Runtime User** – Select a valid runtime user with the appropriate VMware authority for the job from the drop-down list.

Step 5   Specify the appropriate **Tracking** and **Duration** information for the job. Refer to the *Tidal Enterprise Scheduler User Guide* for information on these options.

Step 6   Click the **VMware** tab.

Step 7   In the **Task** field, select the type of task from the drop-down menus.

The Task Details that display depend on the selected task type. The screenshot above is an example of the **Suspend** task. Refer to the Field Descriptions for VMware Tasks for field descriptions for a specific task.

Step 8   If a **Power** task is selected, you can specify that the job complete normally if the virtual machine is already in the specified power state by selecting the **Skip if already in expected power state** check box.

If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

Step 9   Select the name of the **Virtual Machine** that you want to suspend from the drop-down list.

> **Note**   You can use the **Variables** button to insert a variable into this field.

Step 10   Click **OK** to save the job.

Field Descriptions for VMware Tasks

For each VMware job, you must select a task to be performed. The selected task determines the fields that display on the VMware page of the **VMware Job Definition** dialog. This section provides field descriptions for each available VMware task.

Power Tasks

This section provides field descriptions for each of the **Power Tasks** that are available with VMware Adapter.

Query Power State Task

The **Query Power State** task is used to query a virtual machine to determine its current power state.

The following task detail field displays for this task:

- **Virtual Machine** – Name of the virtual machine that you want to query.

Note   You can use the **Variables** button to insert a variable into this field.

Power On Task

The **Power On** task is used to power on a virtual machine.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the virtual machine is already powered on.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine that you want to power on.

✎

Note   You can use the **Variables** button to insert a variable into this field.

- **Host** – Name of the host server on which the virtual machine resides. By default, this field is populated with the current server on which the virtual machine resides.

- **Wait for Agent on Port** – Select this check box if you want the job to wait until a listener is found on the specified agent port, indicating that the agent is up and running.

- **Wait for VMware Tools** – Select this check box if you want the job to wait for the corresponding service to start. You can configure the *Tools* service to depend on other required application services, which ensures that the required application services are available when the job completes. See Appendix A for instructions on configuring the *VMware Tools* service.

- **Wait Timeout** – If you select the **Wait for Agent** or **Wait for VMware Tools** check box, you can specify the time period to wait before the job fails to prevent downstream jobs from running if the required application services are unavailable. Use the scroll arrows to select the number of seconds to wait before the job times out.

Power Off Task

The **Power Off** task is used to power off a virtual machine.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the virtual machine is already powered off.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine that you want to power off.

Note   You can use the **Variables** button to insert a variable into this field.

Suspend Task

The **Suspend** task is used to suspend a virtual machine.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the virtual machine is already suspended.

    If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine that you want to suspend.

Note   You can use the **Variables** button to insert a variable into this field.

Reset Task

The **Reset** task is used to reset the power on a virtual machine. This task allows user to power off, then power on a virtual machine.

If the current state is *poweredOn*, then this operation first invokes the **Power Off** task operation for a hard shutdown. After the power state is poweredOff, the **Reset** task operation invokes the **Power On** operation.

Note   Although this operation powers off then powers on, the two operations are atomic with respect to other clients. Other power operations cannot be performed until the reset method completes.

A **Reset** operation can not be performed while VM is in the **poweredOff** state.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the virtual machine has already been reset.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine that you want to reset.

✎

Note   You can use the **Variables** button to insert a variable into this field.

- **Wait for Agent on Port** – Select this check box if you want the job to wait until a listener is found on the specified agent port, indicating that the agent is up and running.

- **Wait for VMware Tools** – Select this check box if you want the job to wait for the corresponding service to start. You can configure the *Tools* service to depend on other required application services, which ensures that the required application services are available when the job completes. See Appendix A for instructions on configuring the *VMware Tools* service.

- **Wait Timeout** – If you select the **Wait for Agent** or **Wait for VMware Tools** check box, you can specify the time period to wait before the job fails to prevent downstream jobs from running if the required application services are unavailable. Use the scroll arrows to select the number of seconds to wait before the job times out.

Reboot Guest Task

The **Reboot Guest** task is used to restart a guest operating system on a virtual machine. This task shuts the machine down gracefully prior to powering the machine back up.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the guest operating system on the virtual machine has already been restarted.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine on which the guest operating system resides.

Note   You can use the **Variables** button to insert a variable into this field.

- **Wait for Agent on Port** – Select this check box if you want the job to wait until a listener is found on the specified agent port, indicating that the agent is up and running.

- **Wait for VMware Tools** – Select this check box if you want the job to wait for the corresponding service to start. You can configure the *Tools* service to depend on other required application services, which ensures that the required application services are available when the job completes. See Appendix A for instructions on configuring the *VMware Tools* service.

- **Wait Timeout** – If you select the **Wait for Agent** or **Wait for VMware Tools** check box, you can specify the time period to wait before the job fails to prevent downstream jobs from running if the required application services are unavailable. Use the scroll arrows to select the number of seconds to wait before the job times out.

Shutdown Guest Task

The **Shutdown Guest** task is used to power off a guest operating system on a virtual machine gracefully.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the guest operating system on the virtual machine has already been shutdown.

   If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine on which the guest operating system resides.

> **Note**   You can use the **Variables** button to insert a variable into this field.

Standby Guest Task

The **Standby Guest** task is used to put a guest operating system on a virtual machine in standby mode.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the guest operating system on the virtual machine is already in standby mode.

    If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the virtual machine was not in the expected power state to perform the operation.

- **Virtual Machine** – Name of the virtual machine on which the guest operating system resides.

Note   You can use the **Variables** button to insert a variable into this field.

Snapshot Tasks

This section provides field descriptions for each of the **Snapshot Tasks** that are available with the VMware Adapter.

Create Snapshot Task

The **Create Snapshot** task is used to take a snapshot on a virtual machine at a checkpoint.

The following options and task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshot will be taken.

> **Note**   You can use the **Variables** button to insert a variable into this field.

- **Snapshot the virtual machine's memory** – Select this check box if you want the snapshot to also include the memory on the virtual machine.
- **Quiesce virtual machine during snapshot** – Select this check box if you want to quiesce file system writes before the snapshot is taken.
- **Snapshot Name** – Enter a name for the snapshot. You can use variables in the snapshot name by clicking the **Variables** button and selecting the variable from the drop-down lists.
- **Snapshot Description** – Enter a description of the snapshot. You can use variables in the snapshot description by clicking the **Variables** button and selecting the variable from the drop-down lists.

Revert to Current Task

The **Revert to Current** task is used to restore the most recent snapshot on a virtual machine to that state. If you choose to revert to the current state, the current disk and memory states on the virtual machine become the parent snapshot.

The following task details field displays for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshot will be reverted.

✎

Note   You can use the **Variables** button to insert a variable into this field.

Revert to Snapshot Task

The **Revert to Snapshot** task is used to restore the virtual machine to a specific snapshot. When you revert to a snapshot, the current disk and memory states are discarded and the virtual machine is brought back to the reverted-to state. The snapshot you revert to then becomes the new parent snapshot. The parent snapshot, however, is not always the most recently taken snapshot. If you revert back to an older snapshot, it then becomes the parent of the current state of the virtual machine.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshot was taken.

> **Note** You can use the **Variables** button to insert a variable into this field.

- **Snapshot Name** – Select the name for the snapshot from the drop-down list. The list contains all the snapshots that have been saved for the specified virtual machine.
- **Snapshot Description** – This field is automatically populated with the description of the selected snapshot.

Rename Snapshot Task

The **Rename Snapshot** task is used to assign a new name to a snapshot that has already been taken.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshot was taken.

✎
Note   You can use the **Variables** button to insert a variable into this field.

- **Snapshot Name** – Select the name of the snapshot that you want to rename from the drop-down list. The list contains all the snapshots that have been saved for the specified virtual machine.

- **New Snapshot Name** – Enter a new name for the snapshot. You can use variables in the snapshot name by clicking the **Variables** button and selecting the variable from the drop-down lists.

- **Snapshot Description** – Enter a new description for the snapshot or use the original snapshot description. You can use variables in the snapshot description by clicking the **Variables** button and selecting the variable from the drop-down lists.

Remove Snapshot Task

The **Remove Snapshot** task is used to delete a specific snapshot that was taken on the specified virtual machine. Any associated storage is deleted.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshot was taken.

> **Note** You can use the **Variables** button to insert a variable into these fields.

- **Snapshot Name** – Select the name of the snapshot that you want to delete from the drop-down list. The list contains all the snapshots that have been saved for the specified virtual machine.

- **Snapshot Description** – This field is automatically populated with the description of the selected snapshot.

Remove All Snapshots Task

The **Remove All Snapshots** task is used to delete all the snapshots that have been taken on the specified virtual machine. When you delete all snapshots for a virtual machine, all of the delta files that are created are merged back into the original VMDK disk file for the virtual machine and then deleted.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which the snapshots were taken.

> ✎
> **Note**   You can use the **Variables** button to insert a variable into this field.

Host Tasks

This section provides field descriptions for the **Host Tasks** that are available with the VMware Adapter.

Power Up Host Task

The **Power Up Host** task is used to power on an ESX host.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the host server is already powered on.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the host was not in the expected power state to perform the operation.

- **Host** – Name of the host server that you want to power on

- **Timeout (in seconds)** – You can specify the time period to wait before the job fails. Use the scroll arrows to select the number of seconds to wait before the job times out.

Power Down Host Task

The **Power Down Host** task is used to power off an ESX host.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the host server is already powered down.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the host was not in the expected power state to perform the operation.

- **Host** – Name of the host server that you want to power down

- **Timeout (in seconds)** – You can specify the time period to wait before the job fails. Use the scroll arrows to select the number of seconds to wait before the job times out.

- **Evacuate Guests** – Select this check box if you want all the guests currently associated with the host server to be migrated to other available hosts in the compute resource pool before powering down the host.

Reboot Host Task

The **Reboot Host** task is used to restart an ESX host.

The following options and task details fields display for this task type:

- **Host** – Name of the host server that you want to reboot

- **Timeout (in seconds)** – You can specify the time period to wait before the job fails. Use the scroll arrows to select the number of seconds to wait before the job times out.

Enter Maintenance Task

The **Enter Maintenance** task is used to move a host server offline so that maintenance can be performed on it. While this task is running and when the host is in maintenance mode, no virtual machines can be powered on and no provisioning operations can be performed on the host. Once the call completes, it is safe to turn off a host without disrupting any virtual machines.

The task completes once there are no powered-on virtual machines on the host and no provisioning operations in progress on the host. The operation does not directly initiate any operations to evacuate or power-down powered-on virtual machines. However, if the host is part of a cluster with VMware DRS enabled, DRS provides migration recommendations to evacuate the powered-on virtual machines. If DRS is in fully-automatic mode, these are automatically scheduled.

If the host is part of a cluster and the task is issued through VirtualCenter with `evacuatePoweredOffVms` set to true, the task will not succeed unless all the powered-off virtual machines are reregistered to other hosts. If VMware DRS is enabled, VC will automatically evacuate powered-off virtual machines. The task is cancellable.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the host is already in maintenance state.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the host was not in the expected power state to perform the operation.

- **Host** – Name of the host server that you want to move into maintenance state

- **Timeout (in seconds)** – You can specify the time period to wait before the job fails. Use the scroll arrows to select the number of seconds to wait before the job times out.

- **Evacuate Guests** – Select this check box if you want all the guests currently associated with the host server to be migrated to other available hosts in the compute resource pool before powering down the host.

Exit Maintenance Task

The **Exit Maintenance** task is used to bring a host server back online after maintenance has been performed on it. This blocks if any concurrent running maintenance-only host configurations operations are being performed. For example, if VMFS volumes are being upgraded.

The following options and task details fields display for this task type:

- **Skip if already in expected power state** – Select this check box if you want the job to complete normally if the host is not in maintenance state.

  If you do not select the check box, the job completes abnormally and a message will display in the output informing you that the host was not in the expected power state to perform the operation.

- **Host** – Name of the host server that you want to move out of maintenance state

- **Timeout (in seconds)** – You can specify the time period to wait before the job fails. Use the scroll arrows to select the number of seconds to wait before the job times out.

Configuration Tasks

This section provides field descriptions for the **Configuration Tasks** that are available with the VMware Adapter.

Reconfigure Task

The **Reconfigure** task is used to modify the memory and number of CPUs allocated to the virtual machine.

The following task details fields display for this task type:

- **Virtual Machines** – Name of the virtual machine to be reconfigured.

✎

Note   You can use the **Variables** button to insert a variable into this field.

- **Memory (MB)** – Size of the virtual machine's memory in MB
- **Number of CPUs** – Number of virtual processors to allocate to the virtual machine
- **Config File (.vmx)** – Path name to the configuration file for the virtual machine (.vmx file). This also implicitly defines the configuration directory.
- **Notes** – Any relevant information that describes the job.

Migrate Task

The **Migrate** task is used to migrate a virtual machine from one server to another server.

The following task details fields display for this task type:

- **Virtual Machines** – Name of the virtual machine to be migrated

- **Target Host** – Name of the specific host server to migrate the virtual machine

- **Target Resource Pool** – The target resource pool for the virtual machine. If the pool parameter is left unset, the virtual machine's current pool is used as the target pool.

- **Priority** – The priority of the migration task. (default, high or low)

- **Power State** – If specified, the virtual machine migrates only if the state matches the specified state.

Clone Virtual Machine Task

The **Clone Virtual Machine** task is used to clone a virtual machine.

The following task details fields display for this task type:

- **Virtual Machines** – Name of the virtual machine to be cloned

- **Host** – Name of the host server that you want to clone

- **Resource Pool** – The target resource pool for the virtual machine. If the pool parameter is left unset, the virtual machine's current pool is used as the target pool.

- **Datastore** – The storage device attached to the host you want to use as main disk storage for the virtual machine you are cloning

- **Folder** – Name of the folder in the inventory where you want to put the virtual machine you are cloning

- **Clone Name** – Name of the new virtual machine resulting from the cloning process.

- **Power On** – Power on the cloned virtual machine after it has been created

- **Create Template** – Creates a virtual machine template from which other virtual machines can be cloned

Relocate Virtual Machine Task

The **Relocate Virtual Machine** task is used to relocate a virtual machine from one server to another server.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine to be relocated

- **Host** – Name of the host server that you want to relocate

- **Resource Pool** – The target resource pool for the virtual machine. If the pool parameter is left unset, the virtual machine's current pool is used as the target pool.

- **Datastore** – The storage device attached to the host you want to use as main disk storage for the virtual machine you are relocating

Upgrade Virtual Hardware Task

The **Upgrade Virtual Hardware** task is used to upgrade the virtual machine's virtual hardware to the latest revision that is supported by the virtual machine's current host.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine to be upgraded

✎
Note   You can use the **Variables** button to insert a variable into this field.

- **Version** – If specified, the virtual hardware is upgraded to the specified version. If the version is not specified, the virtual hardware is upgraded to the most current virtual hardware supported on the host.

Install/Upgrade Tools Task

The Install/Upgrade Tools task is used to upgrade existing VMware Tools on a Windows virtual machine using the VMware Tools installer.

Upgrading VMware Tools requires the following prerequisites be met:

- ESX Server must be version 3.0.1 or later.
- The virtual machine must be powered on.
- VMware Tools must be installed and running.
- The VirtualMachine's guest.toolsStatus property must be either "toolsOK" or "toolsOld".
- VMware Tools must be the version that ships with ESX Server.

The following task details fields display for this task type:

- **Virtual Machine** – Name of the virtual machine on which to install or upgrade the VMware tools.

Note   You can use the **Variables** button to insert a variable into this field.

- **Options** – Command line options passed to the installer to modify the installation procedure for tools.

Monitoring VMware Jobs

As VMware tasks run as pre-scheduled or event-based jobs, you can monitor the jobs as you would any other type of job in Enterprise Scheduler using the **Job Details** dialog. You can also use the Business view to monitor job activity and view when the jobs are active (see the *Tidal Enterprise Scheduler User Guide* for instructions on using Business Views).

To monitor job activity:

Step 1   In the **Navigator** pane, select **Operations>Job Activity** to display the **Job Activity** pane.

Step 2   Right-click job and select **Details** from the context menu.

The **Job Details** dialog displays.

The **Status** tab displays by default. You can view the status of the job, the start and end time, how long it ran, and how it was scheduled.

Step 3   Click the **Output** tab to view a task summary.

Step 4   Click the **Run Info** tab to view the additional details about the job.
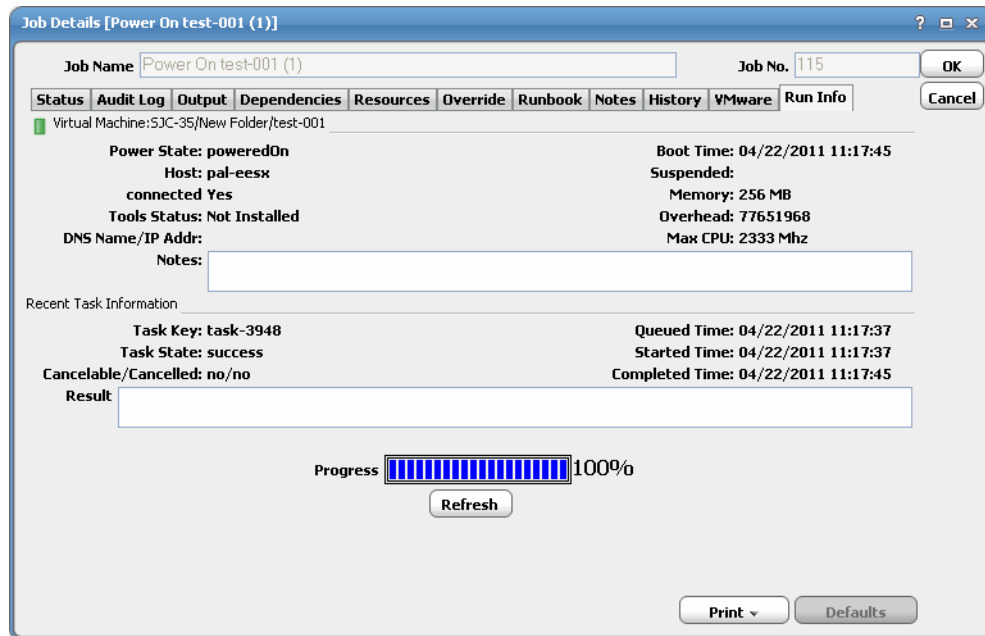
Step 5 Click the **VMware** tab to view the job definition details and the variables that were used when the job was submitted. If the job is not running, you can override the values on the screen.
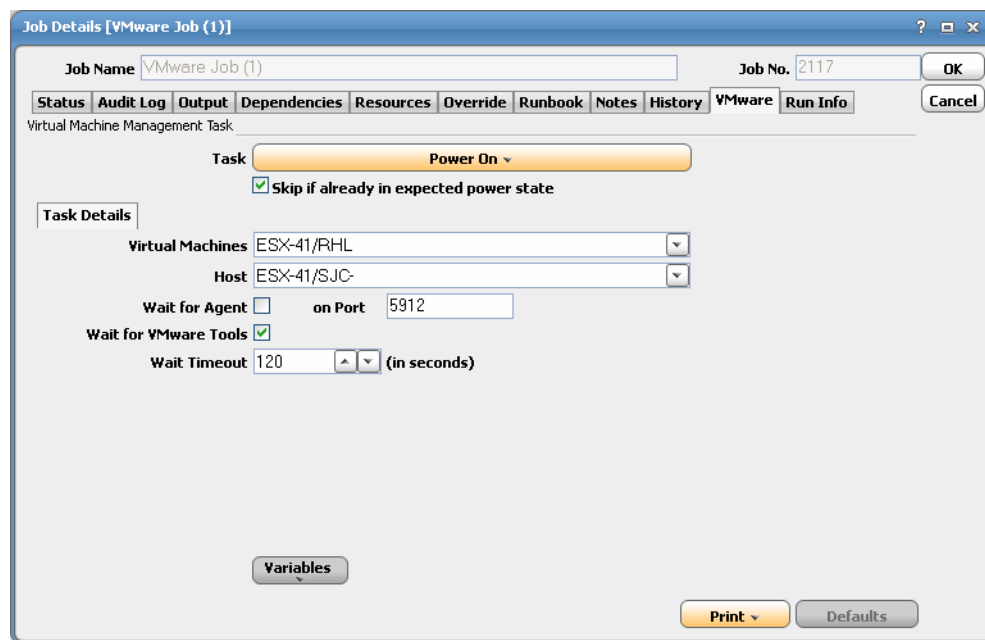
The screenshot above is an example of the **Power On** task. For descriptions of each task, see "Field Descriptions for VMware Tasks".

Step 6 When you have completed view the job activity details, click **OK** to close the dialog.

Note   If Enterprise Scheduler is shut down while a VMware Job is active, or a user disables a VMware connection while a VMware Job using the same connection is active, the Job will enter the Orphan state. This job will continue to execute on the VMware Server and the progress of the job can be monitored through vSphere Client Interface. The Job in Orphan status will not resume once the Master starts up or the connection is established again. This Job will remain in Orphan state.

Defining VMware Events

Using the VMware Adapter, you can define events that can be used for alerting and invoking an automated response through new jobs inserted into the schedule. There are two categories of VMware events:

- Power events – These events trigger an action when the power state of a virtual machine changes to that specified in the event.

- Performance events – These events trigger an action when the specified performance counter meets the criteria specified in the event.

Defining a VMware Power State Change Event

To define a VMware Power State Change event:

Step 1   In the **Navigator** pane, select **Definitions>Events>VMware Events** to display the **VMware Events** pane.

Step 2   Right-click **VMware Events** and select **Add>VMware Event** from the context menus.

The **VMware Event Definition** dialog displays.

Step 3   Enter a name for the event in the **Event Name** field and select an **Owner** from the drop-down list.

Step 4 In the **Monitor** area, specify the following information:

- **VMware Connection** – Select the VMware connection from the drop-down list. This is the connection that will be monitored for the specified event.

- **VMware Event** – Select the type of event that will be monitored list (Power State Change, Performance Alarm - Host, or Performance Alarm - Guest).

- **ESX Host** – Select the host server where the monitored virtual machine resides. Wildcards can be used in this field.

- **Virtual Machine** – Select the virtual machine that will be monitored for the event. Wildcards can be used in this field.

- **Power State** – Select the power state that will trigger the event (Powered On, Tools Running, Powered Off, Suspended, or Any State Change).

- **Check Trigger On Connect** – Select this check box if you want the event to be triggered when the condition is detected upon connection to the Virtual Infrastructure server.

  If you want the event to be triggered only when the condition changes to match the trigger, *do not* select this check box.

  ✎
  Note   The other tabs on the VMware Event Definition dialog are general event configuration options and are not specific to the VMware Adapter. Any action that is available in Enterprise Scheduler, such as sending email, generating alerts, sending SNMP traps, setting variables, and adding jobs is available as a response to a VMware event.

Step 5 Click **OK** to save the event definition.

Defining a VMware Performance Event

To define a VMware Performance event:

Step 1 In the **Navigator** pane, select **Definitions>Events>VMware Events** to display the **VMware Events** pane.

Step 2 Right-click **VMware Events** and select **Add>VMware Event** from the context menus.

The **VMware Event Definition** dialog displays.

Step 3   Enter a name for the event in the **Event Name** field and select an **Owner** from the drop-down list.

Step 4   In the **Monitor** area, specify the following information:

- **VMware Connection** – Select the VMware connection from the drop-down list. This is the connection that will be monitored for the specified event.

- **VMware Event** – Select the type of event that will be monitored list (Power State Change, Performance Alarm - Host, or Performance Alarm - Guest).

- **ESX Host** – Select the host server where the monitored virtual machine resides. Wildcards can be used in this field.

- **Performance Counter** – Select the performance counter that will be monitored.

- **Trigger** – Select the comparators for the trigger. In the example shown in , the event will trigger when the CPU Usage average exceeds 90 percent.

- **Check Trigger On Connect** – Select this check box if you want the event to be triggered when the condition is detected upon connection to the Virtual Infrastructure server.

    If you want the event to be triggered only when the condition changes to match the trigger, *do not* select this check box.

✎
Note   The other tabs on the VMware Event Definition dialog are general event configuration options and are not specific to the VMware Adapter. Any action that is available in Enterprise Scheduler, such as sending email, generating alerts, sending SNMP traps, setting variables, and adding jobs is available as a response to a VMware event.

Step 5   Click **OK** to save the event definition.

Defining an Action for a VMware Event

You can add any action for a VMware event that is available in Enterprise Scheduler.

To define an email action for VMware event:

Step 1 In the **Navigator** pane, select **Definitions>Actions>E-Mail** to display the **E-Mail Actions** pane.

Step 2 Right-click **E-Mail** and select **Add Action** from the context menus.
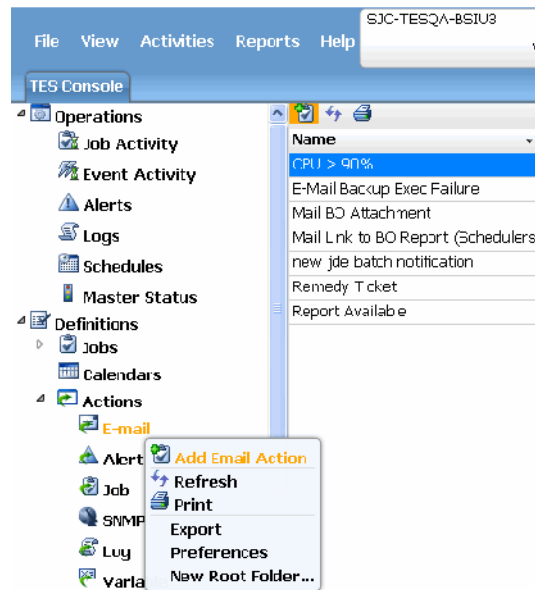
The **Action Definition: E-Mail** dialog displays.
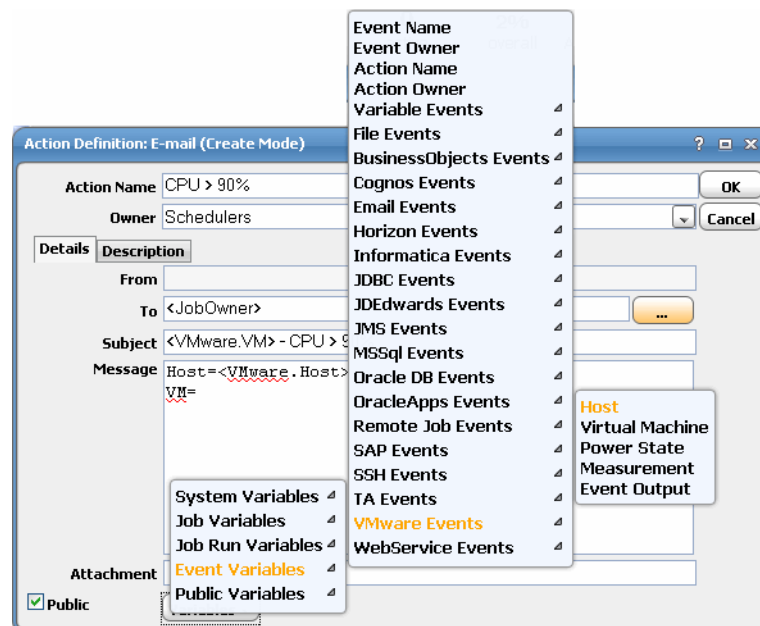
The VMware Event variables that are available with the VMware Adapter are shown in , but may not apply to all events.

Step 3 Complete the required fields on the **Action Definition** dialog and click **OK**.

Working with Virtual Machine Templates

Using a standardized naming convention for templates, some inventory panel views do not offer the opportunity to sort by type. Create a standard prefix for templates to help you intuitively identify them by sorting by name. Also, include enough descriptive information in the template name to know what is contained in the template.

Instead of saving virtual machine templates in a completely separate inventory, VirtualCenter 2 stores templates into the main inventory with other virtual machines. However, templates are identified by a different icon and by the ability to prevent them from powering on. As such, templates can now be:

- Viewed from the "Virtual Machines and Templates" or the "Hosts and Clusters" inventory views.

- Quickly converted back and forth between virtual machines that can be powered on and receive updates and templates that cannot be powered on, but can be used as the source images from which to deploy new virtual machines.

- Stored in monolithic (runnable) virtual disk format for quick template -t- virtual machine conversions or stored in sparse (non-runnable) virtual disk format to conserve storage space.

Because of this, it is not possible to programmatically identify virtual machine templates to prevent running tasks on them. If a user tries to execute a job on virtual machine template, the output will confirm that the operation is not supported.

Special Characters in Names

Any / (slash), \ (backslash), character used in this name element is escaped. Similarly, any % (percent) character used in this name element is escaped, unless it is used to start an escape sequence. A slash is escaped as %2F or %2f. A backslash is escaped as %5C or %5c, and a percent is escaped as %25.

So, if a folder, VM or host name contains any of these special characters, the end user will be expected to "escape" those characters according to the rules above.

Controlling Adapter and Agent Jobs

Scheduler provides the following job control capabilities for either the process currently running or the job as a whole:

- Holding a Job—Hold a job waiting to run.
- Aborting a Job—Abort an active job.
- Rerunning a Job—Rerun a job that completed.
- Making One Time Changes to an Adapter or Agent Job Instance—Make last minute changes to a job.
- Deleting a Job Instance before It Has Run—Delete a job instance before it has run.

Holding a Job

Adapter/agent jobs are held in the same way as any other Scheduler jobs.

Adapter/agent jobs can only be held before they are launched. Once a job reaches the Adapter/Agent system, it cannot be held or suspended.

To hold a job:

Step 1   From the **Job Activity** pane, right-click on the job.

Step 2   Select **Job Control>Hold/Stop**.

Aborting a Job

Adapter/agent jobs are aborted in the same way as any other Scheduler jobs.

To abort a job:

Step 1   From the **Job Activity** pane, right-click on the job.

Step 2   Select **Job Control>Cancel/Abort**.

Rerunning a Job

On occasion, you may need to rerun an Adapter/Agent job. You can override parameter values first, if necessary, from the Adapter/Agent tab.

To rerun a job:

Step 1   From the **Job Activity** pane, right-click the Adapter/Agent job you need to rerun.

Step 2   Select **Job Control>Rerun** option from the context menu.

Making One Time Changes to an Adapter or Agent Job Instance

Prior to a run or rerun, you can edit data on the specific **Adapter/Agent** tab. To ensure that there is an opportunity to edit the job prior to its run, you can set the **Require operator release** option on the **Options** tab in the Adapter **Job Definition** dialog. Use this function to make changes to an Adapter job after it enters Waiting on Operator status as described in the following procedure.

To make last minute changes:

Step 1   From the **Job Activity** pane, double-click the Adapter/Agent job to display the **Job Details** dialog.

Step 2   Click the Adapter tab.

Step 3   Make the desired changes to the job and click **OK** to close the **Job Details** dialog.

Step 4   If this job is Waiting on Operator, perform one of the following tasks:

- To release the job, select **Job Control->Release**.

- To rerun the job with changes, select **Job Control->Rerun**.

Deleting a Job Instance before It Has Run

Adapter/Agent job instances are deleted in the same way as any other Scheduler job.

Deleting a job from the **Job Activity** pane removes the job from the Scheduler job activity only. The original definition is left in tact.

To delete a job instance:

Step 1   From the **Job Activity** pane, right-click the Adapter/Agent job to be deleted.

Step 2   Select **Remove Job(s) From Schedule**.

Configuring service.props

About Configuring service.props

The **service.props** file is used to configure adapter behavior. **service.props** is located in the \config directory located under the Adapter's GUID directory, You can create both the directory and file if it does not yet exist. Properties that can be specified in service.props control things like logging and connection configuration. Many of the properties are specific to certain adapters; others are common across all adapters.

service.props Properties

The table below lists many of the parameters that can be specified in service.props. Some properties apply to all adapters (shaded in the table) and some properties are adapter-specific as indicated by the **Applicable Adapter(s)** column. The properties are listed in alphabetical order.

Property	Applicable Adapter(s)	Default	What It Controls
BYPASS_SEC_VALIDATION	Oracle Apps	N	If set to Y, the secondary user validation is bypassed. If not, secondary user validation is performed.
CLASSPATH	All	<none>	(Optional) – The path to the JDBC driver. If the default CLASSPATH used when the Adapter process is started does not include an appropriate JDBC driver jar required to connect to the PowerCenter Repository Database, you will need to specify this *service.props* configuration
CONN_SYNC	All	N	Setting this flag to Y allows synchronous connections without overloading the RDOnly Thread. If set to N, the adapter might stop trying to reconnect after an outage or downtime.
DISCONN_ON_LOSTCONN	Informatica	N	Setting this flag to Y avoids an unnecessary logout call to the Informatica server when the connection is lost. This logout call usually hangs.

Property	Applicable Adapter(s)	Default	What It Controls
EnableDynamicPollingInterval	All	N	Use to avoid frequent polling on long-running jobs. When set to Y in service.props of a particular adapter, these properties are enabled: MinDynamicPollInterval—Minimum value should be 5 seconds. MaxDynamicPollIntervalInMin—Maximum value should be 5 minutes. PercentOfEstDuration—Default value is 5.
IGNORE_CODES	Informatica	\<none\>	This parameter can be set in service.props, job configuration and connection configuration parameters. The order of precedence is service.props (applicable for all jobs running in all connections), job level (only for that particular job), and connection (applicable for all jobs in the connection). This parameter is used to specify Informatica-specific error codes, separated by commas (,), that you want to ignore while running a job.
IGNORESUBREQ	Oracle Apps	N	Y or N. Setting this flag to Y stops huge job xml file transfers back and forth between the adapter and the AdapterHost during polls when a single request set has multiple sub-requests of more than 100. The default value is N or empty.
jarlib	Hive and MapReduce	\<none\>	Specifies the specific Java library to use for the adapter: • For Apache 1.1.2, add: **jarlib=apache1.1.2** • For Cloudera 3, add: **jarlib=cloudera** • For Cloudera 4, add: **jarlib=cdh4** • For MapR add: **jarlib=apache1.1.2**
kerbrealm	MapReduce	\<none\>	If the Hadoop cluster is Kerberos secured, use this value to specify the Kerberos Realm. For example, **kerbrealm=TIDALSOFT.LOCAL**
kerbkdc	MapReduce	\<none\>	If the Hadoop cluster is Kerberos secured, use this value to specify the KDC Server. For example, **kerbkdc=172.25.6.112**

Property	Applicable Adapter(s)	Default	What It Controls
Keystore	BusinessObjects, BusinessObjects BI, BusinessObjects DS, Cognos, JD Edwards, Oracle Applications, UCS Manager, VMware, Web Service	<none>	Specify `Keystore=c:\\<adapter_certificate_directory>\\<your_trusted_keystore>.keystore` when importing certificates into a Java keystore.
LAUNCH_DELAY (in milliseconds)	Informatica	<none>	This parameter can be set in service.props, job configuration and connection configuration parameters. The order of precedence is service.props (applicable for all jobs running in all connections), job level (only for that particular job), and connection (applicable for all jobs in the connection). If a non-zero value is set for this parameter, then the jobs are delayed for the specified number of milliseconds before being submitted to Informatica.
LoginConfig	BusinessObjects BI Platform, BusinessObjects Data Services	<none>	Specifies the location of the login configuration if using WinAD or LDAP authentication. For example: `LoginConfig=c:\\windows\\bscLogin.conf` where `"c:\\windows\\bscLogin.conf"` is the location of the login configuration information. Note the use of \\ if this is a Windows location.
MaxLogFiles	Informatica, JDBC	50	(Optional) – Number of logs to retain. Defaults to 50 if not specified.
OUTPUT_ASYNC_LOGOUT	Informatica	N	Setting this flag to Y avoids jobs getting stuck in Gathering Output status.
OUTPUT_SYNC	All	Y	Enables concurrent output gathering on a connection. To enable this feature, set the value to N in service.props of this adapter.
POLL_SYNC	All	Y	Enables concurrent polling on connections of the same type. This is helpful when there is a heavily load on one connection of an adapter. The heavily loaded connection will not affect the other adapter connection. To enable this feature, set the value to N in the service.props of this adapter.
QUERY_TIMEOUT	Oracle Apps	N	Y or N. If set to Y, the timeout value defined using the parameter QUERY_TIMEOUT_VALUE is applied to the SQL queries. Default value is N or empty.

Property	Applicable Adapter(s)	Default	What It Controls
QUERY_TIMEOUT_VALUE	Oracle Apps	unset	The time period in seconds that SQL queries wait before timeout. If 0 or not set, there is no timeout.
READPCHAINLOG	SAP	Y	Used to control the log gathering in SAP Process Chain jobs. This property depends on the Summary Only check box of the job definition Options tab.
SCANFOR_SESSIONSTATS	Informatica	Y	Y or N - Set this parameter to N to turn off the default behavior of Informatica jobs collecting the session statistics during the job run.
SCANFOR_SESSIONSTATS_AFTER_WF_ENDS	Informatica	N	Y or N - Set this parameter to Y to turn off the gathering of session statistics during each poll for the status of Informatica jobs.
TDLINFA_LOCALE	Informatica	<none>	Points to the Load Manager Library locale directory. See "Configuring the Informatica Adapter" in the *Informatica Adapter Guide* for how to set this for Windows and Unix environments.
TDLJDBC_LIBPATH	JDBC (Windows only, optional)	<none>	An alternate path to the JDBC library files. The library file path should have been configured given system environment variables. This option is available in case you wish to use an alternate set of libraries and may be helpful for trouble-shooting purposes.
TDLJDBC_LOCALE	JDBC	<none>	The path to the JDBC locale files.
TDLINFA_REQUESTTIMEOUT	Informatica	<none>	(Optional) – The number of seconds before an API request times out. The default is 120 seconds, if not specified.
TRANSACTION_LOG_BATCH_SIZE	MS SQL	5000	Set this parameter if more than 5000 lines need to be read from the transaction table.
version_pre898	JD Edwards	N	If running on a JD Edwards server version that is less than 8.9.8, set version_pre898=Y.