You can find the most up-to-date technical documentation on the VMware Web site at:

http://www.vmware.com/support/

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:

docfeedback@vmware.com
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The vRealize Operations Service Discovery Management Pack describes how to install and configure the management pack for VMware vRealize Operations Manager.

**Intended Audience**

This information is intended for anyone who wants to install, or use vRealize Operations Service Discovery Management Pack.

**VMware Technical Publications Glossary**

VMware Technical Publications provides a glossary of terms that might be unfamiliar to you. For definitions of terms as they are used in VMware technical documentation, go to http://www.vmware.com/support/pubs.
Introduction to vRealize Operations Service Discovery Management Pack

vRealize Operations Service Discovery Management Pack is a service awareness adapter to the vRealize Operations Manager that provides continuous dependency mapping of applications.

vRealize Operations Service Discovery Management Pack offers an application context to virtual infrastructure administrators for monitoring and managing virtual infrastructure inventory objects and actions. Administrators can use the management pack to understand the impact of the change on the virtual environment in their application infrastructure. Administrators can discover services running on each virtual machine. The management pack also shows dependencies between different virtual machines.

Figure 1-1. High-Level Architecture
Installing vRealize Operations Service Discovery Management Pack

You can download the vRealize Operations Service Discovery Management Pack from the VMware Solution Exchange website.

Install the vRealize Operations Service Discovery Management Pack

The vRealize Operations Service Discovery Management Pack consists of a PAK file that contains default dashboards to discover services running in each virtual machine.

Use a remote collector to install vRealize Operations Service Discovery Management Pack.

Prerequisites

- Verify that you are using vCenter version 6.5 or later.
- Verify that you have downloaded the PAK file from VMware Solution Exchange.
- Verify that VMware tools 10.1 or above is installed and running in the Guest operating system of all virtual machines.

**Note** If VMware tools are not installed or are of earlier version, the management pack cannot discover the services from VMs.

- Verify that the time of the virtual machine, host and time zone between vRealize Operations Manager and vCenter Server is synchronized.
- Verify that VMware ESXI 6.0 or above is installed.

Procedure

1. Log in to the vRealize Operations Manager user interface with administrator privileges.
2. In the left pane of vRealize Operations Manager, click the Administration icon and click Solutions.
3. On the Solutions tab, click the plus sign.
4. Browse to the folder where you downloaded the PAK File and select the PAK file.
5. Click Upload.
   - The upload might take several minutes.
6. Read and accept the EULA, and click Next.
   - Installation details appear in the window during the process.
7. When the installation is completed, click Finish.
What to do next

After you install the vRealize Operations Service Discovery Management Pack, configure the adapter to discover and show the dependencies between different virtual machines.
When you configure the management pack, you can discover and retrieve application-related information running on each virtual machine. The adapter also displays the dependencies between different virtual machines.

**Figure 3-1. Configuring a Solution**

### Prerequisites
- Verify that a guest user mapping is created for each virtual machine. For more information on automating guest user mapping, see “Automate Guest User Mapping,” on page 13.
- Verify that the vCenter Server is already configured with VMware vSphere.

### Procedure
1. In the left pane of vRealize Operations Manager, click the **Administration** icon and click **Solutions**.
2. On the **Solutions** tab, select vRealize Operations Service Discovery Management Pack and click **Configure** on the toolbar.
3. Enter a name and description for the adapter configuration.
4. Under the **Basic Settings** section, provide the **vCenter Server** address.

VMware, Inc.
5 To select a plan to discover services from virtual machine:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shallow Discovery</td>
<td>You can discover only known services from a virtual machine.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> If there are unknown services that are responsible for the</td>
</tr>
<tr>
<td></td>
<td>relationship between any two VMs, then such services are not shown.</td>
</tr>
<tr>
<td>Deep Discovery</td>
<td>You can discover all the known and unknown services from a virtual machine.</td>
</tr>
<tr>
<td></td>
<td>Known services are displayed with their names and unknown</td>
</tr>
<tr>
<td></td>
<td>services are displayed with the process name and they are prefixed with</td>
</tr>
<tr>
<td></td>
<td>unknown service.</td>
</tr>
</tbody>
</table>

6 Select **Enable** or **Disable** from the **Dynamic Application Group** drop-down menu.

7 To add credentials, click the plus sign.
   a In the **Credential name** text box, enter the name by which you are identifying the configured credentials.
   b Type the User name and Password for the vCenter Server instance.
   c Enter a default name for **Windows** and **Linux**.

   **Note** If the authentication fails with common user name and passwords then the VM is tested with Guest user mapping and is marked for guest user mapping for the rest of the collection cycle unless the user saves the settings.

   d To collect SRM data when SRM is configured in the same vCenter, enter a **SRM User name** and **SRM Password**.
   e Enter a **Guest User Mapping CSV Password**.
   f Click **OK**.

8 Click **Test Connection** to validate the connection with your vCenter Server instance.

9 Expand the **Advanced Settings** and select the collector group from the **Collectors/Groups** drop-down menu.

10 Click **Save Settings**.

   The adapter instance is added to the list.

   **Note** If you click **Save Settings**, then all the existing data is discarded and the next collection cycle takes longer time.
Configuring Guest user Mapping

The vRealize Operations Service Discovery Management Pack provides the functionality of automatic configuration of guest user mappings for virtual machines.

For information on configuring the guest user mapping, see the VMware vSphere 6.5 Information Center.

Automate Guest User Mapping

The vRealize Operations Service Discovery Management Pack cannot discover services on a VM if the guest user mapping is not defined in the vCenter Server. However, you can discover services when default user name and passwords is provided during the configuration of the adapter. The automation helps you to automate the process of defining the guest user mapping.

When a Guest User Mapping is applied by the Service Discovery Adapter, the mapping is configured only for the vCenter Server user configured in the credentials page of service discovery adapter.

**Note** If a user changes the SSO user details of a configured service discovery then the user has to re-apply the guest user mapping to regain control on VMs.

**Prerequisites**

- Verify that you have configured the vRealize Operations Service Discovery Management Pack.
- Verify that you have the user credentials of the VM that has administrator rights.
- Verify that you have completed at least one cycle of object collection.
- Verify that your environment has VMware 10.1 tools.

**Procedure**

1. In the left pane of the VMware vRealize Operations Manager, click *Administration* and click *Inventory Explorer*.
2. Select the vCenter adapter instance on which the service discovery is configured and click the *Actions* icon.
3. To export the guest user mappings in a CSV template, select *Export Guest User Mappings* and enter the file path where the CSV file is created.

   **Note** Ensure that vRealize Operations Manager process has write access to the file path and specify the CSV file path. If the path is not specified, then the guest user mapping is saved in the default folder for a specific node on which the adapter instance is collecting data.

4. Click *Begin Action* to export operation.

   The Export Guest User Mappings appears with a task ID for the action.
5 Select the task ID to display all the recent tasks.

You can track the progress of each action under the recent tasks section. The export operation status changes to completed under the Associated objects section. Export operation creates a CSV file in the provided location and populates them with the name of the exported VM in the first column of the CSV. The second and third columns display a dummy user name and password. You can edit the CSV file and provide the correct user name and password for each VM.

6 To encrypt the CSV file, run the following command: gpg --symmetric <exported csv file>.

The CSV file consists of three columns, VM name, Guest OS user name and Password. If you do not want to perform a Guest user mapping from the exported CSV file then you can remove any of the entries of a VM from the exported file.

7 To apply the guest user mappings, select the Inventory Explorer and select the vCenter adapter instance where a service discovery is configured.

8 Click the Actions icon and select Apply Guest User Mappings.

9 Enter the Encrypted CSV path and Status CSV path, and click Begin Action.

You can provide the CSV file with the VM names and the guest OS credentials. You can either create or edit a CSV file. The CSV file must have three columns, VM Name, guest OS user name and Password.

**Encrypted CSV path**

Encrypted CSV path is the path where a user provides CSV file that contains guest user name and password in an encrypted format.

**Status CSV path**

Status CSV path is the output file where the adapter can write the status of an operation.

10 As the export action begins, click on the task ID to view the task progress and status from the Apply Guest User Mappings.

When the operation is completed, a message is displayed with the number of VMs for which guest user mapping has been successfully applied.

11 To clear all the guest user mappings, select Clear Guest User Mappings from the Actions drop-down menu.

**Note** When you select Clear Guest User Mappings, all the mappings related to the selected guest user mentioned in the CSV file is deleted. This action is not only applicable to the mappings applied using the Apply Guest User Mapping feature but all the mappings to a guest user is deleted.
You can view the application related data to verify that the vRealize Operations Service Discovery Management Pack is configured and collecting data.

You can verify that the vRealize Operations Service Discovery Management Pack is correctly installed and collecting data.

**Table 5-1. Successful Installation Indicators**

<table>
<thead>
<tr>
<th>Where to view the information</th>
<th>Information to view</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Administration Solution tab, under the <strong>Management Pack for</strong> vRealize Operations Service Discovery Management Pack <strong>Solution Details.</strong></td>
<td>You can view the collection state and the collection status columns.</td>
</tr>
<tr>
<td>Environment Overview Inventory</td>
<td>The objects related to applications are added to the inventory.</td>
</tr>
<tr>
<td>Dashboards</td>
<td>vRealize Operations Service Discovery Management Pack dashboards provides a graphical and topological representation of discovered known and unknown services of a virtual machine.</td>
</tr>
</tbody>
</table>
Dashboards in vRealize Operations Service Discovery Management Pack

You can determine the inter-dependencies of virtual machines and the dependencies of each service in the respective virtual machines.

The dashboards are added to the default vRealize Operations Service Discovery Management Pack and are specific to this adapter.

Access Dashboards

You can use the dashboards to view, monitor and troubleshoot objects in your cloud infrastructure.

Procedure

◆ To access the dashboards, select the Dashboard List > Service Discovery option from the vRealize Operations Manager menu bar.

Services Relationships

You can use the services relationship dashboard to view the dependency of a service on a virtual machine. The service discovered by vRealize Operations Service Discovery Management Pack are labeled and can be viewed in the service topology widget.

Figure 6-1. Service Relationship Dashboard
Widgets in Service Relationships

You can use the widgets in the service relationship dashboard to view the list of discovered services and their corresponding topology of the selected services. You can also retrieve information on how the services communicate with different services running on other VMs.

Table 6-1. Widgets in Service Relationships

<table>
<thead>
<tr>
<th>Widget</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>This widget displays all services that are discovered by the vRealize Operations Service Discovery Management Pack.</td>
</tr>
<tr>
<td>Service Topology</td>
<td>This widget displays the relationship between the services and other services running on other VMs.</td>
</tr>
<tr>
<td>Properties</td>
<td>This widget displays all the properties of the selected service from the Services and Service Topology widget. For more information on properties, see “List of Known Services,” on page 24.</td>
</tr>
</tbody>
</table>

**Note**  When there is a new resource found, then the virtual machine column under the Services widget is empty for a collection cycle. Only after a subsequent collection cycle, the information in the virtual machine column is then populated.

Virtual Machine Relationships

You can use the virtual machine relationship dashboard to monitor all the known virtual machines, their properties and their relationship between each other.

Figure 6-2. Virtual Machine Relationships Dashboard
Widgets in Virtual Machines Topology

You can use the virtual machine widgets to view the list of virtual machines, topology map, and the object relationship.

Table 6-2. Widgets in Virtual Machines Topology

<table>
<thead>
<tr>
<th>Widgets</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Machines</td>
<td>This widget displays all virtual machines that are discovered by vCenter adapter. The widget contains the following columns to provide a complete information pertaining to a virtual machine discovered by the service discovery MP: Name, Service Discovery Status, Service Discovery Method, Incoming and outgoing Connection, Recovery Plans, Protection Group, Guest OS, Power State</td>
</tr>
<tr>
<td>Relationship</td>
<td>This widget displays the relationship between each objects.</td>
</tr>
<tr>
<td>Services</td>
<td>This widget displays all the properties for the selected VM under the Virtual Machines and Relationships widgets.</td>
</tr>
<tr>
<td>Virtual Machine Topology</td>
<td>This widget displays the relationship between one or more VMs with each other when you select a virtual machine under the virtual machines widget. This data is based on the relationship between the services running on them.</td>
</tr>
</tbody>
</table>

Service Distribution

The service distribution dashboard shows the distribution of different service type in the selected data center, cluster, or a host system.

Figure 6-3. Service Distribution Dashboard

Widgets in Service Distribution

You can use this widget to view the distribution of different service types in a data center resource.
### Table 6-3. Widgets in Service Distribution

<table>
<thead>
<tr>
<th>Widgets</th>
<th>Description</th>
</tr>
</thead>
</table>
| Resources                | This widget provides a hierarchical representation of resources in the form of badges. The widget lists the following badges:  
  - vSphere World  
  - vCenter Server  
  - Data center  
  - Cluster Compute resource  
  - Host system |

| Known Services Distribution | This widget consists of a pie chart, which displays different applications discovered from a selected resource. The pie chart populates the distribution of a known service when you select a resource from the resources widget. If the selected item does not have any services discovered, then the pie chart displays the following message: The view cannot be rendered for the specified object. |
| Service Categories        | This widget displays the service categories that are discovered by selecting a resource from the resource widget. |
| Unknown Services Distribution | This widget shows all the unknown services of a selected resource. |

### Service Visibility

The service visibility dashboard provides an overall view of the virtual machines that contains unknown services.

This dashboard also provides information about VMs where the discovery has failed or has not occurred. For example, if a VM is powered off then discovery of such VMs does not occur.

**Figure 6-4. Service Visibility**
Widgets in Service Visibility

You can use this dashboard to view an overall visibility of unknown service of a selected data center resources.

Table 6-4. Widgets in Service Visibility

<table>
<thead>
<tr>
<th>Widget Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>This widget provides a hierarchical representation of resources in the form of badges. The widget lists the following badges:</td>
</tr>
<tr>
<td></td>
<td>■ vSphere World</td>
</tr>
<tr>
<td></td>
<td>■ vCenter Server</td>
</tr>
<tr>
<td></td>
<td>■ Data center</td>
</tr>
<tr>
<td></td>
<td>■ Cluster Compute Resource</td>
</tr>
<tr>
<td></td>
<td>■ Host System</td>
</tr>
<tr>
<td>Virtual Machines without Service Visibility</td>
<td>This widget displays information about failed discovery of VMs.</td>
</tr>
<tr>
<td>Virtual Machines with Unknown Services</td>
<td>This widget displays the list of VM’s where the unknown service count is not 0.</td>
</tr>
</tbody>
</table>
The Service Discovery adapter has a set of rules where you can identify the applications and services running processes on the guest. Some services can be identified and some might not; such services are called as unknown services. The unknown services and are displayed with a non-defined process names. The administrators change the category of a service by marking unknown services as known services by providing meaningful names to those services.

You can edit the name of a service or even revert the service to an unknown service. There are different actions provided to mark an unknown service as a known service.

**Mark Service as Known**

The administrator can mark an unknown service as a known service and provide a meaningful name for the service.

**Edit Service Name**

The administrator can edit the name of a known service that was known using the Mark Service.

**Revert to Unknown Service**

The administrator can revert the action of marking the service as known.

This chapter includes the following topics:

- “Change the Service Category,” on page 23
- “List of Known Services,” on page 24

### Change the Service Category

You can change the service category from an unknown service to a known service and provide meaningful names.

Services that are not listed under the known services are considered as unknown services. For more information on known services, see “List of Known Services,” on page 24.

**NOTE** You can change the category of a service for only a configured instance at that time and not for all the instances of service discovery adapter.

#### Procedure

1. To mark an unknown service as a known service, select a service from **Service Topology - Service** widget and click the **Actions** icon.
2. Select Mark as Known from the Actions drop-down menu and enter a name for that known service.
3. Click **Begin Action**

   The action saves this information in a properties file on the vRealize Operations Manager server. The changes are reflected in the next collection cycle.
To edit a known service name, select a service from the **Service Topology - Service** widget and select the newly renamed unknown service.

**List of Known Services**

The service discovery adapter lists a number of known services that can be discovered.

**Table 7-1. Known services list**

<table>
<thead>
<tr>
<th>Known Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Active Directory</td>
</tr>
<tr>
<td>IIS</td>
</tr>
<tr>
<td>Sharepoint</td>
</tr>
<tr>
<td>SQL Server</td>
</tr>
<tr>
<td>vCenter Site Recovery Manager Server</td>
</tr>
<tr>
<td>SRM – vSphere Replication Server</td>
</tr>
<tr>
<td>vShield</td>
</tr>
<tr>
<td>weblogic</td>
</tr>
<tr>
<td>Oracle DB</td>
</tr>
<tr>
<td>Apache HTTP</td>
</tr>
<tr>
<td>TC Server</td>
</tr>
<tr>
<td>Gemfire</td>
</tr>
<tr>
<td>Tomcat</td>
</tr>
<tr>
<td>JBoss</td>
</tr>
<tr>
<td>Hyperic Server</td>
</tr>
<tr>
<td>Hyperic Agent</td>
</tr>
<tr>
<td>Ms Sql server</td>
</tr>
<tr>
<td>VMwareVCenterServer</td>
</tr>
<tr>
<td>VMwareVCenterServerAppliance</td>
</tr>
<tr>
<td>MySQL</td>
</tr>
<tr>
<td>NGINX</td>
</tr>
<tr>
<td>RabbitMQ-Server</td>
</tr>
<tr>
<td>MS-Exchange-Client-Access</td>
</tr>
<tr>
<td>MS-Exchange-Hub-Transport</td>
</tr>
<tr>
<td>MS-Exchange-Mailbox</td>
</tr>
<tr>
<td>MS-Exchange-Unified-Messaging</td>
</tr>
<tr>
<td>MS-Exchange-Edge-Transport</td>
</tr>
<tr>
<td>VCloudDirector</td>
</tr>
</tbody>
</table>

**Service Types**

All the known services are grouped and shown as one service type. To view all the VMs where the corresponding services are running, navigate to **Environment > Inventory**.
Table 7-2. Services properties

<table>
<thead>
<tr>
<th>Property Names</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>VirtualMachine</td>
<td></td>
</tr>
<tr>
<td>Pid</td>
<td></td>
</tr>
<tr>
<td>InstallPath</td>
<td></td>
</tr>
<tr>
<td>Version</td>
<td></td>
</tr>
<tr>
<td>Port</td>
<td></td>
</tr>
<tr>
<td>ConnectionCount</td>
<td></td>
</tr>
<tr>
<td>ConnectionType</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE** Some version values can be missing in the property list under the Service Topology dashboard.

VM Properties

Table 7-3. List of VM properties

<table>
<thead>
<tr>
<th>Property Names</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>InboundPorts</td>
<td></td>
</tr>
<tr>
<td>UnknownServiceCount</td>
<td></td>
</tr>
<tr>
<td>KnownServiceCount</td>
<td></td>
</tr>
<tr>
<td>DiscoveryMethod</td>
<td></td>
</tr>
<tr>
<td>InboundPorts</td>
<td></td>
</tr>
<tr>
<td>IncomingConnectionCount</td>
<td></td>
</tr>
<tr>
<td>KnownServiceCount</td>
<td></td>
</tr>
<tr>
<td>OutGoingConnectionCount</td>
<td></td>
</tr>
<tr>
<td>ServiceDiscoveryStatus</td>
<td></td>
</tr>
<tr>
<td>UnknownServiceCount</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE** When a circular dependency is detected among the discovered services, no relationship is added to a such resources. Due to this functionality, the incoming and outgoing connection count value might differ than the actual number of connections in the dashboard. For example, in a vRealize Operations cluster, all the member relationships cannot be added. However, to validate them, search for their cyclic relationship member in the log file.
Integration With Site Recovery Manager

vRealize Operations Service Discovery Management Pack integrates with VMware Site Recovery Manager where the information related to the protection groups and recovery plans for each VM is collected and added as a property of that VM.

If a VM is part of any recovery plan or a protection group, then the VM can have a property set for that particular VM. You can connect to VMware Site Recovery Manager with a user name and a password during the Service Discovery adapter configuration. After you connect to SRM, the VM properties are updated with two new properties:

- Protection Group - The name of the protection group for a configured VM.
- Recovery Plans - The names of one or more recovery plans for a configured VM.

**Figure 8-1. SRM Integration**

Dynamic Application Group

All the connected services are grouped based on their types such as Database or an Application server.

When you enable the Dynamic Application Group when configuring the vRealize Operations Service Discovery Management Pack, all connected services are grouped in tier based on the category. All such types are then again grouped to form an application and a name is assigned to such applications. You can navigate to **Environment > Application** and rename the application. When you click any application, different types of services with their associated child services are then displayed.
Remove and Filter System Services

When you are configuring a list of services to be excluded, you can either filter or remove some of the services from the discovery list.

You can remove services explicitly that you want to discover even if they have a port assigned for each of them.

**NOTE** You can remove or filter a service only for a configured instance at that time and not for all the instances of the service discovery adapter.

**Figure 9-1. Configuring Excluded Services**

The table provides a list of services are removed from the excludes list.

**Table 9-1. Removed System Services**

<table>
<thead>
<tr>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>cupsd</td>
</tr>
<tr>
<td>sendmail:</td>
</tr>
<tr>
<td>svchost.exe</td>
</tr>
<tr>
<td>System</td>
</tr>
<tr>
<td>wininit.exe</td>
</tr>
<tr>
<td>spoolsv.exe</td>
</tr>
<tr>
<td>rpcbind</td>
</tr>
<tr>
<td>dhclient</td>
</tr>
<tr>
<td>rpc.statd</td>
</tr>
<tr>
<td>master</td>
</tr>
</tbody>
</table>

**NOTE** You can add any of the system services back in your configuration excludes. For more information, see “Configure Excluded Service List,” on page 30.
Configure Excluded Service List

When you select the deep discovery plan during the configuration of the adapter instance, the adapter discovers all the known and unknown services running on the Guest OS. Most operating system has several system services that can always run and appear in the discovered services list. You can remove or filter such service when you are configuring a list of excluded service list.

Procedure

1. From Inventory Explorer, select the Service Discovery adapter instance on which the excluded services list is configured.
2. Click the Actions icon and select Configure Excluded Services. The Configure Excluded Services dialog box appears.
3. Enter the list of services that you want to exclude and click Begin Action.
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