SQL Loader Adapter Installation and Configuration Guide

vCenter Operations Manager 1.0

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Contents

SQL Loader Adapter Installation and Configuration Guide

The *SQL Loader Adapter Installation and Configuration Guide* describes how to install and configure the SQL Loader adapter for vCenter Operations Manager.

Intended Audience

This information is intended for anyone who needs to install or configure the SQL Loader adapter.

Updated Information

The *SQL Loader Adapter Installation and Configuration Guide* is updated with each release of the product or when necessary.

This table provides the update history of the *SQL Loader Adapter Installation and Configuration Guide*.

Revision	Description
EN-000982-06	Updated the library files listed in "SQL Loader Adapter Folders and Files," on page 15.
EN-000982-05	Added "Query Returns Incorrect Time Stamp," on page 36.
EN-000982-04	Added information about applying zero values to metrics in "Add an Adapter Instance," on page 21.
EN-000982-03	■ Added "Security Considerations," on page 11. ■ Corrected the log file location information in "Viewing System Log Files," on page 32.
EN-000982-02	Updated the document for the 5.6 release. ■ Added information about instance-generated and adapter-specific metrics. See "Instance Generated Metrics," on page 10. ■ Added the `collect_status_messages.properties` and `open_source_license.txt` files to "SQL Loader Adapter Folders and Files," on page 15. ■ Added information about the **Child Adapter Kinds To Clear** text box to "Add an Adapter Instance," on page 21. ■ Added the `COLLECT_STATUS_NOTIFICATION_ENABLED` property to "Modifying Adapter Properties," on page 25. ■ Added information about viewing collection states and collection status values. See "View Collection Information," on page 29. ■ Added adapter classes to "SQL Loader Adapter Classes," on page 33.
EN-000982-01	■ Removed Sybase database support. ■ Added "Adapter Cannot Discover Resources During Auto-Discovery," on page 34.
EN-000982-00	The *SQL Loader Adapter Technical Note* is now the *SQL Loader Adapter Installation and Configuration Guide*.
	The *SQL Loader Adapter Technical Note* was the initial release of this document.

Introduction to the SQL Loader Adapter

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The SQL Loader adapter is an embedded adapter for vCenter Operations Manager. The adapter uses JDBC drivers to access an external database.

This chapter includes the following topics:

How the Adapter Retrieves Data

The SQL Loader adapter uses select statements in SQL query files to retrieve data from source database tables. The adapter can retrieve data from multiple tables in multiple databases.

The main data query file is named `DB_QUERY_n.sql`, where *n* is a number that identifies an adapter instance. For example, `DB_QUERY_1.sql`.

The SQL Loader adapter can use either auto-discovery or manual discovery to discover resources. To discover resources manually, you create a discovery query file. Discovery query files are named `DISCOVER_DB_QUERY_n.sql`, where *n* identifies the corresponding adapter instance, for example, `DISCOVER_DB_QUERY_1.sql`.

The SQL Loader adapter can use a query file to retrieve parent-child relationships for the resources that it tracks. Relationships query files are named `RELATIONSHIPS_DB_QUERY_n.sql`, where *n* identifies the corresponding adapter instance, for example, `RELATIONSHIPS_DB_QUERY_1.sql`.

The file naming convention for the main data query, discovery query, and relationships query files enables the SQL Loader adapter to identify the query files for different adapter instances.

If the SQL Loader adapter cannot retrieve data for a metric during a collection cycle, it can use a query file to retrieve a default value for the metric from a database table. The database table can reside in the source database or in another database. The metric default values query file is named `METRIC_DEFAULT_VALUES.sql`. All adapter instances use the same metric default values query file.

Instance Generated Metrics

In vCenter Operations Manager 5.x and later releases, all adapter instances, including SQL Loader adapter instances, collect certain adapter-specific metrics under **Instance Generated**. These metrics include the elapsed time to collect data, the new metrics and resources in each collect call, the number of down resources, and the total number of metrics and resources collected.

In vCenter Operations Manager 5.6 and later releases, metrics specific to each adapter kind appear under **Instance Generated** in **Adapter Specific**. Adapter-specific metrics provide additional information about adapter instance operation.

Table 1-1. SQL Loader Adapter-Specific Metrics

Metric	Description
Data Process Time	Amount of time that the adapter takes to retrieve and process data.
Historic Phase	Boolean value that specifies whether the adapter is running in historic phase.
Query Execution Time	Amount of time that the adapter takes to execute the main query.
Relationships Process Time	Amount of time that the adapter takes to process relationships.

How the Adapter Retrieves Events

The SQL Loader adapter can retrieve events from the source database. The events that the adapter retrieves appear as Notification events in the Custom user interface.

Because an SQL Loader adapter instance can process either data or events, you must create a separate adapter instance to process events.

An SQL Loader adapter instance that retrieves events typically returns messages for resources that another SQL Loader adapter instance has already created. If the adapter instance retrieves events for resources that do not exist, it creates the resources in the database.

Overview of Adapter Operation

The START_TIME property in the adapter instance-level properties file determines the earliest date and time for which each query returns data. START_TIME always reflects the oldest data that might be collected for any resource.

After each monitoring cycle, the SQL Loader adapter updates the START_TIME property based on the previous start time, whether data was collected for all resources, and the MAX_MIN_WAIT_FOR_DATA and NUM_DATA_MINUTES_PER_DB_READ property values.

In real-time phase, the MAX_MIN_WAIT_FOR_DATA property specifies the number of minutes that the adapter waits for new data to appear for a resource before it determines that the data is missing. In historic phase, the NUM_DATA_MINUTES_PER_DB_READ property in the adapter-level properties file specifies the time interval, in minutes, that the adapter uses to filter time-series metrics for each retrieval cycle.

In real-time phase, the end time equals the current time. In historic phase, the end time is the sum of the START_TIME and NUM_DATA_MINUTES_PER_DB_READ property values.

The default monitoring interval is five minutes. In general, you should not change the default monitoring interval, but you can set the monitoring interval to a minimum of one minute, if necessary.

Installation and Configuration Requirements

Before you install the SQL Loader adapter, verify that your system meets certain requirements.

Supported Database Types

The external database that contains the source data for the SQL Loader adapter, including the the resources that the adapter discovers, must be one of the following database types:

- SQL Server
- Oracle
- MySql
- PostreSQL
- DB2

The database version that the SQL Loader adapter supports depends on the version of the JDBC driver that is included with the adapter installation files. To find the JDBC driver version, examine the JDBC drivers in the `general_sql_adapter3/lib` folder.

Connection Requirements

The SQL Loader adapter uses a JDBC URL to connect to the database that contains the source data. The format of the JDBC connection URL depends on the database type.

Table 1-2. JDBC Connection URL Formats

Database Type	URL Format
SQL Server	`jdbc:sqlserver://host:port;DatabaseName=dbname`
Oracle	`jdbc:oracle:thin:@host:port:dbname`
MySql	`jdbc:mysql://host:port/dbname`
PostgreSQL	`jdbc:postgresql://host:port/dbname`
DB2	`jdbc:postgresql://host:port/dbname`

Credential Requirements

The SQL Loader adapter requires the user name and password of a user account that can read the database that contains the source data. You use this user name and password when you create a credential for an SQL Loader adapter instance.

Security Considerations

The Collector service must have access to all of the configuration files in the SQL Loader adapter's `conf` and `work` folders and the files should be secured.

For more information about SQL Loader adapter folders and files, see "SQL Loader Adapter Folders and Files," on page 15. For information about SQL Loader adapter log files, see "Viewing System Log Files," on page 32.

Installing the SQL Loader Adapter 2

How you install the SQL Loader adapter depends on whether you have a vCenter Operations Manager Standalone or vApp installation.

This chapter includes the following topics:

Install the Adapter in a Standalone Installation

If you have standalone, you install the SQL Loader adapter by extracting the adapter installation files from a TGZ file and running an installation utility.

Prerequisites

- Download the adapter installation TGZ file anonymously from ftp://ftp.integrien.com/.

- Make a note of the build number in the TGZ file name. The build number appears after the adapter name, for example, *adaptername–buildnumber*.tgz.

- Read the release notes that are included with the TGZ file.

Procedure

1 Open the TGZ file and extract the TAR file to a temporary folder on your vCenter Operations Manager server.

2 In the temporary folder, open the TAR file and extract and run the installer for your operating system platform.

3 Log in to the Custom user interface as an administrator.

4 Select **Admin > Support**.

5 On the **Info** tab, find the Adapters Info pane and click the **Describe** icon (⚙).

   The **Describe** icon is located at the top right of the Adapters Info pane.

6 Click **Yes** to start the describe process and click **OK**.

   The Custom user interface finds the adapter files, gathers information about the abilities of the adapter, and updates the user interface with information about the adapter. If you have remote collectors, it installs the adapter on the remote collectors.

   The describe process might take several minutes. When the describe process is finished, the adapter appears in the Adapters Info pane. The build number is in the Adapter Version column.

7   Verify that the build number in the Adapter Version column for the adapter matches the build number in the TGZ file that you downloaded.

The installation utility creates the `general_sql_adapter3` folder and `general_sql_adapter3.jar` file under the `vcenter-ops`/user/plugins/inbound folder.

Install the Adapter in a vApp Installation

If you have a vApp, you install the SQL Loader adapter from a PAK file.

Prerequisites

- Download the adapter installation PAK file anonymously from ftp://ftp.integrien.com.

- Make a note of the build number in the PAK file name. The build number appears after the adapter name, for example, *adapter*name-*buildnumber*.pak.

- Read the release notes that are included with the PAK file.

Procedure

1   Save the PAK file in a temporary folder.

2   Log in to the Admin user interface as the admin user.

For example: **https://*ipaddress*/admin/**

3   On the **Update** tab, click **Browse** to locate the temporary folder and select the PAK file.

4   Click **Update** and click **OK** to confirm the update.

The Admin user interface uploads the PAK file. The upload might take several minutes.

5   Read and accept the EULA and click **OK**.

6   Click **OK** to confirm and start the update process.

The update might take several minutes. Status information appears on the **Update** tab when the update is finished.

7   Log in to the Custom user interface as an administrator.

For example: **https://*ipaddress*/vcops-custom/**

8   Select **Admin > Support**.

9   On the **Info** tab, find the Adapters Info pane and click the **Describe** icon (⊚).

The **Describe** icon is located at the top right of the Adapters Info pane.

10   Click **Yes** to start the describe process and click **OK**.

The Custom user interface finds the adapter files, gathers information about the abilities of the adapter, and updates the user interface with information about the adapter.

The describe process might take several minutes. When the describe process is finished, the adapter appears in the Adapters Info pane. The build number is in the Adapter Version column.

11   Verify that the build number in the Adapter Version column for the adapter matches the build number in the PAK file that you uploaded.

The installation process creates the `general_sql_adapter3` folder and `general_sql_adapter3.jar` file under the `vcenter-ops`/user/plugins/inbound folder.

SQL Loader Adapter Folders and Files

The adapter installation folder, *vcenter–ops*/user/plugins/inbound/general_sql_adapter3, contains several subfolders and files.

Table 2-1. SQL Loader AdapterFolders and Files

Folder	Subfolder	File	Description
conf		db.properties	Contains database settings for all SQL Loader adapter instances.
		hpoc.properties	Contains settings that apply to the overall operation of the SQL Loader adapter or to all SQL queries that run under its control.
		describe.xml	Describes the adapter.
		history.txt	Describes the history of adapter changes.
		version.txt	Contains information about the adapter version.
		collect_status_messages.properties	(vCenter Operations Manager 5.6 and later only) Contains properties that define the messages that appear in the Custom user interface when you point to the collection status of an adapter instance on the Environment Overview page.
		DB_QUERY_*n*.sql	Main data query file. Contains the query that an adapter instance uses to retrieve time-series metrics. *n* is a number that identifies the adapter instance.
		DISCOVER_DB_QUERY_*n*.sql	Contains the query that an adapter instance uses to find resources during manual discovery. *n* is a number that identifies the adapter instance.
		RELATIONSHIPS_DB_QUERY_*n*.sql	Contains the query that an adapter instance uses to retrieve resource relationships. *n* is a number that identifies the adapter instance.
		METRIC_DEFAULT_VALUES.sql	Contains the query that all adapter instances use to retrieve default values for metrics.
		open_source_license.txt	Open source license file.
lib		OSS library files: ■ commons–dbcp–1.2.1.jar ■ commons–pool–1.2.jar ■ jtds.jar ■ mysql–connector–java–3.1.8.jar ■ postgresql–9.2–1000.jdbc4.jar Non-OSS library files: ■ ojdbd14.jar ■ sqljdbc4.jar	Database drivers and other commonly used files.
samples	conf	DB_QUERY_*n*.sql	Sample files that you can modify and use to create your own queries.
		DISCOVER_DB_QUERY_*n*.sql	
		RELATIONSHIPS_DB_QUERY_*n*.sql	
		METRIC_DEFAULT_VALUES.sql	

Table 2-1. SQL Loader AdapterFolders and Files (Continued)

Folder	Subfolder	File	Description
	work		Empty by default.
work		allParents_*resourceID*.txt	Keeps track of all parent resources that have relationships that the adapter creates. If a parent resource is removed from the source relationships table, the adapter uses the parent cached in this file to delete the related relationship from the vCenter Operations Manager database.
		DB_QUERY_*n*.properties	Contains property settings for a DB_QUERY_*n*.sql file.

The work folder, and the DB_QUERY_*n*.properties files that it contains, do not exist until after you create an adapter instance.

Configuring the SQL Loader Adapter **3**

Configuring the SQL Loader adapter involves creating query files, adding an adapter instance and credential, and modifying adapter and instance-level properties files.

This chapter includes the following topics:

- "Overview of Configuration Steps," on page 17
- "Creating a Main Data Query File," on page 18
- "Creating a Query File to Retrieve Events," on page 19
- "Creating a Relationships Query File," on page 20
- "Creating a Metric Default Values Query File," on page 20
- "Add an Adapter Instance," on page 21
- "Modifying Adapter Properties," on page 25
- "Common Aliases in Query Files," on page 27
- "Database Properties," on page 28

Overview of Configuration Steps

You must perform the configuration steps in a particular order.

1   Create a main data query file. See "Creating a Main Data Query File," on page 18.

2   (Optional) Create a query file to retrieve events. See "Creating a Query File to Retrieve Events," on page 19.

3   (Optional) Create a query file to retrieve resource relationships. See "Creating a Relationships Query File," on page 20.

4   (Optional) Create a query file to retrieve default values for metrics. See "Creating a Metric Default Values Query File," on page 20.

5   Create one or more adapter instances. See "Add an Adapter Instance," on page 21.

6   (Optional) Create a query file to discover resources manually. See "Creating a Discovery Query File," on page 24.

7   (Optional) Configure adapter and instance-level properties. See "Modifying Adapter Properties," on page 25.

Using Stored Procedure Calls to Retrieve Data

If the source database is an SQL Server, Oracle, or MySql database, the SQL Loader adapter can run stored procedure calls instead of select statements in database query files to retrieve data.

Oracle Example

This is an example of a stored procedure call for Oracle.

```
call sp_get_metrics starttime = %f, endtime = %t
```

SQL Server Example

This is an example of a stored procedure call for SQL Server.

```
exec WFTest.dbo.uspGetMetrics @startTime = %f, @endTime = %t
```

If you pass additional parameters for SQL Server, you must also pass the optional parameters (parameters that have default values), unless those parameters are at the end of the parameters list in the stored procedure call definition.

MySql Example

This is an example of a stored procedure call for MySql.

```
call GetAllRawData st = %f, et = %t
```

Placeholders

`%f` and `%t` are placeholders. When the adapter runs, it replaces `%f` with the `START_TIME` property value and `%t` with the calculated end time of the collection cycle.

Creating a Main Data Query File

The SQL Loader adapter uses the main data query file to retrieve time-series metrics from the source database. Each adapter instance that retrieves data must have its own main data query file.

The main data query file contains property settings and an SQL query. The SQL query is a select statement that reads metrics from the source database. You can use a sample database query file in the `samples/conf` folder to create your own main data query file.

Name main data query files `DB_QUERY_n.sql` and save them in the `conf` folder. Use the *n* in the file name to identify the adapter instance, for example, `DB_QUERY_1.sql`.

The following example shows a database query statement that retrieves metrics. When the adapter instance runs, it replaces `%f` with the `START_TIME` property value and `%t` with the calculated end time of the collection cycle.

```
select Agent RESOURCENAME,
'SVT' RESOURCEKIND,
'' ADAPTERKIND
LastOccurance TIMESTAMP,
'TotalTransaction' METRICNAME1,
TotalTrans VALUE1,
'TotalTransaction_Over_SLA' METRICNAME2,
TToSLA VALUE2,
'SVT_21' METRICNAME3,
svt21 VALUE3,
'SVT_21_Over_SLA' METRICNAME4,
svt21oSLA VALUE4,
```

```
'SVT_201' METRICNAME5,
svt201 VALUE5,
'SVT_201_Over_SLA' METRICNAME6,
svt201oSLA VALUE6,
'SVT_100' METRICNAME7,
svt100 VALUE7,
'SVT_100_Over_SLA' METRICNAME8,
svt100oSLA VALUE8,
'SVT_901' METRICNAME9,
svt901 VALUE9,
'SVT_901_Over_SLA' METRICNAME10,
svt901oSLA VALUE10
from toleranceTest
WHERE (LastOccurance >= %f) AND (LastOccurance < %t)
ORDER BY 'TIMESTAMP'
```

Creating a Query File to Retrieve Events

You can configure the SQL Loader adapter to retrieve events from the source database. You must create a separate adapter instance to process events. An SQL Loader adapter instance can collect either data or events.

You must describe the events in a table in the source database and create a query file to retrieve the events from the table. You specify event-related properties in the instance-level properties file for the adapter instance.

Name query files that retrieve events `DB_QUERY_events.sql` and save them in the `conf` folder. You can use a sample database query file in the `samples/conf` folder to create your own events query file.

Source Events Table Format

The source events table must include certain columns.

Table 3-1. Columns in the Events Table

Column	Description
resKind	Contains the resource kind. The value in this column must match a resource kind that the adapter imports.
resName	Contains the resource name. The value in this column must match a resource name that the adapter imports.
eventMessage	Contains the event message.
eventTime	Contains a time stamp for the event.

If you use different column names, write the select statement to refer to the new column name. For example, if you name the column that contains the resource name Machine instead of resName, the select statement should read `select Machine RESOURCENAME`.

Sample Database Query to Retrieve Events

The following example shows a query statement that retrieves events. When the adapter instance runs, it replaces `%f` with the `START_TIME` property value and `%t` with the calculated end time of the collection cycle.

```
select AdapterKind ADAPTERKIND
resKind RESOURCEKIND,
resName RESOURCENAME,
eventMessage MESSAGE,
```

```
eventTime TIMESTAMP
from events
WHERE (eventTime >= %f) AND (eventTime < %t)
ORDER BY 'TIMESTAMP'
```

Creating a Relationships Query File

You can configure the SQL Loader adapter to create parent-child relationships for the resources that it tracks.

You must describe the topology of your environment in a table in the source database and create a query file to retrieve parent-child relationships from the table. Each adapter instance must have its own relationships query file.

You enable relationship processing for an adapter instance by setting the PROCESS_RELATIONSHIPS property to true in the instance-level properties file for the adapter instance.

NOTE   If you store relationships for all adapter instances in one source relationships table, set the PROCESS_RELATIONSHIPS property to true in the relationships query file for one of the adapter instances.

Name relationships query files RELATIONSHIPS_DB_QUERY_*n*.sql and store them in the conf folder. The *n* in the file name is a number that identifies the corresponding adapter instance. For example, if the main data query file for an adapter instance is called DB_QUERY_1.sql, name the relationships query file for that adapter instance RELATIONSHIPS_DB_QUERY_1.sql.

You can use the sample relationships query file in the samples/conf folder to create your own relationships query file. The sample relationships query file contains the following select statement.

```
select parentResName PARENT_RESOURCENAME,
childRes CHILD_RESOURCENAME,
parentResKind PARENT_RESOURCEKIND,
childResKind CHILD_RESOURCEKIND,
parentAdapterKind PARENT_ADAPTERKIND,
childAdapterKind CHILD_ADAPTERKIND,
parentResIds PARENT_RESOURCEIDS,
childResIds CHILD_RESOURCEIDS,
parentIsContainer PARENT_IS_CONTAINER
from Relationships
```

The query in the sample relationships query file works only if the name of your source relationships table is Relationships and the field names in the statement match the field names in your source relationships table. If your source relationships table does not meet these requirements, modify the statement and create a statement that works for your source relationships table.

Creating a Metric Default Values Query File

You can configure the SQL Loader adapter to retrieve metric default values from a database table that you create. The table does not have to be in the adapter instance source database, but it must be in a type of database that the adapter supports.

The table must contain the ResourceKind, MetricName, and DefaultValue fields. For each combination of ResourceKind and MetricName, you must enter a default value in the table. You must type the default values for all metrics for all adapter instances in a single table.

NOTE   You set default values for each ResourceKind, not for each Resource.

You must create a metric default values query file to retrieve default values from the table. Name the metric default values query file METRIC_DEFAULT_VALUES.sql and store it in the conf folder.

Because the metric default values table can be in a different database than the adapter instance source database, the metric default values query file contains database properties that describe how to connect to the database that contains the table.

Table 3-2. Database Properties in the METRIC_DEFAULT_VALUES.sql File

Property	Description
DBTYPE	Database type. Valid values are SQL_server, Oracle, MySQL, and PostgreSQL.
USERNAME	User name to use to connect to the database. The user name must have permission to run the SQL query and read the defined data from the database.
PASSWORD	Password for the user name. Type the password in plain text. The password is encrypted when the adapter runs if PASSWORD_ENCRYPTED is set to False.
PASSWORD_ENCRYPTED	Set to False. When the adapter encrypts the password, it sets this property to True. If you omit this property, the adapter does not encrypt the password. To change the password, replace the encrypted password with a new plain-text password and set this property to False. The adapter encrypts the new password the next time it runs.
JDBCCONNECTIONSTRING	URL to use to connect to the database that contains the default values.
QUERY_STATEMENT	Select statement to retrieve the default values for resource kinds and metrics that you specified in the adapter instance.

Add an Adapter Instance

An SQL Loader adapter instance defines the adapter type, describes how to connect to the source database, and specifies the SQL file that contains the database query to use.

You can create multiple adapter instances and assign a different SQL query file to each instance. To collect events, you must create two adapter instances: one instance to collect data and another instance to collect events. A single adapter instance cannot retrieve both data and events.

Prerequisites

- Install the SQL Loader adapter. See Chapter 2, "Installing the SQL Loader Adapter," on page 13.

- Create a credential, or, if you plan to create a credential when you define the adapter instance, become familiar with creating credentials. See "Add a Credential," on page 24.

- If you are creating an adapter instance to collect data, create a main data query file. See "Creating a Main Data Query File," on page 18.

- If you are creating an adapter instance to collect events, create an events query file. See "Creating a Query File to Retrieve Events," on page 19.

- (Optional) To retrieve resource relationships from the source database, create a relationships query file. See "Creating a Relationships Query File," on page 20

- (Optional) To use default values for missing metrics data, create a metric default values query file. See "Creating a Metric Default Values Query File," on page 20.

Procedure

1   Log in to the Custom user interface as an administrator.

2   Select **Environment > Configuration > Adapter Instances**.

3   Select the collector to use from the **Collector** drop-down menu.

Unless you added additional collectors, the only available collector is **vCenter Operations Server**. You can change the name of this collector when you install the standalone version.

4   Select **General Sql Data Loader** from the **Adapter Kind** drop-down menu.

5   Click the **Add New Adapter Instance** icon.

6   Type a name for the adapter in the **Adapter Instance Name** text box.

7   Configure how the adapter instance connects to the source database.

Field	Action
DB Type	Select the source database type.
Host	Type the host name or IP address of the source database host. If you plan to use a named instance of SQL Server, type the instance name or instance port after the host name or IP address. Use a backslash (\) character to separate the host name or IP address and the instance name or port. For example, **10.1.15.12\QA64SQL2K5**.
Port	Type the port to use to connect to the source database. If the source database is SQL Server and you specified a named instance in the **Host** text box, the adapter instance ignores this port number.
DB Name	Type the name of the source database.
Additional URL Field	(Optional) Type a database-specific field to append to the JDBC URL. Use a semicolon (;) to delimit the additional field. For example, to add a failover server host name to the URL, you might type **;failoverPartner–10.118.48.127\QA64SQL2K5**.

8   From the **Date Type** drop-down menu, select the date type to use in the query.

Option	Description
DATETIME	Source database date input field is not a string.
STRING	Source databases uses the STRING date type.
EPOCHSTRING	Source database uses UNIX epoch string time stamps.
EPOCHLONG	Source database uses UNIX epoch long time stamps.

9   Provide the required data format, time zone, SQL file, and properties file information.

Field	Action
Date Format	Type the date format to use when the adapter instance reads date and time information from the source database. The adapter instance uses this format if the date type is STRING or the database type is MySQL and the date type is DATETIME.
Timezone	Select the time zone of the source database host. The adapter instance uses this value for metric data time stamps. vCenter Operations Manager adjusts the time stamps so that they correspond to the time stamps in the vCenter Operations Manager database server. NOTE This value is not applicable if you select the EPOCHSTRING or EPOCHLONG date type.
SQL file	Type the name of the SQL file that contains the database query to use. The adapter instance uses the query statement in this file to parse the source database. All database query files are in the conf folder. For example, **DB_QUERY_1.sql**.
Properties file	Type a name for the database query properties file that corresponds to the database query file. For example, if the database query file in the **SQL file** text box is DB_QUERY_1.sql, name the properties file DB_QUERY_1.properties.

10   Configure how the adapter instance handles metric values if it cannot retrieve data for a metric during a collection cycle.

Option	Action
Use default values	Select **true** to retrieve a default value that you defined.
Use zero as all metric default value	Select **true** if you did not define metric default values. The adapter uses 0 for a metric value if it cannot retrieve data for a metric during the collection cycle. NOTE When you set this option to **true**, the adapter ignores the **Use default values** setting.

An adapter instance cannot apply zero values until it has collected at least one data point for a resource's metrics. For example, if you use manual discovery to create a resource, the adapter instance does not apply zero values because the resource does not yet have metrics. Later, after the adapter instance has collected data for the resource, it applies zero values to metrics that do not have values.

11   (Optional) To configure the SQL Loader adapter instance to clear child resource relationships only for specific adapter kinds, type those adapter kinds in the **Child Adapter Kinds To Clear** text box.

Separate multiple adapter kinds with a comma.

When you type an adapter kind in this text box, the SQL Loader adapter instance clears the child resources of that adapter kind and preserves all other child relationships. For example, if you type `General Sql Data Loader`, the adapter instance clears relationships only for a parent resource that has child resources of the adapter kind General Sql Data Loader.

If you leave this text box blank (the default), the adapter instance clears all child relationships before it creates new relationships based on the query that you specify.

The most practical use of this option is to add the child adapter for relationships that this adapter instance creates so that the relationships created by other adapters for a parent resource are preserved.

NOTE   This option applies only to vCenter Operations Manager 5.6 and later versions.

12   Type **yes** or **no** in the **Support Autodiscovery** text box to enable or disable auto-discovery.

If you enable auto-discovery, the data collection process discovers new resources and creates the resources for you. If you disable auto-discovery, you must discover resources manually.

13   Select the credential to use to sign on to the data source from the **Credential** drop-down menu, or click **Add** to add a new credential.

14   (Optional) Click **Test** to test the adapter instance.

15   Click **OK** to save your configuration.

vCenter Operations Manager adds the adapter instance to the list of adapter instances and creates the `work` folder under the `general_sql_adapter3` folder.

What to do next

If you disabled autodiscovery for the adapter instance, create a discovery query file and perform manual discovery to add resources to the vCenter Operations Manager database. See "Creating a Discovery Query File," on page 24.

To enable relationship or event processing, set properties in the instance-level properties file for the adapter instance. See "Modifying Adapter Properties," on page 25.

Add a Credential

An SQL Loader adapter instance uses a user name and password to connect to the source database. You use this user name and password to create a credential for the adapter instance.

You can add the credential before you create the adapter instance and select the correct credential when you define the adapter instance, or you can add the credential when you define the adapter instance.

Prerequisites

Install the SQL Loader adapter. See Chapter 2, "Installing the SQL Loader Adapter," on page 13.

Procedure

1 Log in to the Custom user interface as an administrator.

2 Select **Environment > Configuration > Credentials**.

3 Select **General Sql Data Loader** from the Adapter Kind drop-down menu.

4 Select the credential kind from the **Credential kind** drop-down menu.

5 At the top of the list of credentials, next to **Action**, click **Add**.

6 Type a unique name for the credential instance in the **Instance name** text box.

7 Type the user name and password combination in the **User name** and **Password** text boxes.

8 Click **OK** to add the credential for the adapter kind.

The credential appears in the list in the Manage Credentials window.

Creating a Discovery Query File

If you disable auto-discovery for an SQL Loader adapter instance, you must create a discovery query file and perform manual discovery to discover resources in the source database. You can use a sample discovery query file in the `samples/conf` folder to create your own discovery query file.

NOTE The SQL Loader adapter can discover only resources that have the General SQL Loader Adapter resource kind.

Name discovery query files `DISCOVER_DB_QUERY_n.sql` and save them in the `conf` folder. The n in the file name is a number that identifies the corresponding adapter instance. For example, if the main data query file for an adapter instance is called `DB_QUERY_1.sql`, name the discovery query file `DISCOVER_DB_QUERY_1.sql`.

You identify resources in a discovery query file by using one of the following combinations of resource properties:

■ Adapter Kind, ResourceKind, and ResourceName

■ AdapterKind, ResourceKind, and a set of unique Resource Identifiers

If you do not define Resource Identifiers in a query, the adapter uses ResourceName to determine resource uniqueness. If you do not define AdapterKind in a query, the adapter uses General Sql Data Loader as the adapter kind.

Resource properties are not case sensitive.

Modifying Adapter Properties

You can tune adapter operation by modifying properties in the `hpoc.properties` and instance-level properties files. In a vApp installation, you modify the properties file on the Analytics virtual machine.

Adapter-Level Properties

Adapter-level properties affect the overall operation of the SQL Loader adapter or all SQL queries that run under its control. You define adapter-level properties in the `hpoc.properties` file in the `conf` folder.

Table 3-3. Adapter-Level Properties

Property	Description
SEC_TO_SLEEP_IN_HISTORIC_PHASE	Pause time, in seconds, between two consecutive attempts to retrieve time-series data in historic phase.
MIN_TO_DETERMINE_HISTORIC_PHASE	Time offset from the current time to determine whether the phase is real-time or historic. If START_TIME is less than the current time minus MIN_TO_DETERMINE_HISTORIC_PHASE, the phase is historic. The value of MIN_TO_DETERMINE_HISTORIC_PHASE must be at least twice as large as the smallest MAX_MIN_WAIT_FOR_DATA setting for a query.
NUM_DATA_MINUTES_PER_DB_READ	Time interval, in minutes, to use to filter time series data for each retrieval cycle in historic phase. The default value is 1800. The adapter retrieves time-series data in chunks filtered by START_DATE and end date. End date is the sum of START_DATE and NUM_DATA_MINUTES_PER_DB_READ. For example, if a query's start time is 12:00 a.m. on March 24, the default value means that the cycle collects information from March 24 at 12:00 a.m. through March 25 at 6:00 a.m. You set start times in the SQL file for each query. The adapter updates the start times.

Table 3-3. Adapter-Level Properties (Continued)

Property	Description
MIN_DATE_ROUNDING	Integer value that the adapter uses to round data point dates, in minutes. Times are always rounded down. If the rounded times for two or more data points for a metric are equal, the adapter sends only the last data point to vCenter Operations Manager. This setting can reduce the amount of data that the adapter sends to vCenter Operations Manager. For example, a particular metric collects the following values at the indicated times: ■ 12:10:00 = 22 ■ 12:10:30 = 24 ■ 12:11:00 = 21 ■ 12:11:30 = 23 If MIN_DATE_ROUNDING is set to 2, all of the data point dates are rounded down to 12:10:00 and the adapter sends only the final value, 23, to vCenter Operations Manager. A value of 0 (the default setting) means that the adapter sends all collected data to vCenter Operations Manager and does not round data point dates. NOTE The rounding, in minutes, must be smaller than the monitoring interval.
COLLECT_STATUS_NOTIFICATION_ENABLED	(vCenter Operations Manager 5.6 and later only) When you point to the collection status of an SQL Loader adapter instance on the Environment Overview page in the Custom user interface, a message can appear after the collection status in the pop-up dialog box. Ths property determines whether vCenter Operations Manager generates notification events for the problems that these messages describe.

Instance-Level Properties

You can set secondary properties for each database query in an instance-level properties file in the work folder. vCenter Operations Manager creates the work folder when you add an adapter instance.

Instance-level property files are named DB_QUERY_*n*.properties, where *n* identifies the corresponding adapter instance. For example, if the main data query file for an adapter instance is called DB_QUERY_1.sql, the instance-level properties file for the adapter instance is named DB_QUERY_1.properties.

You can set instance-level properties for each individual data query file.

Table 3-4. Instance-Level Properties

Property	Description
DB_QUERY_FILTER_DATE_FORMAT	The format string that the adapter instance uses to replace the start (%f) and end (%t) times in the query when date type is set to STRING for the adapter instance.
START_TIME	The earliest date and time for which the query returns data in the format mm/dd/yyy hh:mm. The START_TIME value equals the current time minus MIN_TO_DETERMINE_HISTORIC_PHASE. The default is one hour. Before you run the query for the first time, set START_TIME to the date and time of the earliest historic data to collect. After each collection cycle, the adapter updates the start time based on the previous start time, whether data was collected for all resources, the MAX_MIN_WAIT_FOR_DATA setting, and the NUM_DATA_MINUTES_PER_DB_READ setting in the hpoc.properties file. The START_TIME value always reflects the oldest data that might be collected for a resource.

Table 3-4. Instance-Level Properties (Continued)

Property	Description
MAX_MIN_WAIT_FOR_DATA	During real-time phase, the number of minutes that the adapter instance waits for new data to appear for a resource before it determines that data is missing. If no data appears within the specified time period, the adapter instance sends the metric default value or zero (depending on how the adapter instance is configured) to the vCenter Operations Manager database.
	If new data appears after the time period expires, the adapter does not send the data to the vCenter Operations Manager database. For example, if MAX_MIN_WAIT_FOR_DATA is set to 15 and data does not appear for a resource from 06:00 through 06:15, the adapter instance sets the metric values for that time period to the default values or zero. At 06:17, if a new value appears for the metric for 06:00, the adapter instance does not collect that value because the start time is later than 06:00.
	The adapter instance does not update the START_TIME for a query until either data is collected for all resources or the MAX_MIN_WAIT_FOR_DATA value is reached.
PROCESS_RELATIONSHIPS	Boolean value that determines whether the adapter instance retrieves relationships and pushes those relationships to the vCenter Operations Manager database.
EVENT_PROCESSOR	Boolean value that determines whether the adapter instance can process events.
	NOTE You must create a separate adapter instance to process events. A single adapter instance cannot process both data and events.
EVENT_MANAGED_EXTERNALLY	Boolean value that determines whether to cancel notification alerts when the adapter instance stops receiving new event notifications.
	For example, an event message might indicate that a component has overheated. If alerts are generated on every cycle, the first alert is not canceled when the component cools down. Instead, alert notifications stop. The EVENT_MANAGED_EXTERNALLY property controls whether to cancel existing notification alerts when the notifications that created the alerts stop.

Common Aliases in Query Files

The SQL Loader adapter requires queries to return data in specific aliased names. For examples of aliased names, see the sample query files in the `samples/work` folder.

Table 3-5. Aliases in Query Files

Alias	Type of Data
ADAPTERKIND	AdapterKind
RESOURCEKIND	ResourceKind
RESOURCENAME	ResourceName
TIMESTAMP	Timestamp
IDENTKEYn	ResourceIdentifierKey
IDENTVALUEn	ResourceIdentifierValue
METRICNAMEn	MetricName
VALUEn	MetricValue
STRMETRICNAMEn	String MetricName
STRVALUEn	MetricStringVaue

For aliases that include the variable n, replace n with an integer starting from 1.

Database Properties

The SQL Loader adapter stores the database settings that all adapter instances require in the `db.properties` file in the `conf` folder.

Table 3-6. Database Properties

Property	Description
defaultAutoCommit	Default auto-commit state of connections that the connection pool creates.
maxActive	Maximum number of active connections to allocate from the pool at the same time.
initialSize	Initial number of connections that the adapter creates when the pool starts.
minIdle	Minimum number of connections that can remain idle in the pool without extra connections being created.
maxIdle	Maximum number of connections that can remain idle in the pool without connections being released.
poolPreparedStatements	Enables or disables prepared statement pooling for the pool.
maxOpenPreparedStatements	Maximum number of open statements allocated from the statement pool at the same time. Zero means no limit.
maxWait	Maximum number of millisecond that the pool waits for a connection, when no connections are available for a connection, before it throws an exception.
PostgreSql_Driver	JDBC driver for the PostgreSql database.
PostgreSql_URL	URL for the PostgreSql database.
MsSql_Driver	JDBC driver for the SQL Server database.
MsSql_URL	URL for the SQL Server database.
MySql_Driver	JDBC driver for the MySql database.
MySql_URL	URL for the MySql database.
Oracle_Driver	JDBC driver for the Oracle database.
Oracle_URL	URL for the Oracle database.
DB2_URL	URL for the DB2 database.

Troubleshooting the SQL Loader Adapter

4

Known troubleshooting information can help you diagnose and correct problems with the SQL Loader adapter.

This chapter includes the following topics:

- "Troubleshooting an SQL Loader Adapter Instance," on page 29
- "View Collection Information," on page 29
- "Validating Data and Events," on page 31
- "Viewing System Log Files," on page 32
- "Resolving Common Problems," on page 33

Troubleshooting an SQL Loader Adapter Instance

Perform these general troubleshooting steps to diagnose and correct problems with an SQL Loader adapter instance.

1   View the collection status and collection state for the adapter instance resource on the Environment Overview page in the Custom user interface. See "View Collection Information," on page 29.

2   Validate the data and events that the SQL Loader adapter retrieves. See "Validating Data and Events," on page 31.

3   Check the adapter and collector logs for errors. See "Viewing System Log Files," on page 32.

View Collection Information

You can view collection information for an SQL Loader adapter instance in the Custom user interface. This information can help you diagnose and troubleshoot adapter problems.

Prerequisites

Become familiar with the collection states and status values. See "Collection States," on page 30 and "Collection Status Values," on page 31.

Procedure

1   Log in to the Custom user interface as an administrator.

2   Select **Environment > Environment Overview** and find the SQL Loader adapter instance resource on the **List** tab.

3   Point to the icon in the Collection State column to see whether vCenter Operations Manager should be collecting data through the adapter instance.

The collection state appears in a pop-up window. If the adapter instance is set to collect data, the collection state is Collecting.

4   If you have vCenter Operations Manager 5.6 or later, click the icon in the **Collection State** column to see detailed information about the collection state.

5   Point to the icon in the **Collection Status** column to see whether vCenter Operations Manager is receiving data through the adapter instance.

The collection status and a collection status message appear in a pop-up window. If vCenter Operations Manager is receiving data through the adapter instance, the collection status is Data Receiving.

In vCenter Operations Manager 5.6 and later, the SQL Loader adapter can generate an additional message in the pop-up window. For example, if the adapter encounters a non-numeric value during the last collection cycle, the message `Encountered Non Numeric Values` appears after the collection status. You might need to refresh the page to see the latest status and message.

Collection States

The resource collection state indicates whether vCenter Operations Manager should be collecting data for the resource.

The resource collection state appears in a pop-up window when you point to an icon in the Collection State column in the resource list on the Environment Overview page. If vCenter Operations Manager collects data for a resource through more than one adapter instance, a separate icon appears for each adapter instance.

Table 4-1. Collection States

State	Description
Collecting	Resource is set to collect data.
Not Collecting	Resource is set to not collect data.
Starting	Collection is starting.
Stopping	Collection is stopping.
Updating	Resource is being updated.
Failed	Resource configuration problem.
In Maintenance	Resource is in scheduled maintenance.
In Maintenance (Manual)	Resource is in manual maintenance.
Removing	Resource is being deleted.

If you click an icon in the Collection State column, detailed information appears in a pop-up window.

Table 4-2. Detailed Collection State Information

Field	Description
Adapter Instance	Name of the adapter instance.
Collector	Name of the collector that the adapter instance uses.
Last Heartbeat	Amount of time since vCenter Operations Manager received a heartbeat message from the adapter. A long period of time might indicate a connection problem.
Status	Status message from the collector.
Last Collection Time	Amount of time since the end of the last collection cycle and the number of metrics that the adapter collected during that cycle.

Table 4-2. Detailed Collection State Information (Continued)

Field	Description
Last Collection Duration	Length of time of the last collection cycle.
Metric Sparklines	Graphical representations of the last collection cycle duration and the number of metrics and resources that the adapter collected during that cycle.

Collection Status Values

The collection status value for a resource indicates whether vCenter Operations Manager is receiving data for the resource. Collection status values appear in a pop-up window when you point to an icon in the Collection Status column in the resource list on the Environment Overview page.

If vCenter Operations Manager collects metrics for a resource through more than one adapter instance, a separate icon appears for each adapter instance in the Collection Status column.

A resource has a status value only if its collection state is Collecting. For information about collection states, see "Collection States," on page 30.

Table 4-3. Collection Status Values

Status	Description
Data Receiving	vCenter Operations Manager is receiving data for the resource.
Old Data Receiving	Data is not current. The most recent value is at least five monitoring cycles old.
No Data Receiving	Adapter instance is collecting data, but vCenter Operations Manager has not received data for the resource.
None	vCenter Operations Manager or collection was recently started and no data has been received for five monitoring cycles.
Error	An error occurred when vCenter Operations Manager attempted to collect data for the resource.
Unknown	Status of the resource is not known because the adapter instance cannot connect to the resource.
Resource Down	Resource is not operational.
No parent resource monitoring	Adapter instance resource is stopped.
Collection down	Collector or adapter instance is not operational.

NOTE Some adapter instances write customized status and messages. These messages typically provide more information about data collection problems.

Validating Data and Events

You can use the Custom user interface to validate the data and events that the SQL Loader adapter retrieves.

Verify the Data that the Adapter Retrieves

You can use the Custom user interface to verify that the SQL Loader adapter retrieves data correctly.

Procedure

1   Select **Environment > Environment Overview.**

2   Verify that the expected resources appear on the Environment Overview page.

3   Select a resource that the SQL Loader created and click the **Show Detail** icon.

4   Compare the metric values that the SQL Loader adapter collected to the metric values in the source database.

What to do next

If the SQL Loader adapter cannot retrieve data, see "Adapter Cannot Retrieve Data," on page 34.

Verify the Relationships that the Adapter Creates

You can use the Custom user interface to verify that the SQL Loader creates resource relationships correctly.

Procedure

1   Select **Environment > Advanced > Resource Relationship**.

2   In the Parent Selection pane, select a parent resource that the SQL Loader adapter loaded.

3   Verify that the parent resource displays the child resources that you defined in the relationships table in the source database.

What to do next

If the SQL Loader adapter cannot create resource relationships, see "Adapter Cannot Create Relationships," on page 35. If the adapter cannot update existing relationships, see "Adapter Cannot Update Relationships," on page 35.

Verify the Events that the Adapter Retrieves

You can use the Custom user interface to verify that the SQL Loader retrieves events correctly.

Procedure

1   Select **Alerts > Alerts Overview**.

2   Select the SQL Loader adapter instance in the left pane.

3   Compare the event notifications that appear in the alerts list to the events in the source database.

Viewing System Log Files

You can view SQL Loader adapter errors in the vCenter Operations Manager adapter and collector log files. You can view adapter and collector log files in the Custom user interface or in an external log viewer.

SQL Loader adapter log files are in the *vcenter–ops*/user/log/adapters/GeneralSqlAdapter folder and collector log files are in the *vcenter–ops*/users/log folder, where *vcenter–ops* represents your installation folder. In a vApp installation, log files are on the Analytics virtual machine.

The logging level is set to ERROR by default. To troubleshoot issues, set the logging level to INFO. To view detailed messages, including micro steps, queries, and returned results, set the logging level to DEBUG.

You can set the logging level for each class in the log4j.properties file in the *vcenter–ops*/log/conf/collector folder, for example:

```
log4.logger.com.integrien.adapter3.generalsqldataloader.EventReader=DEBUG
```

NOTE   If you set the logging level to DEBUG, log files can become large very quickly. Set the logging level to DEBUG only for short periods of time.

For information about viewing log files and modifying logging levels, see the online help.

SQL Loader Adapter Classes

The SQL Loader adapter uses certain adapter classes.

- com.integrien.*adapter3*.generalsqldataloader.GeneralSQLDataLoaderAdapter
- com.integrien.*adapter3*.generalsqldataloader.DataReader
- com.integrien.*adapter3*.generalsqldataloader.Discover
- com.integrien.*adapter3*.generalsqldataloader.EventReader
- com.integrien.*adapter3*.generalsqldataloader.GeneralSQLDataLoaderConstants
- com.integrien.*adapter3*.generalsqldataloader.GeneralSQLDataLoaderRelationshipProcessor
- com.integrien.*adapter3*.generalsqldataloader.dbaccess.DBConnectionManager
- com.integrien.*adapter3*.generalsqldataloader.exceptions.GeneralSQLDataLoaderException
- com.integrien.*adapter3*.generalsqldataloader.exceptions.SystemException
- com.integrien.*adapter3*.generalsqldataloader.objects.DBDataQuery
- com.integrien.*adapter3*.generalsqldataloader.objects.DBQuery
- com.integrien.*adapter3*.generalsqldataloader.objects.DefaultValueDataObject
- com.integrien.*adapter3*.generalsqldataloader.objects.GeneralSqlAdapterCollectResult
- com.integrien.*adapter3*.generalsqldataloader.objects.GeneralSqlAdapterEvent
- com.integrien.*adapter3*.generalsqldataloader.objects.GeneralSqlAdapterMetricData
- com.integrien.*adapter3*.generalsqldataloader.properties.GeneralSQLDataLoaderProperties
- com.integrien.*adapter3*.generalsqldataloader.properties.QueryProperties
- com.integrien.*adapter3*.generalsqldataloader.utils.GeneralSQLDataLoaderUtils

These adapter classes are only in vCenter Operations Manager 5.6 and later.

- com.integrien.*adapter3*.generalsqldataloader.objects.AdapterSpecificAttributes
- com.integrien.*adapter3*.generalsqldataloader.objects.CollectStatusNotificationEvent

Resolving Common Problems

Follow recommended procedures when you resolve common problems.

Adapter Cannot Connect to the Source Database

The SQL Loader adapter cannot connect to the source database.

Problem

vCenter Operations Manager returns an error when you click **Test** on the Add Adapter Instance window.

Cause

The adapter instance is misconfigured or the select statement in the main data query file is incorrect.

Solution

- Verify that the adapter instance is configured to access the correct database.

- Verify that the field names in the select statement in the DB_QUERY_*n*.sql file for the adapter instance match the field names in the source database.

Adapter Cannot Retrieve Data

The SQL Loader adapter does not retrieve data.

Problem

Resources and metrics do not appear on the Environment Overview page in the Custom user interface.

Cause

The START_TIME property is set to the wrong time zone or the select statement is not formed correctly.

Solution

- Verify that the START_TIME property is set correctly in the instance-level properties file for the adapter instance.

  The value of the START_TIME must be set to the time zone of the adapter instance.

- Set the logging level to INFO and examine the last query in the adapter log file.

  The where clause shows the date range that the adapter used when it last collected data.

- Find Finalized query= in the adapter log file, copy the query statement, and use a client software program to run the query against the source database.

  If the query does not return data, the query is not formed correctly.

Adapter Cannot Discover Resources During Auto-Discovery

The SQL Loader adapter does not discover resources during auto-discovery.

Problem

No new resources appear on the Environment Overview page during auto-discovery.

Cause

This problem typically occurs because the data in the source table is old (not real-time data). Auto-discovery occurs during the data collection process. The data collection process uses a query that has a time range. If no data exists for that time range, the adapter does not discover any resources.

NOTE   Because the query the adapter uses during the data collection process is different from the query that it uses when you perform manual discovery, it is possible for the adapter to find resources during manual discovery and not find resources during auto-discovery.

Solution

Check the source data for the time range that the data collection query uses. If no data exists, change the START_TIME property in the adapter instance-level properties file in the work folder to an older time.

Adapter Cannot Discover Resources During Manual Discovery

The SQL Loader adapter does not discover resources when you perform manual discovery.

Problem

No new resources appear on the Environment Overview page when you perform manual discovery.

Cause

For manual discovery to work, the adapter kind in the discovery query file must be set to General Sql Data Loader Adapter. An adapter can discover only resources of its own kind during manual discovery.

Solution

Make sure that the adapter kind in the DISCOVER_DB_QUERY_*n*.sql file for the adapter instance is either set to General Sql Data Loader Adapter or is not set. When the adapter kind is not set, it defaults to General Sql Data Loader Adapter. If you specify an adapter kind for resources other than the default (General Sql Data Loader Adapter), you cannot use manual discovery.

Adapter Cannot Create Relationships

The SQL Loader adapter cannot create resource relationships in vCenter Operations Manager.

Problem

The child resources that you defined for a resource do not appear in the Custom user interface.

Cause

The select statement is incorrect or the source relationships table contains an error.

Solution

- Verify that the select statement in the main data query file points to the correct database.
- Verify that the fields in the select statement in the RELATIONSHIPS_DB_QUERY_*n*.sql file for the adapter instance matches the field names in the source relationships table.
- Verify that the fields in the source relationships table are large enough to hold the data.
- Check that the AdapterKind, ResourceKind, ResourceName, and ResourceIdentifiers fields are correct for both the parent and child resources in the source relationships table.

Adapter Cannot Update Relationships

The SQL Loader adapter cannot update resource relationships in vCenter Operations Manager.

Problem

Resource relationships are not updated in the Custom user interface.

Cause

The allParents.txt file is missing from the work folder or the RELATIONSHIPS_DB_QUERY_*n*.sql for the adapter instance was changed.

Solution

1. Verify that the allParents.txt file appears in the work folder for the adapter instance.
2. If the allParents.txt file is missing from the work folder, restart the vCenter Operations Manager service.
3. If the allParents.txt file exists in the work folder, verify that the query statement in the RELATIONSHIPS_DB_QUERY_*n*.sql file for the adapter instance is unchanged.

Query Returns Incorrect Time Stamp

An SQL Server query returned the wrong date in a time stamp.

Problem

The Microsoft `sqljdbc4` driver encountered a problem when it tried to retrieve a value from the SQL Server `datetime2` data type.

Cause

This is a known problem on certain Java versions, including Java 1.7.

Solution

1   If possible, change the data type of the time stamp column from `datetime2` to `datetime`.

2   If you cannot change the data type of the time stamp column, modify the `db.properties` file to use the `jtds` driver instead of the `sqljdbc4` driver.

    a   Open the `db.properties` file in a text editor.

       The db.properties file is in the *vcenter–ops*`/user/plugins/inbound/general_sql_adapter3/conf` folder. In a vApp installation, edit the `db.properties` file on the Analytics virtual machine.

    b   Comment out the `MsSql` properties that specify the `sqljdbc4` driver.

       For example:

```
#MsSql_Driver=com.microsoft.sqlserver.jdbc.SQLServerDriver
#MsSql_URL=jdbc:sqlserver://<HOST>:<PORT>;DatabaseName=<DBNAME>
```

    c   Add these `MsSql` properties to specify the `jtds` driver.

```
MsSql_Driver=net.sourceforge.jtds.jdbc.Driver
MsSql_URL=jdbc:jtds:sqlserver://<HOST>:<PORT>;DatabaseName=<DBNAME>
```

3   If the adapter instance connects to a named SQL Server instance, modify the adapter instance identifier to specify the named instance.

    a   In the Custom user interface, select **Environment > Configuration > Adapter Instances**.

    b   Select the adapter instance to modify and click the **Edit Selected Adapter Instance** icon.

    c   In the **Host** text box, type the host name or IP address of the source database.

       Do not include the instance name after the host name.

       For example: `hostname`

    d   In the **Additional URL Field**, type the `instance` field and set it to the instance name.

       Use a semicolon (;) to delimit the field.

       For example: `;instance=`*instancename*

    e   Click **OK** to save your changes.

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