# Cisco Tidal Enterprise Scheduler MSSql Adapter Guide

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*Cisco Tidal Enterprise Scheduler MSSql Adapter Guide*

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# PREFACE

## TOPICS COVERED IN THIS PREFACE

About this Guide (page 4)

- Conventions
- Alert Statements

Product Documentation (page 5)

- Documentation Formats
- Guides and Release Notes
- Online Help

Submitting a Service Request (page 5)

# About this Guide

## Conventions

The following conventions are observed throughout this document:

- **Bold** sans-serif text is used to designate folder names, dialog titles, names of buttons, icons, and menus, and terms that are objects of a user selection.
- *Italic* text is used to indicate file names, defined terms, user-specified text, document titles, and word emphasis.
- Monospace text (`Courier`) is used to show literal text as you would enter it, or as it would appear onscreen.

## Alert Statements

The alert statements—**Note**, **Caution**, and **Warning**—are formatted in the following styles:

**Note** Information that is related to the main text flow, or a point or tip provided in addition to the previous statement or instruction.

**Caution** Advises of important information, such machine or data error that could occur should the user fail to take or avoid a specified action.

**Warning** Requires immediate action by the user to prevent actual loss of data or where an action is irreversible, or when physical damage to the machine or devices is possible.

# Product Documentation

## Documentation Formats

Documentation is provided in the following electronic formats:

- Adobe® Acrobat® PDF files
- Online help

You must have Adobe® Reader® installed to read the PDF files. Adobe Reader installation programs for common operating systems are available for free download from the Adobe Web site at www.adobe.com.

## Guides and Release Notes

You can download the Installation & Configuration Guide, User Guide and Release Notes in PDF format from the product DVD.

## Online Help

You can access online help by clicking the **Help** button from within the application.

# Submitting a Service Request

For information on submitting a service request and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

# 1

# INTRODUCTION

## TOPICS COVERED IN THIS CHAPTER

Overview (page 8)

Prerequisites (page 8)

# Overview

The Microsoft SQL Server (MSSQL) adapter integrates Tidal Enterprise Scheduler (Scheduler) with MSSQL Server allowing you to:

- Create, schedule and run MSSQL queries and MSSQL Agent jobs through Scheduler.
- Monitor events within a MSSQL database, including table, index, and row creation, modification and deletion.

The MSSQL Adapter supports running jobs under both Microsoft SQL Server 2000, 2005, 2008, and 2012. However, event monitoring is supported on 2005, 2008 and 2012 only.

If you are installing Microsoft SQL Server 2000 and 2005 on the same machine, you will need to have separate names for each instance. Or, alternatively, you can assign each instance its own unique listening port. The default database port is usually 1433.

If you are using different versions of Microsoft SQL Server, it is a good idea to place all jobs under a SQL group. This way, when switching between versions, you only need to switch the connection at the group level.

# Prerequisites

Refer to your *Cisco Tidal Enterprise Scheduler Reference Guide* for a complete list of hardware and software prerequisites.

## Database Jobs

Creating, viewing and running database jobs requires a variety of permissions. The easiest way to accomplish this is to assign the **sysadmin** role to your user. Run the following query to determine if your user is assigned the sysadmin role:

```
select is_srvrolemember('sysadmin')
```

If assigning the sysadmin role is not possible, then your user must be granted each of the following permissions: Run the queries below to verify these have been granted:

```
select has_perms_by_name('msdb..sysobjects', 'object', 'select')
select has_perms_by_name('msdb..sysproxies', 'object', 'select')
select has_perms_by_name('master..syslogins', 'object', 'select')
select has_perms_by_name('master..sysdatabases', 'object', 'select')
select has_perms_by_name('sys.objects', 'object', 'select')
select has_perms_by_name('sys.schemas', 'object', 'select')
select has_perms_by_name('sys.sysusers', 'object', 'select')
select has_perms_by_name('sys.syslogins', 'object', 'select')
```

If one or more of these permissions are missing, issue the following statements to grant them to your user. Assume your user is **TIDALSOFT\myuser**.

```
grant select on object::msdb..sysobjects to [TIDALSOFT\myuser];
grant select on object::msdb..sysproxies to [TIDALSOFT\myuser];
grant select on object::master..syslogins to [TIDALSOFT\myuser];
grant select on object::master..sysdatabases to [TIDALSOFT\myuser];
grant select on object::sys.objects to [TIDALSOFT\myuser];
grant select on object::sys.schemas to [TIDALSOFT\myuser];
grant select on object::sys.sysusers to [TIDALSOFT\myuser];
grant select on object::sys.syslogins to [TIDALSOFT\myuser];
```

Your user must have the following permissions for each database your SQL Adapter jobs reference. In the example below the database is called **XYZ**.

```
select has_perms_by_name('[XYZ]..sysobjects', 'object', 'select')
select has_perms_by_name('[XYZ]..sysusers', 'object', 'select')
select has_perms_by_name('[XYZ]', 'database', 'showplan')
```

If any of these permissions are missing, issue the following statements:

```
grant select on object::[XYZ]..sysobjects to [TIDALSOFT\myuser];
grant select on object::[XYZ]..sysusers to [TIDALSOFT\myuser];
grant showplan on database::[XYZ] to [TIDALSOFT\myuser];
```

Your user must be able to call these database functions. You do not need to assign any permissions by default.

```
getDate()
getUtcDate()
getServerProperty()
suser_sname()
```

Your user must be assigned the **sysadmin** role or one of the following SQL Server Agent roles: **SQLAgentUserRole**, **SQLAgentReaderRole** or **SQLAgentOperatorRole**. Only the **sysadmin** role can create, view and run all jobs in the database. Refer to SQL Server documentation about the restrictions placed on each of the SQL Server Agent roles with regard to jobs. Refer to the documentation about how to check which roles are assigned to your user and how to assign one of these roles to your user.

## Database Events

Monitoring database events requires your user be assigned to the **sysadmin** role and the **db_owner** role for each database being monitored.

# 2

# Configuring the Microsoft SQL Adapter

## Topics covered in this chapter

Overview (page 12)

Defining a Microsoft SQL Security Policy (page 12)

Licensing the Microsoft SQL Adapter (page 13)

Securing the Microsoft SQL Database Adapter (page 14)

Define a Microsoft SQL Connection (page 17)

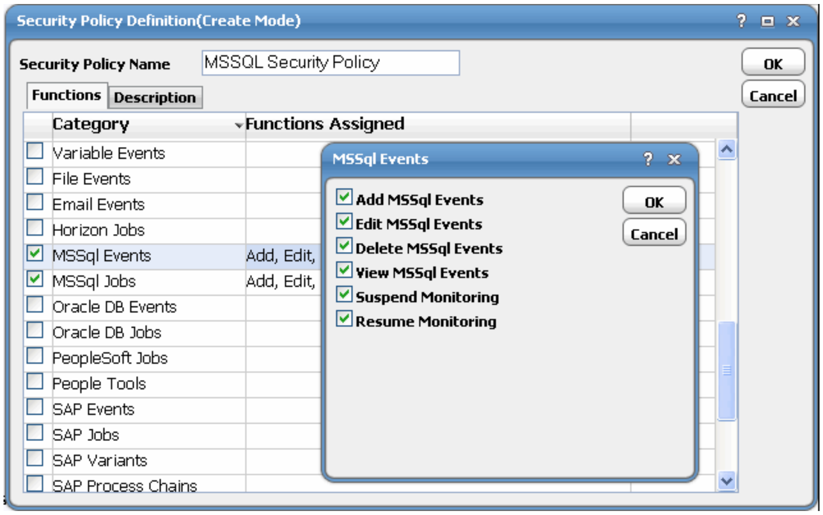
# Overview

While the Microsoft SQL adapter software is already installed as part of a normal installation of Scheduler, you must perform the following steps to license and configure the adapter before you can run Microsoft SQL jobs:

- *Define a Microsoft SQL security policy* – Create a security policy to assign to the users that will run Microsoft SQL jobs. You may want to create different security policies to differentiate between users who just run Microsoft SQL jobs versus users who can run and edit Microsoft SQL jobs.
- *License the Microsoft SQL adapter* – License the connection(s) to the Microsoft SQL instance. You cannot define a Microsoft SQL connection until you have applied the Microsoft SQL license from Tidal Software.
- *Securing the Microsoft SQL Database adapter* – Create one or more user definitions in Scheduler with access to the Microsoft SQL instance using Microsoft SQL user names and passwords provided by the Microsoft SQL administrator. Users in Scheduler are authorized to run Microsoft SQL jobs on behalf of these Microsoft SQL runtime users.
- *Define a Microsoft SQL connection* – Define a Microsoft SQL connection so the master can communicate with the Microsoft SQL instance.

# Defining a Microsoft SQL Security Policy

You can create a new security policy or modify an existing security policy in Scheduler that includes the authority to add, edit, view and delete Microsoft SQL jobs and events. In the **Security Policy Definition** dialog, there is an **MSSql Jobs** and **MSSql Events** category.



Security Policy Name: MSSQL Security Policy

| | Category | Functions Assigned |
|---|---|---|
| □ | Variable Events | |
| □ | File Events | |
| □ | Email Events | |
| □ | Horizon Jobs | |
| ☑ | MSSql Events | Add, Edit, |
| ☑ | MSSql Jobs | Add, Edit, |
| □ | Oracle DB Events | |
| □ | Oracle DB Jobs | |
| □ | PeopleSoft Jobs | |
| □ | People Tools | |
| □ | SAP Events | |
| □ | SAP Jobs | |
| □ | SAP Variants | |
| □ | SAP Process Chains | |

☑ Add MSSql Events
☑ Edit MSSql Events
☑ Delete MSSql Events
☑ View MSSql Events
☑ Suspend Monitoring
☑ Resume Monitoring

**Figure 1** Security Policy Definition Dialog

▶ ***To grant access privileges:***

1. In the **Navigator** pane, select **Security Policies** to display the **Security Policies** pane.
2. Select a security policy for the Microsoft SQL job privileges and double-click on it to display its **Security Policy Definition** dialog.
3. Scroll down the list of function categories and double-click on the **MSSql Events** or **MSSql Jobs** category to display the available functions.
4. Select the desired job privileges, then click **OK**.

   A check mark appears next to the **MSSql** function category indicating that one or more functions are selected within the category.

   If needed, different security policies with varying authorized functions can be created to provide different levels of access for a variety of users.

For more information about the Security Policy Definition dialog, refer to the chapter on User Administration in your Scheduler *Reference Guide*.

## Licensing the Microsoft SQL Adapter

The Microsoft SQL adapter application cannot be used unless it is properly licensed. You can obtain the license code from the licensing manager at Tidal Software. Registering the license for the Microsoft SQL adapter is done from the Tidal Web client.

To load a production license for the Microsoft SQL adapter, you need the proper license file. You normally receive this license file when you purchase the Microsoft SQL adapter or you can obtain one by sending an email to licensing@tidalsoftware.com.

▶ ***To license the Microsoft SQL Adapter with a Full license:***

1. Stop the master:

   For 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.

   For Unix:

   Enter **`tesm stop`**.
2. Rename your Full license file to *master.lic*.
3. Place the file in the **C:\Program File\TIDAL\Scheduler\Master\config** directory.
4. For Windows, restart the master by clicking **Start** in the Service Control Manager. For Unix, restart the master by entering **`tesm start`**.

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

# Securing the Microsoft SQL Database Adapter

There are two types of users associated with the Microsoft SQL database 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 Microsoft SQL jobs represent those users and passwords required to connect to the SQL Server database to run queries and jobs. Runtime users are also for connecting to SQL Servers to monitor database events.

- **Schedulers**

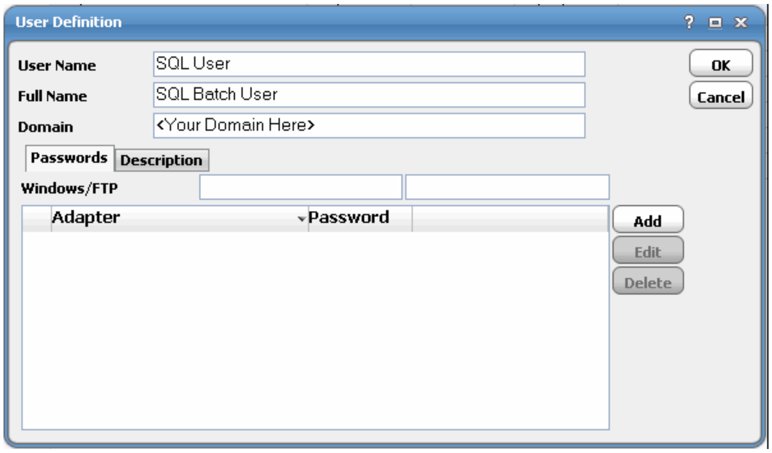
  Schedulers are those users who will define and/or manage Microsoft SQL jobs and events. There are three aspects of a user profile that grant and/or limit access to scheduling jobs that invoke Microsoft SQL:

  - Security policy that grants or denies add, edit, delete and view capabilities for Microsoft SQL jobs and events.
  - Authorized runtime user list that grants or denies access to specific database user accounts for use with database connections to monitor for events and with database jobs.
  - Authorized agent list that grants or denies access to specific Microsoft SQL adapter connections for use when defining Microsoft SQL jobs and events.

## Defining Runtime Users (Database Users)

***To define a database runtime user to run SQL jobs and monitor events:***

1. From the **Navigator** pane, select **Administration>Runtime Users** to display the **Users** pane.
2. Right-click and select **Add Runtime User** from the context menu, or select and existing user and choose **Edit** to display the **User Definition** dialog.



User Name: SQL User
Full Name: SQL Batch User
Domain: <Your Domain Here>

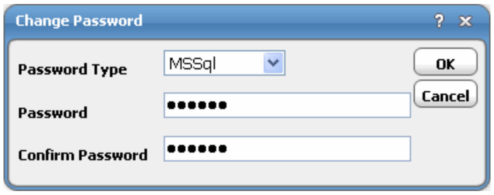
**Figure 2** User Definition Dialog

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

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

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

6 On the **Passwords** tab, click **Add** to display the **Change Password** dialog.



Password Type: MSSql
Password: ••••••
Confirm Password: ••••••

**Figure 3** User Definition Dialog, Change Password Dialog

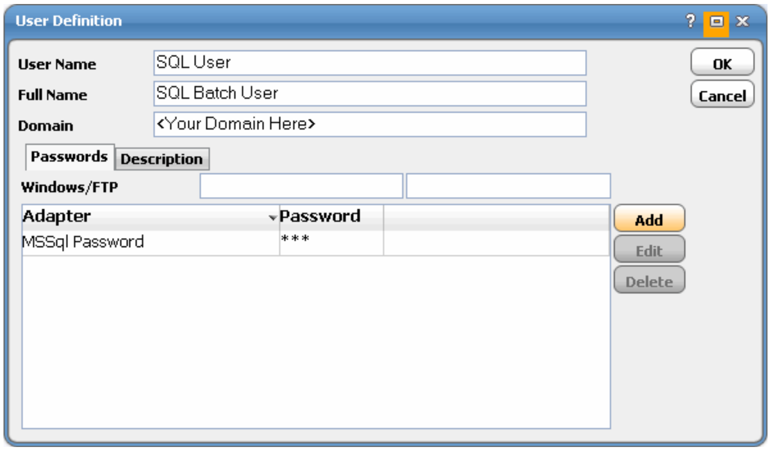
7 From the **Password Type** list, select **MSSql**.

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

Only those users with a password specified for Microsoft SQL will be available for use with Microsoft SQL jobs and events. The password may be the same as the one specified for Windows/FTP jobs.

9 Click **OK** on the **Change Password** dialog.

The **User Definition** dialog displays the new record.



User Name: SQL User
Full Name: SQL Batch User
Domain: <Your Domain Here>
Windows/FTP

| Adapter | Password |
|---|---|
| MSSql Password | *** |

**Figure 4** User Definition Dialog

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

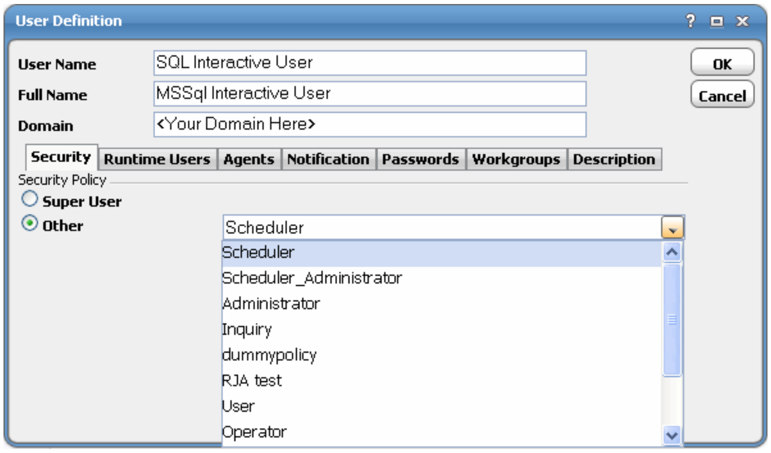
## Authorizing Schedulers to Work With Microsoft SQL Jobs and Events

▶ ***To define a Scheduler user to work with Microsoft SQL jobs and events:***

1 From the **Navigator** pane, select **Administration>Interactive Users** to display the **Users** pane, listing all defined users.

2 Right-click and select **Add Interactive User** from the context menu, or select an existing user and choose **Edit Interactive User** to display the **User Definition** dialog (Figure 2).

✓ **Note** Refer to the *Tidal Enterprise Scheduler Reference Guide* for a general discussion on setting up a user to work with Scheduler.



User Definition

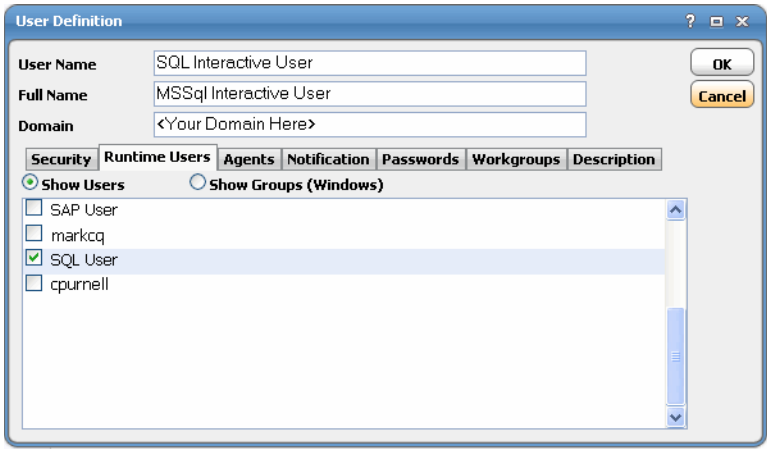
User Name: SQL Interactive User
Full Name: MSSql Interactive User
Domain: <Your Domain Here>

Security Policy
○ Super User
● Other: Scheduler

**Figure 5** User Definition Dialog, Security Tab

3 On the **Security** tab, select a security policy that includes authorization for Microsoft SQL jobs and/or events.

4 Click the **Runtime Users** tab.



User Definition

User Name: SQL Interactive User
Full Name: MSSql Interactive User
Domain: <Your Domain Here>

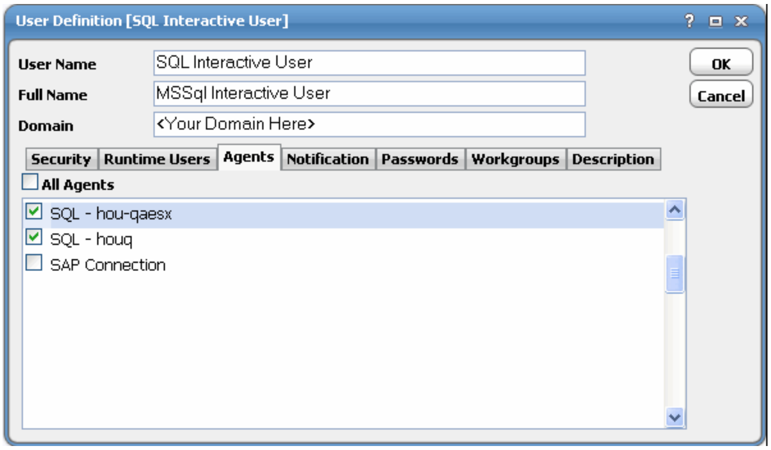
● Show Users ○ Show Groups (Windows)

☐ SAP User
☐ markcq
☑ SQL User
☐ cpurnell

**Figure 6** User Definition Dialog, Runtime Users Tab

5 Select the database users that this scheduling user may use when defining Microsoft SQL jobs and/or connections for database event monitoring.

6 Click the **Agents** tab.



User Definition [SQL Interactive User]

User Name: SQL Interactive User
Full Name: MSSql Interactive User
Domain: <Your Domain Here>

□ All Agents

☑ SQL - hou-qaesx
☑ SQL - houq
□ SAP Connection

**Figure 7** User Definition Dialog, Agents Tab

7 Select which Microsoft SQL connections that this scheduling user can access when scheduling jobs or events.

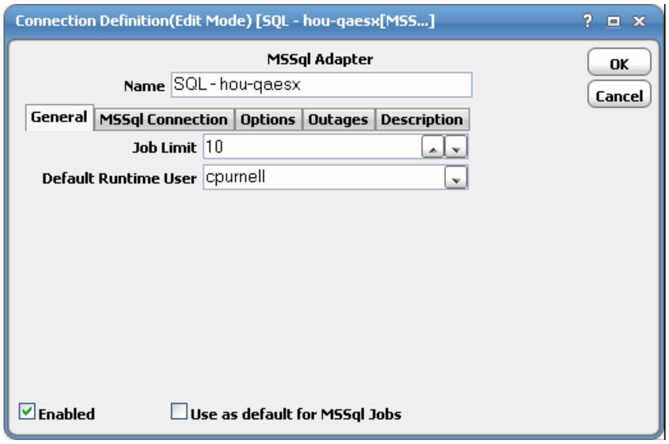
8 Click **OK** to save the user definition.

## Define a Microsoft SQL Connection

You must create a connection to the Microsoft SQL instance(s) before Scheduler can run your Microsoft SQL jobs or monitor database events. These connections also must be licensed before Scheduler can use them.

The connection for the Microsoft SQL adapter is defined like other Scheduler connections except it requires configuration information unique to Microsoft SQL instances.

You can create connections to one or more Microsoft SQL instances and/or databases. Microsoft SQL access can be managed by limiting a user account to use only certain connections to particular servers. A connection is created through the **Connection Definition** dialog.



MSSql Adapter

Name: SQL - hou-qaesx

Job Limit: 10

Default Runtime User: cpurnell

☑ Enabled

□ Use as default for MSSql Jobs

**Figure 8** Connection Definition Dialog

This dialog contains the following elements:

- **Name** – Enter a name for this Microsoft SQL adapter connection.
- **Enabled** – Activates or disables (deactivates) the connection, shutting down the adapter.

  A job cannot run on an adapter if its connection is disabled. If jobs try to run on a disabled connection, the job enters Agent Disabled status. Jobs already running on an agent that is disabled (or if the connection to the agent is lost) run to completion; however, their completion status is not returned until the agent is enabled.
- **Use as default for MSSQL Jobs** – Select to use the connection as your default connection when setting up future Microsoft SQL jobs.
- **General** – This tab designates a job limit and default runtime user.
- **MSSQL Connection** – This tab provides information to connect to the designated Microsoft SQL instance.
- **Options** – This tab provides configuration options for accessing the Microsoft SQL instance.
- **Description** – This tab describes the connection and provides a convenient place for notes about its purpose and use.

## Adding a Microsoft SQL Connection

**Note** Modifying an adapters connection configuration should only be done when there are no jobs running that utilize the adapter connection. If the connection is created while jobs are active, the jobs may go into an orphan state.

▶ ***To add a connection:***

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

2 Click the **Add** button or right-click and select **Add Connection>MSSQL Adapter** from the context menu to display the **MSSQL Connection Definition** dialog (Figure 8).

3 Enter a name for the new connection in the **Name** field.

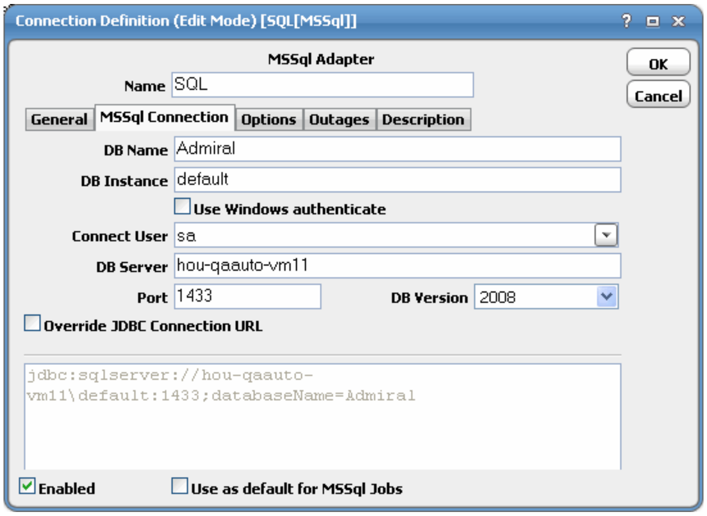
4 In the **Job Limit** field of the **General** tab, select the maximum number of concurrent active processes that Scheduler should submit to this Microsoft SQL instance and/or database at one time.

5 In the **Default Runtime User** list, select the name of a default user for Microsoft SQL jobs.

This is optional.

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

6 Click the **MSSQL Connection** tab.



Connection Definition (Edit Mode) [SQL[MSSql]]

MSSql Adapter

Name SQL

General | MSSql Connection | Options | Outages | Description

DB Name Admiral

DB Instance default

□ Use Windows authenticate

Connect User sa

DB Server hou-qaauto-vm11

Port 1433 DB Version 2008

□ Override JDBC Connection URL

```
jdbc:sqlserver://hou-qaauto-
vm11\default:1433;databaseName=Admiral
```

☑ Enabled □ Use as default for MSSql Jobs

**Figure 9** Connection Definition Dialog, MSSql Connection Tab

This tab defines how to access a Microsoft SQL instance. There are several different ways to connect to a Microsoft SQL instance. SIf you wish to connect to a specific database, you can designate that Microsoft SQL database for the connection.

7 In the **DB Name** field, enter the name of the default database for this connection.

This is identical to the `DatabaseName` value in a JDBC connection string.

This field is optional. If not specified here, you will need to select a database for each job and/or event definition that uses this connection.

8 In the **DB Instance** field, enter the name of the database instance to connect to (if there are multiple instances installed on the same server).

This field is optional. Leave blank to use the default, unnamed instance.

9 (Optional) Check the **User Windows authenticate** checkbox to enable the use Windows Authentication feature.

**Note** When using Windows Authentication, verify that the MSSql Server for that instance is running as a domain account. MSSql Server requires AD access for login account verification when the adapter intends to connect to MSSql Server.

✓ **Note** If Windows Authentication is checked, the connection user and all runtime users associated with jobs for the connection will be authenticated with Windows Authentication. Similarly, if Windows Authentication is left unchecked, the connection user and all runtime users will be authenticated using SQL Authentication. Mixing the two authentication methods is not allowed for a single connection.

The jTDS JDBC driver is used to support Windows Authentication. You can download this driver from http://jtds.sourceforge.net.

To apply the driver:

**a** Stop the master.

**b** Unzip the download driver file, then copy the jTDS JDBC driver (*jtds-1.2.5.jar*) into **{TIDAL_HOME}/services/{CAFA6E81-E29F-4263-8E80-4928FFF416A2}/lib**.

**c** Restart the master.

**10** From the **Connect User** list, select the appropriate Microsoft SQL user.

**11** In the **DB Server** field, enter the machine name where the Microsoft SQL database is located.

**12** In the **Port** field, specify the port the database instance listens on.

**13** In the **DB Version** list, verify the correct version of the database you are connecting to.

**14** Select the **Override Jdbc URL** option if you need to override the JDBC connection string.

**15** Click the **Options** tab to configure parameters for this connection.

**16** Click the **Outages** tab to define time windows when the agent/adapter will not be available.

**17** Click **OK** to add the connection to the Scheduler database.

## Microsoft SQL Connection Status Light

If the Microsoft SQL connection is not available to the master, the connection status light in the first column of the display is red (or yellow if other agents are connected to the master).

The status light indicates the health of the adapter connection to the SQL server.

If the Enterprise Scheduler master cannot connect or loses its connection to a Microsoft SQL instance, you will see a red status light next to your Microsoft SQL connection in the **Connections** pane of the Tidal Web client.

✓ **Note** If the SQL master adapter connection is not available, you will not be able to define Microsoft SQL jobs and extract information on job steps from your Microsoft SQL instance.

# 3

# DEFINING A JOB

## TOPICS COVERED IN THIS CHAPTER

Overview (page 22)

Adding a Microsoft SQL Job (page 23)

Adding a Database Job (page 26)

Linking to an Existing Database Job (page 30)

## Overview

You can start creating and scheduling Microsoft SQL jobs once you have:

- added the Microsoft SQL database user to Scheduler.
- defined your Microsoft SQL connection(s).

You can create a Microsoft SQL job using the context menu within the **Jobs** pane. You can also edit, copy and delete an existing Microsoft SQL job. If you add a Microsoft SQL job to a Scheduler job group, items common between the job group and the Microsoft SQL job are inheritable.

However, unless the parent group has a Microsoft SQL agent assigned to it, you must clear the **Inherited** option and choose an appropriate Microsoft SQL connection.

Selecting the **Add MSSQL Job** option from the Scheduler **Jobs** pane displays the **MSSql Job Definition** dialog.

There are three types of Microsoft SQL adapter job that you can define in scheduler:

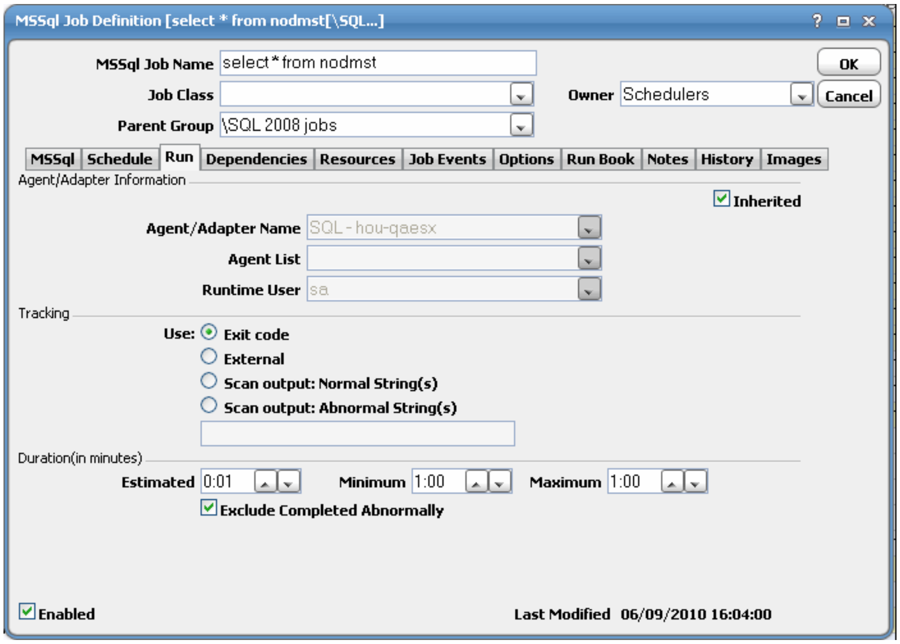
- **MSSQL Job** – Direct inclusion of T-SQL statements.
- **Database Job** – Includes one or more steps of various database task types, including the following:
  - T-SQL
  - ActiveX Scripts
  - Operating system command
  - Replication distributor
  - Replication merge
  - Replication queue reader
  - Replication snapshot
  - Replication transaction-log reader
  - SQL Server analysis services command
  - SQL Server analysis services query
- **Existing Database Job** – Includes jobs already defined to run under the SQL server agent.

# Adding a Microsoft SQL Job

▶ ***To add a Microsoft SQL job:***

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

2 Click the **Add** button from the Scheduler toolbar or right-click in either the **Navigator** or **Jobs** pane and select **Add MSSQL Job** from the context menu to display the **MSSQL Job Definition** dialog.



MSSql Job Definition [select * from nodmst[\SQL...]

MSSql Job Name: select * from nodmst

Job Class:

Owner: Schedulers

Parent Group: \SQL 2008 jobs

Agent/Adapter Information

☑ Inherited

Agent/Adapter Name: SQL - hou-qaesx

Agent List:

Runtime User: sa

Tracking

Use: ● Exit code
○ External
○ Scan output: Normal String(s)
○ Scan output: Abnormal String(s)

Duration(in minutes)

Estimated 0:01 Minimum 1:00 Maximum 1:00

☑ Exclude Completed Abnormally

☑ Enabled

Last Modified 06/09/2010 16:04:00

**Figure 10** MSSql Job Definition Dialog

3 In the **MSSql Job Name** field, enter a name up to 50 characters in length for your job.

The Microsoft SQL Job Name is an identifier for Scheduler only. All of the other job definition information, such as Job Class, Owner and Parent Group, is also the same as a standard Scheduler job and is used in the same way.

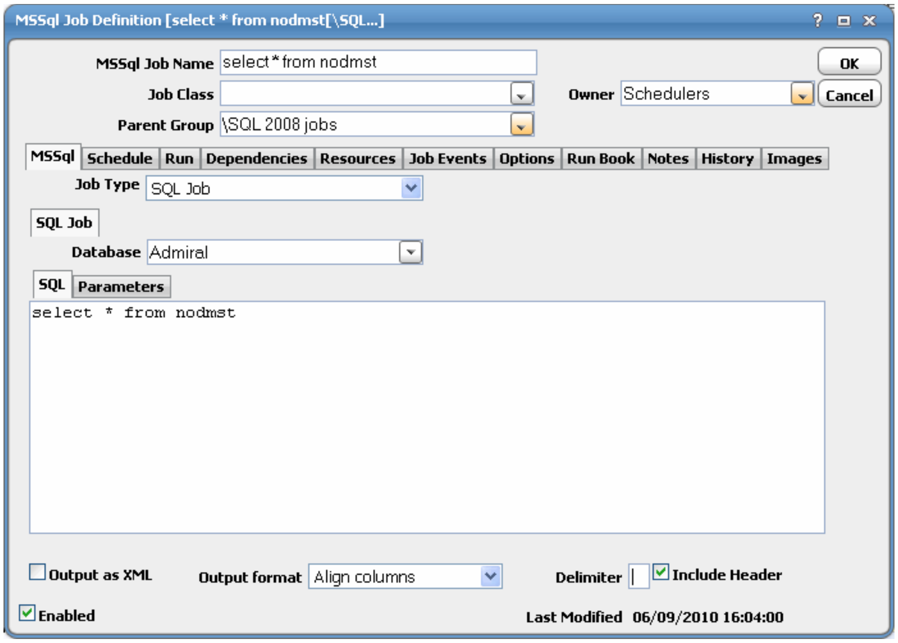
If you are putting your Microsoft SQL job into a group, note that unless the parent group selected has a Microsoft SQL agent connection assigned, you must clear the **Inherited** option on the **Run** tab before you can select a Microsoft SQL connection.

4 On the **Run** tab, select an agent/adapter name from the **Agent/Adapter Name** list.

5 Select a runtime user from the **Runtime User** list.

For information on authorizing a runtime user, see *"Defining Runtime Users (Database Users)" on page 14*.

6 Click the **MSSql Job** tab.



MSSql Job Name: select * from nodmst

Job Class:

Owner: Schedulers

Parent Group: \SQL 2008 jobs

Job Type: SQL Job

Database: Admiral

```
select * from nodmst
```

□ Output as XML  Output format: Align columns  Delimiter: |  ☑ Include Header

☑ Enabled  Last Modified 06/09/2010 16:04:00

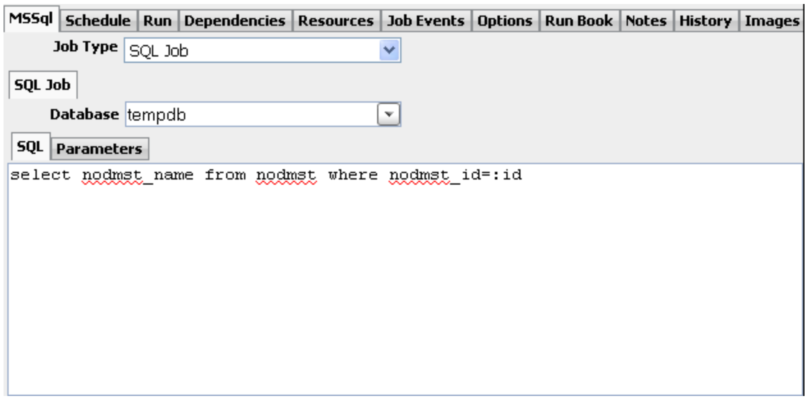
**Figure 11** MSSql Job Definition Dialog, MSSql Job Tab, SQL Job

7 Select the job type (**SQL Job**) from the **Type** list.

8 Select the database associated with the job from the **Database** list.

9 In the **SQL** tab field, type in SQL statements to execute here (multiple statements separated by semi-colons).

To include parameters that are replaced at runtime, use a parameter name of your choice preceded by a colon (i.e. **:id**).



Job Type: SQL Job

Database: tempdb

```
select nodmst_name from nodmst where nodmst_id=:id
```

10 Select the **Output as XML** option to write the query results in XML format, if desired.

11 In the **Output Format** list, select how the query results are formatted, if **Output as XML** is not selected.

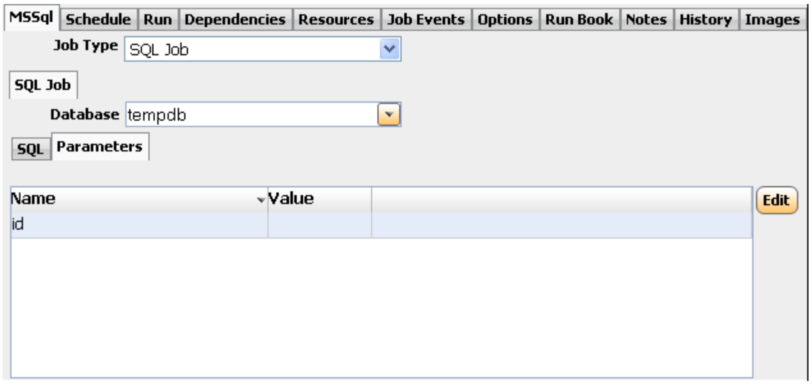
- **Align Columns** – Displays the values in the most readable format.
- **CSV Format** – Separates values with commas.

- **Raw** –Separates values with a user-defined character.

12 In the **Delimiter** field, specify the custom character to use for delimiting the query results, if **Raw** is selected for **Output Format**.

13 Select the **Include Headers** option to write out the column headers of the results as well.

14 If you are using parameters to be replaced at runtime, click the **Parameters** tab view a list of parameters that have been preceded by a colon where you can provide values.



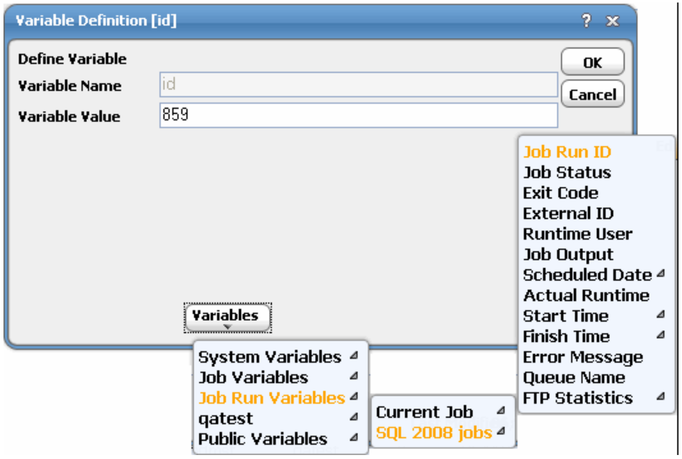
Job Type: SQL Job

Database: tempdb

| Name | Value |
|---|---|
| id | |

**Figure 12** Parameters Tab

15 Click **Edit** display the **Variable Definition** dialog.



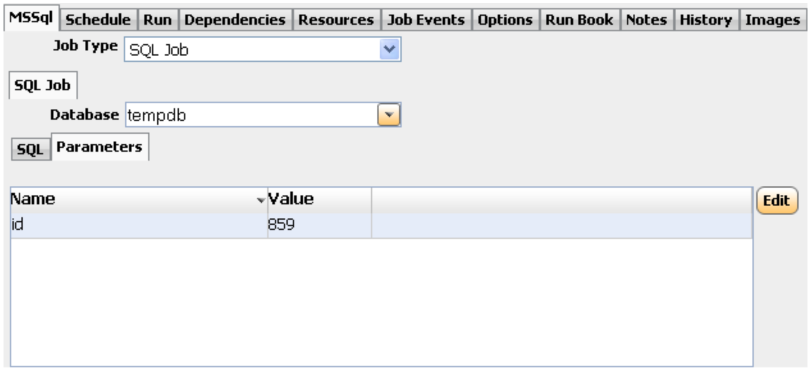
Variable Name: id

Variable Value: 859

**Figure 13** Varaible Definition Dialog

**16** Enter a parameter value, then click **OK** to save the value.

The value displays in the variable row.



Job Type: SQL Job

Database: tempdb

| Name | Value |
|---|---|
| id | 859 |

**Figure 14** Parameters Tab with Value

**17** Click **OK** to save the job.

## Adding a Database Job

▶ ***To add a database job:***

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

**2** Click the **Add** button from the Scheduler toolbar or right-click in either the **Navigator** or **Jobs** pane and select **Add MSSQL Job** from the context menu to display the **MSSQL Job Definition** dialog (Figure 10).

**3** In the **MSSql Job Name** field, enter a name up to 50 characters in length for your job.

The Microsoft SQL Job Name is an identifier for Scheduler only. All of the other job definition information, such as Job Class, Owner and Parent Group, is also the same as a standard Scheduler job and is used in the same way.

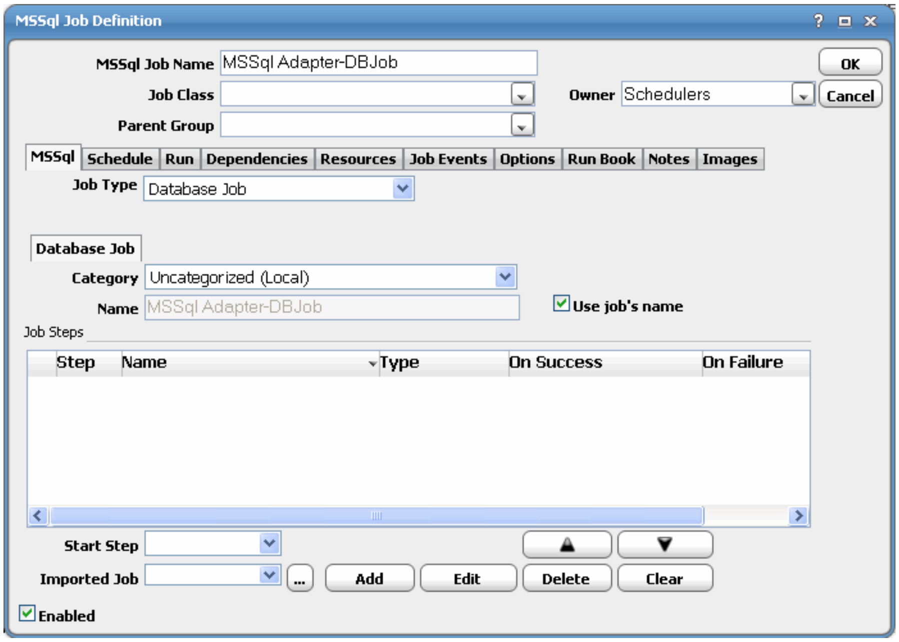
If you are putting your Microsoft SQL job into a group, note that unless the parent group selected has a Microsoft SQL agent connection assigned, you must clear the **Inherited** option on the **Run** tab before you can select a Microsoft SQL connection.

**4** On the **Run** tab, select an agent/adapter name from the **Agent/Adapter Name** list.

**5** Select a runtime user from the **Runtime User** list.

For information on authorizing a runtime user, see *"Defining Runtime Users (Database Users)" on page 14*.

6 Click the **MSSql Job** tab.



MSSql Job Name: MSSql Adapter-DBJob

Owner: Schedulers

Job Type: Database Job

Category: Uncategorized (Local)

Name: MSSql Adapter-DBJob ☑ Use job's name

☑ Enabled

**Figure 15** MSSql Job Definition Dialog, MSSql Job Tab, Database Job

7 Select the job type (**Database Job**) from the **Job Type** list.

8 In the **Name** field, enter the name you want to use to identify the job within SQL Server.

If you would like the SQL job name to match the Scheduler job name, leave this field blank and select the **Use Job's Name** option.

When this option is selected, the **Name** field will be disabled.

9 On the **Database Job** tab, select the SQL Server category to classify job under from the **Category** list.

The default is **Uncategorized**.

10 From the **Start Step** list, select the first step to execute when job is run.

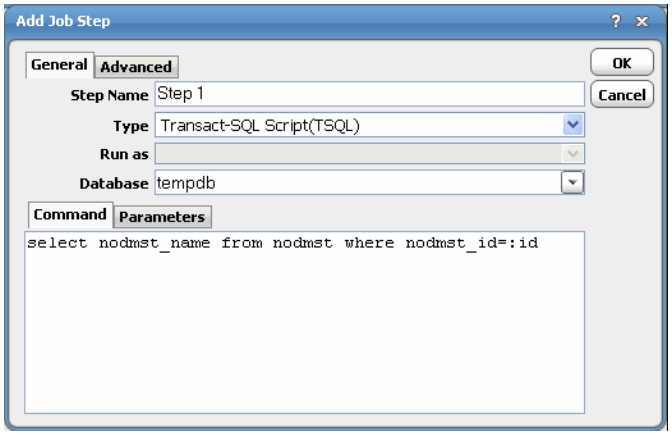
11 Use the **Import Job** field to select a pre-existing job to import as a template.

See "Importing Steps from an Existing Database Job" on page 29.

12 Select the **Enabled** option to enable/disable job definition.

13 Click **OK**.

**14** Click **Add** to display the **Job Step** dialog.



Step Name: Step 1
Type: Transact-SQL Script(TSQL)
Run as:
Database: tempdb

```
select nodmst_name from nodmst where nodmst_id=:id
```

**Figure 16** Job Step Dialog

**15** Enter a name for the step in the **Step Name** field.

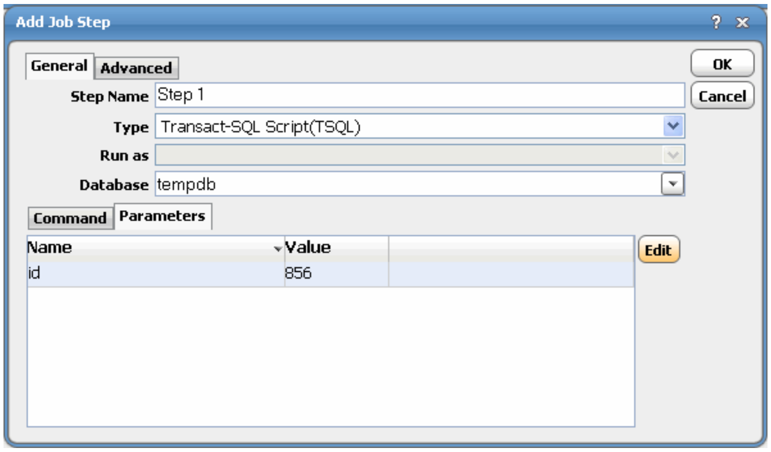
**16** Select the type of step from the **Type** field.

Database jobs support a variety of step types, from ActiveX scripts to T-SQL procedures.

**17** Select the database associated with the job from the **Database** list.

**18** In the **Command** tab field, type in a command to execute.

**19** If you are using parameters to be replaced at runtime, click the **Parameters** tab to view a list of parameters that have been preceded by a colon where you can provide values.

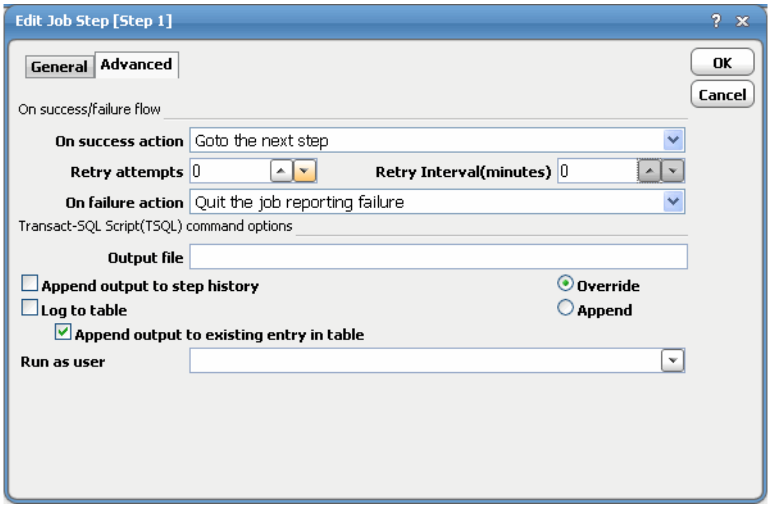


Step Name: Step 1
Type: Transact-SQL Script(TSQL)
Run as:
Database: tempdb

| Name | Value |
|---|---|
| id | 856 |

**Figure 17** Parameters Tab

**20** Click the **Advanced** tab to configure options for this step.



Edit Job Step [Step 1]

General | Advanced

On success/failure flow

On success action: Goto the next step

Retry attempts: 0 — Retry Interval(minutes): 0

On failure action: Quit the job reporting failure

Transact-SQL Script(TSQL) command options

Output file:

□ Append output to step history — ● Override

□ Log to table — ○ Append

☑ Append output to existing entry in table

Run as user:

**Figure 18** Job Step Dialog, Advanced Tab

**Note** Depending on the option selected from the **Type** list of the **General** tab, this dialog displays different options.

**21** Select the **Append output to step history** option.

You can also re-direct the output to a local file or log it to a database table.

In the advanced configuration, you can also specify what action to take when a step succeeds or fails. You can stop the entire job, reporting either success or failure. Or, you can jump to any previous or next step. For the last step of the job, you usually want to specify Quit the job reporting success from the **On success action** list.

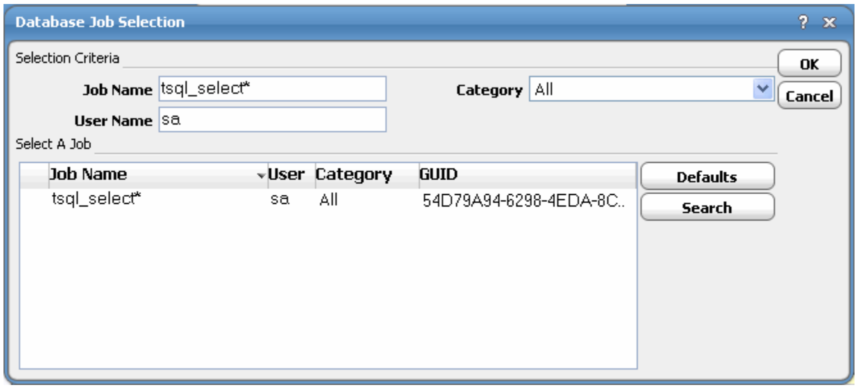
**22** Click **OK** to return to the **MSSql Job** tab.

## Importing Steps from an Existing Database Job

As an alternative to adding steps one-by-one, you can import steps from an existing Microsoft SQL server job definition.

▶ ***To import steps:***

1. On the **MSSql** tab of the **MSSql Job Definition** dialog, select **Database Job** from the **Type** list.
2. In the **Import Job** field, click the ellipsis to display the **Database Job Selection** dialog.



Job Name: tsql_select*

User Name: sa

Category: All

| Job Name | User | Category | GUID |
|---|---|---|---|
| tsql_select* | sa | All | 54D79A94-6298-4EDA-8C.. |

**Figure 19** Database Job Selection Dialog

3 In the **Select A Job** field, select the job that contains the steps you want to import.

4 Click **OK**.

The steps display on in the **Job Steps** field of the **MSSql Job Definition** dialog.

5 If necessary, you can edit the imported step by clicking the **Edit Step** button to display the **Edit Job Step** dialog and you can add a new step by clicking the **Add Step** button to display the **New Job Step** dialog.

6 Click **OK**.

## Linking to an Existing Database Job

▶ ***To link to an existing database job:***

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

2 Click the **Add** button from the Scheduler toolbar or right-click in either the **Navigator** or **Jobs** pane and select **Add MSSQL Job** from the context menu to display the **MSSQL Job Definition** dialog (Figure 10).

3 In the **MSSql Job Name** field, enter a name up to 50 characters in length for your job.

The Microsoft SQL Job Name is an identifier for Scheduler only. All of the other job definition information, such as Job Class, Owner and Parent Group, is also the same as a standard Scheduler job and is used in the same way.

If you are putting your Microsoft SQL job into a group, note that unless the parent group selected has a Microsoft SQL agent connection assigned, you must clear the **Inherited** option on the **Run** tab before you can select a Microsoft SQL connection.

4 On the **Run** tab, select an agent/adapter name from the **Agent/Adapter Name** list.

5 Select a runtime user from the **Runtime User** list.

For information on authorizing a runtime user, see *"Defining Runtime Users (Database Users)" on page 14*.

6 Click the **MSSql Job** tab.

7 Select the job type (**Existing Database Job**) from the **Type** list.

8 In the **Job** field, click the ellipsis to create a link to an existing job.

The **Database Job Selection** dialog (Figure 19) displays.

9 From the **Results** section, select the job.

10 Click **OK** to return to the **MSSql Job** tab where the select job steps are displayed in the **Job Steps** field.

11 From the **Start Step** field, select the first step to execute when the job is run.

12 If necessary, you can edit this step by clicking **Edit** or you can add a new step by clicking **Add** to display the **Job Step** dialog (Figure 16).

13 If adding a step, enter a name for the step in the **Step Name** field.

14 Select the type of step from the **Type** field.

Database jobs support a variety of step types, from ActiveX scripts to TSQL procedures.

15 Select the database associated with the job from the **Database** list.

16 In the **Command** tab field, type in a command to execute.

17 Click the **Parameters** tab (Figure 17) to enter variables inside the query for parameter replacement.

18 Click the **Advanced** tab to collect output for this step.

**Note** Depending on the option selected from the **On success action** list, this dialog displays different options.

19 Select the **Append output to step history** option.

You can also re-direct the output to a local file or log it to a database table.

In the advanced configuration, you can specify what action to take when a step succeeds or fails. You can stop the entire job, reporting either success or failure.

Or, you can jump to any previous or next step. For the last step of the job, you usually want to specify Quit the job reporting success from the **On success action** list.

20 Click **OK** to save the job.

# 4

# WORKING WITH JOBS

## TOPICS COVERED IN THIS CHAPTER

Understanding Microsoft SQL Job Output (page 34)

Controlling Microsoft SQL Jobs (page 36)

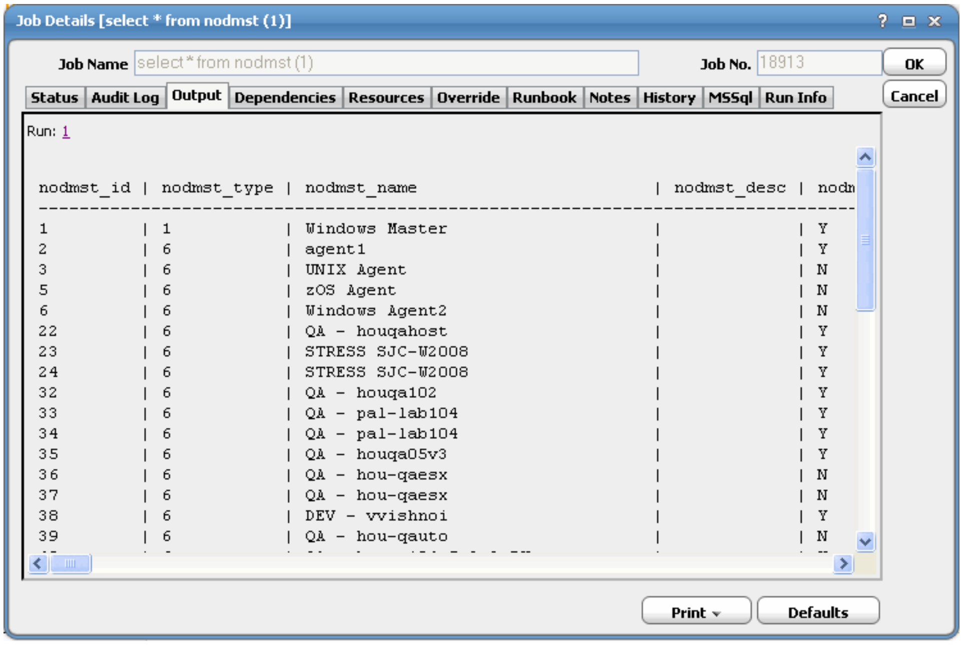
# Understanding Microsoft SQL Job Output

The **Job Details** dialog displays by double-clicking on a job instance record in the **Job Activity** pane or by right-clicking and selecting the **Details** option from the context menu. The **Job Detail** dialog provides information on the job after it has completed or as it is still running. The tabs of this dialog specific to the Microsoft SQL adapter are the **Output**, **MSSQL**, and **Run Info** tabs.

## Output Tab

The **Output** tab of the **Job Detail** dialog, if job is configured to save output, the Microsoft SQL logs generated for the job and any output if available. Scheduler can be configured to save or discard job output by default from the **Defaults** tab of the **System Configuration** dialog. Regardless of the system default, any individual job instance can be configured from its job definition to override the system default. Each time a job is rerun that run's output is separated by a block of number signs (#).

**Note** Scheduler's default is to discard job output. If you want to be able to view job output, you must select the **Save Output** option on the **Options** tab in the **Job Definition** dialog or change the system default on the **Defaults** tab in the **System Configuration** dialog.



Job Details [select * from nodmst (1)]

Job Name: select * from nodmst (1)

Job No. 18913

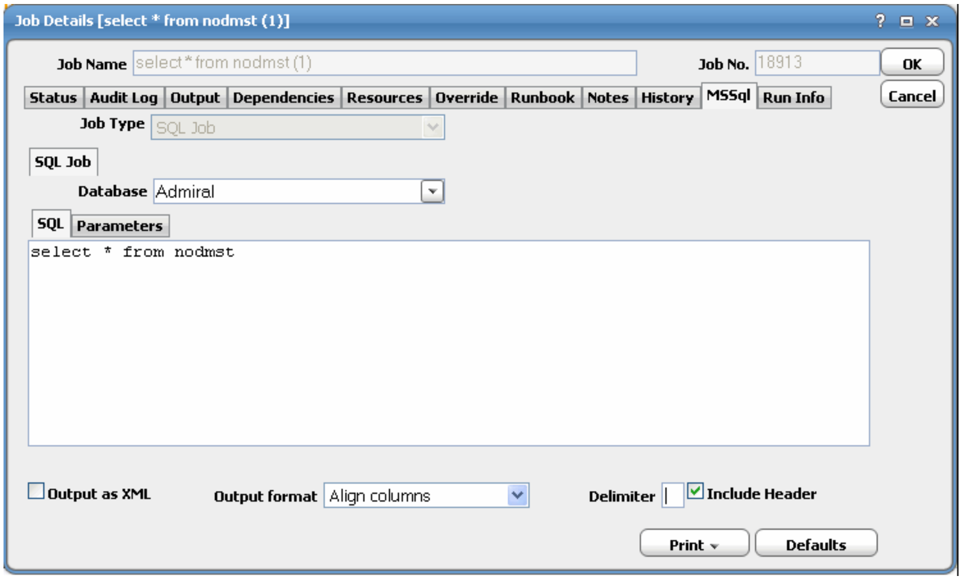
Run: 1

```
nodmst_id | nodmst_type | nodmst_name                          | nodmst_desc | nodn
----------------------------------------------------------------------------------------
1         | 1           | Windows Master                       |             | Y
2         | 6           | agent1                               |             | Y
3         | 6           | UNIX Agent                           |             | N
5         | 6           | zOS Agent                            |             | N
6         | 6           | Windows Agent2                       |             | N
22        | 6           | QA - houqahost                       |             | Y
23        | 6           | STRESS SJC-W2008                     |             | Y
24        | 6           | STRESS SJC-W2008                     |             | Y
32        | 6           | QA - houqa102                        |             | Y
33        | 6           | QA - pal-lab104                      |             | Y
34        | 6           | QA - pal-lab104                      |             | Y
35        | 6           | QA - houqa05v3                       |             | Y
36        | 6           | QA - hou-qaesx                       |             | N
37        | 6           | QA - hou-qaesx                       |             | N
38        | 6           | DEV - vvishnoi                       |             | Y
39        | 6           | QA - hou-qauto                       |             | N
```

**Figure 20** Job Details Dialog, Output Tab

## MSSql Tab

The **MSSql** tab of the **Job Detail** dialog contains the request with the variables used when this job was submitted. This tab allows you to override the parameter values listed.


Job Details [select * from nodmst (1)]
? □ ×
OK
Cancel
Status | Audit Log | Output | Dependencies | Resources | Override | Runbook | Notes | History | MSSql | Run Info
SQL Job
SQL | Parameters
Print
Defaults

Job Name: select * from nodmst (1)
Job No. 18913
Job Type: SQL Job
Database: Admiral

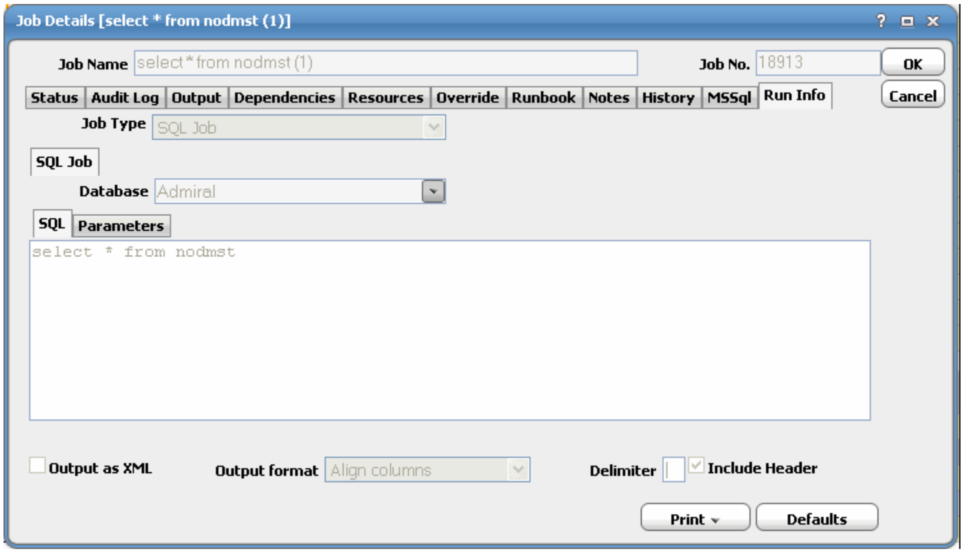
```
select * from nodmst
```

☐ Output as XML
Output format: Align columns
Delimiter: |
☑ Include Header

**Figure 21** Job Details Dialog, MSSql Tab

## Run Info Tab

The **Run Info** tab of the **Job Detail** dialog contains the request that was submitted to Microsoft SQL. Each tab reflects the last run of this Microsoft SQL instance. This may or may not be the same thing you see on the **MSSQL** tab depending on whether you have made any changes to this instance since the last run. This tab is read-only.


Job Details [select * from nodmst (1)]
? □ ×
OK
Cancel
Status | Audit Log | Output | Dependencies | Resources | Override | Runbook | Notes | History | MSSql | Run Info
SQL Job
SQL | Parameters
Print
Defaults

Job Name: select * from nodmst (1)
Job No. 18913
Job Type: SQL Job
Database: Admiral

```
select * from nodmst
```

☐ Output as XML
Output format: Align columns
Delimiter: |
☑ Include Header

**Figure 22** Job Details Dialog, Run Info Tab

## Controlling Microsoft SQL Jobs

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

- Hold a Microsoft SQL job waiting to run
- Abort an active Microsoft SQL job
- Rerun a Microsoft SQL job that completed (or rerun from a specific step)
- Make last minute changes to a Microsoft SQL job
- Delete a Job Instance Before It Has Run

### Holding a Job

Microsoft SQL jobs are held in the same way as any other Scheduler jobs.

Microsoft SQL jobs can only be held before they are launched. Once a job reaches the Microsoft SQL agent, it cannot be held or suspended.

▶ ***To hold a job:***

1. Right-click on the job.
2. Select **Job Control>Hold/Stop**.

### Aborting a Job

Microsoft SQL jobs are aborted in the same way as any other Scheduler jobs.

▶ ***To abort a job:***

1. Right-click on the job.
2. Select **Job Control>Cancel/Abort**.

### Restarting a Job From Any Step

On occasion, you may need to rerun a Microsoft SQL job without starting from the beginning.

From the **MSSQL Job Detail** dialog, you can restart a Microsoft SQL job starting from any step in the job.

▶ ***To restart a job:***

1. From the **Job Activity** pane, double-click the Microsoft SQL job being rerun to open its **MSSQL Job Detail** dialog.
2. Click the **MSSQL** tab to display the steps that comprise the job instance.
3. Select the step to restart the job from, then right-click and select **Job Control>Rerun** option from the context menu.

## Making Last Minute Changes To a Microsoft SQL Job

You can create a Microsoft SQL job that can be edited prior to runtime. By selecting the **Require operator release** option on the **Options** tab in the **MSSQL Job Definition** dialog, you activate the **WAITOP** function. Use the **WAITOP** function to make changes to a Microsoft SQL job after it enters Microsoft SQL Scheduled (P) status by clicking the **Edit** button on the **MSSQL** tab of the **Job Detail** dialog.

✓ **Note** You can only make changes to a Scheduler Microsoft SQL job that has already entered Microsoft SQL Scheduled (P) status if you selected the **Require operator release** option on the **Options** tab in the **MSSQL Job Definition** dialog.

▶ ***To make last minute changes:***

1. From the **Job Activity** pane, double-click the Microsoft SQL job to display the **Job Detail** dialog.
2. Click the **MSSQL** tab.
3. Select the job step and click **Edit** to display the **Job Step Details** dialog.
4. Make the desired changes to the job step and click **OK** to close the **Job Step Details** dialog.
5. To run the Microsoft SQL job, select the job in the **Job Activity** pane and right-click and select the **Release** option from the **MSSQL** menu.

## Deleting a Job Instance Before It Has Run

Microsoft SQL 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 only. The job still remains in the Microsoft SQL database.

▶ ***To delete a job instance:***

1. From the **Job Activity** pane, right-click the Microsoft SQL job to be deleted.
2. Select **Remove Job(s) From Schedule**.

# 5

# WORKING WITH EVENTS

## TOPICS COVERED IN THIS CHAPTER

Overview (page 40)

Adding a Microsoft SQL Event (page 40)

Assigning an Alert Action to an Event (page 44)

# Overview

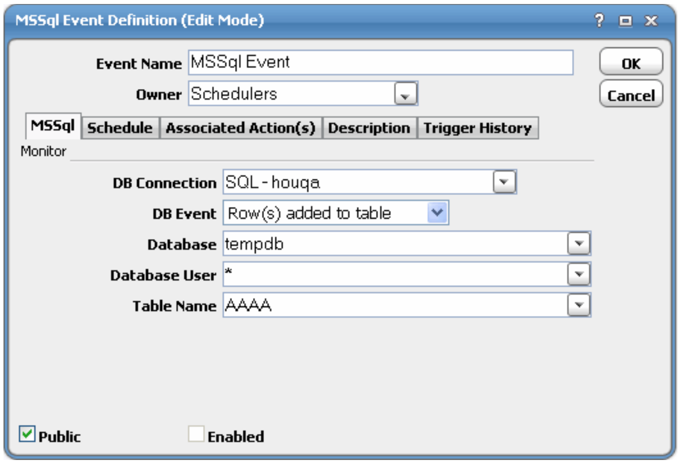
You can add new events that are triggered on Windows SQL Server for table, index, and row creation, modification and deletion.

# Adding a Microsoft SQL Event

▶ ***To add an event:***

1 From the **Navigator** pane, select **Events>MSSql Events** to display the **MSSql Events** pane.

2 Click the **Add** button or right-click on the **MSSql Events** pane and select **Add Event** from the context menu to display the **MSSql Event Definition** dialog.



MSSql Event Definition (Edit Mode)

Event Name: MSSql Event

Owner: Schedulers

Monitor

DB Connection: SQL - houqa

DB Event: Row(s) added to table

Database: tempdb

Database User: *

Table Name: AAAA

☑ Public

□ Enabled

**Figure 23** MSSql Event Definition Dialog

3 In the **Event Name** field, enter a name for the event.

4 From the **Owner** list, select the owner of the event.

5 On the **MSSql** tab, specify which database connection to monitor from the list of defined connections from the DB Connection list.

This tab designates the data table and indexes in the Microsoft SQL database to be monitored and defines the condition that will raise the event. Once the designated change to the data table is detected, the event triggers any linked action(s) as an automatic response to the change.

6 From the **DB Connection** list, specify which database connection to monitor from the list of defined connections.

7 From the **DB Event** list, designate one of the listed database changes from the list as the event trigger.

8 From the **Database** list, specify the database to be monitored.

Initially this text field defaults to the database in the Connection Definition.

**9** From the **Database User** list, select the name of the user making the change in the database.

Initially this text field defaults to the user in the Connection Definition.

The value entered here must be all uppercase with without any spaces. The wildcard characters ***** and **?** can be used in this text field.

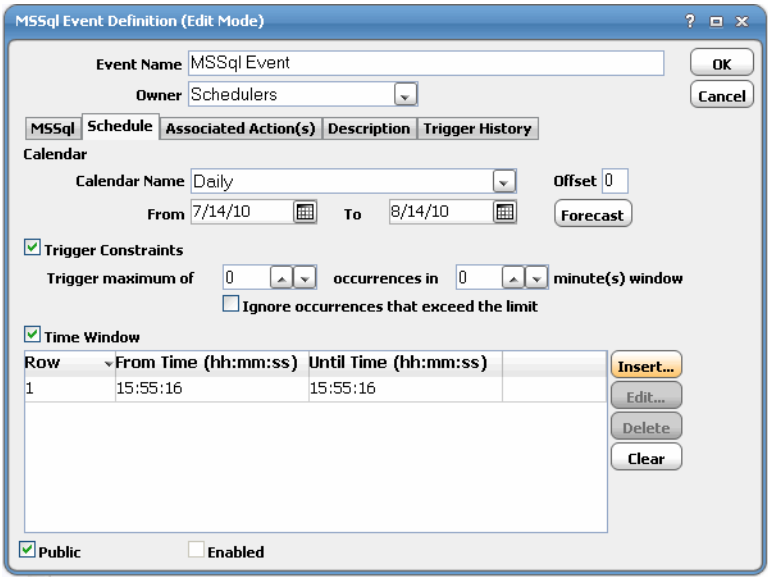
**10** From the **Table Name** list, select the name of the data table to be monitored.

The wildcard characters ***** and **?** can be used in this text field, but only if the database event being monitored is one of the following:

- Table created
- Table deleted
- Index created
- Index deleted

All other database events require a specific table name. The value entered here must be all uppercase without any spaces.

**11** Click the **Schedule** tab to assign a schedule to the event.



Event Name: MSSql Event
Owner: Schedulers

Calendar
Calendar Name: Daily
Offset: 0
From: 7/14/10 To: 8/14/10

☑ Trigger Constraints
Trigger maximum of 0 occurrences in 0 minute(s) window
□ Ignore occurrences that exceed the limit

☑ Time Window

| Row | From Time (hh:mm:ss) | Until Time (hh:mm:ss) |
|---|---|---|
| 1 | 15:55:16 | 15:55:16 |

☑ Public □ Enabled

**Figure 24** MSSql Event Definition Dialog, Schedule Tab

**12** From the **Calendar Name** field, select the calendar or calendar group indicating which days the event monitor should run.

You must select a calendar for the event monitor to be scheduled automatically. A calendar can encompass one or more days. If you do not select a calendar than the event monitor will run every day.

You can clear a calendar by right-clicking on the **Calendar** field and selecting **Clear** from the context menu or by pressing the **Delete** key.

**13** In the **Offset** field, enter the number of days before or after every day in the calendar that the event will be monitored.

Each day in the calendar is adjusted by the offset you provide. For example, if the event monitor is using the Fiscal Month End calendar with an offset of 2, the event monitor will be inserted into the schedule 2 days after Fiscal Month End date. If you use an offset of -2, the event monitor will be inserted 2 days before the Fiscal Month End date.

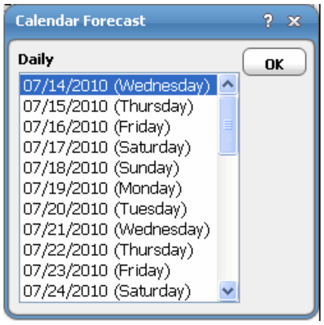
14 In the **From** field, select the earliest date that the event monitor should be active.

The event monitor will operate starting from the first date in the calendar that is on or after this date. You can choose a date using the built-in calendar dialog by clicking the adjacent drop-down arrow.

15 In the **To** field, select the last date the event monitor can operate based on the calendar.

If not specified, and your calendar includes repetitive dates, your event monitor will run indefinitely. You can choose a date using the built-in calendar dialog by clicking the adjacent drop-down arrow.

16 Click **Forecast** to display the **Calendar Forecast** dialog for the selected calendar (adjusted by offset, if provided) showing all the dates for which the event monitor will be active.



07/14/2010 (Wednesday)
07/15/2010 (Thursday)
07/16/2010 (Friday)
07/17/2010 (Saturday)
07/18/2010 (Sunday)
07/19/2010 (Monday)
07/20/2010 (Tuesday)
07/21/2010 (Wednesday)
07/22/2010 (Thursday)
07/23/2010 (Friday)
07/24/2010 (Saturday)

**Figure 25** Calendar Forecast Dialog

17 On the **Schedule** tab, select the **Trigger Constraints** option.

The **Trigger Constraints** section defines constraints on actions associated with the event monitor. The constraints allow you to throttle the execution of actions. At times, the event condition we are searching for may trigger in rapid successions. Rather than act on each and every event in the short interval, it may be preferable to limit the action execution frequency.

**Note** While the event may be suppressed from occurring each time the event conditions are detected, the event monitor will still perform the associated action each time it detects the specified condition. The configured action always occurs whenever an event condition is detected whether the event “counts” or not.

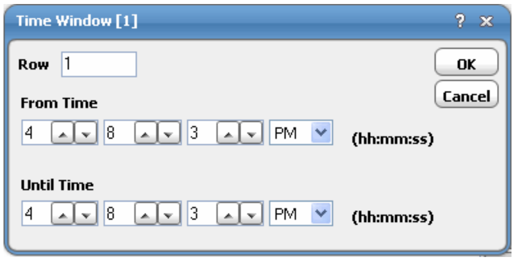
18 In the **Trigger maximum of** field, specify the maximum number of times that the event monitor will react to the defined conditions within a certain time window.

19 In the **Occurrences in __ minute (s)** field, designate the time window within which the event monitor will react to the defined conditions.

20 Select the **Ignore occurrences that exceed the limit** option if you want to ignore any occurrences that exceed configured value.

**21** Select the **Time Window** option.

Selecting this option will limit the event monitor to being active only during the defined time windows that are listed here. If this option is not selected then the event monitor will always be active. This section lists multiple time windows that the event monitor will monitor for the defined conditions. Any number of time windows can be created via the **Time Window** dialog.



Time Window [1]

Row: 1

From Time: 4 8 3 PM (hh:mm:ss)

Until Time: 4 8 3 PM (hh:mm:ss)

**Figure 26** Time Window Dialog

- **Row** – A sequence number for the defined time window.
- **From Time (hh:mm:ss)** – Designates the time that the event monitor will begin actively monitoring for the defined conditions. This is expressed in a 24 hour clock format of hours, minutes and seconds.
- **Until Time (hh:mm:ss)** – Designates the time that the event monitor will stop actively monitoring for the defined conditions. This is expressed in a 24 hour clock format of hours, minutes and seconds.

**22** Click **OK** to add the new event.

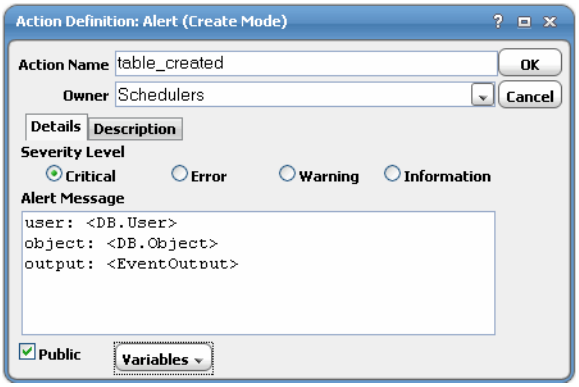
# Assigning an Alert Action to an Event

You can assign an Alert action to an event so you know when the event has triggered. You can use the following Microsoft SQL event variables:

- **DB.User** – The database user who triggered the event.
- **DB.Object** – The database object that triggered the event.
- **EventOutput** –The output of the event selected.

▶ ***To assign an Alert action:***

1. In the **Navigator** pane, select **Definitions>Actions>Alert** to display the **Alerts** pane.
2. Click the **Add** button or right-click on the **Alerts** pane and select **Add Action** from the context menu to display the **Action Definition** dialog.



Action Definition: Alert (Create Mode)

Action Name: table_created

Owner: Schedulers

Details | Description

Severity Level: ● Critical ○ Error ○ Warning ○ Information

Alert Message:

```
user: <DB.User>
object: <DB.Object>
output: <EventOutput>
```

☑ Public

**Figure 27** Action Definition Dialog

3. In the **Action Name** field, enter a name for the alert.
4. From the **Owner** list, select the owner name.
5. In the **Severity Level** section, select the severity level of the alert.

   You can select from four different severity levels:

   - **Critical** – Sends the highest priority alert to the **Job Activity** pane when the action is triggered.
   - **Error** – Sends a high priority alert to the Job Activity pane when the action is triggered.
   - **Warning** – Sends a medium priority alert to the Job Activity pane when the action is triggered.
   - **Information** – Sends the lowest priority alert to the Job Activity pane when the action is triggered.

6 In the **Alert Message** field, enter the message the operator receives when viewing the alert from the **Alert Details** dialog.

You can enter a combination of text and/or variables in your message. Click the **Variable** button to choose variables from the variables context menu.

7 Select the **Public** option.

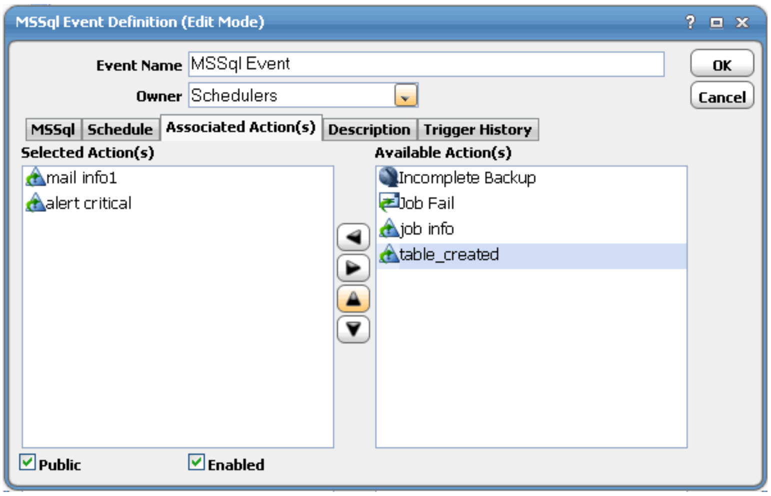
When selected, the action is available to all Scheduler users (within the constraints of their security policy). You can select the default condition for this option from the **Defaults** tab of the **System Configuration** dialog.

8 Click **OK**.

9 From the **Navigator** pane, select **Events>MSSql Events** to display the **MSSql Events** pane.

10 Double-click on the event that you would like to assign the **Alert** action to display the **MSSql Event Definition** dialog.

11 Click the **Associated Action(s)** tab.


MSSql Event Definition (Edit Mode)

Event Name: MSSql Event
Owner: Schedulers

Selected Action(s):
- mail info1
- alert critical

Available Action(s):
- Incomplete Backup
- Job Fail
- job info
- table_created

☑ Public
☑ Enabled

**Figure 28** Associated Action(s) Tab

12 In the **Available Action(s)** field, select the appropriate alert.

**Note** You can also add an alert from this field by right-clicking and selecting an option from the context menu.

13 Click the left arrow button to move the event into the **Selected Action(s)** field.

14 Click **OK**.

# A

# SECURITY

## TOPICS COVERED IN THIS CHAPTER

Database Roles and Priveleges (page 48)

# Database Roles and Priveleges

The database users that you will use with the Microsoft SQL adapter require specific priveleges to successfully create and run jobs and or monitor events.

## Database Events

Monitoring database Microsoft SQL events requires the adapter connection user to be assigned the **sysadmin** role and the **db_owner** role for each database being monitored.

## Database Jobs

Creating, viewing and running database jobs requires a variety of permissions. The easiest way to accomplish this is to assign the sysadmin role to your user. Run the following query to determine if the runtime user for the job is assigned the **sysadmin** role:

```
select is_srvrolemember('sysadmin')
```

If assigning the **sysadmin** role is not acceptable, then verify that the runtime users have be granted the correct permissions using the following queries:

```
select has_perms_by_name('msdb..sysobjects', 'object', 'select')
select has_perms_by_name('msdb..sysproxies', 'object', 'select')
select has_perms_by_name('master..syslogins', 'object', 'select')
select has_perms_by_name('master..sysdatabases', 'object', 'select')
select has_perms_by_name('sys.objects', 'object', 'select')
select has_perms_by_name('sys.schemas', 'object', 'select')
select has_perms_by_name('sys.sysusers', 'object', 'select')
select has_perms_by_name('sys.syslogins', 'object', 'select')
```

If one or more permissions are missing, issue the following statements to grant them to the runtime user, in this case, **TIDALSOFT\myuser**.

```
grant select on object::msdb..sysobjects to [TIDALSOFT\myuser];
grant select on object::msdb..sysproxies to [TIDALSOFT\myuser];
grant select on object::master..syslogins to [TIDALSOFT\myuser];
grant select on object::master..sysdatabases to [TIDALSOFT\myuser];
grant select on object::sys.objects to [TIDALSOFT\myuser];
grant select on object::sys.schemas to [TIDALSOFT\myuser];
grant select on object::sys.sysusers to [TIDALSOFT\myuser];
grant select on object::sys.syslogins to [TIDALSOFT\myuser];
```

The user must have the following permissions for each database the user accesses through the Microsoft SQL adapter. In the example below the database is called **XYZ**.

```
select has_perms_by_name('[XYZ]..sysobjects', 'object', 'select')
select has_perms_by_name('[XYZ]..sysusers', 'object', 'select')
select has_perms_by_name('[XYZ]', 'database', 'showplan')
```

If any of these permissions are missing, issue the following statements:

```
grant select on object::[XYZ]..sysobjects to [TIDALSOFT\myuser];
grant select on object::[XYZ]..sysusers to [TIDALSOFT\myuser];
grant showplan on database::[XYZ] to [TIDALSOFT\myuser];
```

The user must be able to call these database functions. You do not need to assign any permissions by default.

```
getDate()
getUtcDate()
getServerProperty()
suser_sname()
```

The user must be assigned the **sysadmin** role or one of the following Microsoft SQL Agent roles: **SQLAgentUserRole**, **SQLAgentReaderRole** or **SQLAgentOperatorRole**. Only the **sysadmin** role can create, view and run all jobs in the database. Refer to SQL Server documentation about the restrictions placed on each of the SQL Server Agent roles with regard to jobs. Refer to the documentation about how to check which roles are assigned to your user and how to assign one of these roles to your user.