SQL Monitor 2.1

December 2010

Note: these pages apply to a version of
this product that is not the current released version.

For the latest support documentation, please see
http://documentation.red-gate.com

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Contents

Getting Started

SQL Monitor is a web-based monitoring and alerting tool for SQL Servers. It displays real-time data about the current performance of all host machines, SQL Server instances, and databases that you choose to monitor, and raises alerts when problems occur.

For help installing SQL Monitor, see the Installation guide.

For problems setting up SQL Monitor and connecting to the servers you want to monitor, see the Troubleshooting topics in the table of contents on the right.

You can use SQL Monitor to:

- Quickly identify servers that require attention using the Global Overview
- Drill down to view the current health and performance of any server or database
- View detailed alerts for a wide range of issues such as job failures, deadlocks, overdue backups and fragmented indexes
- Configure each type of alert for each server, job, database etc., to suit your environment; and set up email notifications
- Analyze performance counters over time to determine performance trends and identify abnormal performance
- "Rewind time" to review the activity on your servers when a problem occurred in the past
- Run your own reports against the Data Repository SQL Server database that contains all collected data

What servers can I monitor?

SQL Monitor monitors both the host Windows machine as well as SQL Server instances.

You can monitor the following host Windows machines:

- Windows 2000
- Windows XP
- Windows Server 2003
- Windows Server 2008
- Windows Vista
- Windows 7

You can monitor the following versions of SQL Server:

- SQL Server 2000 SP4
- SQL Server 2005
- SQL Server 2008

Getting help in the product

- Get hints for features and options in the interface by clicking ❓.
- Read about guidelines and best practices in the **Description** panels for performance counters and alerts.

What does SQL Monitor monitor?

SQL Monitor shows information about your servers in three main areas:

Overviews

The Overviews show current performance data about your servers, updated every few seconds.

When you click the Overviews tab, the **Global Overview** page is the first page that is displayed. The Global Overview summarizes the current health of all your servers, and shows which servers require your attention. You can drill down from the Global Overview to a Windows machine, a cluster, a SQL Server instance, and a particular database. Each type of Overview shows relevant up-to-date performance information, and summarizes the alerts that have been raised for the current object.

More about overviews

Alerts

The **Alerts** page lists all the alerts that have been raised for your servers. SQL Monitor has 28 types of alerts that are triggered when various issues are detected on your host machines, instances and databases. When you first install SQL Monitor, each alert is pre-configured with sensible defaults. As you receive these alerts, you can customize them to better match your environment.

When you click the Alerts tab, the **Alert Inbox** shows an email inbox style list of all the alerts that have been raised. You can filter this list in many different ways, for example to show only alerts for a particular server or database, or to only view certain types of alerts. Click on any alert to view more details about it, including a snapshot of performance data captured when the alert was raised.

As you investigate alerts, you can mark them as read, clear them (so they are hidden by default from the list) or add a comment.

More about alerts

Analysis

The **Analysis** page offers a range of performance counters that you can plot as graphs for any monitored object (machine, instance or database) over a selected time period. You can also compare graphs across similar time ranges, for example Today vs Yesterday or This Week vs Last Week, and export the graph data as a .csv file.

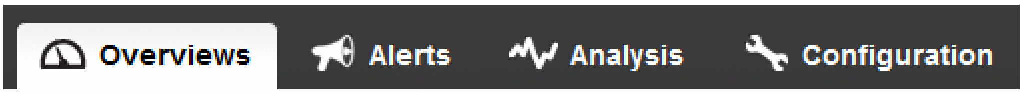
Click on any sparkline graph on an Overview page to view that performance counter in more detail on the Analysis page.

More about the Analysis page

Navigating in SQL Monitor

Top navigation bar

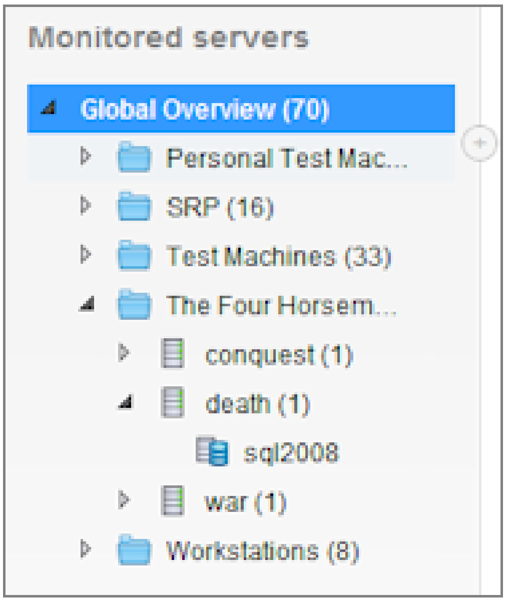
SQL Monitor contains four main areas, shown as tabs across the top of the screen:



When you click on a tab in the top bar, the landing page for the selected area is displayed. For example, clicking on Overviews takes you to the Global Overview, and clicking on Alerts takes you to the Alert Inbox. You can then drill down to view more detailed information.

Note: If you have clicked on a different tab, and want to return to your previous page instead of the landing page, use your browser's **Back** button. Clicking on a top level tab always starts you at the landing page. You can open pages in new tabs or windows if you want to view multiple pages simultaneously.

Monitored servers list



The servers you are monitoring, and any groups you have created, are shown on the left side of the screen in various places in SQL Monitor: the overviews, the Alert Inbox and the alert settings pages.

Click on an object in the list to view the relevant overview or show only alerts/alert settings for the selected object. Click the arrow ▷ next to an object name to view levels beneath.

Group

Cluster

Host machine (Windows server)

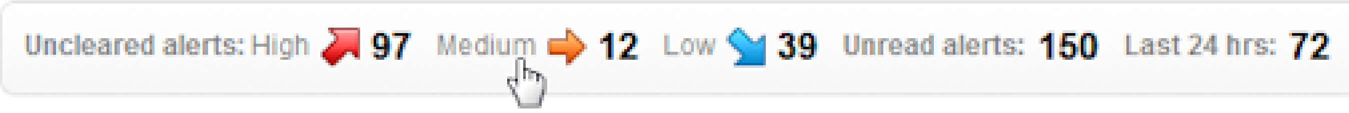
SQL Server instance

- In the Alert Inbox, you can continue to drill down to view databases. Clicking on a database shows alerts for the selected database.
- When configuring alerts, you can also drill down to view individual jobs.
- On the overviews, the number (n) after a group or server name shows the number of objects beneath. In the Alert Inbox, the number in brackets indicates the number of **unread** alerts.

Tip: If the names of your servers are truncated because they are too long, click ⊕ to expand the width of the left pane.

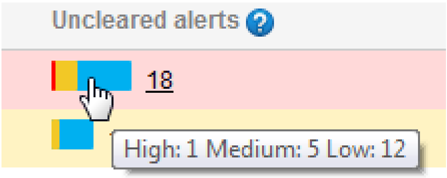
Navigating in the Global Overview

- Click on any object (server or database) in the **Monitored servers** list to view the Overview page for that object.
- Click on a group to filter the Global Overview to show only servers in the selected group.
- Click on the name of a host machine or SQL Server instance in the **Servers** column to go to the Overview page for that server. You can also click in the **Status** column.
- Click on a number in the alerts summary panel at the top of the page to go to the Alert Inbox pre-filtered by your selection (e.g. High or Unread) across all servers.



Uncleared alerts: High 97 Medium 12 Low 39 Unread alerts: 150 Last 24 hrs: 72

- Click on the colored bar graph under **Uncleared alerts** to go to the Alert Inbox to view alerts for that host machine or SQL Server instance:

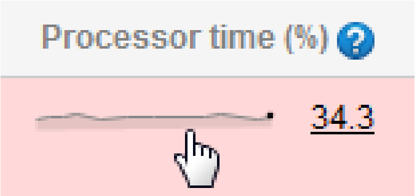


Uncleared alerts

18

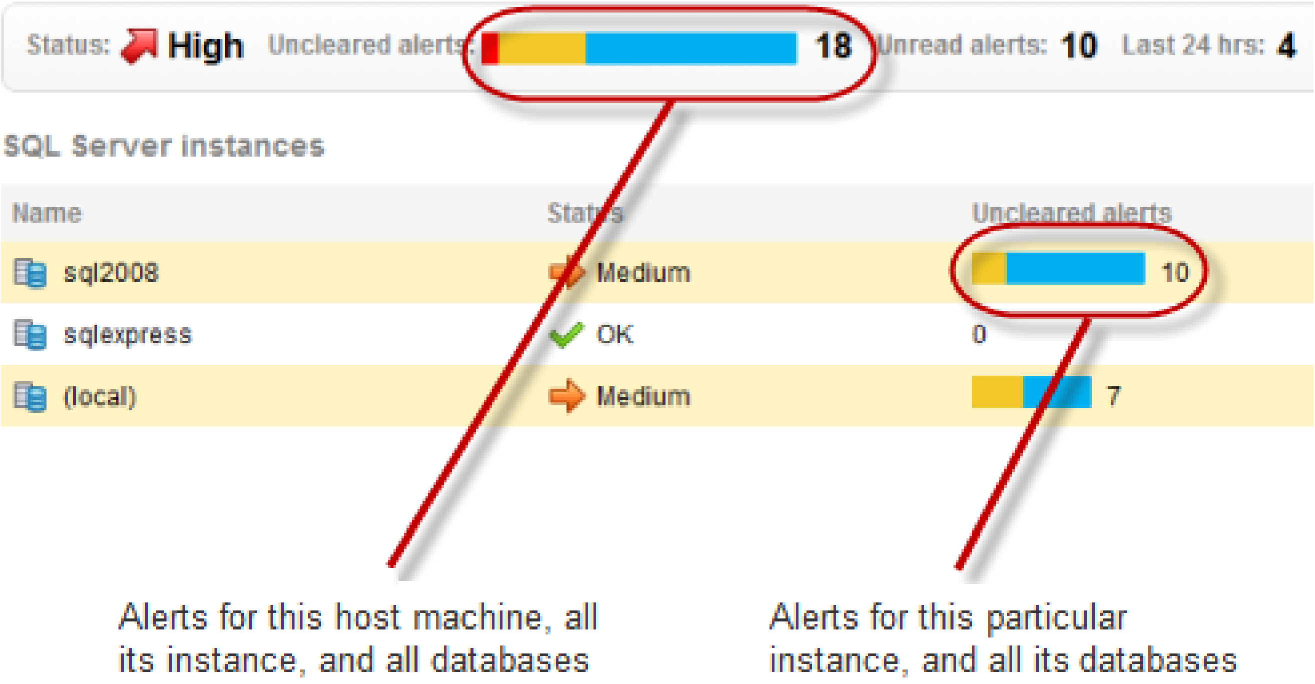
High: 1 Medium: 5 Low: 12

- Click on a sparkline graph for Processor time or Memory Used to go the Analysis page for those counters



Navigating in a server or database overview page

- For a host machine, its monitored SQL Server instances are listed. Click in the **Name** or **Status** column to drill down to the SQL Server overview page.
- For a SQL Server instance, all its databases are listed. Click in the **Name** or **Status** column for a database to drill down to the database overview page.
- Click on **Uncleared alerts**, **Unread alerts** or **Last 24hrs** in the alerts summary panel at the top of the page to go to the Alert Inbox for all alerts relating to this object and everything below it in the hierarchy (e.g. for a host machine, it will show alerts for the machine as well as SQL Server instances and databases)
- Click on **Uncleared alerts, Unread alerts** or **Last 24hrs** for a SQL Server instance or database to go to the Alert Inbox for alerts relating only to the specific object (e.g. a SQL Server instance) and levels below it, if applicable:



Status: High Uncleared alerts: 18 Unread alerts: 10 Last 24 hrs: 4

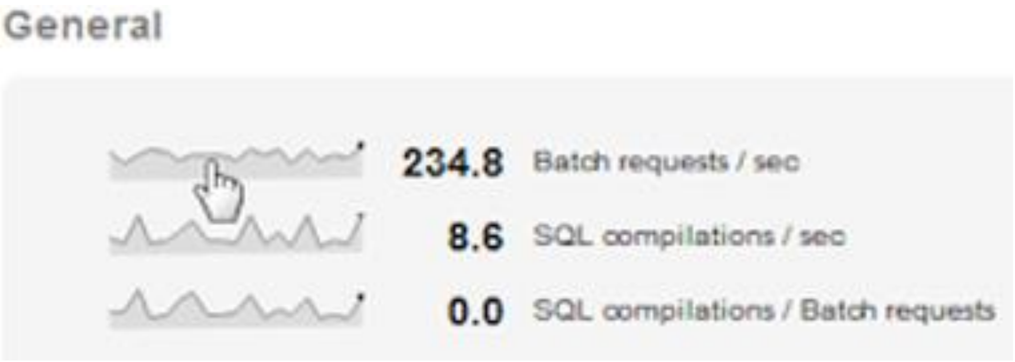
SQL Server instances

Name	Status	Uncleared alerts
sql2008	Medium	10
sqlexpress	✓ OK	0
(local)	Medium	7

Alerts for this host machine, all its instance, and all databases

Alerts for this particular instance, and all its databases

- Click on any sparkline graph to go to the Analysis page for the selected counter:


General
234.8 Batch requests / sec
8.6 SQL compilations / sec
0.0 SQL compilations / Batch requests

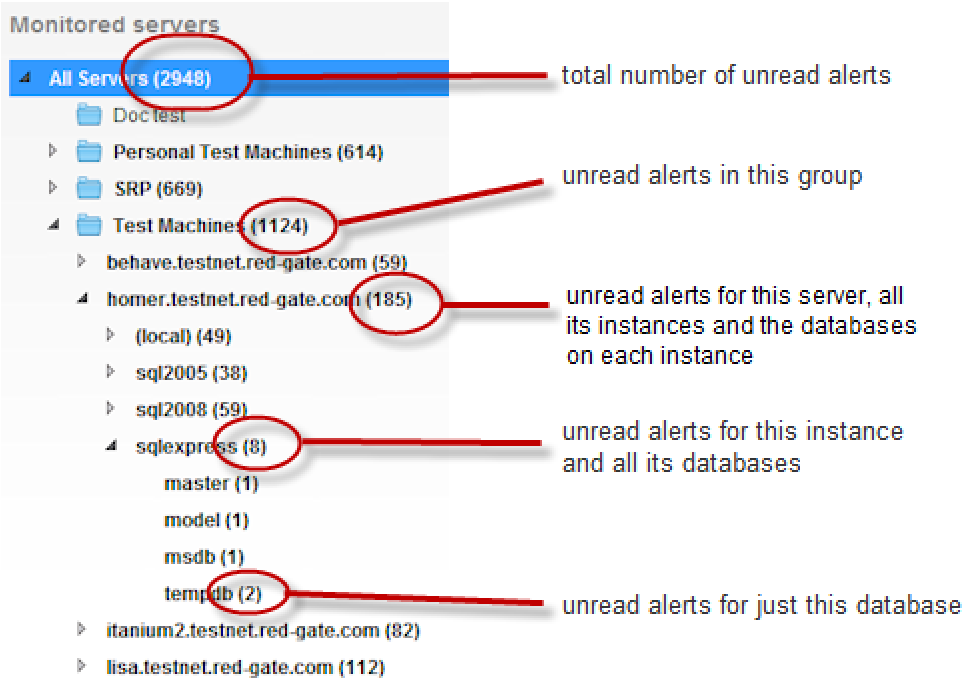
Navigating in the Alert Inbox

In the Alert Inbox, you can filter the alerts that are displayed in two ways:

- Select a server or database in the **Monitored servers** list on the left, and
- Filter which alerts are shown, using a Global filter or a filter in the Filter panel

These two filters work in combination. For example, you can view all High level unread alerts on one instance raised in the last hour, or all Cleared alerts across all servers.

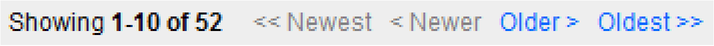
The number in brackets after a server or database name in the Monitored servers list always shows the number of **unread** alerts, regardless of the current filters applied. As you drill down in the hierarchy, the number of unread alerts at each level is displayed:


Monitored servers
All Servers (2948)
DocTest
Personal Test Machines (614)
SRP (669)
Test Machines (1124)
behave.testnet.red-gate.com (59)
homer.testnet.red-gate.com (185)
(local) (49)
sql2005 (38)
sql2008 (59)
sqlexpress (8)
master (1)
model (1)
msdb (1)
tempdb (2)
itanium2.testnet.red-gate.com (82)
lisa.testnet.red-gate.com (112)
total number of unread alerts
unread alerts in this group
unread alerts for this server, all its instances and the databases on each instance
unread alerts for this instance and all its databases
unread alerts for just this database

Click on any level to filter the list of alerts for that level and all levels below. (The alerts displayed will also depend on the filters you have selected.)

Viewing more alerts

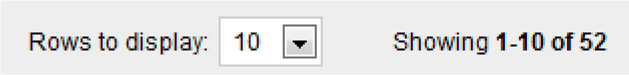
When you first install SQL Monitor, the Alert Inbox shows a maximum of ten alerts per page. You can navigate through this list using the **Newer** and **Older** links:



Showing **1-10 of 52**

The total number of alerts shown (...of **n**) is useful to indicate how many alerts match the current set of filters. Note that this will not necessarily match the number of unread alerts in the Monitored servers list.

To increase the number of alerts shown, use the **Rows to display** option below the inbox:



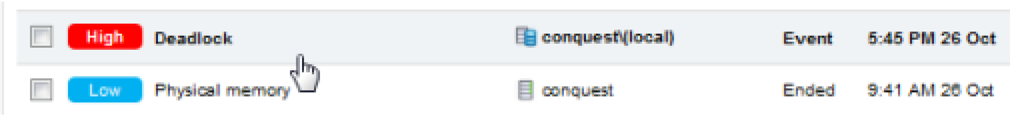
Rows to display: 10

Showing **1-10 of 52**

The **Rows to display** value is stored as a cookie in your browser.

Viewing alert details

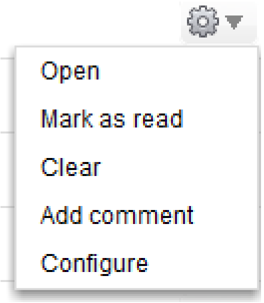
To view the details for an alert, click anywhere in the row for that alert:



□	High	**Deadlock**	**conquest\(local)**	**Event**	**5:45 PM 26 Oct**
□	Low	Physical memory	conquest	Ended	9:41 AM 26 Oct

The alert opens in its own page, where you can review the detailed alert information and performance data. You can also apply various actions, for example, mark it as Cleared or add a comment.

Click ⚙▾ in the **Actions** column to apply an action to an alert:



If you click **Clear** or **Mark as read**, the alert may disappear from the list, depending on your current set of filters.

Supported platforms and hardware requirements

Supported platforms and prerequisites

.NET runtime

The Web Server computer and Base Monitor computer both require **.NET 3.5 SP1 or later**. If you don't have .NET 3.5 SP1 installed, download it here (http://www.microsoft.com/downloads/details.aspx?FamilyID=ab99342f-5d1a-413d-8319-81da479ab0d7&amp;displaylang=en).

SQL Monitor Web Server

Supported operating systems for the Web Server computer if you don't have an IIS server (SQL Monitor will install its own standalone Web Server):

- Windows XP
- Windows Server 2003
- Windows Server 2008
- Windows Vista
- Windows 7

If you want to add SQL Monitor to an existing IIS server, the following versions are supported:

- IIS 6
- IIS 7 or later

Supported browsers for the web application

- Firefox 3 or later
- Chrome 2 or later
- Safari 5 or later
- Opera 10 or later
- IE 7 or later

  Note: If you experience slow performance using IE, try switching to an alternative browser.

SQL Monitor Base Monitor service

Supported operating systems for the Base Monitor computer:

- Windows XP (32 bit) SP3 or later
- Windows XP (64 bit) SP2 or later
- Windows Server 2003 SP2 or later
- Windows Server 2008 or later
- Windows Vista
- Windows 7

Note: 32-bit SQL Server instances running on 64-bit Windows machines are not supported by SQL Monitor, and some performance counter objects are not available. For more information, see this MSDN article on 64-bit Support (http://msdn.microsoft.com/en-us/library/aa371636%28VS.85%29.aspx).

SQL Monitor Data Repository

The SQL Monitor Data Repository requires an MS SQL Server 2005 or 2008 database to store the data it collects from your monitored servers.

Support for clusters

SQL Monitor supports Microsoft cluster servers. Other proprietary clustering server systems may not behave as expected and are not supported.

Hardware requirements and performance guidelines

The information in this section is based on in-house testing at Red Gate, and is intended to be indicative only. In your environment, the performance may vary.

Specifications for Base Monitor machine

The Base Monitor machine runs the service that monitors the machines and instances you monitor in SQL Monitor.

- **Processor**: 3 GHz dual core should be sufficient to monitor 10 servers (a server is defined as a host machine plus single SQL Server instance)
- **Physical memory**: 2 GB RAM should be sufficient to run SQL Monitor as well as Windows OS and other small applications. The SQL Monitor process itself should use approximately 300 to 400 MB, depending on the number of servers being monitored.

Monitoring more servers will require a more powerful machine; in our testing, a 64-bit dual quad-core processor machine with 8 GB of RAM could monitor 30+ machines quite comfortably.

Growth in size of Data Repository database

The Data Repository is the SQL Server database that stores all data collected by SQL Monitor for all monitored machines and instances.

- Expect the database to use 100 MB per server (host machine plus single SQL Server instance) per day.
- 10 servers over 7 days will therefore increase the size of your database by 7 GB.

Note: If your monitored servers host a large number of objects and databases, the Data Repository will use significantly more storage space, potentially up to a maximum of 450 MB per day.

Before installation, we recommend creating the Data Repository database manually using a SQL Server management tool with settings appropriate to your environment. This allows you to estimate the eventual size of your Data Repository based on the guidelines above, and set fixed autogrowth and transaction log size relative to your database size. It should help prevent autogrowths, which can negatively affect performance and contribute to physical file fragmentation. For more information, see:

Considerations for the autogrow and autoshrink settings in SQL Server (http://support.microsoft.com/kb/315512)

Recover from a full transaction log in a SQL Server database (http://support.microsoft.com/kb/873235)

You can allow SQL Monitor to create the Data Repository for you using the model database on your SQL Server system as a template. If the model database defaults are insufficient for the estimated eventual size of your database, consider creating the database manually instead. For more information about the model database defaults, see model Database (http://msdn.microsoft.com/en-us/library/ms186388.aspx).

The database is created by SQL Monitor using the SIMPLE recovery model. If you change to FULL recovery model, the database growth will be much greater.

Network bandwidth impact on monitored servers

Total network traffic (inbound plus outbound) : 10 KB/sec per server.

A server is defined as a host machine plus a single SQL Server instance. For multiple instances, the impact will be slightly greater per additional instance. For servers with a large number of objects (for example, 200 databases and 20,000 tables), the total network traffic may be up to 20 KB/sec.

Running SQL Monitor on a virtual machine

You can run SQL Monitor without problems on a virtual machine, but you should ensure that your VM host can deliver the required resources (CPU and RAM) described above. If your physical machine hosts multiple VMs, for example, then this will limit the resources available to SQL Monitor, which may cause slow performance.

If you locate the Data Repository database on a SQL Server instance running on a VM, then we recommend that you use a physical disk or partition rather than a virtual disk for the database data files. For more information about using mapped hardware in Hyper-V, see http://msdn.microsoft.com/en-us/library/cc768529(v=bts.10).aspx (http://msdn.microsoft.com/en-us/library/cc768529(v=bts.10).aspx).

Installation guide

SQL Monitor is a web application that runs in your browser. It does not require anything to be installed on the SQL Servers you want to monitor.

Installation overview

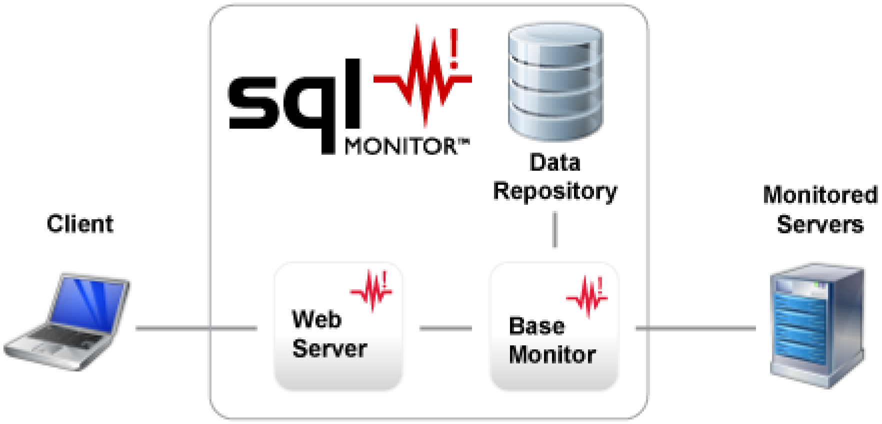
SQL Monitor comprises three main components that need to be installed:

- **Web Server**

  The Web Server delivers all the pages for the SQL Monitor web interface
- **Base Monitor service**

  The Base Monitor is a Windows service that continuously monitors your SQL Servers
- **Data Repository database**

  The Data Repository is an MS SQL Server database that stores all the data collected by the Base Monitor service



Click ? in the installation wizard to read more about a SQL Monitor component or installation option.

For information about installing on an IIS server, see Using SQL Monitor with IIS.

If you have encountered error messages when installing SQL Monitor, see Account credentials required when installing SQL Monitor.

Where to install components

The Web Server and Base Monitor service can be installed on the same computer, or on different computers on your network.

The SQL Server database for the Data Repository can be hosted on any SQL Server instance, but the Base Monitor computer will need access to this database.

Note: Installing the Web Server and Base Monitor service on the same computer that's hosting the SQL Server instances you want to monitor is not recommended.

The **Base Monitor service** computer needs to be able to connect to the following:

- the SQL Servers you want to monitor, for collecting data about their performance
- the Data Repository database, for storing the collected data

The **Web Server** should be accessible by any PC or device on which you want to view the SQL Monitor client, and must be able to connect to the Base Monitor.

The **Data Repository** requires a SQL Server 2005 or 2008 database.

The Base Monitor and Web Server computers should always be switched on.

Installing the SQL Monitor Web Server

1. Run the SQL Monitor installer on the computer that you want to host the Web Server.

   If you choose to install only the Web Server, the installation wizard will finish once the Web Server is installed; otherwise the wizard will continue with options for installing the Base Monitor and Data Repository.
2. Choose whether to install the SQL Monitor Web Server or use an existing IIS Web server.

   If your computer is **already in use** as an IIS Web Server, you can choose to configure IIS to add SQL Monitor. See Using SQL Monitor with IIS.

   If this is not the case, you will need to install the SQL Monitor Web Server. The SQL Monitor Web Server is a self-contained XSP Web Server that runs using the .NET 3.5 runtime.
3. Select a TCP port for incoming connections to the Web Server.

   Use the default port of 8080 unless it is already in use.
4. If you are installing just the Web Server, click **Finish** to close the installation wizard and automatically open SQL Monitor in your browser. You can then download the Base Monitor installer to another computer and install the Base Monitor and Data Repository.

   Note: SQL Monitor relies on the JavaScript engine of your web browser to interpret and execute JavaScript correctly. The engines used by certain browsers may not perform as well as others, and in turn this may affect the performance of SQL Monitor. Should you experience performance issues, try switching to one of the other supported browsers listed in Supported platforms and hardware requirements.

   We recommend that you copy the SQL Monitor URL link displayed on the final page of the wizard.

   If you are installing both components, the wizard will continue automatically with options for installing the Base Monitor service and Data Repository database.

Installing the SQL Monitor Base Monitor service

1. Specify where to install the files that will run the service, and provide a writable folder for the configuration file.

The configuration file stores the location of the Data Repository and the connection string for accessing the database. The configuration file requires a writeable location so that it can be updated by SQL Monitor if you move the Data Repository database to a different SQL Server instance.

2. Select a TCP port to use for communicating with the Web Server and the Data Repository.

   Use the default port of 7399 unless it is already in use.

You now need to create a SQL Server database to use for the Data Repository, and ensure the Base Monitor service can connect to it.

Setting up the Data Repository

The SQL Monitor Data Repository requires an MS SQL Server 2005 or 2008 database to store all the data it collects from your monitored servers.

We recommend that you estimate the eventual size of your database using the guidelines described in Supported platforms and hardware requirements, and use a SQL Server management tool to create a database with settings appropriate to your environment. You can then follow the instructions below on using an existing database.

Note: If you are installing the Data Repository on a virtual machine, make sure that the SQL Server database is installed on a physical disk mapped to the virtual machine. Storing the Data Repository database on a virtual disk will affect performance and is not recommended.

Using an existing database for the Data Repository

If you have followed our recommendations and created a new database, it should be completely empty, i.e., it should not contain any tables.

You can also select a database created during installation of a previous version of SQL Monitor v2.

To specify your Data Repository database:

1. Click **Set Up Data Repository** and then select **Use an existing SQL Server database**.
2. Click **Next**, then select the SQL Server instance.
3. In the **Database** box, select the database you want to use; databases on the SQL Server should be automatically detected, and appear in the list.

   You can type an instance name or IP address directly into the Server box if the instance name does not appear in the drop-down list.
4. Click **Next**. SQL Monitor checks the database. Once the database connection has been confirmed, click **Close**.

Note: To make sure CPU isn't wasted on monitoring files that don't need monitoring, we recommend that you configure your antivirus settings to ignore SQL Monitor database `.mdf` and `.ldf` files.

To create a new database for the Data Repository

1. Click **Set up Data Repository** and then select **Create a new SQL Server database**.
2. Click **Next**, then enter the SQL Server instance name.

   You can type an instance name or IP address directly into the **SQL Server** box if the instance name does not appear in the drop-down list.
3. By default, SQL Monitor will create a database called `RedGateMonitor`. To use a different name, in the **Database** box, type the name you want.
4. Under **Create database using**, one of the following:
   - **Use current credentials** to use the account that you are currently logged into.
   - **Specify an account**. If you select Windows authentication, SQL Monitor assumes this account is in the current domain. To use a different domain account, enter credentials in the format **username@domain-name** or **domain-name\username**. Enter the password.

   The specified account must have Create Database permissions.
5. Click **Create Now** to create the database. Once database creation has been confirmed, click **Close**. If you go back a page in the wizard, this will not undo the creation of the database.

Note: If you have antivirus software installed on your server, we recommend that you configure it to stop monitoring the folders where your SQL Monitor database `.mdf` and `.ldf` are stored; this can free up valuable CPU.

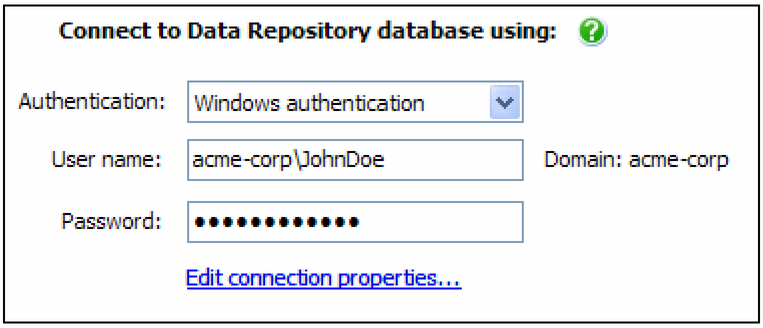
Error when creating the database?

If you encounter an "Invalid sequential schema version" or "Database is not empty...." error when creating the database, see Errors when creating a Data Repository database.

If the error is related to permissions, see also Account credentials required when installing SQL Monitor.

Connecting to the Data Repository database

The Base Monitor service requires credentials to connect to the database you just created in order to store and retrieve collected data. This account must have **administrator privileges** (db_owner database role) on the database.



Connect to Data Repository database using:

Authentication: Windows authentication

User name: acme-corp\JohnDoe

Domain: acme-corp

Password: ●●●●●●●●●●●●

Edit connection properties...

Windows authentication

If you connect to the database using Windows authentication, the Windows account you select will also be used to run the SQL Monitor Base Monitor service. If the account does not have permissions to run a Windows service, then it will be granted these permissions.

The user name defaults to your current domain. You can change the domain in the **User name** box using either of the following formats:

- mydomain\username
- username@mydomain

SQL Server authentication

You can connect to the database using SQL Server authentication. If you provide SQL Server login credentials, the Base Monitor service will run under the Local Service account (http://msdn.microsoft.com/en-us/library/ms684188(VS.85).aspx).

If you encounter an error message when connecting to the database, see Account credentials required when installing SQL Monitor.

Error reporting

SQL Monitor can send data back to Red Gate about the features you use and any application errors you encounter. This helps us to improve SQL Monitor for future releases.

Data is anonymized before we receive it, and no confidential information is sent to us.

If you are happy to allow this data to be sent, select **Send error reports**, and optionally enter your email address. We will only contact you in the event of an error for which we require further information, to help us eliminate bugs.

Summary

1. Review all your installation options on the Summary page. If you want to change anything, use the **Back** button to edit the required page.

   Note: Once your database for the Data Repository has been created, it will not be deleted if you go back and set up a different Data Repository.
2. Click **Install** to start installing SQL Monitor using the selected settings.
3. When installation has completed, click **Finish** to launch SQL Monitor.

What next?

To start using SQL Monitor, you first need to create a password to use when logging in to the SQL Monitor pages.

See Using SQL Monitor for the first time.

Using SQL Monitor with IIS

SQL Monitor does not install IIS. If you do not have an existing IIS Web Server, you will need to install the SQL Monitor Web Server. See the Installation guide.

ASP.NET

SQL Monitor is an ASP.NET application. Some default installation of IIS do not enable ASP.NET; check that your IIS server has ASP.NET enabled before installing SQL Monitor.

For more information about ASP.NET troubleshooting, see Issues with IIS and ASP.NET.

For IIS 7

Note: Before you install, make sure your account permissions have **Full Control** over the folders described in the topic Account permissions required by SQL Monitor (in the section "SQL Monitor Web Service account").

1. Run the SQL Monitor installer on your IIS server, and select **Use existing IIS Web Server**.
2. Select a destination folder for the SQL Monitor website.

   All the files for the SQL Monitor website will be extracted to this folder.
3. After completing installation, use IIS Manager to add the SQL Monitor website:
   a. Select **Add web site** and choose a name for the website.
   b. Enter the physical path for the website folder - this is the location of the website folder specified during installation of SQL Monitor.
   c. Specify an available port number and apply any other options, such as binding or certification that you need.
   d. Click **Browse** to test that the website is working; you should see the SQL Monitor front page.

A new application pool is automatically created for the SQL Monitor website. If you want to add SQL Monitor to an existing application pool, edit the **Advanced properties** for the site to change its application pool.

Read more about setting up your IIS website (Microsoft KB article) (http://support.microsoft.com/kb/323972)

For IIS 6

Note: Before you install, make sure your account permissions have **Full Control** over the folders described in the topic Account permissions required by SQL Monitor (in the section "SQL Monitor Web Service account").

1. Run the SQL Monitor installer on your IIS server, and select **Use existing Web Server**.

2. Select a destination folder for the SQL Monitor website.

   All the files for the SQL Monitor website will be extracted to this folder.
3. After completing installation, use IIS Manager to add the SQL Monitor website:
   a. Right-click **Web Sites** and click **New > Web site**.
   b. In the Web Site Creation Wizard, type the name of the website (for example "SQL Monitor") in the **Description** box.
   c. Enter the IP address of your IIS server and specify an available port (80 is the default port).
   d. Leave the Host header box empty, unless you have a specific requirement for a host header.
   e. In the Web Site Home Directory page, copy the path you specified in the SQL Monitor installer into the **Path** box (by default, this is: C:\Program Files\SQL Monitor 2\Website)
   f. Ensure that **Allow anonymous access to this Web site** is checked. SQL Monitor requires anonymous access to the website. For more information about website authentication, please read the following Windows KB article for more information: http://support.microsoft.com/kb/324274 (http://support.microsoft.com/kb/324274) (How to configure IIS Web site authentication in Windows Server 2003).
   g. Leave the default permissions on the Web Site Access Permissions page.
4. SQL Monitor is an ASP.NET MVC application that uses URLs without extensions, so you will need to use wildcard mapping:
   a. Right-click the Monitor website you just created and click **Properties**.
   b. In the Properties dialog, go to the Home Directory page and click **Configuration**. (If you have set SQL Monitor to be a virtual directory beneath an existing website, then go to the Virtual Directory page).
   c. Under Wildcard application maps, click **Insert**.
   d. In the Add/Edit Application Extension Mapping dialog, type the path to the aspnet.isapi.dll file in the **Executable** box. This should be mapped to `C:\windows\microsoft.net\framework\v2.0.50727\aspnet_isapi.dll` or, for 64 bit Windows, to `C:\windows\Microsoft.NET\Framework64\v2.0.50727\aspnet_isapi.dll`.
   e. Ensure that Verify that file exists is **not** checked.
   f. Reload the SQL Monitor page to check that it displays correctly.

Moving from SQL Monitor Web Server to IIS

If you already have SQL Monitor installed and are using the default XSP web server, you can later move hosting to IIS by doing the following:

1. Ensure that there is an IIS Web Server installed on the machine, and that ASP.NET is enabled.
2. Run the SQL Monitor installer and select **Use existing Web Server**.

3. On the Set up Web Server page, browse to and select the existing XSP web server file path as the install location for the IIS web server files. By default, these are located in:

   ```
   C:\Program Files\Red Gate\SQL Monitor 2\Web
   ```

4. Complete the installation by following the remaining instructions for IIS 7 or IIS 6 above.
5. Stop the XSP server. To do this, go to Services (in XP, **Start > All Programs > Administrative Tools > Services**) and stop **SQL Monitor Web Service**.

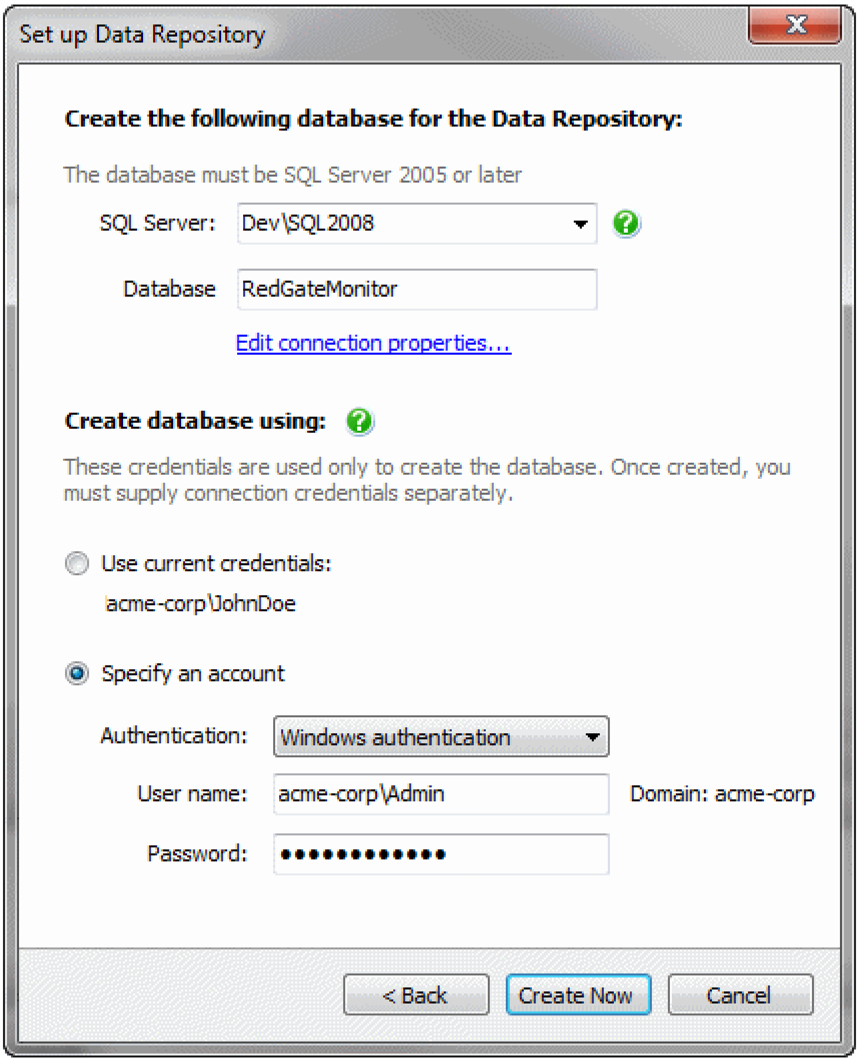
Account credentials required when installing SQL Monitor

When installing and setting up SQL Monitor you need to provide credentials for the following:

- creating a SQL Server database to use as the SQL Monitor Data Repository
- connecting the Base Monitor service to the Data Repository (if you use a Windows account, this account will also run the Base Monitor service)
- connecting to the machine (the physical or virtual server) hosting the SQL Server you want to monitor
- connecting to each SQL Server instance you want to monitor

Creating the Data Repository database account

To create the Data Repository, you need an account with **Create Database** permissions on the specified SQL Server. This account is used ONLY to create the database that SQL Monitor uses as its Data Repository. Once the Data Repository has been created, the credentials you enter here are not used by SQL Monitor.



Set up Data Repository

Create the following database for the Data Repository:

The database must be SQL Server 2005 or later

SQL Server: Dev\SQL2008

Database: RedGateMonitor

Edit connection properties...

Create database using:

These credentials are used only to create the database. Once created, you must supply connection credentials separately.

○ Use current credentials:

acme-corp\JohnDoe

● Specify an account

Authentication: Windows authentication

User name: acme-corp\Admin

Domain: acme-corp

Password: ●●●●●●●●●●●●●

- If you specify a different Windows account, and this account fails, SQL Monitor will then automatically attempt to create the database using your current credentials.
- The database is created as soon as you click **Create Now**. If you cancel the installation, the database will **not** be automatically deleted.

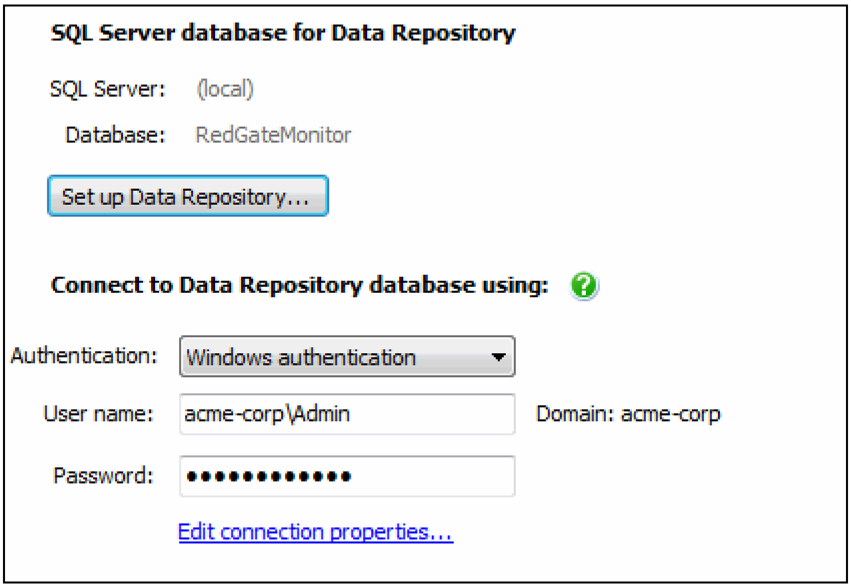
If you don't have a login for the SQL Server with the correct permissions, use the `sp_addsrvrolemember` stored procedure to assign a login to the **dbcreator** role. More information about sp_addsrvrolmember (http://msdn.microsoft.com/en-us/library/ms186320.aspx).

If an error message is displayed, see Error messages: creating a Data Repository database.

Connect to Data Repository account

Once you have created the Data Repository database, you need to supply an account that can be used by the SQL Monitor Base Monitor service to access the database. This account must have permissions to access the database you created on the SQL Server.

The database name and SQL Server instance for the Data Repository are indicated in the upper part of the dialog. To change the database used for the Data Repository, click **Set up Data Repository**.



SQL Server database for Data Repository

SQL Server: (local)

Database: RedGateMonitor

Connect to Data Repository database using:

Authentication: Windows authentication

User name: acme-corp\Admin

Domain: acme-corp

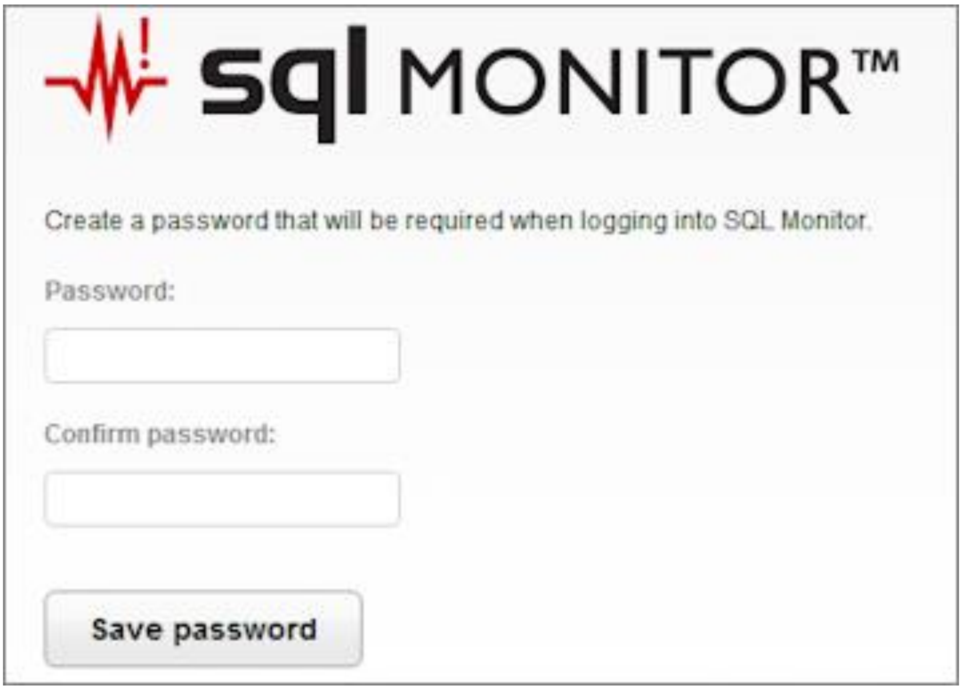
Password: ●●●●●●●●●●●●

- If you choose Windows authentication, the account you enter will also be used to run the Base Monitor service.
- The domain defaults to the domain of your current log-in; if you don't type the domain, the current domain will be assumed.
- If this account does not have **Log on as Service** permissions, SQL Monitor will automatically attempt to grant them to the account.
- If you select SQL Server authentication, the Base Monitor service will run as Local Service.

For more information, see Account permissions required by SQL Monitor.

When you have installed SQL Monitor for the first time

1. Create a password to log in to SQL Monitor.



Create a password that will be required when logging into SQL Monitor.

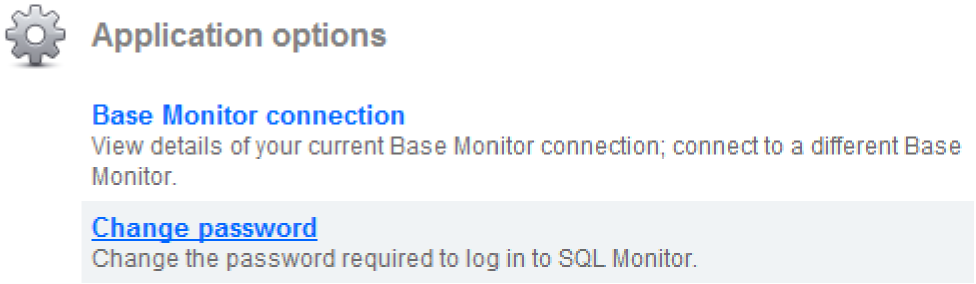
Password:

Confirm password:

This password will be required for anyone logging in to the SQL Monitor website.

Note: If the Create password screen is not displayed when you enter the URL for SQL Monitor, check that the details for the Base Monitor machine and port number are correct and that the Base Monitor service is running.

You can subsequently change this password by clicking the Configuration tab and selecting **Change password**:



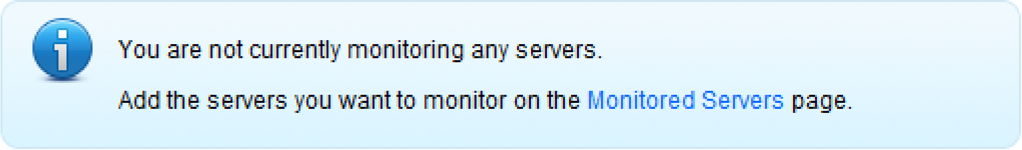
Application options

Base Monitor connection
View details of your current Base Monitor connection; connect to a different Base Monitor.

Change password
Change the password required to log in to SQL Monitor.

2. Select the servers you want to monitor.

Click the **Monitored Servers** link in the message box, or select **Manage monitored servers** from the left side.



You are not currently monitoring any servers.

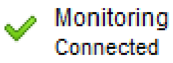
Add the servers you want to monitor on the Monitored Servers page.

You need to supply credentials for SQL Monitor to connect to both the host machine and SQL Server instance. Click any ? icon for more information about the format for entering a server name and the credentials required.

See Adding servers to monitor.

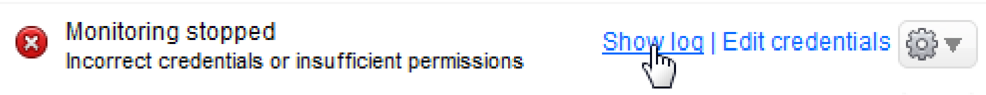
3. Check that SQL Monitor can connect to the servers using the supplied credentials.

   The status of each server you add is shown in the **Status** column. When SQL Monitor is successfully monitoring the following is displayed:



✓ Monitoring
Connected

   If there is a problem collecting data from a server, click **Show log**:



Monitoring stopped
Incorrect credentials or insufficient permissions

   Review the error message, and if required, edit the credentials, or take other remedial action. See Account permissions required by SQL Monitor.

4. Go to the Global Overview page to see the current health of your monitored servers and databases.

   Click the **Overviews** tab. All your monitored servers should be displayed, showing performance data and any raised alerts. You can start to drill down by selecting particular instances or databases from the Monitored servers list on the left side. See Using the overviews.

After you have been using SQL Monitor for a short while

1. If required, organize your monitored servers into groups. This will help you manage your development or production servers more easily in SQL Monitor.

   See Organizing monitored servers into groups.

2. Review any raised alerts.

   You may see some alerts already raised for your servers. SQL Monitor is pre-configured with default settings for all alert types.

   To review any raised alerts, go to the **Alerts** tab and click on an alert in the inbox to view its details. You can then start to clear alerts that you have dealt with, or configure their settings. See Working with alerts.

3. Review the default settings for all alerts.

   Click the **Configure alerts** link under Monitored servers on an overview or alert page to view all the alerts that SQL Monitor can raise, and review their default settings. You can configure an alert's settings globally (at the All Servers level) or for any group, server, database or job. See Customizing alerts.

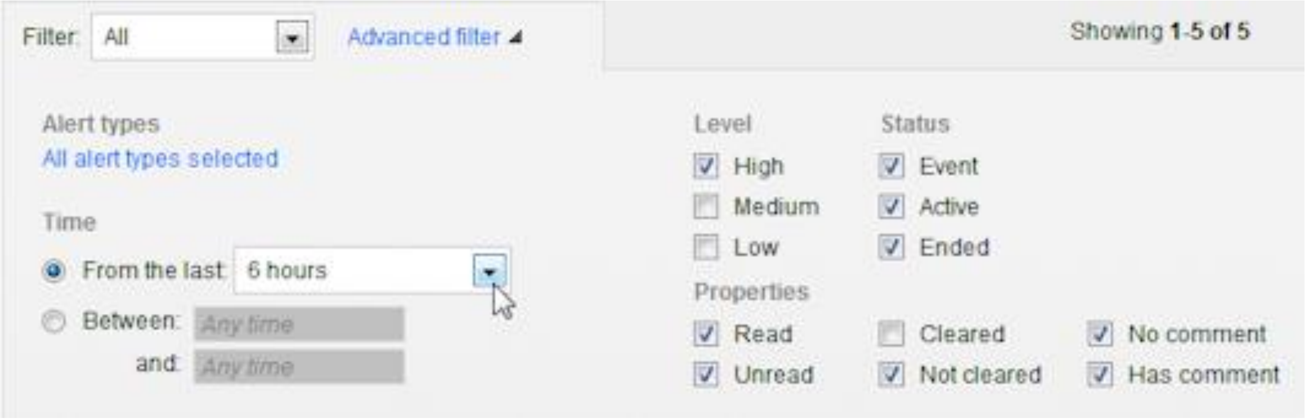
4. Set up email notification for your alerts.

   Go to the **Email settings** page (Configuration > Email settings), and enter your SMTP mail server settings and a global email address. SQL Monitor will send emails to this email address when alerts are raised. You can later configure each type of alert to send emails to different recipients. See Setting up email notification.

When you have been running SQL Monitor overnight

1. Set up a filter to see only important alerts raised since you were last at your computer.

   In the **Alert Inbox** click to expand the **Advanced filter** panel, and select a time from the **From the last** box, or enter a custom time range. You can also filter to show only alerts raised at a certain level. Click **Save as custom filter** to re-apply the filter options quickly every morning:



Filter: All

Showing 1-5 of 5

Alert types: All alert types selected

Time

● From the last 6 hours

○ Between: Any time

and: Any time

Level: ☑ High □ Medium □ Low

Status: ☑ Event ☑ Active ☑ Ended

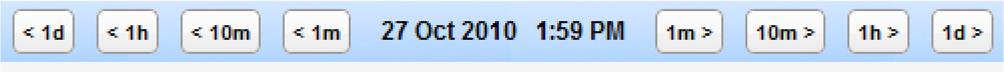
Properties: ☑ Read ☑ Unread □ Cleared ☑ Not cleared ☑ No comment ☑ Has comment

   You can save any number of useful filters to help you prioritize reading alerts in the Alert Inbox.

2. Rewind time to look at the performance of your servers at a point during the night.

   Go to the **Global Overview** page, drill down to a SQL Server instance or database, then click the **Rewind time** button in the top right corner:

Select a time and click **Apply**. All the sparkline graphs are updated to show their value at the time you select. Use the Back in Time bar to step forward or backward to see how these values change over time:



See Rewinding time (Back in Time mode).

3. Go to the **Analysis** tab to view graphs of various performance counter values for the last few hours for your key servers.

   See Working with analysis data.

When you have been running SQL Monitor for several days

1. Review the data purging options.

   As SQL Monitor collects monitoring data from your servers, the size of the SQL Monitor Data Repository will increase. You can adjust how much historical data SQL Monitor stores in this database, to manage its size and ensure that you don't run out of disk space.

   See Purging SQL Monitor data.

2. Continue to tweak the configuration of alerts as they are raised.

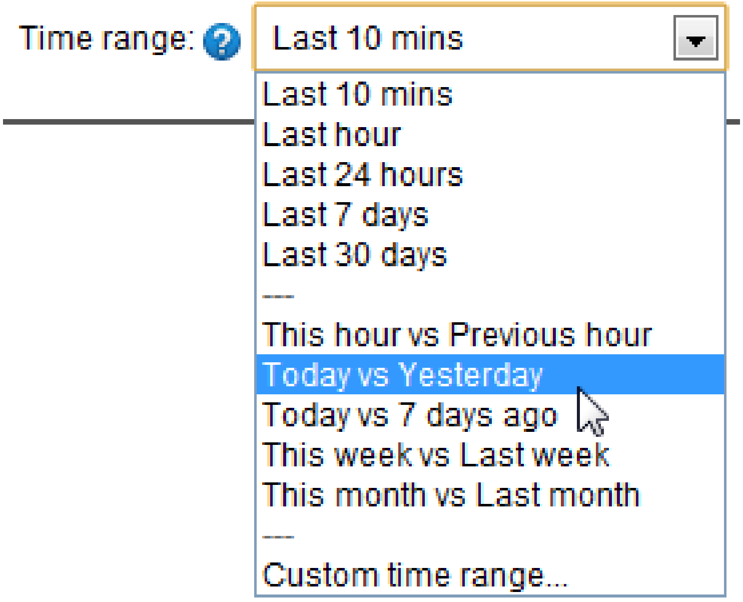
   Over time you can improve the relevance of the information SQL Monitor provides by customizing more alerts, at a more granular level. When an alert is raised, open it and click the **Customize alert** link to edit the settings for only the relevant object, e.g. a specific server, database or job.

3. Set up different email recipients for different types of alerts or servers.

   As part of each alert's configuration, you can enter a different email address, so that other colleagues in your organization are notified when a particular type of problem occurs, or a specific database is affected. See Configuring email notification settings.

4. Compare the performance of various aspects of your server or database performance on different days.

Go to the **Analysis** tab and select the performance counter and server or database you are interested in. You can now select a comparison timeframe from the **Time range** drop-down box:

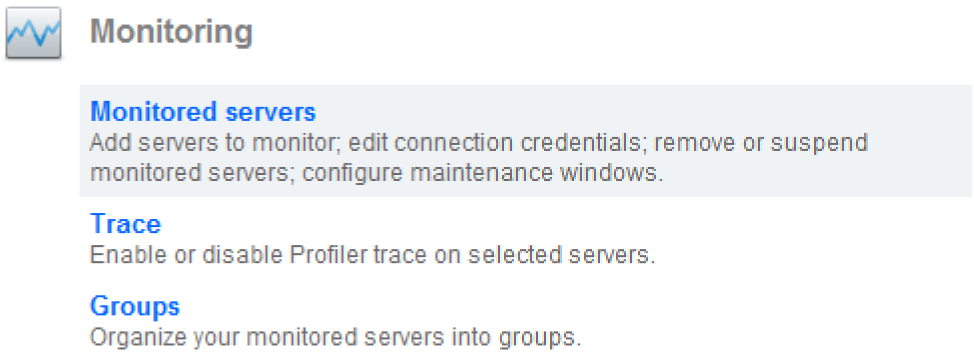


5. When your evaluation period expires, go to the **Licensing** page (Configuration > Licensing) to enter your serial numbers and choose which servers you want to license.
6. Go to the **Monitored servers** page to remove any servers you are no longer monitoring.

Adding servers to monitor

Once you have installed SQL Monitor and created the login password, choose the SQL Servers you want to monitor.

1. Go to the **Configuration** tab and under **Monitoring**, select **Monitored servers**.



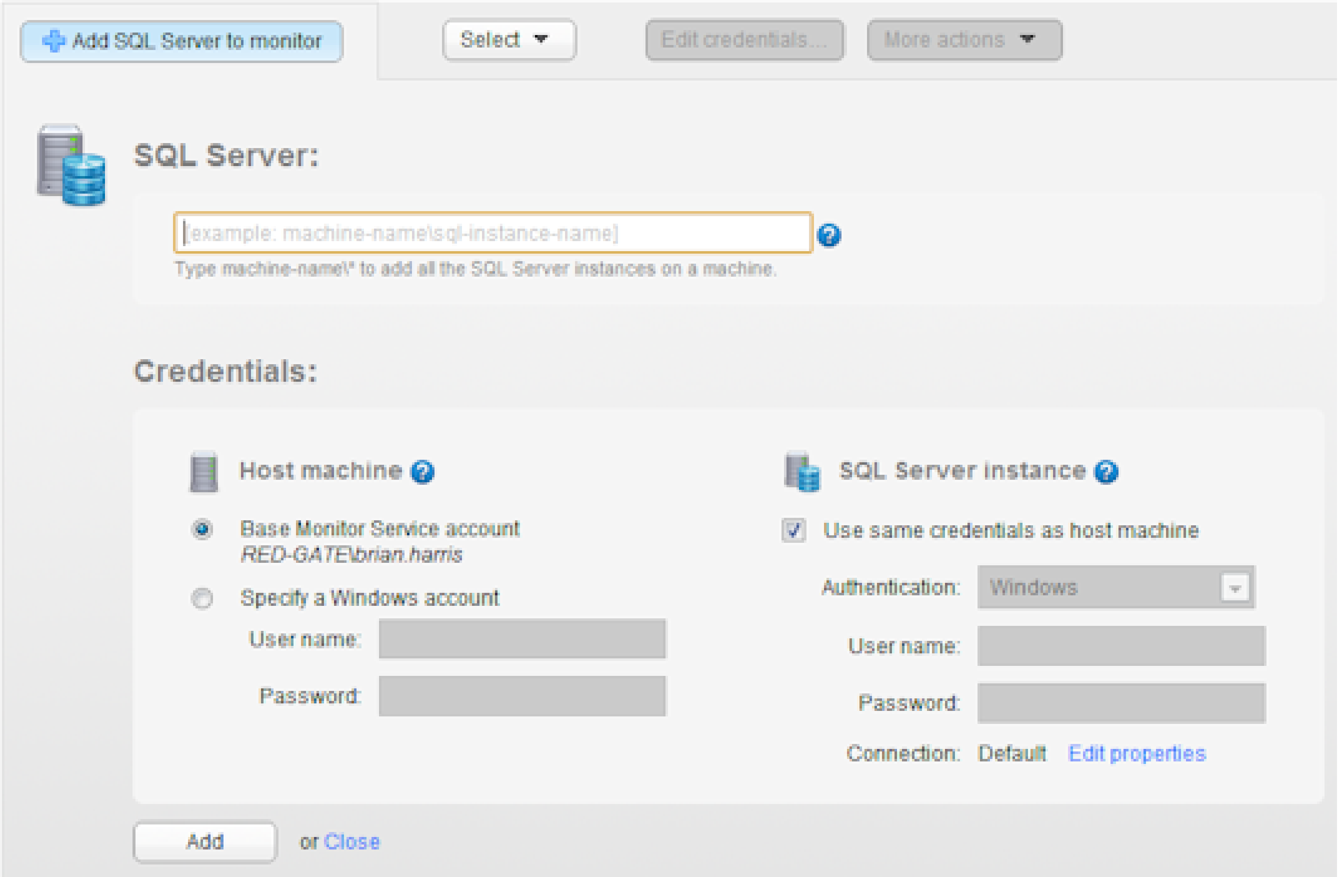
Monitoring

Monitored servers
Add servers to monitor; edit connection credentials; remove or suspend monitored servers; configure maintenance windows.

Trace
Enable or disable Profiler trace on selected servers.

Groups
Organize your monitored servers into groups.

2. Click the **Add SQL Server to monitor** button. The Add SQL Server panel is expanded:



SQL Server:

[example: machine-name\sql-instance-name]

Type machine-name* to add all the SQL Server instances on a machine.

Credentials:

Host machine

● Base Monitor Service account
RED-GATE\brian.harris

○ Specify a Windows account

User name:

Password:

SQL Server instance

☑ Use same credentials as host machine

Authentication: Windows

User name:

Password:

Connection: Default Edit properties

3. Enter the fully qualified name of the instance you want to monitor in the **SQL Server** box, including any subdomains. You can type the first few characters of a server name to display matching suggestions.

   To add a cluster, enter the name of any node in the cluster. Click ? for more information about accepted formats.

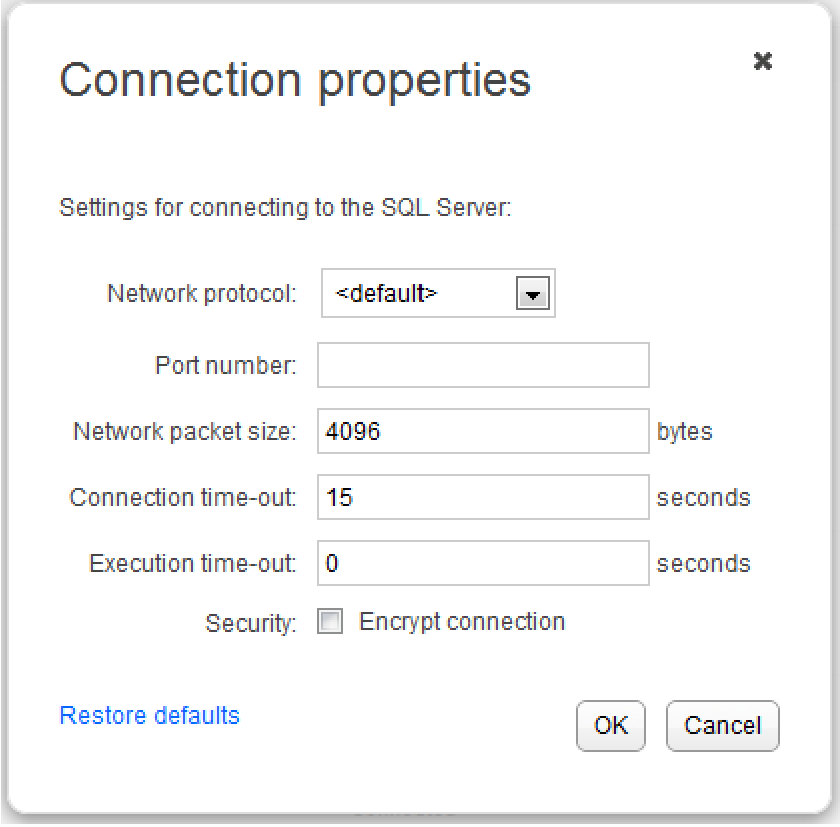
4. You will need to provide two sets of credentials:

   - to connect to the host Windows machine on which the instance is running
   - to connect to the SQL Server instance

   By default SQL Monitor uses the Base Monitor Service account for both sets of credentials. This is the Windows account you specified during installation to connect to the Data Repository (the SQL Server database that stores all collected data). You can specify a different account to use to connect to the host Windows machine and to the SQL Server instance.

   For more information, see "Monitoring SQL Servers" in Account permissions required by SQL Monitor.

5. To set more advanced properties, for example, to connect to a SQL on a different port, click **Edit properties** to display the Connection properties box:



Connection properties

Settings for connecting to the SQL Server:

Network protocol: <default>

Port number:

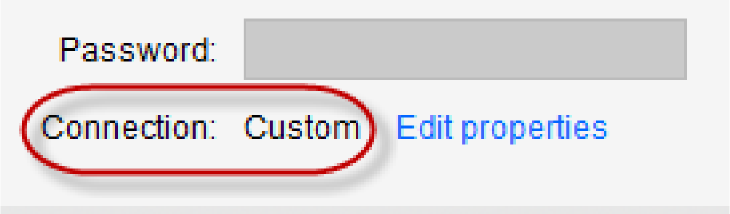
Network packet size: 4096 bytes

Connection time-out: 15 seconds

Execution time-out: 0 seconds

Security: □ Encrypt connection

Enter the properties you want to change for this instance, then click **OK**. If you change the connection properties, they are identified as **Custom**:

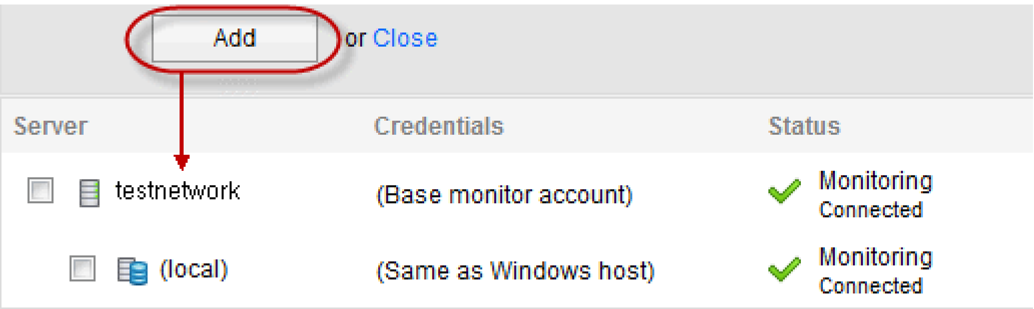


Password:

Connection: Custom

Note that the connection properties are persisted until you move to a different page in SQL Monitor. If you add more servers, they will use the custom connection properties.

6. When you click **Add**, the host machine and instance(s) are both added to the list of monitored servers below the **Add SQL Server to monitor** panel. Once added, server names cannot be edited. If you have typed the name incorrectly, the server will be added with a status of "Connection failed (Unreachable)". You will need to remove the server, and then add it again.



Server	Credentials	Status
□ testnetwork	(Base monitor account)	✓ Monitoring Connected
□ (local)	(Same as Windows host)	✓ Monitoring Connected

Once connection has been established and a data collection event has been successful, the status is displayed as Monitoring (Connected). If SQL Monitor encounters a problem and a different status is displayed, see Monitoring status explained for more information.

Editing the credentials or properties of monitored servers

See Configuring monitored servers

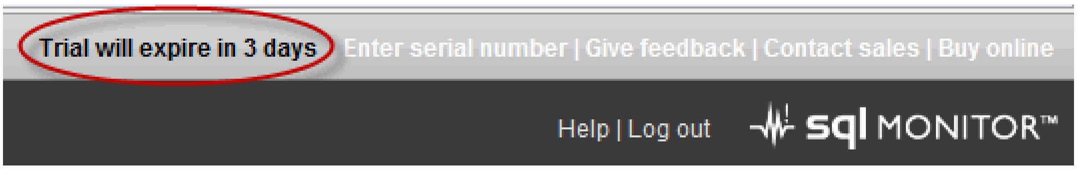
Licensing and activating SQL Monitor

SQL Monitor requires a license for each monitored host machine (including virtual machines), regardless of how many SQL Server instances are running on the machine. If you are managing clusters, a separate license is required for each node in the cluster.

Using the trial version of SQL Monitor

How long before my trial expires?

If you're currently using an evaluation version of SQL Monitor, the number of days remaining before your trial expires is displayed in the top right corner of the page:


Trial will expire in 3 days
Enter serial number | Give feedback | Contact sales | Buy online
Help | Log out
sql MONITOR™

What happens when my trial period expires?

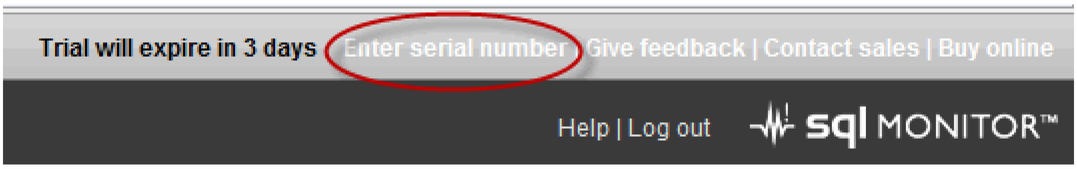
Under special circumstances, Red Gate Sales may be able to extend your trial period. The trial license can only be extended once: if your extended trial has expired, contact Red Gate support (mailto:support@red-gate.com).

Once your trial has expired, SQL Monitor stops collecting data for your monitored servers and all unlicensed machines are removed from the Overview pages. Their status is changed to Unlicensed on the Monitored servers page. Click Contact sales (mailto:dba.info@red-gate.com) to send an email to Red Gate, or Buy online (http://www.red-gate.com/about/contact.htm) to access the website.

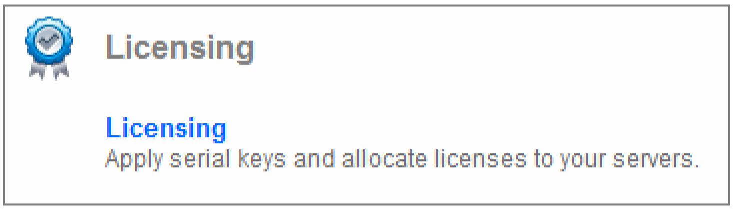
Licensing your servers

Go to the Licensing page by doing one of the following:

- Click on the **Enter serial number** link in the top right corner of the page:


Trial will expire in 3 days
Enter serial number | Give feedback | Contact sales | Buy online
Help | Log out
sql MONITOR™

- Go to the **Configuration** tab and under **Licensing**, select **Licensing**:



Licensing

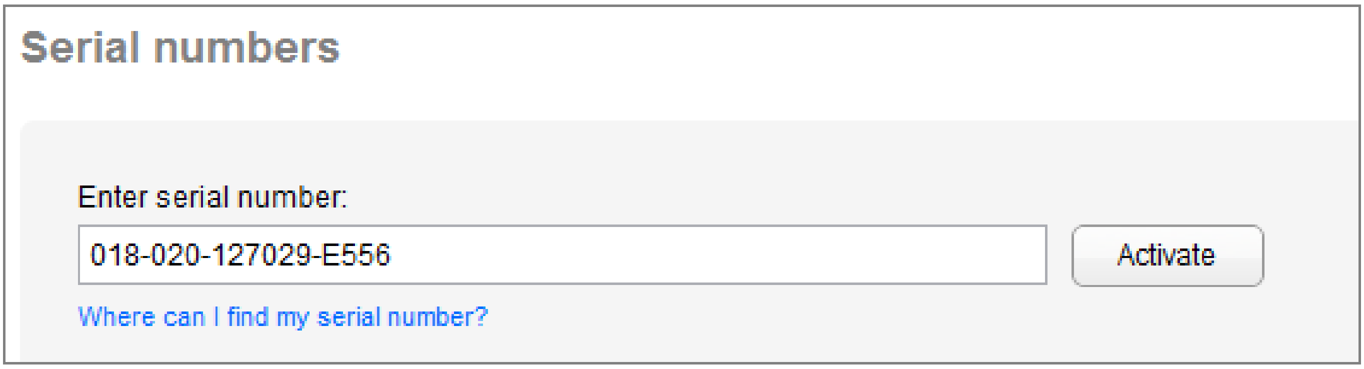
Licensing

Apply serial keys and allocate licenses to your servers.

Entering serial numbers

When you purchase SQL Monitor, the Sales team will send you an email containing the serial number(s) to activate your licenses. To access your serial numbers at any time, login to the Red Gate website (http://www.red-gate.com/dynamic/endusers/enduserlogin.aspx) and follow the instructions.

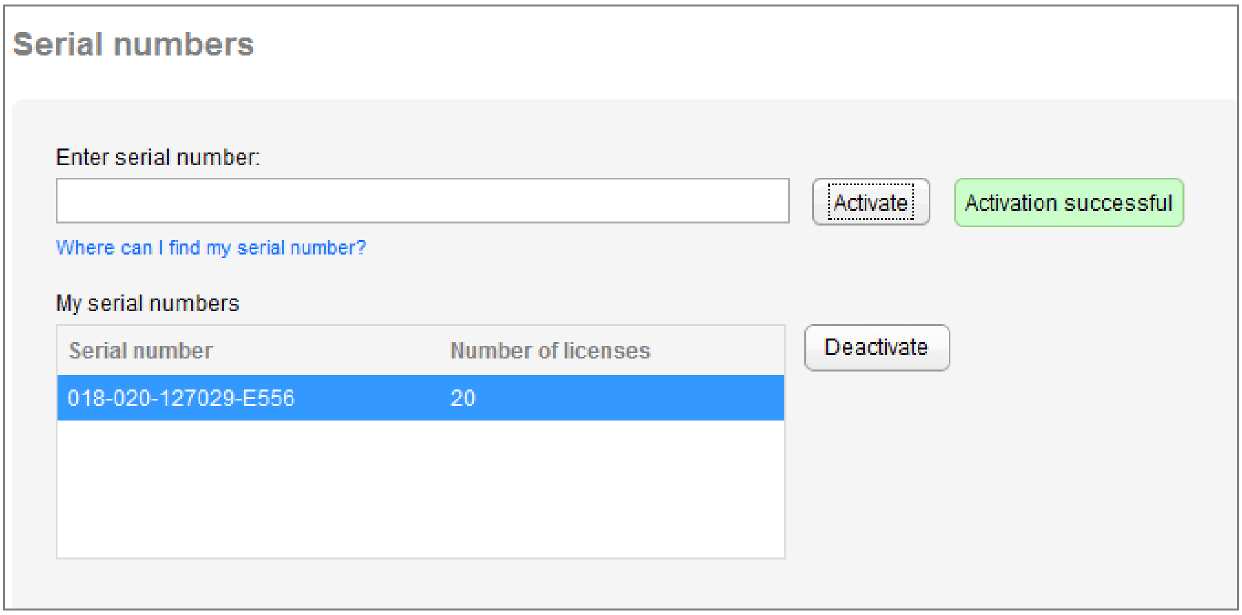
Paste a serial number into the **Enter serial number** text box and click **Activate**.



Serial numbers

Enter serial number: 018-020-127029-E556

When a successful activation has been confirmed, details are displayed in the **My serial numbers** table:



Serial numbers

Enter serial number:

Activation successful

My serial numbers

Serial number	Number of licenses
018-020-127029-E556	20

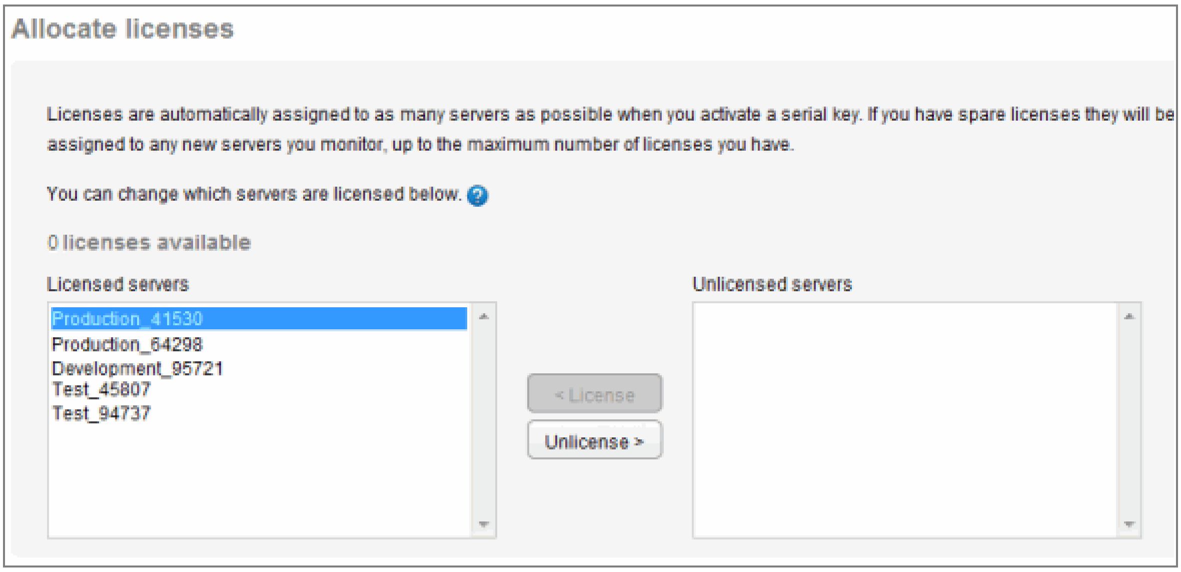
If the serial number cannot be activated, a message is displayed explaining the nature of the problem. You may need to contact Red Gate for further assistance.

Allocating licenses

SQL Monitor detects the number of servers currently being monitored and allocates available licenses to them automatically. These are displayed in the **Licensed servers** list. If during your evaluation you were monitoring more servers than you purchased licenses for, or you subsequently add more servers to monitor than you have licenses available, the servers added most recently will not be allocated licenses. These are displayed in the **Unlicensed servers** list. Unlicensed servers are not removed from the Monitored Servers list, but they will not be monitored and alerts cannot be raised on them.

You can change which servers have licenses allocated to them using the **< License** and **Unlicense >** buttons to move selected servers from one list to the other.

In the example below, five licenses have been purchased and allocated to the five servers currently being monitored. There are no spare licenses available.



Allocate licenses

Licenses are automatically assigned to as many servers as possible when you activate a serial key. If you have spare licenses they will be assigned to any new servers you monitor, up to the maximum number of licenses you have.

You can change which servers are licensed below.

0 licenses available

Licensed servers

Production_41530
Production_64298
Development_95721
Test_45807
Test_94737

Unlicensed servers

Deactivating a serial number

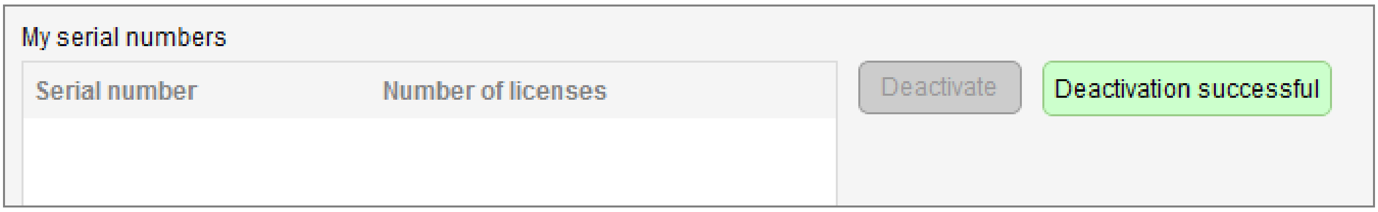
You may need to deactivate a serial number if:

- You are moving the Base Monitor service to a different machine
- You are evaluating a new version of SQL Monitor, and your existing serial number is for fewer servers that you want to monitor in trial mode; deactivating the serial number in this case will return you to trial mode (assuming you are within the evaluation period).
- Red Gate sales or support have sent you a different serial number to use

To deactivate a serial number

Select the serial number in the list and click **Deactivate**.

SQL Monitor contacts the Red Gate licensing server, and the serial number is removed from the list:


My serial numbers

Serial number	Number of licenses

Deactivation successful

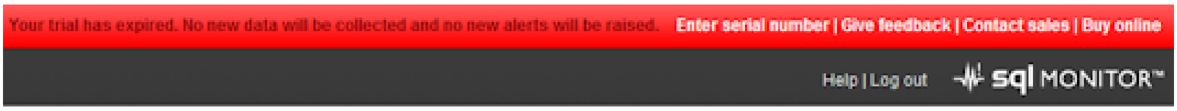
If there is a problem deactivating, a message is displayed explaining the nature of the problem. You may need to contact Red Gate for further assistance.

What happens when I deactivate a serial number?

The relevant number of servers are automatically moved from **Licensed servers** to **Unlicensed servers.** For example, if your serial number was for 10 licenses, then 10 servers will be unlicensed.

If you have licensed your servers using several serial numbers, you may have more licensed servers than are being removed. In this case, SQL Monitor removes the oldest servers first (those that were added to SQL Monitor first).

If all your servers are now unlicensed, SQL Monitor displays a warning banner:


Your trial has expired. No new data will be collected and no new alerts will be raised.

Enter serial number | Give feedback | Contact sales | Buy online
Help | Log out
sql MONITOR™

No further monitoring data will be collected, and no new alerts will be raised, until you enter a serial number.

Setting up email notification

About email notification

You can set up SQL Monitor to send an email whenever an alert is raised.

Notification behavior is entirely configurable. You can set up SQL Monitor:

- to send an email for every type of alert
- not to send emails at all
- to send emails only for those alerts you consider important

Once you have set up your basic email notification settings, you can also tweak email notifications at a more granular level - to use a different recipient for an alert on a particular server, for example, or disable notifications for one or more types of alert.

What is in the email?

Each email message sent by SQL Monitor contains a brief summary of the issue, including:

- the machine and object against which it has been raised
- the alert type and level it was raised at
- the unique ID number that forms part of the URL for this alert
- a hyperlink so that you can open this alert in your browser

Emails sent when a **Job failed** or **Job backup overdue** alert is raised will also contain the job name.

If you send emails to other people, they will be prompted for the SQL Monitor password when they follow the link.

When does SQL Monitor send emails?

Each time an alert is raised, it is considered an occurrence of that type of alert, and triggers an email (if email notification is enabled for that type of alert and for that monitored object). For example, if 200 deadlocks occur on one of your instances, 200 emails will be sent, one for each raised alert.

Some types of alerts are continuous (they are raised as **Active**) and can have a duration. For example, a **Backup overdue** alert is considered Active until the backup is performed. In this case, only a single email will be sent when the problem is first detected. If the problem escalates, you can choose to receive further emails. See the **Also send emails when** section below.

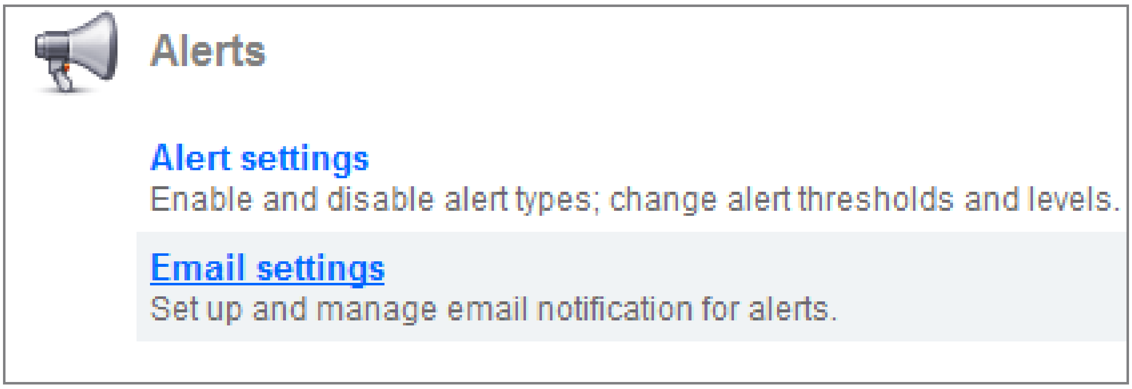
Limiting the number of emails sent by SQL Monitor

SQL Monitor limits the number of emails sent to ensure it does not flood your mail servers. It will not send more than 1000 emails per 24 hour period. If this limit is reached, a warning email is sent with advice on how to reduce the volume of emails. This limit is for all emails sent by SQL Monitor, regardless of recipient.

The warning email also contains instructions for adjusting the daily email limit.

To set up email notification

Go to the **Configuration** tab. Under **Alerts**, select **Email settings**:



Alerts

Alert settings

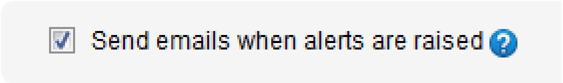
Enable and disable alert types; change alert thresholds and levels.

Email settings

Set up and manage email notification for alerts.

Enabling or disabling all emails

If you want to use email notification in SQL Monitor, select the **Send emails when alerts are raised** check box:

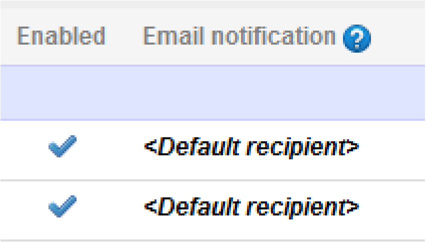


☑ Send emails when alerts are raised

If this check box is cleared, SQL Monitor will not send **any** emails, regardless of all other settings.

Setting up the default email address

Enter an email address that all SQL Monitor emails will be sent to by default in the **Send emails to** box. This is the email address that will be shown on the Alert settings page as the ***<Default recipient>***:



Enabled	Email notification ?
✓	*<Default recipient>*
✓	*<Default recipient>*

To add multiple email addresses, separate each with a comma. You can later customize the email recipient for different alert types or servers. If you subsequently change the email address in the **Send emails to** box, this will be automatically applied to any alerts that use <Default recipient>. Alerts where you have specified a different email recipient will not be affected.

Entering a send from email address

The **Send from email address** is the email address that will appear in the From field for all email messages sent by SQL Monitor when an alert is raised.

Enter the email address in the format: username@domain.com. You can only send a test email when a valid address in the right format has been entered. You can enter the **Send emails to** and **Send from** addresses before supplying your mail server details, but you won't be able to send the test email until your mail server details are provided. See **Enter your mail server settings** below.

Also send emails when

These are global options that apply to alerts that are raised with a status of **Active**.

Some types of alerts have a status of **Event -** their level cannot increase, and their status does not change to ended, so these options do not apply. For more information, see List of alerts.

An alert level increases

Some alerts can be configured with multiple thresholds: Low, Medium and High. These alerts are raised with a status of Active and can escalate automatically to a higher level when another threshold is passed. Select **An alert level increases** to specify that if this happens, a subsequent email should be sent.

No emails will be sent if:

- the level of an Active alert is automatically downgraded (for example, drops from High to Medium)
- an Active alert is downgraded and then subsequently escalates to its previous higher level

An alert's status changes to Ended

Active alerts automatically change to **Ended** when the condition that triggered them no longer applies; for example if memory used falls below the defined threshold for the alert, or if a backup is performed. Select **An alert's status changes to Ended** to specify that an email should be sent to inform the recipient that this particular occurrence of the alert has ended.

About PagerDuty

PagerDuty (http://www.pagerduty.com/r/sql-monitor) is an alarm aggregation and dispatching service. It collects alerts from your monitoring tools in a single repository, and notifies users via SMS, phone calls or emails. It enables to you to add alert severity filters, on-call scheduling, escalation policies and incident tracking to SQL Monitor.

How do I integrate SQL Monitor with PagerDuty?

There are integration guidelines in PagerDuty's Red Gate SQL Monitor Integration Guide (http://www.pagerduty.com/docs/guides/red-gate-sql-monitor-integration-guide). The only configuration change required in SQL Monitor is to add the PagerDuty integration email address to the **Send emails to** section of the Configuration>Email settings page.

Once you have created a SQL Monitor service in PagerDuty, you can edit the service settings. By default, PagerDuty will notify users of alerts with a status of high or medium, and low status alerts will be ignored. You can choose to be notified of all alerts, or high status alerts only.

Enter your mail server settings

If you don't know the DNS name or the IP address and port number of your outgoing SMTP mail server, check with your system administrator and enter them in the relevant text boxes.

Select **Require a secure (SSL or TLS) connection** to enable explicit SSL email. Once the SMTP connection is established, SSL is requested and the message delivered using the supplied credentials.

Also check with your administrator to find out whether your mail server requires a user name and password. If this is the case, select the **Mail server requires a user name and password** check box and enter details.

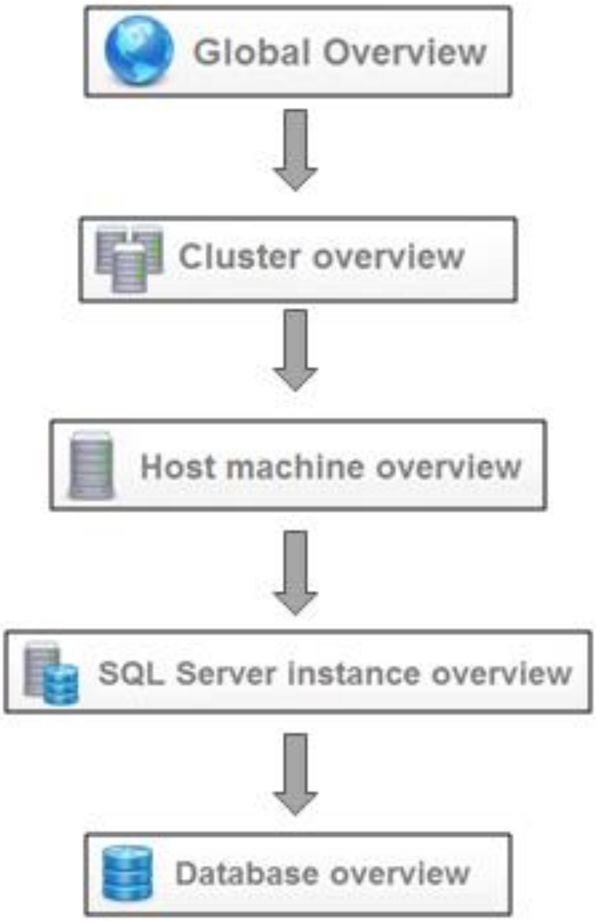
URL settings

When SQL Monitor sends an email notification, it includes a hyperlink to the alert. This hyperlink contains the name of your website. In some situations, this link will not work for other people (for example if the URL is localhost:<portnumber> this will only open SQL Monitor on your local computer).

If this is the case, you can enter the fully qualified URL to be included in the email hyperlink. Enter the URL in the **Fully qualified website URL** box.

Using the overviews

The overviews in SQL Monitor show the current health of your monitored servers, and are arranged into a hierarchy:



The overview pages update automatically every 30 seconds. You do not need to hit Refresh in your browser.

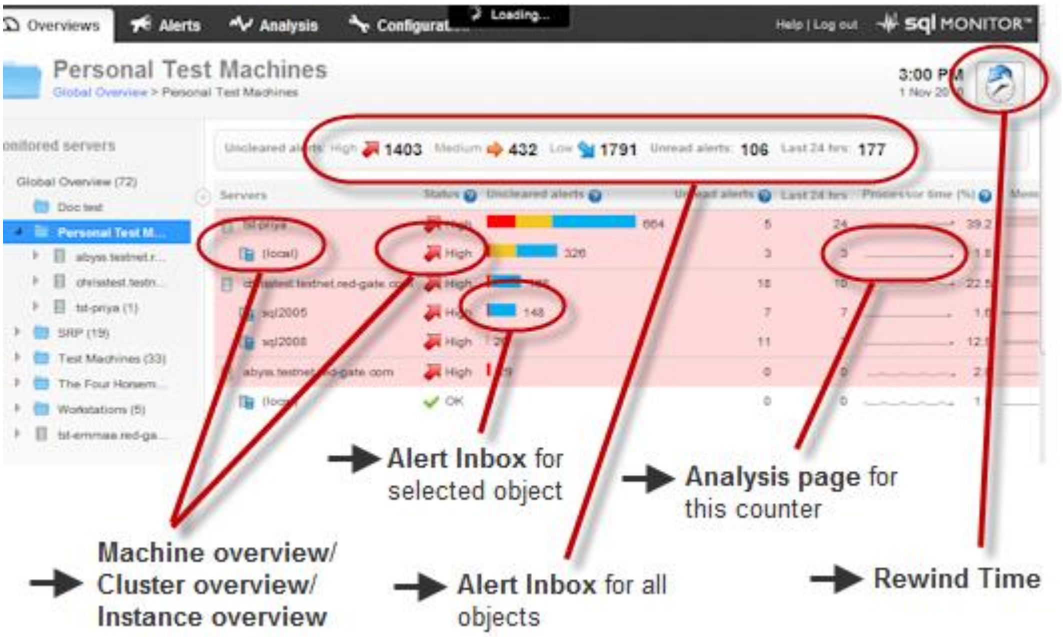
You can drill down through the hierarchy in two ways:

- From the **Monitored servers** list
- By clicking a hyperlink on the current overview page to take you to a lower level (e.g. from a host machine to a SQL Server instance or from an instance to a database)

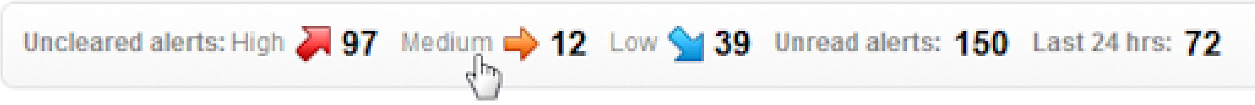
Global Overview

The Global Overview is the default front page for SQL Monitor. It presents a high-level summary of the health of all your servers, showing which servers have uncleared alerts raised against them, and what their current CPU and memory usage is. Servers that require attention are color-coded. From the Global Overview, you can quickly decide which server to investigate in more detail.

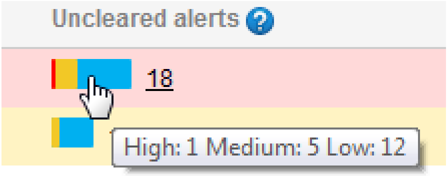
Following links from the Global Overview


Overviews
Alerts
Analysis
Configurat...
Loading...
Help | Log out
sql MONITOR
Personal Test Machines
Global Overview > Personal Test Machines
3:00 PM
Uncleared alerts: High 1403 Medium 432 Low 1791 Unread alerts: 106 Last 24 hrs: 177
Alert Inbox for selected object
Analysis page for this counter
Machine overview/ Cluster overview/ Instance overview
Alert Inbox for all objects
Rewind Time

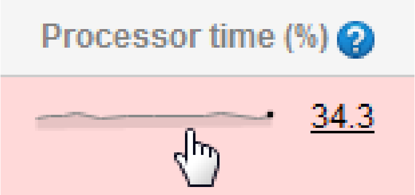
- Click on any object (server or database) in the **Monitored servers** list to view the overview page for that object.
- Click on a group to filter the Global Overview to show only servers in the selected group.
- Click on the name of a host machine or SQL Server instance in the **Servers** column to go to the Overview page for that server. You can also click in the **Status** column.
- Click on a number in the alerts summary panel at the top of the page to go to the Alert Inbox pre-filtered by your selection (e.g. High or Unread) across all servers.


Uncleared alerts: High 97 Medium 12 Low 39 Unread alerts: 150 Last 24 hrs: 72

- Click on the colored bar chart under **Uncleared alerts** to go to the Alert Inbox to view alerts for that host machine or SQL Server instance:

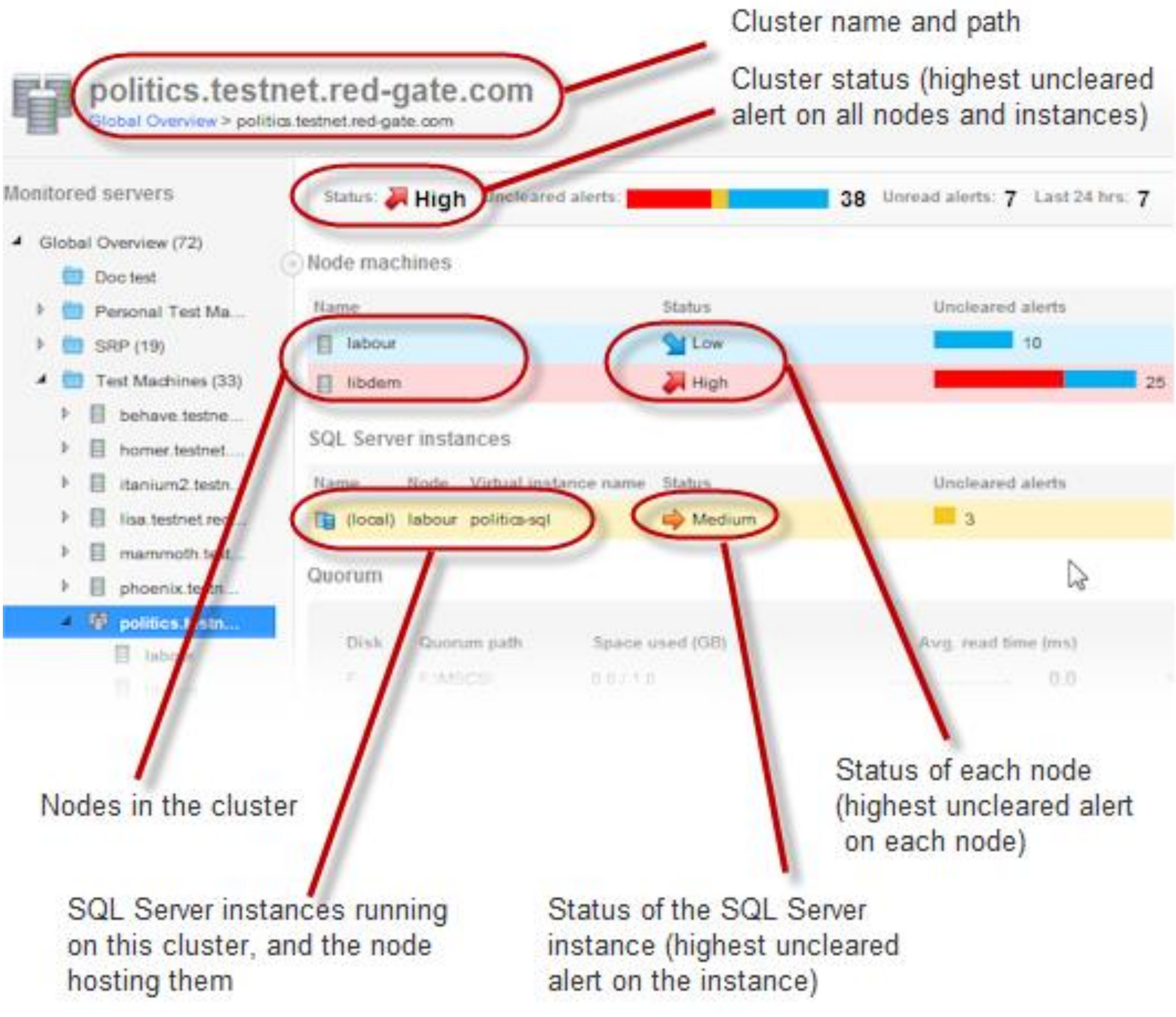

Uncleared alerts
18
High: 1 Medium: 5 Low: 12

- Click on a sparkline graph in the **Processor time** or **Memory Used** column to go the Analysis page for those counters, showing the last 10 minutes:



Cluster overview

The cluster overview shows all nodes in the cluster, and the SQL Server instances running on the cluster:



Cluster name and path

Cluster status (highest uncleared alert on all nodes and instances)

Nodes in the cluster

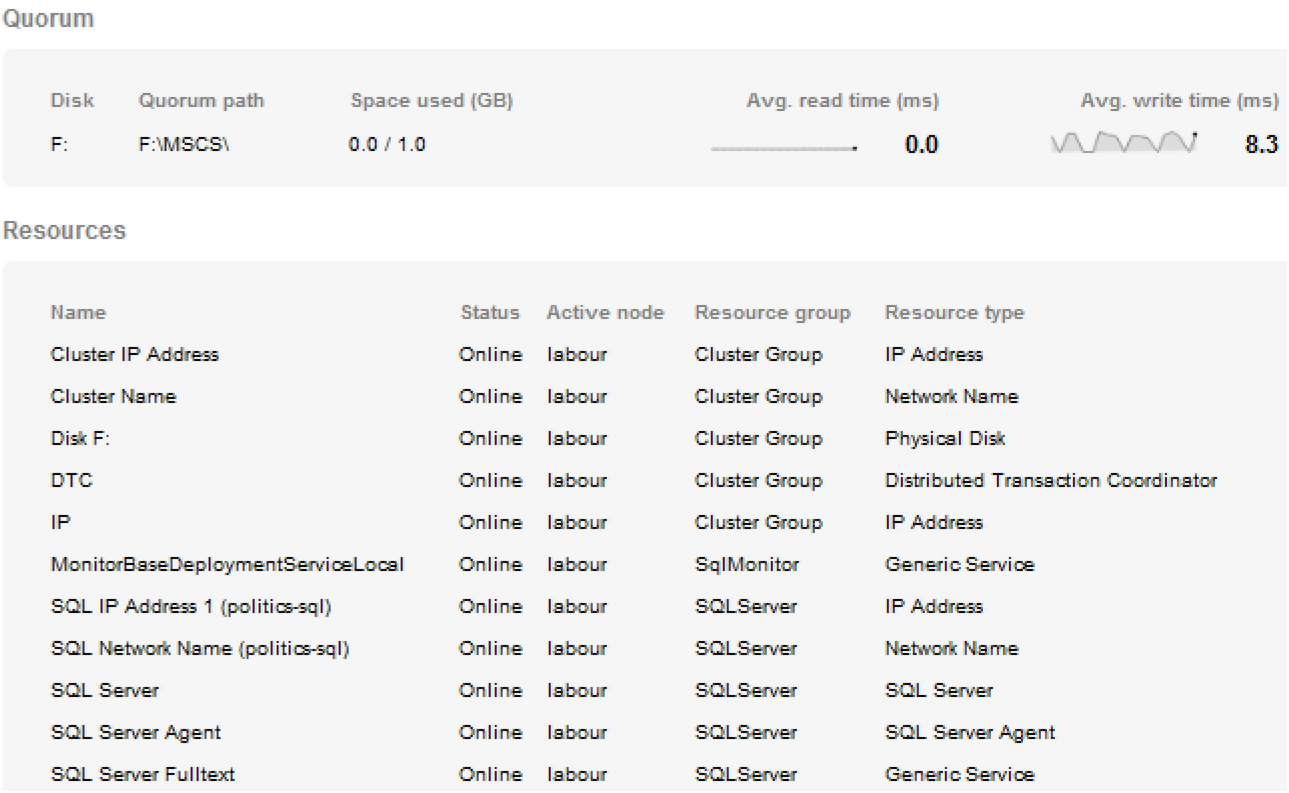
Status of each node (highest uncleared alert on each node)

SQL Server instances running on this cluster, and the node hosting them

Status of the SQL Server instance (highest uncleared alert on the instance)

You can drill down from the Cluster overview to the Alert Inbox or Analysis page in the same way as from the Global Overview.

You can also see information about the quorum path and to which resource groups the various resources (including SQL Server instances) are allocated:



Quorum

Disk	Quorum path	Space used (GB)	Avg. read time (ms)	Avg. write time (ms)
F:	F:\MSCS\	0.0 / 1.0	0.0	8.3

Resources

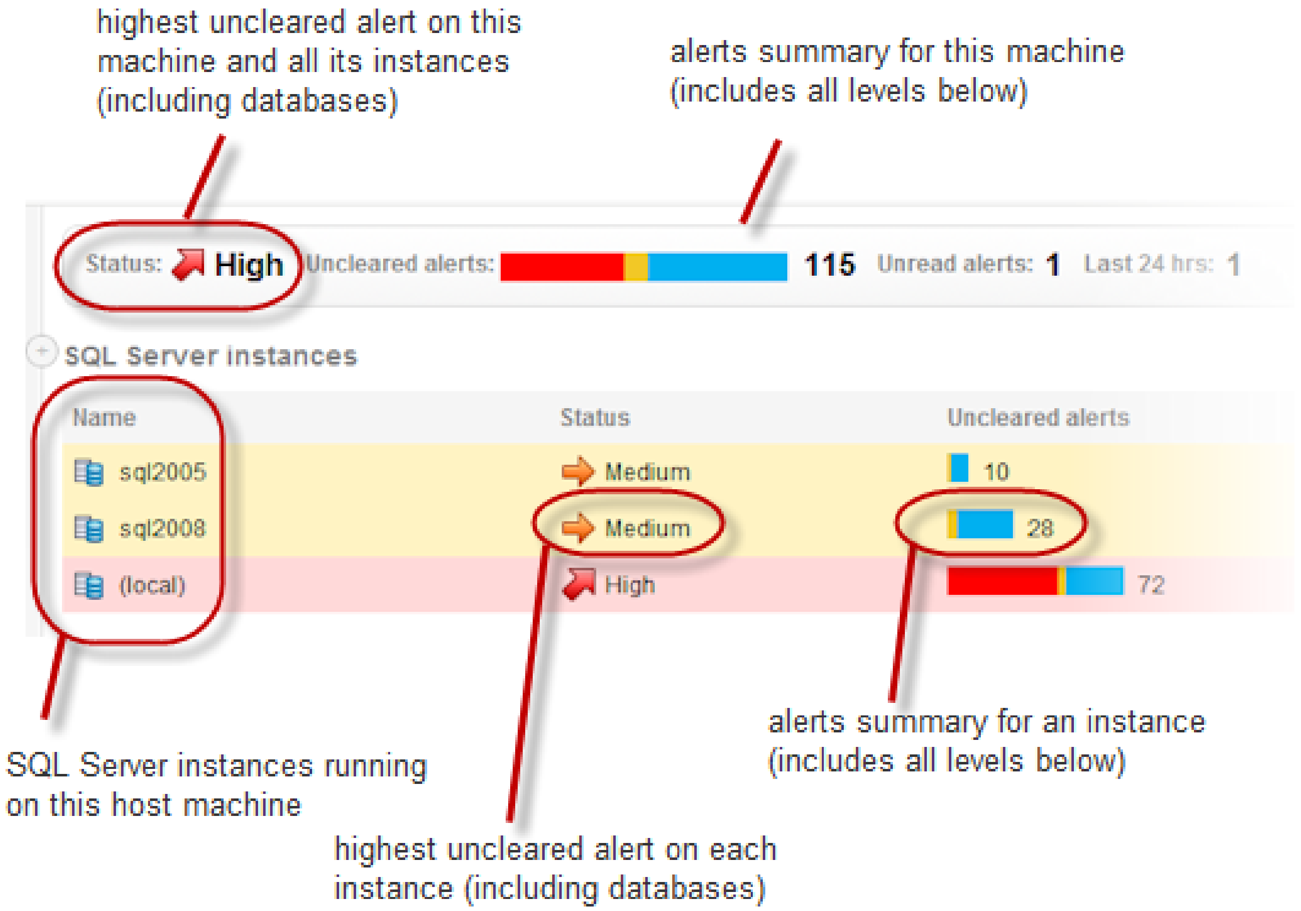
Name	Status	Active node	Resource group	Resource type
Cluster IP Address	Online	labour	Cluster Group	IP Address
Cluster Name	Online	labour	Cluster Group	Network Name
Disk F:	Online	labour	Cluster Group	Physical Disk
DTC	Online	labour	Cluster Group	Distributed Transaction Coordinator
IP	Online	labour	Cluster Group	IP Address
MonitorBaseDeploymentServiceLocal	Online	labour	SqlMonitor	Generic Service
SQL IP Address 1 (politics-sql)	Online	labour	SQLServer	IP Address
SQL Network Name (politics-sql)	Online	labour	SQLServer	Network Name
SQL Server	Online	labour	SQLServer	SQL Server
SQL Server Agent	Online	labour	SQLServer	SQL Server Agent
SQL Server Fulltext	Online	labour	SQLServer	Generic Service

- The quorum is a shared network drive that controls which nodes host which resources, and maintains the configuration data necessary for recovery of the cluster. In SQL Server terms, this equates to which node is active for a particular instance.
- The resources are various entities that are capable of being managed by a cluster. A resource can only be owned by one node at a time.
- A resource group is a collection of resources that are managed as a single unit (e.g. the SQL Server group). During a failover, the groups is moved from one node to another node.

For more information, see Cluster fundamentals (MSDN article) (http://technet.microsoft.com/en-us/library/cc757640(WS.10).aspx).

Host machine overview

The host machine overview is similar to the cluster overview. You can see the status for the machine itself, view all its monitored SQL Server instances, and follow links to the Alert Inbox.



Status: High Uncleared alerts: 115 Unread alerts: 1 Last 24 hrs: 1

SQL Server instances

Name	Status	Uncleared alerts
sql2005	Medium	10
sql2008	Medium	28
(local)	High	72

highest uncleared alert on this machine and all its instances (including databases)

alerts summary for this machine (includes all levels below)

SQL Server instances running on this host machine

highest uncleared alert on each instance (including databases)

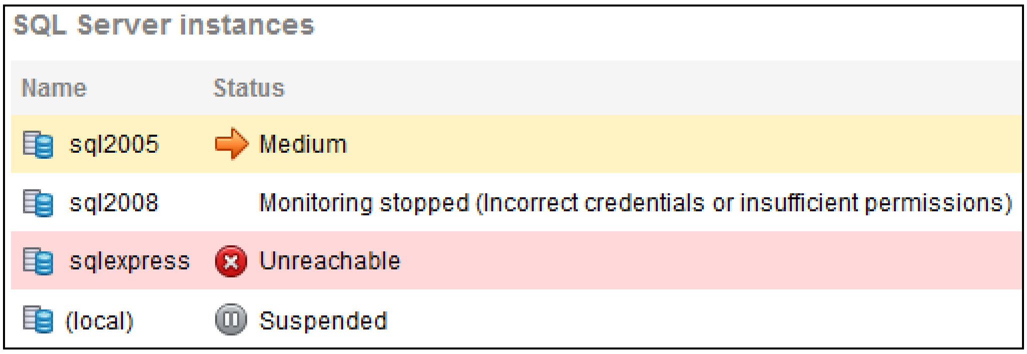
alerts summary for an instance (includes all levels below)

- Click in the **Name** or **Status** column for an SQL Server instance to drill down to overview page for the selected instance.
- Click on the colored alert bar for a SQL Server instance to go to the Alert Inbox for all uncleared alerts relating to that instance
- Click on **Uncleared alerts**, **Unread alerts** or **Last 24hrs** in the alerts summary panel at the top of the page to go to the Alert Inbox for all alerts relating to the host machine and everything below it in the hierarchy (alerts for all SQL Server instances and databases)

What does the Status column mean?

The **Status** column shows the level of the highest uncleared alert on the machine or any level beneath. If there are no uncleared alerts then the status is **OK**.

The status also shows if the monitoring status is currently anything other than Monitoring (Connected):

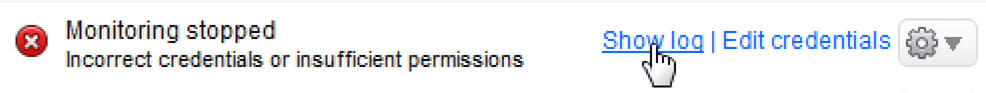


SQL Server instances

Name	Status
sql2005	Medium
sql2008	Monitoring stopped (Incorrect credentials or insufficient permissions)
sqlexpress	Unreachable
(local)	Suspended

If the Status column shows there is a problem with monitoring, for example, it displays Monitoring stopped or Unreachable, then do the following:

1. Click the **Manage monitored servers** link under the **Monitored servers** list on the left.
2. All your monitored servers are listed, and their current status. Click **Show log** for the server with the problematic status:



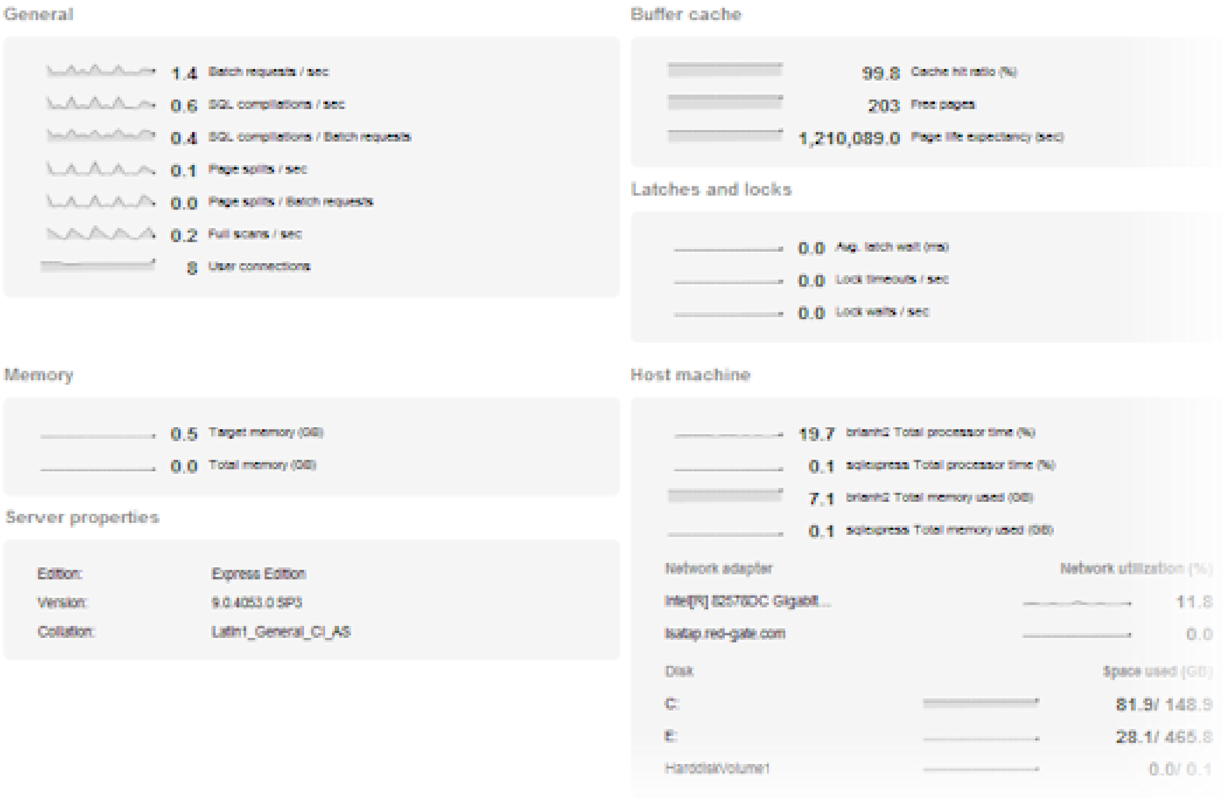
Monitoring stopped
Incorrect credentials or insufficient permissions

3. Review the log of data collection events to investigate the problem.

For more information about monitoring status, see Monitoring status explained.

Performance data on the host machine overview

The host machine overviews display various types of current information about your machine:



General

1.4	Batch requests / sec
0.6	SQL compilations / sec
0.4	SQL compilations / Batch requests
0.1	Page splits / sec
0.0	Page splits / Batch requests
0.2	Full scans / sec
8	User connections

Buffer cache

99.8	Cache hit ratio (%)
203	Free pages
1,210,089.0	Page life expectancy (sec)

Latches and locks

0.0	Avg. latch wait (ms)
0.0	Lock timeouts / sec
0.0	Lock waits / sec

Memory

0.5	Target memory (GB)
0.0	Total memory (GB)

Server properties

Edition:	Express Edition
Version:	9.0.4053.0 SP3
Collation:	Latin1_General_CI_AS

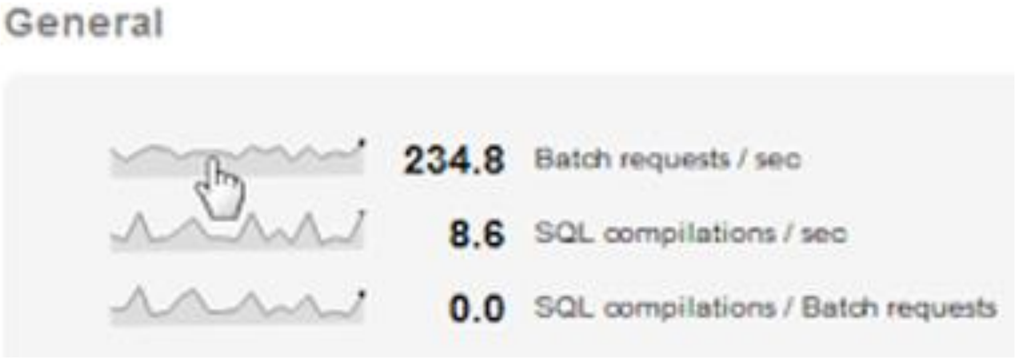
Host machine

19.7	brianh2 Total processor time (%)
0.1	sqlexpress Total processor time (%)
7.1	brianh2 Total memory used (GB)
0.1	sqlexpress Total memory used (GB)

Network adapter	Network utilization (%)
Intel[R] 82578DC Gigabit...	11.8
isatap.red-gate.com	0.0

Disk	Space used (GB)
C:	81.9/ 148.9
E:	28.1/ 465.8
HarddiskVolume1	0.0/ 0.1

Each sparkline graph show the current numerical value (in bold) and the last five minutes performance trend. Click on a sparkline graph to go to the Analysis page for the selected counter, where you can view a larger graph and specify a time range:



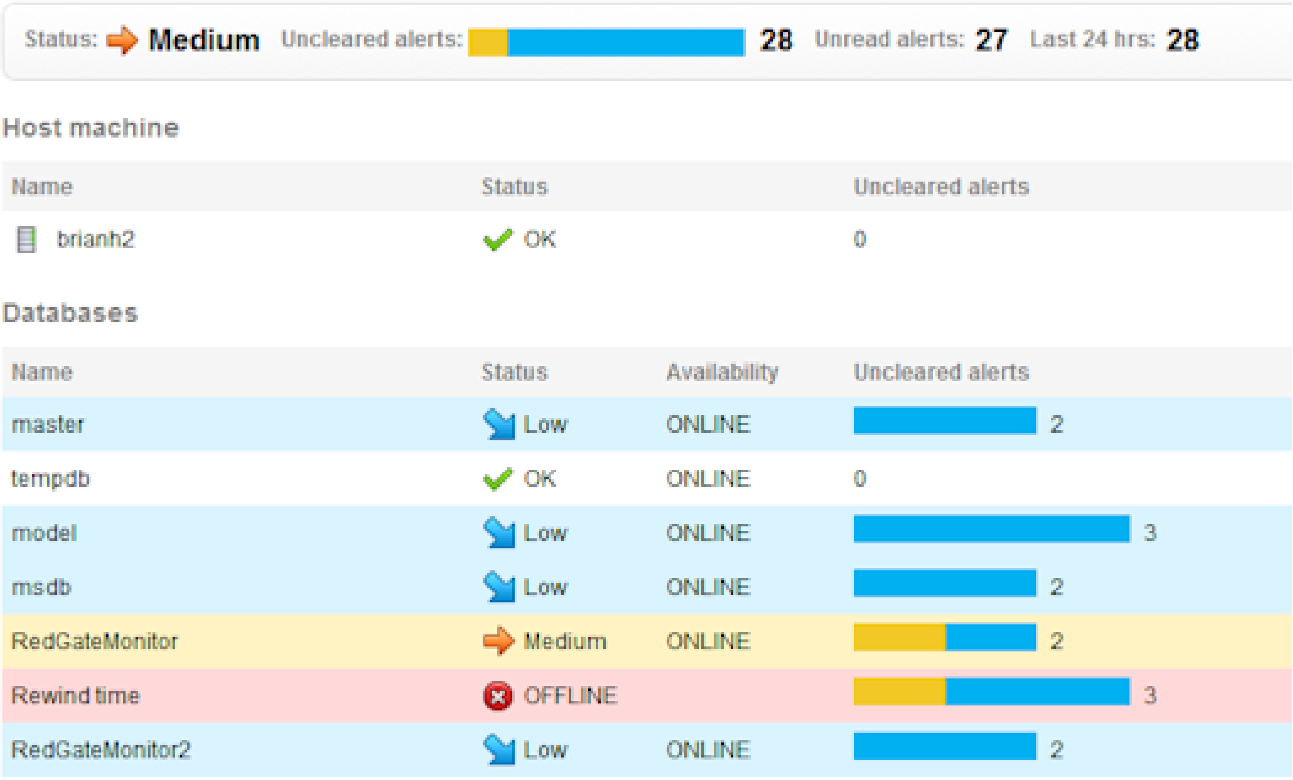
General

234.8	Batch requests / sec
8.6	SQL compilations / sec
0.0	SQL compilations / Batch requests

Note: Processor time % and memory used graphs are not available for individual system processes on the Analysis page.

SQL Server instance overview

The SQL Server instance overview lists all the databases hosted on the instance and shows the status of each:



Status: Medium Uncleared alerts: 28 Unread alerts: 27 Last 24 hrs: 28

Host machine

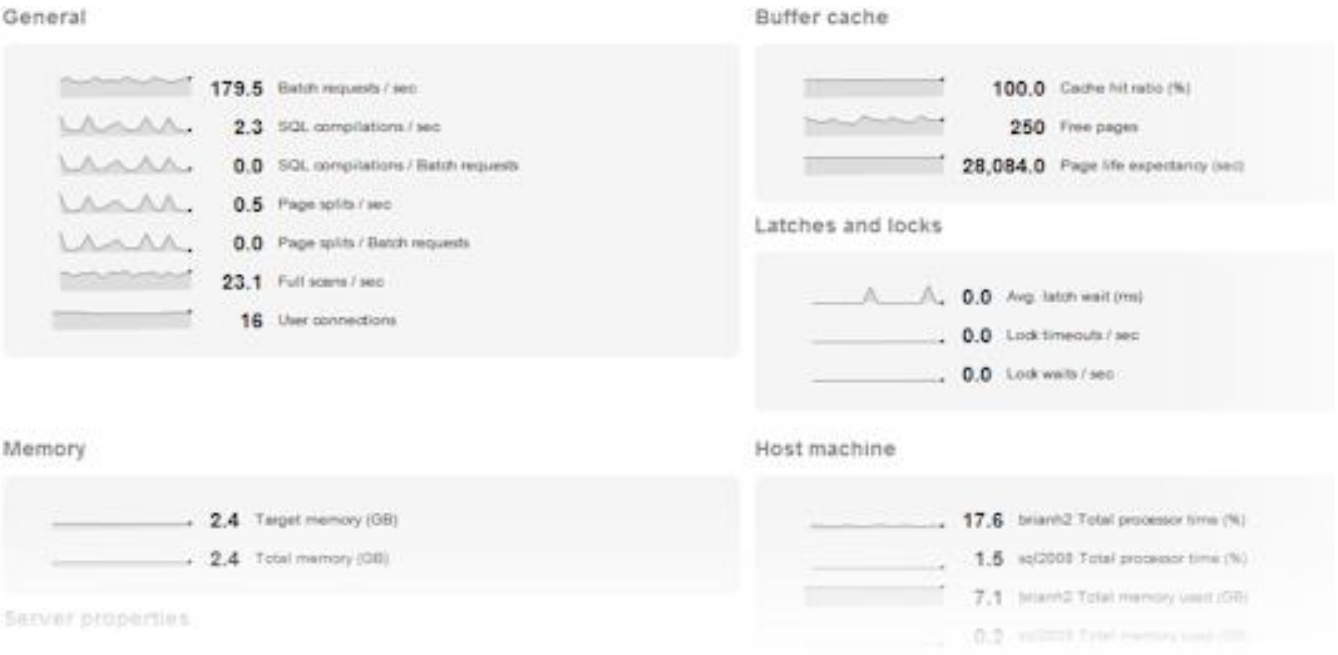
Name	Status	Uncleared alerts
brianh2	✓ OK	0

Databases

Name	Status	Availability	Uncleared alerts
master	Low	ONLINE	2
tempdb	✓ OK	ONLINE	0
model	Low	ONLINE	3
msdb	Low	ONLINE	2
RedGateMonitor	Medium	ONLINE	2
Rewind time	☒ OFFLINE		3
RedGateMonitor2	Low	ONLINE	2

- Click in the **Name** or **Status** column for a database to drill down to the overview page for the selected database.
- Click on the colored alert bar for a database to go to the Alert Inbox for all uncleared alerts relating to that database
- Click on **Uncleared alerts**, **Unread alerts** or **Last 24hrs** in the alerts summary panel at the top of the page to go to the Alert Inbox for all alerts relating to this SQL Server instance (and all its databases)

It shows various types of current information about the instance itself and and performance data for the last five minutes for a range of useful counters. As for the other overviews, click on any sparkline graph to go to the Analysis page for that counter.



General

179.5 Batch requests / sec
2.3 SQL compilations / sec
0.0 SQL compilations / Batch requests
0.5 Page splits / sec
0.0 Page splits / Batch requests
23.1 Full scans / sec
16 User connections

Buffer cache

100.0 Cache hit ratio (%)
250 Free pages
28,084.0 Page life expectancy (sec)

Latches and locks

0.0 Avg. latch wait (ms)
0.0 Lock timeouts / sec
0.0 Lock waits / sec

Memory

2.4 Target memory (GB)
2.4 Total memory (GB)

Server properties

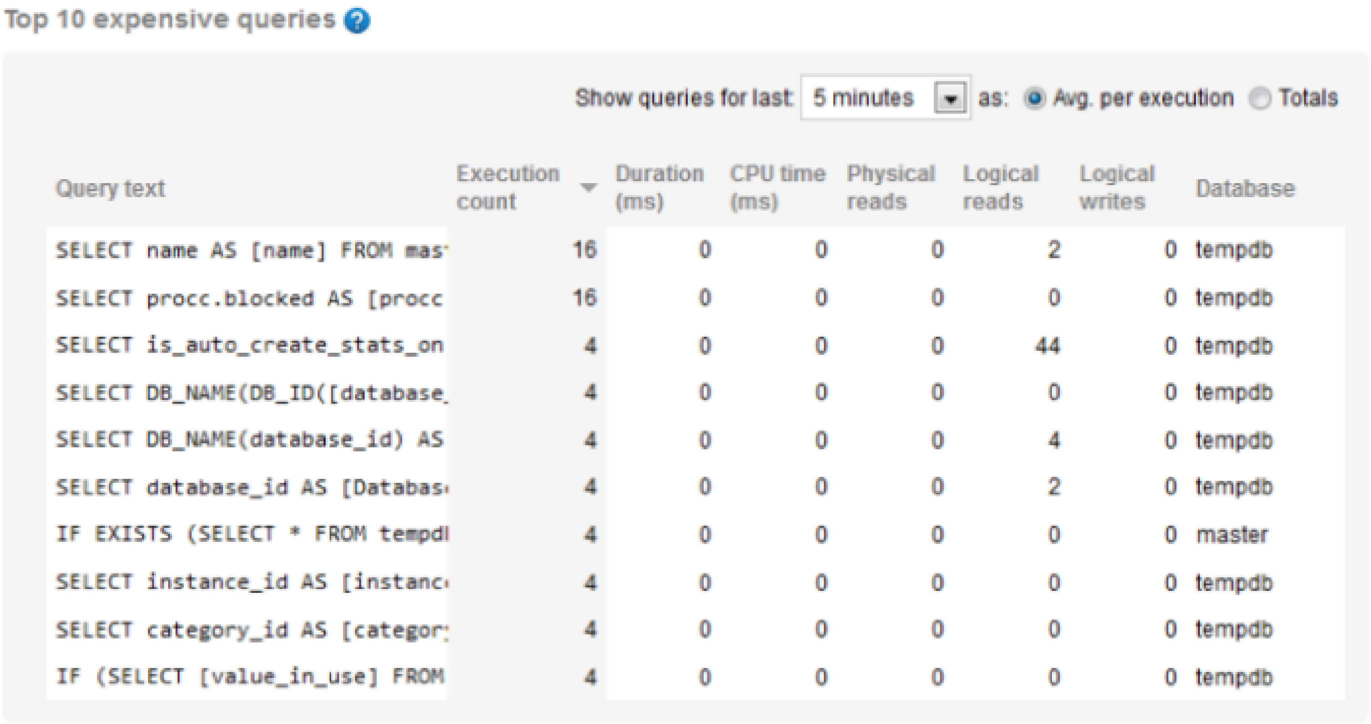
Host machine

17.6 brianh2 Total processor time (%)
1.5 sql2008 Total processor time (%)
7.1 brianh2 Total memory used (GB)
0.2 sql2008 Total memory used (GB)

Top 10 expensive queries

Note: This feature is not available for servers running on Microsoft SQL Server 2000.

The SQL Server instance overview displays the top 10 queries that used the most resource over a selected period of time. This data helps you to evaluate the performance of queries and the efficiency of I/O usage, and can be checked to see what queries were running around the time certain alerts were triggered.

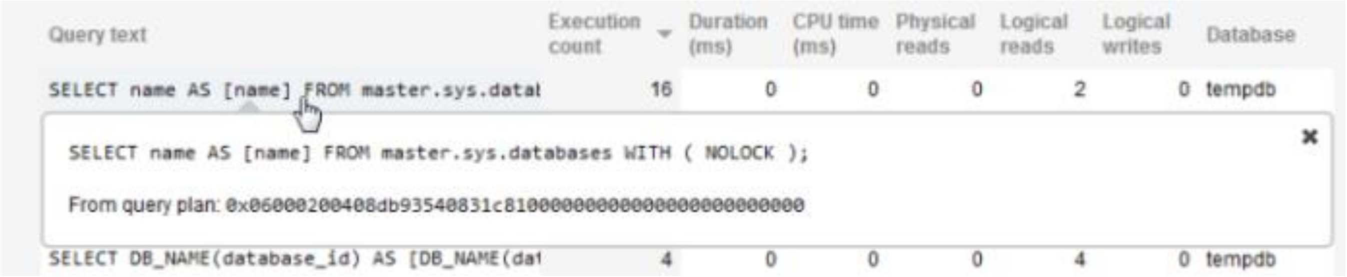


Top 10 expensive queries

Show queries for last: 5 minutes as: ● Avg. per execution ○ Totals

Query text	Execution count	Duration (ms)	CPU time (ms)	Physical reads	Logical reads	Logical writes	Database
SELECT name AS [name] FROM mas	16	0	0	0	2	0	tempdb
SELECT procc.blocked AS [procc	16	0	0	0	0	0	tempdb
SELECT is_auto_create_stats_on	4	0	0	0	44	0	tempdb
SELECT DB_NAME(DB_ID([database_	4	0	0	0	0	0	tempdb
SELECT DB_NAME(database_id) AS	4	0	0	0	4	0	tempdb
SELECT database_id AS [Databas	4	0	0	0	2	0	tempdb
IF EXISTS (SELECT * FROM tempdl	4	0	0	0	0	0	master
SELECT instance_id AS [instanc	4	0	0	0	0	0	tempdb
SELECT category_id AS [categor	4	0	0	0	0	0	tempdb
IF (SELECT [value_in_use] FROM	4	0	0	0	0	0	tempdb

Click on the query text to display the full query together with the identifier for the query plan from which it originates:



Query text	Execution count	Duration (ms)	CPU time (ms)	Physical reads	Logical reads	Logical writes	Database
SELECT name AS [name] FROM master.sys.datal	16	0	0	0	2	0	tempdb
SELECT DB_NAME(database_id) AS [DB_NAME(dat	4	0	0	0	4	0	tempdb

```
SELECT name AS [name] FROM master.sys.databases WITH ( NOLOCK );
```

From query plan: 0x06000200408db93540831c81000000000000000000000000000

What data is displayed?

The following query data is displayed:

- Execution count - the number of times this query statement was executed. By default, queries are listed in descending order according to this metric.
- Duration - how long it took in milliseconds to execute the query.
- CPU time - how much processor time in milliseconds was used to execute the query.
- Physical reads - the number of times a page is read into the buffer cache. If the page is in the cache already, it uses the page already in memory and does not generate a physical read.
- Logical reads - the number of times the database engine requested a page from the buffer cache.
- Logical writes - the number of times data is modified in a page in memory. If a page stays in memory for an extended period, more than one logical write may be required before it is physically written to disk.

The database that each query was run against is displayed in the Database column.

Updating the list of queries

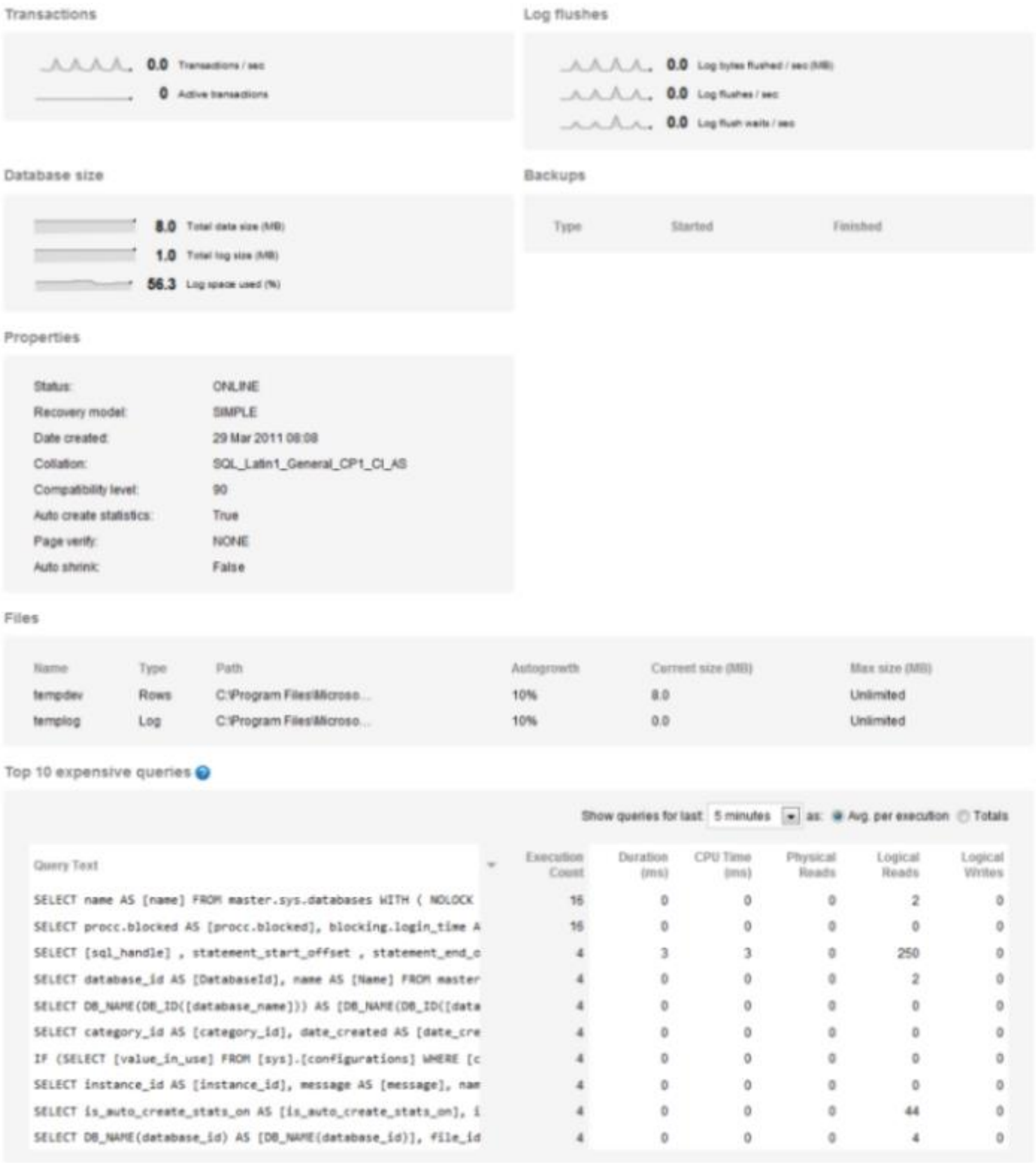
The data in the table is automatically updated every 60 seconds. You can also update the list as follows:

- Select a different time period from the drop-down list above the table. Time periods range from the last five minutes (selected by default), to the last three days.
- Click **Totals** to display queries based on total values.
- Click **Avg. per execution** (selected by default) to display queries based on average metrics over the time period selected. Note: This does not affect Execution count which always displays total values.
- Click on a different column heading to display queries based on that metric in descending order.

Note: Selecting one of these options does not simply change the sort order of the existing list of queries. A new table is generated according to the selected option, so different queries are likely to be displayed.

Database overview

The database overview is the lowest level in the overview hierarchy. It shows information about the database, its general properties, its data and log file sizes and locations, its top 10 most expensive queries and also any backups:



Transactions

0.0 Transactions / sec
0 Active transactions

Log flushes

0.0 Log bytes flushed / sec (MB)
0.0 Log flushes / sec
0.0 Log flush waits / sec

Database size

8.0 Total data size (MB)
1.0 Total log size (MB)
56.3 Log space used (%)

Backups

Type	Started	Finished

Properties

Status:	ONLINE
Recovery model:	SIMPLE
Date created:	29 Mar 2011 08:08
Collation:	SQL_Latin1_General_CP1_CI_AS
Compatibility level:	90
Auto create statistics:	True
Page verify:	NONE
Auto shrink:	False

Files

Name	Type	Path	Autogrowth	Current size (MB)	Max size (MB)
tempdev	Rows	C:\Program Files\Microso...	10%	8.0	Unlimited
templog	Log	C:\Program Files\Microso...	10%	0.0	Unlimited

Top 10 expensive queries

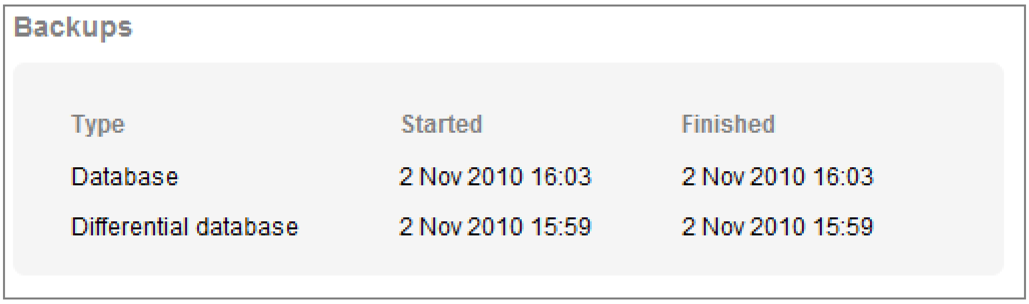
Show queries for last: 5 minutes as: ● Avg. per execution ○ Totals

Query Text	Execution Count	Duration (ms)	CPU Time (ms)	Physical Reads	Logical Reads	Logical Writes
SELECT name AS [name] FROM master.sys.databases WITH (NOLOCK	16	0	0	0	2	0
SELECT procc.blocked AS [procc.blocked], blocking.login_time A	16	0	0	0	0	0
SELECT [sql_handle] , statement_start_offset , statement_end_o	4	3	3	0	250	0
SELECT database_id AS [DatabaseId], name AS [Name] FROM master	4	0	0	0	2	0
SELECT DB_NAME(DB_ID([database_name])) AS [DB_NAME(DB_ID([data	4	0	0	0	0	0
SELECT category_id AS [category_id], date_created AS [date_cre	4	0	0	0	0	0
IF (SELECT [value_in_use] FROM [sys].[configurations] WHERE [c	4	0	0	0	0	0
SELECT instance_id AS [instance_id], message AS [message], nam	4	0	0	0	0	0
SELECT is_auto_create_stats_on AS [is_auto_create_stats_on], i	4	0	0	0	44	0
SELECT DB_NAME(database_id) AS [DB_NAME(database_id)], file_id	4	0	0	0	4	0

Note: The top 10 expensive queries are not available for servers running on Microsoft SQL Server 2000.

Why aren't all my backups listed?

The backups section shows only the **most recent** backup of each type:

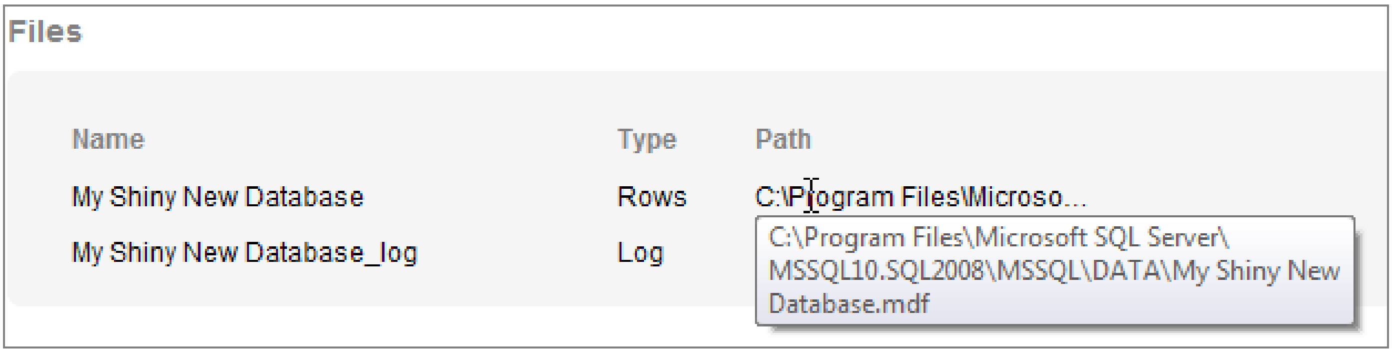


Backups

Type	Started	Finished
Database	2 Nov 2010 16:03	2 Nov 2010 16:03
Differential database	2 Nov 2010 15:59	2 Nov 2010 15:59

Viewing the full path to data files

The path to your data and log files is likely to be truncated on screen. To see the full path, move your mouse pointer over it to display a tooltip:



Files

Name	Type	Path
My Shiny New Database	Rows	C:\Program Files\Microso...
My Shiny New Database_log	Log	

C:\Program Files\Microsoft SQL Server\MSSQL10.SQL2008\MSSQL\DATA\My Shiny New Database.mdf

Rewinding time (Back in Time mode)

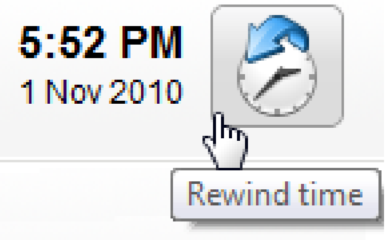
You can "rewind time" in SQL Monitor to enter **Back in Time mode**, where you can examine the state of any overview as it was at a time in the past.

While in Back in Time mode, you can step forward or backwards in time to see how the values on the overview page change. This is useful to examine the performance of your servers around the time that a problem occurred.

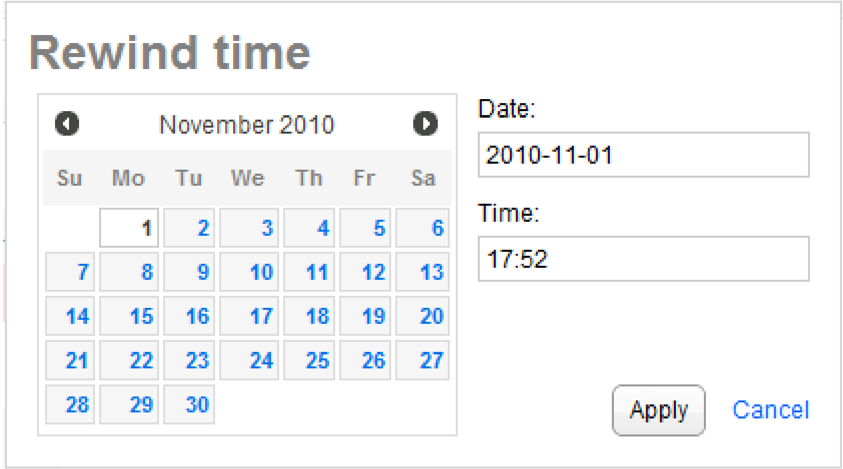
Note: Using Rewind time may be affected by how long you have opted to keep data in the Data Repository. See Purging SQL Monitor data.

To enter Back in Time mode

1. Click the **Rewind time** button at the top right of any overview page, next to the time. If you know the server or database where there was a performance issue in the past, you should first drill down from the Global Overview page to the relevant overview page.



   The Rewind time box is displayed, defaulted to the current date and time:



Rewind time

November 2010

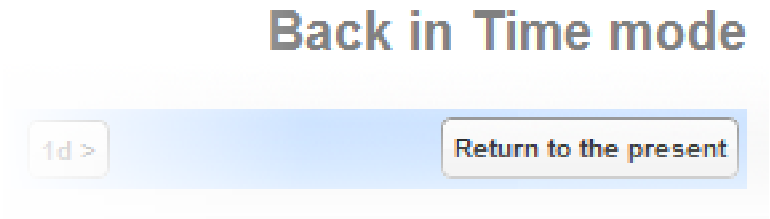
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Date: 2010-11-01

Time: 17:52

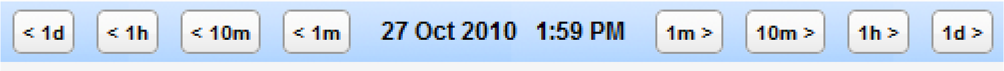
2. Enter the date and time when the problem was first identified. You may want to go back five minutes earlier, so you can watch the performance as it changed.
3. Click **Apply**.

The date and time is removed, and the page is updated at the top right to show that you are now Back in Time and no longer viewing current data:



Back in Time mode is a frozen snapshot of data at the time you specified. SQL Monitor does not automatically advance the time, so the sparkline graphs and values will not move forward in time.

4. Use the Back in Time bar buttons to adjust the time in increments of 1 minute, 10 minutes, 1 hour or 1 day:



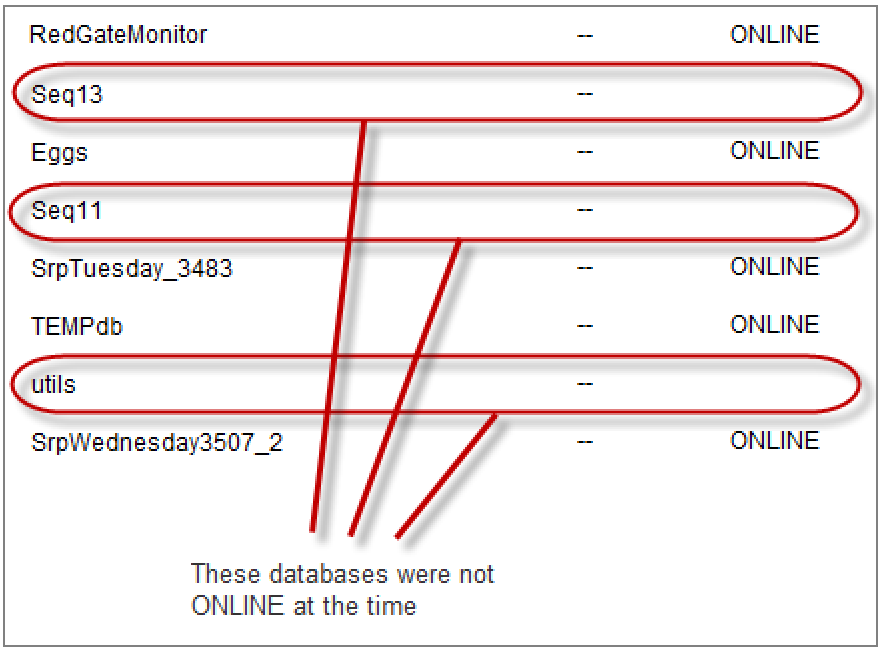
5. While you are in Back in Time mode, you can continue navigating through the overview pages as usual. The time remains frozen until you return to the present. For example, you can first investigate the performance of the host machine, drill down to a SQL Server instance and then to a particular database, all frozen at the same time.
6. To return to normal operation, click **Return to the present**.

What is displayed in Back in Time mode?

- All performance counters on the overview pages reflect the time entered in Back in Time mode; the sparkline graph shows the trend for 5 minutes leading up to this time.

  Click on a sparkline graph to go the **Analysis** page showing a performance graph of that counter for the ten minute period before the 'frozen' time. **Note**: If you then select an option from the **Time range** drop-down list, Back in Time mode is canceled and the time range is relative to the current time.

- All processes and error log entries reflect the time entered.
- Database availability is shown for the time entered in Back in Time mode. If the database was at any state other than ONLINE, then the Availability column is shown as blank.



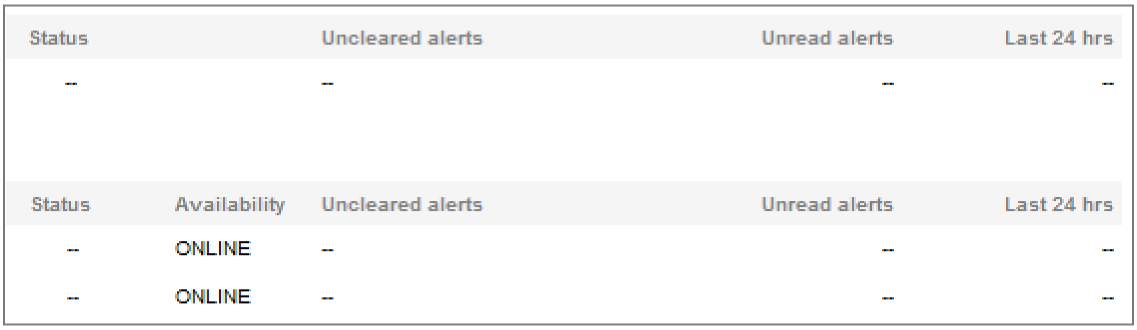
RedGateMonitor	--	ONLINE
Seq13	--	
Eggs	--	ONLINE
Seq11	--	
SrpTuesday_3483	--	ONLINE
TEMPdb	--	ONLINE
utils	--	
SrpWednesday3507_2	--	ONLINE

These databases were not ONLINE at the time

Data not available in Back in Time mode

Alert summary information on the overview pages is **not** shown when in Back in Time mode:

- The alert summary panel at the top of the overview page is removed.
- A dash -- is shown in place of the numbers in the Uncleared alerts, Unread alerts and Last 24 hrs columns. If you click the dash, the Alert Inbox will show these alerts for the current time, not the time in the past.
- The Status column shows a dash (as the Status is determined by uncleared alerts).



Status	Uncleared alerts	Unread alerts	Last 24 hrs
--	--	--	--

Status	Availability	Uncleared alerts	Unread alerts	Last 24 hrs
--	ONLINE	--	--	--
--	ONLINE	--	--	--

What happens when I go back in time before a server was added?

Servers added recently that were not being monitored at the time you are viewing are removed from the **Monitored servers** list.

If you are already viewing an overview page, and rewind time to a point where the SQL Server instance or machine was not yet being monitored, then the page contains no data. Try advancing the time forward to a point where the sparkline graphs are displayed.

About alerts

SQL Monitor raises alerts when it detects problems across your servers.

What alerts does SQL Monitor raise?

SQL Monitor alerts warn you about various issues on your host machines, SQL Server instances and databases.

List of all alert types raised by SQL Monitor

Event alerts and continuous alerts

The following types of alerts are **Event** alerts, which are raised for incidents that occur at a specific point in time:

- Cluster failover
- Deadlock
- Job failed
- SQL Server error log entry

Event alerts are raised at a defined level (Low, Medium or High) which you can configure.

All other types of alert are **Continuous** alerts. Continuous alerts can have the following status:

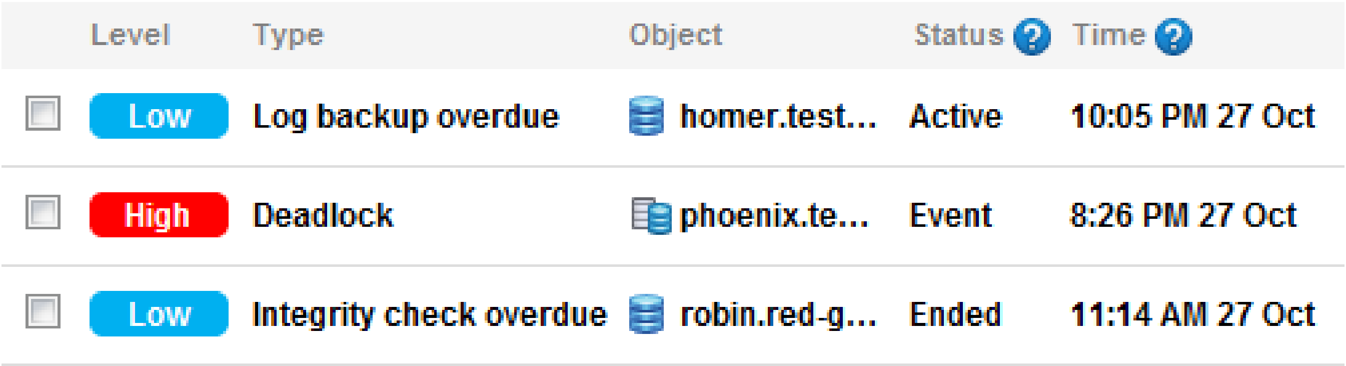
- **Active:** the issue is still currently a problem
- **Ended:** the issue has been resolved

Depending on the type of alert, the Active duration of an alert can be quite short, for example less than a minute for long-running query alerts, or several days or even weeks for backup overdue alerts.

Like event alerts, continuous alerts are raised at a defined level (Low, Medium or High) which you can configure. For continuous alerts, however, you can configure multiple thresholds, so this level can automatically escalate or downgrade while the alert status is Active.

Alert status

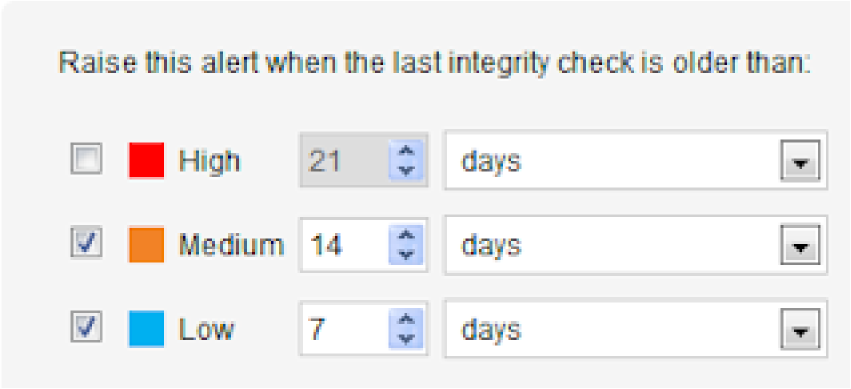
The status of each alert is shown in the **Status** column in the **Alert Inbox**:



	Level	Type	Object	Status	Time
□	Low	Log backup overdue	homer.test...	Active	10:05 PM 27 Oct
□	High	Deadlock	phoenix.te...	Event	8:26 PM 27 Oct
□	Low	Integrity check overdue	robin.red-g...	Ended	11:14 AM 27 Oct

Alert level

The level at which each alert is raised is defined as part of its configuration. You can adjust this on the **Alert settings** page for each type of alert. For continuous alerts, you can also configure multiple thresholds:



Raise this alert when the last integrity check is older than:

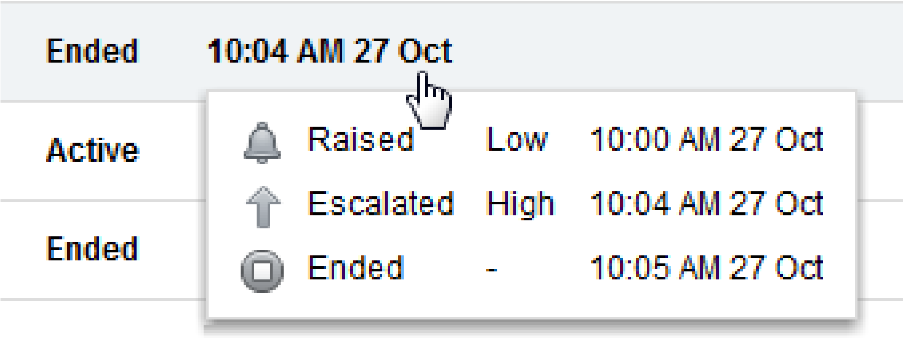
□	🟥	High	21	days
☑	🟧	Medium	14	days
☑	🟦	Low	7	days

In this example, only the Low and Medium levels are defined. You do not have to enable multiple thresholds.

Alert history

Each alert has a history, showing the time when it was raised, and for continuous alerts, the time when it changed level and when it Ended. If you clear an alert, this is also included in the history for that alert occurrence.

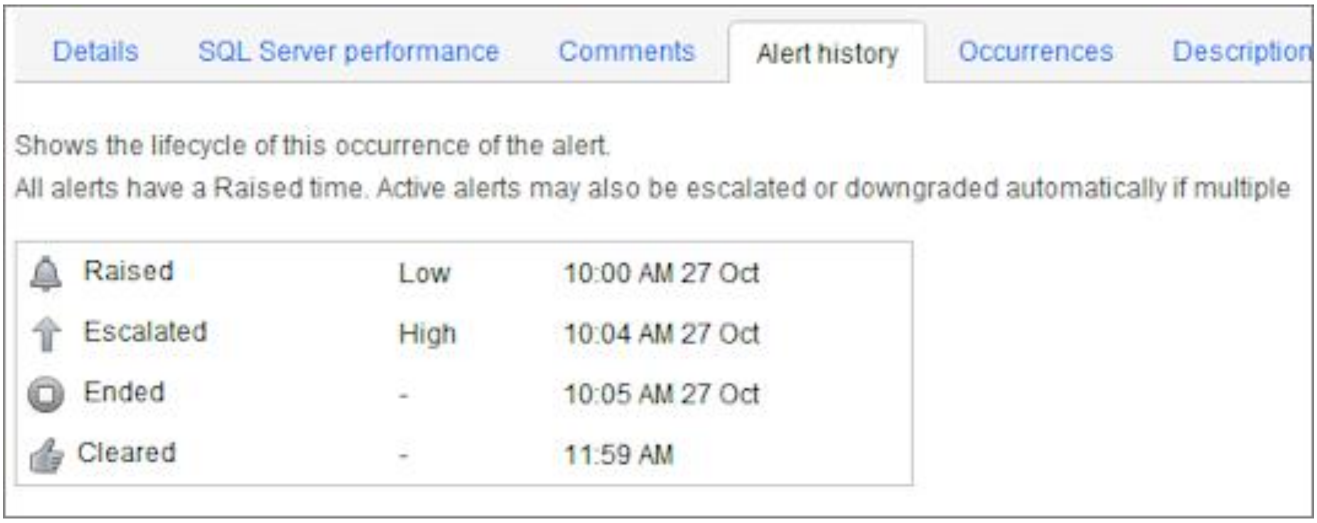
Move your mouse pointer over the **Time** column to view a history of the alert:



Ended	10:04 AM 27 Oct
Active	
Ended	

Raised	Low	10:00 AM 27 Oct
Escalated	High	10:04 AM 27 Oct
Ended	-	10:05 AM 27 Oct

The history for a raised alert is also displayed in the **Alert history** tab on the **Alert details** page:



Shows the lifecycle of this occurrence of the alert.

All alerts have a Raised time. Active alerts may also be escalated or downgraded automatically if multiple

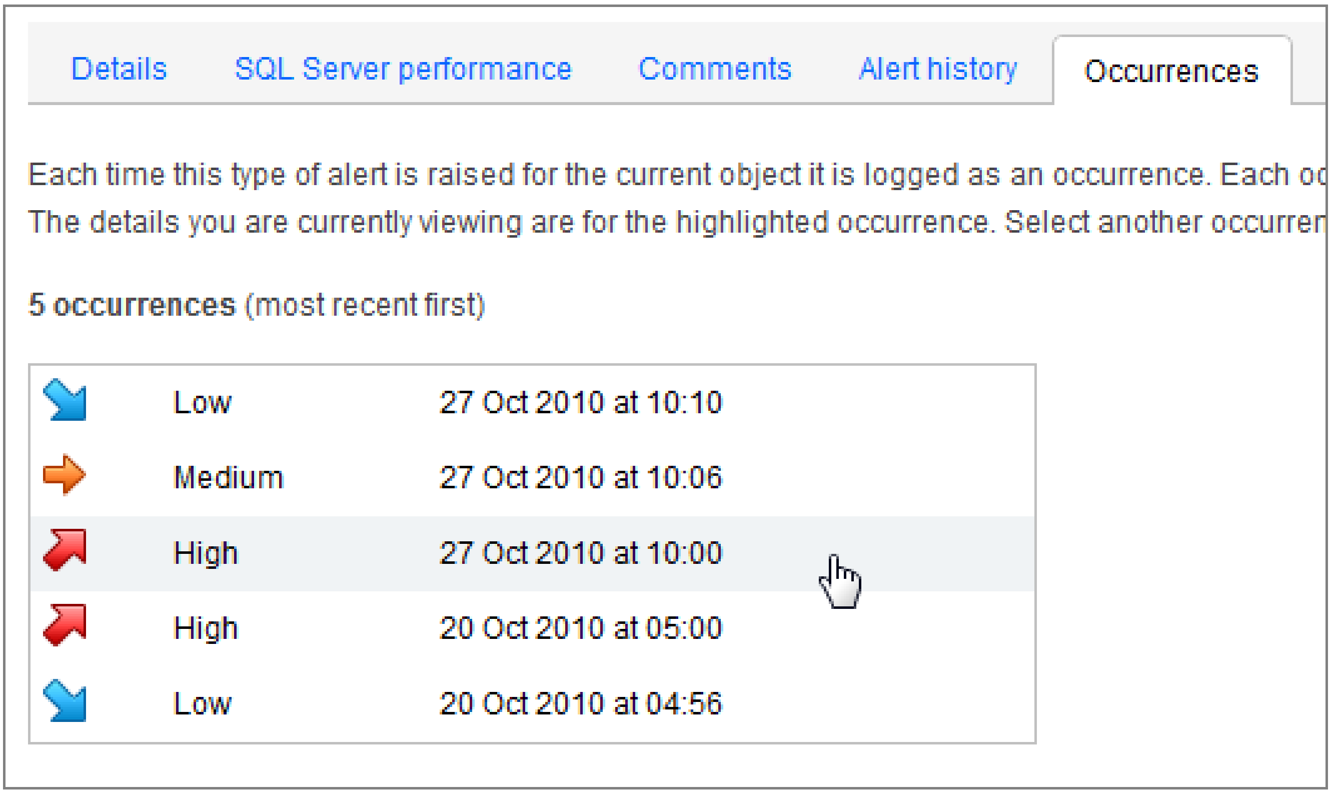
Raised	Low	10:00 AM 27 Oct
Escalated	High	10:04 AM 27 Oct
Ended	-	10:05 AM 27 Oct
Cleared	-	11:59 AM

Alert occurrences

Each time an alert is raised, it is logged as an occurrence. An occurrence represents a single entry in the Alert Inbox.

Continuous alerts for a monitored object (a server, job or database) have to be Ended before a subsequent occurrence of that alert type can be raised. While the alert is Active, it is a single occurrence, even if its level changes several times.

You can browse historical occurrences of the current alert type for the current monitored object in the **Occurrences** tabs on the **Alert details** page:



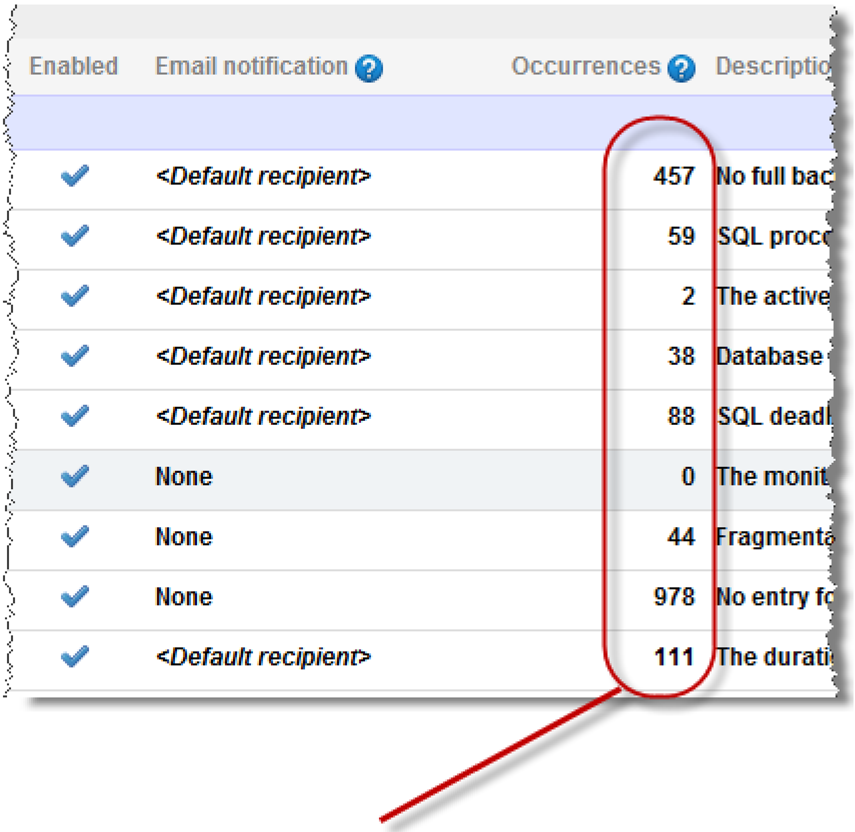
Each time this type of alert is raised for the current object it is logged as an occurrence. Each oc
The details you are currently viewing are for the highlighted occurrence. Select another occurren

5 occurrences (most recent first)

↘	Low	27 Oct 2010 at 10:10
→	Medium	27 Oct 2010 at 10:06
↗	High	27 Oct 2010 at 10:00
↗	High	20 Oct 2010 at 05:00
↘	Low	20 Oct 2010 at 04:56

Click on any occurrence to view its alert details.

To view the number of occurrences for each type of alert, go to the **Alert settings** page:



Enabled	Email notification	Occurrences	Descriptio
✓	*<Default recipient>*	457	No full bac
✓	*<Default recipient>*	59	SQL proc
✓	*<Default recipient>*	2	The active
✓	*<Default recipient>*	38	Database
✓	*<Default recipient>*	88	SQL deadl
✓	None	0	The monit
✓	None	44	Fragmenta
✓	None	978	No entry fo
✓	*<Default recipient>*	111	The durati

Total number of occurrences raised for each type of alert.
To view occurences for a particular server or database, select it in the **Monitored servers** list.

Alert times displayed in SQL Monitor

All alert times in SQL Monitor are displayed in the local time of your web browser, regardless of where the Base monitor server or your monitored servers are located.

SQL Monitor automatically converts all alert times to your local time.

For example, if an alert is raised on a server in London at 18:00 and you are using SQL Monitor in New York, the alert time will be displayed as 13:00 (local time for New York).

Note: The web browser clock and Base Monitor clock need to be synchronized for SQL Monitor to work correctly.

Working with alerts

Viewing a list of raised alerts

The Alert Inbox page lists all the alerts that have been raised. You can filter the inbox in many ways, to list only alerts that you are interested in.

Viewing the details of a single raised alert

The Alert details page shows information about a single alert. Click on any alert in the Alert Inbox to view its details.

Changing alert settings

The Alert settings page allows you to disable an alert or change its level and thresholds.

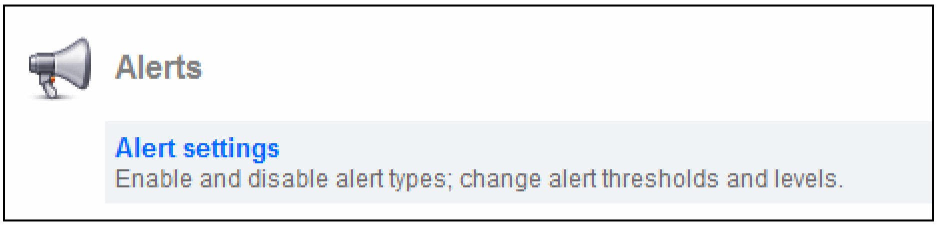
Temporarily suspending alerts

The Configuration page allows you to schedule maintenance windows during which alerting is suspended on selected servers.

List of alerts

The Alert settings page lists all the alert types that SQL Monitor can raise.

Go to the **Configuration** tab. Under **Alerts**, select **Alert settings**:



Alerts

Alert settings

Enable and disable alert types; change alert thresholds and levels.

Managing alerts

For each type of alert, you can:

- disable it, so the alert will not be raised in future
- change the level at which it is raised, to either low, medium, or high
- change the thresholds that trigger the alert to be raised

You can edit the alert settings for a single SQL Server instance or across a number of instances at once (by creating a group). For job-related, disk-related or database-related alerts, you can edit the alert for a specific job, disk or database.

When an alert is raised, you can quickly change its settings by clicking **Configure alert** in the **Alert details** page.

SQL Server specific alerts

SQL Monitor raises the following types of alerts for problems on a SQL Server instance or database:

Backup overdue

Raised when:	Either of the following conditions apply: • No entry for a full database backup of this database in the [msdb].[dbo].[backupset] system table. • The most recent entry for a full database backup of this database in the [msdb].[dbo].[backupset] system table is older than a specified time.
Configurable thresholds:	Most recent backup is older than x seconds/minutes/hours/days

Default settings:

- Raised as **Low** after 7 days
- **Medium**: not enabled
- **High**: not enabled

Type:

Continuous

Continuous alerts can have multiple thresholds and are automatically updated from **Active** to **Ended** when the condition that caused the alert to be raised no longer applies - in this case, when a full backup is detected.

Possible causes:

- No backup job scheduled.
- Backup jobs not running or not completing. Check **Job failed** alerts on this SQL Server instance.
- SQL Server Agent Service is not started - check for any **SQL Server Agent Service status** alerts.

Blocked process

Raised when:

A SQL connection has been waiting for another process to release its blocking lock for longer than a specified duration.

Configurable thresholds:

SQL process blocked for longer than x seconds/minutes/hours/days

Default settings:

- Raised as **Low** after 20 seconds
- Escalated to **Medium** after 40 seconds
- Escalated to **High** after 1 minute

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the condition that caused the alert to be raised no longer applies - in this case, when the block ends.

Possible causes:

- Long-running queries.
- Using Insert, Update or Delete on large numbers of records in a single transaction.
- Canceling queries, but not rolling them back.

Cluster failover

Raised when:	The active node of a cluster changes to a different node.
Configurable thresholds:	None
Default settings:	Raised as **High**
Type:	Event **Event** alerts are raised for incidents that occur at a specific point in time; they do not change level, or update their status to **Ended**.
Possible causes:	The previously active node has failed or been manually switched to a different node.

Database unavailable

Raised when:	The database state is something other than Online.
Configurable thresholds:	None
Default settings:	Raised as **Medium**
Type:	Continuous Automatically updated from **Active** to **Ended** when the database state changes back to Online.
Possible causes:	Database has been manually removed, or has encountered a problem causing its state to change to Suspect, Emergency, Recovering or Restoring.

Deadlock

Raised when:	SQL deadlock is detected.
Configurable thresholds:	None
Default settings:	Raised as **High**
Type:	Event **Event** alerts are raised for incidents that occur at a specific point in time; they do not change level, or update their status to **Ended**.

Possible causes:

- Inefficient application code.
- Application accesses objects in a different order each time.
- User input during transactions.
- Lengthy transactions.
- Locks not being released as early as possible.

Deadlock trace flag disabled

Raised when: SQL Monitor is unable to turn on the deadlock trace flag on a SQL Server instance; this means no deadlock alerts can be raised.

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** when SQL Monitor can enable the trace flag.

Possible causes: Insufficient privileges for the account used to connect to the SQL Server instance.

SQL Monitor requires sysadmin permissions on this account to turn on the deadlock trace flag.

Fragmented indexes

Raised when: Both of the following conditions apply:

- Fragmentation of one or more indexes in a database exceeds a percentage threshold.
- The fragmented indexes contain more than a specified number of pages.

Configurable thresholds: Percentage fragmentation level

Indexes contain more than x pages

Default settings:

- Raised as **Low** when fragmentation is above 15%

- **Medium**: not enabled
- **High**: not enabled

Raised for indexes with more than 1000 pages

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the condition that caused the alert to be raised no longer applies - in this case, when there are no fragmented indexes (based on the thresholds defined) for the database.

Possible causes:

Regular deleting or updating existing rows or values in a table.

Notes:

Checking for index fragmentation is a very resource-intensive activity.

For this reason, SQL Monitor only checks for fragmented indexes once a week: on Sunday 02:00.

This means that the alert may remain **Active** for some time after you fix the issue, and will only be updated after the next scheduled weekly check.

Integrity check overdue

Raised when:

Either of the following conditions apply:

- No entry for an integrity check found following DBCC DBINFO WITH TABLERESULTS.
- The most recent entry for an integrity check is older than a specified time.

Configurable thresholds:

Most recent integrity check is older than x seconds/minutes/hours/days

Default settings:

- Raised as **Low** after 7 days
- **Medium**: not enabled
- **High**: not enabled

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the condition that caused the alert to be raised no longer applies - in this case, when an integrity check of the database (DBCC

CHECKDB) is detected.

Possible causes:

No integrity check has been carried out on a database, or the most recent integrity check was too long ago.

Job duration unusual

Raised when:

The job execution time is different from the baseline duration (the median of the last ten runs) by a specified percentage.

Configurable thresholds:

Percentage difference from baseline duration (either slower or quicker).

Ignore jobs with run times less than x seconds.

Default settings:

These defaults assume that once the baseline for a job is established, that job should not start running significantly more slowly or more quickly.

- Raised as **Low** when duration is 50% different to baseline
- Escalated to **Medium** when duration is 60% different to baseline
- Escalated to **High** when duration is 70% different to baseline
- Ignore jobs that run for less than 2 seconds.

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the job next completes with a duration that is within the allowed percentage of the baseline duration.

Possible causes:

- High system load
- Sub-optimal SQL execution plan
- Job is waiting on an event or blocked

Notes:

SQL Monitor calculates the baseline duration by using the job history to find the last ten run times.

SQL Monitor will not raise the **Job duration unusual** alert until the job history contains at least ten runs.

Job failed

Raised when:

Job does not complete successfully, and returns error code.

Configurable thresholds:

None

Default settings:

Raised as **Medium**

Type:

Event

Event alerts are raised for incidents that occur at a specific point in time; they do not change level or update their status to Ended.

Possible causes:

Check the **Job outcome message** for a raised alert to help determine the problem.

Log backup overdue

Raised when:

Either of the following conditions apply:

- No entry for a transaction log backup or a full backup of this database in the [msdb].[dbo].[backupset] system table.
- The most recent entry for a transaction log backup or full backup of this database in the [msdb].[dbo].[backupset] system table is older than a specified time.

Configurable thresholds:

Most recent backup is older than x seconds/minutes/hours/days

Default settings:

- Raised as **Low** after 1 day
- **Medium**: not enabled
- **High**: not enabled

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the condition that caused the alert to be raised no longer applies - in this case, when a transaction log backup is detected.

Possible causes:

- No log backup job scheduled.
- Log backup jobs not running or not completing. Check **Job failed** alerts on this SQL Server instance.
- SQL Server Agent Service is not started -

check for any **SQL Server Agent Service status** alerts.

Long-running query

Raised when: Query has been running for longer than a specified duration.

Configurable thresholds: Query duration is longer than x seconds/minutes/hours/days

Do not raise alerts for queries that contain certain strings (matching specified regular expressions).

Default settings:

- Raised as **Low** after 1 minute
- Escalated to **Medium** after 2 minutes
- Escalated to **High** after 2 minutes 10 seconds

Type: Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when the query completes.

Possible causes:

- Complex query
- Insufficient physical memory
- CPU over-utilized

Monitoring error (SQL Server data collection)

Raised when: One of the following conditions applies continuously for 2 minutes:

- Problems with WMI
- Problems with the remote registry
- File sharing issues
- SQL connectivity issues

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** when data can be collected from the instance again.

Possible causes:

- One of the required services (WMI or remote registry) has been stopped.
- Remote file access permissions have changed or hidden administrative shares have been disabled.
- SQL Server Service has been stopped.

Monitoring stopped (SQL server credentials)

Raised when: SQL Monitor is unable to collect monitoring data from the SQL Server because the credentials supplied to connect to the instance are invalid or lack permissions.

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** once the correct credentials are entered and authentication is confirmed.

Possible causes:

- Your user name or password has been changed.
- Your permissions have changed and are no longer sufficient.

Page verification

Raised when: PAGE_VERIFY is set to NONE (SQL Server 2005 or SQL Server 2008) or TORN_PAGE_DETECTION is set to FALSE (SQL Server 2000) for a database.

Configurable thresholds: None

Default settings: Raised as **Low**

Type: Continuous

Automatically updated from **Active** to **Ended** when SQL Monitor detects that Page verification has been turned on.

Possible causes: New databases inherit this setting from the Model database. Check that Page Verify is turned on for the Model databases, if required.

SQL Server Agent Service status

Raised when: SQL Server Agent Service status matches the status specified in the alert configuration.

Configurable thresholds: Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings: Raised as **Medium** when service is **Stopped or Paused**.

Type: Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

SQL Server Analysis Service status

Raised when: SQL Server Analysis Service status matches the status specified in the alert configuration.

Configurable thresholds: Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings: Raised as **Medium** when service is **Stopped or Paused**.

Type: Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

SQL Server error log entry

Raised when: An error message has been written to the SQL Server error log with a severity level above a specified value.

Configurable thresholds: Error severity equal to or higher than x

Default settings:

- Raised as **Low** for severity level 17 or 18
- Raised as **Medium** for severity level 19
- Raised as **High** for severity level 20 or higher

Type: Event

Event alerts are raised for incidents that occur at a specific point in time; they do not change level, or update their status to **Ended**.

Possible causes: Various

Check the **SQL Server error log entry** area of the alert to see the error message text.

SQL Server Full Text Search Service status

Raised when: SQL Server Full Text Search Service status matches the status specified in the alert configuration.

Configurable thresholds: Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings: Raised as **Medium** when service is **Started or Paused**.

Type: Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

SQL Server instance unreachable

Raised when:	The SQL Server instance cannot be reached by SQL Monitor because it is not running, or because of some other error (other than permissions).
Configurable thresholds:	None
Default settings:	Raised as **High**
Type:	Continuous Automatically updated from **Active** to **Ended** when SQL Monitor can contact the SQL Server instance.
Possible causes:	• Host machine unreachable • SQL Server service failed • SQL Server service manually stopped Check the list of component services on the relevant Windows machine. Check for **Machine unreachable** alerts.

SQL Server Reporting Service status

Raised when:	SQL Server Reporting Service status matches the status specified in the alert configuration.
Configurable thresholds:	Service status is one of the following: • Stopped • Stopped or paused • Started • Started or paused
Default settings:	Raised as **Medium** when service is **Stopped or Paused**.
Type:	Continuous Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.
Possible causes:	• Service failed • Service manually stopped or started Check the list of component services on the relevant Windows machine.

Host machine alerts

SQL Monitor raises the following types of alerts for problems on a host machine (Windows server):

Clock skew

Raised when:	The difference between the Base Monitor clock time and the monitored server clock time is greater than 15 seconds. (The Base Monitor is the server which is running the monitoring service)
Configurable thresholds:	None **Note**: This alert is always raised as **High**.
Default settings:	Time difference greater than 15 seconds.
Type:	Continuous Automatically updated from **Active** to **Ended** when the times are synchronized (within 15 seconds of each other).
Possible causes:	Server times across your network have not been fully synchronized.

Disk space

Raised when:	One of the following conditions apply, depending on how you configure the alert: • logical disk space used is above a percentage threshold, OR • logical disk space available is less than a fixed value.
Configurable thresholds:	You can configure this alert in two ways: • Used disk space percentage, or • Disk space available (in MB or GB). Low disk space has lasted longer than x seconds .
Default settings:	Disk space available: • Raised as **Low** when less than 1GB • Escalated to **Medium** when less than 800MB • Escalated to **High** when less than 400MB

For longer than: 120 seconds

Type: Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when disk space is above the lowest defined threshold for at least the specified duration.

Possible causes:

- Database and log files may be growing too large without frequent backups.
- Other applications may be using the disk drive for file storage.

Note: SQL Monitor only collects disk space data at 15-second intervals:

- the minimum value for the duration is 15 seconds.
- when you configure the alert, change the duration value by 15 second increments.

Machine unreachable

Raised when: The Windows server (host machine) does not respond to a Ping request from SQL Monitor.

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** when SQL Monitor can contact the host machine.

Possible causes:

- Host machine turned off or has suffered a problem.
- Ping request blocked by machine or a firewall.

Check the log for the machine on the **Monitored servers** page.

Monitoring error (host machine data collection)

Raised when: One of the following conditions applies continuously for 2 minutes:

- Problems with WMI

- Problems with the remote registry
- File sharing issues

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** when data can be collected from the host machine again.

Possible causes:

- One of the required services (WMI or remote registry) has been stopped.
- Remote file access permissions have changed or hidden administrative shares have been disabled.

Monitoring stopped (host machine credentials)

Raised when: SQL Monitor is unable to collect monitoring data from the host machine because the credentials supplied to connect to the machine are invalid or lack permissions.

Configurable thresholds: None

Default settings: Raised as **High**

Type: Continuous

Automatically updated from **Active** to **Ended** once the correct credentials are entered and authentication is confirmed.

Possible causes:

- Your user name or password has been changed.
- Your permissions have changed and are no longer sufficient.

Physical memory

Raised when: One of the following conditions apply, depending on how you configure the alert:

- physical memory used is above a percentage threshold, OR
- physical memory available is less than a fixed value.

Configurable thresholds:

You can configure this alert in two ways:

- Used physical memory percentage, or
- Physical memory available (in MB or GB).

Low physical memory has lasted longer than x seconds.

Default settings:

Physical memory available:

- Raised as **Low** when less than 400MB available
- Escalated to **Medium** when less than 200MB available
- Escalated to **High** when less than 100MB available

For longer than: 60 seconds

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when physical memory is above the lowest defined threshold for at least the specified duration.

Possible causes:

- SQL Server has been configured with insufficient memory.
- Page file space running low.
- Other processes consuming physical memory.
- Not enough RAM on server.

Note:

SQL Monitor only collects physical memory data at 15-second intervals:

- the minimum value for the duration is 15 seconds.
- when you configure the alert, change the duration value by 15 second increments.

Processor under-utilization

Raised when:

Total processor utilization, averaged across all CPUs, is below a percentage threshold for longer than a specified duration.

Configurable thresholds:

Processor utilization less than a specified percentage.

Under-utilization has lasted longer than x seconds.

Default settings:

Alert is **disabled** by default

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when processor utilization is above the lowest defined threshold for at least the specified duration.

Possible causes:

Processor utilization is not as high as expected under normal operations: may indicate that SQL Server is not running normally or processing data - freeing up CPU.

Note:

SQL Monitor only collects processor utilization data at 15-second intervals:

- the minimum value for the duration is 15 seconds.
- when you configure the alert, change the duration value by 15 second increments.

Processor utilization

Raised when:

Total processor utilization, averaged across all CPUs, is above a percentage threshold for longer than a specified duration.

Configurable thresholds:

Processor utilization above a specified percentage.

Utilization above this percentage has lasted longer than x seconds.

Default settings:

- Raised as **Low** when utilization is above 85%
- Escalated to **Medium** when above 90%
- Escalated to **High** when above 95%

For longer than: 60 seconds

Type:

Continuous

Can have multiple thresholds applied and is automatically updated from **Active** to **Ended** when processor utilization is above the lowest defined threshold for at least the specified duration.

Possible causes:

- Other processes running on the server - check the **System processes** area of the raised alert.
- CPU-intensive SQL queries - if Profiler trace is turned on for the SQL Server, check the SQL statements in the **SQL processes/Profiler trace** area of the raised alert.

Note:

SQL Monitor only collects processor utilization data at 15-second intervals:

- the minimum value for the duration is 15 seconds.
- when you configure the alert, change the duration value by 15 second increments.

SQL Server Browser Service status

Raised when:

SQL Server Browser Service status matches the status specified in the alert configuration.

Configurable thresholds:

Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings:

Raised as **Medium** when service is **Stopped or Paused**.

Type:

Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

SQL Server Integration Service status

Raised when:

SQL Server Integration Service status matches the status specified in the alert configuration.

Configurable thresholds: Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings: Raised as **Medium** when service is **Stopped or Paused**.

Type: Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

SQL Server VSS Service status

Raised when: SQL Server VSS Service status matches the status specified in the alert configuration.

Configurable thresholds: Service status is one of the following:

- Stopped
- Stopped or paused
- Started
- Started or paused

Default settings: Raised as **Medium** when service is **Stopped or Paused**.

Type: Continuous

Automatically updated from **Active** to **Ended** when the service status changes to a status other than that specified.

Possible causes:

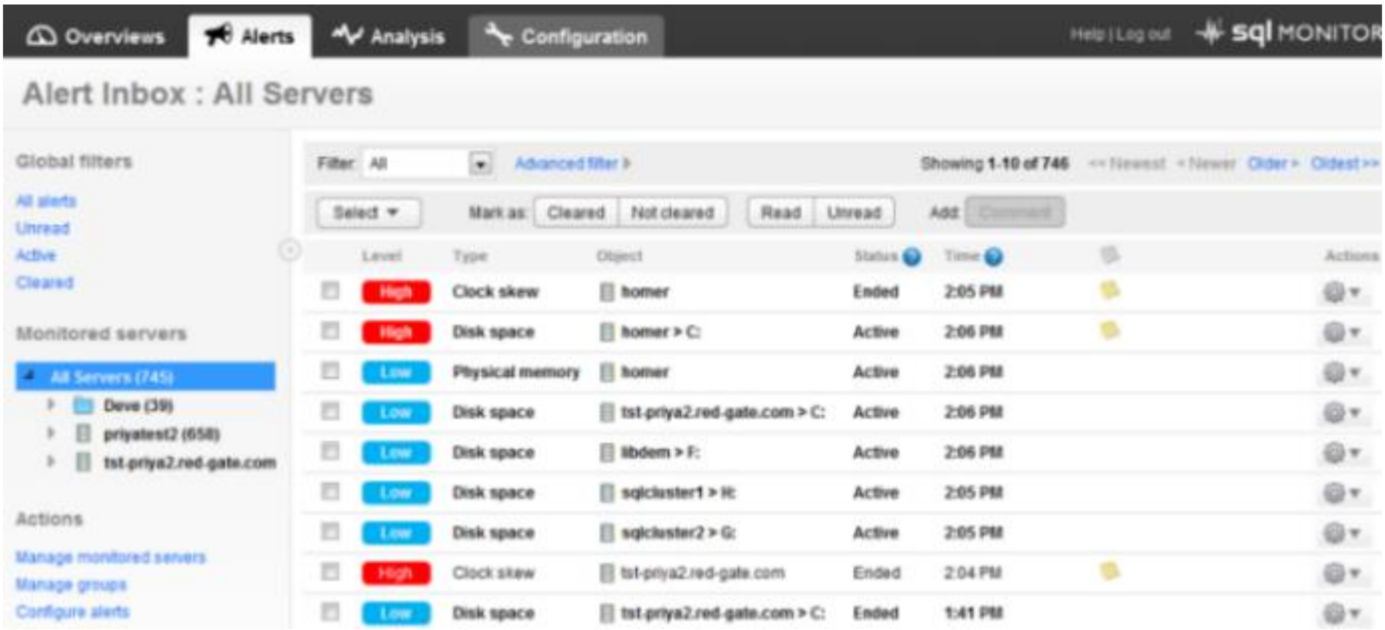
- Service failed
- Service manually stopped or started

Check the list of component services on the relevant Windows machine.

Using the Alert Inbox

The Alert Inbox is an email-style inbox for all the alerts that SQL Monitor has raised. Like an email inbox, you can browse through the list, open a particular alert, mark it as read, or select multiple alerts at a time.

- The Alert Inbox updates automatically to check for new alerts every 30 seconds. You do not need to manually Refresh your browser.
- By default all the alerts are pre-configured with sensible default values.

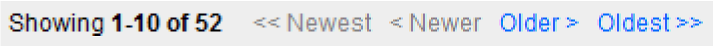


	Level	Type	Object	Status	Time		Actions
□	High	Clock skew	homer	Ended	2:05 PM	●	⚙ ▾
□	High	Disk space	homer > C:	Active	2:06 PM	●	⚙ ▾
□	Low	Physical memory	homer	Active	2:06 PM		⚙ ▾
□	Low	Disk space	tst-priya2.red-gate.com > C:	Active	2:06 PM		⚙ ▾
□	Low	Disk space	libdem > F:	Active	2:06 PM		⚙ ▾
□	Low	Disk space	sqlcluster1 > H:	Active	2:05 PM		⚙ ▾
□	Low	Disk space	sqlcluster2 > G:	Active	2:05 PM		⚙ ▾
□	High	Clock skew	tst-priya2.red-gate.com	Ended	2:04 PM	●	⚙ ▾
□	Low	Disk space	tst-priya2.red-gate.com > C:	Ended	1:41 PM		⚙ ▾

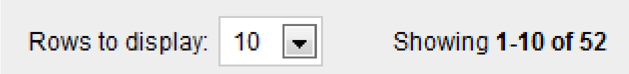
Seeing more alerts

When you first install SQL Monitor, the Alert Inbox shows a maximum of ten alerts per page.

- To view the next ten alerts, click **Older**.
- To view the last page of alerts, click **Oldest**.

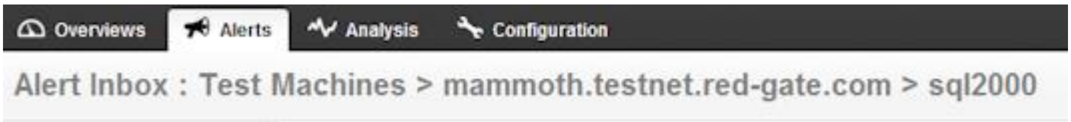


- To increase the number of alerts shown, use the **Rows to display** option below the inbox:



Viewing alerts for a particular object

When you first click the **Alerts** tab, SQL Monitor always shows every uncleared alert across all your servers. Under **Monitored servers**, click on a group, host machine, SQL Server instance, or database. The Alert Inbox page title reflects the currently selected object:

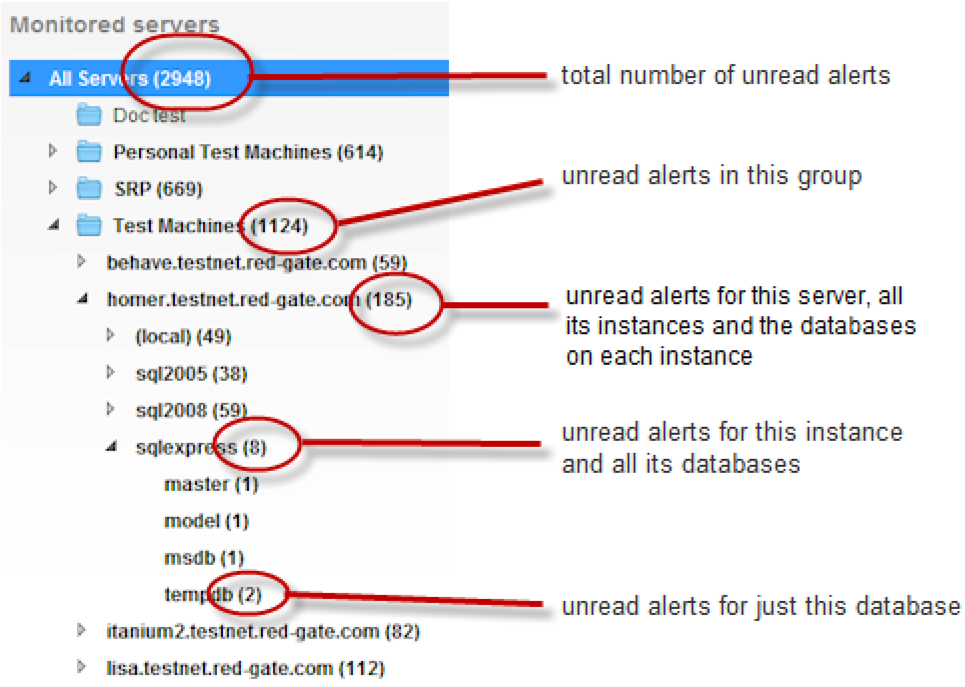

Overviews
Alerts
Analysis
Configuration
Alert Inbox : Test Machines > mammoth.testnet.red-gate.com > sql2000

Note: If you arrive at the Alert Inbox by clicking on a link from an overview page, the relevant object is pre-selected in the **Monitored servers** list. Clicking on **Uncleared alerts** in a database overview page, for example, will automatically select that database, and show only alerts related to it.

To change the list of alerts displayed, continue to drill down in the **Monitored servers** list. Alerts are shown for the currently selected level **and all levels below**. If you select a host machine, for example, you will see:

- alerts raised for the machine itself (such as disk space or memory alerts)
- alerts raised for all instances running on it (such as job failed or error log entries)
- alerts raised for all databases on those instances (such as fragmented indexes or backup overdue alerts)

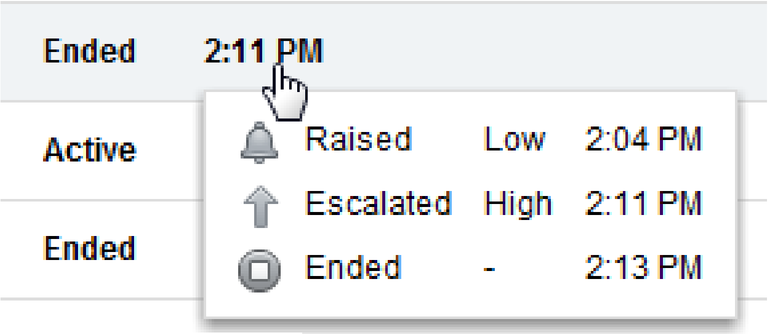
The number in brackets after an object in the Monitored servers list always shows the number of **unread** alerts, regardless of the current filters applied. As you drill down in the hierarchy, the number of unread alerts at each level is displayed:


Monitored servers
All Servers (2948)
DocTest
Personal Test Machines (614)
SRP (669)
Test Machines (1124)
behave.testnet.red-gate.com (59)
homer.testnet.red-gate.com (185)
(local) (49)
sql2005 (38)
sql2008 (59)
sqlexpress (8)
master (1)
model (1)
msdb (1)
tempdb (2)
itanium2.testnet.red-gate.com (82)
lisa.testnet.red-gate.com (112)
total number of unread alerts
unread alerts in this group
unread alerts for this server, all its instances and the databases on each instance
unread alerts for this instance and all its databases
unread alerts for just this database

Note: The list of alerts is also filtered by whatever is set in the **Filter** drop-down.

How alerts are sorted in the inbox

Alerts are sorted by the time they were raised, or for continuous alerts, whenever they changed level or were updated to **Ended**.



Ended 2:11 PM

Active

Ended

🔔	Raised	Low	2:04 PM
↑	Escalated	High	2:11 PM
⏹	Ended	-	2:13 PM

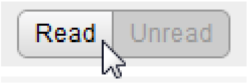
Note: The displayed time may differ from the time used to sort the list. In the above example, the displayed alert time shows 2:11 rather than 2:04, as this is when the alert reached its highest level.

An alert's timestamp is **not** updated when:

- An alert changes to Ended
- An alert is cleared
- An alert downgrades to a lower level
- An alert escalates to a level that it has already previous reached

Actions you can apply to alerts

To:	**Do any of the following:**
Open an alert, in order to view its details on a separate page	Click anywhere in the row for the alert. Click **Open** from the Actions list ⚙▾.
Mark an alert as read (only available for alerts that are currently unread)	Click **Mark as read** from the Actions list ⚙▾. Select the alert using its check box: ☑ High then click the **Read** button:



This is useful when selecting multiple alerts to mark as read.

Open the alert: alert is automatically marked as read.

Clear the alert: alert is automatically marked as read.

Mark an alert as unread

(only available for alerts that are currently read)

Click **Mark as unread** from the Actions list ⚙▾.

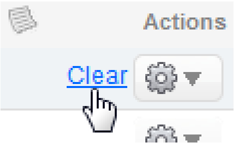
Select the alert using its check box then click the **Unread** button.

This is useful when selecting multiple alerts to mark as unread.

Clear an alert

(Cleared alerts are hidden from the inbox by default)

Click **Clear** in the alert row:



Click **Clear** from the Actions list ⚙▾.

Select the alert using its check box then click the **Cleared** button.

This is useful when clearing multiple alerts.

Add a comment	Open the alert and select the Comments tab, then use the **Add comment** button. Click **Add comment** from the Actions list ⚙▾ . Select the alert using its check box then click the **Comment** button. You can add a comment to multiple selected alerts. Comments are displayed in the Alert Inbox. Only the most recent comment for each alert is available. To display a comment, hold the mouse pointer over the Comments icon 📝.
Select one or more alerts	Select the check box ☑ High next to each alert.
Configure an alert	Click **Configure** from the Actions list ⚙▾ This takes you to the relevant alert settings page for the selected alert type and object. Under **Actions** on the left side, click the **Configure alerts** link to go to the **Alert settings** main page, where you can adjust the settings for any alert at any level. See Customizing alerts.

Selecting alerts

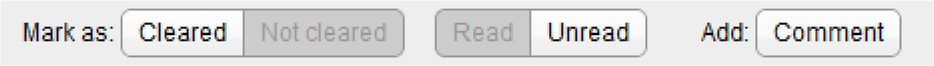
Selecting alerts is a useful way to apply actions to multiple alerts at once, rather than having to perform the action for each alert in turn.

Turn on the check box ☑ High next to each alert you want to select. Use Shift + click to select a block of alerts.

Selected alerts are highlighted in the inbox by row color.

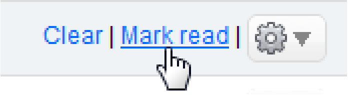
Applying actions to selected alerts

Use the command bar above the Alert Inbox to apply actions to all the currently selected alerts:



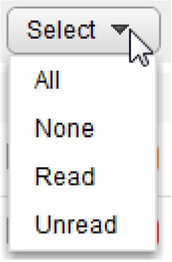
- If you select **Add Comment**, the same comment will be added to all the selected alerts.
- Clearing or reading a selection of alerts may remove them from the Alert Inbox, depending on the current filter settings.

Inline commands and actions from the Actions drop-down menu are only ever applied to the single alert:



Using the Select button

Use the **Select** drop-down button to select large groups of alerts at once:

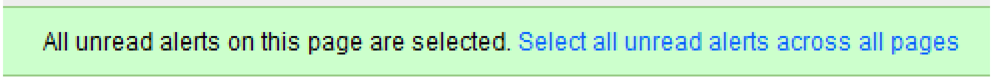


The Select option **only applies to the current filtered view of your alerts**. For example, if you are currently filtering the Alert Inbox to show only Medium Job failed alerts, and choose **Read**, then only Medium Job failed alerts that are marked as read are selected.

The Select drop-down list is context sensitive. If you are currently filtering the Alert Inbox to view only unread alerts, the **Unread** option will not be available.

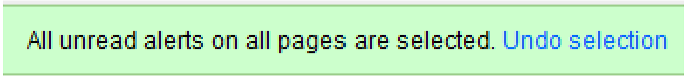
Selecting alerts across multiple pages

When there are several pages of alerts, only the current page of alerts is selected by default. You can choose to apply the selection to all alerts on all pages:



All unread alerts on this page are selected. Select all unread alerts across all pages

If you choose this option, the message is updated:



All unread alerts on all pages are selected. Undo selection

Use the **Older** and **Newer** links to confirm that alerts are selected on other pages. Clicking **Undo selection** will undo the selection on all pages except the page where you first applied the selection.

Any actions you apply at this point, for example Mark as read, Clear, or Add comment will be applied to all selected alerts on all pages.

Filtering alerts

You can filter which alerts appear in the inbox by any of their attributes:

- by level (Low, Medium, High)
- by status (Event, Active, Ended, Cleared)
- by type (e.g. Job failed, Backup overdue, or any selection)
- by action taken (Read, Unread, Commented, No Comment)
- by time

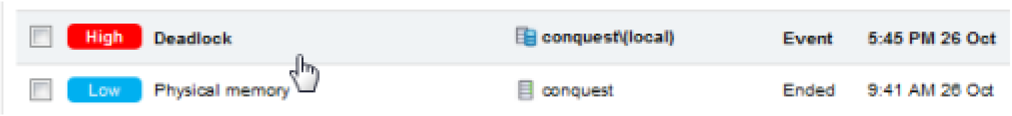
SQL Monitor has built-in filters for the most common options you may want. You can also create your own filters using the Advanced filter pane.

See Filtering alerts.

Viewing details of an alert

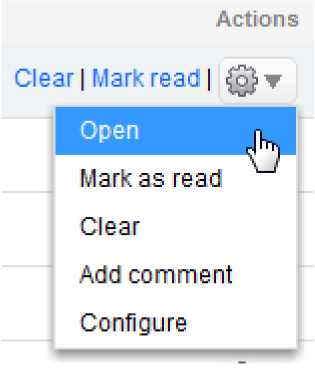
To view the details of raised alert, from the Alert Inbox, do one of the following:

- Click anywhere in the row for that alert:



□	High	Deadlock	conquest\(local)	Event	5:45 PM 26 Oct
□	Low	Physical memory	conquest	Ended	9:41 AM 26 Oct

- Select **Open** from the Actions drop-down menu:



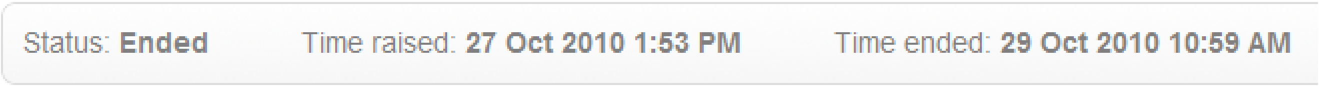
The alert is opened in its own page. When you open an alert, it is automatically marked as read.

Tip: To open the alert on a separate page, use your browser's **Open in new window** context menu command. (This only works for the Actions menu **Open** command.)

What information is provided for an alert?

Alert details are organized into three main areas, from top to bottom:

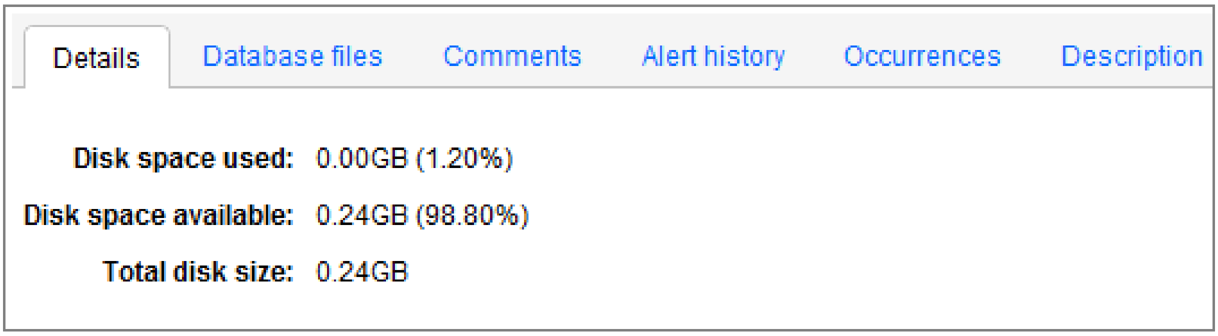
Summary pane



Status: **Ended** Time raised: **27 Oct 2010 1:53 PM** Time ended: **29 Oct 2010 10:59 AM**

Shows the current status of the alert and its raised time and (if applicable) its ended time.

Alert details area



Disk space used: 0.00GB (1.20%)

Disk space available: 0.24GB (98.80%)

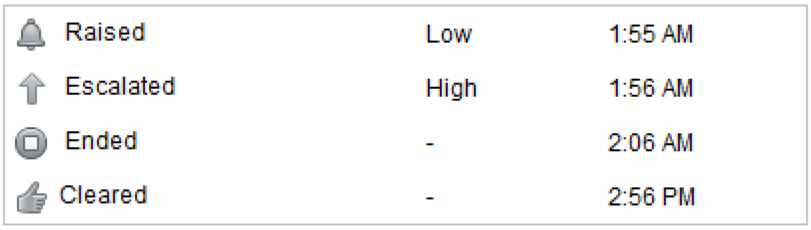
Total disk size: 0.24GB

The alert details area is organized into several tabs:

Details: general data showing the nature of the issue.

Comments: all comments that have been added for this occurrence of the alert.

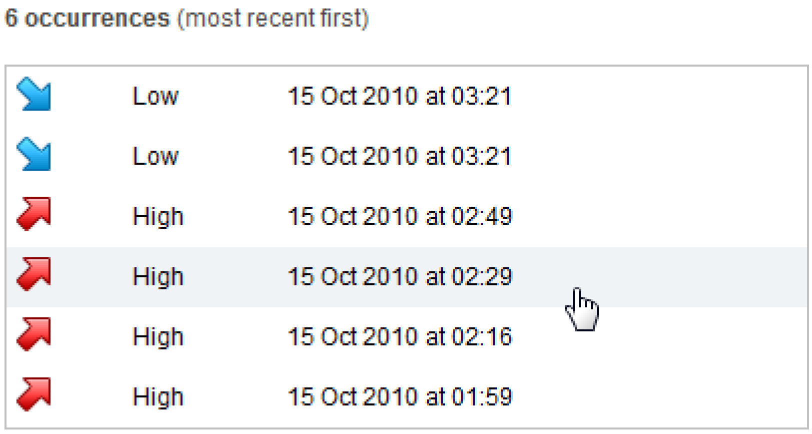
Alert history: the lifecycle of this occurrence of the alert, displayed as a list of entries representing each significant change:



Raised	Low	1:55 AM
Escalated	High	1:56 AM
Ended	-	2:06 AM
Cleared	-	2:56 PM

For continuous alerts that are frequently being escalated and downgraded over time, there may be a long list of entries. The maximum number of entries displayed in the Alert history page is 200. In the unlikely event that the number of entries exceeds this limit, the initial 100 entries and the most recent 100 entries are displayed.

Occurrences: lists all alerts of this type raised for the current object, in order of time raised. Click on any occurrence to view its details.



6 occurrences (most recent first)

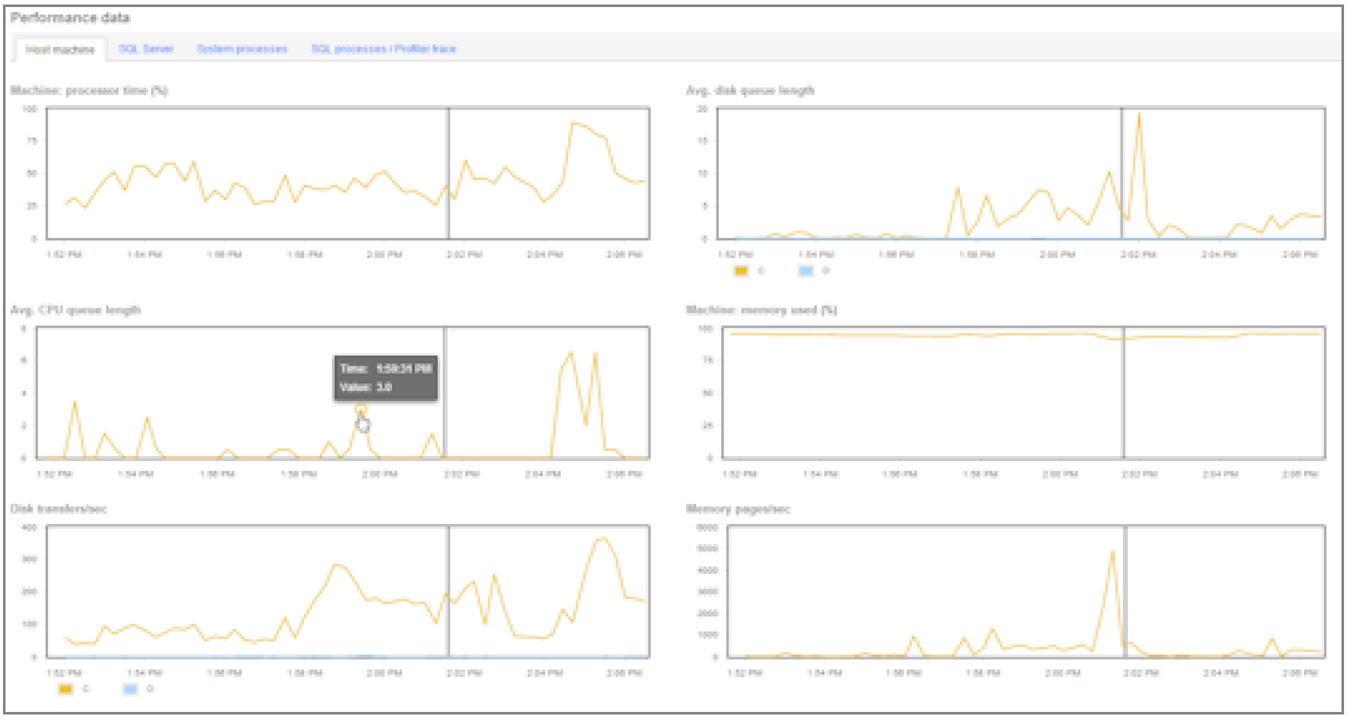
↘	Low	15 Oct 2010 at 03:21
↘	Low	15 Oct 2010 at 03:21
↗	High	15 Oct 2010 at 02:49
↗	High	15 Oct 2010 at 02:29
↗	High	15 Oct 2010 at 02:16
↗	High	15 Oct 2010 at 01:59

Description: explanation of this alert, when it is raised, and links to further information.

Some alert types have an additional tab that contains more detail about the issue or related information.

Performance data area

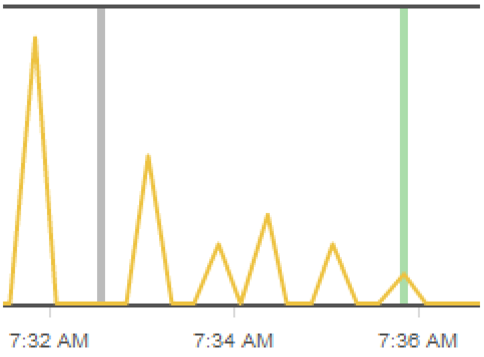
The performance data area shows various performance counter values and process information captured around the time the alert was raised.



Host machine: shows graphs for counters relevant to the host Windows machine (e.g. processor time, disk queue length).

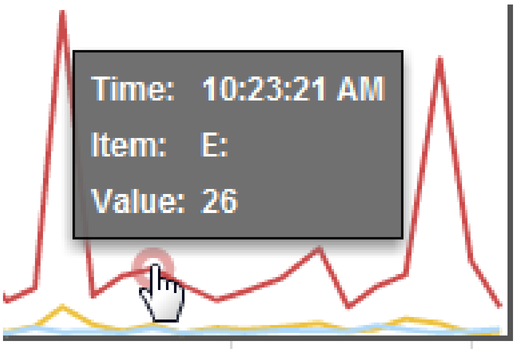
SQL Server: shows graphs for counters relevant to the SQL Server instance (e.g. user connections, buffer cache hit ratio).

The alert raised time is represented by the vertical gray line. For alerts that have ended, the ended time is shown as a green line:



For each graph, you can do the following:

- Click anywhere on the graph to go to the **Analysis** page, with the counter and object pre-selected, so you can expand the time range.
- Move your mouse pointer over a point on the graph to read the value:

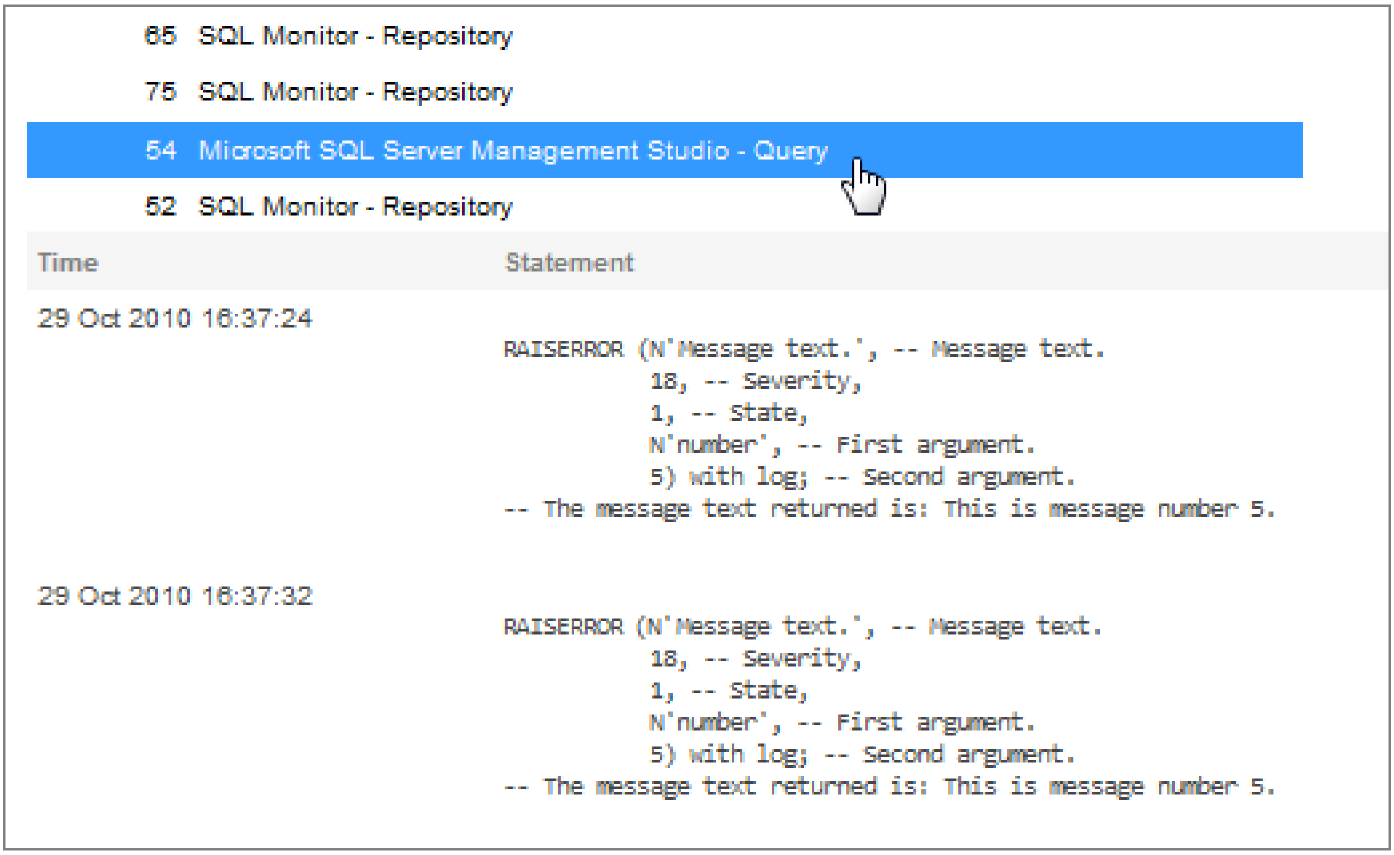


The start and end times of all these graphs relative to the alert raised time will vary depending on the nature of the alert and when SQL Monitor last collected monitoring data.

System processes: A snapshot of the processes that were running at the time the alert was raised. The processes are sorted by name.

SQL processes/Profiler trace: A snapshot of the SQL processes that were running at the time the alert was raised.

If you have enabled trace on the server on which this alert was raised, you can click on a SQL process in the list to view the detailed trace output:



65 SQL Monitor - Repository

75 SQL Monitor - Repository

54 Microsoft SQL Server Management Studio - Query

52 SQL Monitor - Repository

Time	Statement
29 Oct 2010 16:37:24	RAISERROR (N'Message text.', -- Message text. 18, -- Severity, 1, -- State, N'number', -- First argument. 5) with log; -- Second argument. -- The message text returned is: This is message number 5.
29 Oct 2010 16:37:32	RAISERROR (N'Message text.', -- Message text. 18, -- Severity, 1, -- State, N'number', -- First argument. 5) with log; -- Second argument. -- The message text returned is: This is message number 5.

Top 10 expensive queries: This tab is available for SQL Server alerts only. It displays the top 10 queries that used the most resource for a 15 minute period, starting 10 minutes before the alert was triggered.

Note: This feature is not available for servers running on Microsoft SQL Server 2000.

The following query data is displayed:

- Execution count - the number of times this query statement was executed. By default, queries are listed in descending order according to this metric.
- Duration - how long it took in milliseconds to execute the query.
- CPU time - how much processor time in milliseconds was used to execute the query.
- Physical reads - the number of times a page is read into the buffer cache. If the page is in the cache already, it uses the page already in memory and does not generate a physical read.
- Logical reads - the number of times the database engine requested a page from the buffer cache.
- Logical writes - the number of times data is modified in a page in memory. If a page stays in memory for an extended period, more than one logical write may be required before it is physically written to disk.

The database that each query was run against is displayed in the Database column.

You can also update the list as follows:

- Click **Totals** to display queries based on total values.
- Click **Avg. per execution** (selected by default) to display queries based on average metrics over the time period selected. Note: This does not affect Execution count which always displays total values.
- Click on a different column heading to display queries based on that metric in descending order.

Note: Selecting one of these options does not simply change the sort order of the existing list of queries. A new table is generated according to the selected option, so different queries are likely to be displayed.

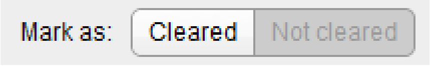
Why is there no trace data?

- The selected SPID may not have any trace output associated with it.
- You have not enabled Profiler trace for this server. See Configuring Profiler trace.

Working with raised alerts

When you have read the details of a raised alert, you may want to do one of the following:

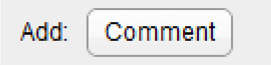
- **Clear the alert**

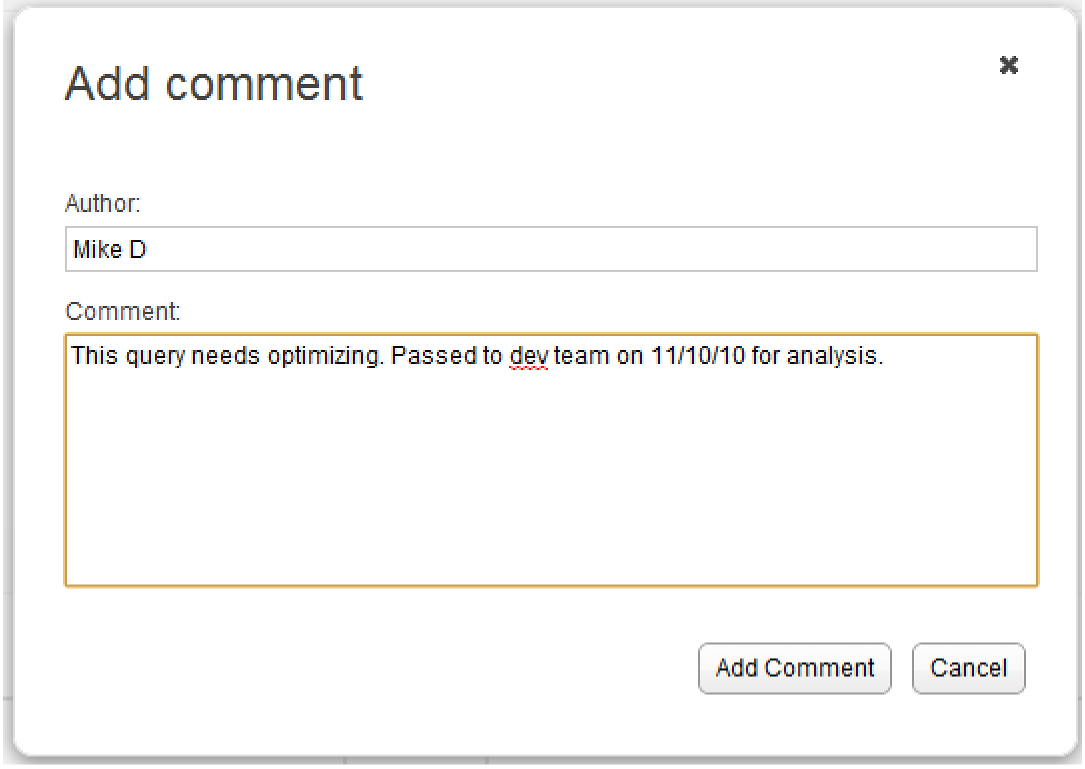
  Clearing an alert hides it from the default "All" filter in the Alert Inbox. Clear alerts that you have investigated, or are not important to you. Cleared alerts are not included in the alert summary counts on the overview pages.

  To view cleared alerts in the Alert Inbox, use the **Cleared** filter in the Advanced filter pane.

- **Add a comment**

Adding a comment allows you to make a note about this occurrence of the alert.



Add comment

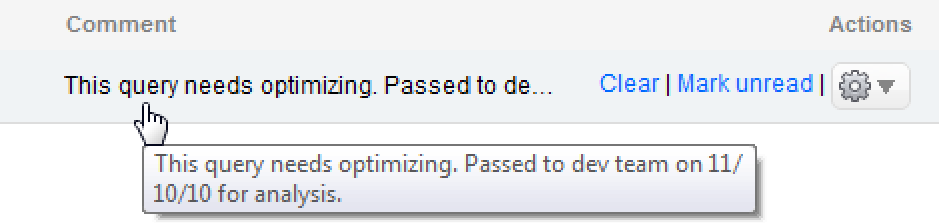
Author:

Mike D

Comment:

This query needs optimizing. Passed to dev team on 11/10/10 for analysis.

The comment is displayed in the Alert Inbox. Move your mouse pointer over the comment to view a tooltip containing the full comment text:

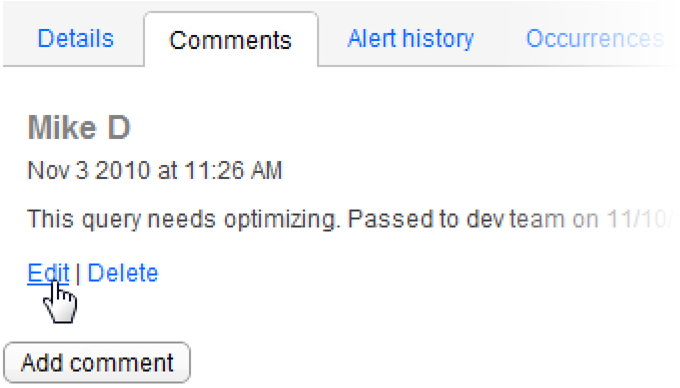


Comment	Actions
This query needs optimizing. Passed to de...	Clear | Mark unread |

This query needs optimizing. Passed to dev team on 11/10/10 for analysis.

Only the most recent comment for each occurrence is displayed in the Alert Inbox. To view all alerts with comments, use the **Has comment** filter in the Advanced filter pane.

You can add further comments to an alert, and delete or edit an existing comment. Open the alert, and use the **Comments** tab to manage comments:



Mike D

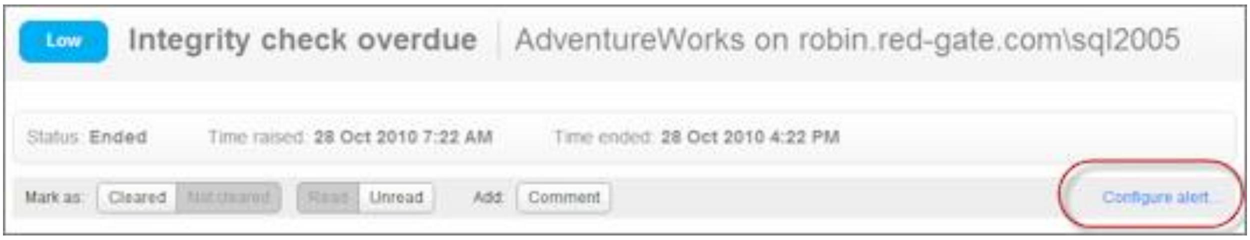
Nov 3 2010 at 11:26 AM

This query needs optimizing. Passed to dev team on 11/10/

If you edit an existing comment, the timestamp for the comment is not updated.

- **Customize the alert**

  Customizing the settings for an alert is useful if alerts are being raised that you do not want to be alerted about in future, or if you want to adjust the thresholds that trigger the alert, or set up email notifications to be sent to colleagues. Click **Configure alert**:



Integrity check overdue | AdventureWorks on robin.red-gate.com\sql2005

Status: Ended   Time raised: 28 Oct 2010 7:22 AM   Time ended: 28 Oct 2010 4:22 PM

  SQL Monitor takes you straight to the configuration settings page for the specific object, but you can choose to configure the alert at any level in the hierarchy. See Customizing alerts.

Filtering alerts

You can filter the alerts that are displayed in the Alert Inbox in two basic ways:

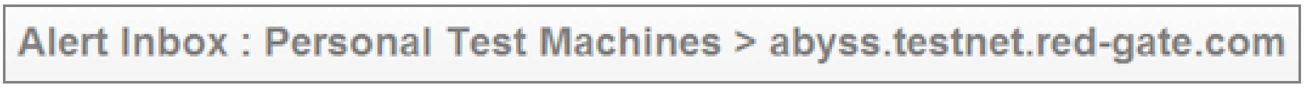
- by the selection in the **Monitored servers** list
- by alert attributes (using system or custom filters)

These two methods of filtering the Alert Inbox always work in combination.

The Monitored servers list

The Monitored servers list controls the objects for which alerts are displayed. For example, if you select a database in the list, then only alerts relating to that database are listed.

The current object selection is reflected in the page heading:

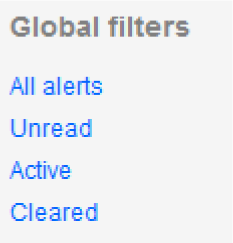


Alert Inbox : Personal Test Machines > abyss.testnet.red-gate.com

In this example, the Alert Inbox is displaying only alerts on a selected host machine. The heading includes the full path to the selected object, showing where it is in the hierarchy of groups, machines, instances and databases.

Global filters

The Global filters are available above the Monitored servers list. They are a quick way of getting back to a sensible starting point.



Global filters

All alerts
Unread
Active
Cleared

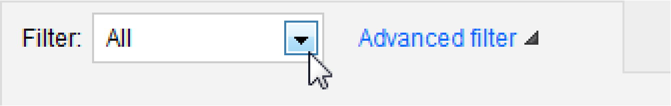
The Global filters are shortcuts that carry out two actions at once:

1. Reset the Monitored servers list back to All Servers.
2. Apply a system filter to the **Filter** drop-down list.

Note: The **All alerts** filter excludes cleared alerts. Cleared alerts are hidden by default so they do not clutter up your Alert Inbox.

System filters

The **Filter** drop-down above the Alert Inbox contains a number of predefined filters, covering typical scenarios for filtering the Alert Inbox. For example, you can view only Low, Medium, or High level alerts, or see all Active alerts.



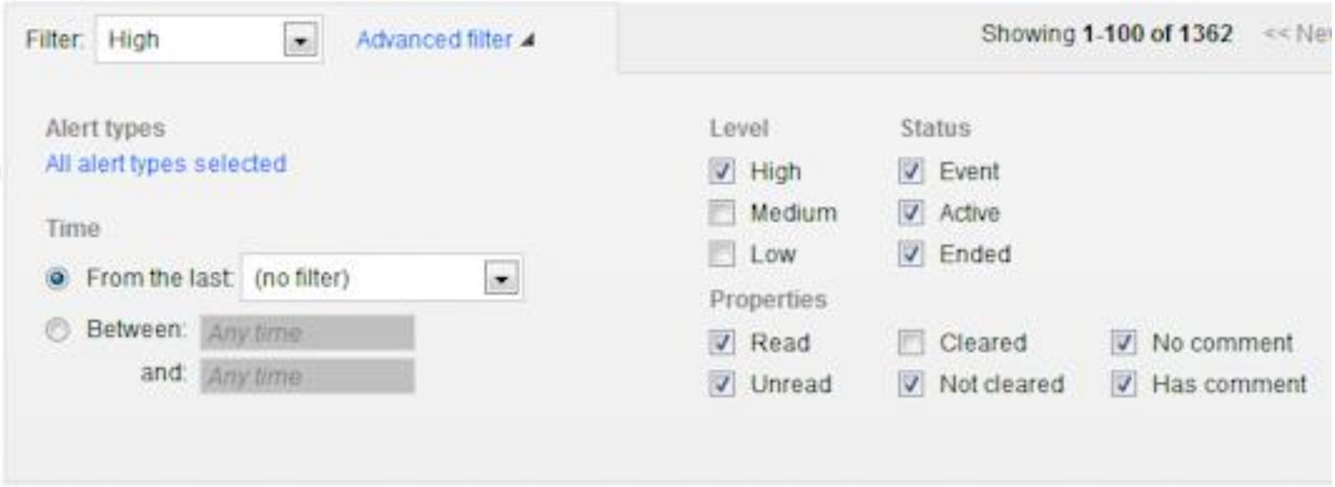
Filter: All

As soon as you select a filter, the Alert Inbox is updated.

Tip: Use the **Cleared** filter to view all cleared alerts. All the other filters (including **All**) hide cleared alerts from the inbox.

Custom filters

Click **Advanced filter** to expand the filter panel, where you can apply any combination of filter options you want.



Filter: High

Showing 1-100 of 1362

Alert types: All alert types selected

Time

● From the last: (no filter)

○ Between: Any time

and: Any time

Level

☑ High

□ Medium

□ Low

Status

☑ Event

☑ Active

☑ Ended

Properties

☑ Read

☑ Unread

□ Cleared

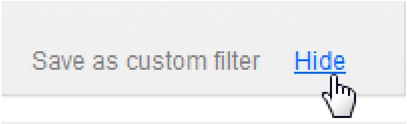
☑ Not cleared

☑ No comment

☑ Has comment

To collapse the filter panel:

- Click **Advanced filter** again, or
- Click the **Hide** hyperlink at the bottom right corner of the panel



The Advanced filter panel allows you to filter alerts in a number of ways:

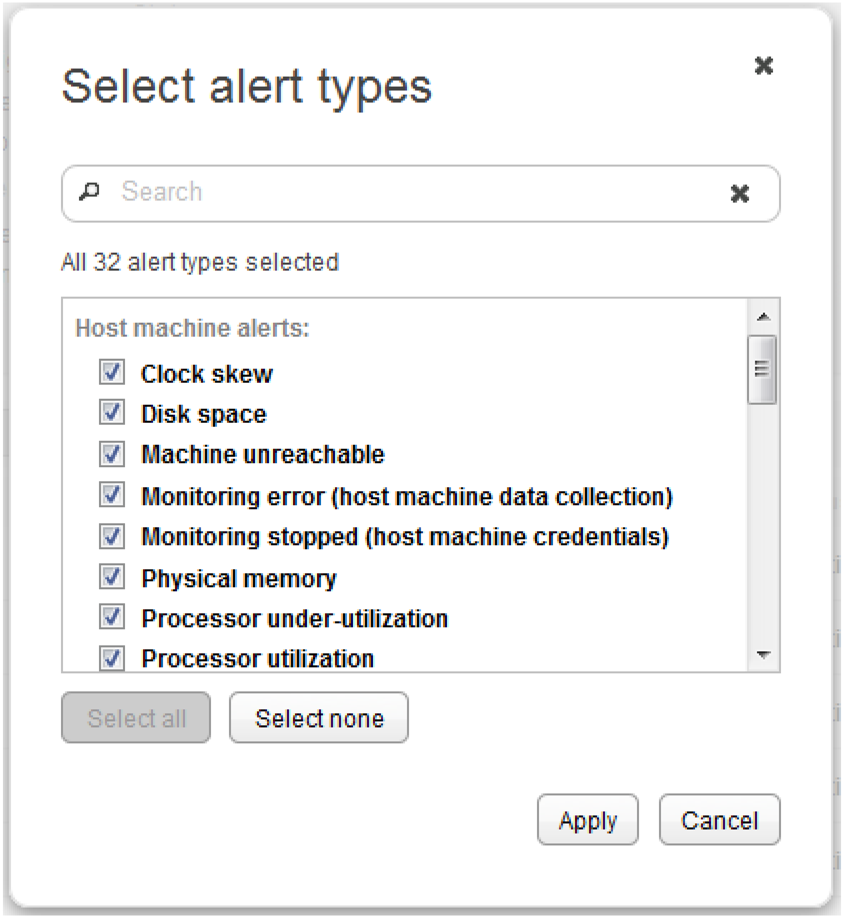
- By type
- By time (when the alert was raised)
- By level
- By status
- By properties

All these options work in combination. You can be very specific about which alerts you want to see, for example, High level deadlocks that are unread in the last hour, or all Active alerts with comments except Low level alerts and Job failed alerts between last night and today.

You can then save and apply these custom filters to all objects or selected objects only.

Filtering by type

Click **All alert types selected**. The Select alert types box is displayed:



Select alert types

All 32 alert types selected

Host machine alerts:

- ☑ Clock skew
- ☑ Disk space
- ☑ Machine unreachable
- ☑ Monitoring error (host machine data collection)
- ☑ Monitoring stopped (host machine credentials)
- ☑ Physical memory
- ☑ Processor under-utilization
- ☑ Processor utilization

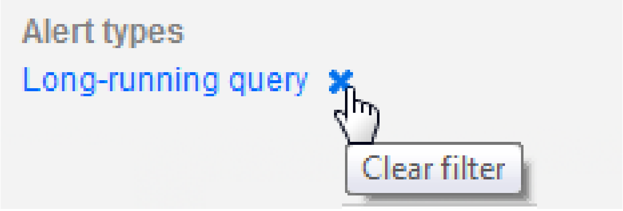
Select the check box for each alert type you want to show in the Alert Inbox.

Tip: Use the **Select none** button first to clear the selection, if you only want to choose one or two types to display.

If you are familiar with the alert names, type the first few characters of an alert name in the **Search** box. Only matching alerts are displayed. (You may need to choose **Select none** and then **Select all** if you want to select only the matching alerts.)

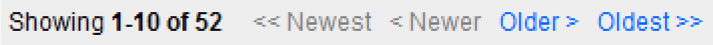
As soon as you click **Apply**, the Alert Inbox is filtered by your selection, and the Advanced filter panel is updated:

- The selected alert type is displayed (or the number of types selected, if more than one).

  
  Alert types
  Long-running query ✖

  Click the **x** to remove the alert type filter; the link is reset to **All alert types selected**.

- You can see how many alerts match the current filter options by looking at the **Showing**.... number.

  
  Showing **1-10 of 52**

Filtering by time

The time filter applies to the time each alert was raised. Under **Time**, select how you want to filter the alerts:

- **From the last**: select a fixed time period from the drop-down list
- **Between x and y**: click in each box to choose a date and time. You can use only one box if required, for all alerts that were raised up to a fixed point in time, or all alerts starting from a fixed point in time.

  Note: Alerts will be shown that were raised in the minute matching the "End" time; for example, if you want to view alerts between 10:00 and 14:00, alerts that were raised up till 14:01 will be shown.

Click anywhere in the alert panel outside of the boxes to apply the time filter options. The number of alerts is updated instantly, and the **Showing....** number changes accordingly.

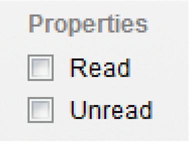
Click the **x** to remove the time filter (reset it to "Any time").

Filtering by other properties

Choose the required check boxes under **Level**, **Status**, and **Properties** to filter the Alert Inbox. As soon as you clear or select a check box, the list of alerts is updated accordingly to match your selection.

Why have all the alerts vanished from the list?

You can select combinations of filter options that will always result in zero matching alerts:



Properties

□ Read

□ Unread

In this example, you are telling SQL Monitor that you don't want to see alerts that are either Read or Unread. However, all alerts must be either Read or Unread; therefore no alerts will ever match this set of options.

Similarly, you can choose both **Has comment** and **No comment** or **Cleared** and **Not cleared**. In each case, no alerts can possibly match the selection.

The Alert Inbox may also be empty because no alerts happen to match a legitimate combination of options.

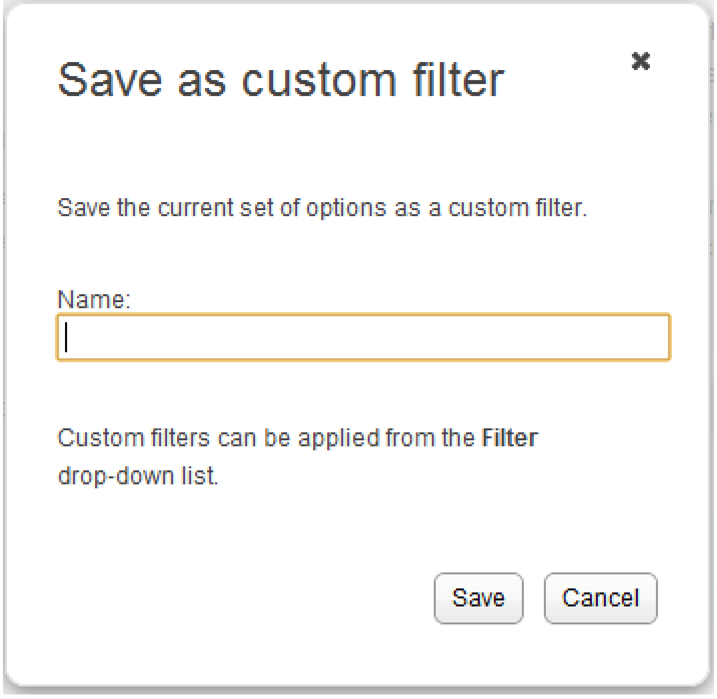
Saving advanced filter options as a custom filter

When you have selected the advanced filter options you want, you can save them as a custom filter.

This allows you to quickly reapply all the filter options you have selected, without having to reselect them again each time. You can save any number of custom filters, and this may help you prioritize which alerts you investigate - Deadlocks first, followed by all High alerts except deadlocks, then all alerts within the last two hours, and so on.

To save your filter options as a custom filter:

1. Click the **Save as custom filter** hyperlink. The Save as custom filter box is displayed:



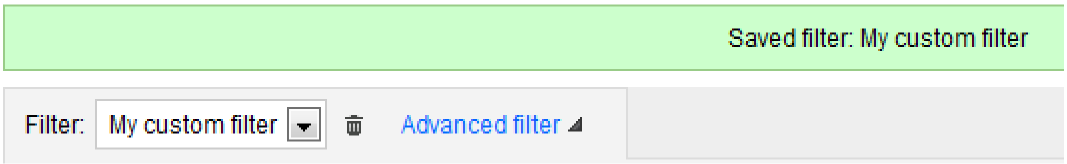
Save as custom filter

Save the current set of options as a custom filter.

Name:

Custom filters can be applied from the **Filter** drop-down list.

2. Type a name for the custom filter. You cannot use the name of a system filter.
3. Click **Save**. Your custom filter is now available from the **Filter** drop-down list:



Saved filter: My custom filter

Filter: My custom filter

To delete a custom filter

1. Select the filter you want to delete from the **Filter** list.
2. Click the delete button 🗑.

   The Filter list defaults back to All, but the custom filter options are persisted until you explicitly select something else.

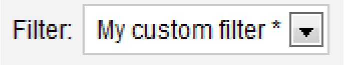
To edit a custom filter

1. Select the filter you want to edit from the **Filter** list.

   This filter is immediately applied to the Alert Inbox.

2. Click **Advanced filter** to display the advanced filter pane, showing the saved options for this filter.

3. Edit the options. An asterisk * next to the custom filter name identifies it as being modified:



Filter: My custom filter *

4. Select **Save as custom filter**. The filter name is pre-filled in the **Name** box:
    - To save the edited custom filter, leave the existing name and click **Save**.
    - To create a new custom filter, enter a new name for the custom filter. The previous custom filter remains unchanged, and a new custom filter is created.

Customizing alerts

SQL Monitor provides sensible factory defaults for alert types so that alerts can be raised as soon as you've installed the application. You can use the **Alert settings** page (Configuration > Alert settings) to customize individual alert types for specific jobs, disks, databases, servers, clusters and groups.

How are alert settings applied?

Alert settings are applied in a hierarchy; an object inherits its alert settings from the level above in the hierarchy. For example, a database inherits its settings from the instance, which in turn inherits settings from the host machine, which inherits from the group to which it belongs.

When you first add a server to monitor, it inherits default alert settings for every type of alert from the All Servers level, which is the highest level in the hierarchy.

What can be configured?

For each type of alert, you can:

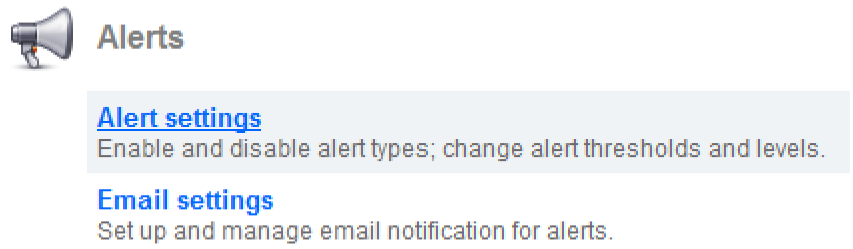
- disable it, so the alert will not be raised in future
- change the level at which it is raised, to either Low, Medium, or High
- change the thresholds that raise an alert to be raised (certain alert types only)
- change the email recipient

Each type of alert can be customized for each object you are monitoring (for example, a specific server, job, or database). You can also customize alerts across groups of objects (all databases on an instance, all servers in a group), or change everything at once using the All Servers setting.

To set up and configure global email notification settings, see Setting up email notification.

Configuring alert settings

Go to the **Configuration** tab. Under **Alerts**, select **Alert settings**:

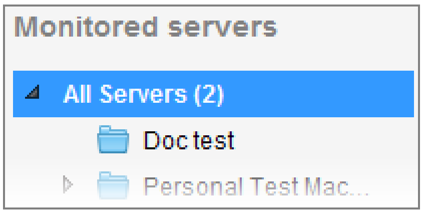

Alerts
Alert settings
Enable and disable alert types; change alert thresholds and levels.
Email settings
Set up and manage email notification for alerts.

To configure an alert type for a group, host machine, SQL Server instance, database or job, drill down to select the required object from the **Monitored servers** list. The alert types relevant for the selected object are listed. For example, if you select a database, only the six database-specific alert types are displayed.

Click on the alert type in the list that you want to edit and follow the instructions in *Customizing settings* below.

Changing the default alert settings (the All Servers level)

By default, when you first go to the Alert settings page, you are at the All Servers level. Changing the settings at the All Servers level applies the settings to everything you're monitoring:



Click on the alert type in the list that you want to edit.

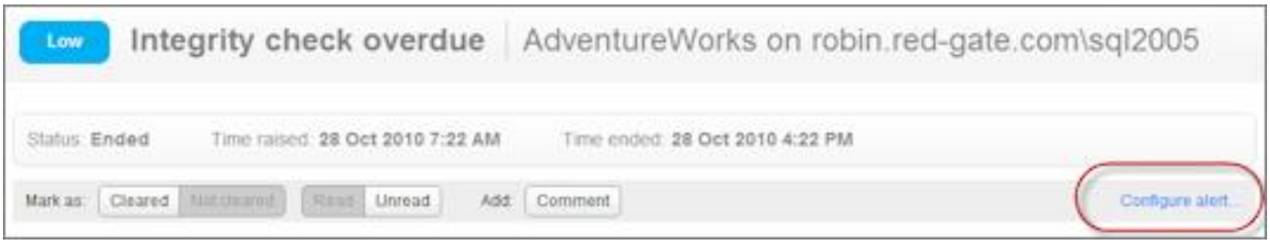
Note: Changing alerts at the All Servers level does not affect any alerts you have already customized at a lower level (for a specific server or database, for example).

Click **Restore defaults** to reset an alert type back to its factory settings

Configuring the settings for a raised alert

When you click **Configure alert...** for a raised alert (from the Alert Inbox or from an individual alert page), SQL Monitor takes you straight to the configuration settings page for the object of that alert.

For example, configuring an **Integrity check overdue** alert will take you to the alert settings page for the specific database for which the alert was raised:

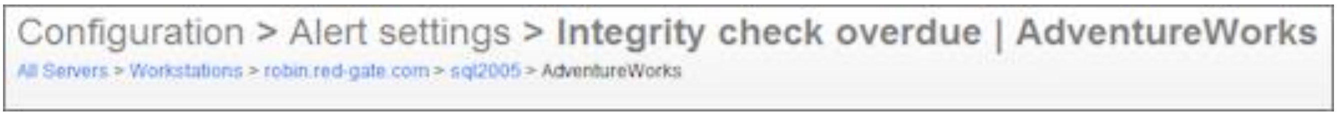


Integrity check overdue | AdventureWorks on robin.red-gate.com\sql2005

Status: Ended Time raised: 28 Oct 2010 7:22 AM Time ended: 28 Oct 2010 4:22 PM

Mark as: Cleared Not cleared Read Unread Add: Comment Configure alert...

On the alert settings page, the page title and hyperlinked breadcrumbs beneath identify exactly what settings are displayed:

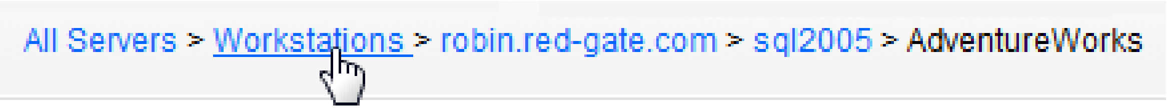


Configuration > Alert settings > Integrity check overdue | AdventureWorks

All Servers > Workstations > robin.red-gate.com > sql2005 > AdventureWorks

In the example above, the alert settings page is for the AdventureWorks database on the sql2005 instance only. If you edit the settings at this level, you will be changing the alert for just that database.

To edit this alert so that it applies to a broader scope of objects, click on the appropriate higher level in the breadcrumbs. For example, to edit the settings for all databases in the "Workstations" group:

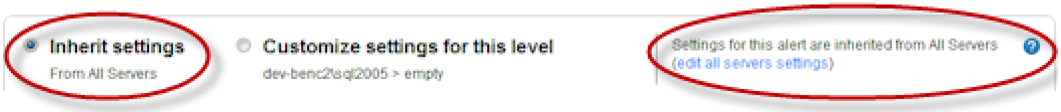


All Servers > Workstations > robin.red-gate.com > sql2005 > AdventureWorks

The page title is updated to reflect the fact that you are editing the alert settings for a group.

Customizing settings

The level from which the selected object currently inherits its settings for this alert type is displayed at the top of the page. The rest of the configuration options are grayed out.



● Inherit settings
From All Servers

○ Customize settings for this level
dev-benc2\sql2005 > empty

Settings for this alert are inherited from All Servers
(edit all servers settings)

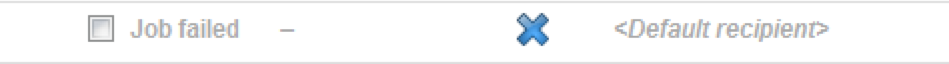
Select **Customize settings for this level** to configure this alert type for the current level and all levels beneath. Once selected, the other options on this page become available. After you have customized a particular level, this level *will not* inherit subsequent changes made to the levels above, including changes applied at the All Servers level.

Disabling an alert

Every alert type (except Processor under-utilization) is enabled by default for all servers when you first install SQL Monitor. This should ensure that you're aware of any potential problems with your servers.

Select **Disabled** to stop raising alerts of the current type for the selected object. This will prevent any future occurrences of this type of alert appearing in the Alert Inbox when the conditions that would have triggered this alert are encountered. The rest of the configuration options on the page are grayed out.

Click **Apply changes** near the bottom of the page. The alert is grayed out in the Alert settings page and the **Enabled** column displays a ✖ disabled icon:



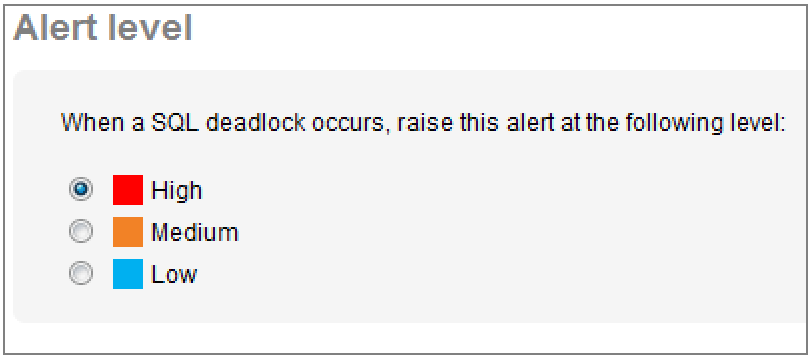
☐ Job failed – ✖ <Default recipient>

If you disable an alert type when there are currently Active alerts of that type, these alerts are automatically updated to Ended when SQL Monitor next polls your servers.

Setting alert levels

All alert types can be raised at either Low, Medium or High, depending on how critical they are to your systems. You can change this level to suit your priority levels.

For example, if a SQL deadlock occurs, by default the **Deadlock** alert is raised as a High alert because in most cases, a DBA would treat this as priority and want to investigate it immediately. For some servers, however, you may want to drop the level to Medium or Low, so that you can filter them out when viewing your most critical High level alerts.



Alert level

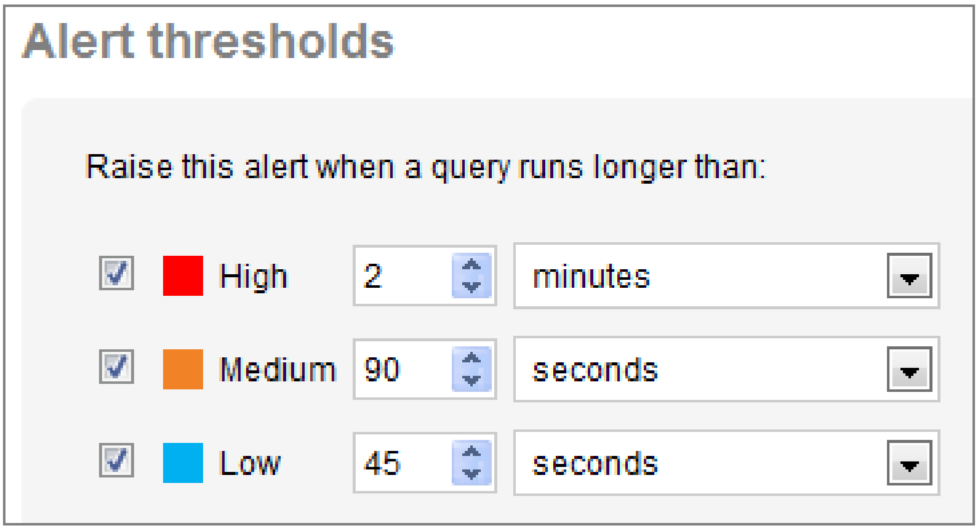
When a SQL deadlock occurs, raise this alert at the following level:

● 🟥 High
○ 🟧 Medium
○ 🟦 Low

Setting alert thresholds

Some types of alerts have multiple thresholds that you can match to Low, Medium or High level. The alert is raised when it passes the lowest-defined threshold, and can then escalate to a higher level when it passes another threshold. You do not have to enable all these levels.

In the example below, the **Long-running query** alert is configured to be raised as a Low alert after 45 seconds, be automatically escalated to a Medium alert after 90 seconds, and then to High after 2 minutes. When the query finally ends it will be marked as Ended.



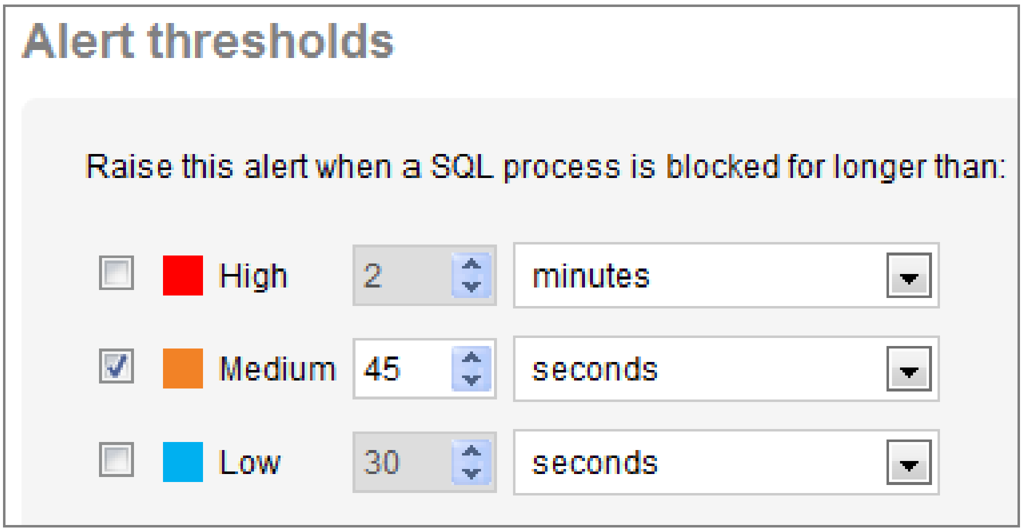
Alert thresholds

Raise this alert when a query runs longer than:

☑	🟥	High	2	minutes
☑	🟧	Medium	90	seconds
☑	🟦	Low	45	seconds

In the Alert Inbox, the alert level will change automatically as the different thresholds are passed. This allows you quickly to keep track of how serious this problem is, and prioritize queries for investigation that have escalated to High.

In the example below, only the Medium level has been enabled for the **Blocked process** alert. In this case, no alert will be raised until the block lasts for at least 45 seconds, and the alert will be raised as Medium. It will remain as a Medium alert however much longer the block lasts. When SQL Monitor detects that the block is over, the alert is marked as Ended.



Alert thresholds

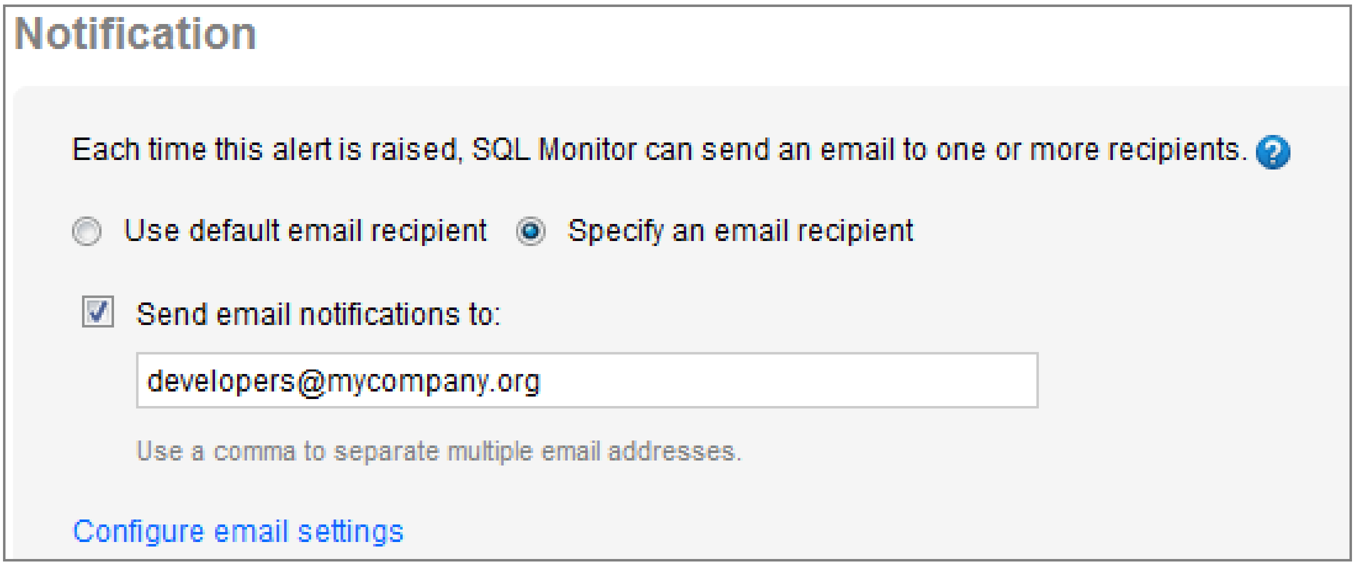
Raise this alert when a SQL process is blocked for longer than:

□	🟥	High	2	minutes
☑	🟧	Medium	45	seconds
□	🟦	Low	30	seconds

Note that in both examples, the thresholds are multiple of 15 seconds. SQL Monitor only collects data about most problems on your servers every 15 seconds.

Configuring email notification

Until you set up your mail server settings in SQL Monitor, no emails will be sent, regardless of the settings you apply on any Alert settings page. Click **Configure email settings** to enable email notification across the application. See Setting up email notification.



Notification

Each time this alert is raised, SQL Monitor can send an email to one or more recipients.

○ Use default email recipient ● Specify an email recipient

☑ Send email notifications to:

developers@mycompany.org

Use a comma to separate multiple email addresses.

Configure email settings

There are two options for sending email notifications:

- **Use default email recipient**

  Sends email notifications for this alert to the email address entered in the **Send emails to** box on the **Email settings** page. If you edit the global email address on the Email settings page, then this alert will automatically pick up the new global setting.

- **Specify an email recipient**

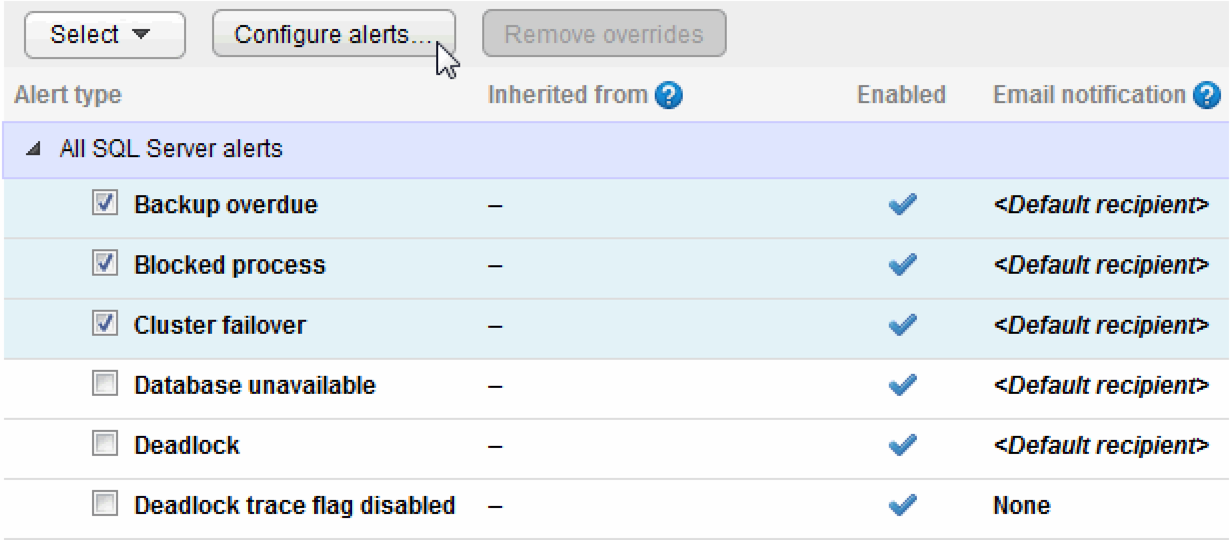
  Customize email notifications for this alert:

  To disable emails for this alert, clear the **Send email notifications to** box.

  To send emails for this alert to one or more recipients, type the email addresses you want in the box.

Configuring multiple alerts

To configure multiple alert types simultaneously, select them using the check boxes or the **Select** drop-down list, and click **Configure alerts**:

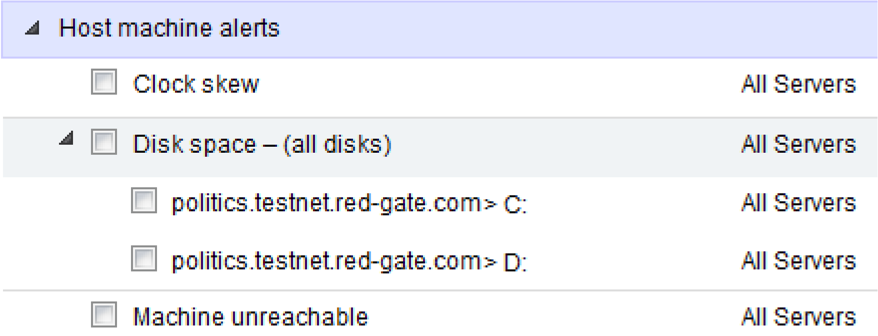


Alert type	Inherited from	Enabled	Email notification
All SQL Server alerts			
☑ Backup overdue	–	✓	*<Default recipient>*
☑ Blocked process	–	✓	*<Default recipient>*
☑ Cluster failover	–	✓	*<Default recipient>*
□ Database unavailable	–	✓	*<Default recipient>*
□ Deadlock	–	✓	*<Default recipient>*
□ Deadlock trace flag disabled	–	✓	None

For multiple alert types, you can only configure whether all the selected alerts are enabled or disabled, and apply email notification properties. Configurable thresholds either don't exist or vary greatly for certain alert types, so these changes must be carried out on an individual basis.

Configuring alert settings for individual disks

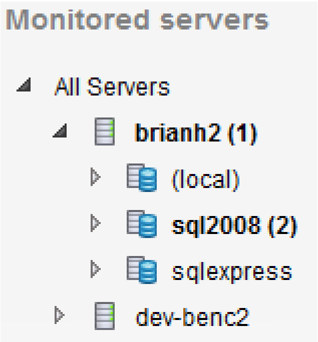
For the Disk space alert, you can configure alert settings for individual drives on your machine. Click on the arrow ▷ before the alert to display the drives, and select individual or multiple drives for configuration:



Host machine alerts	
□ Clock skew	All Servers
□ Disk space – (all disks)	All Servers
□ politics.testnet.red-gate.com> C:	All Servers
□ politics.testnet.red-gate.com> D:	All Servers
□ Machine unreachable	All Servers

Finding customized alerts

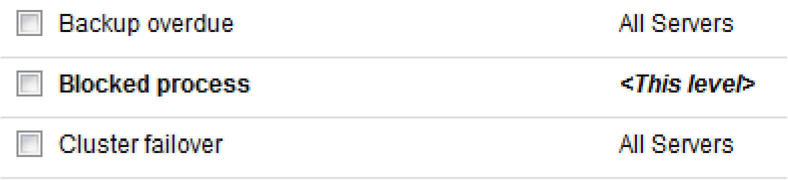
You can see which alerts have been customized at which levels in the **Monitored servers** list; they are indicated by the number in brackets:



Monitored servers

- All Servers
  - **brianh2 (1)**
    - (local)
    - **sql2008 (2)**
    - sqlexpress
  - dev-benc2

In the above example, one alert has been customized at the machine level, and two at the SQL Server instance level. When you select a level in the **Monitored servers** list, those alerts that have been customized at the selected level are identified by **<This level>** and highlighted in bold:



□	Backup overdue	All Servers
□	**Blocked process**	***<This level>***
□	Cluster failover	All Servers

Working with analysis data

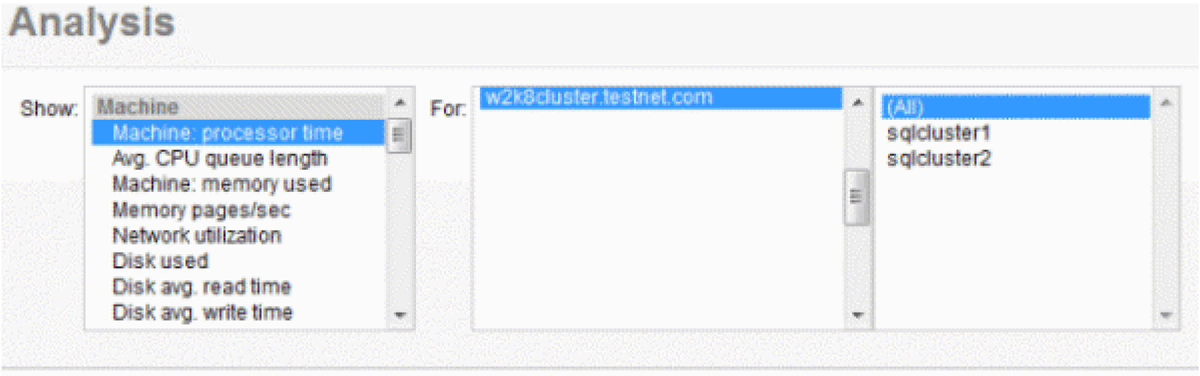
The Analysis page charts performance data for monitored servers and databases. You can display graphs containing data points that represent points in time when performance data was collected.

To view an analysis graph

1. Choose the performance counter you want to plot from the **Show** drop-down list.

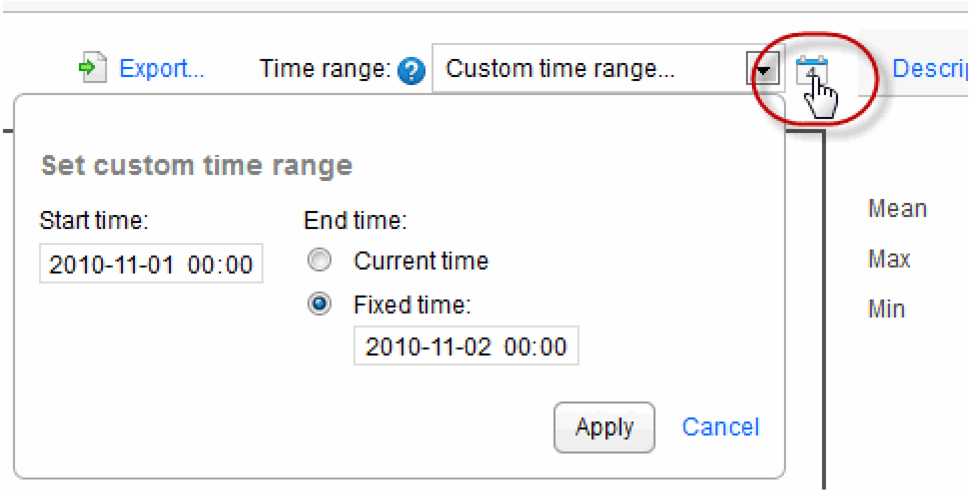
   Performance counters are grouped into Machine, SQL Server and Database categories. Database specific counters are at the bottom of the list.

2. Select the object to plot. For some types of counters you can plot all the objects together. The example below shows Machine: processor time for all machines in the clusters on the selected server.



3. Choose a time range. By default, the graph shows the last 10 minutes, but you can select a different fixed value from the **Time range** drop-down list.

4. To specify a particular time range, click the **Set custom time range** icon 4 and enter the start and end time.



Set custom time range

Start time: 2010-11-01 00:00

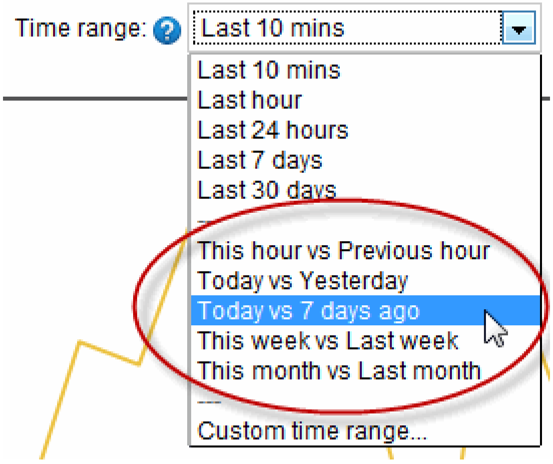
End time:

○ Current time

● Fixed time: 2010-11-02 00:00

Comparing time ranges

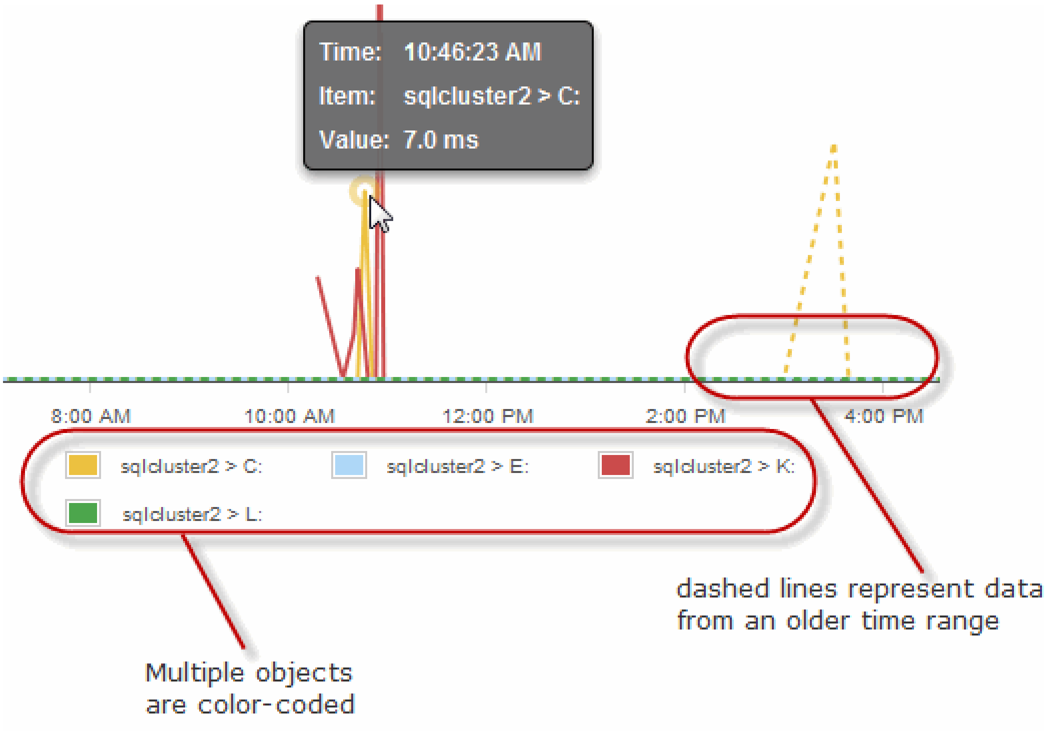
You can also use the **Time range** drop-down list to compare how your servers were performing in relation to the same time period from the last hour, day, week or month. Your options for comparison are as follows:



Viewing values on the graph

Each graph line represents the performance of a selected object. SQL Monitor plots up to a maximum of 500 data points on each graph and draws straight lines between consecutive points. For short time ranges (less than 10 minutes) the graph displays fewer data points. For longer time ranges, more data points are displayed, so that these graphs can still provide a detailed overview of changes in values. Move your mouse pointer over a line on the graph to view a tooltip showing the time, object and value at that data point.

If you are comparing data for different time ranges, the graph line for the older time range is displayed as a dashed line. If you are comparing data for multiple objects, a color-coded key is displayed below the graph.



Viewing statistics

Click the **Statistics** tab to the right of the graph to display the mean, maximum and minimum performance counter values for the selected time range. If you're comparing data at different time ranges, the difference between each value is also displayed.

Exporting the data

Click **Export...** to open or save performance data as a .csv file for the object and time range specified. This means you can record object data for use in reports on performance metrics. The export.csv file contains:

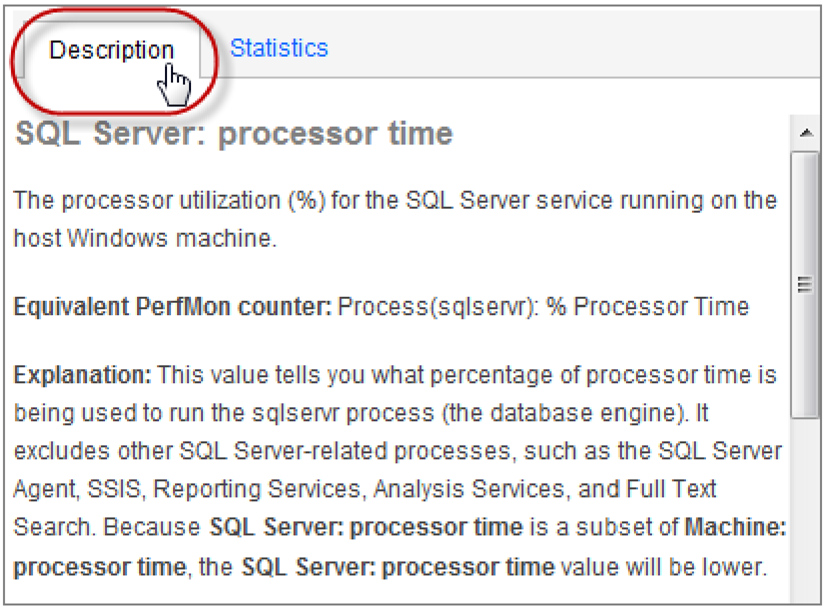
- the name of the selected performance counter and host machine.
- the type of value displayed if this doesn't form part of the performance counter name, for example, bytes, milliseconds or percentages.
- a column containing the date and time of every data point displayed on the analysis graph. The time is displayed as Coordinated Universal Time (UTC).
- columns containing details of every data point for each selected object.

Note: If necessary, you may consider adjusting the UTC times displayed in the file according to the time zone in which your servers are located.

Finding more information about performance counters

Click the **Description** tab to the right of the graph to display detailed information about the selected performance counter, including:

- the name of the equivalent PerfMon counter
- an explanation of what this performance counter measures
- guidelines for acceptable values, and values that may suggest a problem with your object
- related performance counters that should also be checked
- suggestions for solutions to problems caused by unacceptable values
- links to articles or white papers containing additional information



SQL Server: processor time

The processor utilization (%) for the SQL Server service running on the host Windows machine.

Equivalent PerfMon counter: Process(sqlservr): % Processor Time

Explanation: This value tells you what percentage of processor time is being used to run the sqlservr process (the database engine). It excludes other SQL Server-related processes, such as the SQL Server Agent, SSIS, Reporting Services, Analysis Services, and Full Text Search. Because **SQL Server: processor time** is a subset of **Machine: processor time**, the **SQL Server: processor time** value will be lower.

Not enough data to plot one or more items?

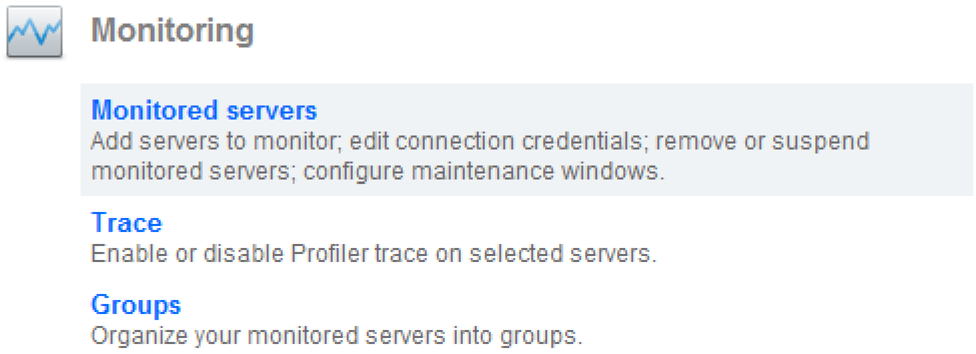
Data cannot be plotted on the graph for the time range selected for the following reasons:

- there aren't enough data points on the graph; there must be at least two data points for plotting to take place. The frequency of data points depends on the counter and time range selected, for example, if Last 10 mins is selected for Machine: processor time, data points are plotted at 15 second intervals. Plotting is less frequent for some other counters and for certain longer time intervals.
- data for that time range has been purged
- servers had not been added to the Monitored servers page, or monitoring was paused

If data cannot be plotted, a blank area is displayed on the graph.

Configuring monitored servers

Use the **Monitored servers** page to add more servers to monitor, remove existing servers from SQL Monitor, suspend monitoring on servers, or change the connection credentials for one or more servers. Go to the **Configuration** tab. Under **Monitoring**, select **Monitored servers**:



Monitoring

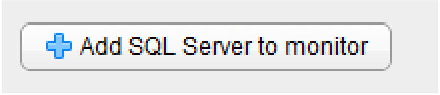
Monitored servers
Add servers to monitor; edit connection credentials; remove or suspend monitored servers; configure maintenance windows.

Trace
Enable or disable Profiler trace on selected servers.

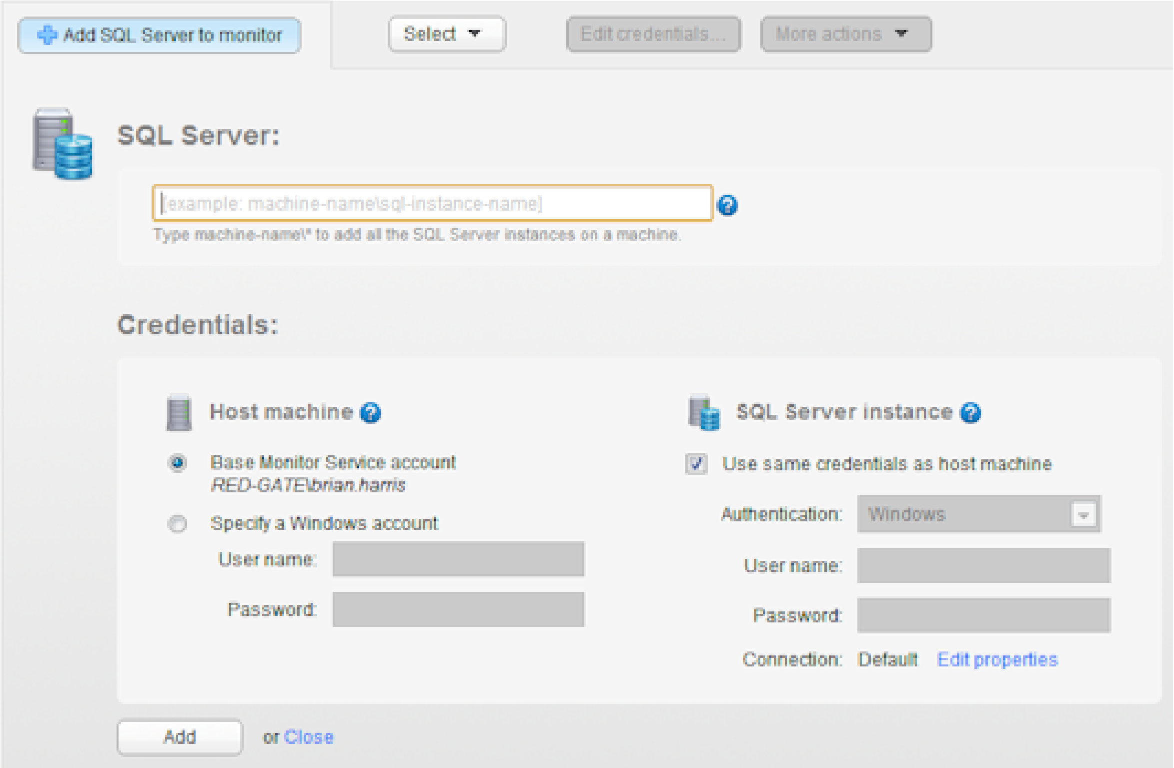
Groups
Organize your monitored servers into groups.

Adding servers to monitor

1. Click **Add SQL Server to monitor** button to expand the Add SQL Server panel:



2. Enter the name of the server and supply credentials for connecting to the host Windows machine and SQL server instance:



SQL Server:

[example: machine-name\sql-instance-name]

Type machine-name* to add all the SQL Server instances on a machine.

Credentials:

Host machine

● Base Monitor Service account *RED-GATE\brian.harris*

○ Specify a Windows account

User name:

Password:

SQL Server instance

☑ Use same credentials as host machine

Authentication: Windows

User name:

Password:

Connection: Default Edit properties

3. Click **Add**.

For more information about adding servers, see Adding servers to monitor.

Editing the credentials or properties of added servers

You can configure some or all of your servers or instances at once:

- to select multiple servers or instances, use the check boxes to the left of each row in the table.
- to select all servers or instances, choose from the **Select** drop-down button near the top of the page.

Editing credentials

You may be forced to change the credentials used to log in to the Windows server on which the SQL Server instance is running, or the authentication details to log into the SQL Server instance:

- to change the credentials for a single server or instance, move your mouse pointer over a row and click **Edit credentials**.
- to change the credentials for multiple servers or instances, select them and click the **Edit credentials** button near the top of the page.

Once you've applied your changes to the existing credentials, SQL Monitor will automatically retry the connection using the updated credentials.

Editing connection properties

You can change the default properties used to connect to the SQL Server instance, for example, you can supply a port number, change the network protocol, and choose to encrypt the connection.

1. Select the instances whose properties you want to edit and click **Edit credentials**.
2. Click **Edit properties** near the bottom of the dialog and update the connection details. Once you've edited these settings and clicked **OK**, the Connection type will be displayed as Custom, not Default.

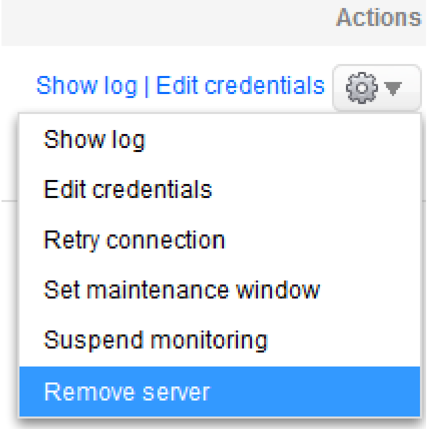
Removing a monitored server

You may want to remove a server from SQL Monitor for a number of reasons:

- server name typed incorrectly; you will need to remove the server before adding it again with the correct name
- the server is no longer in use in your organization
- your trial has expired and you do not wish to license this server

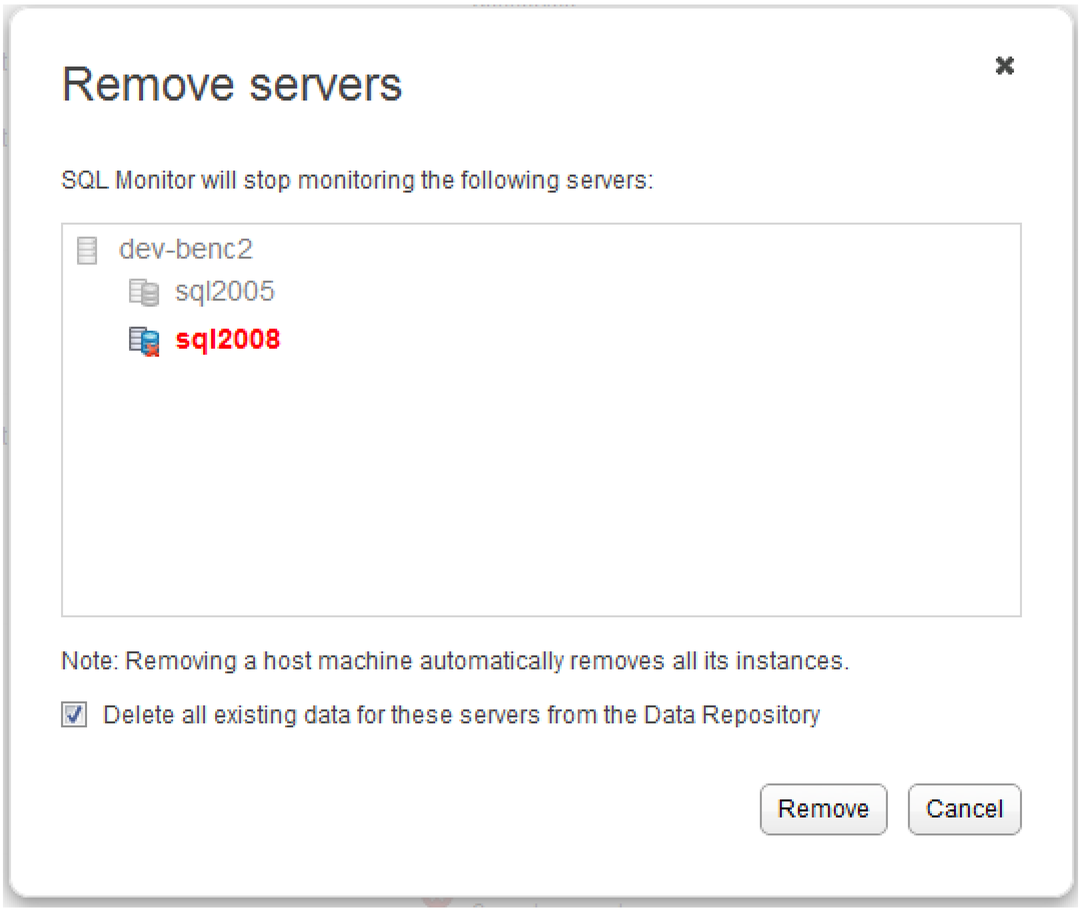
To remove a server:

1. In the row for the server you want to remove select **Remove server** from the Actions list:



Note: You cannot remove an individual node in a cluster. You should remove the cluster management node itself.

2. The Remove servers box is displayed, indicating what will be removed:



Remove servers

SQL Monitor will stop monitoring the following servers:

- dev-benc2
  - sql2005
  - **sql2008**

Note: Removing a host machine automatically removes all its instances.

☑ Delete all existing data for these servers from the Data Repository

The servers that will be removed are highlighted in the list. If you remove a host machine, all its instances are also removed.

3. To remove data that is currently stored in the Data Repository for the selected servers, select the **Delete all existing data...** check box.

The server is removed from the **Monitored servers** list; if you have selected to remove existing data, all alerts for that server are removed.

Suspending a monitored server

You may want to stop monitoring temporarily, for example, if one of your servers requires immediate, one-off maintenance and you don't want SQL Monitor to connect to it during this time, to avoid raising redundant alerts.

Note: If routine maintenance is carried out on your servers at regular intervals, you can schedule maintenance windows. During these windows, SQL Monitor remains connected to the servers but alerting is suspended. See Setting maintenance windows.

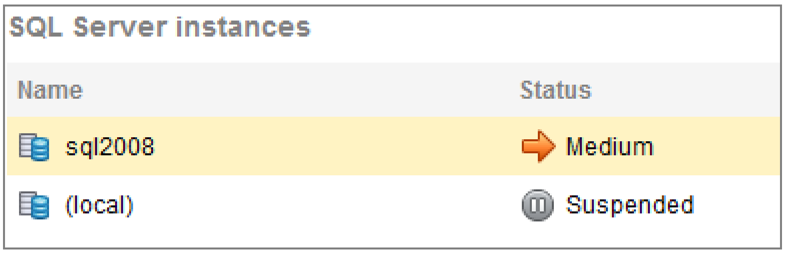
To suspend monitoring:

- for a single server or instance, click the ⚙▾ **Actions** button at the end of the row and select **Suspend monitoring**
- for multiple servers or instances, select them and choose **Suspend monitoring** from the **More actions** drop-down button near the top of the page

If you suspend monitoring on a host machine, all its instances will also be suspended.

What are the effects of suspending monitoring?

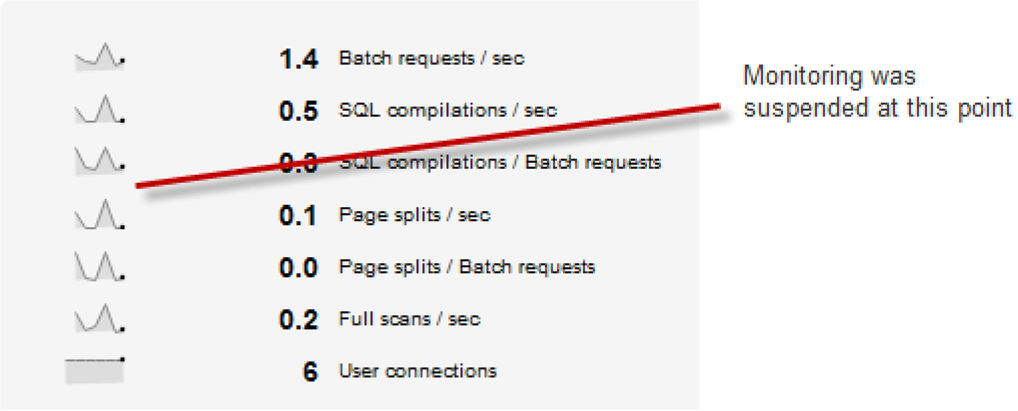
- SQL Monitor will not attempt any connection to the suspended server; all data collection methods are therefore inactive.
- The suspended host machine or instance remains in the **Monitored servers** list, but is identified on all overview pages as being suspended:



SQL Server instances

Name	Status
sql2008	➡ Medium
(local)	⏸ Suspended

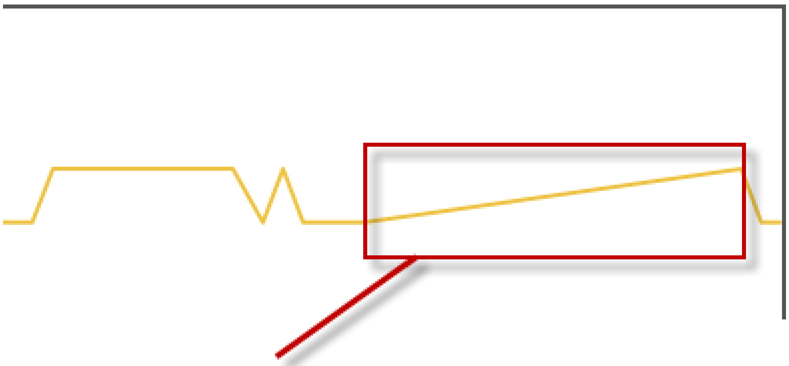
- Values and sparkline graphs are not updated on the overview pages:



1.4	Batch requests / sec
0.5	SQL compilations / sec
0.3	SQL compilations / Batch requests
0.1	Page splits / sec
0.0	Page splits / Batch requests
0.2	Full scans / sec
6	User connections

Monitoring was suspended at this point

- The Analysis page for counters on this server will plot a graph if possible, but fewer data points will be available:



Server was suspended during this period. SQL Monitor draws a straight line between the last data point before suspension and the first data point after monitoring is resumed.

Resuming monitoring on a suspended server

Go to the Monitored servers page, click the ⚙▾ **Actions** button at the end of the row and select **Resume monitoring**.

Setting maintenance windows

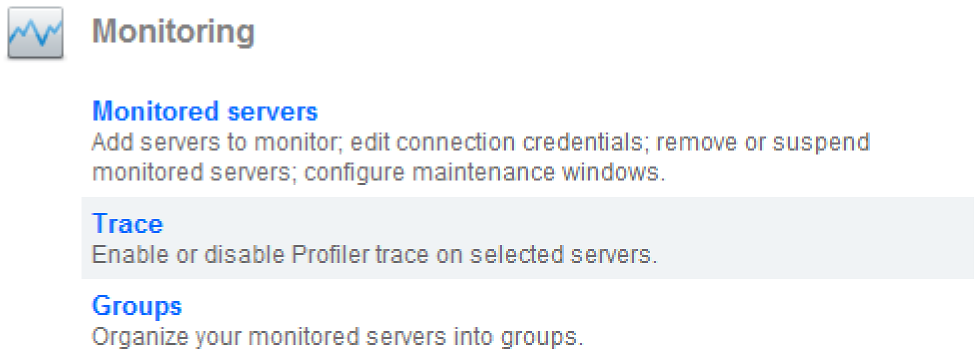
You can configure SQL Monitor to temporarily suspend alerts during set weekly durations, allowing you to carry out maintenance on your servers without raising redundant alerts. For details, see Setting maintenance windows.

Configuring Profiler trace

Enabling trace allows you to continuously capture SQL Profiler trace data on the selected instance. When an alert is raised, the SQL statements that were executing around the time of the alert are displayed under SQL Processes in the Performance data section for that alert.

Configuring trace

1. Go to the **Configuration** tab. Under **Monitoring**, select **Trace**:



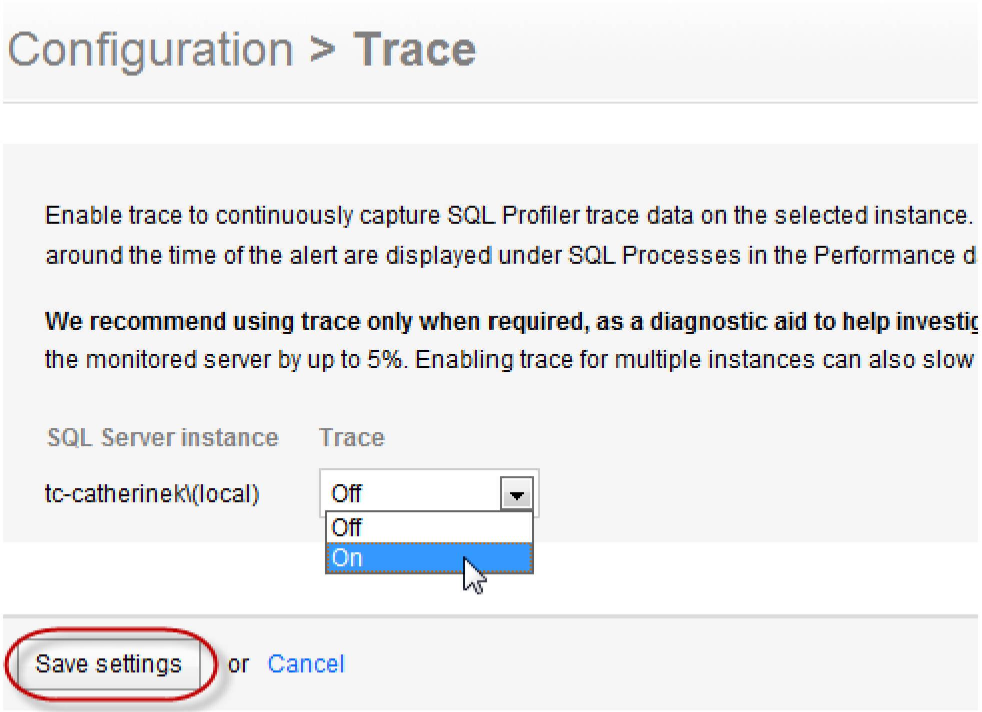
Monitoring

Monitored servers
Add servers to monitor; edit connection credentials; remove or suspend monitored servers; configure maintenance windows.

Trace
Enable or disable Profiler trace on selected servers.

Groups
Organize your monitored servers into groups.

2. For each SQL Server instance you want to store trace data for, Select **On** from the **Trace** drop-down list, then click the **Save settings** button.



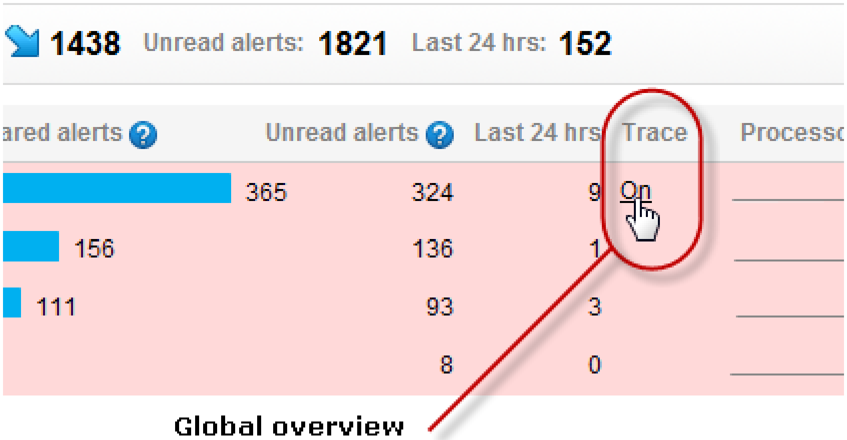
Configuration > Trace

Enable trace to continuously capture SQL Profiler trace data on the selected instance.
around the time of the alert are displayed under SQL Processes in the Performance d

We recommend using trace only when required, as a diagnostic aid to help investig
the monitored server by up to 5%. Enabling trace for multiple instances can also slow

SQL Server instance	Trace
tc-catherinek\(local)	Off

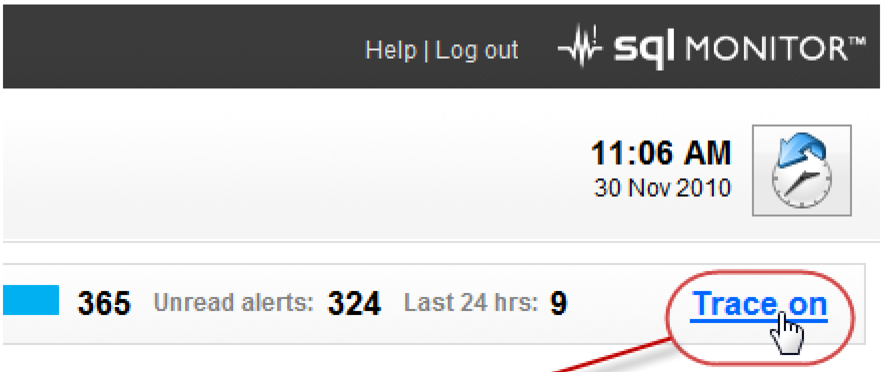
If trace is enabled for a SQL Server instance, the trace status is displayed on the Global overview and Host machine overview pages:



1438 Unread alerts: 1821 Last 24 hrs: 152

ared alerts	Unread alerts	Last 24 hrs	Trace	Processo
365	324	9	On	
156	136	1		
111	93	3		
	8	0		

Global overview
Click to display the Trace page



11:06 AM
30 Nov 2010

365 Unread alerts: 324 Last 24 hrs: 9 Trace on

Host machine overview
Click to display the Trace page

What trace data is captured?

The following trace information is captured (SQL Server event number in brackets):

- RPC_Starting (11)
- SQL_BatchStarting (13)
- Audit_Login (14)
- Attention (16)
- SQL_Exception (33)

Storing and purging trace data

If trace is enabled, a trace data file is stored locally on the monitored server. Sections of the data file from around the time an alert was raised are copied to the SQL Monitor Data

Repository. When you click on an alert in the Alert Inbox to display more details, the trace data is retrieved from the Data Repository.

Note: To prevent the trace data file from taking up excessive storage space on the monitored server, it is automatically deleted after it has remained on the server for 15 minutes, or reaches 1 GB in size.

Trace data stored in the Data Repository is categorized as **SQL Server data** for the purposes of purging. To specify how long to keep stored trace data in the Data Repository, use the **SQL Server data** purging option on the **Data purging** page (Configuration > Data purging).Trace data stored in the Data Repository is categorized as **SQL Server data** for the purposes of purging. To specify how long to keep stored trace data in the Data Repository, use the **SQL Server data** purging option on the **Data purging** page (Configuration > Data purging).

See Purging SQL Monitor data.

Organizing monitored servers into groups

Use the **Groups** page (Configuration > Groups) to organize your servers into groups sharing similar properties.

Why create a group?

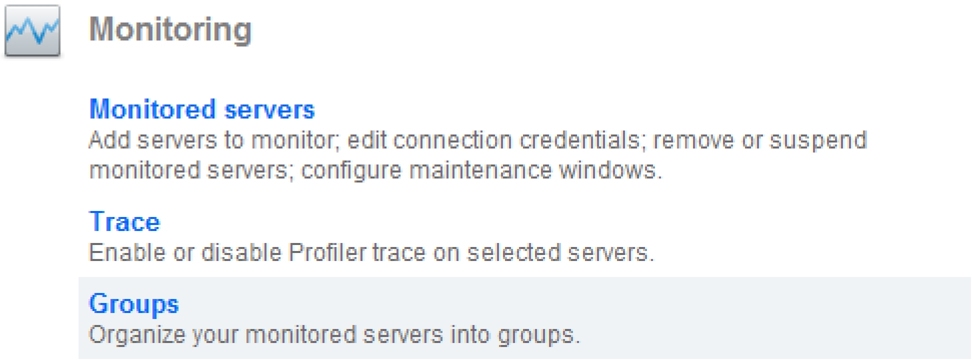
Monitored servers can be grouped together so you can apply the same alert configuration settings to them more easily. For example, you may have a number of production servers on different host machines but you want them all to use the same alert settings.

You can also filter the Global Overview and Alert Inbox by group, to look at information for groups of servers at a time.

Groups are identified in the **Monitored servers** list by the group 📁 icon.

Creating a group

1. Go to the **Configuration** tab. Under **Monitoring**, select **Groups**:

   Monitoring

   Monitored servers
   Add servers to monitor; edit connection credentials; remove or suspend monitored servers; configure maintenance windows.

   Trace
   Enable or disable Profiler trace on selected servers.

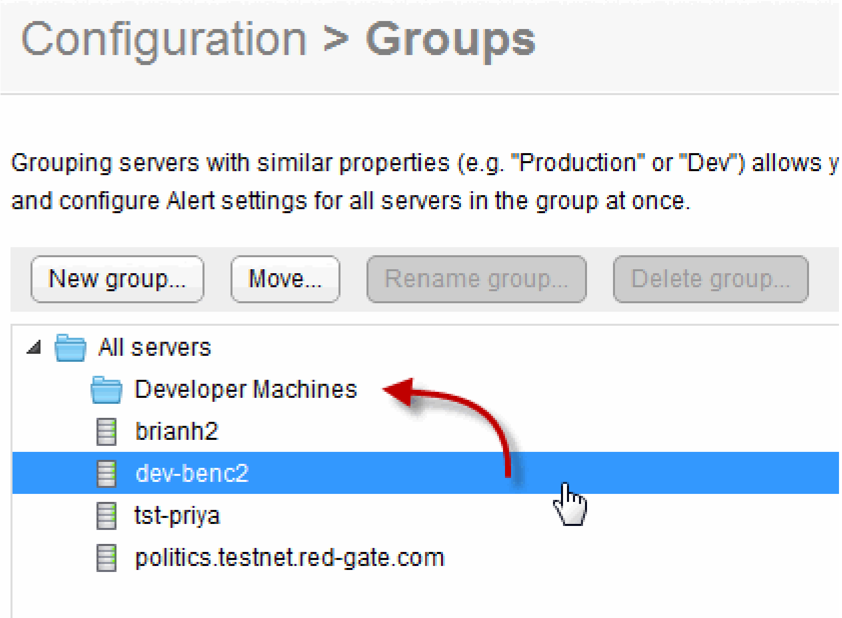
   Groups
   Organize your monitored servers into groups.

   You can also use the **Manage groups** link on the left of any overview page or the Alert Inbox.

2. Click **New group**, enter a name and click **Create**.

   To add servers to the group, drag and drop each one in turn onto the group name. (You cannot drag multiple selected servers.)

In the example below, the server dev-benc2 is about to be moved to the "Developer Machines" group:



Configuration > Groups

Grouping servers with similar properties (e.g. "Production" or "Dev") allows y
and configure Alert settings for all servers in the group at once.

Only host machines are listed:

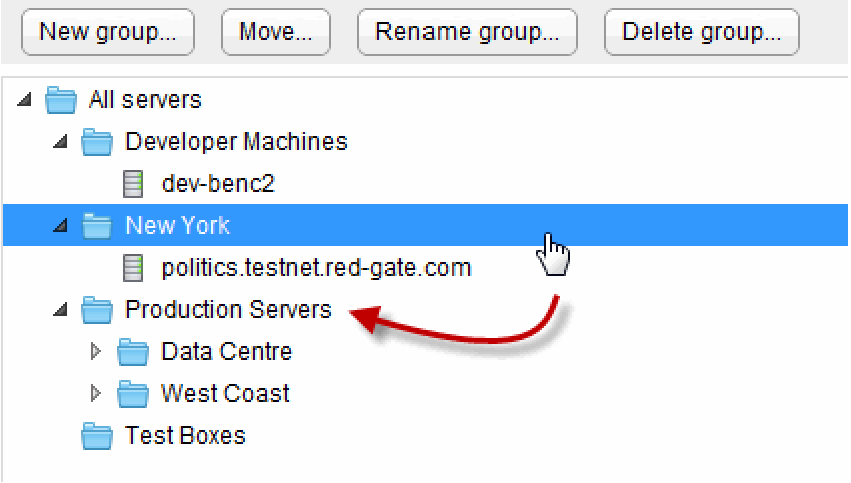
- You cannot move individual SQL Server instances; they are moved automatically with their host machine
- If you move a cluster into a group, all its nodes and instances are moved with it

You can also select a server, and click **Move**. Select the destination group in the Move box.

Creating a hierarchy

You can move one group into another. For example, if you want to further organize your Production servers into several regions, you should first create your Production group, then create a group for each region and move those groups into "Production".

In the example below several sub-groups have been created for the "Production servers" group. Moving the "New York" group will also move any servers in that group.



By default, each group inherits all alert settings from the group above; so this allows you to create alert settings for all your production servers, which are applied to each region. However, you can then tweak the settings for just one of those regions, if required.

Removing a server from a group

To remove a server from a group, do one of the following:

- Drag it to **All servers**
- Select the server, click Move and then select **All servers**

Working with groups

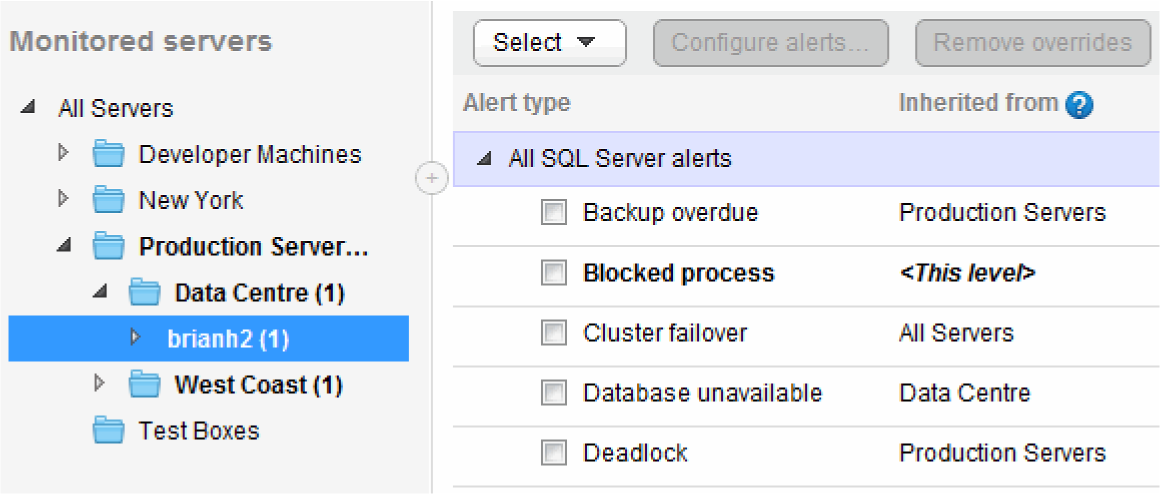
Use the buttons above the list of groups to rename, delete or move a selected group.

Deleting a group doesn't delete the servers it contains; instead the servers are moved to the next level up in the server hierarchy.

Configuring alerts by group

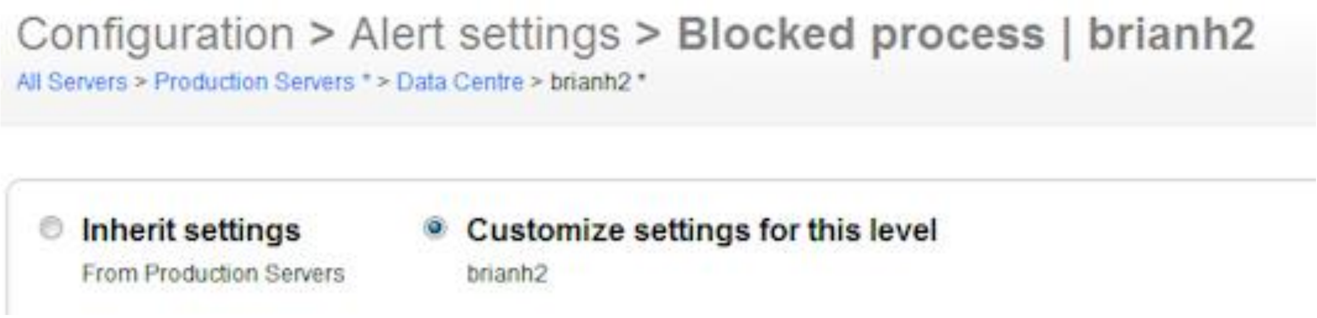
One of the main benefits of adding servers to a group is that you can configure alert settings at the group level. Everything in that group inherits these settings (unless specifically customized at a lower level). Each group in the hierarchy can be customized separately.

In the example below, on the **Alert settings** page, different types of alerts have been customized at various levels; the **Inherited from** column shows which level each type of alert is customized at.



Alert type	Inherited from
All SQL Server alerts	
□ Backup overdue	Production Servers
□ **Blocked process**	***<This level>***
□ Cluster failover	All Servers
□ Database unavailable	Data Centre
□ Deadlock	Production Servers

When editing the alert settings, the breadcrumbs show the full inheritance path for this type of alert. Any level with an asterisk * has been customized. In the example below, the Blocked process alert is being customized for a specific machine, but it has also been set more generically for the "Production servers" group.



Configuration > Alert settings > **Blocked process | brianh2**

All Servers > Production Servers * > Data Centre > brianh2 *

○ **Inherit settings**
From Production Servers

● **Customize settings for this level**
brianh2

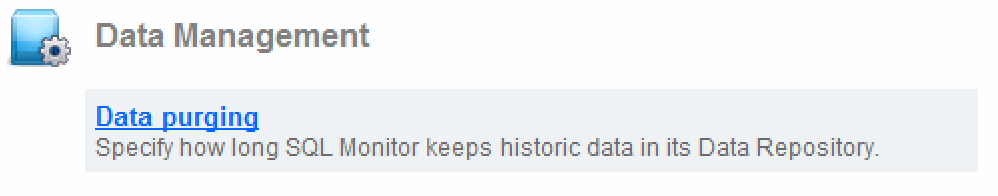
For more information, see Customizing alerts.

Purging SQL Monitor data

SQL Monitor stores a large amount of high, medium and low volume data in the Data Repository. To prevent the Data Repository database using all your hard disk space, SQL Monitor checks for old data every hour, and purges data that is older than the time specified for each category in your purging policy.

Configuring data purging

Go to the **Configuration** tab. Under **Data Management**, select **Data purging**:



Data Management

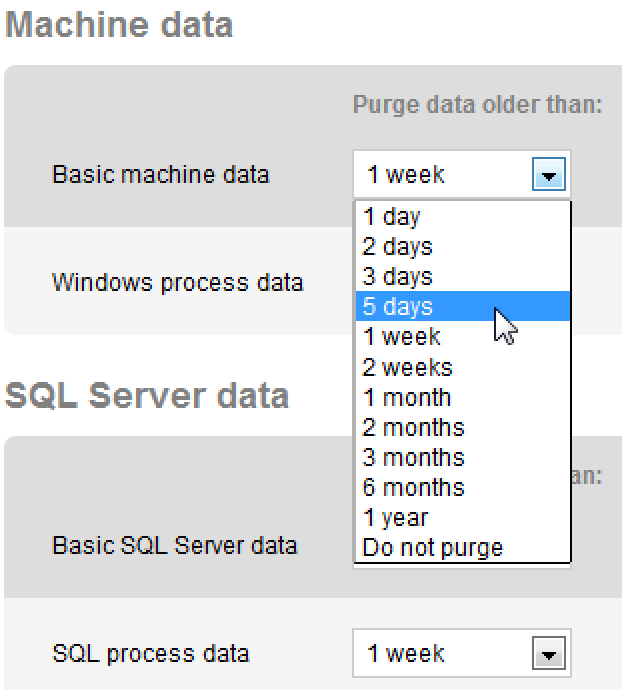
Data purging

Specify how long SQL Monitor keeps historic data in its Data Repository.

Data is stored in three separate categories: Machine data, SQL Server data and Alert data. Each category is broken down further to make it easier to identify whether the data could become high, medium or low volume, and where the data is displayed in SQL Monitor:

- **Machine data:**
  - Basic machine data (low volume data) - displayed on the Host machine, Cluster, and SQL Server instance overview pages, and as counters listed under Machine on the Analysis page.
  - Windows process data (high volume data) - displayed as the System processes (top 10) on the Host or Cluster machine overview pages.
- **SQL Server data:**
  - Basic SQL Server data (low volume data) - displayed on the SQL Server instance overview pages, and as counters listed under SQL Server on the Analysis page.
  - SQL process data (high volume data) - displayed as SQL user processes (top 10 by CPU usage) on the SQL Server instance overview pages, and as alert details when Trace is turned off.
  - Top 10 queries data (high volume data) - displayed as the Top 10 expensive queries on the SQL Server instance and Database overview pages.
  - Database performance counter data (medium volume data) - displayed on the Database overview pages, and as counters listed under Database on the Analysis page.
- **Alert data:**
  - Basic alert data (low volume data) - displayed on the Alert pages of raised alerts and including alert details, history of occurrences and performance data.
  - Trace data (high volume data) - displayed under SQL Processes/Profiler trace in the Performance data section of the Alert pages when Trace is turned on.

The default purge settings ensure that high volume data is purged more frequently than medium or low volume data. To change this, select a different time limit from the drop-down list for each category and click **Save settings**.



Machine data

Purge data older than:

Basic machine data: 1 week

Windows process data

SQL Server data

Basic SQL Server data

SQL process data: 1 week

How frequently should I purge data?

Your purging frequency depends on:

- how important it is for you to retain historic information about each category. For example, for auditing purposes, you may need to keep data about your machines for longer than alert data.
- the amount of disk space you have available in your Data Repository to store collected data. If space is an issue, you may consider purging high volume data on a more frequent basis.

Note: There is a **Do not purge** option for each category, which means data will be stored indefinitely in your Data Repository. You should ensure that you have enough disk space available to accommodate potentially high volumes of data.

What is the growth rate of the SQL Monitor Data Repository?

You should expect the Data Repository database to grow by about 35 - 100 MB per day for each SQL Server instance you are monitoring. If you monitor 10 SQL Servers for a week, your database will increase by between 2 and 7 GB.

Note: This amount will depend on how busy your monitored SQL Servers are, particularly the number of Windows processes, SQL processes and the number of databases on each instance.

What is the effect of purging data?

- For overview data, a dash (--) or (no data) will be displayed on the overview pages next to a value if you rewind time to a point for which data does not exist because it has been purged.
- For alert data, purging will result in older alerts no longer being displayed in the application.
- For analysis graphs, a blank area will be displayed on the graph for the duration purged.

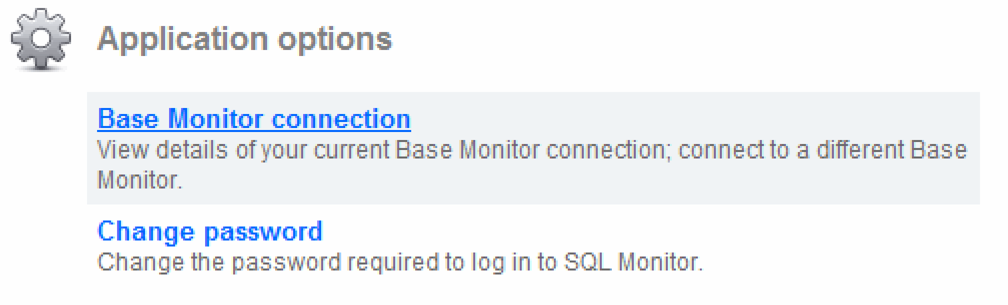
Changing the Base Monitor connection

The Base Monitor Service account is the Windows account you specified during installation to connect to the Data Repository (the SQL Server database that stores all collected data). See Installation guide.

You may need to disable the machine on which the Base Monitor Service account is running, but you do not want to stop monitoring data. You can do this by installing the Base Monitor on another machine and then changing the connection.

Configuring the Base Monitor connection

Go to the **Configuration** tab. Under **Application options**, select **Base Monitor connection**:



Application options

Base Monitor connection
View details of your current Base Monitor connection; connect to a different Base Monitor.

Change password
Change the password required to log in to SQL Monitor.

Installing the Base Monitor on another machine

1. Click the Base Monitor installer link to download the SQLMonitorBaseMonitorInstaller.exe file.
2. Run the .exe file. Click **Next** to display the **Set up Base Monitor** page.
3. Specify where to install the files that will run the service, and provide a writable folder for the configuration file.

   The configuration file stores the location of the Data Repository and the connection string for accessing the database. The configuration file requires a writeable location so that it can be updated by SQL Monitor if you move the Data Repository database to a different SQL Server instance.
4. Select a TCP port to use for communicating with the Web Server and the Data Repository. Click **Next**.
5. By default, the SQL Server database set up when you installed will still be used as the Data Repository. If you're happy to continue using this, go to the instructions below on *Connecting to the database*.

   If you want to create a new database or use an existing one, first follow the instructions below.

Creating a new database for the Data Repository

1. Click **Set up Data Repository** and then select **Create a new SQL Server database**.
2. Click **Next**, then enter the SQL Server instance name.

   You can type an instance name or IP address directly into the **SQL Server** box if the instance name does not appear in the drop-down list.
3. By default, SQL Monitor will create a database called `RedGateMonitor`. To use a different name, in the **Database** box, type a name for the database.
4. Under **Create database using**, one of the following:
   - **Use current credentials** to use the account that you are currently logged into.
   - **Specify an account**. If you select Windows authentication, SQL Monitor assumes this account is in the current domain. To use a different domain account, enter credentials in the format **username@domain-name** or **domain-name\username**. Enter the password.

   The specified account must have Create Database permissions.
5. Click **Create Now** to create the database. Once database creation has been confirmed, click **Close**. If you go back a page in the wizard, this will not undo the creation of the database.

The database is created using all the default settings for creating a new database on the SQL Server instance you selected. If you encounter an error message when creating the database, see Account credentials required when installing SQL Monitor.

Using existing database for the Data Repository

You should only use an existing database if you want to create the database outside of the SQL Monitor installer using a SQL Server management tool, in order to specify options such as filegroups, autogrowth, and so on.

To specify your Data Repository database:

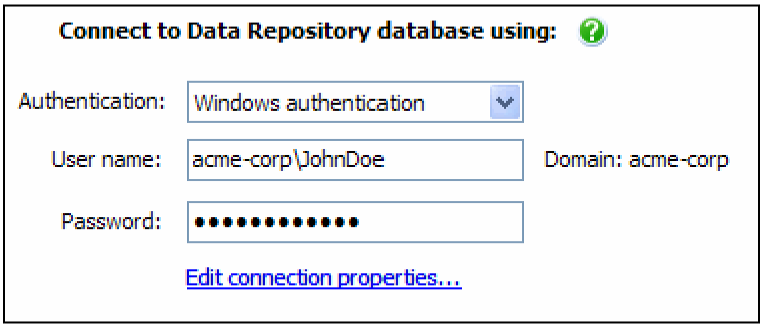
1. Click **Set Up Data Repository** and then select **Use an existing SQL Server database**.
2. Click **Next**, then select the SQL Server instance.
3. In the **Database** box, select the database you want to use; databases on the SQL Server should be automatically detected, and appear in the list.

   You can type an instance name or IP address directly into the Server box if the instance name does not appear in the drop-down list.
4. Click **Next**. SQL Monitor checks the database. Once the database connection has been confirmed, click **Close**.

If you encounter an error message when connecting to the database, see Account credentials required when installing SQL Monitor.

Connecting to the database

The Base Monitor service requires credentials to connect to the database you just specified in order to store and retrieve collected data. This account must have **administrator privileges** on the database.



Connect to Data Repository database using:

Authentication: Windows authentication

User name: acme-corp\JohnDoe Domain: acme-corp

Password: ●●●●●●●●●●●●

Windows authentication

If you connect to the database using Windows authentication, the Windows account you select will also be used to run the SQL Monitor Base Monitor service. If the account does not have permissions to run a Windows service, then it will be granted these permissions.

The user name defaults to your current domain. You can change the domain in the **User name** box using either of the following formats:

- mydomain\username
- username@mydomain

SQL Server authentication

You can connect to the database using SQL Server authentication. If you provide SQL Server login credentials, the Base Monitor service will run under the Local Service account.

Read more information about the Local Service account (http://msdn.microsoft.com/en-us/library/ms684188(VS.85).aspx).

Error reporting

SQL Monitor can send data back to Red Gate about the features you use and any application errors you encounter. This helps us to improve SQL Monitor for future releases.

All data is anonymized before we receive it, and no confidential information is sent to us.

If you are happy to allow this data to be sent, select **Send error reports**, and optionally enter your email address. We will only contact you in the event of an error for which we require further information, to help us eliminate bugs.

Summary

1. Review all your installation options on the Summary page. If you want to change anything, use the **Back** button to edit the required page.

   Note: Once your database for the Data Repository has been created, it will not be deleted if you go back and set up a different Data Repository.

2. Click **Install** to start installing SQL Monitor using the selected settings.
3. When installation has completed, click **Finish** to launch SQL Monitor.

To start using SQL Monitor, you first need to create a password to use when logging in to the SQL Monitor pages.

Changing the Base Monitor connection

Once you've installed the Base Monitor on another machine, you can change the connection:

1. Enter the full domain name or IP address for the machine that has the Base Monitor installed on it.
2. Select the TCP port you specified during installation to use for communicating with the Web Server and the Data Repository.
3. Click **Change connection**.

Account permissions required by SQL Monitor

The following are the *minimum permissions* required to run SQL Monitor and monitor your servers.

To test these permissions, see Testing data collection methods.

SQL Monitor Web service account

- The account should have **Log on as service** rights.
- The account should have **Full Control** over the folder `C:\Documents and Settings\All Users\Application Data\Red Gate\SQL Monitor 2`.

  For Vista and Windows 7: `C:\ProgramData\Red Gate\SQL Monitor 2`.
- The account should have **Full Control** over the folder `C:\Documents and Settings\All Users\Application Data\Red Gate\Logs\SQL Monitor 2` or equivalent location.

Note: the SQL Monitor Web Service is not installed if you use IIS as your Web Server.

SQL Monitor Base Monitor service account

- The account should have **Log on as service** rights.
- The account should have **Full Control** over the folder `C:\Documents and Settings\All Users\Application Data\Red Gate\Logs\SQL Monitor 2`.

  For Vista and Windows 7 : `C:\ProgramData\Red Gate\Logs\SQL Monitor 2`.
- The login should be a member of the **db_owner** database role on the Data Repository database (called RedGateMonitor by default).

Monitoring host Windows machines

The account should be an administrator on the machine.

Monitoring SQL Server instances

The account used to monitor your SQL Server instance should have the following permissions:

For SQL Server 2005 and SQL Server 2008:

- member of the **db_datareader** role on the msdb system database.
- member of **SQLAgentReader** role on the msdb system database.
- member of the **db_ddladmin** database role on all databases.
- **VIEW ANY DEFINITION** server permission.
- **ALTER TRACE** server permission (if you want to enable trace data).
- **VIEW SERVER STATE** and **VIEW DATABASE STATE** database permissions on all databases.
- **sysadmin** role required for Integrity check overdue alerts and to allow SQL Monitor to turn on the deadlock trace flag (this flag is required for Deadlock alerts to be raised; you can turn on the flag manually if you don't want to enable sysadmin permissions).

For SQL Server 2000:

If you want SQL Monitor to be able to collect trace data (trace data can optionally be displayed as part of some alerts), then the account must be a member of the **sysadmin** server role.

If you do not want SQL Monitor to collect trace data, then the account should have the following permissions:

- member of the **db_datareader** database role on the msdb system database.
- member of the **db_datareader** database role on the master database.
- member of the **db_ddladmin** database role on all databases.

  Note: the sysadmin fixed role is a superset of these permissions, and can also be used, but is not explicitly required except for trace collecting

SQL Monitor connection error: Cannot generate SSPI context

If the status of a SQL Server instance displayed on the Monitored servers configuration page is **Connection failed - Cannot connect**, and the exception message in the log file contains "Cannot generate SSPI context", do the following:

Stop your SQL Server service

1. Open the Services Microsoft Management Console (MMC) (**Control Panel > Administrative Tools > Services**).
2. Double-click on the SQL Server service and on the General tab, click **Stop**.

Restart using the Local System account and then stop it again

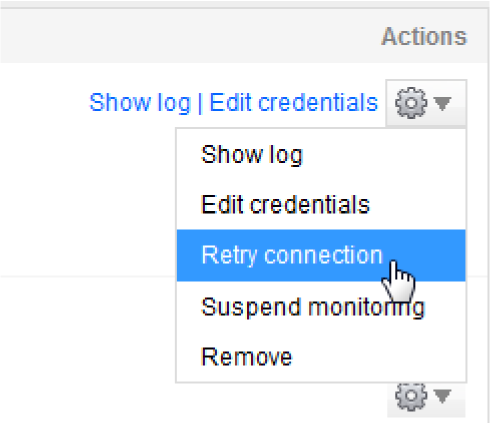
1. In the Log On tab, select **Local System account** and click **OK**.
2. On the General tab, click **Start**.
3. Once the Service status is confirmed as Started, click **Stop**.

Switch back to your domain account and restart

1. In the Log On tab, select **This account**.
2. Enter your SQL Server domain account details and click **OK.**
3. On the General tab, click **Start**.

Retry the connection in SQL Monitor

At the Monitored servers page (Configuration > Monitored servers), select **Retry connection** from the Actions list for the SQL Server instance:



For more information, see http://blogs.msdn.com/b/sql_protocols/archive/2005/10/15/481297.aspx (http://blogs.msdn.com/b/sql_protocols/archive/2005/10/15/481297.aspx).

SQL Monitor browser error: Cannot display webpage; connection timed out; webpage not available; could not locate remote server

If you are unable to view the SQL Monitor web page, and your browser displays one of the following messages:

Internet Explorer: Internet Explorer cannot display the webpage

Firefox: The connection has timed out

Chrome: This web page is not available

Opera: Could not locate remote server

Please check the following:

- The host machine name and port number are correct.

  The URL should be in the format **http://mymachine.domain:8080/** or **http://127.0.0.1:8080/**.

- The SQL Monitor web server has been installed and the service is running.

  Under local services on the web server machine, check that the **SQL Monitor 2 Web Service** is started.

- If there is a firewall on the web server machine, ensure that it is configured to allow connections on the SQL Monitor port.

  See Accessing SQL Monitor through a firewall for more information.

- You have internet connectivity.

  Check that you can access other websites.

Accessing SQL Monitor through a firewall

If you are unable to view the SQL Monitor web page, and your browser displays a "cannot connect" type message, then you may need to check that SQL Monitor is not being blocked by the firewall on the web server machine.

If possible, install the Base Monitor on a server that does not need to go through a firewall to access the SQL Servers you want to monitor. If your network configuration prevents this, then we recommend that you use a VPN link between the Base Monitor and the monitored SQL Servers.

Note: if your organization uses Network Address Translation (NAT), then you may not be able to monitor SQL Servers that are subject to it.

To allow access to SQL Monitor through the firewall, follow the steps below.

Allow access to TCP ports and WMI

SQL Monitor requires access to:

- TCP port 135 used by the Remote Procedure Call (RPC) service. Also make sure that the remote registry service is started on the server.
- TCP port 445 used by the Server Message Block (SMB) service that allows remote file access.
- TCP port 1433 used as the default registered address for the SQL Server Database Engine. If your SQL Server uses a different TCP configuration, use that port number instead.
- WMI. You will need to configure each server you want to monitor separately. See the following:

  Connecting Through Windows Firewall (http://msdn.microsoft.com/en-us/library/aa389286%28v=vs.85%29.aspx)

  Setting Namespace Security with the WMI Control (http://msdn.microsoft.com/en-us/library/aa393613.aspx)

  Security a Remote WMI Connection (http://msdn.microsoft.com/en-us/library/aa393266.aspx)

  Setting Up a Fixed Port for WMI (http://msdn.microsoft.com/en-us/library/bb219447%28VS.85%29.aspx)

For XP, Vista and Windows Server 2003 and 2008

1. Open the **Control Panel** on the machine where you installed the SQL Monitor Web Server.
2. Go to **Security Center** and click **Windows Firewall**.
3. Click **Change settings**.
4. Under Exceptions, click **Add port** and then enter a name and the port number.

You can use any name to identify that this exception is for SQL Monitor.

The port number should be your SQL Monitor web server port number, specified during installation; this is 8080 by default.

5. Click **OK**.

For Windows 7

1. On the machine where you installed the SQL Monitor Web Server, open **Windows Firewall with Advanced Security**:
   - Type "Firewall" into the Search programs and files box, or
   - From the Control Panel, select **System and Security** then **Windows Firewall** then **Advanced settings**.
2. Click **Inbound Rules**.
3. Click **New Rule**.
4. Select **Port** as the type of rule you want to create, then click **Next**.
5. Choose **TCP** as the port type, then under **Specific local ports**, enter the SQL Monitor port number.

   Your SQL Monitor web server port number is specified during installation; this is 8080 by default.
6. Click **Next**, then select **Allow the connection**.
7. Click **Next**, then choose the type of profile to apply the rule to.
8. Click **Next**, then enter a name to identify that this exception to your firewall is for SQL Monitor.
9. Click **Finish**.

Further information

For XP, see the following Microsoft KB article: http://support.microsoft.com/kb/842242 (http://support.microsoft.com/kb/842242)

For Windows 7, see the following Microsoft article: http://windows.microsoft.com/en-us/windows7/Allow-a-program-to-communicate-through-Windows-Firewall (http://windows.microsoft.com/en-us/windows7/Allow-a-program-to-communicate-through-Windows-Firewall)

Global Overview doesn't display any details in your browser

If the Global Overview page doesn't contain any data, please check the following:

For Internet Explorer on Windows Server 2008 and 2008 R2, ensure that the SQL Monitor website has been added to the list of allowed local intranet sites:

1. Go to **Tools > Internet Options > Security**.
2. Under **Zones**, select **Local intranet**.
3. Click **Sites** (For IE 8, click **Advanced > Sites**).
4. Add the SQL Monitor website. (This should be pre-selected.)

For all browsers: Check that Javascript is not disabled on your browser.

Moving the Data Repository database

If you want to move the SQL Monitor Data Repository, follow these steps:

1. Stop the Base Monitor service.

   To do this, go to Services (select **Start > Run**, enter **services.msc** and click **OK**) and stop **SQL Monitor 2 Base Monitor**.

2. In your SQL Server management tool, back up your current Data Repository database and then restore it to your preferred location. If you did not change the default name when installing, the Data Repository database will be called **RedgateMonitor**.

3. Edit the SQL Monitor configuration file to update the connection string that locates the SQL Monitor database.

   Navigate to the folder you specified for the configuration file during installation. By default, this is C:\Documents and Settings\All Users\Application Data\Red Gate\SQL Monitor 2 for Windows XP and Windows Server 2003, or C:\ProgramData\Red Gate\SQL Monitor 2 in Windows Server 2008, Windows Vista and Windows 7. Open **RedGate.Response.Engine.Alerting.Base.Service.exe.settings.config** in a text editor or XML editor. The Data Repository database is specified in the **<connectionStrings>** section near the end of the file:

   ```
   <connectionStrings>
            <add name="DataConnectionString" connectionString="Data
   Source=MACHINENAME\SQLInstancename;Initial
   Catalog=RedgateMonitor;Integrated Security=True;Application
   Name=&quot;SQL Monitor - Repository&quot;"/>
   </connectionStrings>
   ```

   Note: The Data Repository comprises a single database schema. The **DataConnectionString** entry specifies the database that will contain all SQL Monitor monitoring and alert data.

   By default, this entry points to the Data Repository database that you specified during installation. To move the Data Repository to a different database, edit this entry to point to a different Data Source (SQL Server instance) and Catalog (database name).

   For example:

   ```
   <add name="DataConnectionString" connectionString="Data
   Source=SECUREMACHINENAME\MyInstance;Initial
   Catalog=RedgateMonitor;Integrated Security=True;Application
   Name=&quot;SQL Monitor - Repository&quot;"/>
   ```

4. Save the configuration file.

5. Restart the **SQL Monitor 2 Base Monitor** service.

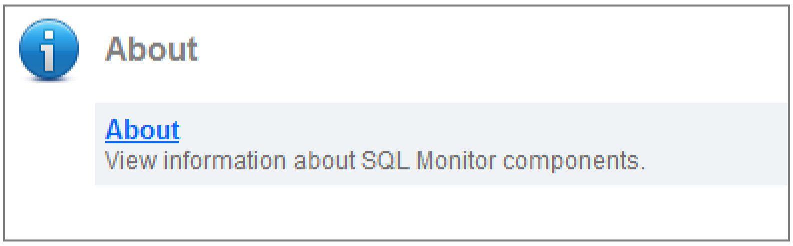
6. Launch SQL Monitor v2 in your browser. To check that your change has been made, go to the **About** page (Configuration > About). Under **Base Monitor**, ensure that the settings for **Database** have been updated to the new database name.

Viewing component information and log files

You can view details about your components and display log files on your SQL Monitor Web Server and Base Monitor activity using the About page. Some of this information, such as the SQL Monitor version number you're using and the detailed logs of activities, will be useful should you need to contact Red Gate support.

Viewing the component information and log files

Go to the **Configuration** tab. Under **About**, select **About**:



About

About

View information about SQL Monitor components.

The page displays useful information about the following SQL Monitor components:

- Web Server - including the server name, server path and current user
- Base Monitor - including the location, user, domain and database details
- Client Browser - agent details

Viewing log files

Click the **View Web server log file** or **View Base Monitor log file** links to display detailed logs of the activities for each of these SQL Monitor components.

Sending log files to Red Gate support

The log file pages also display the network location of each log file. If you need to send Web server or Base Monitor log files to Red Gate support, attach a copy of the original log file to your email. This maintains the initial log format, which can be checked more quickly and easily by support than reformatted content.

Testing data collection methods

SQL Monitor collects data from your monitored servers using the following methods:

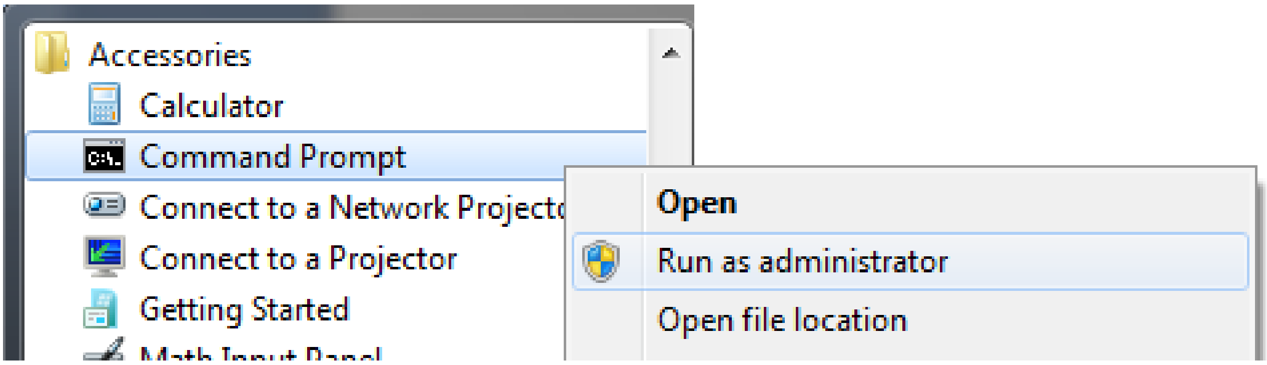
- Ping
- Remote registry (PerfMon & registry access)
- WMI
- Remote file access
- SQL

If you are experiencing connection issues in SQL Monitor, you can start to diagnose where the problem occurs by testing each type of connection independently.

Opening the command prompt

To test each data channel, you will first need to open a command prompt as an administrator:

1. Log in to the machine that is running the SQL Monitor Base Monitor service. See the **About** page (Configuration > About) for details of which machine is running the Base Monitor service.
2. Run the command prompt as an administrator:
   a. From the **Start** menu, select **All Programs > Accessories**.
   b. Right-click on Command Prompt and select **Run as administrator**.



   c. A security warning may be displayed. Click **Yes** to continue.

Testing ping

At the command prompt, run:

```
ping myserver.example.com
```

where `myserver.example.com` is the name of the Windows server you are attempting to monitor.

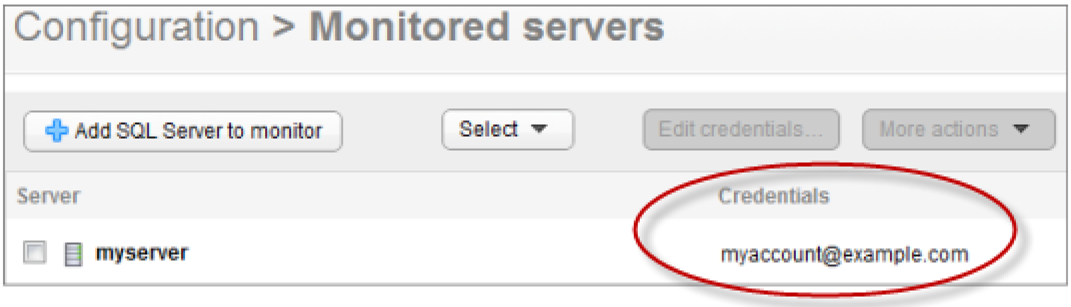
For more information, including details about the most common error messages that may be displayed, see Testing Network Connections with Ping (http://technet.microsoft.com/en-us/library/cc940095.aspx).

Testing remote registry (PerfMon)

1. At the command prompt, run:

   ```
   runas /netonly /user:example.com\myaccount "perfmon"
   ```

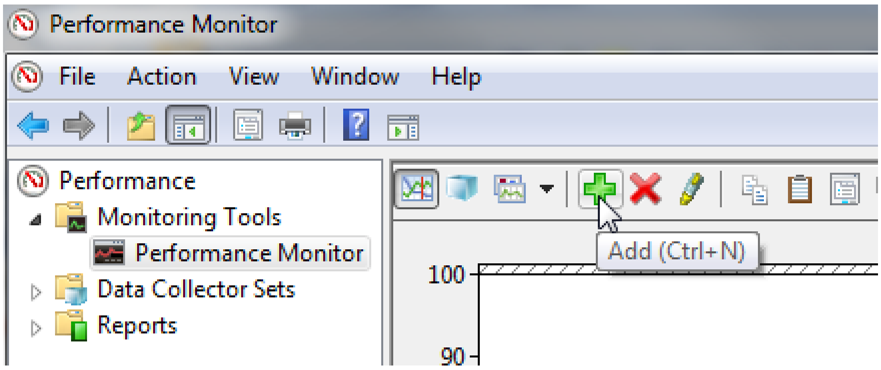
   where `example.com\myaccount` is the Windows account you are using to monitor the server. This is the account listed under Credentials on the **Monitored servers** page in SQL Monitor (Configuration > Monitored servers), as shown below:



Configuration > Monitored servers

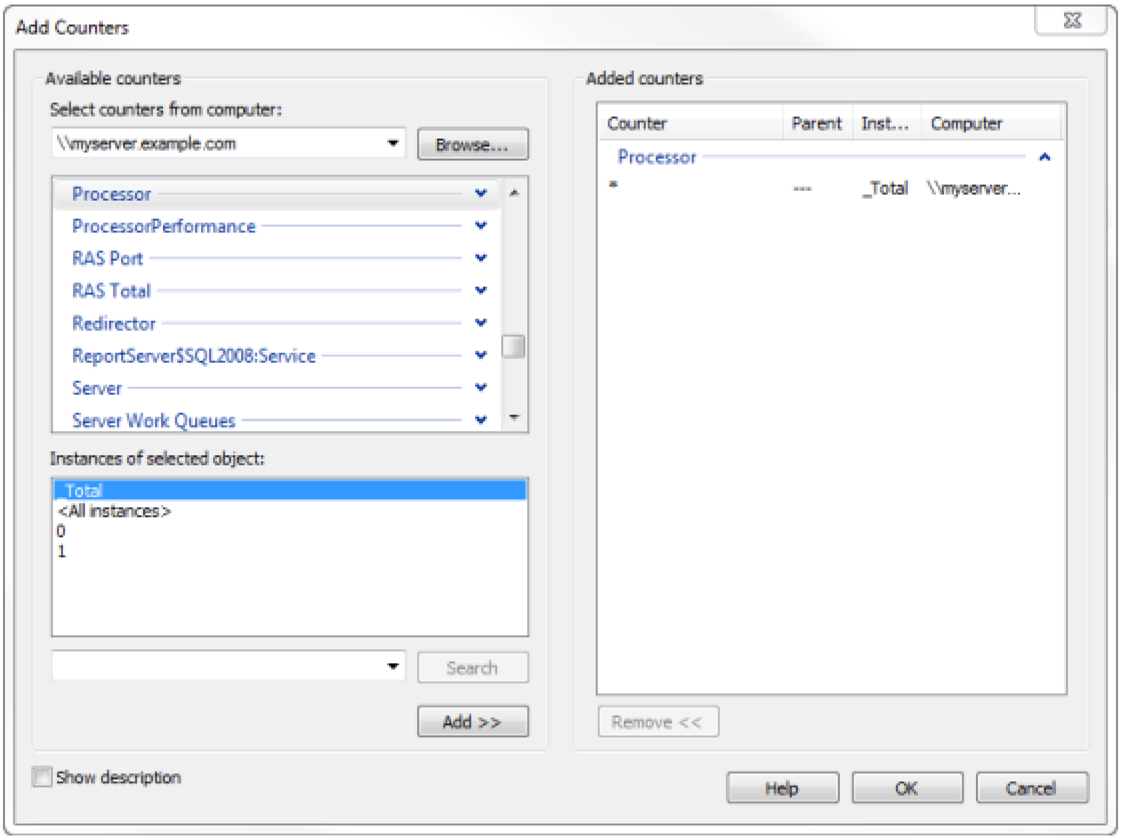
Server	Credentials
□ myserver	myaccount@example.com

2. When prompted, enter the password for this account.
3. Click on Performance Monitor in the left pane, then click the **Add** button:



4. In the **Select counters from computer** box, enter the name of the server you are attempting to monitor.
5. By default, **Processor** is selected in the list of counters and **_Total** in the **Instances of selected object** box.

6. Click **Add>>**. The selected counter appears in the Added counters box on the right:



Select counters from computer: \\myserver.example.com

Instances of selected object:
_Total
<All instances>
0
1

Counter	Parent	Inst...	Computer
Processor			
*	---	_Total	\\myserver...

7. To check another server you are attempting to monitor, type its name in the **Select counters from computer** box and repeat the steps above.

The connection test can fail if the remote registry is not running, not responding, or the interprocess communications (IPC) pipe is blocked by a policy or registry change. The affected server will report either of the following errors:

- (PerfMon) `Unable to connect to specified machine or machine is offline (-2147481648)`
- (Registry) `The network path was not found (53)`

To troubleshoot this, try the following solutions in turn and retest the remote registry connection after each attempt:

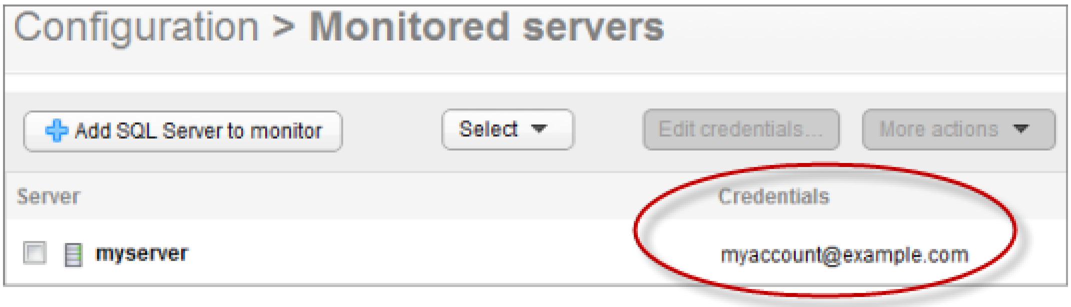
- Check that the remote registry service is running. Click **Start > Control Panel > Administrative Tools > Services**, and make sure that the Remote Registry Startup Type setting is **Automatic**, and the Status is **Started**.
- Restart the remote registry service.
- Check that you have the necessary permissions to access the remote registry. For more information, see How to Manage Remote Access to the Registry (http://support.microsoft.com/kb/314837).
- Check that the Active Directory Domain Services do not contain a policy that blocks access to the Remote Registry service. See Active Directory Domain Services (http://technet.microsoft.com/en-us/library/cc770946%28WS.10%29.aspx).
- If your PerfMon library has become corrupt, rebuild it. For details, see http://support.microsoft.com/kb/300956 (http://support.microsoft.com/kb/300956).

Testing remote registry

1. At the command prompt, run:

   ```
   runas /netonly /user:example.com\myaccount "regedit"
   ```

   where `example.com\myaccount` is the Windows account you are using to monitor the server. This is the account listed under Credentials on the **Monitored servers** page in SQL Monitor (Configuration > Monitored servers), as shown below:

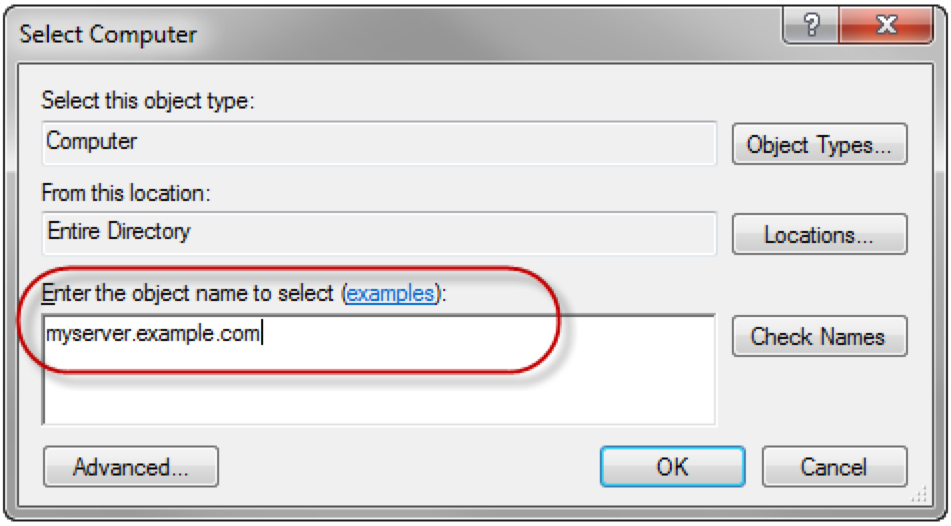
   

   Configuration > Monitored servers

Server	Credentials
□ myserver	myaccount@example.com

2. When prompted, enter the password for this account.
3. In the Registry Editor, select **File > Connect Network Registry**.

4. Enter the name of the server you are attempting to monitor in the Select Computer dialog box:



Select Computer

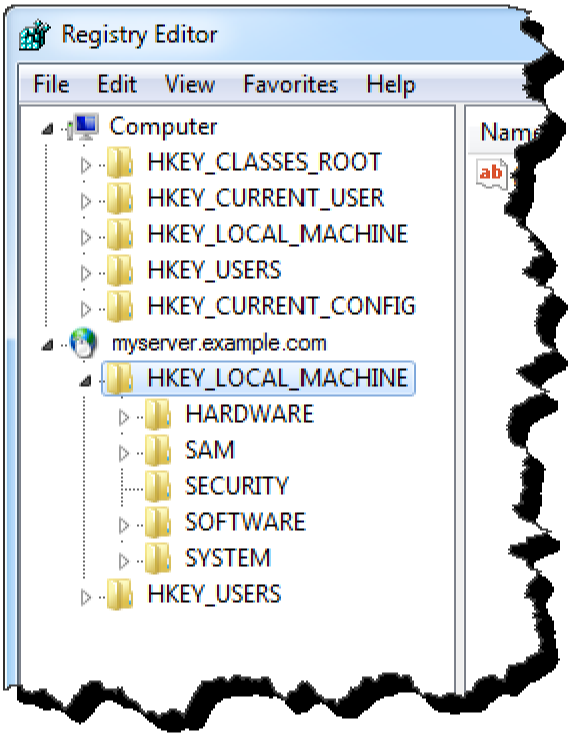
Select this object type:
Computer

From this location:
Entire Directory

Enter the object name to select (examples):
myserver.example.com

5. Click **OK**. The name of the server should be displayed in the left pane.

6. Beneath the name of the server, expand HKEY_LOCAL_MACHINE. You should see a list of registry keys:



7. Repeat the steps above for other servers you want to test.

The connection test can fail if the remote registry is not running, not responding, or the interprocess communications (IPC) pipe is blocked by a policy or registry change. The affected server will report the following error:

- `The network path was not found (53)`

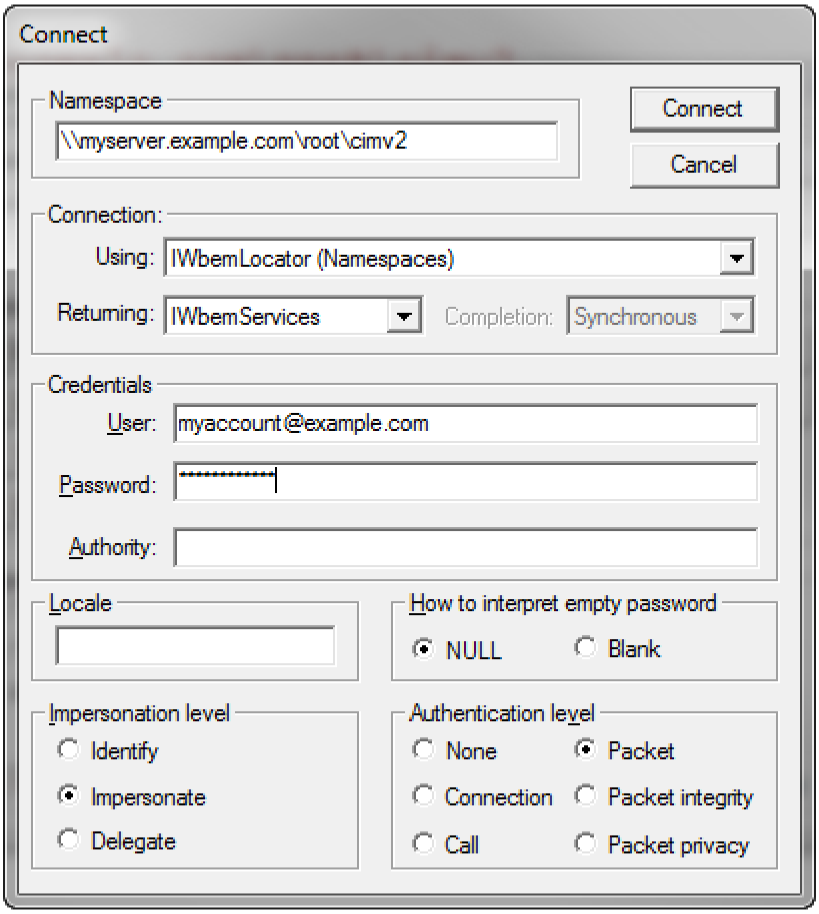
To troubleshoot this, try the same solutions described for Testing remote registry (PerfMon) above.

Testing WMI

1. At the command prompt, run:

   ```
   wbemtest
   ```

2. In the Windows Management Instrumentation Tester dialog box, click **Connect**.
3. In the **Namespace** box, type `\\myserver.example.com\root\cimv2` where where `myserver.example.com` is the name of the Windows server you are attempting to monitor.
4. Under **Credentials**, enter the Windows account you are using to monitor the server and the password. This is the account listed under Credentials on the **Monitored servers** page in SQL Monitor (Configuration > Monitored servers).



Namespace: \\myserver.example.com\root\cimv2

Connection:

Using: IWbemLocator (Namespaces)

Returning: IWbemServices   Completion: Synchronous

Credentials

User: myaccount@example.com

Password: *************

Authority:

Locale:

How to interpret empty password: ● NULL ○ Blank

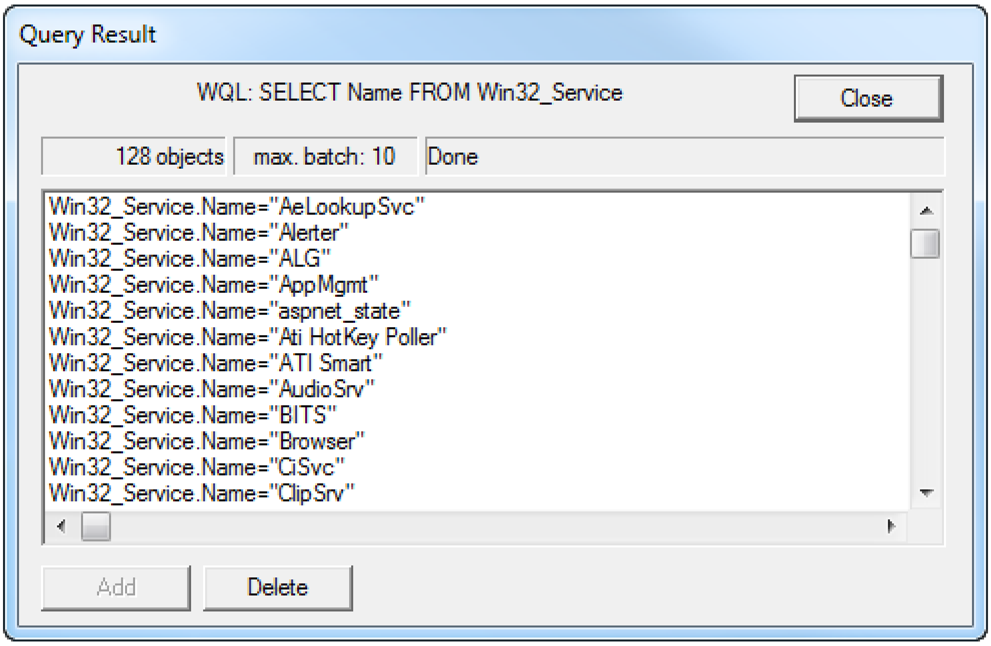
Impersonation level: ○ Identify ● Impersonate ○ Delegate

Authentication level: ○ None ● Packet ○ Connection ○ Packet integrity ○ Call ○ Packet privacy

5. Click **Connect**.
6. Click **Query** and enter the following query:

   ```
   SELECT Name FROM Win32_Service
   ```

7. Click **Apply**. You should see a list of results similar to those shown below:



WQL: SELECT Name FROM Win32_Service

128 objects | max. batch: 10 | Done

```
Win32_Service.Name="AeLookupSvc"
Win32_Service.Name="Alerter"
Win32_Service.Name="ALG"
Win32_Service.Name="AppMgmt"
Win32_Service.Name="aspnet_state"
Win32_Service.Name="Ati HotKey Poller"
Win32_Service.Name="ATI Smart"
Win32_Service.Name="AudioSrv"
Win32_Service.Name="BITS"
Win32_Service.Name="Browser"
Win32_Service.Name="CiSvc"
Win32_Service.Name="ClipSrv"
```

If connection fails and an "Access Denied" error message is displayed, see WMI Troubleshooting (http://msdn.microsoft.com/en-us/library/aa394603%28v=vs.85%29.aspx) and WMI Isn't Working! (http://technet.microsoft.com/en-us/library/ff406382.aspx).

Testing remote file access

1. At the command prompt, run:

   ```
   runas /netonly /user:example.com\myaccount "explorer"
   ```

   where `example.com\myaccount` is the Windows account you are using to monitor the server. This is the account listed under Credentials on the **Monitored servers** page in SQL Monitor (Configuration > Monitored servers).

2. When prompted, enter the password for this account.

3. In the Explorer window address bar, type `\\myserver.example.com\c$` where `myserver.example.com` is the name of the server you are attempting to monitor. You should see the contents of that server's C: drive displayed.

If remote file access fails and an "Access Denied" error message is displayed:

- Check that the server you are attempting to monitor has security policy permissions set to allow remote access.
- Check that the files you are attempting to access on the server's C: drive have file sharing permissions set to allow access.

Testing SQL connection

You can test SQL connectivity using SQL Server Management Studio.

Testing SQL connection using SQL Server authentication:

1. From the **Start** menu, select **All Programs > Microsoft SQL Server 2005/2008 > SQL Server Management Studio**.
2. At the Connect to Server dialog, enter the fully qualified name of the SQL Server instance you are attempting to monitor in the **Server** name box.
3. Select **SQL Server Authentication**.
4. Enter the SQL Server login and password you are using to connect to the SQL Server instance and click **Connect**.

Testing SQL connection using Windows authentication:

1. From the **Start** menu, select **All Programs > Microsoft SQL Server 2005/2008** to display a sub-menu.
2. Hold down the Shift key, right-click on **SQL Server Management Studio** and select **Run as different user**.
3. At the Windows Security dialog, enter the Windows user name and password you are using to connect to the SQL Server instance and click **OK**.
4. At the Connect to Server dialog, enter the fully qualified name of the SQL Server instance you are attempting to monitor in the **Server name** box, and click **Connect**.

If connection fails, one of the following error messages is displayed:

- Timeout expired
- An existing connection was forcibly closed by the remote host
- No process is on the other end of the pipe
- Login failed for user <x>

A connection failure may also occur if the system administrator privileges used to access the database engine are inadvertently deleted. To resolve these issues, see Troubleshooting Database Engine Connectivity (http://msdn.microsoft.com/en-us/library/ms191243.aspx).

Managing security in SQL Monitor

SQL Monitor is a web application that is accessed using a web browser within your LAN. The following aspects of SQL Monitor may therefore require security considerations:

Encryption between the Base Monitor service and Web Server

The communication between the Base Monitor service and the Web Server is encrypted using a self signed certificate. For future releases, we plan to support the use of user-specified certificates.

Where does SQL Monitor store credentials for host machines and SQL Server instances?

When you install SQL Monitor, it creates a single Data Repository database in which all monitoring data, alert information and configuration settings are stored.

When you add servers to monitor in the SQL Monitor v2 application, the login and password you provide for each host Windows machine and SQL Server instance are stored in settings tables inside the Data Repository.

Passwords are obfuscated before they are stored in the Data Repository.

Protecting the configuration file

The configuration file referenced above may contain password information in plain text if you specify SQL Server authentication as part of the connection string. You should ensure that unauthorized users are unable to view the contents of this file, for example, by denying then access to the folder.

Note: The Base Monitor service account needs access to the configuration file.

Log files

There is no sensitive information logged in the log files created by the Base Monitor service or the Web Server.

Password for accessing the SQL Monitor website

When you first install and run SQL Monitor, you will be prompted to create a password that will be required for anyone accessing SQL Monitor web pages.

There are no complexity restrictions for the password.

Resetting your SQL Monitor password

To reset the password used to log in to SQL Monitor, you will need to delete the current password stored in the SQL Monitor Data Repository database:

1. Log in to the SQL Server instance hosting your SQL Monitor Data Repository database.
2. In SQL Server Management Studio (or equivalent SQL editing tool) run the following query:

   ```
   USE RedGateMonitor

   GO

   DELETE FROM settings.UserAccount
   ```

   (where `RedGateMonitor` is the name of the database you are using for the Data Repository).
3. Paste the URL for SQL Monitor into your browser address bar, e.g. `http://MyServer.mydomain:8080`.

   Note: If your browser displays a message asking if you want to repost the data, ignore it. Reposting will enter the password you have just deleted.
4. The **Create password** page is displayed. Enter your new password.