Solution Package for MongoDB User's Guide

Version 3.3

RTView®

SL Corporation
240 Tamal Vista Blvd.
Corte Madera, CA 94925 USA

Phone: 415.927.8400
Fax: 415.927.8401
Web: http://www.sl.com

Preface

Welcome to the Solution Package for MongoDB User's Guide.

Read this preface for an overview of the information provided in this guide and the documentation conventions used throughout, additional reading, and contact information. This preface includes the following sections:

About This Guide

The Solution Package for MongoDB User's Guide describes how to install, configure and use the Monitor.

Document Conventions

This guide uses the following standard set of typographical conventions.

Convention	Meaning
italics	Within text, new terms and emphasized words appear in italic typeface.
boldface	Within text, directory paths, file names, commands and GUI controls appear in bold typeface.

Courier	Code examples appear in Courier font:
	`amnesiac > enable`
	`amnesiac # configure terminal`

< >	Values that you specify appear in angle brackets: **interface <ipaddress>**

Additional Resources

This section describes resources that supplement the information in this guide. It includes the following information:

Release Notes

The Release Notes document, which is available on the SL Technical Support site at http://www.sl.com/support/, supplements the information in this user guide.

Documentation and Support Knowledge Base

For a complete list and the most current version of SL documentation, visit the SL Support Web site located at http://www.sl.com/support/documentation/. The SL Knowledge Base is a database of known issues, how-to documents, system requirements, and common error messages. You can browse titles or search for keywords and strings. To access the SL Knowledge Base, log in to the SL Support site located at http://www.sl.com/support/.

Contacting SL

This section describes how to contact departments within SL.

Internet

You can learn about SL products at http://www.sl.com.

Technical Support

If you have problems installing, using, or replacing SL products, contact SL Support or your channel partner who provides support. To contact SL Support, open a trouble ticket by calling 415 927 8400 in the United States and Canada or +1 415 927 8400 outside the United States.

You can also go to http://www.sl.com/support/.

CHAPTER 1 Introduction to the Monitor

This section contains the following:

Overview

The Solution Package for MongoDB is an easy to configure and use monitoring system that gives you extensive visibility into the health and performance of your MongoDB instances, databases, and collections.

The Monitor enables MongoDB users to continually assess and analyze the health and performance of their infrastructure, gain early warning of issues with historical context, and effectively plan for capacity of their messaging system. It does so by aggregating and analyzing key performance metrics across all instances, databases, and collections, and presents the results, in real time, through meaningful dashboards as data is collected.

Users also benefit from predefined dashboards and alerts that pin-point critical areas to monitor in most environments, and allow for customization of thresholds to let users fine-tune when alert events should be activated.

The Monitor also contains alert management features so that the life cycle of an alert event can be managed to proper resolution. All of these features allow you to know exactly what is going on at any given point, analyze the historical trends of the key metrics, and respond to issues before they can degrade service levels in high-volume, high-transaction environments.

Solution Package

The MongoDB Monitor can be installed as a Solution Package within the RTView Enterprise Monitor® product. RTView Enterprise Monitor is an end-to-end monitoring platform that allows application support teams to understand how infrastructure, middleware, and application performance data affect the availability and health of the entire application. Used as a solution package within RTView Enterprise Monitor, the MongoDB metrics and health state are but one source of information that determines the entire health state of the application.

Get Started

Go to "Quick Start - Solution Package" for details on how to get up and running with the Solution Package for MongoDB. RTView Enterprise Monitor® 3.3 must be installed on your system.

For more information about RTView Enterprise Monitor®, see the *RTView Enterprise Monitor® User's Guide*, available at http://www.sl.com/support/documentation/.

System Requirements

Please refer to the **README_sysreq.txt** from your product installation. A copy of this file is also available on the product download page.

CHAPTER 2 Quick Start - Solution Package

This section describes how to install, configure, and start the Solution Package for MongoDB. See **README_sysreq.txt** for the full system requirements for RTView®.

The Solution Package for MongoDB requires RTView Enterprise Monitor 3.3.

For Linux, these instructions require a Bourne-compatible shell.

These instructions assume you are familiar with the start/stop scripts for RTView Enterprise Monitor. For details, see the *RTView Enterprise Monitor® User's Guide* available at http://www.sl.com/support/documentation/.

As a general rule, SL recommends creating a top-level directory named **RTView** and installing RTView Enterprise Monitor under this directory. The following sections assume that you have created an **RTView** directory and installed RTView Enterprise Monitor under the **RTView** directory, thus resulting in the **RTView/rtvapm** directory structure.

This document also assumes you created a project directory, **rtvapm_projects**, when you installed RTView Enterprise Monitor. All examples (of configurations, property settings, command execution, and so forth) refer to the project directory. The Solution Package for MongoDB configuration is located in the **rtvapm_projects/emsample/servers/miscmon**.

This section includes:

Install & Setup

Prerequisite: RTView Enterprise Monitor 3.3 must be installed on your system. You also need to copy the **mongo-java-driver-3.2.1.jar** file into a subdirectory under **C:\RTView** (see step 5 for more information).

1. Download the **rtvapm_mongomon_<version>.zip** archive to your local Windows/UNIX/Linux server.

2. Extract the files:

   Windows:

   Type **unzip rtvapm_mongomon _<version>.zip** and save the files to the **C:\RTView** directory.

   UNIX/Linux:

Type **unzip -a rtvapm_mongomon _<version>.zip** and save the files to the **/opt/RTView** directory.

3. Verify that the **mongomon** directory was created under **rtvapm** and extracted correctly.

4. Verify you do not have an extra **rtvapm** directory containing **mongomon**. If you do, move these directories under the first **rtvapm** directory and delete the nested **rtvapm**.

5. Create an additional directory under the **RTView** directory, **ext** for example (**C:/RTView/ext**), which should contain third party libraries and supporting files. Under this directory, create a **mongodb** directory (**C:/RTView/ext/mongodb**) and copy the **mongo-java-driver-3.2.1.jar** file into the directory.

   Once the file is copied to this directory, go to the mongmon section in the **sample.properties** file in **C:/RTView/rtvapm_projects/emsample/servers/miscmon** and uncomment the following line:

   ```
   #collector.sl.rtview.cp=%RTVAPM_HOME%/../ext/mongodb/mongo-java-driver-3.2.1.jar
   ```

6. Set **JAVA_HOME** to the location of your Java installation and include the **bin** directory under **JAVA_HOME** in the path.

   Important: This environment variable must be defined in UNIX/Linux systems for Tomcat to start successfully.

Proceed to "Connect Your Databases," next.

Connect Your Databases

Connect your own databases and enable for data collection.

1. Open the **RTView/rtvapm_projects/emsample/servers/miscmon/sample.properties** file and find the following section:

```
# MONGO SERVER STATUS DS CONNECTION Settings
#
# Copy and paste the following line, assign a name to the connection, and provide the
URL and port to your Mongo DB

#collector.sl.rtview.mongoserverstatusds.conn=__name=ConnectionName url=mongodb://
myUserAdmin:abc123@MongoDbUrl:MongoDbPort/admin
```

2. Uncomment and add/edit the following lines for each MongoDB database to which you want to connect (to enable the Monitor to collect data from them):

```
#collector.sl.rtview.mongoserverstatusds.conn=__name=ConnectionName url=mongodb://
myUserAdmin:abc123@MongoDbUrl:MongoDbPort/admin
```

The connection string should use the following format:

```
mongodb://[username:password@]host1[:port1][,host2[:port2],...[,hostN[:portN]]][/
```

`[database][?options]]`

- **mongodb://** is a required prefix to identify that this is a string in the standard connection format.
- **username:password@** are optional. If given, the driver will attempt to login to a database after connecting to a database server. For some authentication mechanisms, only the username is specified and the password is not, in which case the ":" after the username is left off.
- **host1** is the only required part of the URI. It identifies a server address to which to connect.
- **:portX** is optional and defaults to **:27017** if not provided.
- **/database** is the name of the database to login to and thus is only relevant if the username:password@ syntax is used. If not specified, the **admin** database will be used by default.
- **?options** are connection options. Note that if the database is absent, there is still a **/** required between the last host and the **?** introducing the options. Options are name=value pairs and the pairs are separated by **&**. For backwards compatibility, **;** is accepted as a separator in addition to **&**, but should be considered as deprecated.

Example for two database connections:

collector.sl.rtview.mongoserverstatusds.conn=__name=Mongo-1 url=mongodb://myUserAdmin:abc123@123.4.567.890:27017

collector.sl.rtview.mongoserverstatusds.conn=__name=Mongo-2 url=mongodb://123.456.789.012:27027

Proceed to "Start the Monitor," next.

Start the Monitor

Use the configuration defined in the **rtvservers.dat** file, which is located in the **RTView/rtvapm_projects/emsample/servers** directory.

1. Initialize a command line window by executing the **rtvapm_init** script. For example:

   Windows

   Go to your RTView Enterprise Monitor installation directory and type:

   rtvapm_init

   UNIX

   Go to your Enterprise Monitor installation directory and type:

   ../rtvapm_init.sh

2. Initialize the user project directory by executing the rtvapm_user_init script. For example:

   Windows

   Change directory (**cd**) to **RTView\rtvapm_projects\emsample** and type:

   rtvapm_user_init

   UNIX

   Change directory (**cd**) to **RTView/rtvapm_projects/emsample** and type:

. . / rtvapm_user_init.sh

3. Change directory (**cd**) to **rtvapm_projects / emsample / servers**.

4. Execute **start_rtv.sh central** (**start_rtv central** for Windows) to start the RTView Enterprise Monitor main processes.

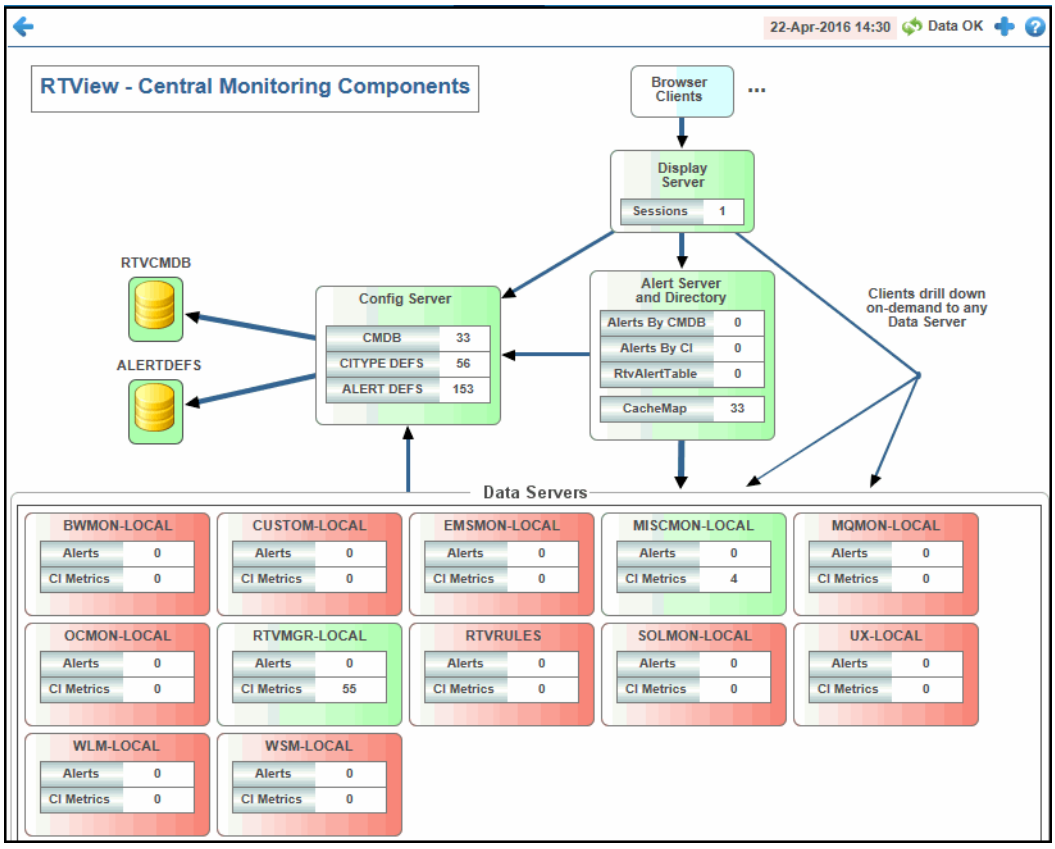
5. Execute **start_rtv.sh rtvmgr** (**start_rtv rtvmgr** for Windows) to start the RTView Manager.

6. Execute **start_rtv.sh miscmon –properties:sample** (or **start_rtv miscmon –properties:sample** for Windows) to start all components of the Solution Package for MongoDB.

   Note: Make sure that you have deployed the **emsample.war** file to your application server prior to attempting the next step. See the “Configure Central Servers” section in the RTView Enterprise Monitor document for more information.

7. Open a browser and go to your RTView Enterprise Monitor deployment.

8. Verify that the Data Server is collecting data by navigating to the **Admin** tab and clicking **Architecture->System Overview** in the navigation tree. The **RTView - Central Monitoring Components** display should open and the Data Server, named **MISCMON-LOCAL** (by default), should be green and the **CI Metrics** value should be greater than zero (**0**). For example:



You have completed the Quick Start.

For information about configuring RTView Enterprise Monitor and Solution Packages for your production environment, see the *RTView Enterprise Monitor® User's Guide* available at http://www.sl.com/support/documentation/.

Stop the Monitor

To stop the Solution Package for MongoDB (in RTView Enterprise Monitor):

1. Change directory (**cd**) to **RTView/rtvapm_projects/emsample/servers**.
2. Execute **stop_rtv.sh miscmon** (or **stop_rtv miscmon** for Windows) to stop all components of the Solution Package for MongoDB.

Troubleshooting

This section includes:

Log Files

When a Monitor component encounters an error, it outputs an error message to the console and/or to the corresponding log file. If you encounter issues, look for errors in the following log files:

- **dataserver.log**
- **historian.log**

which are located in the **rtvapm_projects/emsample/servers/miscmon/logs** directory.

Logging is enabled by default. If you encounter issues with log files, verify the **logs** directory exists in the **rtvapm_projects/emsample/servers/miscmon** directory.

JAVA_HOME

If the terminal window closes after executing the **start_rtv** command, verify that JAVA_HOME is set correctly.

Permissions

If there are permissions-related errors in the response from the **start_rtv** command, check ownership of the directory structure.

Network/DNS

If any log file shows reference to an invalid URL, check your system's hosts file and confirm with your Network Administrator whether your access to the remote system is being blocked.

Verify Data Received from Data Server

If you encounter problems collecting data, restart the Data Server, start the Monitor, and go to the **Admin** tab and select **Architecture> RTView Cache Tables** in the navigation tree. Select **MISCMON-LOCAL** from the **Data Server** drop down list, and search for all caches that start with "Mongo." Make sure these caches are populated (the number of **Rows** and **Columns** in the table should be greater than 0). If not, there might be a problem with the connection to the Data Server.

You should also make sure that the **mongo-java-driver-3.2.1.jar** file has been copied to the **C:\RTView\ext** directory and that the #collector.sl.rtview.cp=%RTVAPM_HOME%/../ext/mongodb/mongo-java-driver-3.2.1.jar property in the **rtvapm_projects/emsample/servers/miscmon/sample.properties** file has been uncommented. See "Install & Setup" for more information.

Verify Port Assignments

If the Viewer, display server, or Historian fail to connect to the Data Server or they receive no data, verify the ports are assigned correctly in your properties files and restart the Data Server.

CHAPTER 3 Solution Package Production Configuration

For information about configuring RTView Enterprise Monitor and Solution Packages for your production environment, see the *RTView Enterprise Monitor® User's Guide* available at http://www.sl.com/support/documentation/.

CHAPTER 4 Deployment

This section describes how to deploy the Monitor components. This section includes:

Overview

The Monitor can be deployed as a stand-alone desktop client or as a web application that runs in a browser. Evaluation environments can use the provided HSQLDB database. Production environments require a supported JDBC- or ODBC-enabled relational database to store historical information. Supported databases are MySql, SyBase, Oracle, SqlServer and DB2.

The central processes are typically deployed on the same host. However, these processes can optionally be configured on separate hosts. Doing so can increase performance in deployments that need to support many end users or systems with large servers.

- "Desktop Application Deployment" on page 13

  If you choose the desktop option, the Monitor desktop application needs to be installed at each client.

- "Web Application Deployment" on page 15

  If you choose the browser option, clients need only a browser and Adobe Flash installed.

Desktop Application Deployment

This section describes how to deploy the Monitor as a desktop application. You deploy the Monitor using the **start_rtv** script (and stop the Monitor using the **stop_rtv** script). In a desktop deployment the stand-alone desktop client connects directly to an RTView Data Server which gathers performance metrics. For desktop deployments, the following processes are started: the RTView Data Server, Historian, and Viewer desktop application, as well as the database.

NOTE: The RTView Data Server, Historian and Display Server can be run as Windows Services. For details, see "RTView Server Components as Windows Services" on page 18.

To deploy the Monitor as a desktop application:

- "Windows" on page 14

- "UNIX/Linux" on page 14

Windows

1. Initialize a command window. Go to your Monitor installation directory and type:
   rtvapm_init
2. Change directory (**cd**) to the **RTView\rtvapm_projects\emsample** directory and type:
   rtvapm_user_init
3. Change directory (**cd**) to **RTView\rtvapm_projects\emsample\servers** and type:
   start_rtv central
   start_rtv rtvmgr
   start_rtv mongomon
4. Start the Viewer by typing:
   start_rtv viewer
5. Login. The default user name and password are:
   User Name: **demo**
   Password: **demo**
   The RTView Enterprise Monitor display opens.

UNIX/Linux

1. Initialize a terminal window. The script used to initialize a terminal window depends on whether you are in csh or rsh (e.g. Linux, Mac OS X). With a Bourne shell, open a terminal window, go to your Monitor installation directory and type:
   ../rtvapm_init.sh
2. Change directory (**cd**) to the **RTView/rtvapm_projects/emsample** directory and type:
   ../rtvapm_user_init.sh
3. Change directory (**cd**) to **RTView/rtvapm_projects/emsample/servers** and type:
   start_rtv.sh central
   start_rtv.sh rtvmgr
   start_rtv.sh mongomon
4. Start the Viewer by typing:
   start_rtv.sh viewer
5. Login. The default user name and password are:
   User Name: **demo**
   Password: **demo**

The RTView Enterprise Monitor display opens.

Web Application Deployment

This section describes how to deploy the Monitor as a web application. You deploy the Monitor using the **start_rtv** script (and stop the Monitor using the **stop_rtv** script). For web application deployments the following processes are started: the RTView Data Server, Historian and Display Server, as well as the database and an application server.

NOTE: The RTView Data Server, Historian and Display Server can be run as Windows Services. For details, see "RTView Server Components as Windows Services" on page 18.

To deploy the Monitor as a web application:

- "Windows" on page 15
- "UNIX/Linux" on page 16

To view a list of iPad Safari limitations:

- "iPad Safari Limitations" on page 16

Windows

1. Copy the **RTView\rtvapm\projects\webapps\emsample.war** file and deploy it to your Application Server.
2. Start your Application Server.
3. Initialize a command window. Go to your Monitor installation directory and type:

   rtvapm_init
4. Change directory (**cd**) to **RTView\rtvapm_projects\emsample** and type:

   rtvapm_user_init
5. Change directory (**cd**) to **RTView\rtvapm_projects\emsample\servers** and type:

   start_rtv central

   start_rtv rtvmgr

   start_rtv mongomon
6. Open a Web browser and type the following URL to open the Monitor:

   http://host:port/emsample

   Where **host** is the IP or host name where your Application Server is running and **port** is the port used by your Application Server. The login display opens in the Web browser.

   Login. The default user name and password are:

   User Name: **demo**

   Password: **demo**

   The main monitor display opens.

UNIX/Linux

1. Copy the **RTView/rtvapm/projects/webapps/emsample.war** file and deploy it to your Application Server.

2. Start your Application Server.

3. Initialize a terminal window. The script used to initialize a terminal window depends on whether you are in csh or rsh (e.g. Linux, Mac OS X). With a Bourne shell, open a terminal window, go to your Monitor installation directory and type:

   ../rtvapm_init.sh

4. Change directory (**cd**) to **RTView/rtvapm_projects/emsample** and type:

   ../rtvapm_user_init.sh

5. Change directory (**cd**) to **RTView/rtvapm_projects/emsample/servers** and type:

   start_rtv.sh central

   start_rtv.sh rtvmgr

   start_rtv.sh mongomon

6. Open a Web browser and type the following URL to open the Monitor:

   http://host:port/emsample

   Where **host** is the IP or host name where your Application Server is running and **port** is the port used by your Application Server. The login display opens in the Web browser.

   Login. The default user name and password are:

   User Name: **demo**

   Password: **demo**

   The main Monitor display opens.

iPad Safari Limitations

- In the iPad settings for Safari, **JavaScript** must be **ON** and **Block Pop-ups** must be **OFF**. As of this writing, the Thin Client has been tested only on iOS 4.3.5 in Safari.
- The iPad does not support Adobe Flash, so the Fx graph objects (obj_fxtrend, obj_fxpie, obj_fxbar) are unavailable. The Thin Client automatically replaces the Fx graph objects with the equivalent non-Fx object (obj_trendgraph02, obj_pie, obj_bargraph). Note that the replacement objects behave the same as the Fx objects in most cases but not in all. In particular, obj_trendgraph02 does not support the sliding cursor object nor the **legendPosition** property. Custom Fx objects are not supported on the iPad.
- The Thin Client implements scrollbars for table objects and graph objects. However, unlike the scrollbars used on desktop browsers, the scrollbars used on the iPad do not have arrow buttons at each end. This can make it difficult to scroll precisely (for example, row by row) on objects with a large scrolling range.

- At full size, users may find it difficult to touch the intended display object without accidentally touching nearby objects and performing an unwanted drill-down, sort, scroll, and so forth. This is particularly true of table objects that support drill-down and also scrolling, and also in panel layouts that contain the tree navigation control. In those cases, the user may want to zoom the iPad screen before interacting with the Thin Client.
- If the iPad sleeps or auto-locks while a Thin Client display is open in Safari, or if the Safari application is minimized by clicking on the iPad's home button, the display is not updated until the iPad is awakened and Safari is reopened. In some cases it may be necessary to refresh the page from Safari's navigation bar.

Because the iPad uses a touch interface there are differences in the Thin Client appearance and behavior in iOS Safari as compared to the conventional desktop browsers that use a cursor (mouse) interface, such as Firefox and Internet Explorer. These are described below.

- Popup browser windows: An RTView object's drill-down target can be configured to open a display in a new window. In a desktop browser, when the RTView object is clicked the drill-down display is opened in a popup browser window. But in iOS Safari 4.3.5, only one page is visible at a time, so when the RTView object is touched a new page containing the drill-down display opens and fills the screen. The Safari navigation bar can be used to toggle between the currently open pages or close them.
- Mouseover text: When mouseover text and drill-down are both enabled on an RTView object (for example, a bar graph), in iOS Safari the first touch on an element in the object (for example, a bar) displays the mouseover text for that element and the second touch on the same element performs the drill-down.
- Resize Mode and Layout: By default, the Display Server runs with **resizeMode** set to **crop**. In **crop** mode, if a display is larger than the panel that contains it only a portion of the display is visible. In a desktop browser, scrollbars become available to allow the user to scroll to view the entire display. In iOS Safari, scrollbars do not appear but the display can be scrolled by dragging two fingers inside the display. (Dragging one finger scrolls the entire page, not the display).

  If the Display Server is run with **resizeMode** set to **scale** or **layout**, the display is resized to fit into the panel that contains it. If a desktop browser is resized after a display is opened, the display is resized accordingly. On the iPad, the Safari browser can only be resized by reorienting the iPad itself, between portrait mode and landscape mode.

  The panel layout feature is supported in the Thin Client. However, unlike a desktop browser which resizes to match the layout size, the size of Safari is fixed. So if the Display Server is run with **resizeMode** set to **crop** or **scale** mode, there may be unused space at the edges of the display(s) or, in **crop** mode, the panels and displays may be cropped.

  This means that **layout** mode should be used for best results on the iPad. For layout mode to be most effective, displays should use the **anchor** and **dock** object properties. Please see RTView documentation for more information.
- Scrolling: The Thin Client implements scrollbars for table objects and graph objects. The scrollbars are activated by dragging with one finger.

  If an RTView display is viewed in **crop** mode and is too large to be displayed entirely in Safari, scrollbars do not appear (as they would in a desktop browser) but the display can be scrolled by dragging with two fingers inside the display.

  Scrollbars do not ever appear in a text area control. If the text area contains more text than is visible, use the two finger drag in the text area to scroll the text.

Regardless of the size of a listbox control, it can only display a single item (typically, the selected item). When the listbox is touched, the list of items appear in a popup list. In other words, on iOS Safari the listbox control and the combobox control behave identically.

- Context menu: The Thin Client context menu is opened by a right mouse button click in a desktop browser. It is opened in iOS Safari by touching any location on a display and holding that touch for 2 seconds. The menu appears in the top left corner of the display, regardless of where the display is touched. The items **Export Table to Excel**, **Drill Down**, and **Execute Command** are not included on the context menu in Safari. All other items are available. The **Export Table to HTML** item is enabled if a table object is touched (unless the table object's drillDownTarget is configured to open another display). After an **Export to PDF/HTML** is performed, the exported content opens on another page in Safari. From there, the content can either be opened by another application (for example, the iBooks application opens PDF) and emailed, or it can be copied ands pasted into an email.

RTView Server Components as Windows Services

This section describes how to configure an RTView process (Data Server and Historian) to run as a Windows service.

To Configure the Data Server or Historian to run as a Windows Service

1. Add the following lines to the **sample.properties** file.

```
##########################
# WINDOWS SERVICES
# Install Monitor servers as Windows services
#
installservice.sl.rtview.cmd_line=-install_service
installservice.sl.rtview.cmd_line=-dir:%RTVAPM_STARTUP%
uninstallservice.sl.rtview.cmd_line=-uninstall_service
#
```

NOTE: The environment variable %RTVAPM_STARTUP% is set by a run script to the directory where the script was started.

2. For each Windows service you want to create, add the following line and replace **name** with a name you choose for the service:

   name.sl.rtview.cmd_line=service:name

Note: Each service must have a unique name and the beginning of the property entered must match the name of the service.

For example, if you choose **MiscMonData** as the name for starting a Data Server as a Windows service.

```
##########################
# WINDOWS SERVICES
# Install Monitor servers as Windows services
#
```

```
    installservice.sl.rtview.cmd_line=-install_service
    installservice.sl.rtview.cmd_line=-dir:%RTVAPM_STARTUP%
    uninstallservice.sl.rtview.cmd_line=-uninstall_service
    MiscMonData.sl.rtview.cmd_line=-service:MiscMonData
#
```

To install and run

Execute the following scripts to start the service:

NOTE: These scripts must be run in an initialized command window.

rundata -propfilter:installservice -propfilter:MiscMonData

To uninstall

Execute the following scripts to uninstall the services:

NOTE: These scripts must be run in an initialized command window.

rundata -propfilter:uninstallservice -propfilter:MiscMonData

Troubleshooting

Log Files

When the Monitor encounters an error, Monitor components output an error message to the console and/or to the corresponding log files. Log files are located in the **project_directory\logs** directory (for example: **rtvapm_projects\emsample\servers\miscmon\logs**). Look at the following log files on the machine where the components are running:

- **dataserver.log**
- **historian.log**

To enable logging, make sure the directory logs exist in your project directory.

Verifying Data Received from Data Server

Open the **Cache Viewer Display** to verify data is arriving correctly from the Data Server. To access the **Cache Viewer Display**, select the **Admin** tab, choose **Administration** in the navigation tree, then choose **RTView Cache Tables** or the **RTView Cache Overview**. You should see all caches being populated with monitoring data (number of rows > 0). Otherwise, there are problems with the connection to the Data Server.

Restarting the Data Server

If the Viewer, the Display Server or the Historian fails to connect to the Data Server or receives no data, verify the ports are assigned correctly in your properties files and then restart the Data Server.

CHAPTER 5 Using the Monitor

This section describes how to read and use Monitor displays. This section includes:

Overview

This section describes the general operation of the MongoDB Monitor and the user interface. This section includes:

- "Navigation Tree" on page 21: Describes the organization of the MongoDB Monitor displays.
- "Heatmaps" on page 22: Describes how to read heatmaps.
- "Tables" on page 24: Describes how to read tables.
- "Trend Graphs" on page 25: Describes how to read trend graphs.
- "Title Bar Functionality" on page 26: Describes the top layer of the title bar shared by EMS Monitor displays.
- "Export Report" on page 26: Allows you to quickly export reports for displays, or for tables and grid objects in a display, to a PDF file.

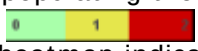
Navigation Tree

The MongoDB Monitor navigation tree (in the left panel) is organized as follows:

- "Mongo Instance Views": The displays in this section present performance metrics and alert statuses for all MongoDB instances.
- "Mongo Database Views": The displays in this section present detailed performance metrics and connection information for all databases or for a specific database.
- "Mongo Collection Views": The displays in this section present several views of performance metrics for collections.

Heatmaps

Heatmaps organize your MongoDB resources (instances, databases, and collections) into rectangles and use color to highlight the most critical value in each. Heatmaps enable you to view various alert metrics in the same heatmap using drop-down menus. Each metric has a color gradient bar that maps relative values to colors. In most heatmaps, the rectangle size represents the number of MongoDB resources in the rectangle; a larger size is a larger value. Heatmaps include drop-down menus by which to filter data. The filtering options vary among heatmaps.

For example, the **All Instances Heatmap** (shown above) contains a **Metric** drop-down menu with options to show **Alert Severity**, **Alert Count**, **Physical Memory**, **Open Cursors, Connections**, and **Databases**. Menu options vary according to the data populating the heatmap. **Alert Severity** is selected and its corresponding color gradient  bar is shown. Each rectangle represents a connection. A red rectangle in the heatmap indicates that one or more resources associated with that connection currently has an alert in an alarm state. The yellow rectangles in the heatmap indicate that one or more resources associated with that host currently have an alert in a warning state. A green rectangle would indicate that no alert is in a warning or alarm state.

In most heatmaps, you can also drill-down to more detail by clicking a rectangle in the heatmap. Or, open a new window by using the  button and then drill-down. The drill-down opens a display that contains relevant and more detailed data.

Note: Typically, it takes about 30 seconds after a server is started to appear in an MongoDB Monitor display. By default, data is collected every 15 seconds, and the display is refreshed 15 seconds afterward.

As previously mentioned, each Metric drop-down menu option has a color gradient bar that maps relative values to colors. The following summarizes the heatmap color code translation for typical heatmaps:

Alert Impact

The product of the maximum **Alert Severity** multiplied by the maximum **Criticality** of alerts in a given heatmap rectangle. Values range from **0 - 10**, as indicated in the color gradient bar, where **10** is the highest **Alert Impact**.

Alert Severity

The maximum alert level in the item (index) associated with the rectangle. Values range from **0 - 2**, as indicated in the color gradient bar, where **2** is the highest Alert **Severity.**

-- Metrics that have exceeded their specified **ALARM LEVEL** threshold have an **Alert Severity** value of **2**. For a given rectangle, this indicates that one or more metrics have reached their alert thresholds.

-- Metrics that have exceeded their specified **WARNING LEVEL** threshold have an **Alert Severity** value of **1**. For a given rectangle, this indicates that one or more metrics have reached their warning thresholds.

-- Metrics that have not exceeded either specified threshold have an **Alert Severity** value of **0**. For a given rectangle, this indicates that no metrics have reached their warning or alert thresholds.

Alert Count

The total number of critical and warning alerts in a given item (index) associated with the rectangle. The color gradient bar  numerical values range from **0** to the maximum count of alerts currently in the heatmap. The middle value in the gradient bar indicates the average alert count.

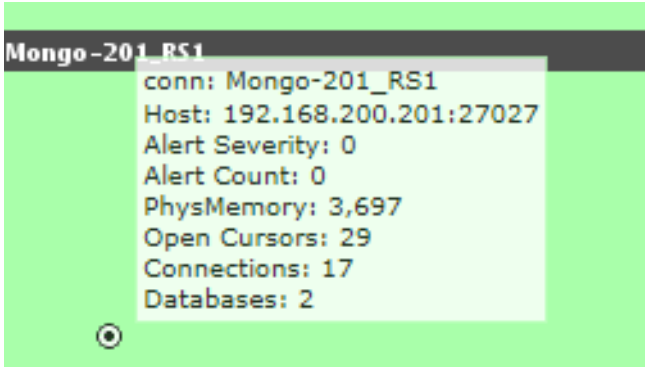
Criticality

The maximum level of **Criticality** (rank of importance) in a given item (index) associated with the rectangle. Values range from **0** to **5**, as indicated in the color gradient bar,  where **5** is the highest Criticality.

Criticality is specified in the Service Data Model by your administrator. **Criticality** values range from **A** to **E**, where **A** is the highest Criticality (level **5** maps to a Criticality of **A** and level **1** maps to a **Criticality** of **E** with equally spaced intermediate values).

Mouse-over

The mouse-over functionality provides additional detailed data in a tooltip when you mouse-over a heatmap. The following figure illustrates mouse-over functionality in a heatmap object. In this example, when you mouse-over a host, details are shown such as alert count, number of connections, and pending messages.



Log Scale

Typically, heat maps provide the Log Scale option, which enables visualization on a logarithmic scale. This option should be used when the range in your data is very broad. For example, if you have data that ranges from the tens to the thousands, then data in the range of tens will be neglected visually if you do not check this option. This option makes data on both extreme ranges visible by using the logarithmic of the values rather than the actual values.

Tables

MongoDB Monitor tables contain the same data that is shown in the heatmap in the same View. Tables provide you a text and numeric view of the data shown in that heatmap, and additional data not included the heatmap. For example, the **All Instances Table** display (shown below) shows the same data as the **All Instances Heatmap** display (shown above).

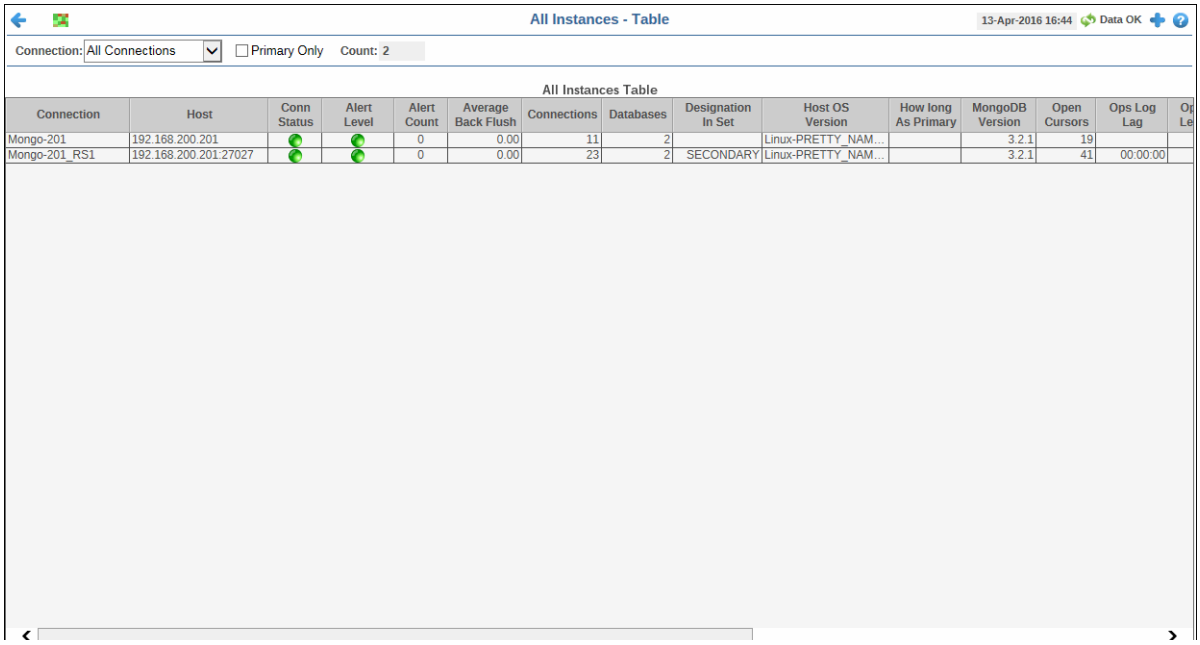


Table rows also sometimes use color to indicate the current most critical alert state for all resources associated with a given row. For example, the color coding is typically as follows:

-- One or more alerts exceeded their critical threshold for one or more associated resources.

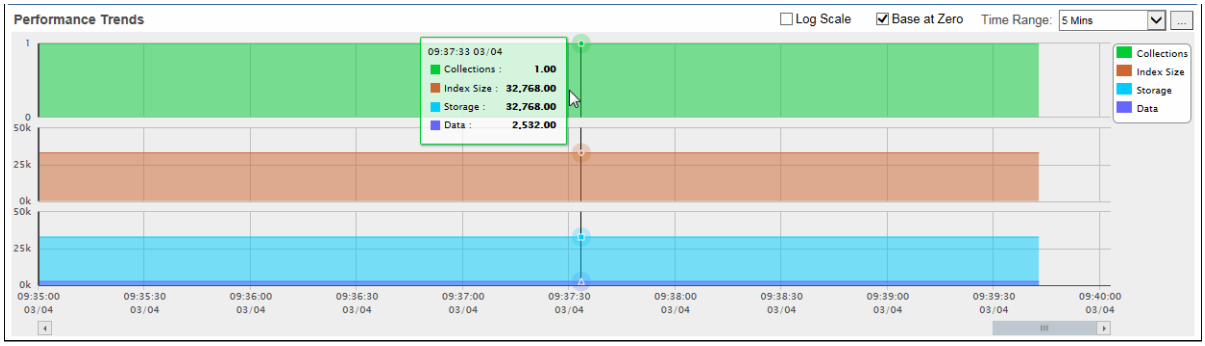
--One or more alerts exceeded their warning threshold for one or more associated resources.

Sorting

MongoDB Monitor allows you to sort the rows of a table using the button. To do so, you click on the column title. A symbol appears when sorting in ascending order, and the inverted symbol when sorting in descending order.

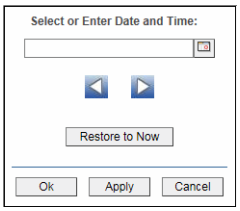
Trend Graphs

MongoDB Monitor trend graphs enable you to view and compare various important metrics over time, such as server memory and virtual memory utilization.



Time Range

Select a time range from the drop down menu varying from **2 Minutes** to **Last 7 Days**, or display **All Data**. By default, the time range end point is the current time. To enter a specific time range, click the associated ellipsis button ....



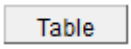
To change the time range click the Open Calendar button , choose the date and time, then click **OK**. Or, enter the date and time in the text field using the following format: **MMM dd, YYYY HH:MM:ss** (for example, Aug 21, 2011 12:24 PM) and click **Apply**. Use the Navigation Arrows to move forward or backward one time period (the time period selected from the Time Range drop-down menu). Click **Restore to Now** to reset the time range end point to the current time.

Mouse-over

The mouse-over functionality provides additional detailed data in an over imposed pop-up window when you mouse-over trend graphs. The above figure illustrates mouse-over functionality. In the example above, when you mouse-over a single dot, or data point, in the Index Size trend graph, a pop-up window shows data for that data point. In this case, the X-axis value is 9:37:30 hours on March 4th, and the Y-axis value is 32768.00 bytes.

Title Bar Functionality

The following table describes the functionality in the display title bar.

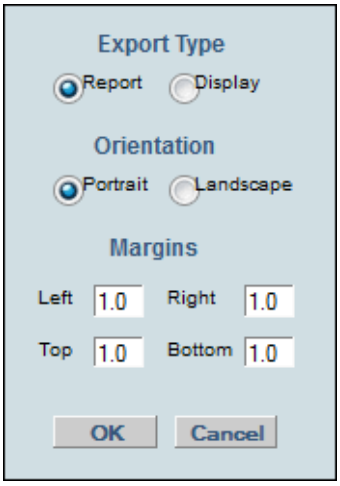
	Opens the previous display.
	Opens the display that is up one level.
	Navigates to a display that is most commonly accessed from the current display. The target display differs among displays.
	Opens the Alerts Table display in a new window.
	The current date and time. If the time is incorrect, this might indicate that RTView stopped running. When the date and time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.
	The data connection state. Red indicates the data source is disconnected (for example, if the Data Server is not receiving data, or if the Display Server does not receive data from the Data Server, this will be red). Green indicates the data source is connected. When the date and time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.
	Opens an instance of the same display in a new window. Each window operates independently, allowing you to switch views, navigate to other displays in RTView EM, and compare server performance data.
	Opens the online help page for the current display.

Export Report

You can quickly export reports for displays, or for tables and grid objects in a display, to a PDF file.

To generate a report for a display:

Right-click on the display and select **Export PDF**. The **Export to PDF** dialog opens.

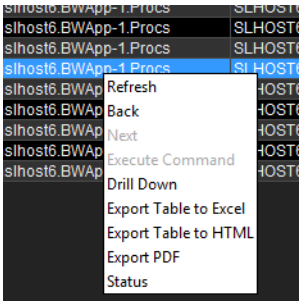


Set the margins and choose the **Export Type**:

- **Report**: Generates an image of the display on the first page, followed by at least one page for each table or object grid in the display. As many pages as are necessary to show all the data in each table or object grid are included in the report. This enables you to view all data in a table or object grid that you otherwise must use a scrollbar to see. If there are no tables or object grids in your display, you only get a image of the display.
- **Display**: Generates an image of the display in PDF format.Choose the page orientation (**Portrait** or **Landscape**), set the page margins and click **OK**. The report opens in a new window.

To generate a report for a table or grid object in a display:

Right-click on the table or grid object and choose **Export PDF**, **Export Table to Excel** or **Export Table to HTML**.



Mongo Instance Views

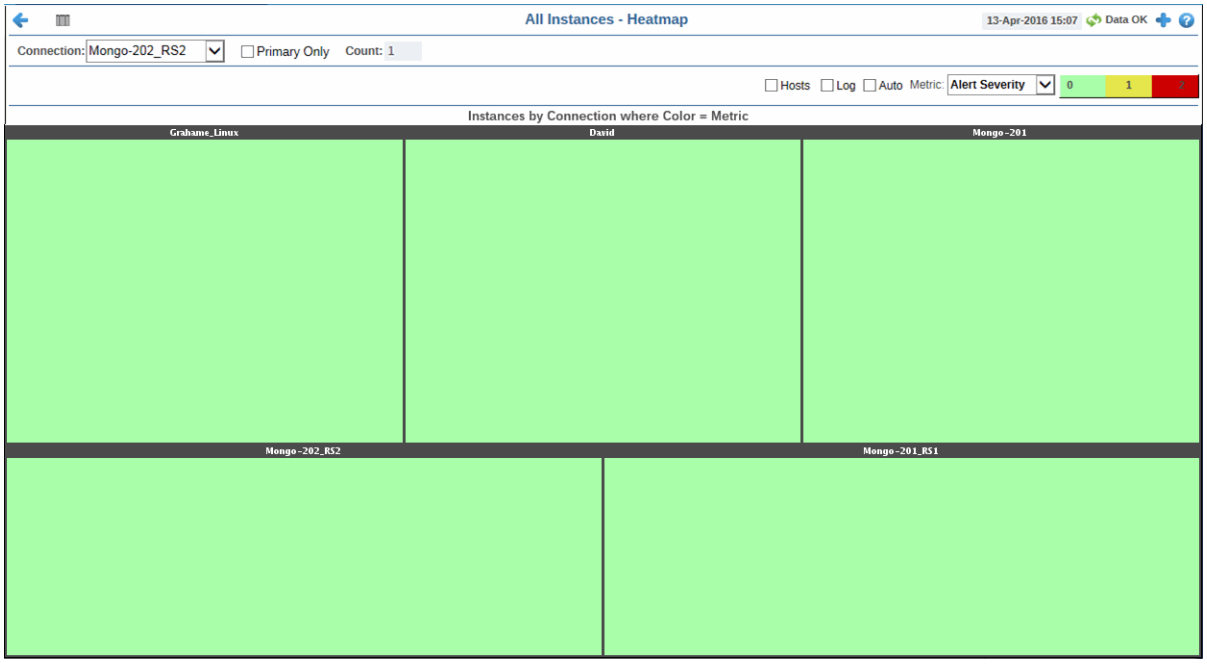
These displays present performance metrics and alert statuses for all MongoDB instances. The first two displays show different views of the same data:

- "All Instances Heatmap" on page 28: This heatmap shows status and alerts for all MongoDB instances.
- "All Instances Table" on page 31: This table shows all available utilization metrics for all MongoDB instances.
- "Single Instance Summary" on page 33: This summary enables you to view available utilization metrics for a single MongoDB instance.

All Instances Heatmap

View status and alerts of all MongoDB Instances. Use the **Metric** drop-down menu to view the **Alert Severity**, **Alert Count**, **Physical Memory**, **Open Cursors**, **Connections**, or **Databases**.

The heatmap is organized by host, each rectangle representing a connection. The rectangle color indicates the most critical alert state. Click on a node to drill-down to the "Single Instance Summary" display and view metrics for a particular connection. You can toggle between the commonly accessed **Table** and **Heatmap** displays by clicking the icon in the upper left-hand corner. Mouse-over rectangles to view more details about host performance and status.



Title Bar: Indicators and functionality might include the following:

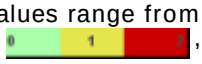
Open the previous and upper display.
Table Navigate to displays commonly accessed from this display.
19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.
Open the **Alert Views - RTView Alerts Table** display.
Open an instance of this display in a new window.
Open the online help page for this display.

Fields and Data
This display includes:

Connection	Select the connection from the drop down list for which you want to view data.
Primary Only	Selecting this check box displays connections in the heatmap that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.
Count	The total number of active, inactive, and standby connections.
Hosts	Select this check box to display the IP address of the host for each rectangle.
Log	Select to enable a logarithmic scale. Use **Log Scale** to see usage correlations for data with a wide range of values. For example, if a minority of your data is on a scale of tens, and a majority of your data is on a scale of thousands, the minority of your data is typically not visible in non-log scale graphs. **Log Scale** makes data on both scales visible by applying logarithmic values rather than actual values to the data.
Auto	When checked, the values of the selected metric are auto-scaled to its highest defined value. When unchecked, the values of the selected metric display based on the threshold defined for the alert associated with the selected metric. Selecting Auto helps to visualize the range of the values currently present for the selected metric instead of the threshold of the alert that has been associated with the metric. All metrics that have not been associated in the heatmap defaults with alerts use a monochromatic color gradient bar (whites and greens). All metrics that have been associated in the heatmap defaults with alerts use a multi-chromatic color gradient bar (reds, yellows, white, and greens).
Metric	Select the metric driving the heatmap display. The default is Alert Severity. Each **Metric** has a color gradient bar that maps values to colors. The heatmap organizes the instances by host, where each rectangle represents an instance. Mouse-over any rectangle to display the current values of the metrics for the instance. Click on a rectangle to drill-down to the associated "Single Instance Summary" display for a detailed view of metrics for that particular instance.

Alert Severity

The maximum alert level in the item (index) associated with the rectangle. Values range from **0** to **2**, as indicated in the color gradient bar  , where **2** is the greatest **Alert Severity**.

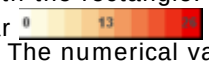
2 -- Metrics that have exceeded their specified **ALARMLEVEL** threshold and have an Alert Severity value of **2** are shown in red. For a given rectangle, this indicates that one or more metrics have exceeded their alarm threshold.

1 -- Metrics that have exceeded their specified **WARNINGLEVEL** threshold and have an Alert Severity value of **1** are shown in yellow. For a given rectangle, this indicates that one or more metrics have exceeded their warning threshold.

0 -- Metrics that have not exceeded either specified threshold have an Alert Severity value of **0** and are shown in green. For a given rectangle, this indicates that no metrics have exceeded a specified alert threshold.

Alert Count

The total number of alarm and warning alerts in a given item (index) associated with the rectangle.

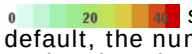
The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of alerts in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

Physical Memory

The total amount of physical memory currently being used in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum amount of physical memory in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

The **Auto** option does not impact this metric.

Open Cursors

The total number of open cursors in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. By default, the numerical values in the gradient bar range from **0** to the alert threshold of **MongoInstanceOpenCursorsHigh**, which is **2000.** The middle value in the gradient bar indicates the middle value of the range (the default is **1000**).

When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Connections

The total number of connections in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of connections in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

The **Auto** option does not impact this metric.

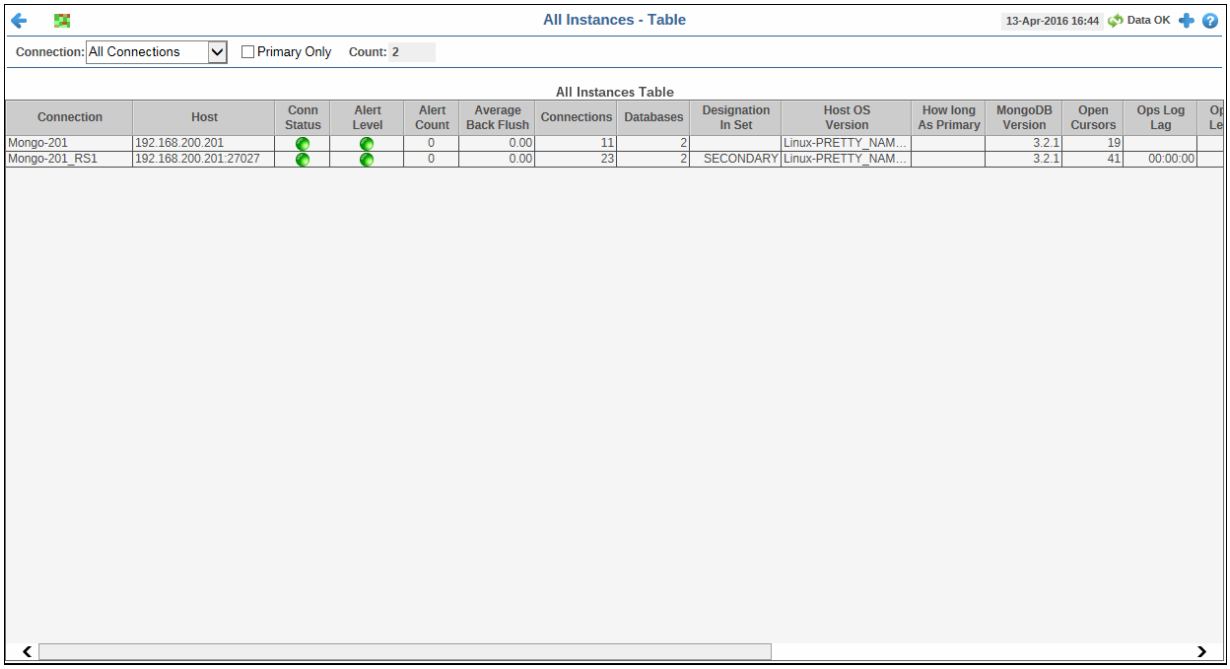
Databases

The total number of databases in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of databases in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

The **Auto** option does not impact this metric.

All Instances Table

This display enables you to investigate detailed utilization metrics for all MongoDB Instances. The **All Instances Table** contains all metrics available for instances, including the number of current connections. Each row in the table contains data for a particular connection. Click a column header to sort column data in numerical or alphabetical order. Click on a table row to drill-down to the "Single Instance Summary" display and view metrics for that particular instance. You can click the icon in the upper left-hand corner to toggle between the commonly accessed **Table** and **Heatmap** displays.



Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.

Table Navigate to displays commonly accessed from this display.

19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.

Open the **Alert Views - RTView Alerts Table** display.

Open an instance of this display in a new window.

Open the online help page for this display.

Fields and Data
This display includes:

Connection Select the connection for which you want to view data, or select **All Connections** to view data for all connections.

Primary Only Selecting this check box displays connections in the table that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.

Count The total number of connections displayed in the table.

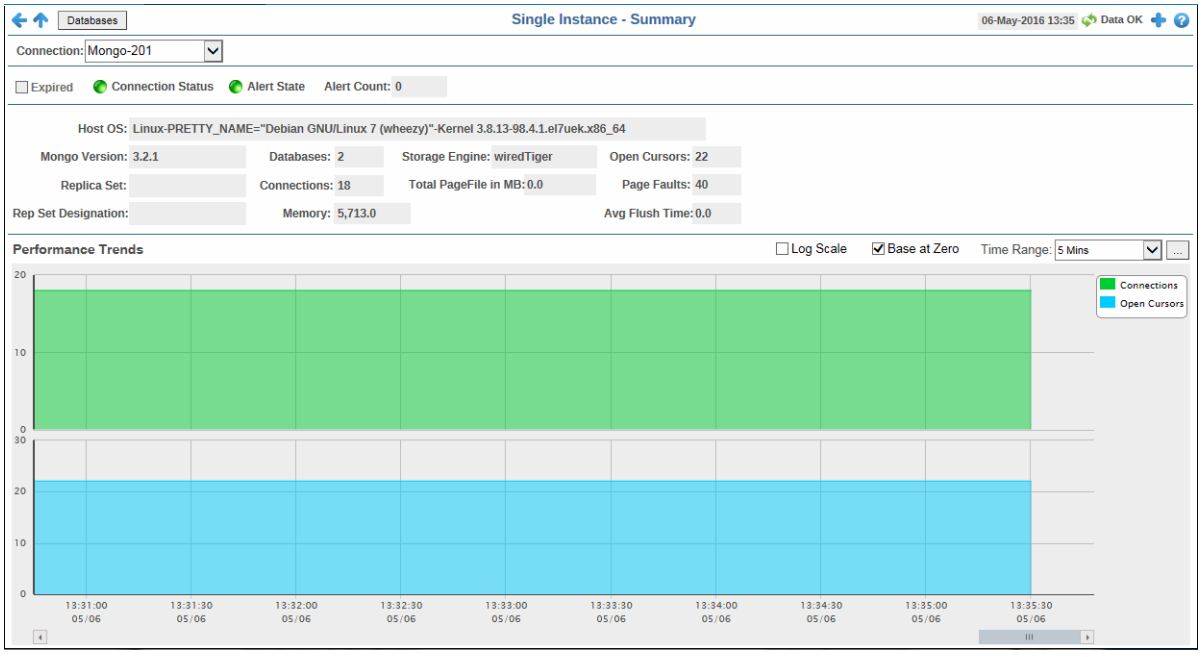
Table This table shows information for the selected connection(s). Click on a table row to drill-down to the "Single Instance Summary" display and view metrics for that particular server.

Connection	The name of the connection.
Host	The host name returned by MongoDB or the host provided by the user to use for connection if the host is not available.
Conn Status	The connection status of the Connection/Host. ● -- The host is not connected. ● -- The host is partially connected, which occurs when the connection has succeeded but the credentials given do not allow access to certain metrics. ● -- The host is connected.
Alert Level	The current alert level. ● -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold. ● -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold. ● -- No alerts have exceeded an alert threshold.
Alert Count	The total number of alerts for the connection.
Average Back Flush	The average time, in milliseconds, for each flush to disk, calculated by dividing the total number of milliseconds by the total number of flushes. **Note:** Background flushing information only appears for instances using the This metric only displays when the storage engine is **MMAPv1** storage engine.
Connections	The number of connections coming in from the clients to the database server, including the current monitor session.
Databases	The number of databases being hosted by the instance.
Designation In Set	The designation of this member of the replica set (**primary**/**secondary**). This column will be empty if no replica set is configured, or set to **unknown** if there is no connection.
Host OS Version	The version of the operating system used by the host.
How Long As Primary	The amount of time the instance has been a primary instance. This field is only populated for primary instances.
MongoDB Version	The version number of the mongod instance.
Open Cursors	The total number of open cursors for the connection.
OpsLog Lag	The amount of time (in hours:minutes:seconds) in which the secondary instance is behind the primary instance. This field is only populated for secondary instances.
OpsLog Length	The length of the OpsLog collection, in bytes.
Page Faults	The number of page faults for the connection. MongoDB reports its triggered page faults as the total number of page faults in one second.

Physical Memory MB	The total amount of system memory (RAM), in megabytes.
Replica Set	The name of the replica set in which the mongod is a part of, if configured. This column will be empty if no replica set is configured, or set to **unknown** if there is no connection. All hosts in the replica set must have the same set name.
Storage Engine	The name of the current storage engine. The name can be either **MMAPv1** or **WiredTiger**. **WiredTiger** is the default as of MongoDB version 3.2.
Total Page File MB	The total size of pagefile defined for the connection, in megabytes.This metric only displays when the storage engine is **MMAPv1**.
Uptime	The amount of time since the instance was last started, shown in days, hours, and minutes (for example, 1d 23:43).
Expired	This check box becomes automatically checked when the data displayed in the row has exceeded the specified cache expiration time (set by default at 45 seconds) and is no longer current. Once the cache has been refreshed and is displaying current data, the check box will return to being unchecked. This check box will remain unchecked as long as the cache has been refreshed within the specified cache expiration time and the data is current.
Time Stamp	The date and time this row of data was last updated.

Single Instance Summary

Track utilization and performance metrics for specific instances.



Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.
Table Navigate to displays commonly accessed from this display.
19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.
Open the **Alert Views - RTView Alerts Table** display.
Open an instance of this display in a new window.
Open the online help page for this display.

Fields and Data
This display includes:

Connection	Select the connection for which you want to view data.
Expired	This check box becomes automatically checked when the data has exceeded the specified cache expiration time (set by default at 45 seconds) and is no longer current. Once the cache has been refreshed and is displaying current data, the check box will return to being unchecked. This check box will remain unchecked as long as the cache has been refreshed within the specified cache expiration time and the data is current.
Connection Status	The connection status of the Connection/Host. -- The host is not connected. -- The host is partially connected, which occurs when the connection has succeeded but the credentials given do not allow access to certain metrics. -- The host is connected.
Alert State	The current alert level. -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold. -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold. -- No alerts have exceeded an alert threshold.
Alert Count	The total number of alerts for the connection.
Host OS	The version of the operating system used by the host.
Mongo Version	The version number of the mongod instance.
Databases	The number of databases being hosted by the instance.
Storage Engine	The name of the current storage engine. The name can be either **MMAPv1** or **WiredTiger**. **WiredTiger** is the default as of MongoDB version 3.2.
Open Cursors	The total number of open cursors for the connection.
Replica Set	The name of the replica set in which the mongod is a part of, if configured. This column will be empty if no replica set is configured, or set to **unknown** if there is no connection. All hosts in the replica set must have the same set name.
Connections	The number of connections coming in from the clients to the database server, including the current monitor session.
Total PageFile in MB	The total size of pagefile defined for the connection, in megabytes. This metric only displays when the storage engine is **MMAPv1**.

Page Faults The number of page faults for the connection. MongoDB reports its triggered page faults as the total number of page faults in one second.

Rep Set Designation The designation of this member of the replica set (**primary**/**secondary**). This column will be empty if no replica set is configured, or set to **unknown** if there is no connection.

Memory The total amount of system memory (RAM), in megabytes.

Avg Flush Time The average time, in milliseconds, for each flush to disk, calculated by dividing the total number of milliseconds by the total number of flushes.

Note: Background flushing information only appears for instances using the **MMAPv1** storage engine.

Performance Trends Graph Shows connection and open cursor data for the connection.

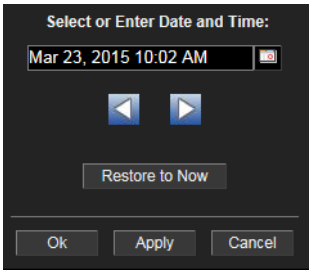
Connections -- Traces the total number of connections coming in from the clients.

Open Cursors-- Traces the total number of open cursors on the connection.

Log Scale This option should be used when the range of your data is very broad. When checked, the values are displayed using a logarithmic scale rather than using the actual values so that data on the extreme ends of the scale can be viewed more effectively. For example, if you have data that ranges from the tens to the thousands, the data in the range of the tens will be neglected visually if you do not check this option.

Base at Zero When this option is checked, zero is set as the Y axis minimum for all graph traces.

Time Range Select a time range from the drop down menu varying from **2 Minutes** to **Last 7 Days**, or display **All Data**. To specify a time range, click the ... button.



By default, the time range end point is the current time. To change the time range end point, click the button and select a date and time from the calendar or enter the date and time in the text field using the following format: **MMM dd, YYYY HH:MM**. For example, **Aug 21, 2011 12:24 PM**.

Use the navigation arrows to move forward or backward one time period. **Note:** The time period is determined by your selection from the **Time Range** drop-down menu.

Click **Restore to Now** to reset the time range end point to the current time.

Mongo Database Views

These displays present detailed performance metrics and alert statuses for all databases (in a heatmap or a tabular format) or for an individual database.

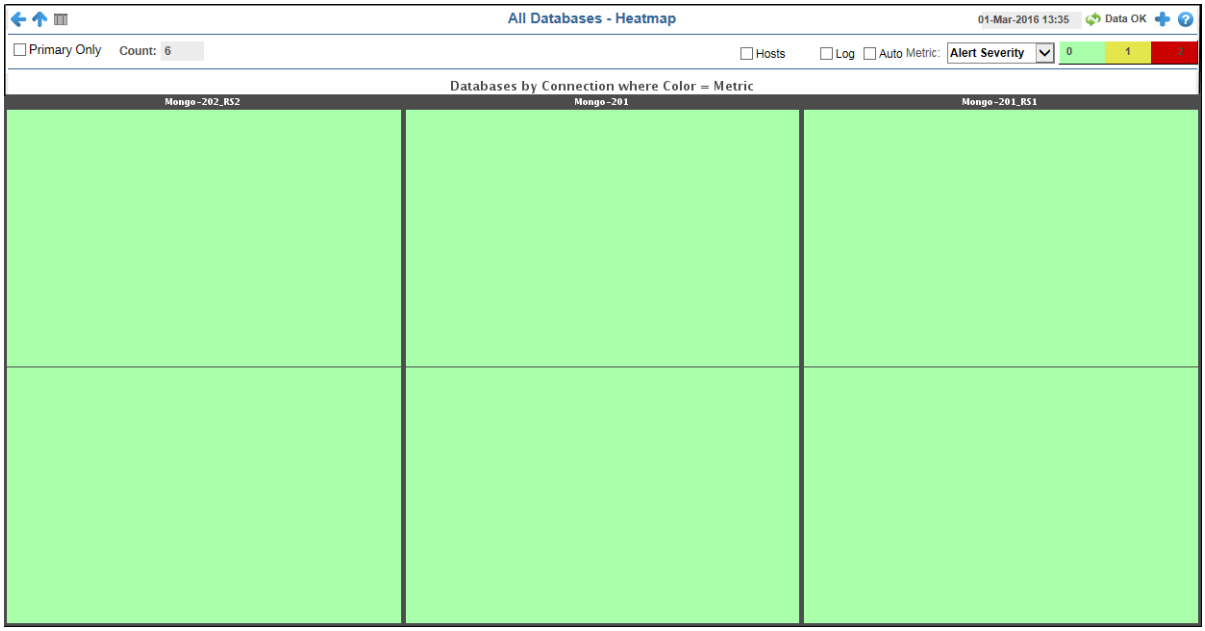
- "All Databases Heatmap" on page 36: Displays a heatmap view of alert states for all databases.
- "All Databases Table" on page 39: Displays a tabular view of all databases and their associated metrics for a single connection, or of all databases and their associated metrics for all connections.
- "Database Summary" on page 41: Displays metrics for a specific database.

Note: No database information will display in the heatmap, table, or summary displays if a connection cannot be established.

All Databases Heatmap

Track utilization and performance metrics for all databases in a heatmap format. Use the **Metric** drop-down menu to view **Alert Severity**, **Alert Count**, **NumObjects** (number of objects), or **AvgObjectSize** (average object size).

The heatmap is organized so that each rectangle represents a database associated with a specific connection. The rectangle color indicates the value of the selected metric in the **Metric** drop down list. You can mouse-over rectangles to view more details about the performance and status of each database or click on a rectangle to drill-down to the "Database Summary" display and view metrics for that particular database. You can click the table icon in this display to navigate to the "All Databases Table" display.

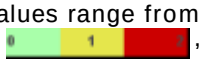


Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.
Table Navigate to displays commonly accessed from this display.
19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.
Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.
Open the **Alert Views - RTView Alerts Table** display.
Open an instance of this display in a new window.
Open the online help page for this display.

Fields and Data
This display includes:

Primary Only	Selecting this check box displays connections in the heatmap that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.
Count	The total number of active and inactive databases.
Hosts	Select this check box to display the name/IP address of the host for each rectangle.
Log	Select to enable a logarithmic scale. Use **Log Scale** to see usage correlations for data with a wide range of values. For example, if a minority of your data is on a scale of tens, and a majority of your data is on a scale of thousands, the minority of your data is typically not visible in non-log scale graphs. **Log Scale** makes data on both scales visible by applying logarithmic values rather than actual values to the data.
Auto	When checked, the values of the selected metric are auto-scaled to its highest defined value. When unchecked, the values of the selected metric display based on the threshold defined for the alert associated with the selected metric. Selecting **Auto** helps to visualize the range of the values currently present for the selected metric instead of the threshold of the alert that has been associated with the metric. All metrics that have not been associated in the heatmap defaults with alerts use a monochromatic color gradient bar (whites and greens). All metrics that have been associated in the heatmap defaults with alerts use a multi-chromatic color gradient bar (reds, yellows, white, and greens).
Metric	Select the metric driving the heatmap display. The default is **Alert Severity.** Each **Metric** has a color gradient bar that maps values to colors. The heatmap organizes the databases by connection, where each rectangle represents a database. Mouse-over any rectangle to display the current values of the metrics for the database. Click on a rectangle to drill-down to the associated "Database Summary" display for a detailed view of metrics for that particular database.

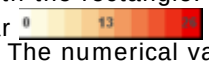
Alert Severity The maximum alert level in the item (index) associated with the rectangle. Values range from **0** to **2**, as indicated in the color gradient bar  , where **2** is the greatest **Alert Severity**.

2 -- Metrics that have exceeded their specified **ALARMLEVEL** threshold and have an Alert Severity value of **2** are shown in red. For a given rectangle, this indicates that one or more metrics have exceeded their alarm threshold.

1 -- Metrics that have exceeded their specified **WARNINGLEVEL** threshold and have an Alert Severity value of **1** are shown in yellow. For a given rectangle, this indicates that one or more metrics have exceeded their warning threshold.

0 -- Metrics that have not exceeded either specified threshold have an Alert Severity value of **0** and are shown in green. For a given rectangle, this indicates that no metrics have exceeded a specified alert threshold.

Alert Count The total number of alarm and warning alerts in a given item (index) associated with the rectangle.

The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of alerts in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

Collections The total number of collections in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum number of collections in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

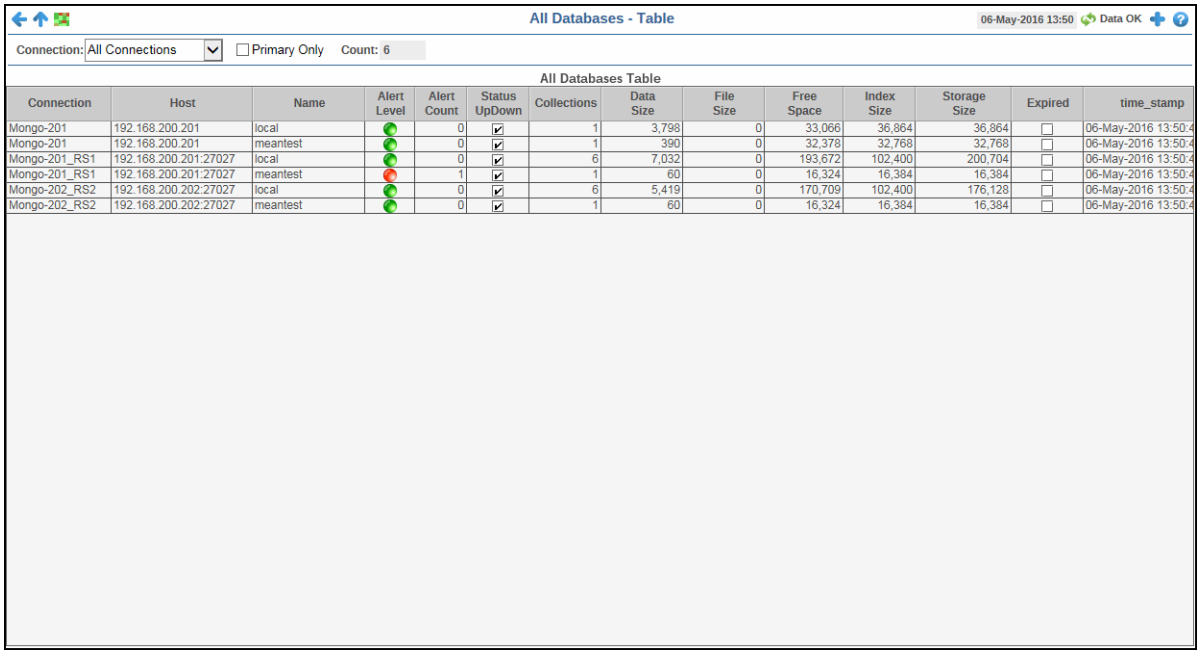
The **Auto** option does not impact this metric.

Data Size The total size (in bytes) of the data in a given item (index) associated with the rectangle. The color gradient bar  shows the range of the value/color mapping. By default, the numerical values in the gradient bar range from **0** to the alert threshold of **MongoDatabaseDataSizeHigh**, which is **100,000**. The middle value in the gradient bar indicates the middle value of the range (the default is **50,000.**).

When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

All Databases Table

View details for all databases in a single connection, or view details for all databases in all connections.



Connection	Host	Name	Alert Level	Alert Count	Status UpDown	Collections	Data Size	File Size	Free Space	Index Size	Storage Size	Expired	time_stamp
Mongo-201	192.168.200.201	local		0	☑	1	3,798	0	33,066	36,864	36,864	☐	06-May-2016 13:50:4
Mongo-201	192.168.200.201	meantest		0	☑	1	390	0	32,378	32,768	32,768	☐	06-May-2016 13:50:4
Mongo-201_RS1	192.168.200.201:27027	local		0	☑	6	7,032	0	193,672	102,400	200,704	☐	06-May-2016 13:50:4
Mongo-201_RS1	192.168.200.201:27027	meantest		1	☑	1	60	0	16,324	16,384	16,384	☐	06-May-2016 13:50:4
Mongo-202_RS2	192.168.200.202:27027	local		0	☑	6	5,419	0	170,709	102,400	176,128	☐	06-May-2016 13:50:4
Mongo-202_RS2	192.168.200.202:27027	meantest		0	☑	1	60	0	16,324	16,384	16,384	☐	06-May-2016 13:50:4

Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.

Table Navigate to displays commonly accessed from this display.

19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.

Open the **Alert Views - RTView Alerts Table** display.

Open an instance of this display in a new window.

Open the online help page for this display.

Fields and Data
This display includes:

Connection Select the connection for which you want to view data, or select **All Connections** to view data for all connections.

Primary Only Selecting this check box displays connections in the table that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.

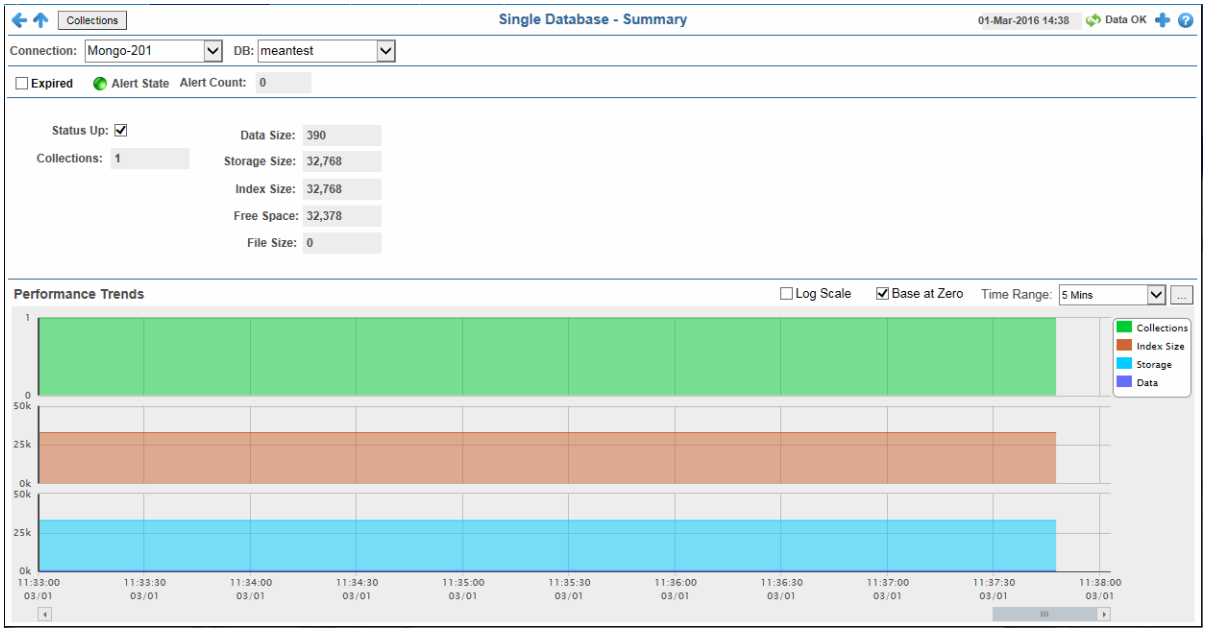
Count The total number of databases displayed in the table.

Table This table shows information for the selected connection(s). Click on a table row to drill-down to the "Database Summary" display and view metrics for that particular server.

Connection	The name of the connection
Host	The host name returned by MongoDB or the host provided by the user to use for connection if the host is not available.
Name	The name of the database.
Alert Level	The current alert level. 🔴 -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold. 🟡 -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold. 🟢 -- No alerts have exceeded an alert threshold.
Alert Count	The total number of alerts for the database.
Status UpDown	When checked, signifies that the database is up and running.
Collections	The number of collections in the database.
Data Size	The total size, in bytes, of the data held in the database including the padding factor. The **Data Size** will not decrease when the document size decreases, but will decrease when documents are removed. **Note:** The **scale** argument affects this value.
File Size	The total size, in bytes, of the data files in the database. This value includes preallocated space as well as the padding factor, and only reflects the size of the data files in the database and not the size of the namespace file.
Free Space	The total free space remaining on the database (**Storage Size** minus **Data Size**).
Index Size	The total size, in bytes, of all indexes created on the database. **Note:** The **scale** argument affects this value.
Storage Size	The total amount of space, in bytes, allocated to collections in this database for document storage. The Storage Size does not decrease when documents are removed or the size of the documents decrease. **Note:** The **scale** argument affects this value.
Expired	When checked, signifies that data has not been received from this host in the specified amount of time. The default setting is **35** seconds.
time_stamp	The date and time the data in this row was last updated.

Database Summary

View all available utilization and performance data for a specific database.



Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.

Table Navigate to displays commonly accessed from this display.

19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.

Open the **Alert Views - RTView Alerts Table** display.

Open an instance of this display in a new window.

Open the online help page for this display.

Fields and Data
This display includes:

Connection	Select the connection for which you want to view data.
DB	Select the database for which you want to view data.
Expired	This check box becomes automatically checked when the data has exceeded the specified cache expiration time (set by default at 45 seconds) and is no longer current. Once the cache has been refreshed and is displaying current data, the check box will return to being unchecked. This check box will remain unchecked as long as the cache has been refreshed within the specified cache expiration time and the data is current.

Alert State The current alert level.

 -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold.

 -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold.

 -- No alerts have exceeded an alert threshold.

Alert Count The total number of alerts for the database.

Status Up When checked, signifies that the database is up and running.

Collections The total number of collections in the database.

Data Size The total size, in bytes, of the data held in the database including the padding factor. The **Data Size** will not decrease when the document size decreases, but will decrease when documents are removed.

Note: The **scale** argument affects this value.

Storage Size The total amount of space, in bytes, allocated to collections in this database for document storage. The Storage Size does not decrease when documents are removed or the size of the documents decrease.

Note: The **scale** argument affects this value.

Index Size The total size, in bytes, of all indexes created on the database.

Note: The **scale** argument affects this value.

Free Space The total free space remaining on the database (**Storage Size** minus **Data Size**).

File Size The total size, in bytes, of the data files in the database. This value includes preallocated space as well as the padding factor, and only reflects the size of the data files in the database and not the size of the **namespace** file.

Performance Trends Graph Shows connection and open cursor data for the connection.

Collections -- Traces the total number of collections in the database.

Index Size -- Traces the total size of indexes created on the database.

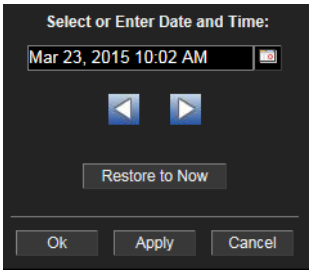
Storage -- Traces the total amount of space allocated to collections in the database.

Data -- Traces the total size of the data held in the database.

Log Scale This option should be used when the range of your data is very broad. When checked, the values are displayed using a logarithmic scale rather than using the actual values so that data on the extreme ends of the scale can be viewed more effectively. For example, if you have data that ranges from the tens to the thousands, the data in the range of the tens will be neglected visually if you do not check this option.

Base at Zero When this option is checked, zero is set as the Y axis minimum for all graph traces.

Time Range Select a time range from the drop down menu varying from **2 Minutes** to **Last 7 Days**, or display **All Data**. To specify a time range, click the ... button.



By default, the time range end point is the current time. To change the time range end point, click the button and select a date and time from the calendar or enter the date and time in the text field using the following format: **MMM dd, YYYY HH:MM**. For example, **Aug 21, 2011 12:24 PM**.

Use the navigation arrows to move forward or backward one time period. **Note:** The time period is determined by your selection from the **Time Range** drop-down menu.

Click **Restore to Now** to reset the time range end point to the current time.

Mongo Collection Views

These displays present several views of performance metrics for collections. You can view heatmap or tabular views of all collections that exist in the connections in the "All Collections Heatmap"and "All Collections Table" displays, or you can view all details for a specific collection contained in a particular database in the "Collection Summary" display.

- "All Collections Heatmap" on page 44: A heatmap representation that allows you to view performance and utilization metrics for all collections that exist in each of your connections.
- "All Collections Table" on page 46: A tabular view that allows you to view performance and utilization metrics for all collections in a particular database, or for all collections on all databases.
- "Collection Summary" on page 48: Shows detailed performance and utilization metrics and trends for a specified collection on a particular database.

All Collections Heatmap

This display provides a heatmap view of the status and alerts of all collections within each connection. Use the **Metric** drop-down menu to view **Alert Severity**, **Alert Count**, **NumObjects** (number of objects), or **AvgObjectSize** (average object size).

The heatmap is organized so that each rectangle represents a collection contained within a specific connection. The rectangle color indicates the value of the selected metric in the **Metric** drop down list. You can mouse-over rectangles to view more details about the performance and status of each collection or click on a rectangle to drill-down to the "Collection Summary" display and view metrics for that particular collection. You can click the table icon in this display to navigate to the "All Collections Table" display.

Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.

Table Navigate to displays commonly accessed from this display.

19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.

Open the **Alert Views - RTView Alerts Table** display.

Open an instance of this display in a new window.

Open the online help page for this display.

Fields and Data
This display includes:

Primary Only Selecting this check box displays connections in the heatmap that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.

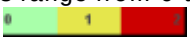
Count The total number of collections.

Hosts Select this check box to display the names of the hosts in the heatmap.

Log Select to enable a logarithmic scale. Use **Log Scale** to see usage correlations for data with a wide range of values. For example, if a minority of your data is on a scale of tens, and a majority of your data is on a scale of thousands, the minority of your data is typically not visible in non-log scale graphs. **Log Scale** makes data on both scales visible by applying logarithmic values rather than actual values to the data.

Auto When checked, the values of the selected metric are auto-scaled to its highest defined value. When unchecked, the values of the selected metric display based on the threshold defined for the alert associated with the selected metric. Selecting **Auto** helps to visualize the range of the values currently present for the selected metric instead of the threshold of the alert that has been associated with the metric. All metrics that have not been associated in the heatmap defaults with alerts use a monochromatic color gradient bar (whites and greens). All metrics that have been associated in the heatmap defaults with alerts use a multi-chromatic color gradient bar (reds, yellows, white, and greens).

Metric Select the metric driving the heatmap display. The default is **Alert Severity**. Each **Metric** has a color gradient bar that maps values to colors. The heatmap organizes the collections by connection, where each rectangle represents a collection. Mouse-over any rectangle to display the current values of the metrics for the collection. Click on a rectangle to drill-down to the associated "Collection Summary" display for a detailed view of metrics for that particular collection.

Alert Severity The maximum alert level in the item (index) associated with the rectangle. Values range from **0** to **2**, as indicated in the color gradient bar  , where **2** is the greatest **Alert Severity**.

2 -- Metrics that have exceeded their specified **ALARMLEVEL** threshold and have an Alert Severity value of **2** are shown in red. For a given rectangle, this indicates that one or more metrics have exceeded their alarm threshold.

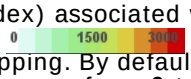
1 -- Metrics that have exceeded their specified **WARNINGLEVEL** threshold and have an Alert Severity value of **1** are shown in yellow. For a given rectangle, this indicates that one or more metrics have exceeded their warning threshold.

0 -- Metrics that have not exceeded either specified threshold have an Alert Severity value of **0** and are shown in green. For a given rectangle, this indicates that no metrics have exceeded a specified alert threshold.

Alert Count The total number of alarm and warning alerts in a given item (index) associated with the rectangle.

The color gradient bar  shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of alerts in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

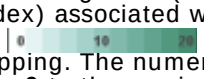
NumObjects

The total number of objects or documents in a given item (index) associated with the rectangle. The color gradient bar 

shows the range of the value/color mapping. By default, the numerical values in the gradient bar range from **0** to the alert threshold of **MongoCollectionNumObjectsHigh**, which is **2000**. The middle value in the gradient bar indicates the middle value of the range (the default is **1000**).

When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

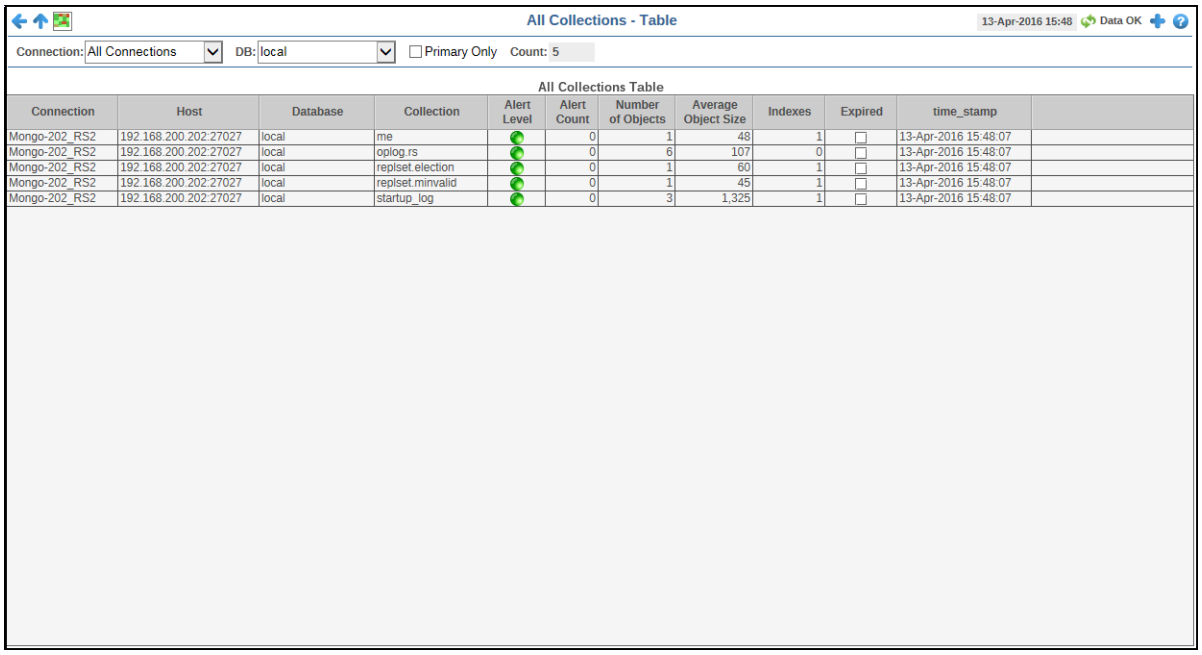
AvgObjectSize

The average size (in bytes) of an object in a given item (index) associated with the rectangle. The color gradient bar 

shows the range of the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of objects in the heatmap. The middle value in the gradient bar indicates the middle value of the range.

All Collections Table

Track performance and utilization metrics for all collections on a single database, or for all connections on all databases.



Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.
Table Navigate to displays commonly accessed from this display.
19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.
Open the **Alert Views - RTView Alerts Table** display.
Open an instance of this display in a new window.
Open the online help page for this display.

Fields and Data
This display includes:

Connection Select the connection for which you want to view collection data.

DB Select the database for which you want to view collection data, or select **All Databases** to view all collections for all databases.

Primary Only Selecting this check box displays connections in the table that have **Designation in Set** (within a replica set) defined as **Primary**, as well as those connections that are not part of a replica set (do not have a defined **Designation in Set**). Those connections with **Designation in Set** defined as **Secondary** will not be displayed.

Count The total number of collections found for the selected database(s).

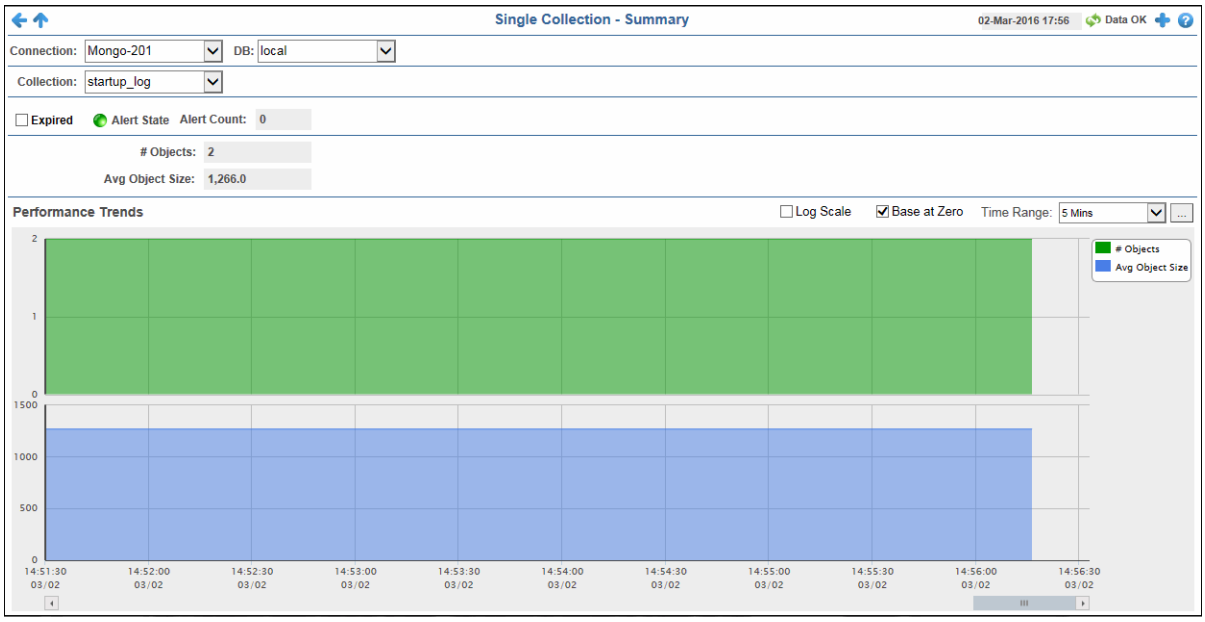
Table This table describes all topics on the selected server. Click a row to view metrics for a single topic in the "Collection Summary" display.

Connection	The name of the connection.
Host	The name of the host.
Database	The name of the database.
Collection	The name of the collection.
Alert Level	The current alert level. -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold. -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold. -- No alerts have exceeded an alert threshold.
Alert Count	The total number of alerts for the database.
Number of Objects	The total number of objects or documents in the collection.
Average Object Size	The average size, in bytes, of the objects in the collection.
Indexes	The total number of indexes in the collection.

Expired	This check box becomes automatically checked when the data displayed in the row has exceeded the specified cache expiration time (set by default at 45 seconds) and is no longer current. Once the cache has been refreshed and is displaying current data, the check box will return to being unchecked. This check box will remain unchecked as long as the cache has been refreshed within the specified cache expiration time and the data is current.
time_stamp	The date and time this row of data was last updated.

Collection Summary

Track performance and utilization metrics for a single collection on a single database.



Title Bar: Indicators and functionality might include the following:

Open the previous and upper display.

Table Navigate to displays commonly accessed from this display.

19-Feb-2014 16:50 The current date and time. When the time is incorrect, this might indicate that RTView stopped running. When the time is correct and the **Data OK** indicator is green, this is a strong indication that the platform is receiving current and valid data.

Data OK The data connection state. Red indicates the data source is disconnected (for example, the Data Server is not receiving data, or the Display Server is not receiving data from the Data Server). Green indicates the data source is connected.

Open the **Alert Views - RTView Alerts Table** display.

Open an instance of this display in a new window.

Open the online help page for this display.

Fields and Data
This display includes:

Connection	Select the connection for which you want to view collection data.

DB Select the database for which you want to view collection data, or select **All Databases** to view all collections for all databases.

Collection Select the connection for which you want to view data.

Expired This check box becomes automatically checked when the data displayed in the row has exceeded the specified cache expiration time (set by default at 45 seconds) and is no longer current. Once the cache has been refreshed and is displaying current data, the check box will return to being unchecked. This check box will remain unchecked as long as the cache has been refreshed within the specified cache expiration time and the data is current.

Alert State The current alert level.

 -- One or more alerts have exceeded their specified **ALARMLEVEL** threshold.

 -- One or more alerts have exceeded their specified **WARNINGLEVEL** threshold.

 -- No alerts have exceeded an alert threshold.

Alert Count The total number of alerts for the database.

 # Objects The total number of objects in the collection.

Avg Object Size The average size, in bytes, of the objects in the collection.

Performance Trends Graph Shows message data for the selected collection.

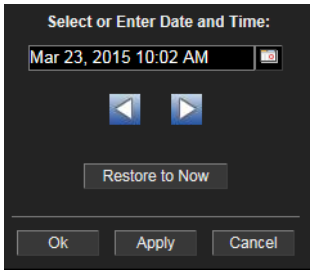
 # Objects -- Traces the total number of objects in the collection.

Avg Object Size -- Traces the average size of objects in the collection.

Log Scale This option should be used when the range of your data is very broad. When checked, the values are displayed using a logarithmic scale rather than using the actual values so that data on the extreme ends of the scale can be viewed more effectively. For example, if you have data that ranges from the tens to the thousands, the data in the range of the tens will be neglected visually if you do not check this option.

Base at Zero When this option is checked, zero is set as the Y axis minimum for all graph traces.

Time Range Select a time range from the drop down menu varying from **2 Minutes** to **Last 7 Days**, or display **All Data**. To specify a time range, click the ... button.



By default, the time range end point is the current time. To change the time range end point, click the button and select a date and time from the calendar or enter the date and time in the text field using the following format: **MMM dd, YYYY HH:MM**. For example, **Aug 21, 2011 12:24 PM**.

Use the navigation arrows to move forward or backward one time period. **Note:** The time period is determined by your selection from the **Time Range** drop-down menu.

Click **Restore to Now** to reset the time range end point to the current time.

APPENDIX A Alert Definitions

This section describes alerts for MongoDB and their default settings.

Alert Name	WARN. LEVEL	ALARM LEVEL	DURATION	ENABLED
MongoCollectionExpired A collection was not able to be contacted for longer than the normal expiration window. **Index Type(s)**: PerCollection **Metric**: Expired	NaN	NaN	30	FALSE
MongoCollectionNumObjectsHigh The number of objects for the collection exceeds a given threshold. **Index Type(s)**: PerCollection **Metric**: numberOfObjects	1600	2000	30	FALSE
MongoDatabaseDataSizeHigh The database size for the database exceeds a given threshold. **Index Type(s)**: PerDatabase **Metric**: dataSize	80000	100000	30	FALSE
MongDatabaseExpired The database was not able to be contacted for longer than the normal expiration window. **Index Type(s)**: PerDatabase **Metric**: Expired	NaN	NaN	30	FALSE
MongoInstanceExpired The instance was not able to be contacted for longer than the normal expiration window. **Index Type(s)**: PerInstance **Metric**: Expired	60	80	30	FALSE
MongoInstanceNotConnected The instance was not able to be contacted for longer than the normal expiration window. **Index Type(s)**: PerInstance **Metric**: connectionStatus	NaN	NaN	30	FALSE
MongoInstanceOpenCursorsHigh The number of Open Cursors for the Instance exceeds a given threshold. **Index Type(s)**: PerInstance **Metric**: openCursors	160	200	30	TRUE

APPENDIX B Third Party Notice Requirements

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**JQuery

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