Solace PubSub+ Monitor User's Guide

Version 5.0

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Contents

Preface

Welcome to the *Solace PubSub+ Monitor 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 *Solace PubSub+ Monitor 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 Quick Start - On-premise

These instructions are for those customers who wish to evaluate the Monitor for purchase. These are the minimum steps required to gather monitoring data and get the Monitor up and running. Default settings are used and Apache Tomcat which is delivered with the Monitor.

These instructions are for the On-premise option. If you are using an Amazon Machine Image (AMI), see "Quick Start - AMI".

After you complete your evaluation, if you wish to setup and use all monitoring features in your organization, see "Configuration".

Prerequisites for Solace On-premise

- Obtain login credentials for each Solace broker you wish to monitor.
- Java JDK 1.7 or 1.8 64 bit
- Set the **JAVA_HOME** environment variable to point to your Java installation. For example:

  UNIX

  export JAVA_HOME=/opt/Java/jdk1.7.0

  Windows

  set JAVA_HOME=C:\Java\jdk1.7.0
- Linux On-premise Users:
  - These instructions require a Bourne-compatible shell.
  - JAVA_HOME is required to be in the PATH for Tomcat to start correctly.

To evaluate the On-premise option:

1. Download **RTViewSolaceMonitor_<version>.zip** to your local server and extract the files: **unzip -a RTViewSolaceMonitor_<version>.zip**

Important: On UNIX systems it is a requirement that the installation directory path not contain spaces.

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2. Navigate to the **RTViewSolaceMonitor/bin** directory and run **./start_servers.sh -eval** (**start_servers.bat -eval** in Windows).

Important: UNIX/Linux - To make the script in the **bin** directory executable, use the **sh** command (as shown), or execute **chmod a+x start_servers.sh**, then execute **./start_servers.sh**.

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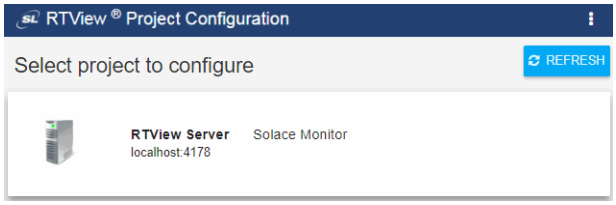
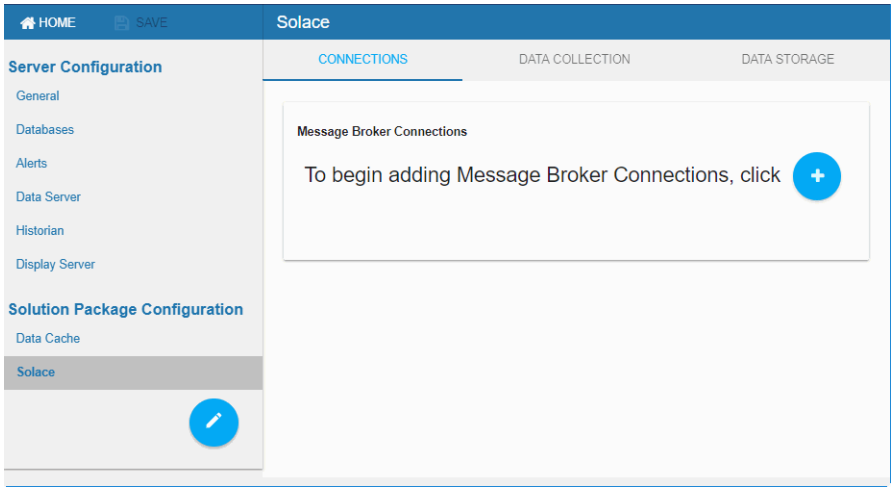
3. Browse to the following URL and login (**rtvadmin**/**rtvadmin**) to open the "RTView Configuration Application for Solace" **HOME** page:

- **http://IPAddress:8068/rtview-solmon-rtvadmin** if you are executing your browser on a different host than where the monitor is running.
- **http://localhost:8068/rtview-solmon-rtvadmin** if you are executing your browser in the same host where the monitor is running.

4. Select the **Solace Monitor** project to open the **Solace** configuration page.



5. Select **Solace** in the navigation tree (left panel), then click + to add a broker connection.



6. In the **Add Connection** dialog, enter the **Connection Name**, **URL**, **Username** and **Password**, toggle on **Edition** if this is a Solace PubSub+ Cloud service instance. Optionally, enter the **SEMP Version** and the **VPN Name**.

   Notes:

   - If you want to collect additional metrics for a specific VPN, enter the **VPN Name**. Use this option carefully as this can increase the amount of data collected and impact monitor performance.
   - If your broker is a Solace PubSub+ Cloud Edition, toggle on the **Edition** option.
   - For versions prior to Solace 7.2, enter the SEMP Version. Otherwise, leave the default value.
   - Monitoring data is collected through SEMP (Solace Element Management Protocol), which is a RESTful API for managing Solace brokers. If your Solace PubSub+ message brokers are a version prior to 8.7 or your Solace Appliance is version prior to 8.3, see "Obtain SEMP Version" for instructions on getting the SEMP version installed in your message brokers.

7. Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

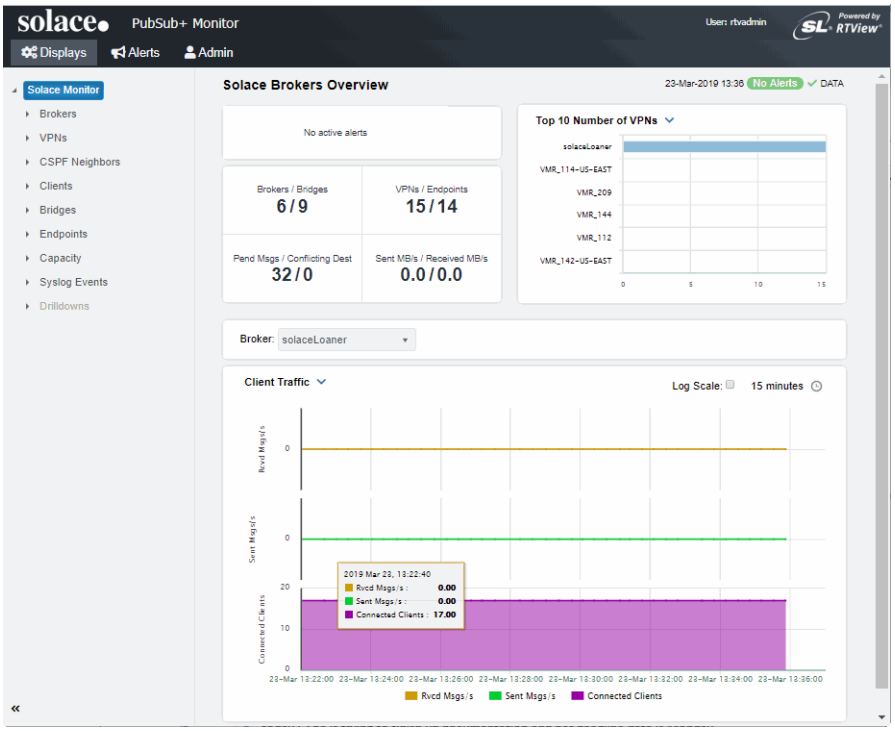
   The connections you create are listed in the **Connections** tab.

8. Repeat these steps to add more brokers and click RESTART SERVERS to apply your settings. The data server will be available again in 10-15 seconds.

9. Browse to the Solace PubSub+ Monitor and login (**rtvadmin**/**rtvadmin**, if login is enabled):

   http://IPAdress:8068/rtview-solmon if you are running the monitor remotely

   http://localhost:8068/rtview-solmon if you are running the monitor locally



You should now see monitoring data. If you encounter issues, check the log files in the **RTViewSolaceMonitor/projects/rtview-server/log** directory for errors.

You have completed the Quick Start!

If you wish to setup and use all monitoring features in your organization, proceed to "Configuration".

CHAPTER 2 Quick Start - AMI

These instructions are for those customers who wish to evaluate the Monitor for purchase. These are the minimum steps required to gather monitoring data and get the Monitor up and running. Default settings are used and Apache Tomcat which is delivered with the Monitor.

These instructions are for the AMI option (either Windows or Linux) and require that you "Create AMI Instance".

If you are using the On-premise option, see "Quick Start - On-premise".

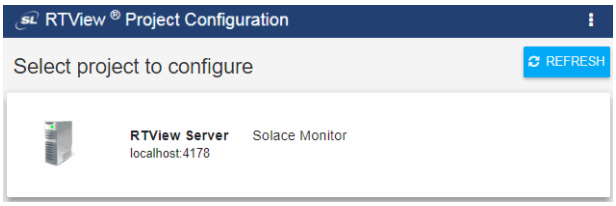
After you complete your evaluation, if you wish to setup and use all monitoring features in your organization, see "Configuration".

Prerequisites for Solace AMI

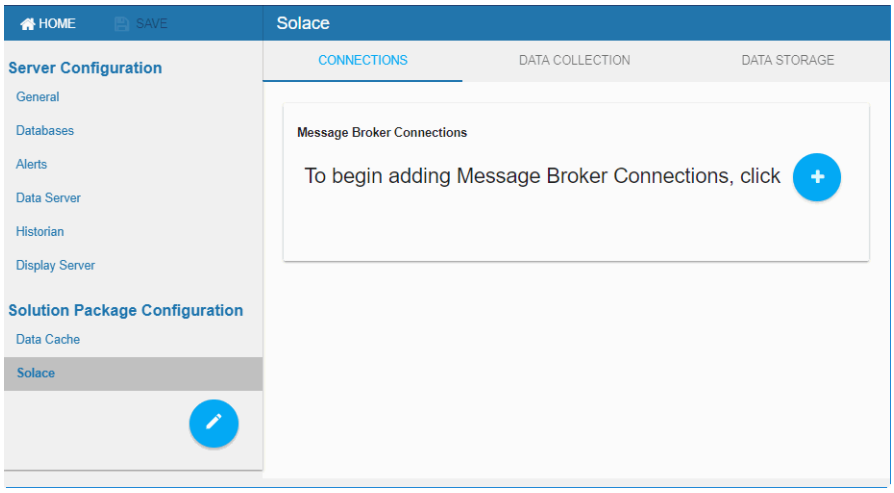
- Obtain login credentials for each Solace broker you will monitor.
- "Create AMI Instance".

To evaluate the AMI option:

1. Browse to the following URL and login (**rtvadmin**/**rtvadmin**) to open the "RTView Configuration Application for Solace" **HOME** page:
   - **http://IPAddress:8068/rtview-solmon-rtvadmin** if you are executing your browser on a different host than where the monitor is running.
   - **http://localhost:8068/rtview-solmon-rtvadmin** if you are executing your browser in the same host where the monitor is running.
2. Select the **Solace Monitor** project to open the **Solace** configuration page.



3. Select **Solace** in the navigation tree (left panel), then click + to add a broker connection.



4. In the **Add Connection** dialog, enter the **Connection Name**, **URL**, **Username** and **Password**, toggle on **Edition** if this is a Solace PubSub+ Cloud service instance. Optionally, enter the **SEMP Version** and the **VPN Name**.

   Notes:

   - If you want to collect additional metrics for a specific VPN, enter the **VPN Name**. Use this option carefully as this can increase the amount of data collected and impact monitor performance.
   - If your broker is a Solace PubSub+ Cloud Edition, toggle on the **Edition** option.
   - For versions prior to Solace 7.2, enter the SEMP Version. Otherwise, leave the default value.
   - Monitoring data is collected through SEMP (Solace Element Management Protocol), which is a RESTful API for managing Solace brokers. If your Solace PubSub+ message brokers are a version prior to 8.7 or your Solace Appliance is version prior to 8.3, see "Obtain SEMP Version" for instructions on getting the SEMP version installed in your message brokers.

5. Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

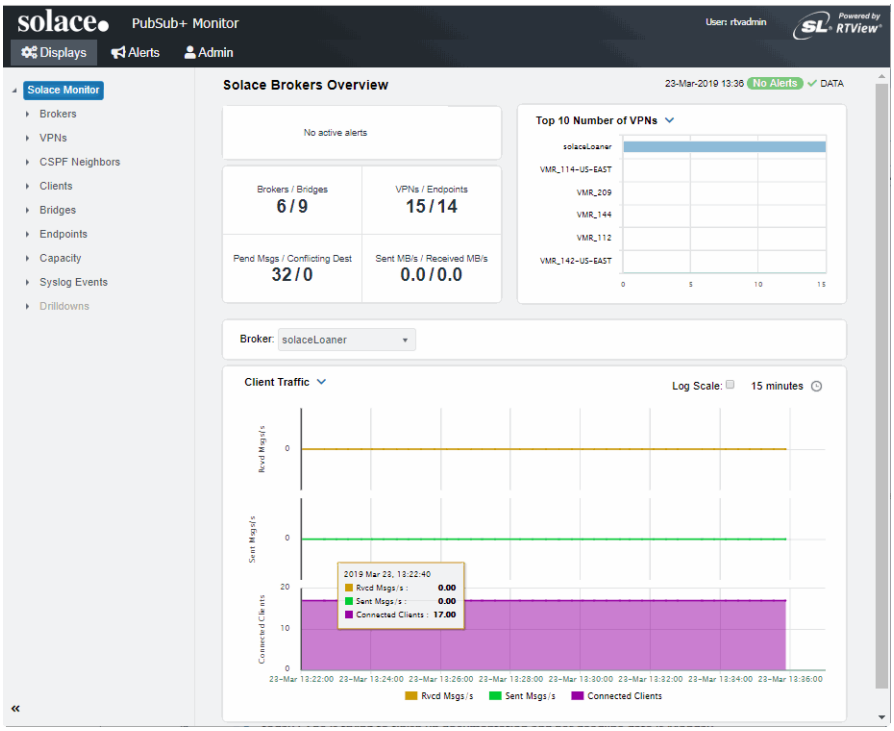
   The connections you create are listed in the **Connections** tab.

6. Repeat these steps to add more brokers and click RESTART SERVERS to apply your settings. The data server will be available again in 10-15 seconds.

7. Browse to the following URL and login (**rtvadmin**/**rtvadmin**) to open the Solace PubSub+ Monitor:

   http://IPAdress:8068/rtview-solmon if you are running the monitor remotely

http://localhost:8068/rtview-solmon if you are running the monitor locally



You should now see monitoring data. If you encounter issues, check the log files in the **RTViewSolaceMonitor/projects/rtview-server/log** directory for errors.

You have completed the Quick Start!

If you wish to setup and use all monitoring features in your organization, proceed to "Configuration".

CHAPTER 3 Introduction to the Monitor

This section contains the following:

Overview

The Solace PubSub+ Monitor is an easy to configure and use monitoring system that gives you extensive visibility into the health and performance of your Solace brokers and the infrastructure that relies on them.

The Solace PubSub+ Monitor enables Solace 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 broker versions, bridges, endpoints and clients, 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 Solace PubSub+ 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.

Solace PubSub+ Monitor is comprised of the following which you access with a browser:

- Solace PubSub+ Monitor, which monitors Solace performance metrics and used by teams to monitor the health of Solace components (brokers, bridges, clients, endpoints and VPNs). With the Solace PubSub+ Monitor AMI version, the health of "MySQL Database" and "Docker Engines" can be also monitored. For details, see "Using the Monitor".
- RTView Manager for Solace, which administrators use to set alert thresholds for RTView® Monitor for Solace®. For details, see "Using the Monitor".
- RTView Manager, which administrators use to monitor the health of RTView® Monitor for Solace®. That is, to monitor components of the monitoring system itself (RTView servers, JVMs, Tomcat servers, hosts, Docker, MySQL and alert settings for these components). For details, see "Using the Monitor".
- RTView Configuration Application, which administrators use to configure the majority of the monitoring system. For details, see "Configuration".

You can also install the monitor as a Solution Package (rather than a standalone product). See "Solution Package Version" for details.

Solace PubSub+ Monitor On-premise Version

To evaluate the Solace PubSub+ Monitor, go to "Quick Start - AMI" to get up and running with Solace PubSub+ Monitor using default settings.

To install and use all features in Solace PubSub+ Monitor.

Solace PubSub+ Monitor AMI Version

The Solace PubSub+ Monitor AMI version is an Amazon EC2 Amazon Machine Image (AMI) running Linux. It comes pre-configured with a 30-day license. The AMI instance includes an application stack including (among others) MySQL and Docker for convenience of quick deployment. Please refer to your instance's **/home/ec2-user/amibase/MANIFEST.txt** for the full version information.

To evaluate the Solace PubSub+ Monitor, go to "Quick Start - AMI" to get up and running with Solace PubSub+ Monitor using default settings.

To install and use all features in Solace PubSub+ Monitor.

Solution Package Version

The Solace PubSub+ Monitor can also 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 system. Used as a Solution Package within RTView Enterprise Monitor, the Solace metrics are but one source of data, among many other sources (solution packages are available for TIBCO EMS, Amazon CloudWatch, TIBCO BusinessWorks, MicroSoft SQL and many others), that determine the entire health state of the application.

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

For browser support, hardware requirements, JVM support and other system requirement information, please refer to the **README_sysreq.txt** file from your product installation. A copy of this file is also available on the product download page.

Installation

The Monitor can also be installed as a Solution Package within the RTView Enterprise Monitor® product.

Download the **RTViewSolaceMonitor_<version>.zip** file and unzip the **RTViewSolaceMonitor_<version>.zip** file into a directory of your choosing. The **RTViewSolaceMonitor/rtvapm/solmon** directory is auto-created after you unzip the file.

Important: On UNIX systems it is a requirement that the installation directory path not contain spaces.

For more information about RTView Enterprise Monitor see the *RTView Enterprise Monitor® User's Guide*, available on the SL Product Documentation website.

File Extraction Considerations

On Windows systems, using the extraction wizard of some compression utilities might result in an extra top-level directory level based on the name of the .zip file. The additional directory is not needed because the .zip files already contain the rtvapm top-level directory. This extra directory must be removed before clicking the Next button that performs the final decompression.

On UNIX/Linux systems, use the -a option to properly extract text files.

For more information about RTView Enterprise Monitor see the *RTView Enterprise Monitor® User's Guide*, available on the SL Product Documentation website.

CHAPTER 4 Configuration

This chapter describes how to setup and modify all Solace PubSub+ Monitor features (both On-premise and AMI versions). Some of the configurations apply to both the On-premise and AMI versions and others don't (where noted).

This section contains:

- "Required Setup"
- "Optional Configurations"

If you wish to evaluate Solace PubSub+ Monitor using default settings, see one of the following (then return here to setup all features):

  – "Quick Start - On-premise"

  – "Quick Start - AMI"

Assumptions

This document assumes that you have:

- verified "System Requirements".
- installed the Monitor per instructions in "Installation".
- created an AMI instance. If you have not, see "Create AMI Instance". (**Required for AMI only**)

Required Setup

To configure the Solace PubSub+ Monitor do the following (in the order shown):

- "Start the Solace PubSub+ Monitor"
- "Login to Solace PubSub+ Monitor"
- "Open the RTView Configuration Application"
- "Configure Data Collection"

Start the Solace PubSub+ Monitor

Navigate to the **RTViewSolaceMonitor/bin** directory and execute the **start_servers.sh** script (or **start_servers.bat** for Windows).

Important: UNIX/Linux - To make the script in the **bin** directory executable, use the **sh** command (as shown), or execute **chmod a+x start_servers.sh**, then execute **./start_servers.sh**.

Login to Solace PubSub+ Monitor

Open a browser and go to:

- **http://IPAddress:8068/rtview-solmon** if you are executing your browser on a different host than where the monitor is running.
- **http://localhost:8068/rtview-solmon** if you are executing your browser in the same host where the monitor is running.

The Solace Monitor opens. The displays populate with data after you add connection properties for your Solace Message Brokers (which is subsequently described in these instructions).

Proceed to "Open the RTView Configuration Application".

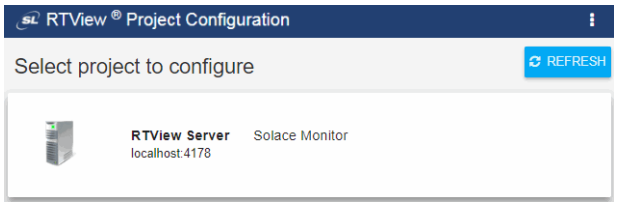
Open the RTView Configuration Application

Open a browser and go to:

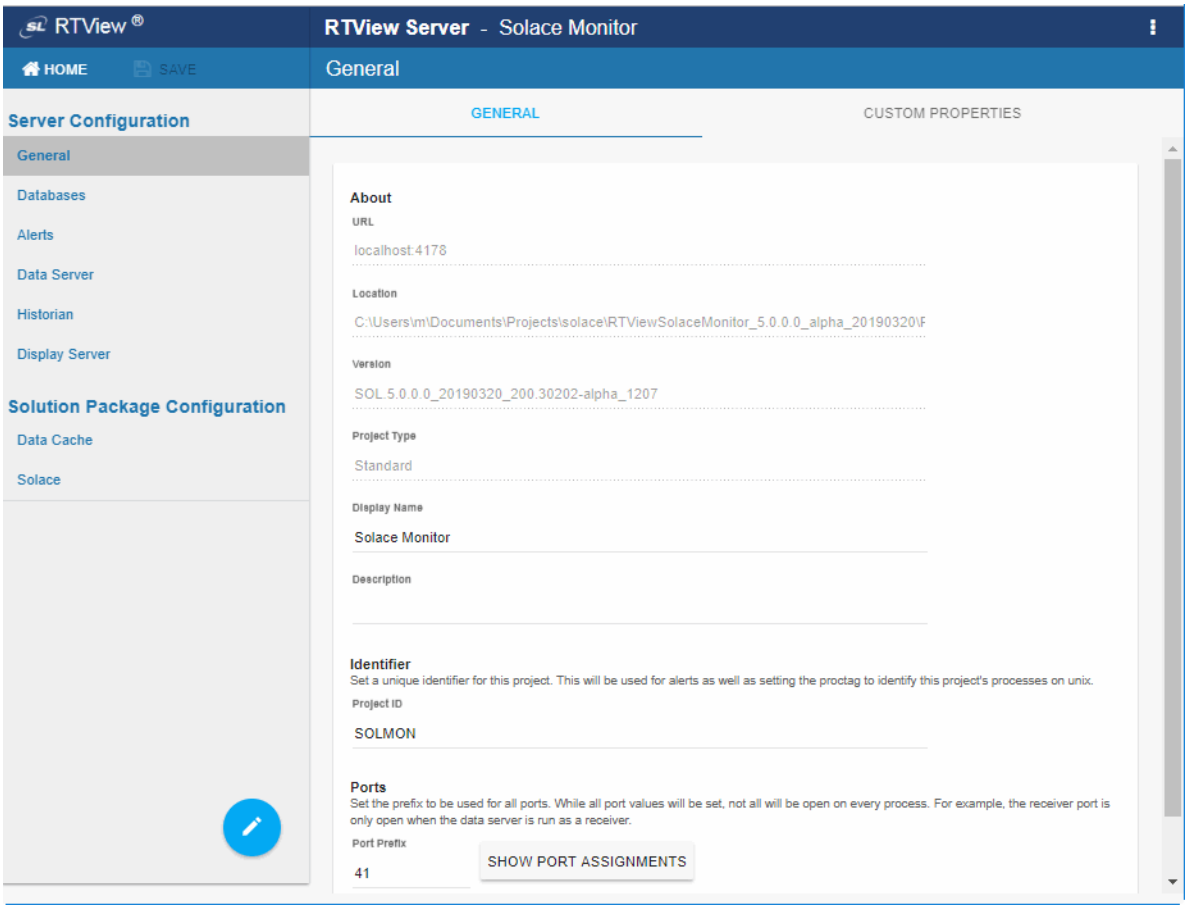
- **http://IPAddress:8068/rtview-solmon-rtvadmin** if you are executing your browser on a different host than where the monitor is running.
- **http://localhost:8068/rtview-solmon-rtvadmin** if you are executing your browser in the same host where the monitor is running.

Use **rtvadmin**/**rtvadmin** for username/password.

The RTView Configuration Application **HOME** page opens.



Select the **Solace Monitor** project.



The main configuration page for the **RTView Server - Solace Monitor** project opens. The navigation tree is in the left panel and the **General** and **Custom Properties** tabs are shown in the upper part of the main page. The name of the selected tab is highlighted and the other tabs are grayed out. You click on either of the grayed tabs to change the selected tab.

These instructions use the following format to describe navigation to each tab: **Navigation tree>Tab**. For example, the figure above illustrates the **General>GENERAL Tab**.

Proceed to "Configure Data Collection" (a required configuration).

Configure Data Collection

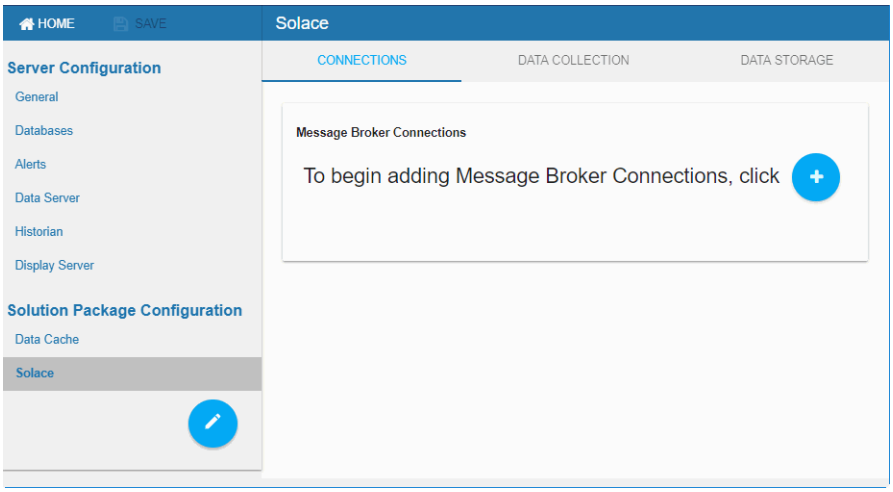
This section describes how to define connection details for the brokers you wish to monitor and verify data is collected from them. This configuration must be performed before running any deployment of the Monitor. This configuration is the only required configuration.

If you don't have special requirements for running the monitor (such as running multiple data collectors in the same host), there is no need to cover the optional subsections. Consult Technical Support before modifying other configurations to avoid the circumstance of future upgrade issues.

Note that the monitoring data is collected through SEMP (Solace Element Management Protocol), which is a RESTful API for managing Solace brokers. If your virtual brokers (software brokers) are a **version prior to 8.7 or Solace Appliance version prior to 8.3**, see "Obtain SEMP Version" for instructions on getting the SEMP version installed in your brokers.

To define Solace broker connections:

1. "Open the RTView Configuration Application", select **Solace>CONNECTIONS** tab and click  .



The **Add Connection** dialog opens.

2. In the **Add Connection** dialog, enter the **Connection Name**, **URL**, **Username** and **Password**, toggle on **Edition** if this is a Solace PubSub+ Cloud service instance. Optionally, enter the **SEMP Version** and the **VPN Name**.

   Notes:

   - If you want to collect additional metrics for a specific VPN, enter the **VPN Name**. Use this option carefully as this can increase the amount of data collected and impact monitor performance.
   - If your broker is a Solace PubSub+ Cloud Edition, toggle on the **Edition** option.
   - For versions prior to Solace 7.2, enter the SEMP Version. Otherwise, leave the default value.
   - Monitoring data is collected through SEMP (Solace Element Management Protocol), which is a RESTful API for managing Solace brokers. If your Solace PubSub+ message brokers are a version prior to 8.7 or your Solace Appliance is version prior to 8.3, see "Obtain SEMP Version" for instructions on getting the SEMP version installed in your message brokers.

3. Click 

to close the dialog and 

(in title bar) to save your settings.

   The connection you created is listed in the **Connections** tab.

4. Repeat these steps to add more brokers and click 

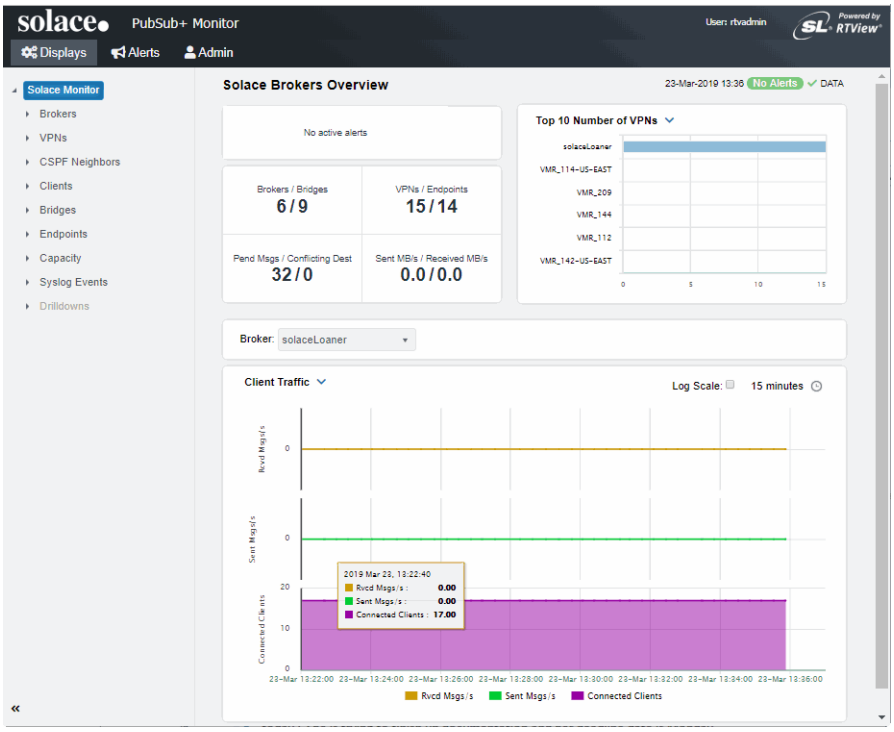
to apply your settings. The data server will be available again in 10-15 seconds. (Note that the **RESTART SERVERS** option is visible only if you saved your connection entries.)

5. Open a browser and go to the Solace PubSub+ Monitor:

   http://IPAddress:8068/rtview-solmon if you are executing your browser on a different host than where the monitor is running.

   http://localhost:8068/rtview-solmon if you are executing your browser in the same host where the monitor is running.

   Use **rtvadmin**/**rtvadmin** for username/password (if login is enabled).



You should now see monitoring data. If you encounter issues, check the log files in the **RTViewSolaceMonitor/projects/rtview-server/log** directory for errors.

You have completed configuring data collection! There are no other required configurations. To take advantage of the many optional Solace PubSub+ Monitor features, proceed to "Optional Configurations".

Optional Configurations

See the following instructions in this Guide for optional configurations:

- "Modify Default Polling Rates for Solace Caches": Change the default polling rates for Solace caches
- "Modify Default Settings for Storing Historical Data": (**On-premise only**) Change the default settings for how historical data is collected, aggregated and stored in caches.
- "Change Port Assignments": (**On-premise only**) Change the default port settings.
- "Configure Alert & Historical Database Connections": (**On-premise only**) Configure a production database-. (AMI is pre-configured with MySQL).

- "Configure Alert Notification": Configure alerts to execute an automated action (for example, to send an email alert).
- "Configure High Availability": Configure high failover and failback for Data Servers and the Historian.
- "Troubleshoot": Investigate configuration issues.

On-premise users can optionally:

- "Modify Default Polling Rates for Solace Caches"
- "Modify Default Settings for Storing Historical Data"
- "Change Port Assignments"
- "Configure Alert & Historical Database Connections"
- "Troubleshoot"
- "Configure Alert Notification"

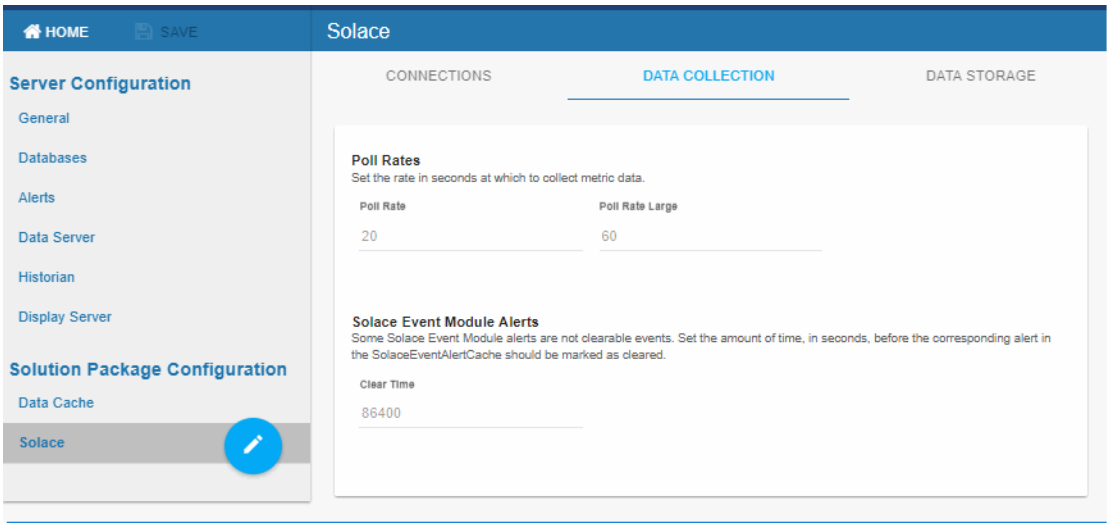
AMI users can optionally:

- "Modify Default Polling Rates for Solace Caches"
- "Modify Default Settings for Storing Historical Data"
- "Troubleshoot"
- "Configure Alert Notification"

Modify Default Polling Rates for Solace Caches

To modify the default polling rate settings for Solace caches, perform the following:

- "Open the RTView Configuration Application" and go to **Solace > DATA COLLECTION** tab.



Poll Rate: Collection period in seconds. This configuration element affects the following caches: SolEndpointStats, SolEndpoints, SolClients, SolClientStats, SolBridges, SolAppliances, SolBridgeStats, SolApplianceInterfaces and SolApplianceMessageSpool.

Poll Rate Large: Slower collection period in seconds for monitoring data that can impact the performance of the monitoring systems if the rate is very fast. This configuration element affects the following caches: SolCspfNeighbors, SolApplicances and SolEnvironmentSensors.

Solace Event Module Alerts Clear Time: Defines the time interval, in seconds, when non-clearable event alerts from the Solace Event Module will be dismissed from the monitor.

- SAVE your settings, then click RESTART SERVERS to apply your settings. The data server will be available again in 10-15 seconds.

Modify Default Settings for Storing Historical Data

Use the RTView Configuration Application to change the default settings for storing historical data for Solace and the default cache settings to modify the default behavior of the data being collected, aggregated and stored.

- "Define the Storage of In Memory History": Specify the maximum number of history rows to store in memory.
- "Define Compaction Rules": Define rules for reducing the amount of data stored over time.
- "Define Duration": Specify when data becomes expired and/or deleted from the Monitor.
- "Enable/Disable Storage of Historical Data": Choose the metrics you want to store in the database and specify a prefix for history table names.
- "Define Prefix for All History Table Names": Specify a prefix to prepend to database table names.

Define the Storage of In Memory History

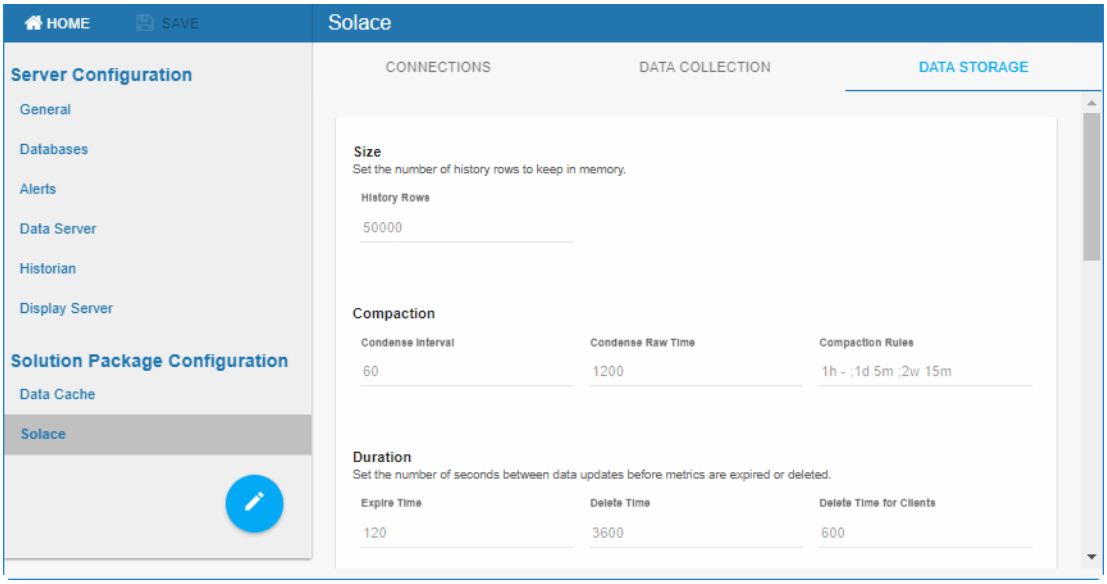
You can define the maximum number of history rows to store in memory in the **Solace / Data Storage / History Rows** property. This property can improve Monitor responsiveness.

Note that changing this value is only recommended if you have a high degree of understanding about how historical data is being stored in memory, as well as how that data is compacted and stored in the database.

The **History Rows** property defines the maximum number of rows to store for the SolVpns, SolClientStats, SolAppliances, SolEndpoints, SolCspfNeighbors, SolBridgeStats, SolApplianceInterfaces, SolApplianceMessageSpool, SolEndpointStats, SolEventModuleEvents and SolAppliancesQuality caches. The default setting for **History Rows** is **50,000**.

To modify the default settings:

- "Open the RTView Configuration Application" and go to **Solace > DATA STORAGE** tab.
- In **Size** region, enter the desired number of rows in the **History Rows** field.
- SAVE your settings, then click RESTART SERVERS to apply your settings.



Define Compaction Rules

Data compaction, essentially, is reducing redundancy in the data to be stored in the database by using a rule so that you store sampled data instead of raw data, which prevents storing of redundant data which potentially can overload the database. The compaction rule is defined through the following fields:

- **Condense Interval**: The time interval at which the cache history is condensed. The default is **60** seconds, which means that every **60** seconds all rows of the same index are condensed. As a result of this first condensing operation there will be only one row per index every minute. The following caches are impacted by this setting: SolVpns, SolClientStats, SolAppliances, SolEndpoints, SolCspfNeighbors, SolBridgeStats, SolApplianceInterfaces, SolApplianceMessageSpool and SolEndpointStats.
- **Condense Raw Time**: The time span of raw data kept in memory. The default is 1200 seconds. The following caches are impacted by this setting: SolVpns, SolClientStats, SolAppliances, SolEndpoints, SolCspfNeighbors, SolBridgeStats, SolApplianceInterfaces, SolApplianceMessageSpool and SolEndpointStats.
- **Compaction Rules**: This field defines the rules used to condense your historical data in the database. By default, the columns kept in history are aggregated by averaging rows with the following rule **1h -;1d 5m;2w 15m**, which means the data from the last hour is not aggregated (1h - rule), the data from the last day is aggregated every 5 minutes (1d 5m rule), and the data from the last 2 weeks old is aggregated every 15 minutes (2w 15m rule). The following caches are impacted by this setting: SolVpns, SolClientStats, SolAppliances, SolEndpoints, SolCspfNeighbors, SolBridgeStats, SolApplianceInterfaces, SolApplianceMessageSpool and SolEndpointStats.

To modify these settings do the following:

- "Open the RTView Configuration Application" and go to **Solace > DATA STORAGE** tab.
- Under **Compaction**, enter values in the **Condense Interval**, **Condense Raw Time** and **Compaction Rules** fields.
- SAVE your settings, then click RESTART SERVERS to apply your settings.

Define Duration

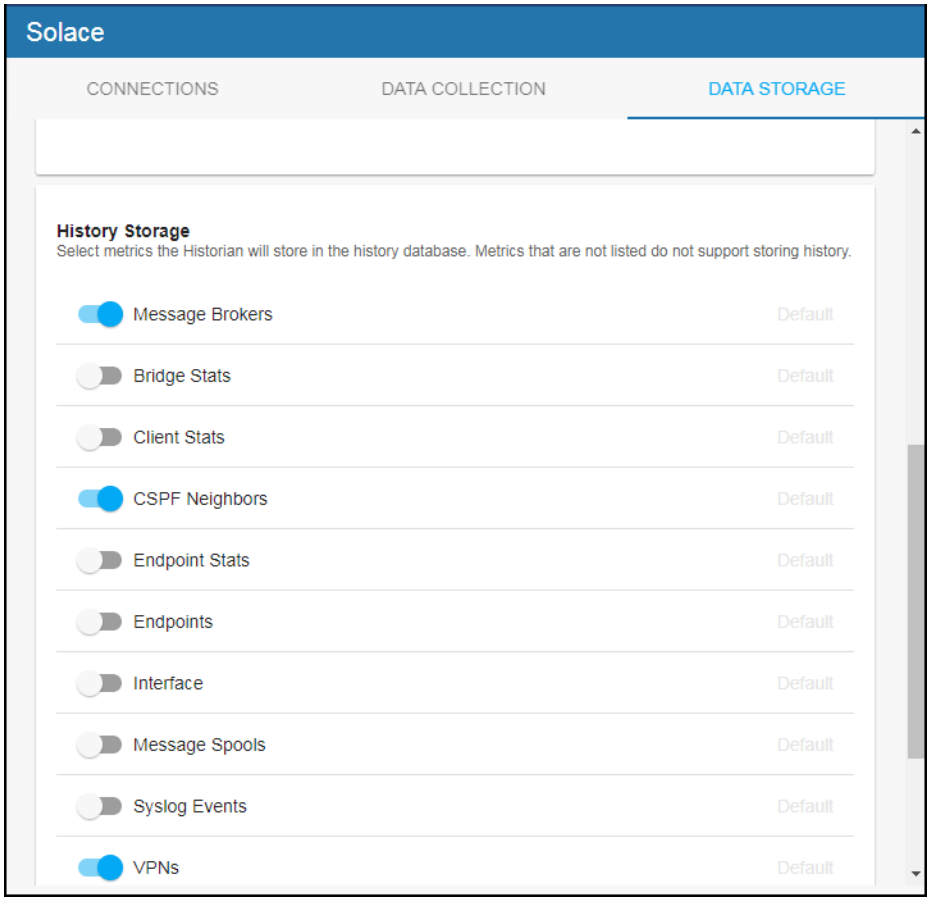
The data for each metric is stored in a specific cache and, when the data is not updated in a certain period of time, that data either marked as expired or, if it has been expired over an extended period of time, it is deleted from the cache altogether.

- **Expire Time**: This field sets the period of time when the Expire metric from the cache is set to true indicating the entry row is expired. The default expiration time is 120 seconds. The following caches have this attribute defined: SolVpns, SolBridges, SolClients, SolClientStats, SolAppliances, SolEndpoints, SolCspfNeighbors, SolBridgeStats, SolApplianceInterfaces, SolApplianceMessageSpool, SolEndpointStats, SolEnvironmentSensors and SolAppliancesQuality.
- **Delete Time**: This field sets the period of time that a given entry row should be expired before it gets deleted from the cache. It defaults to 3600 seconds and applies to the following caches: SolVpns, SolBridges, SolEndpoints, SolBridgeStats, SolEndpointStat and SolEnvironmentSensors caches.
- **Delete Time for Clients**: The meaning of this field is the same as of the Delete Time but applying to the SolClients and SolClientStats caches. The default is 600 seconds.
- **Expire Time for Solace Event Module Events**: This field sets the expiration period exclusively for the SolEventModuleEvents cache, which defaults to 3600 seconds.
- **Delete Time for Solace Event Module Events**: The meaning is as the two previous fields but for the SolEventModuleEvents cache. The default is 1 day (86,400 seconds).

Enable/Disable Storage of Historical Data

Under **History Storage** you can select which tables you want the Historian to store in the database. To enable/disable the collection of historical data, perform the following:

- "Open the RTView Configuration Application" and go to **Solace > DATA STORAGE** tab.
- Scroll down to **History Storage** and toggle to enable/disable the storage of various database tables in the database. Blue (toggled right) enables storage, gray (toggled left) disables storage. The caches impacted by these settings are SolAppliances (Message Routers), SolBridgeStats (Bridge Stats), SolClientStats (Client Stats), SolCspfNeighbors (CSPF Neighbors), SolEndpointStats (Endpoint Stats), SolEndpoints (Endpoints), SolApplianceInterfaces (Interface), SolApplianceMessageSpool (Message Spools), SolSyslogEvents (SolEventModuleEvents) and SolVpns (VPNs).
- SAVE your settings, then click RESTART SERVERS to apply your settings.



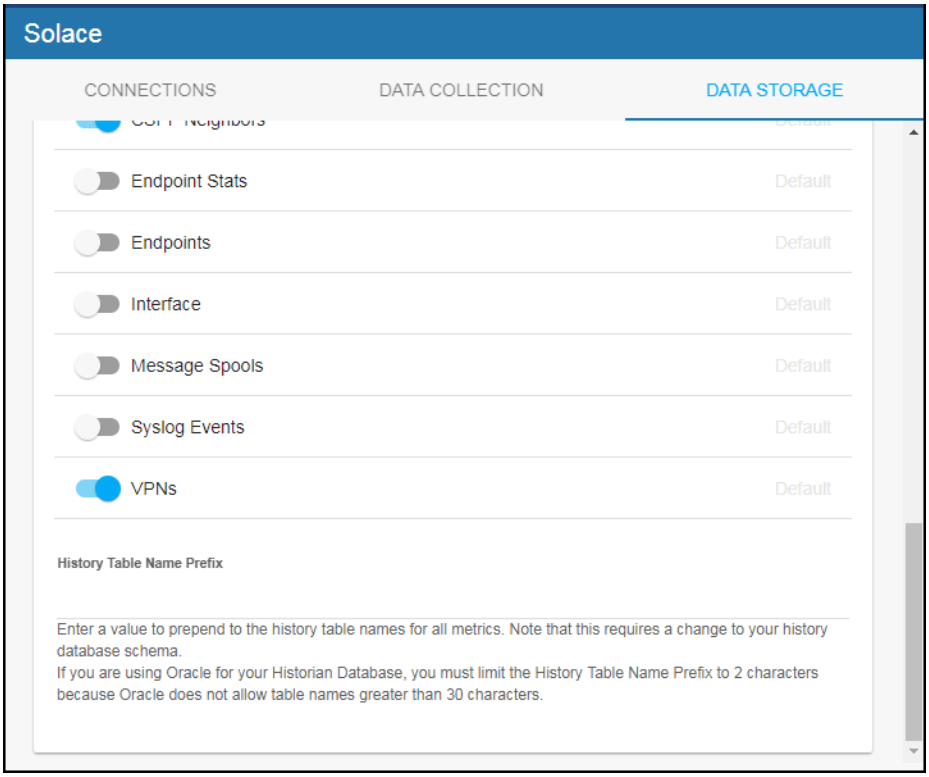
Define Prefix for All History Table Names

The **History Table Name Prefix** field allows you to define a prefix that is added to the database table names so that the Monitor can differentiate history data between data servers when you have multiple data servers with corresponding Historians using the same solution package(s) and database. In this case, each Historian needs to save to a different table, otherwise the corresponding data server will load metrics from both Historians on startup. Once you have defined the **History Table Name Prefix**, you need to create the corresponding tables in your database as follows:

- Locate the .sql template for your database under **RTViewSolaceMonitor/rtvapm/solmon/dbconfig** and make a copy of it
- Add the value you entered for the **History Table Name Prefix** to the beginning of all table names in the copied .sql template
- Use the copied .sql template to create the tables in your database

To add the prefix do the following:

- "Open the RTView Configuration Application", go to **Solace > DATA STORAGE** tab and scroll down to the bottom of the page.
- In the **History Table Name Prefix** field, enter the desired prefix name.
- SAVE your settings, then click RESTART SERVERS to apply your settings.



Change Port Assignments

This configuration is optional for the On-premise version. Ports should not be changed in the AMI version.

There are deployment architectures that might require the change of default ports for selected processes, either because the process will be executed multiple times in the same host or because the selected port number is already in use by another application. In these circumstances, you should reassign ports for Solace using the RTView Configuration Application.

Java Process	Description	Default Port(s)
RTView Data Server	Gathers performance metrics.	Default Port= **4178** Default JMX Port = **4168**
Receiver RTView Data Server	Receiver Data Server in a fault tolerant pair.	Default Port= **4172** Default JMX Port= **4168**
Sender RTView Data Server	Sender Data Server in a fault tolerant pair.	Default Port= **4176** Default JMX Port= **4166**

RTView Historian	Retrieves data from the RTView Data Server and archives metric history to a database.	Default JMX Port= **4167**

To modify port settings or deploy Java processes on different hosts (rather than on a single host):

1. "Open the RTView Configuration Application" and go to **General>GENERAL** tab.
2. Under **Ports** (scroll down to the bottom of the page), specify the port prefix that you want to use in the **Port Prefix** field. Click **Show Port Assignments** to see the port numbers that are created using the **Port Prefix** you specify.
3. Click  (in the title bar) and  to apply your settings.
4. Edit the **update_wars** (**.bat** or **.sh**) file and change the port prefix for all ports to the prefix you just specified.
5. Rebuild the war files and install them to the application server by executing the following script, located in the **RTViewSolaceMonitor/bin** directory:

   Windows:

   make_all.bat

   UNIX:

   ./make_all.sh

Configure Alert & Historical Database Connections

The Monitor is delivered with a default memory resident HSQLDB database, which is suitable for evaluation purposes. However, in production deployments, we recommend that you deploy one of our supported databases. For details, see the *RTView Core® User's Guide*.

This section describes how to setup an alternate production database, and how to configure the Alert Settings Database connection and the Historian Database connection. You connect and configure the databases using the RTView Configuration Application. You also copy portions of the **database.properties** template file (located in the **common\dbconfig** directory) into the RTView Configuration Application.

Monitor Databases

The Monitor requires two database connections that provide access to the following information:

Alert Settings

The ALERTDEFS database contains alert administration and alert auditing information. The values in the database are used by the alert engine at runtime. If this database is not available, the Self-Service Alerts Framework under which alerts are executed cannot work correctly.

Historian

The RTVHISTORY database contains the historical monitoring data to track system behavior for future analysis, and to show historical data in displays.

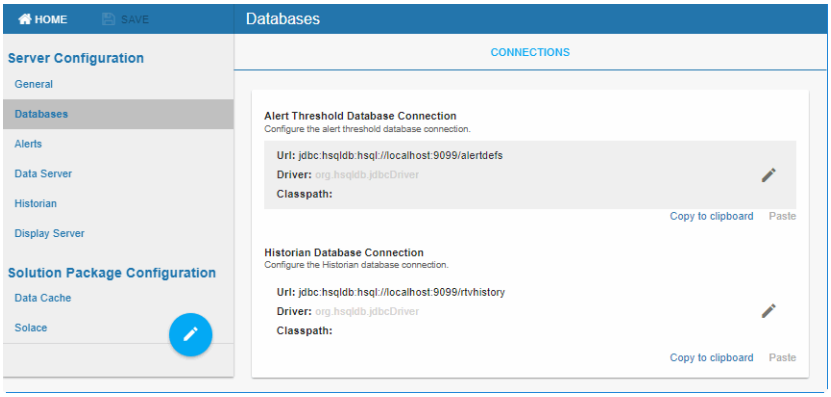
To Configure the ALERTDEFS and RTVHISTORY Databases:

1. Install a database engine of your choice. Supported database engines are Oracle, Sybase, Microsoft SQL Server, MySQL, and DB2.

   NOTE: The default page size of DB2 is 4k. It is required that you create a DB2 database with a page size of 8k. Otherwise, table indexes will not work.

2. Open the **database.properties** template file, which is located in the **common\dbconfig** directory, find the line that corresponds to your supported database in the "Define the ALERTDEFS DB" section and make a note of this information. Keep the **database.properties** template file open.

3. "Open the RTView Configuration Application" and go to **Databases>CONNECTIONS** tab.



4. Click the **Alert Threshold Database Connection** to open the **Edit Connection** dialog.

5. Enter the information (you previously noted from the **database.properties** file) into the **Edit Connection** dialog and click **Save**.

   URL: Enter the full database URL to use when connecting to this database using the specified JDBC driver.

   Driver: Enter the fully qualified name of the JDBC driver class to use when connecting to this database.

   Classpath: Enter the location of the jar where the JDBC driver resides in your environment.

   Username: Enter the username to enter into this database when making a connection.

   Password: Enter the password to enter into this database when making a connection.

   Run Queries Concurrently: Select this check box to run database queries concurrently.

   Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

6. Return to the **database.properties** template file, which is located in the **common\dbconfig** directory, find the line that corresponds to your supported database in the "Define the RTVHISTORY DB" section and make a note of this information.

7. In the RTView Configuration Application, click the **Historian Database Connection** to open the **Edit Connection** dialog.

8. Enter the information (you previously retrieved from the **database.properties** file) into the **Edit Connection** dialog and click **Save**.

URL: Enter the full database URL to use when connecting to this database using the specified JDBC driver.

Driver: Enter the fully qualified name of the JDBC driver class to use when connecting to this database.

Classpath: Enter the location of the jar where the JDBC driver resides in your environment.

Username: Enter the username to enter into this database when making a connection.

Password: Enter the password to enter into this database when making a connection.

Run Queries Concurrently: Select this check box to run database queries concurrently.

9. Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

10. Click RESTART SERVERS to apply your settings.

11. Manually create database tables. If your configured database user has table creation permissions, then you only need to create the Alerts tables. If your configured database user does not have table creation permission, then you must create both the Alert tables and the History tables.

To create tables for your database, use the **.sql** template files provided for each supported database platform, which is located in the **dbconfig** directory of the **common** and **solmon** directories:

- **Alert Settings**

  RTViewSolaceMonitor/rtvapm/common/dbconfig/create_common_alertdefs_tables_<db>.sql

- **Historian**

  RTViewSolaceMonitorrtvapm/solmon/dbconfig/create_solmon_history_tables_<db>.sql

  where **<db>** ={**db2**, **mysql**, **oracle**, **sqlserver**, **sybase**}

NOTE: The standard SQL syntax is provided for each database, but requirements can vary depending on database configuration. If you require assistance, consult with your database administrator.

The most effective method to load the **.sql** files to create the database tables depends on your database and how the database is configured. Some possible mechanisms are:

- **Interactive SQL Tool**
  Some database applications provide an interface where you can directly type SQL commands. Copy/paste the contents of the appropriate **.sql** file into this tool.
- **Import Interface**
  Some database applications allow you to specify a **.sql** file containing SQL commands. You can use the **.sql** file for this purpose.

Before loading the **.sql** file, you should create the database and declare the database name in the command line of your SQL client. For example, on MySQL 5.5 Command Line Client, to create the tables for the Alert Settings you should first create the database:

```
create database myDBName;
```

before loading the **.sql** file:

```
mysql -u myusername -mypassword myDBName <
create_common_alertdefs_tables_mysql.sql;
```

If you need to manually create the Historical Data tables, repeat the same process. In some cases it might also be necessary to split each of the table creation statements in the **.sql** file into individual files.

Third Party Application
If your database does not have either of the two above capabilities, a third party tool can be used to enter SQL commands or import **.sql** files. Third party tools are available for connecting to a variety of databases (RazorSQL, SQLMaestro, Toad, for example).

You have finished configuring the databases. To configure alert notifications, proceed to Configure Alert Notification.

Troubleshoot

This section includes:

Log Files for Solace

When any Solace PubSub+ Monitor component encounters an error, an error message is output to the console and/or to the corresponding log file. Logging is enabled by default. If you encounter issues with log files, verify the **logs** directory exists.

Solace Monitor Log Files

If you encounter issues, look for errors in the following log files, located in the **RTViewSolaceMonitor/projects/rtview-server/logs** directory:

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

RTView Manager Log Files

If you encounter issues, look for errors in the following log files, located in the **RTViewSolaceMonitor/projects/rtview-manager/logs** directory:

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

JAVA_HOME

If you encounter issues starting Solace Monitor or RTView Manager processes on Linux, verify that JAVA_HOME is set correctly in the path as JAVA_HOME is required for Tomcat to start correctly. On Windows, JAVA_HOME or JRE_HOME should exist as environment variables indicating a valid Java path.

Permissions

If you encounter permissions-related errors in the response from the **start_servers** 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 also verify confirm with your network administrator that you're not being blocked from accessing the remote system.

Data Not Received from Data Server

In the Solace PubSub+ Monitor, if you go to the **Administration>RTView Cache Tables** display and see that caches are not being populated with monitoring data (the number of rows in the table is zero), check for connection property errors that are provided to the Data Server. Do the following:

1. "Open the RTView Configuration Application" and go to the **Solace>CONNECTIONS** tab.
2. Verify the connection parameters associated with your brokers.
3. Verify the SEMP version is correct for each of your brokers (monitoring data cannot be collected if the SEMP version is incorrect) and make corrections if necessary.
4. Click 

in the title bar when finished, then 

to apply your settings. It takes about 10-15 seconds for the data server to be available again.
5. In the Solace Monitor, go to the **Admin>RTView Cache Tables** display and verify that all caches are being populated with monitoring data (the number of rows in the table is greater than zero).

CHAPTER 5 Additional Configurations

This section contains the following:

Configure High Availability

This section describes how to configure High Availability (HA) for Solace PubSub+ Monitor. HA prevents the loss of data and alerts during failover. You configure HA by configuring a pair of data servers - one as the primary server and the other as the backup server.

Solace PubSub+ Monitor supports HA for Data Servers, Display Servers and the Historian.

Data Server HA

The primary and backup data servers connect to each other via socket. If the primary data server stops, the backup server takes over. When the primary comes back on line it takes over as primary and the backup server returns to standby mode. Data client connections move between the two servers accordingly.

Data clients of the HA pair can connect using a fault tolerant URL (//PRIMARYHOST:3278,//BACKUPHOST:3278) or to an HA configured rtvdata servlet.

Note: Be aware that data clients can connect to the standby server using a non-fault tolerant URL and still receive data. This is possible because of the proxy feature in which the standby server forwards data requests to the primary server. This can be confusing when you use the HTML cache viewer (at http://localhost:3270/common) on the standby server to view cache contents. It looks like the standby server caches are updating but they are not. You are actually viewing data in the primary server and not the standby server.

Display Server HA (RTView Manager Only)

In Display Server deployments, the primary and backup display servers do not connect to each other. The rtvdisplay servlet is configured to connect first to the primary and if that fails, it tries to connect to the backup. When the server it is connected to becomes unavailable it tries to connect to the other server.

If the **DisplayServerConnectionFailback** property is set to **true**, the rtvdisplay servlet connects to the primary server when it comes back on line. If set to **false**, it does not connect back to the primary server unless the backup server becomes unavailable. Data client connections move between the two servers accordingly.

Historian HA

The primary and backup historians connect to each other via socket. If the primary historian stops, the backup historian takes over. When the primary comes back on line it takes over as primary and the backup returns to standby mode. Only the active historian writes to the database.

The historian is a data client of the data server and connects to it via fault tolerant URL (socket only). This means that the data servers and historians can fail over separately or together.

Requirements

The following are minimum requirements for HA.

- Two host machines, one for the Primary Host and one for the Backup Host.
- Both hosts must be configured such that the RTView processes on each host can connect to each other via socket.
- Both hosts must be able to access:
  - the same data connections.
  - the same historian database.
  - the alert threshold database.
- Data clients for the HA Data Servers have two options for connecting:
  - Via socket
  - Via servlet running on an application server other than the internal Jetty server. **Note:** This requires extra configuration of the servlet **.war** files in the application server.
- rtvquery data clients for HA data servers must connect via servlet running on an application server other than the internal Jetty server. **Note:** This requires extra configuration of the servlet **.war** files in the application server.

To configure HA:

1. Install and configure Solace PubSub+ Monitor on the primary host, including:
   - configure data connections
   - configure server options and databases
   - enable alert persistence
2. Copy the Solace PubSub+ Monitor installation from the primary host to the backup host.
3. Configure the Display Server war file (rtvmgr) to be HA.
4. Configure the rtvquery servlet for HA access by doing the following:
   - Execute **update_wars** to generate the war file
   - jar -xf xx.war WEB-INF/classes/com/sl/rtvquery/rtvquery.properties
   - Edit the **WEB-INF/classes/com/sl/rtvquery/rtvquery.properties** file to uncomment and fill in the DataServerBackup line:

     DataServerBackup=BackupHost:3278

     where **BackupHost** is the name or IP address of the BACKUPHOST and the port number is the same port as in the **DataServerPort** property
   - jar -uf xx.war WEB-INF/classes/com/sl/rtvquery/rtvquery.properties

5. On both the primary and backup hosts, define PRIMARYSERVER and BACKUPSERVER environment variables.

6. On the primary host, open a Windows command line and execute the following script:

   start_server -haprimary

7. On the backup host, open a Windows command line and execute the following script:

   start_server -habackup

8. To verify failover and failback configurations for both Solace PubSub+ Monitor and RTView Manager, look for the following in the log files:

Verify failover and failback configuration by looking at the following in the log files.

primary data server log:

startup

[rtview] Starting as primary HA data server accessible via //primaryhostname:3278,//backuphostname:3278

[rtview] DataServerHA: connected to backuphostname:3278

[rtview] DataServerHA: run as primary server, backuphostname:3278 has lower priority than this server

[rtview] leaving standby mode

backup data server log:

startup

[rtview] Starting as backup HA data server accessible via //primaryhostname:3278,//backuphostname:3278

rtview] entering standby mode

after failover (primary data server exits)

[rtview] DataServerHA: error receiving message: java.net.SocketException: Connection reset (primaryhostname:3278)

[rtview] DataServerHA: becoming primary server, lost connection to primary server primaryhostname:3278

[rtview] leaving standby mode

after failback (primary data server comes back up)

[rtview] DataServerHA: resigning as primary server, got standby directive from other server primaryhostname:3278

[rtview] connected to primaryhostname:3278

[rtview] entering standby mode

Primary historian log:

[rtview] Starting as primary HA historian paired with backup historian at <backuphostname>:3222

[rtview] ServerGroup: status of member <backuphostname>:3222: primary, priority= 1, started=Wed Nov 14 12:56:01 PST 2018

[rtview] ServerGroup: primary server = local

[rtview] ServerGroup: becoming primary server

backup historian log:

[rtview] Starting as backaup HA histoiran paired with primary historian at <primaryhostname>:3222

[rtview] ServerGroup: status of member <primaryhostname>:3222: primary, priority= , started=Wed Nov 14 12:56:01 PST 2018

[rtview] ServerGroup: primary server = <primaryhostname>:3222

after failover (primary historian exits):

[rtview] error receiving message: java.io.EOFException (primaryhostname:3222)

[rtview] ServerGroup: disconnected from primaryhostname:3222

[rtview] ServerGroup: primary server = local

after failback (primary historian starts back up):

[rtview] ServerGroup: status of member primaryhostname:3222: primary, priority= 2, started= Tue Nov 20 09:12:43 PST 2018

[rtview] ServerGroup: connected to primaryhostname:3222

[rtview] ServerGroup: primary server = primaryhostname:3222

Primary display server log:

2018-11-19 14:08:09,366 INFO main - [rtview] Starting as primary HA display server paired with backup display server on <backuphostname>

Backup display server log

2018-11-19 14:08:09,366 INFO main - [rtview] Starting as backup HA display server paired with primary display server on <primaryhostname>

If PRIMARYHOST and/or BACKUPHOST is not set, you will get the following error in the log and HA will be disabled:

ERROR: Disabling HA because the PRIMARYHOST and/or BACKUPHOST environment variable is not set.

Solace Event Module

To use the Solace Event Module you must “Configure PubSub+ Message Broker & Syslog Destination” to send Syslog messages, set the Solace Event Module to run and listen for the Syslog messages the broker sends, and “Configure RTView” to run and receive data from the Solace Event Module.

This section contains:

Introduction

To monitor the PubSub+ message brokers using Syslog events, you can use the Solace Event Module application. The Solace Event Module listens for Syslog event messages that are generated by Solace PubSub+ message brokers and filters them to generate Syslog event-based alerts when required.

The Syslog event messages generated in the PubSub+ message brokers are forwarded to the SolEventModuleEvents cache from the RTView Solace Data Server. The events that trigger alerts are stored in the SolEventModuleAlerts cache from the RTView Solace Data Server.

The Solace Event Module is licensed separately from the Solace PubSub+ Monitor. And therefore, it is not executed by default and requires additional configuration.

To start the Solace Event Module you add a command line argument to the **rtvservers.dat** file, configure the severity level of the Syslog event-based alerts and the Syslog destination address and port.

Configure PubSub+ Message Broker & Syslog Destination

To use the Solace Event Module, you configure your Solace Brokers to send Syslog messages for either the **system.log** or **event.log** and also configure a receiver for those messages that can be accessed by your Solace data server.

For the configuration of PubSub+ message brokers with Syslog, please refer to:

https://docs.solace.com/System-and-Software-Maintenance/Monitoring-Events-Using-Syslog.htm

Configure RTView

This section contains:

Edit rtvservers.dat

Do the following to configure RTView to run and receive data from the Solace Event Module.

1. “Open the RTView Configuration Application”, add a connection to each Broker for which you will be receiving Syslog events through the Solace Event Module and save these changes.

2. Stop RTView by executing the **RTViewSolaceMonitor\bin\stop_servers.bat/sh** script.

3. Open the **RTViewSolaceMonitor\projects\rtvservers.dat** file, locate the following line:

```
solmon        ./rtview-server dataserver      rundata -propfilter:receiver
```

   and add **–soleventmodule** to the end of it. For example:

```
solmon        ./rtview-server dataserver      rundata -propfilter:receiver -soleventmodule
```

4. Add a connection for one or more Syslog receivers in the **RTViewSolaceMonitor\rtvapm\solmon\soleventmodule\config\soleventmodule**

.properties file using the **TCP_EVENT_LISTNERS** property. The other properties can optionally be configured, but the **TCP_EVENT_LISTENERS** property is required.

For details about other properties in the **soleventmodule.properties** file, see "Solace Event Module Properties".

5. "Start the Solace PubSub+ Monitor", then look at the **soleventmodule.log** file, located in the same logs directory that contains your data server log, and verify that the Solace Event Module is running.

Solace Event Module Properties

The **RTViewSolaceMonitor\rtvapm\solmon\soleventmodule\config\soleventmodule.properties** file is used to configure connections and filtering for Syslog events and alerts that are forwarded to RTView.

This section contains:

Syslog Receiver Connections

This section describes how to define the connection to your Syslog event receivers.

TCP_EVENT_LISTENERS – Connection to one or more Syslog event receivers. The format is name|bindAddress|logFile where name is a unique string used to identify this receiver, bindAddress is the ipaddress:port for Syslog messages and logFile is either **event.log** or **system.log** to match the settings on your Broker. Use a comma to separate multiple connections.

Examples:

TCP_EVENT_LISTENERS=SystemSyslogListener|172.30.1.12:10601|system.log

Alert Filter

This section describes how to filter out which Syslog events generate alerts that are forwarded to RTView and stored in the SolEventModuleAlerts cache. The filter is not required, but if used, you must specify all 3 properties.

ALERT_FILTER_LIST_PRIORITY – Specify WHITELIST or BLACKLIST to define which takes priority for Syslog messages that match both filters.

ALERT_WHITELST - Comma separated list of XPath expressions returning a Boolean using the Alert Fields listed at the top of the soleventmodule.properties file.

ALERT_BLACKLIST- Comma separated list of XPath expressions returning a Boolean using the Alert Fields listed at the top of the soleventmodule.properties file.

Examples:

ALERT_FILTER_LIST_PRIORITY = WHITELIST

ALERT_WHITELST = eventName='VPN_SOLCACHE_STATE_CHANGE', eventName='VPN_BRIDGING_LINK_DOWN' and intendedSupportGroup='MW'

ALERT_BLACKLIST = severityCode>=5

Event Filter

This section describes how to filter out which Syslog events are forwarded to RTView and stored in the SolEventModuleEvents cache. The filter is not required, but if used, you must specify all 3 properties.

EVENTWRITER_FILTER_LIST_PRIORITY - Specify WHITELIST or BLACKLIST to define which takes priority for Syslog messages that match both filters.

EVENTWRITER_WHITELST - Comma separated list of XPath expressions returning a Boolean using the Alert Fields listed at the top of the soleventmodule.properties file.

EVENTWRITER_BLACKLIST - Comma separated list of XPath expressions returning a Boolean using the Alert Fields listed at the top of the soleventmodule.properties file.

Examples:

EVENTWRITER_FILTER_LIST_PRIORITY = WHITELIST

EVENTWRITER_WHITELST = eventName='VPN_SOLCACHE_STATE_CHANGE', eventName='VPN_BRIDGING_LINK_DOWN' and intendedSupportGroup='MW'

EVENTWRITER_BLACKLIST = severityCode>=5

Alert Duration

This section describes how to define the amount of time to wait after a clearable event is received for the corresponding clear event before executing the alert. This does not apply to non-clearable alerts which are executed as soon as the corresponding event is received.

ALERT_DURATION = The number of seconds to wait after receiving a clearable event for the corresponding clear event before executing the alert.

For example:

ALERT_DURATION = 30

Solace Event Module Log Properties File

You can adjust the logging for the solace event module by modifying **RTViewSolaceMonitor/rtvapm/solmon/soleventmodule/config/log4j2.properties**.

This section contains:

RTView Solace Event Module Caches and Alerts

The Syslog events from the Solace Event Module are stored in the SolEventModuleEvents cache and displayed in the Solace Monitor->Syslog Events display. See the "Solace Event Module Log Properties File" and the "Event Filter" section for information about how to filter events that are sent to this cache.

This cache keeps history and can optionally be stored to the history database by the Historian. You can adjust the history settings in the RTView Configuration Application using the following fields in the **Solace>DATA-STORAGE** tab:

Size>History Rows – sets the maximum number of rows to keep in memory for this cache

Duration>Expire Time For Solace Event Module Events – the time (in seconds) between updates to expire rows in this cache

Duration>Delete Time For Solace Event Module Events – the time (in seconds) between updates to delete rows in this cache

History Storage>Syslog Events – toggle to true to have the Historian store this cache to the History database

The SolEventModuleAlerts Cache

The Solace Event Module generates alerts based on incoming Syslog events. The definitions of which Syslog events generate which alerts were provided by Solace. Events and alerts are scoped to SYSTEM, VPN and CLIENT. Some alerts are clearable. In this case, a syslog message generates an alert and another syslog message clears the alert.

Other alerts are not clearable. In this case, a syslog message generates the alert, but there is no corresponding syslog message to clear it. In this case, the alert automatically clears in RTView after 24 hours.

The **RTViewSolaceMonitor\rtvapm\solmon\soleventmodule\config\events\event_details.json** file lists all events that generate alerts. The **RTViewSolaceMonitor\solmon\soleventmodule\config\events\event_correlation.json** file lists the raising and clearing events for all clearable alerts. These files must not be modified, but used for reference only.

Alert events from the Solace Event Module are stored in the SolEventModuleAlerts cache. See the “Solace Event Module Log Properties File” and the “Alert Filter” section for information about how to filter alerts that are sent to this cache.

This cache is not visible in displays, nor does it store history. It is used solely to generate the three alerts described below.

Alert events are deleted from this cache within 2 minutes of the alert being cleared. These alert events are cleared in 2 ways:

- Clearable alerts are cleared when the clearing event is received by the Solace Event Module.
- Non-clearable alerts are cleared after 24 hours. This time can be adjusted in the Configuration Application under **Solace>DATA-COLLECTION>Solace Event Module Alerts>Clear Time**. The value is in seconds.

The following RTView alerts are generated from the SolEventModuleAlerts cache:

SolEventModuleBrokerAlert – This alert is generated for rows in the SolEventModuleAlerts where Scope=SYSTEM. In Enterprise Monitor, this alert is mapped to the SOLACE-MSGROUTER CIType.

SolEventModuleVpnAlert - This alert is generated for rows in the SolEventModuleAlerts where Scope=VPN. In Enterprise Monitor, this alert is mapped to the SOLACE-VPN CIType.

SolEventModuleClientAlert - This alert is generated for rows in the SolEventModuleAlerts where Scope=CLIENT. In Enterprise Monitor, this alert is mapped to the SOLACE-CLIENT CIType.

Obtain SEMP Version

Skip this step if your Solace software broker message brokers are using Solace PubSub+ version 8.7+ and Solace Appliance version 8.3+. This step is required if your Solace PubSub+ message brokers are using software versions prior to Solace PubSub+ version 8.7+ and Solace Appliance version 8.3+.

Note: It is recommended to not include a SEMP version string in commands, and only include one if a known deprecated behavior is needed from a particular SEMP schema.

In order to properly request monitored data, the Monitor requires the exact SEMP version on your message routers. These instructions describe how to use SolAdmin to determine the SEMP version for each of your Solace Message Routers or VMRs. You will need this information when you connect your message routers and edit connection properties.

Note: These instructions are for SolAdmin on Windows. For Linux, only the path to the log file changes.

1. Navigate to the SolAdmin installation folder. For example, **C:\Program Files (x86)\SolAdmin**.
2. Change directory (**cd**) to the **bin** directory and open the **log4j.properties** file in a text editor.
3. Change the logging level to **DEBUG** and provide the full path to the logging file (for example, **C:\Logs**) while retaining all other settings. The edited properties are as follows:

```
# full path to the location where you want the log file to be stored. In this example C:\Logs
log4j.appender.A1.File=C:\Logs\soladmin.log
# Set the logging category to DEBUG
log4j.category.com.solacesystems=DEBUG, A1
```

4. Save the **log4j.properties** file.
5. Start SolAdmin and add your message routers or VMRs as managed instances.
6. Open the **soladmin.log** file and locate the semp-version tag in SEMP requests. The SEMP version that will be used by the Monitor replaces underscores (_) with dots (**.**). For example, if the SEMP request in the SolAdmin log file is **7_2VMR**, you use **7.2VMR** for the **$solSempVersion** substitution of the Monitor connection property.

Return to "Quick Start - On-premise".

Create AMI Instance

This section describes how to create obtain the Solace PubSub+ Monitor Amazon Machine Image (AMI).

On-premise users can skip this step.

The Solace PubSub+ Monitor AMI is pre-installed on an Amazon EC2 Amazon Machine Image (AMI) running Amazon Linux. It includes the following application stack for convenience of quick deployment:

- Oracle Java 8
- Node.js
- Docker
- MySQL 5.7 (via Docker) for storage of historical data
- rtvHostAgent (via Docker) for providing host metrics to RTVMGR
- cadvisor-rtview (via Docker) for providing docker metrics to RTVMGR

Solace PubSub+ Monitor AMI is configured to start all RTView processes and supporting services on restart.

The scripts used to create the Docker containers are included in named subdirectories under **/home/ec2-user/amibase**, to be used as templates if you wish to recreate the containers with your preferred configuration.

The MySQL database data is stored external to the Docker container at **/home/ec2-user/amibase/mysql/DATA**.

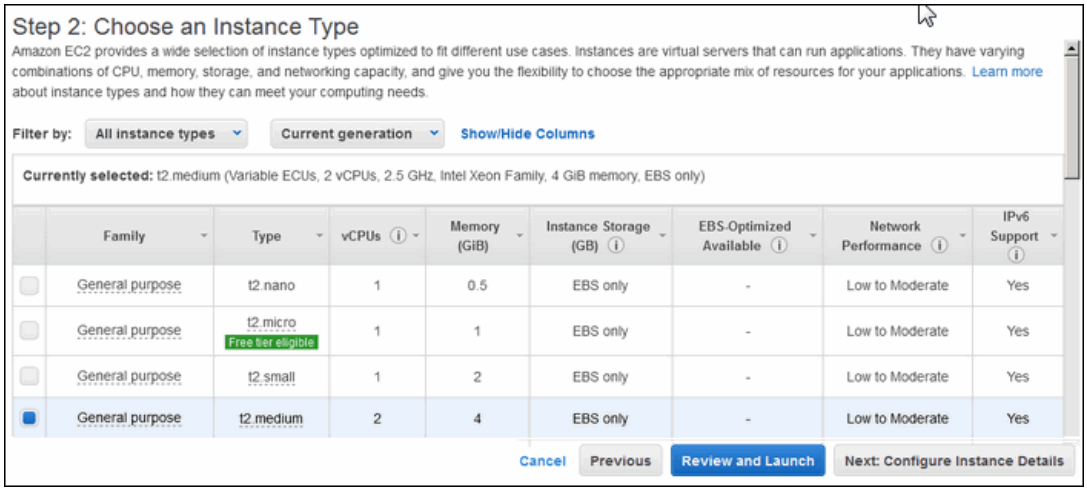
Before you proceed: We recommended that you be logged into your Amazon AWS user account with administrative access before following the link to the AWS Instance Launch Wizard.

1. In a browser, go to **http://sl.com/solace-ami-free-trial/** and complete the form to gain access to the page of region links.

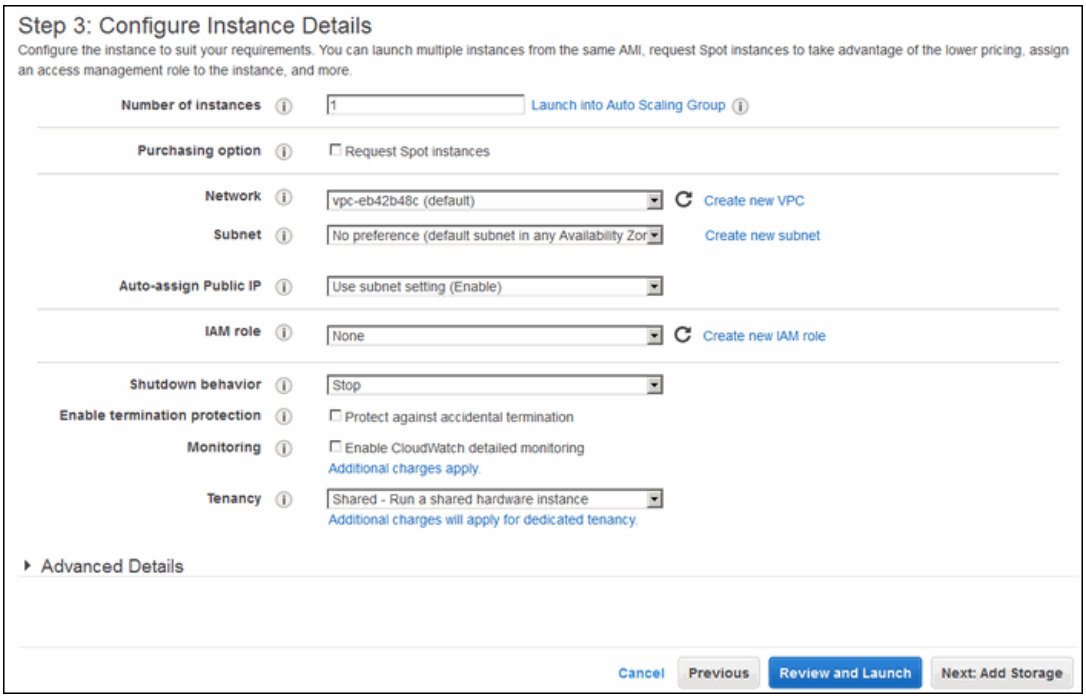
2. Click on the link for the AWS region appropriate for you to go to the AWS Instance Launch Wizard.

3. In the **Configure Instance Details** screen, choose an appropriate **Instance Type** and click **Next: Configure Instance Details**.

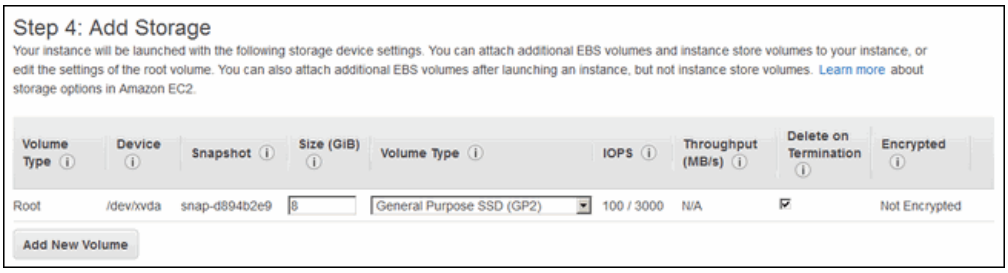
   For information about Instance Types, refer to AWS documentation. We recommend starting with the t2 family, of at least t2.medium.



2. In the **Configure Instance Details** screen, configure the VPC, then click **Next: Add Storage**.

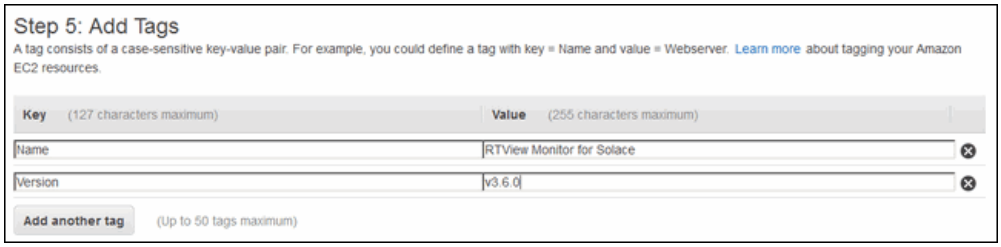


4. In the **Add Storage** screen, accept the **8 GB** storage size, or select a sufficiently-sized volume for the number of Solace brokers that you will be storing archival data for, and then click **Next: Tag Instance**.

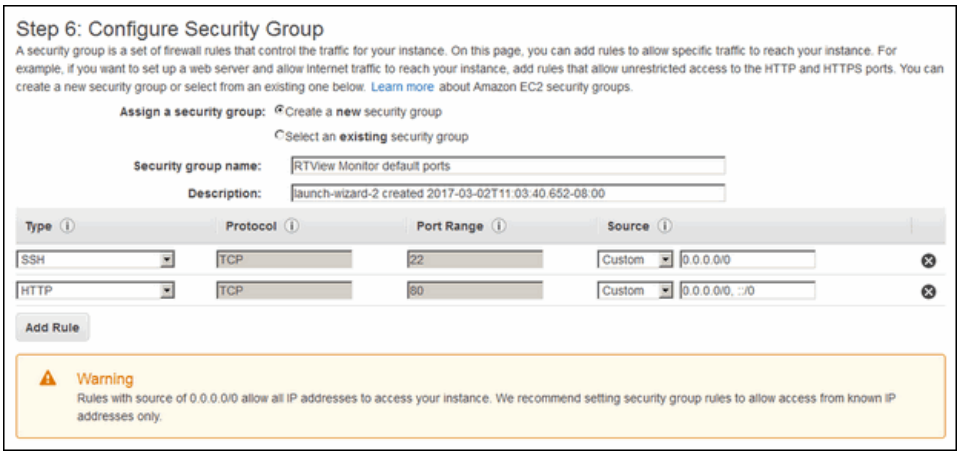


5. In the **Tag Instance** screen, add tags as appropriate to keep your PubSub+ instances organized, then click **Next: Configure Security Group**.

   The following example uses Name, and Version but you can choose any tags that make sense for your application.



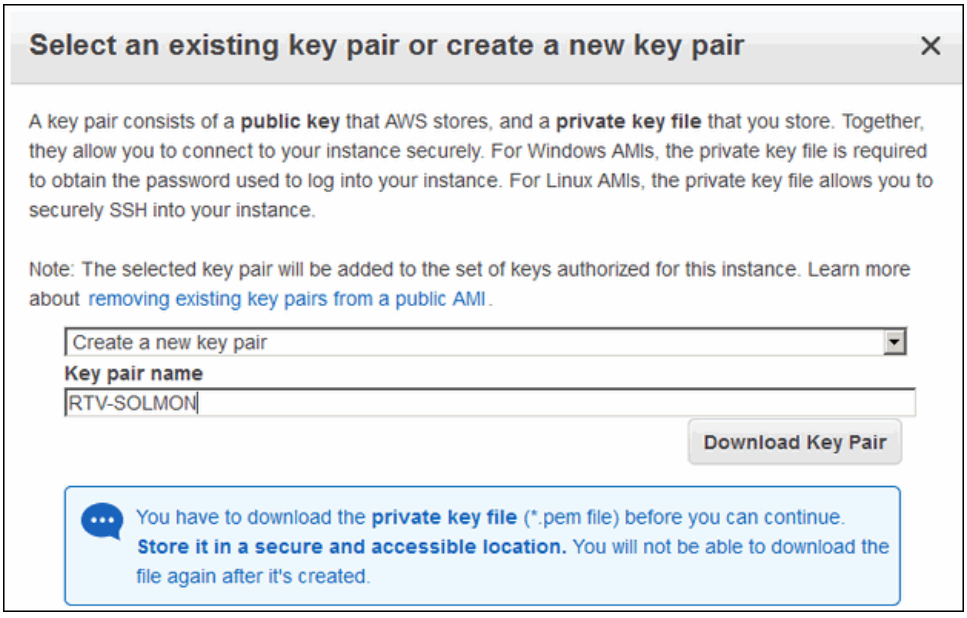
6. In the **Configure Security Group** screen, create or choose an appropriate security rule that allows SSH (22) and HTTP (80) access for the Solace PubSub+ Monitor, then click **Review and Launch**.



7. In the **Review** screen, verify your instance, ignore the warnings, and click **Launch**.

   The instance starts.

8. In the dialog box that opens, choose an authentication key pair for the instance, which can be used for this first login to the instance, then click **Launch Instance**.



9. Look for your Solace PubSub+ Monitor instance in the EC2 dashboard **Instances**. This is where you can see the external and internal IP address of the instance.

   For more information about IP Addressing in the Cloud, refer to Solace Corporation documentation.

10. To log into the Linux Host shell, enter the following command:

ssh -p 22 -i <auth_key> ec2-user@<public_ip>

Return to Quick Start “Quick Start - AMI”.

CHAPTER 6 Configure Alert Notification

This section describes how to configure alert notifications. The Monitor provides alerts concerning conditions in your system through RTView alerts. This section describes how to configure those alerts to execute an automated action (for example, to send an email notification).

Configuring alert notifications is a two-step process:

1. "Set Alert Notification Conditions": First you choose the alert conditions that you want to be notified about. You can set alerts to notify on the following conditions:
   - when a new alert is created
   - the first time the **Severity** field on an alert changes
   - when an alert is cleared
   - periodically renotify at a specified interval (this option is for unacknowledged alerts)
2. "Set Alert Notification Actions": You then specify the alert notification action. You can do this using a script (Batch File/Shell Script) or the Java Command Handler. By default, a **.bat** script is executed when a new alert is created and also when the severity level of an alert changes for the first time. This script, by default, is *not* configured to execute an automated action. However, you can uncomment the line in the script that prints alert data to standard output. Or, you can modify the script to execute an automated action (such as sending an email alert). The following is a sample output from the alert command script:

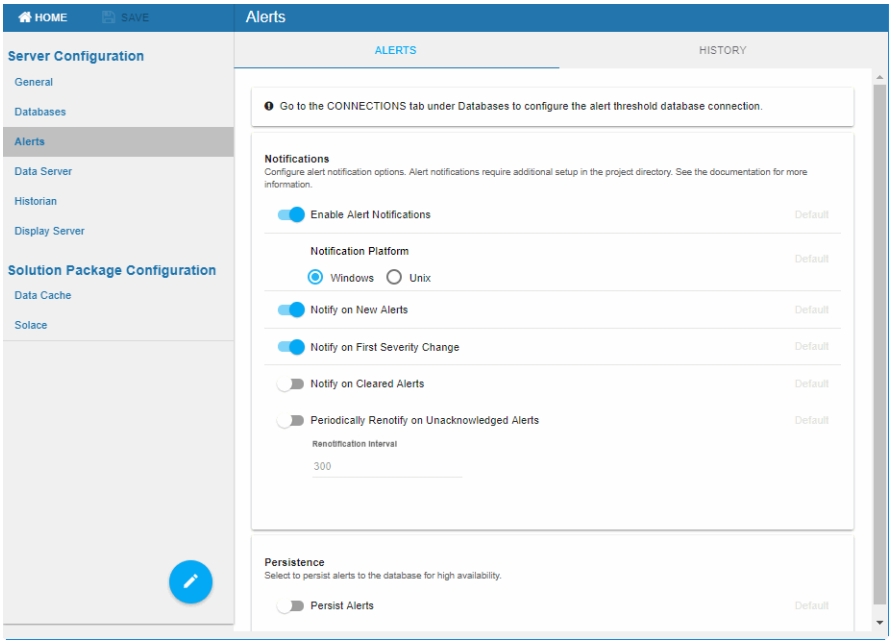
```
----- Alert command script executed: DOMAINNAME=MYMON-1, ALERTNAME=someAlert,
ALERTINDEX=alertIndex1~alertIndex2, ALERTID=1075, ALERTSEVERITY=2, ALERTTEXT=High Alert
Limit exceeded current value: 100.0 limit: 80.0 #####
```

Set Alert Notification Conditions

This section describes how to specify the alert conditions for executing alert notifications.

1. Browse to the RTView Configuration Application (**rtvadmin**/**rtvadmin** for username/password) and go to **Alerts**:
   - **http://IPAddress:8068/rtview-solmon-rtvadmin** if you are executing your browser on a different host than where the monitor is running.

- **http://localhost:8068/rtview-solmon-rtvadmin** if you are executing your browser in the same host where the monitor is running.



2. Make the following changes:

- Toggle on **Enable Alert Notifications** (blue is enabled/gray is disabled).
- If you plan to execute alert notifications "Using a Batch File or Shell Script", select the proper **Notification Platform** - either **Windows** or **Unix -** to specify platform in which the project is running.
- Toggle on alert conditions that you want to be notified about. Alert condition options are:

  Notify on New Alerts: sends notification is executed when a new alert is created.

  Notify on First Severity Change: notification is executed the first time the severity changes on an alert.

  Notify on Cleared Alerts: notification is executed when an alert is cleared.

  Periodically Renotify on Unacknowledged Alerts: notification is executed for an unacknowledged alert, per the **Renotification Interval** specified here. The default is **300** seconds.
- Toggle on **Persist Alerts**.
- Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

3. If you plan to execute alert notifications using a batch file or a shell script, proceed to "Using a Batch File or Shell Script" and follow the instructions.

If you plan to execute alert notifications "Using the Java Command Handler", go to **General** > **CUSTOM PROPERTIES** tab and click .

The **Add Property** dialog opens.

4. In the **Add Property** dialog, create the following two properties as specified here:

Name: sl.rtview.cp

Value: ./custom/lib/rtvapm_custom.jar

Filter: dataserver

Click SAVE to close the dialog.

Name: sl.rtvapm.customcommandhandler

Value: com.sl.rtvapm.custom.RtvApmCommandHandler

Filter: dataserver

Click SAVE to close the dialog and SAVE (in title bar) to save your settings.

The newly created properties are listed in the **Custom Properties** tab.

5. If you enabled the **Notify on New Alerts** option, create the following property as specified here:

   Name: sl.rtview.alert.notifiercommandnew

   Value: system.cust ‘my_alert_notification.$domainName.$alertNotifyType.$alertNotifyCol’ $alertNotifyTable

   Filter: dataserver

   Click SAVE to close the dialog and SAVE to save your settings.

6. If you enabled the **Notify on First Severity Change** option, create the following property as specified here:

   Name: sl.rtview.alert.notifiercommandfirstsevchange

   Value: system.cust ‘my_alert_notification.$domainName.$alertNotifyType.$alertNotifyCol’ $alertNotifyTable

   Filter: dataserver

   Click SAVE to close the dialog and SAVE to save your settings.

7. If you enabled the **Notify on Cleared Alerts** option, create the following property as specified here:

   Name: sl.rtview.alert.notifiercommandcleared

   Value: system.cust ‘my_alert_notification.$domainName.$alertNotifyType.$alertNotifyCol’ $alertNotifyTable

   Filter: dataserver

   Click SAVE to close the dialog and SAVE to save your settings.

8. If you enabled the **Periodically Renotify on Unacknowledged Alerts** option, create the following property as specified here:

   Name: sl.rtview.alert.notifiercommandrenot

   Value: system.cust ‘my_alert_notification.$domainName.$alertNotifyType.$alertNotifyCol’ $alertNotifyTable

   Filter: dataserver

   Click SAVE to close the dialog and SAVE to save your settings.

9. Click RESTART SERVERS to apply your settings.

To complete your alert notifications setup, proceed to “Set Alert Notification Actions”.

Set Alert Notification Actions

This section assumes you already "Set Alert Notification Conditions".

This section describes the two options for setting up alert notification actions. Follow the appropriate instructions for your setup :

- "Using a Batch File or Shell Script": This option requires switching to an OS-specific set of alert definitions that execute the appropriate file type. Windows and UNIX alert definition files are provided with the Monitor. A sample batch file and a sample shell script are also provided which are customized as needed.
- "Using the Java Command Handler": The Java source for the Monitor Java command handler is provided to facilitate customization.

Using a Batch File or Shell Script

This section assumes you already "Set Alert Notification Conditions".

A sample batch file, **my_alert_actions.bat**, and a sample shell script, **my_alert_actions.sh**, which are located in the **common/bin** directory, are provided as templates that you can modify as needed. Use the appropriate file for the platform that hosts Monitor processes. By default, both scripts send alert information to standard output. To uncomment the line in the script so that alert data prints to standard output in:

- "Windows Batch File"
- "UNIX/Linux Shell Script"

Windows Batch File

1. Copy the **my_alert_actions.bat** file, located in the **common/bin** directory, into your project directory.

2. Open the **my_alert_actions.bat** file, located in your project directory, and uncomment the echo line (near the end of the file) to print alert information to standard output. Or, you can modify the script to execute an automated action (such as sending an email alert). This script will be executed for new alerts and on first severity change.

3. If you enabled **Notify on Cleared Alerts**, copy the **my_alert_actions.bat** file, located in your project directory, to **my_alert_actions.cleared.bat**. Optionally modify the script to execute a different action for cleared alerts. This script will execute when an alert is cleared.

4. If you enabled **Periodically Renotify on Unacknowledged Alerts**, copy the **my_alert_actions.bat** file, located in your project directory, to **my_alert_actions.renotify.bat**. Optionally modify the script to execute a different action for renotifications. This script will execute periodically for unacknowledged alerts.

5. Restart the Data Server.

UNIX/Linux Shell Script

1. Copy the **my_alert_actions.sh** file, located in the **common/bin** directory, into your project directory.

2. Open the **my_alert_actions.sh** file, located in your project directory, and uncomment the echo line (near the end of the file) to print alert information to standard output. Or, you can modify the script to execute an automated action (such as sending an email alert). This script will be executed for new alerts and on first severity change.

3. If you enabled **Notify on Cleared Alerts**, copy **my_alert_actions.sh** file, located in your project directory, to **my_alert_actions.cleared.sh**. Optionally modify the script to execute a different action for cleared alerts. This script will execute when an alert is cleared.

4. If you enabled **Periodically Renotify on Unacknowledged Alerts**, copy **my_alert_actions.sh** file, located in your project directory, to **my_alert_actions.renotify.sh**. Optionally modify the script to execute a different action for renotifications. This script will execute periodically for unacknowledged alerts.

5. Restart the Data Server.

Batch File or Shell Script Substitutions

The default **my_alert_actions** scripts use the substitutions described in the table below.

Argument	Description	Values
$alertId	This substitution specifies the unique ID for the alert. For example: **alertId = 1004**	Text or Numeric
$alertIndex	This substitution specifies which source triggered the alert. With tabular objects, the first column of data is typically the **Index** column. The value in the **Index** column is a name that uniquely identifies each table row. The **alertIndex** uses the **Index** column name. For example, if the **CapactityLimitAllCaches** alert is configured to monitor all of your caches, and to trigger when any of the caches exceed the specified capacity threshold, the **alertIndex** indicates specifically which cache triggered the alert. With scalar objects, which do not have a table and therefore do not have a column (the **useTabularDataFlag** property is **False**), the **alertIndex** is blank. For example: **alertIndex = MyCache01**	Text or Numeric
$alertName	This substitution specifies the name of the alert. For example: **alertName = CapacityLimitAllCaches**	Values vary.
$alertSeverity	This substitution specifies the severity level of the alert. **0**: The alert limit has not been exceeded therefore the alert is not activated. **1**: The alert warning limit has been exceeded. **2**: The alert alarm limit has been exceeded. For example: **alertSeverity = 1**	Numeric
$alertText	This substitution specifies the text that is displayed when the alert executes. For example: **alertText = High Warning Limit exceeded, current value: 0.9452 limit: 0.8**	Text

Using the Java Command Handler

This section assumes you already "Set Alert Notification Conditions".

To set alert notification actions using the Java Command Handler:

1. Verify that the **rtvapm_custom.jar** file is built per **Step 4** in the "Customizing the Java Command Handler" instructions.

2. Restart the Data Server.

Customizing the Java Command Handler

The source for the Monitor Java handler is provided in the **RtvApmCommandHandler.java** file, located in the **\projects\custom\src\com\sl\rtvapm\custom** directory of your Monitor installation directory. By default, the handler prints the alert data to standard output. To change this behavior perform the following steps:

1. Open the **RtvApmCommandHandler.java** file.

2. Modify the **OutputAlertString** method as needed. You can replace this method with your own if you modify the **invokeCommand** method to call it, and your method accepts the same arguments as **OutputAlertString**.

3. Save the **RtvApmCommandHandler.java** file.

4. Compile **RtvApmCommandHandler.java** and rebuild **rtvapm_custom.jar** using the supplied script (**make_classes.bat** or **make_classes.sh**) in the **\projects\custom\src** directory.

5. Restart the Data Server.

Java Command Handler Substitutions

When you customize the Java Command Handler, the entire alert table row is passed into the Java Command Handler for each alert that notifies so that all information regarding those alerts is available. The following substitutions are used:

Argument Description

- **$alertNotifyType:** This substitution specifies to show the value of the notification type so you can use the same command for all notifications. Values are **NEW_ALERT**, **CLEARED_ALERT**, **FIRST_SEV_CHANGE** or **COLUMN_CHANGED**.
- **$alertNotifyCol:** This substitution only applies when the **notifyType** is **COLUMN_CHANGED**. Specifies to use a semi-colon delimited list of column names that changed from the **alertNotifierColumns**.
- **$alertNotifyTable:** This substitution specifies the row in the alert table that corresponds to this notification into the command. Notification Persistence

To prevent duplication and missed notifications after restart or failover, you must configure the Data Server for alert persistence in the **ALERTS** tab of the RTView Configuration Application.

Solace Event Module Alerts

When notifying on the Solace Event Module alerts, users may want to do different actions based on the information in the corresponding row in the SolEventModuleAlerts cache. Since not all information in the SolEventModuleAlerts is available in the alert table, a method is available for querying the row from the SolEventModuleAlerts from the custom Java Command Handler:

GmsTabularData
com.sl.rtvapm.solmon.RtvApmAppManager.getExtendedSolEventAlertInfo (String id, String source, int timeoutSec)

- id - the ID value in the SolEventModuleAlerts cache for this alert. You can get this from the AlertIndex – it is the last token in the AlertIndex string (i.e. the part after the last **~**).
- source - should be null when notifying in the RTViewSolaceMonitor.
- timeoutSec - the number of seconds to wait for the data before returning. The data will return very quickly in the RTViewSolaceMonitor case since the cache is local.

CHAPTER 7 Using the Monitor

The Solace PubSub+ Monitor is an advanced messaging platform that allows customer applications to efficiently exchange messages over dedicated VPNs. The Solace PubSub+ Monitor provides pre-configured alerts and dashboards to monitor current status and manage history for the Solace broker. The Solace PubSub+ Monitor can help operators avoid or detect many problems relating to configuration, topology, and performance. This section describes Monitor features, graphs and functionality as well as Monitor displays.

This section contains:

- "Login to Solace Monitor": Describes how to access the Solace Monitor.
- "Login to RTView Manager": Describes how to access the RTView Manager.
- "Overview": Describes the Monitor GUI elements and functionality.
- "Displays": Describes Monitor displays under the "Displays" tab.
- "Alerts": Describes Monitor displays under the "Alerts" tab.
- "Admin": Describes Monitor displays under the "Admin" tab.
- "RTView Manager Displays": Describes RTView Manager displays.

Login to Solace Monitor

To access Solace PubSub+ Monitor browse to:

http://IPAddress:8068/rtview-solmon if you are executing your browser on a different host than where the monitor is running.

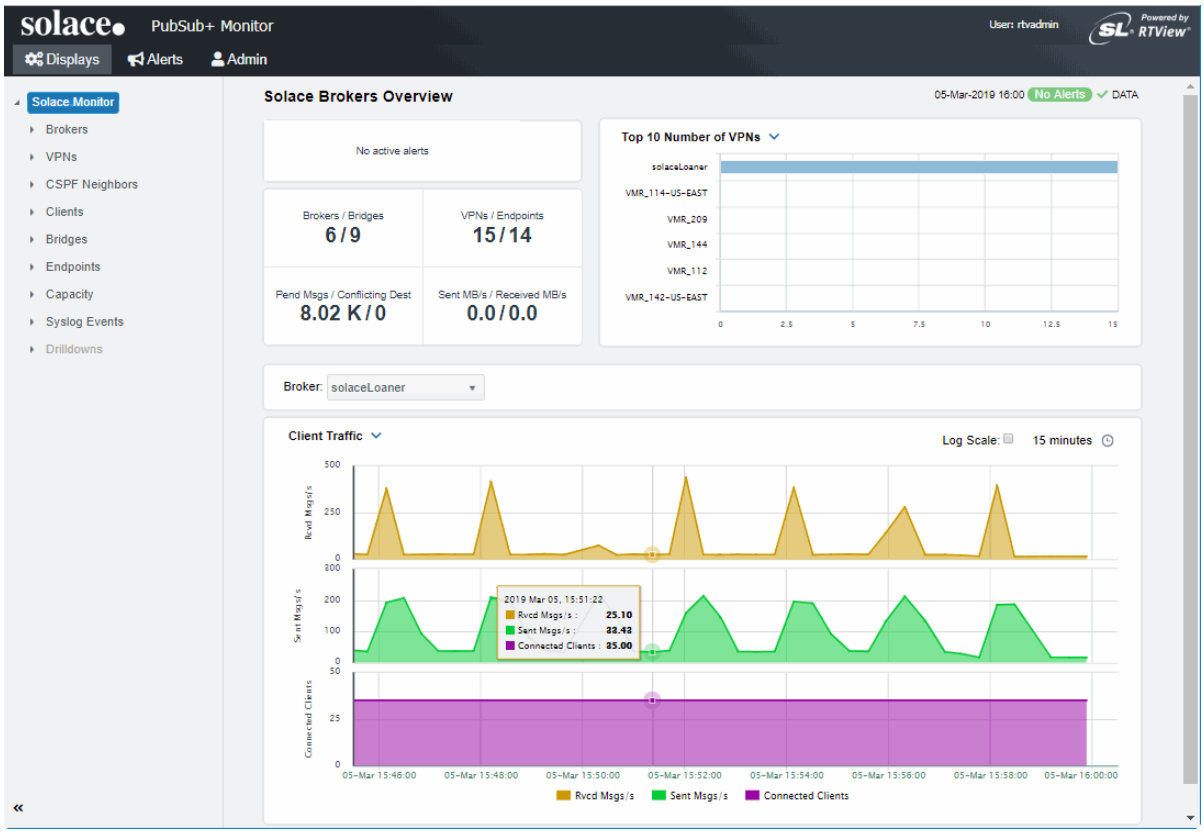
http://localhost:8068/rtview-solmon if you are executing your browser in the same host where the monitor is running.

There are three types of users:

- **End-users** use rtvuser/rtvuser as their username/password which permits read-only access to all displays except for **Admin** tab displays.
- **End-user with alert management privileges** use rtvalertmgr/rtvalertmgr as their username/password which permits the same access as the end-user. Additionally, you can use the **Own**, **Ack**, **Unack** and **Comment** functions in the **Alerts Table**.
- **Administrators** use rtvadmin/rtvadmin as their username/password which permits read-only access to all displays as well as **Admin** tab displays. You can also administer alerts, view cache contents and use the **Own**, **Ack**, **Unack** and **Comment** functions in the **Alerts Table**.

  Note: If you are using the Solace PubSub+ Monitor AMI version, you can also monitor "MySQL Database" and "Docker Engines" displays. If you are using the On-premise version these displays have no data.

The RTView® Monitor for Solace® Displays home page opens, which provides a health summary of all your Solace brokers (see the following figure).



On larger screens the page contains a horizontal menu bar with three tabs:

- **Displays** is used to view Solace displays in the main panel that you select from the navigation tree in the left panel.
- **Alerts** is used to view and manage alerts.
- **Admin** is used to administer alerts and to view cache contents directly. This tab is only accessible to users with administrator privileges (user accounts with the rtvadmin role). You can hide the navigation tree by clicking **<<** (on the lower left).

Navigation through the displays is recorded in the browser history and you can use the browser's back and next buttons to traverse that history. You can hide the navigation tree in the **Displays** and **Admin** tabs by clicking **<<** (on the lower left).

On smaller screens, the horizontal menu bar is replaced by a vertical menu whose visibility is toggled by clicking the menu icon in the upper right corner of the page.

Once a user is logged in, that user remains logged in until the browser window is closed. Closing just the browser tab that contains the user interface does not log out the user, the browser itself must be closed.

See “Displays” for details about displays for Solace.

Note: If you are using the AMI version of the Solace Monitor, you the MySQL database would have been preconfigured in a Docker container. To monitor the preconfigured database and Docker, open a browser and navigate to:

http://IPAddress:8068/rtview-manager-classic if you are executing your browser on a different host than where the monitor is running.

http://localhost:8068/rtview-manager-classic if you are executing your browser in the same host that where the monitor is running.

These displays will not have data if you are using the On-premise version.

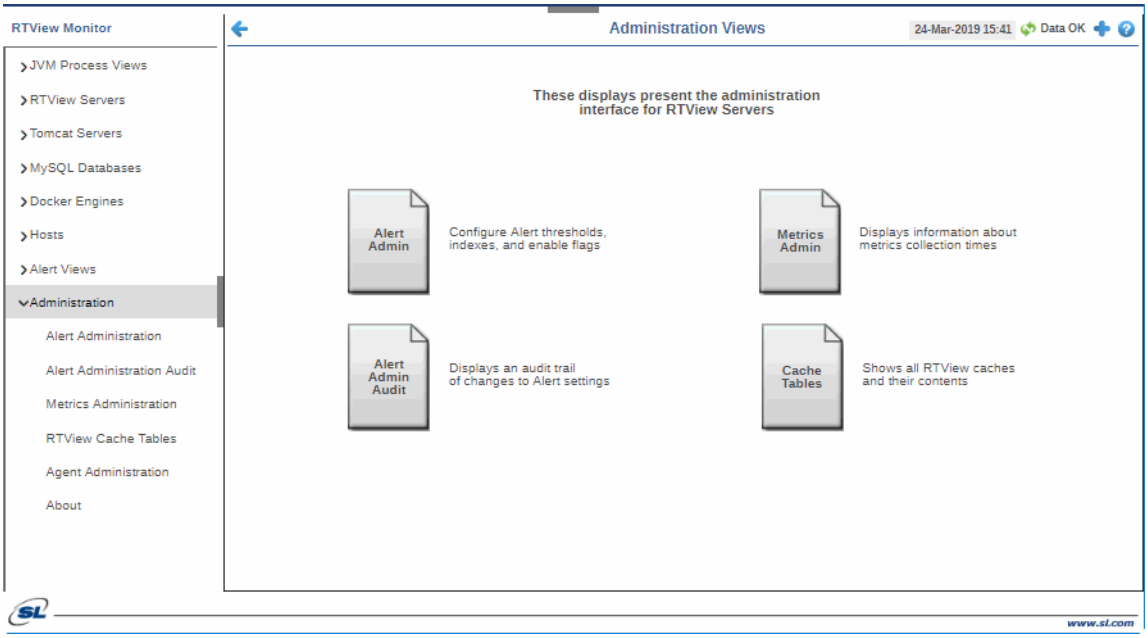
Login to RTView Manager

To access RTView Manager:

- **http://IPAddress:8068/rtview-solmon-rtvadmin** if you are executing your browser on a different host than where the monitor is running.
- **http://localhost:8068/rtview-solmon-rtvadmin** if you are executing your browser in the same host where the monitor is running.

  Use rtvadmin/rtvadmin for username/password.

The RTView Manager opens (see the following figure).



See “RTView Manager Displays” for more about RTView Manager displays.

Overview

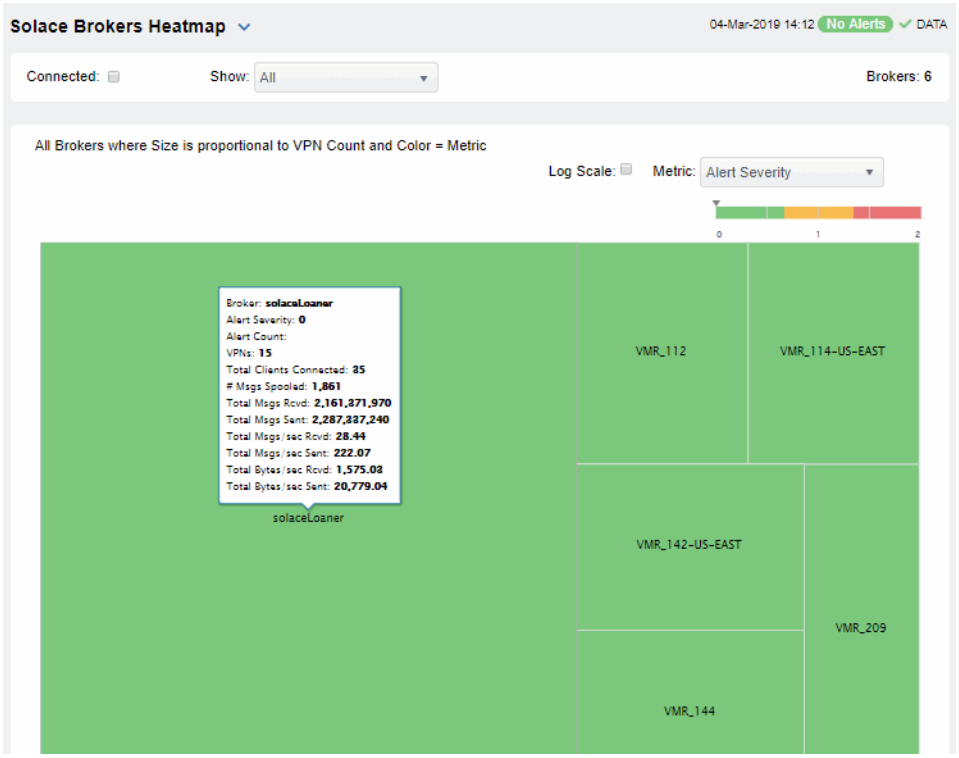
This section describes the general operation of the Solace Monitor, the user interface as well as “Graphic Elements” such as “Heatmaps”, “Tables”, “Trend Graphs” and “Icons and Buttons”.

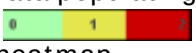
Graphic Elements

This section describes the graphic objects that are used in displays and their behavior:

Heatmaps

Heatmaps organize your Solace 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 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 (the **Solace Brokers Heatmap** is shown below).



For example, the **Solace Brokers Heatmap** contains a **Metric** drop-down menu with options such as **Alert Severity** and **Alert Count**. 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.

Note: Typically, it takes about 30 seconds after a server is started to appear in an Solace 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 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.

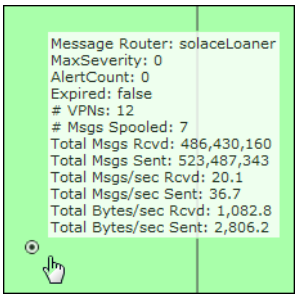
Alert Count

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.

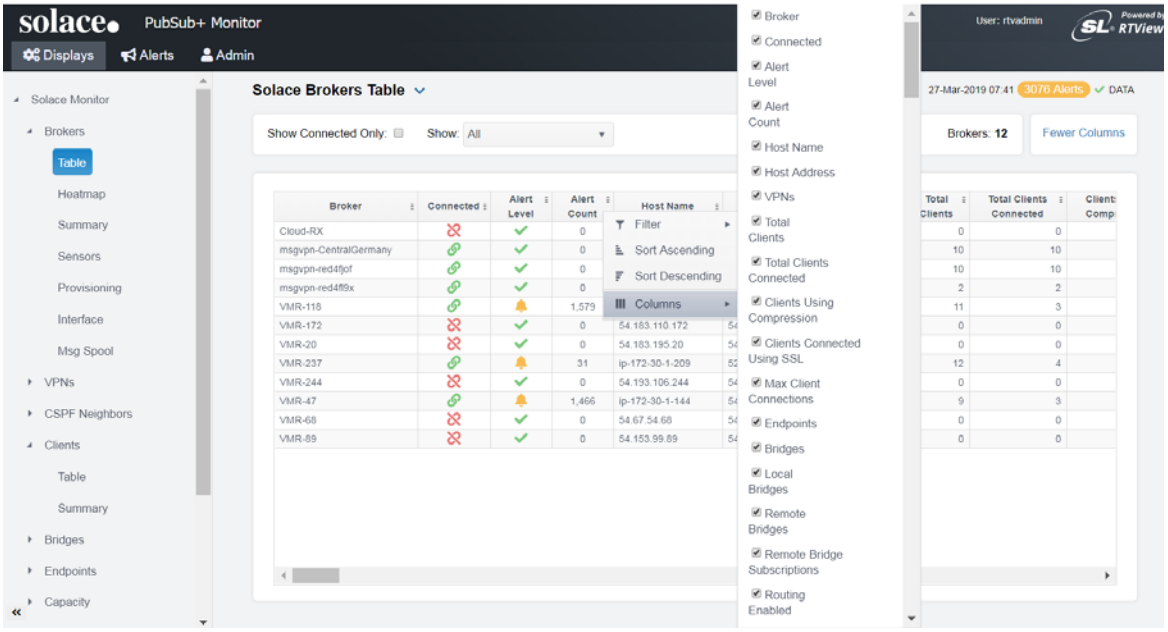
Mouse-over

The mouse-over functionality provides additional detailed data in a tool-tip 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.



Tables

Solace Monitor tables contain the same data that is shown in the heatmap in the same View, and additional data not included in the heatmap. For example, the **VPNs Table** display (shown below) shows the same data as the **VPNs Heatmap** display.



Tables support advanced HTML, interactive features: sorting on multiple columns, filtering on multiple columns, column resizing, column reordering, and hiding columns. Many of these features are accessed from the column menu, shown in the screen shot above, which you open by clicking on the menu icon in a column's header.

Additional features are:

- “Multiple Column Sorting,” next
- “Column Visibility” on page 59
- “Column Filtering” on page 59
- “Column Reordering” on page 60
- “Row Paging” on page 61

Multiple Column Sorting

Click on a column header to sort the table by that column. On the first click, the column is sorted in ascending order (smallest value at the top), on the second click the sort is in descending order, and on the third click, the column is returned to its original unsorted state. A sort on a string column is case-sensitive.

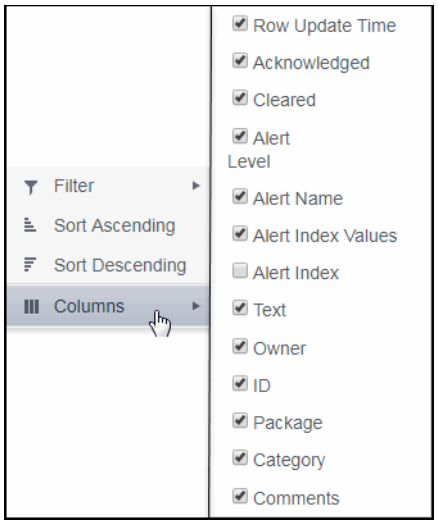
To sort multiple columns, click on the column header for each column you want to sort. The sorting is performed in the order that the column headers were clicked. Multiple column sorting is a very useful feature, but can also cause confusion if you intend to sort on a single column, but forget to "unsort" any previously selected sort columns first. You should check for the up/down sort icon in other column headers if a sort gives unexpected results.

The grid's row selection is cleared if the sort is changed or if columns are resized or reordered.

Column sorting is reflected in an export to HTML and Excel.

Column Visibility

You can hide or show columns in the table by clicking on any column's menu icon, and choosing **Columns** from the menu. This opens a submenu with a check box for each column that toggles the visibility of the column. All columns in the data table appear in the Columns menu, even those that are initially hidden.

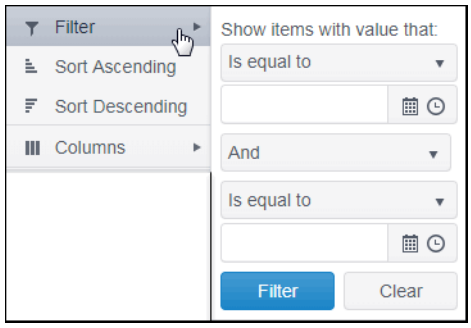


Column visibility changes are NOT reflected in an export to HTML and Excel.

Column Filtering

You can create a filter on any column. If filters are created on multiple columns, then only the rows that pass all of the filters are displayed. That is, if there are multiple filters they are logically "ANDed" together to produce the final result.

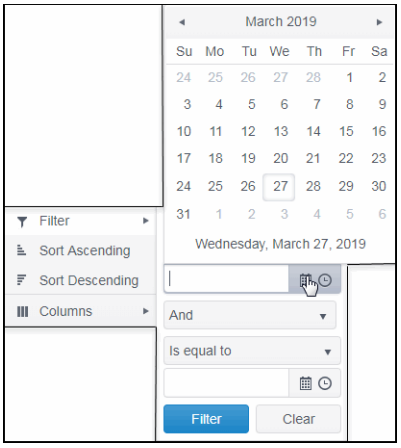
You can configure a filter on any column by clicking on the column's menu icon and choosing **Filter** from the menu. This opens the **Column Filter** dialog:

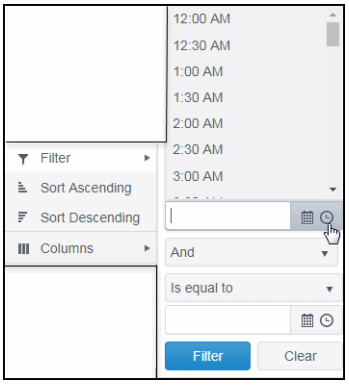


Options in the **Column Filter** dialog vary according to the data type of the selected column:

- **String columns**: You can enter a filter string such as "abc" and, from the drop-down list, select the operator (equal to, not equal to, starts with, contains, etc) to be used when comparing the filter string to each string in the column. All of the filter comparisons on strings are case-insensitive. You can optionally enter a second filter string (e.g. "xyz") and specify if an AND or OR combination should be used to combine the first and second filter results on the column.

- **Numeric columns**: You can enter numeric filter values and select arithmetic comparison operators, (=, !=, >, >=, <, <=). You can optionally enter a second filter value and comparison operator, and specify if an AND or OR combination should be used to combine the first and second filter results.
- **Boolean columns**: You simply select whether matching items should be true or false.
- **Date columns**: You can select a date and time and choose whether matching items should have a timestamp that is the same as, before, or after the filter time. The date is selected by clicking on the calendar icon and picking a date from a calendar dialog. The time is selected by clicking on the time icon and picking a time from a drop-down list:





Data updates to the grid are suspended while the filter menu is opened. The updates are applied when the menu is closed.

Column filtering is reflected in an export to HTML and Excel.

If the row header is enabled, at least one column must remain locked.

Column locking is NOT reflected in an export to HTML and Excel.

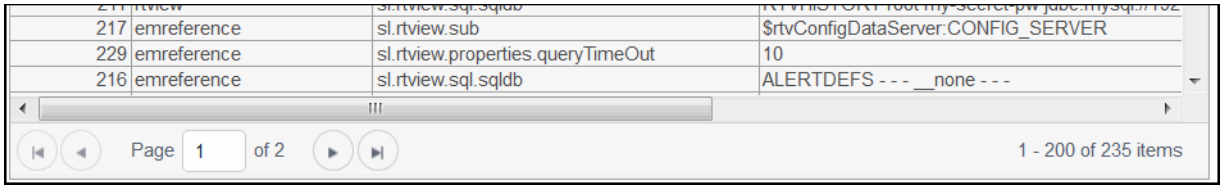
Column Reordering

You can reorder the grid columns by dragging and dropping a column's header into another position. Dragging a column into or out of the row header area (the leftmost columns) is equivalent to locking or unlocking the column.

Column reordering is NOT reflected in an export to HTML and Excel.

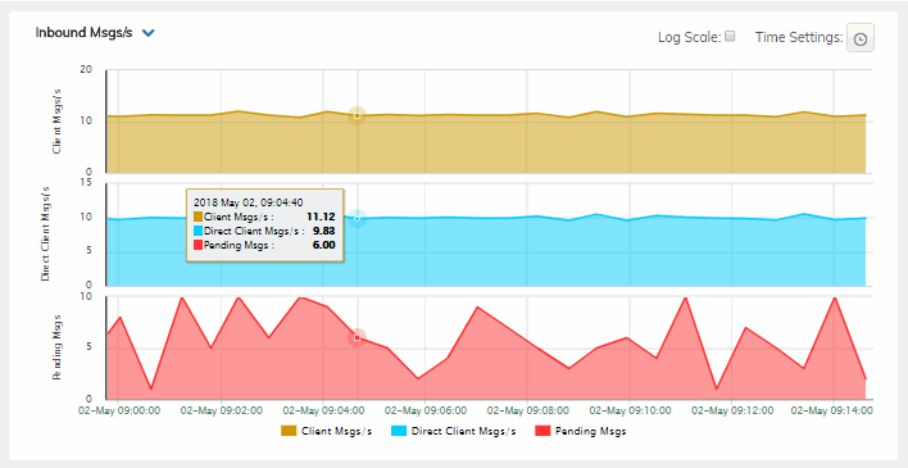
Row Paging

If the data table contains more than one 200 rows, page controls appear at the bottom of the grid.



Trend Graphs

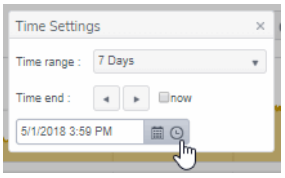
Solace Monitor trend graphs enable you to view and compare various important metrics over time, such as server memory and virtual memory utilization.



Time Settings

By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either:

- choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu.
- specify begin/end dates using the calendar ..
- specify begin/end time using the clock .



Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows .

Restore settings to current time by selecting **now**

.

Mouse-over

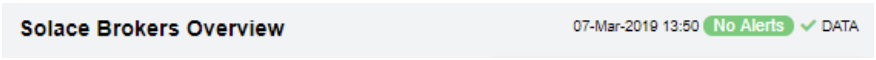
The mouse-over functionality provides additional detailed data in an over imposed pop-up window when you mouse-over trend graphs.

Log Scale

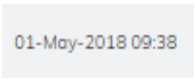
The Log Scale option enables visualization on a logarithmic scale. This option should be used when the range in your data is very broad. For example, if you have data that ranges from the tens to the thousands, then data in the range of tens will be neglected visually if you do not check this option.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

Icons and Buttons

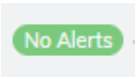
Displays share the same title bar as shown below.

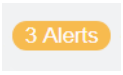


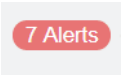
The following describes GUI icons and behavior in the title bar.



The current local date and time. If the time is incorrect, this might indicate that the monitor stopped running. When the date and time is correct and the **Data** indicator is green, this is a strong indication that the platform is receiving current and valid data.





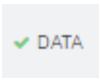


ALERTS: Opens the **Alerts Table**, shows the total number of alerts associated with items currently in the display as well as the maximum alert severity of these, where:

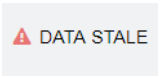
Green indicates that no metrics have exceeded their alert thresholds.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

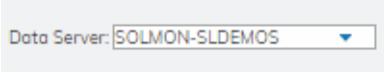
Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.



DATA: The data source is currently connected. When the date and time is correct and the **DATA** indicator is green, this is a strong indication that the platform is receiving current and valid data.



DATA STALE: The data source is currently disconnected. There has been no response from the Data Server for 31+ seconds.

Log Scale	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.
	Drop-down menus filter the item/s you want to view. Options differ among displays.

Displays

The RTView® Monitor for Solace® organizes displays under the following Views:

- "Brokers": The displays in this View present broker-level metrics, which reflect configuration settings, total throughput, current status, errors, and value-added calculations that summarize metrics across all of the VPNs.
- "CSPF Neighbors": The displays in this View present a topology and metrics of your brokers, PubSub+ and servers as well as and their configuration settings.
- "VPNs": The displays in this View present VPN-level metrics.
- "Clients": The displays in this View present metrics for all clients of the broker. These views can be filtered to limit the displays to clients for a single VPN.
- "Bridges": The displays in this View present a topology and metrics of your bridges and VPNs. These views can be filtered to limit the displays to bridges for a single VPN.
- "Endpoints": The displays in this View present metrics for topics and queues on the broker, which can be filtered to limit the displays to topics and queues for a single VPN.
- "Capacity": The displays in this View present current metrics, alert count and severity at the broker level.
- "Syslog Events": View details about Syslog events.

Brokers

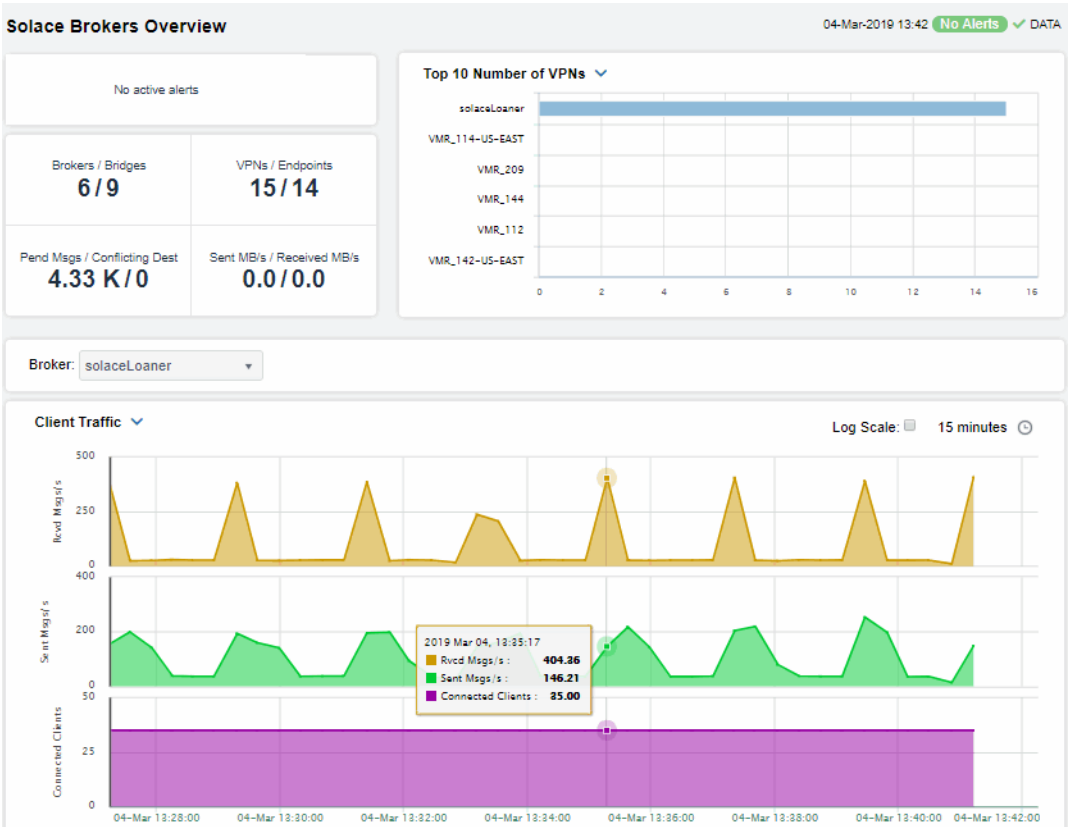
These displays provide detailed metrics for brokers and their connected brokers. Displays in this View are:

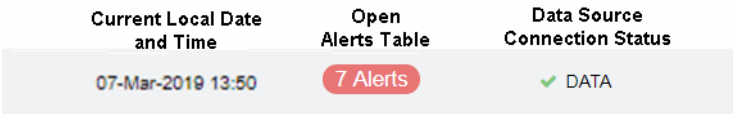
- "Brokers Overview": Health snapshot of top 10 most utilized VPNs, trend graphs trace key performance metrics such as messages sent/received and connected clients.
- "Brokers Heatmap": A color-coded heatmap view of the current status of each of your brokers.
- "Brokers Table": A tabular view of all available broker performance data.
- "Broker Summary": Current and historical metrics for a single broker.
- "Broker Sensors": Provides value and status information for all sensors on a single broker or for all sensors for all brokers.
- "Broker Provisioning": Provides broker details such as host, chassis, redundancy, memory, and fabric data for a particular broker.
- "Broker Interface": Provides detailed data and status information for the interfaces associated with one or all broker(s). You can also view current and historical amounts of incoming and outgoing packets and bytes for a selected interface in a trend graph.
- "Brokers Message Spool": Provides status and usage data for message spools associated with one or all broker(s).

Brokers Overview

View a health snapshot of top 10 most utilized VPNs, trend graph traces key performance metrics such as messages sent/received and connected clients.

Select a data server, broker and metric from the drop-down menus. Consider keeping this display open for monitoring at a glance.





CRITICAL	Total number of current critical alerts for brokers on the selected data server.
WARNING	Total number of current critical alerts for brokers on the selected data server.
Brokers / Bridges	Total number of brokers/bridges on the selected data server.
VPNs / Endpoints	Total number of VPNs/endpoints on the selected data server.
Pending Msgs / Conflicting Dest	Total number of pending messages/conflicting destinations on the selected data server.
Sent MBs / Received MBs	Total number of MBs sent/MBs received on the selected data server.
Top 10 Number of VPNs	Ten brokers with the greatest number of connected VPNs.

Broker

Select a broker to trace performance metrics in the trend graph, then choose a metric:

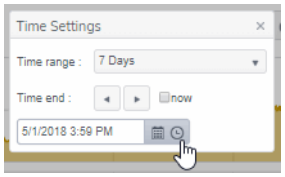
Client Traffic: Traces the number of messages received per second, messages sent per second and the number of connected clients.

Spool Msgs: Traces the number of spooled messages and spool size (in megabytes.)

Time Settings

By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either:

- choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu.
- specify begin/end dates using the calendar .
- specify begin/end time using the clock .



Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows .

Restore settings to current time by selecting **now** .

Log Scale

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.

Brokers Heatmap

Use the **Show** dropdown menu to view the current status of **All** brokers, or just **Expired** or **Unexpired** brokers, in a heatmap. Each rectangle in the heatmap is a single broker where the rectangle size represents the number of connections. The rectangle color maps where the current value is on its color gradient bar. Select a broker from the drop-down menu. For example, by default, **Alert Severity** is shown:

Alert Severity

The current alert severity. Values range from **0** - **2**, as indicated in the color gradient bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

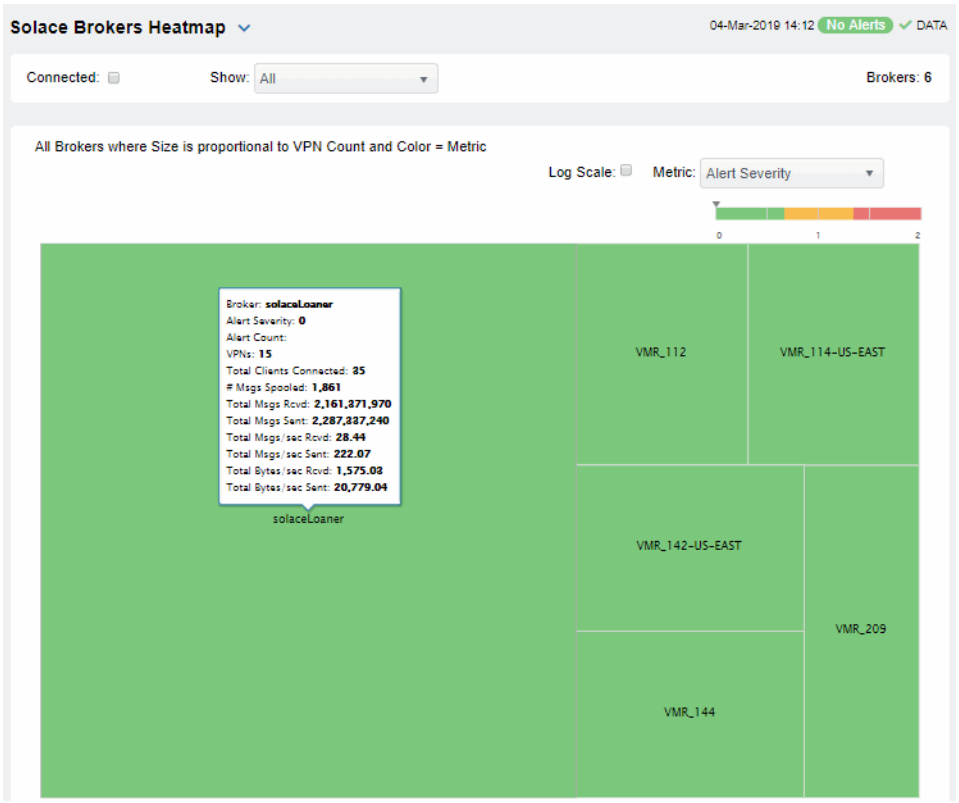
Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

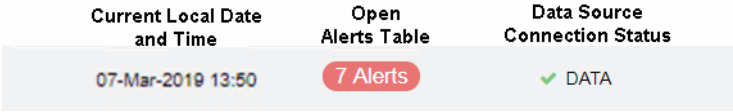
Green indicates that no metrics have exceeded their alert thresholds.

Each metric has its own color gradient bar (scroll down for more "Metric Options").

Mouse over a rectangle to see additional details. Use the check-box ☑ to include / exclude **Connected** brokers and enable **Log Scale** mode. Click a rectangle to drill-down to details about a broker in the "Broker Summary" display.

Consider keeping this display open for monitoring your Solace brokers at a glance.





Metric Options

Choose a metric from the drop-down menu:

Alert Severity

The current alert severity. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count

The total number of critical and warning alerts. The color gradient  bar, populated by the current heatmap, shows 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 average alert count.

 # Msgs Spooled

The total number of spooled messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the defined alert threshold of **SolMsgRouterPendingMsgsHigh**. The middle value in the gradient bar indicates the middle value of the range.

Total Msgs Rcvd The total number of received messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of total messages received in the heatmap. The middle value in the gradient bar indicates the average count.

Total Msgs Sent The total number of sent messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of total messages sent in the heatmap. The middle value in the gradient bar indicates the average count.

Total Msgs/ sec Rcvd The number of messages received per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the defined alert threshold of **SolMsgRouterInboundMsgRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

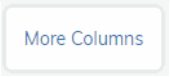
Total Msgs/ sec Sent The total number of messages sent per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the defined alert threshold of **SolMsgRouterOutboundMsgRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

Total Bytes/ sec Rcvd The total number of bytes received per second in the broker. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolMsgRouterInboundByteRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

Total Bytes/ sec Sent The total number of bytes sent per second in the broker. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolMsgRouterOutboundByteRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

Brokers Table

Use the **Show:** dropdown menu to view the current status of **All** brokers, or just **Expired** or **Unexpired** brokers, in a tabular format. Each row in the table is a different broker.

By default, a subset of available metrics is shown. Click 

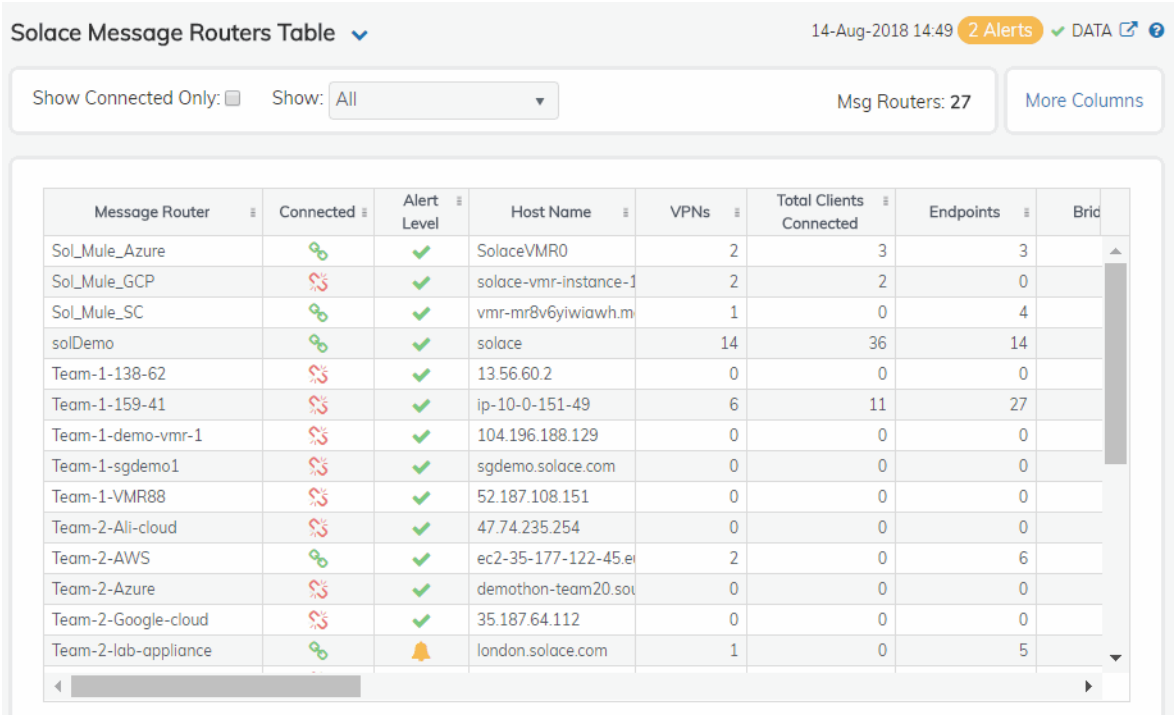
(**More Columns**) to toggle to the complete set of metrics available.

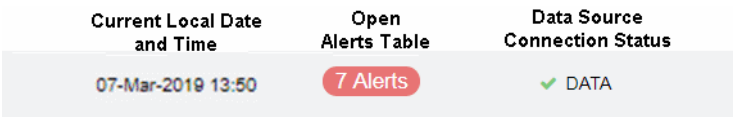
Brokers: 23 (in the upper right portion) is the number of brokers in the display.

Select a broker from the drop-down menu. Sort data in numerical or alphabetical order on column headers. Use the check-boxes ☑ to include / exclude **Connected** and **Expired** brokers.

Data shown in the "Brokers Heatmap" is shown as well as additional metrics.

Double-click a row to drill-down and investigate in the "Broker Summary" display. See "Column Values" for details about metrics shown.





Column Values

Broker	The name of the broker.
Connected	The broker state: Red indicates that the broker is NOT connected. Green indicates that the broker is connected.
Alert Severity	The current alert severity: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	The total number of alerts.

Expired	When checked, performance data about the sensor has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the sensor. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Host Name	The name of the host.
Platform	The name of the platform.
OS Version	The version of the operating system.
Up Time	The amount of time that the broker has been up and running.
VPNs	The total number of VPNs configured on the broker.
Total Clients	The total number of clients associated with the broker.
Total Clients Connected	The total number of clients that are currently connected to the broker.
Clients Using Compression	The number of clients who send/receive compressed messages.
Clients Using SSL	The number of clients using SSL for encrypted communications.

Max Client Connections	The maximum number of available client connections.
Endpoints	The total number of Endpoints configured on the broker.
Bridges	The total number of bridges configured on the broker.
Local Bridges	The total number of local bridges configured on the broker.
Remote Bridges	The total number of remote bridges configured on the broker.
Remote Bridge Subscriptions	The total number of remote bridge subscriptions configured on the broker.
Routing Enabled	This check box is checked when the broker is configured to route messages to other brokers.
Routing Interface	The name of the interface configured to support message routing.
Total # Conflicting Destinations	The total number conflicting destinations.
Pending Messages	The number of pending messages on the broker.
Total Client Msgs Rcvd	The total number of client messages received on the broker.
Total Client Msgs Sent	The total number of client messages sent by the broker.
Total Client Msgs Rcvd / sec	The total number of client messages received per second by the broker.
Total Client Msgs Sent / sec	The total number of client messages sent by the broker.
Total Client Bytes Rcvd	The total number of client bytes received by the broker.
Total Client Bytes Sent	The total number of client bytes sent by the broker.
Total Client Bytes Rcvd / sec	The total number of client bytes received per second by the broker.
Total Client Bytes Sent / sec	The total number of client bytes sent per second by the broker.
Total Client Direct Msgs Rcvd	The total number of direct client messages received by the broker.
Total Client Direct Msgs Sent	The total number of direct client messages sent from the broker.
Total Client Direct Msgs Rcvd / sec	The total number of direct client messages received per second by the broker.
Total Client Direct Msgs Sent / sec	The total number of direct client messages sent per second by the broker.
Total Client Direct Bytes Rcvd	The total number of direct client bytes received by the broker.
Total Client Direct Bytes Sent	The total number of direct client bytes sent by the broker.
Total Client Direct Bytes Rcvd / sec	The total number of direct client bytes received per second by the broker.

Total Client Direct Bytes Sent/sec	The total number of direct client bytes sent per second by the broker.
Total Client Non-Persistent Msgs Rcvd	The total number of non-persistent client messages received by the broker.
Total Client Non-Persistent Msgs Sent	The total number of non-persistent client messages sent by the broker.
Total Client Non-Persistent Msgs Rcvd/sec	The total number of non-persistent client messages received per second by the broker.
Total Client Non-Persistent Msgs Sent/ sec	The total number of non-persistent client messages sent per second by the broker.
Total Client Non-Persistent Bytes Rcvd	The total number of non-persistent client bytes received by the broker.
Total Client Non-Persistent Bytes Sent	The total number of non-persistent client bytes sent by the broker.
Total Client Non-Persistent Bytes Rcvd/sec	The total number of non-persistent client bytes received per second by the broker.
Total Client Non-Persistent Bytes Sent/sec	The total number of non-persistent client bytes sent per second by the broker.
Total Client Persistent Msgs Rcvd	The total number of persistent client messages received by the broker.
Total Client Persistent Msgs Sent	The total number of persistent client messages sent by the broker.
Total Client Persistent Msgs Rcvd/sec	The total number of persistent client messages received per second by the broker.
Total Client Persistent Msgs Sent/ sec	The total number of persistent client messages sent per second by the broker.
Total Client Persistent Bytes Rcvd	The total number of persistent client bytes received by the broker.
Total Client Persistent Bytes Sent	The total number of persistent client bytes sent by the broker.
Total Client Persistent Bytes Rcvd/sec	The total number of persistent client bytes received per second by the broker.
Total Client Persistent Bytes Sent/ sec	The total number of persistent client bytes sent per second by the broker.
Avg Egress Bytes/min	The average number of outgoing bytes per minute.
Avg Egress Compressed Msgs/min	The average number of outgoing compressed messages per minute.
Avg Egress Msgs/min	The average number of outgoing messages per minute.
Avg Egress SSL Msgs/min	The average number of outgoing messages per minute being sent via SSL-encrypted connections.
Avg Egress Uncompressed Msgs/min	The average number of uncompressed outgoing messages per minute.
Avg Ingress Bytes/min	The average number of incoming bytes per minute.
Avg Ingress Compressed Msgs/min	The average number of compressed incoming message per minute.
Avg Ingress Msgs/min	The average number of incoming messages per minute.

Average Ingress SSL Msgs/min	The average number of incoming messages per minute being received via SSL-encrypted connections.
Avg Ingress Uncompressed Msgs/min	The average number of uncompressed messages per minute.
Current Egress Bytes/sec	The current number of outgoing bytes per second.
Current Egress Compressed Msgs/sec	The current number of outgoing compressed messages per second.
Current Egress Msgs/sec	The current number of outgoing messages per second.
Current Egress SSL Msgs/sec	The current number of outgoing messages per second sent via SSL-encrypted connections.
Current Egress Uncompressed Msgs/sec	The current number of outgoing uncompressed messages per second.
Current Ingress Bytes/sec	The current number of incoming bytes per second.
Current Ingress Compressed Msgs/sec	The current number of incoming compressed messages per second.
Current Ingress Msgs/sec	The current number of incoming messages per second.
Current Ingress SSL Msgs/sec	The current number of incoming messages per second received via SSL-encrypted connections.
Current Ingress Uncompressed Msgs/sec	The current number of incoming uncompressed messages per second.
Ingress Comp Ratio	The percentage of incoming messages that are compressed.
Egress Comp Ratio	The percentage of outgoing messages that are compressed.
Egress Compressed Bytes	The number of outgoing compressed bytes.
Egress SSL Bytes	The number of outgoing compressed bytes being sent via SSL-encrypted connections.
Egress Uncompressed Bytes	The number of outgoing uncompressed bytes.
Ingress Compressed Bytes	The number of incoming compressed bytes.
Ingress SSL Bytes	The number of incoming bytes via SSL-encrypted connections.
Ingress Uncompressed Bytes	The number of incoming uncompressed bytes.
Total Egress Discards	The total number of outgoing messages that have been discarded by the broker.
Total Egress Discards/sec	The total number of outgoing messages per second that have been discarded by the broker.
Total Ingress Discards	The total number of incoming messages that have been discarded by the broker.
Total Ingress Discards/sec	The total number of incoming messages per second that have been discarded by the broker.
Client Authorization Failures	The number of failed authorization attempts

Client Connect Failures (ACL)	The number of client connection failures caused because the client was not included in the defined access list.
Subscribe Topic Failures	The number of failed attempts at subscribing to topics.
TCP Fast Retrans Sent	The total number of messages that were retransmitted as a result of TCP Fast Retransmission (one or more messages in a sequence of messages that were not received by their intended party that were sent again).
Memory (KB)	The total available memory (in kilobytes) on the broker.
Memory Free (KB)	The total amount of available memory (in kilobytes) on the broker.
Memory Used (KB)	The total amount of memory used (in kilobytes) on the broker.
Memory Used %	The percentage of total available memory that is currently being used.
Swap (KB)	The total available swap (in kilobytes) on the broker.
Swap Free (KB)	The total amount of available swap (in kilobytes) on the broker.
Swap Used (KB)	The total amount of swap used (in kilobytes) on the broker.
Swap Used %	The percentage of total available swap that is currently being used.
Subscription Mem Total (KB)	The total amount of available memory (in kilobytes) that can be used by queue/topic subscriptions.
Subscription Mem Free (KB)	The current amount of available memory (in kilobytes) that can be used by queue/topic subscriptions.
Subscription Mem Used (KB)	The current amount of memory (in kilobytes) being used by queue/topic subscriptions.
Subscription Mem Used %	The percentage of available memory being used by queue/topic subscriptions.
Chassis Product Number	The product number of the chassis in which the broker is contained.
Chassis Revision	The revision number of the chassis.
Chassis Serial	The serial number of the chassis.
BIOS Version	The basic input/output system used by the chassis.
CPU-1	The name of the central processing unit (CPU 1) used by the broker.
CPU-2	The name of the central processing unit (CPU 2) used by the broker.
Operational Power Supplies	The number of available power supplies that are operational on the chassis.
Power Redundancy Config	The configuration used by the backup broker.
Max # Bridges	The maximum number of bridges allowed on the broker.

Max # Local Bridges	The maximum number of local bridges allowed on the broker.
Max # Remote Bridges	The maximum number of remote bridges allowed on the broker.
Max # Remote Bridge Subscriptions	The maximum number of remote bridge subscriptions allowed on the broker.
Redundancy Config Status	The status of the redundancy configuration.
Redundancy Status	The status of the redundant broker.
Redundancy Mode	Refer to Solace documentation for more information.
Auto-revert	Refer to Solace documentation for more information.
Mate Router Name	If redundancy is configured, this field lists the redundant broker name (mate broker name).
ADB Link Up	This check box is checked if a broker is set up to use guaranteed messaging and an Assured Delivery Blade (ADB) is set up and working correctly.
ADB Hello Up	Refer to Solace documentation for more information.
Pair Primary Status	The primary status of the broker and its redundant (failover) mate.
Pair Backup Status	Refer to Solace documentation for more information.

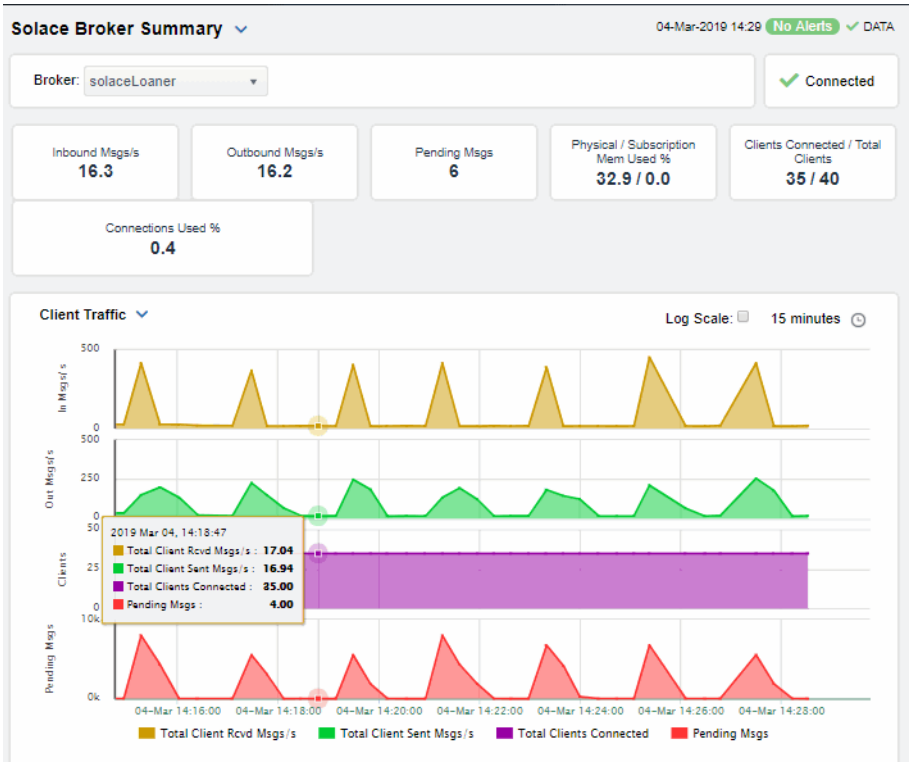
Expired	When checked, performance data about the broker has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the broker. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

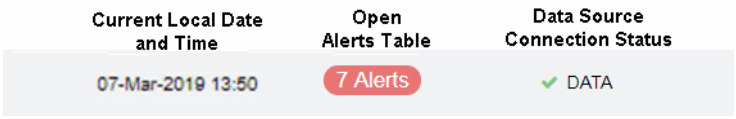
Time Stamp	The date and time the row of data was last updated.

Broker Summary

View trend graphs of current and historical performance metrics of client traffic on a broker. Check general health details for any broker.

Choose a broker from the drop-down menu to view its total number of connected clients, number of incoming messages, **Up Time**, and additional information. You can also view alert statuses and **Spool Status** data for the broker.





The connection status (connected/disconnected).

Inbound Msgs/s The number of messages received per second.

Outbound Msgs/s The number of messages sent per second.

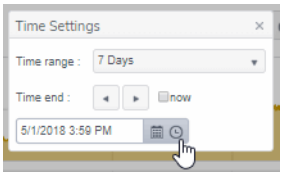
Pending Msgs/s The number of pending messages.

Physical / Subscription Mem Used % The total percentage of physical memory used / the total percentage of subscription memory used.

Clients Connected / Total Clients The current number of clients connected / the total number of clients.

Connections Used % The percentage of connections used.

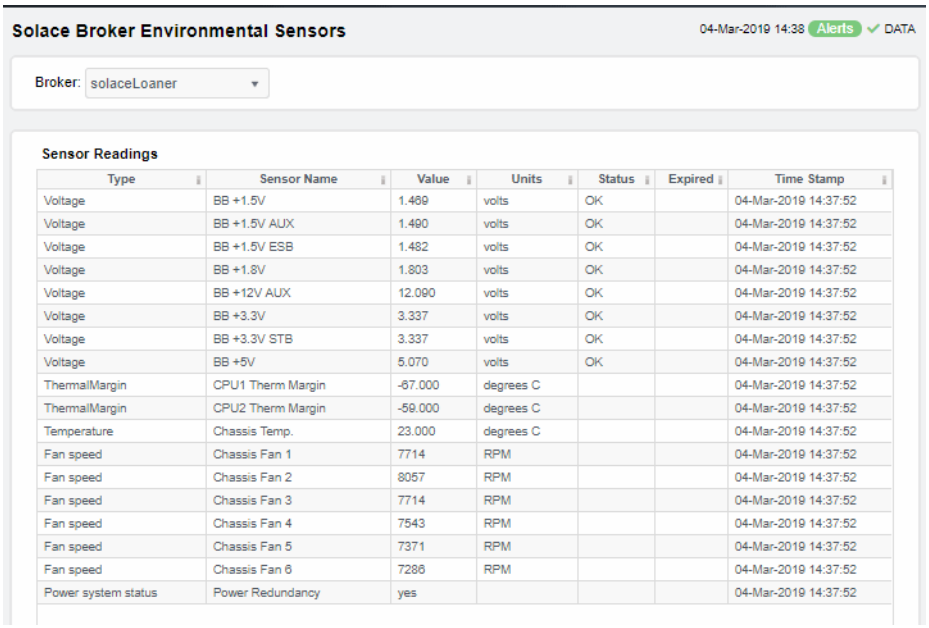
Trend Graphs
Traces the sum for the selected broker.

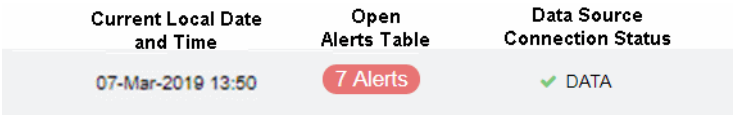
Client Traffic	• **In Msgs/s** - Traces the total number of client messages received per second. • **Out Msgs/s** - Traces the total number of client messages sent per second. • **Clients** - Traces the total number of connected clients. • **Pending Msgs** - Traces the total number of pending messages.
Spool Msgs	• **Pending Msgs**- Traces the total number of pending spool messages. • **Spool Usage MB** - Traces the total amount of space used by spool messages, in megabytes.
Memory	• **Memory Used %**- Traces the percent of memory used. **Subscription Mem Used %** - Traces the percent of memory used by subscriptions.
Log Scale	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.
Time Settings	By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either: • choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu. • specify begin/end dates using the calendar . • specify begin/end time using the clock .  Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows . Restore settings to current time by selecting **now** .

Broker Sensors

This tabular display contains environmental sensor metrics for a selected broker. Use this display to find out the type, name, value, and status of the sensors.

Select a broker from the drop-down menu. Note that display does not show data for VMRs as it only applies to brokers.





Sensor Readings
Each row in the table is a different sensor on the broker.

Type See vendor documentation for details.

Sensor Name The name of the sensor.

Value Lists the value of the sensor.

Units Lists the unit of measure for the sensor.

Status The current status of the sensor.

Expired When checked, performance data about the sensor has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the sensor. To view/edit the current values, modify the following lines in the **.properties** file:

```
# Metrics data are considered expired after this number of seconds
#
collector.sl.rtview.sub=$solRowExpirationTime:45
collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600
```

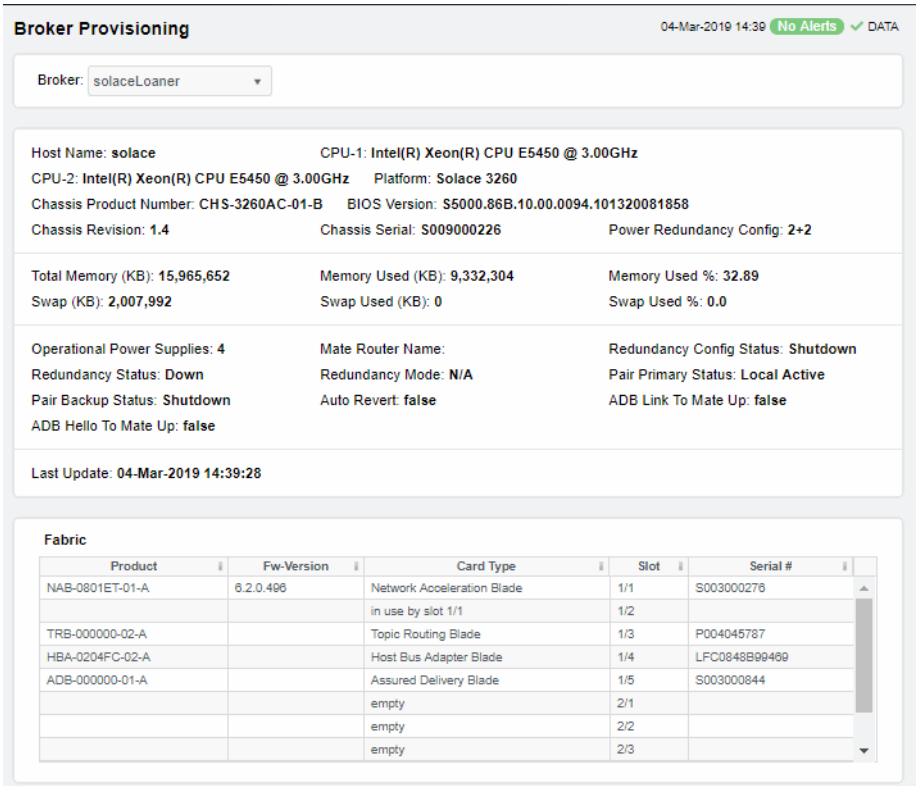
In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

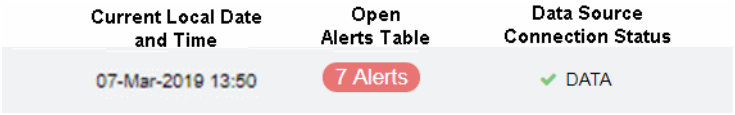
Time Stamp The date and time the row of data was last updated.

Broker Provisioning

This display shows provisioning metrics for a single broker. Use this to see the host, platform, chassis, memory, redundancy and fabric data for a specific broker.

Select a broker from the drop-down menus.





Host Name	The name of the host.
Platform	The platform on which the broker is running.
Chassis Product #	The product number of the chassis in which the broker is contained.
Chassis Revision #	The revision number of the chassis.
Chassis Serial #	The serial number of the chassis.
Power Configuration	The power configuration used by the chassis.
Operational Power Supplies	The number of available power supplies that are operational on the chassis.
CPU 1	The name of the central processing unit (CPU 1) used by the broker.
CPU 2	The name of the central processing unit (CPU 2) used by the broker.
BIOS	The basic input/output system used by the chassis.

Memory (KB)

Physical	Lists the **Total** amount, the **Free** amount, the **Used** amount, and the **Used %** of physical memory.
Swap	Lists the **Total** amount, the **Free** amount, the **Used** amount, and the **Used %** of swap memory.

Redundancy
These fields describe a fault tolerant pair of brokers.

Mate Router Name	If redundancy is configured, this field lists the redundant broker name (mate broker name).
Configuration Status	The status of the configuration for the backup broker.
Redundancy Status	The status of the redundant broker.
Redundancy Mode	Refer to Solace documentation for more information.
Primary Status	The status of the primary broker.
Backup Status	Refer to Solace documentation for more information.
Auto-Revert	Refer to Solace documentation for more information.
ADB Link Up	This check box is checked if a broker is set up to use guaranteed messaging and an Assured Delivery Blade (ADB) is set up and working correctly.
ADB Hello Up	Refer to Solace documentation for more information.

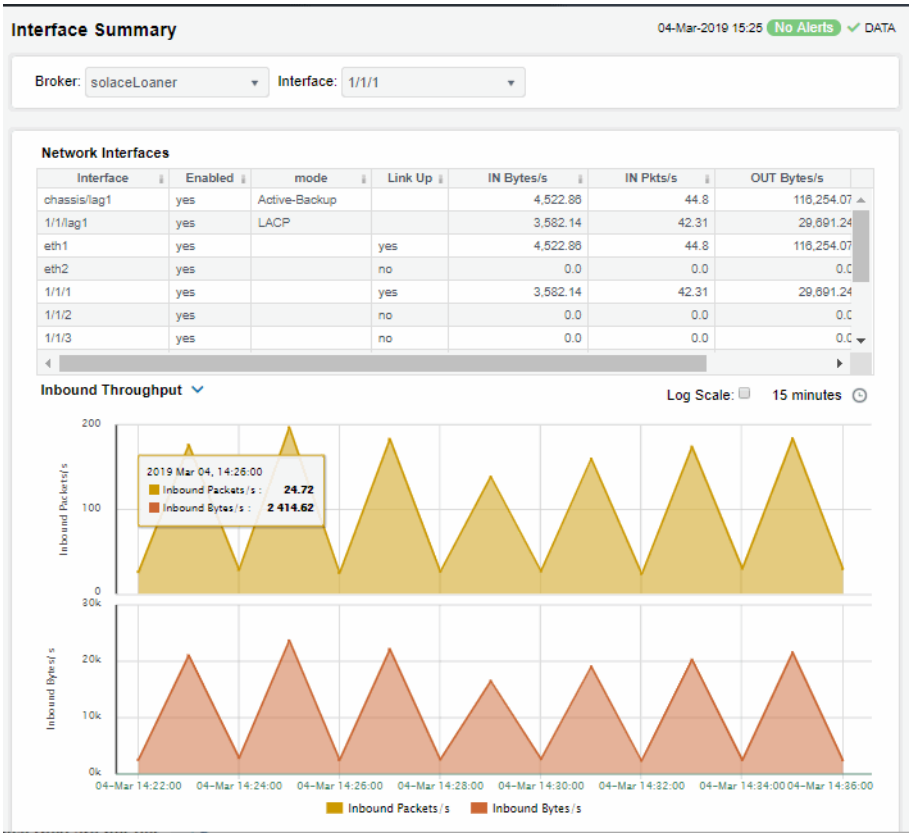
Fabric

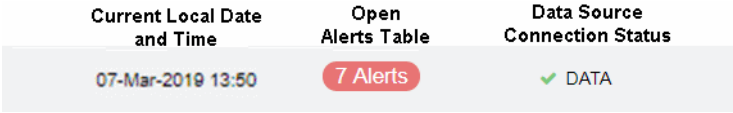
Slot	Displays the slot number on the network switch.
Card Type	The type of card connected to the particular slot.
Product	The product associated with the particular slot.
Serial #	The serial number of the product.
Fw-Version	The firmware version of the product.

Broker Interface

This display lists all network interfaces on a selected broker, and shows network interface status, in/out throughput per second and additional detailed metrics.

Select a broker and interface from the drop-down menus. Each row in the table is a different network interface. Double-click one to trace its current and historical performance data in the trend graph (bytes in/out and packets in/out per second).





Interface The name of the network interface.

Enabled Displays whether or not the network interface is enabled.

mode Describes how the interface is configured to support networking operations.

Link Up Indicates whether the interface is electrically signaling on the transmission medium.

IN Bytes/sec The number of bytes per second contained in incoming messages.

IN Pkts/sec The number of incoming packets per second.

OUT Bytes/ sec The number of bytes per second contained in the outgoing messages.

OUT Pkts/sec The number of outgoing packets per second.

Trend Graphs

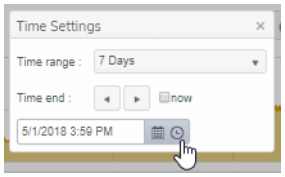
Inbound Pkts/ sec Traces the number of incoming packets per second.

Outbound Bytes/sec Traces the number of bytes per second contained in the incoming messages.

Log Scale 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.

Time Settings By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either:

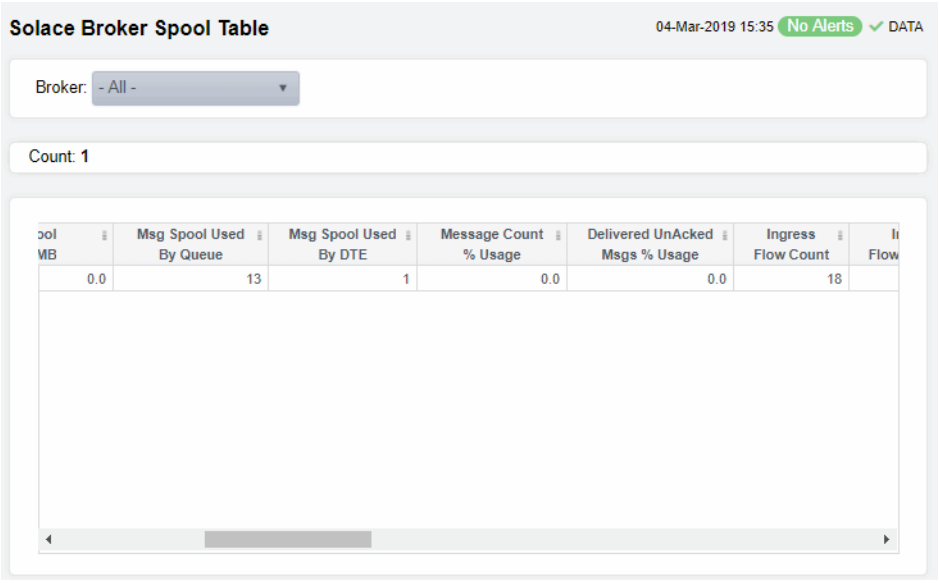
- choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu.
- specify begin/end dates using the calendar .
- specify begin/end time using the clock .

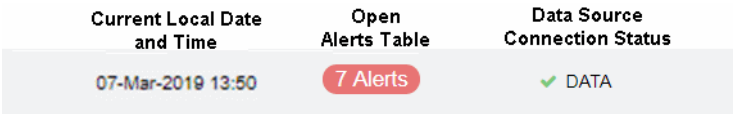


Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows .
Restore settings to current time by selecting **now** .

Brokers Message Spool

Select a broker from the drop-down menu or select **All**. This display shows operational status and spooling performance metrics (if spooling is enabled on the broker) for one or all brokers. Refer to Solace documentation for details about data in this display.





Count	The number of brokers that are using spooling in the table.
Connection	The name of the broker.
Config Status	The status of the connection's configuration.
Operational Status	The operational status of the spool on the broker.
Current Spool Usage (MB)	The current amount of spool used in megabytes on the broker (calculated by summing spool used for each endpoint).
Msg Spool Used By Queue	The amount of spool used by the queue.
Msg Spool Used By DTE	The amount of spool used by DTE.
Message Count % Utilization	The percentage of total messages that use the message spool.
Delivered UnAcked Msgs % Utilization	The percentage of messages delivered via the spool that have not been acknowledged.
Ingress Flow Count	The current incoming flow count.
Ingress Flows Allowed	The total number of incoming flows allowed.
Queue/Topic Subscriptions Used	The number of queue/topic subscriptions used.
Max Queue/Topic Subscriptions	The maximum number of queue/topic subscriptions available.
Sequenced Topics Used	The number of sequenced topics used.
Max Sequenced Topics	The maximum number of sequenced topics available.
Spool Files Used	The number of spool files used.
Spool Files Available	The maximum number of spool files available.
Spool Files % Utilization	The percentage of available spool files that have been used.
Active Disk Partition % Usage	The percentage of available active disk partition that has been used.
Standby Disk Partition % Usage	The percentage of available standby disk partition that has been used.
Disk Usage Current (MB)	The current amount of spool disk usage in megabytes.
Disk Usage Max (MB)	The maximum amount of available spool disk usage in megabytes.
Transacted Sessions Used	The current number of transacted sessions.
Transacted Sessions Max	The maximum number of transacted sessions allowed.
Transacted Session Count % Utilization	The percentage of allowable transacted sessions that have been used.

Transacted Session Resource % Utilization	The percentage of allowable transacted session resources that have been used.

Expired	When checked, performance data about the broker has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the broker. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

CSPF Neighbors

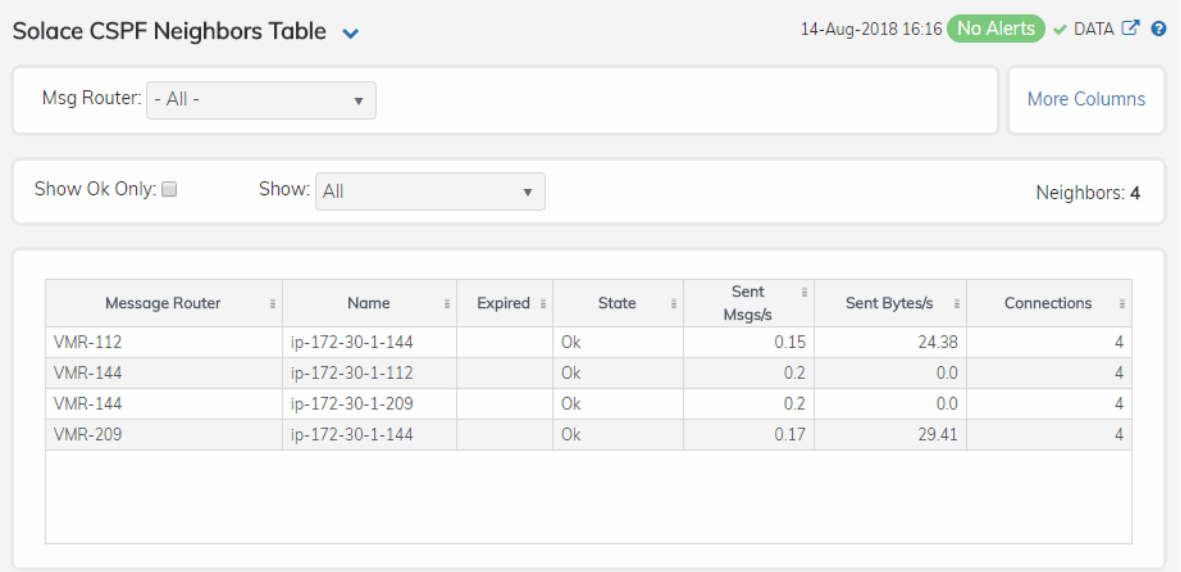
These displays provide detailed data and statuses for CSPF neighbor brokers. Check trends on network traffic among CSPF neighbors. Displays in this View are:

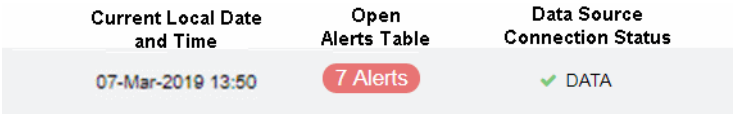
- "Neighbors Table": View metrics for Solace neighbor brokers that use the Content Shortest Path First (CSPF) routing protocol to determine the shortest path in which to send messages from one broker to another broker in the Solace network.
- "Neighbors Diagram": Topological view of CSPF Neighbors that shows broker connections and status of servers (Active/Inactive).
- "Neighbors Summary": View detailed performance metrics for a single Solace neighbor broker that uses the CSPF routing protocol.

Neighbors Table

This tabular display shows Content Shortest Path First (CSPF) "neighbor" metrics for a broker. Select a broker from the drop-down menu. View metrics for a Solace neighbor broker that uses the CSPF routing protocol to determine the least cost path in which to send messages from one broker to another broker in the Solace network.

By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).





Neighbor Count: The number of neighbor brokers connected to the selected **Broker**.

Show:

- **OK** — Select to *only* show neighbor brokers that are connected (**State** is **OK**). By default, this option is not selected (all neighbor brokers are shown.
- **Expired** — Select to show *both* expired and non-expired neighbor brokers. By default, this option is not selected (only non-expired neighbor brokers are shown).

Table:
Each table row is a different neighbor broker.

- **Broker** — The name of the neighbor broker.
- **State** — The current state of the broker.
- **Up Time** — The amount of time the broker has been up and running.
- **Connections** — The number of connections.
- **Link Cost Actual** — Refer to Solace documentation for more information.
- **Link Cost Configured** — Refer to Solace documentation for more information.
- **Data Port** — Refer to Solace documentation for more information.

Expired	When checked, performance data about the broker has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the broker. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Timestamp	The date and time the row of data was last updated.

Neighbors Diagram

Use this topology display to monitor the health of network components: Solace brokers, VMRs and servers. Quickly identify broker neighbors, servers that are inactive and which resources their performance impacts. Drag and drop objects to arrange them on the screen (doing so does not logically impact the Solace brokers, VMRs and servers).

Each object is a Solace broker, VMR or server. Each are labeled with their name and color coded as follows:

- Red indicates that the object has one or more alerts in a critical state.
- Yellow indicates that the object has one or more alerts in a warning state.
- Green indicates that there are no alerts on the object.
- Gray indicates that the object is off-line.

Mouse-over objects to see their host IP address.

Right-click on VMR objects and select **Open VMR UI** to open the Solace VMR login web page.

Save: Saves the arrangement of the objects.

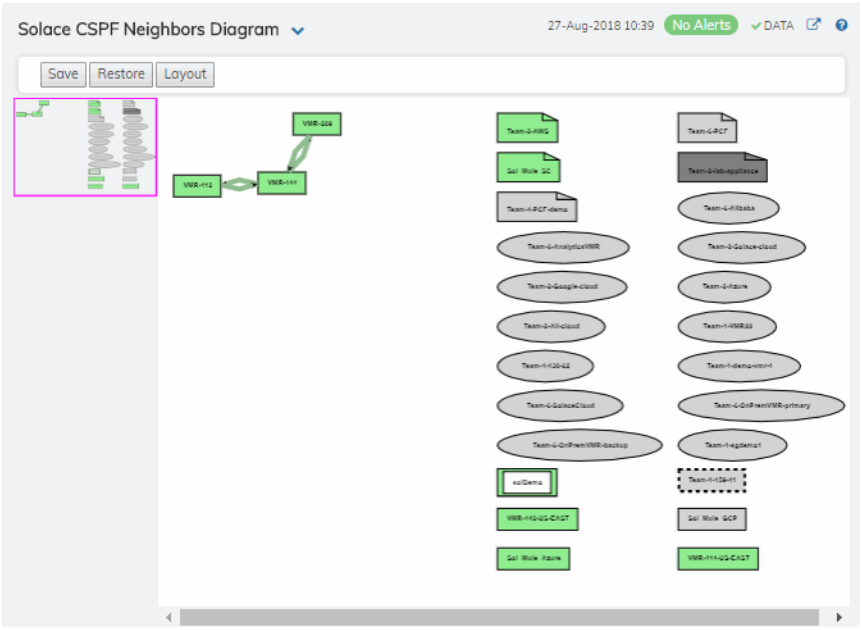
Restore: Returns objects to their previous positions.

Layout: Toggles between two types of layouts. One layout positions objects to the right so you might scroll in that direction to see them. The other layout pulls the objects close together to the left, vertically and in hierarchical order.

Look at the miniature view in (upper left) to see all objects in either layout. Zoom in on an area in the topology by clicking it in the miniature view.

Drill-down to investigate in the “Neighbors Table”.

To monitor network bridges and VPNs, see the “Bridges - Diagram”.



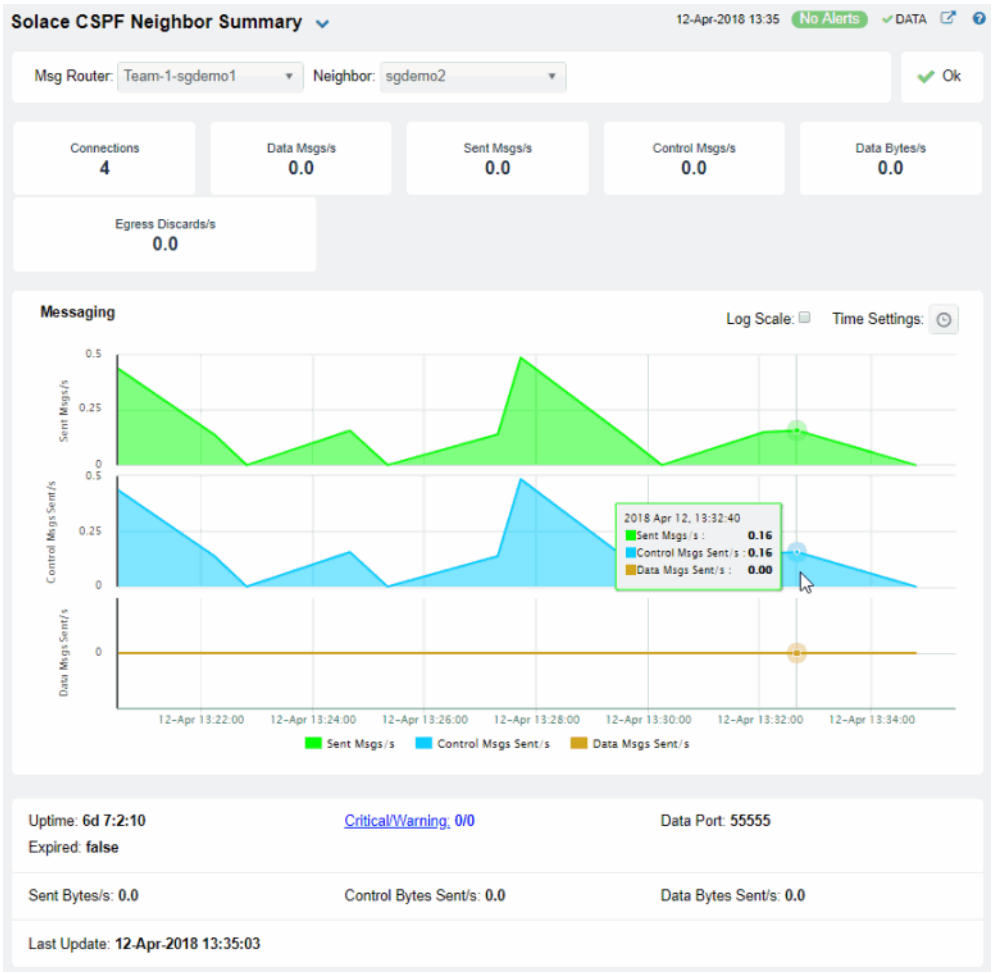
Current Local Date and Time	Open Alerts Table	Data Source Connection Status
07-Mar-2019 13:50	7 Alerts	DATA

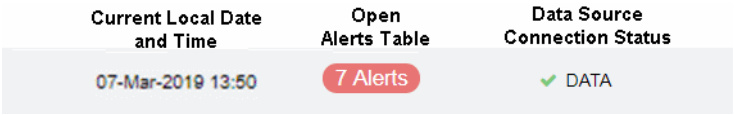
Neighbors Summary

View neighbor broker current configuration details and message throughput rates.

Select a broker and a neighbor broker from the drop down menus. Check message throughput rates to the neighbor broker, as well as neighbor **Up Time**, **State**, **Data Port**, number of connections and link costs.

The trend graph traces the current and historical message throughput (**Data**, **Control**, **Discards** and **Total**).





Neighbor: Select the neighbor broker for which you want to show data in the display.

Connections The current number of connections.

Data Msgs/s Refer to Solace documentation for more information.

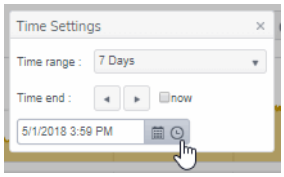
Sent Msgs/s Refer to Solace documentation for more information.

Control Msgs/ s Refer to Solace documentation for more information.

Data Bytes/s Refer to Solace documentation for more information.

Egress Discards/s The total number of discarded messages sent from the selected **Broker** to the selected **Neighbor** broker since the broker was last started.

Trend Graphs
Traces the rates of messages sent from the selected **Broker** to the selected **Neighbor** broker.

Sent Msgs/s	Refer to Solace documentation for more information.
Control Msgs/s	Refer to Solace documentation for more information.
Discards/s	Traces the number of discarded messages sent, per second, from the selected **Broker** to the selected **Neighbor** broker.
Log Scale	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.
Time Settings	By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either: • choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu. • specify begin/end dates using the calendar . • specify begin/end time using the clock .  Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows . Restore settings to current time by selecting **now** .

VPNs

You can view data for all VPNs configured on a specific broker in heatmap, table, or grid formats, or you can view data for a single VPN. Displays in this View are:

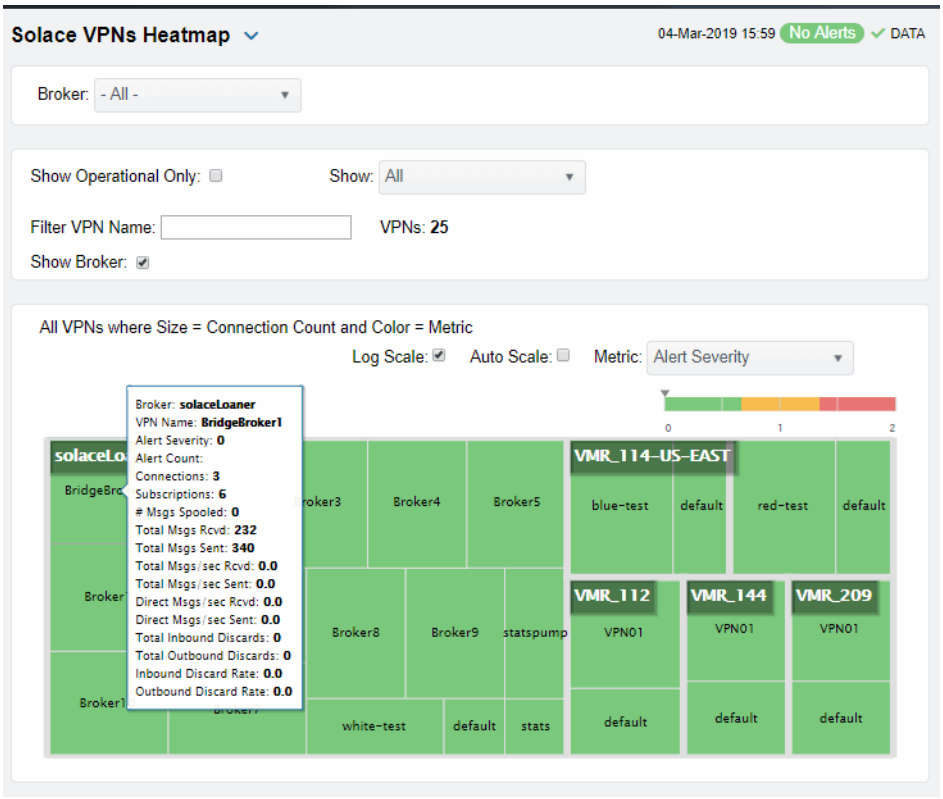
- "VPNs Heatmap" on page 89: A color-coded heatmap view of the current status of all VPNs configured on a specific broker.
- "VPNs Table" on page 93: A tabular view of all available data for all VPNs configured on a specific broker.
- "VPNs Summary" on page 98: Current and historical metrics for a single VPN.

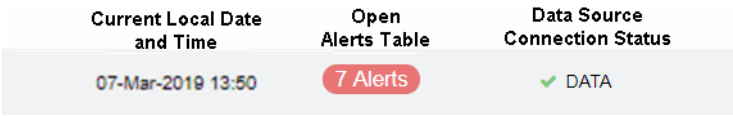
VPNs Heatmap

View the status of all VPNs configured on a specific broker in a heatmap format, which allows you to quickly identify VPNs with critical alerts. Each rectangle in the heatmap represents a VPN. The rectangle color indicates the alert state and rectangle size represents the number of connections.

Select a broker from the **Broker** drop-down menu, or enter a search string in the **Filter VPN Name** field, and select a metric from the **Metric** drop-down menu. Use the **Show Operational Only** check-box ☑ to include or exclude non-operational VPNs in the heatmap. Use the **Log Scale** and **Auto Scale** check-boxes ☑ to apply log or auto scale. Use the **Show Broker** check-box ☑ to include or exclude broker names in the heatmap.

By default, this display shows **Alert Severity**, but you can mouse over a rectangle to see additional metrics. Drill-down and investigate by clicking a rectangle in the heatmap to view details for the selected application in the "VPNs Summary" display.





Operational When checked, only shows operational brokers.

Filter VPN Name Enter a string to show only VPNs with this string in their name.

Metric Choose a metric to view in the display.

Alert Severity

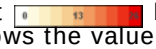
Visually displays the level at which the VPN has or has not exceeded its alarm level threshold. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

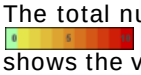
Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count

The total number of critical and warning alerts. The color gradient  bar, populated by the current heatmap, shows 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 average alert count.

Connections

The total number of connections. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnConnectionCountHigh**. The middle value in the gradient bar indicates the middle value of the range.

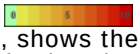
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Subscriptions

The total number of subscriptions. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnSubscriptionCountHigh**. The middle value in the gradient bar indicates the middle value of the range.

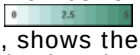
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

 # Msgs Spooled

The total number of spooled messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolMsgRouterPendingMsgsHigh**. The middle value in the gradient bar indicates the middle value of the range.

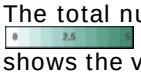
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Total Msgs Rcvd

The total number of received messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of messages received in the heatmap. The middle value in the gradient bar indicates the average count.

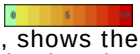
The **Auto** flag does not impact this metric.

Total Msgs Sent

The total number of sent messages. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of messages sent in the heatmap. The middle value in the gradient bar indicates the average count.

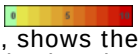
The **Auto** flag does not impact this metric.

Total Msgs/ sec Rcvd

The number of messages received per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnInboundMsgRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Total Msgs/ sec Sent

The number of messages sent per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnOutboundMsgRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Total Bytes/ sec Rcvd

The number of bytes contained in messages received per second. The color gradient  bar, populated by the current heatmap, shows the value/ color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnInboundByteRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

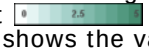
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Total Bytes/ sec Sent

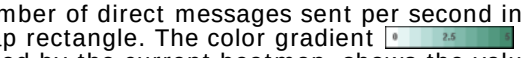
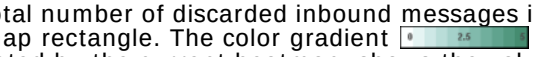
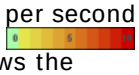
The number of bytes contained in direct messages sent per second. The color gradient  bar, populated by the current heatmap, shows the value/ color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolMsgRouterOutboundByteRateHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Direct Msgs/sec Rcvd

The number of direct messages received per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the average number of direct messages received per second in the heatmap. The middle value in the gradient bar indicates the average count.

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

Direct Msgs/sec Sent	The number of direct messages sent per second in the heatmap rectangle. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the average number of direct messages sent per second in the heatmap. The middle value in the gradient bar indicates the average count. The **Auto** flag does not impact this metric.
Total Inbound Discards	The total number of discarded inbound messages in the heatmap rectangle. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of discarded inbound messages in the heatmap. The middle value in the gradient bar indicates the average count. The **Auto** flag does not impact this metric.
Total Outbound Discards	The total number of discarded outbound messages in the heatmap rectangle. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of discarded outbound messages in the heatmap. The middle value in the gradient bar indicates the average count. The **Auto** flag does not impact this metric.
Inbound Discard Rate	The number of discarded inbound messages per second in the heatmap rectangle. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnInboundDiscardRateHigh**. The middle value in the gradient bar indicates the middle value of the range. 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.
Outbound Discard Rate	The number of discarded outbound messages per second in the heatmap rectangle. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **SolVpnOutboundDiscardRateHigh**. The middle value in the gradient bar indicates the middle value of the range. 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.

VPNs Table

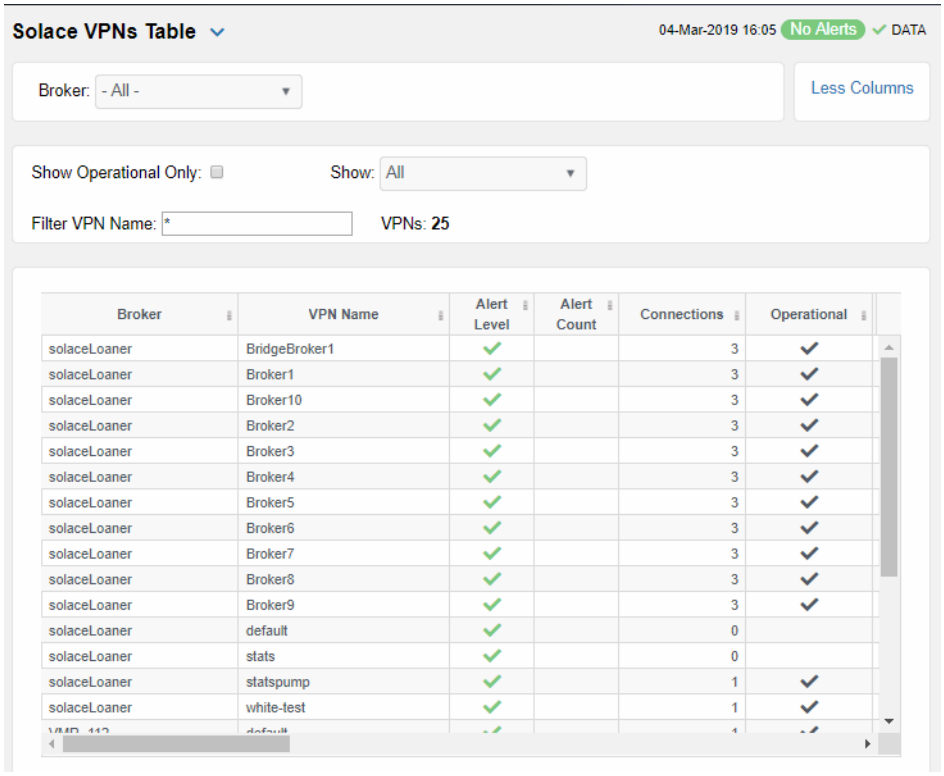
View data shown in the "VPNs Heatmap" display, as well as additional details, in a tabular format. Use this display to view all available data for each VPN associated with a specific broker.

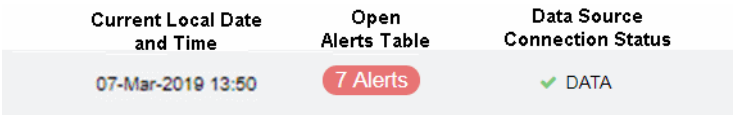
By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).

Select a broker from the **Broker** drop-down menu. Each table row is a different VPN associated with the broker. Click a column header to sort column data in numerical or alphabetical order.

Sort data in numerical or alphabetical order on column headers. Use the check-box ☑ to include / exclude non-operational VPNs. Use the **Show** drop-down to see **All** VPNs, **Expired Only** or **Unexpired Only**. Enter a string to show only VPNs with this string in their name.

Double-click a row to drill-down and investigate in the "VPNs Summary" display.





Broker — The name of the broker.

VPN Name — The name of the VPN.

Alert Level — The maximum level of alerts in the row:
- Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.
- Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.
- Green indicates that no metrics have exceeded their alert thresholds.

Alert Count — The total number of active alerts for the VPN.

Connections — The total number of connections for the VPN.

Operational	When checked, this status indicates that the VPN is enabled and is operating normally.
Total Unique Subscriptions	The total number of unique subscriptions to the VPN.
Total Client Messages Rcvd	The total number of messages received from clients connected to the VPN.
Total Client Messages Sent	The total number of messages sent to clients connected to the VPN.
Total Client Bytes Rcvd	The total number of bytes contained in messages received from clients connected to the VPN.
Total Client Bytes Sent	The total number of bytes contained in messages sent to clients connected to the VPN.
Total Client Msgs/sec Rcvd	The total number of messages received per second from clients connected to the VPN.
Total Client Msgs /sec Sent	The total number of messages sent per second to clients connected to the VPN.
Total Client Bytes/sec Rcvd	The total number of bytes contained in messages received per second from clients connected to the VPN.
Total Client Bytes/sec Sent	The total number of bytes contained in messages sent per second to clients connected to the VPN.
Client Direct Msgs Rcvd	The total number of direct messages received from clients connected to the VPN.
Client Direct Msgs Sent	The total number of direct messages sent to clients connected to the VPN.
Client Direct Bytes Rcvd	The total number of bytes contained in direct messages received from clients connected to the VPN.
Client Direct Bytes Sent	The total number of bytes contained in direct messages sent to clients connected to the VPN.
Client Direct Msgs/sec Rcvd	The total number of direct messages received per second from clients connected to the VPN.
Client Direct Msgs/sec Sent	The total number of direct messages sent per second to clients connected to the VPN.
Client Direct Bytes/sec Rcvd	The total number of bytes contained in the direct messages received per second from clients connected to the VPN.
Client Direct Bytes/sec Sent	The total number of bytes contained in the direct messages sent per second to clients connected to the VPN.
Client NonPersistent Msgs Rcvd	The total number of non-persistent messages received from clients connected to the VPN.
Client NonPersistent Msgs Sent	The total number of non-persistent messages sent to clients connected to the VPN.
Client NonPersistent Bytes Rcvd	The total number of bytes contained in the non-persistent messages received from clients connected to the VPN.
Client NonPersistent Bytes Sent	The total number of bytes contained in the non-persistent messages sent per second to clients connected to the VPN.
Client NonPersistant Msgs/sec Rcvd	The total number of non-persistent messages received per second from clients connected to the VPN.
Client NonPersistent Msgs/sec Sent	The total number of non-persistent messages sent per second to clients connected to the VPN.

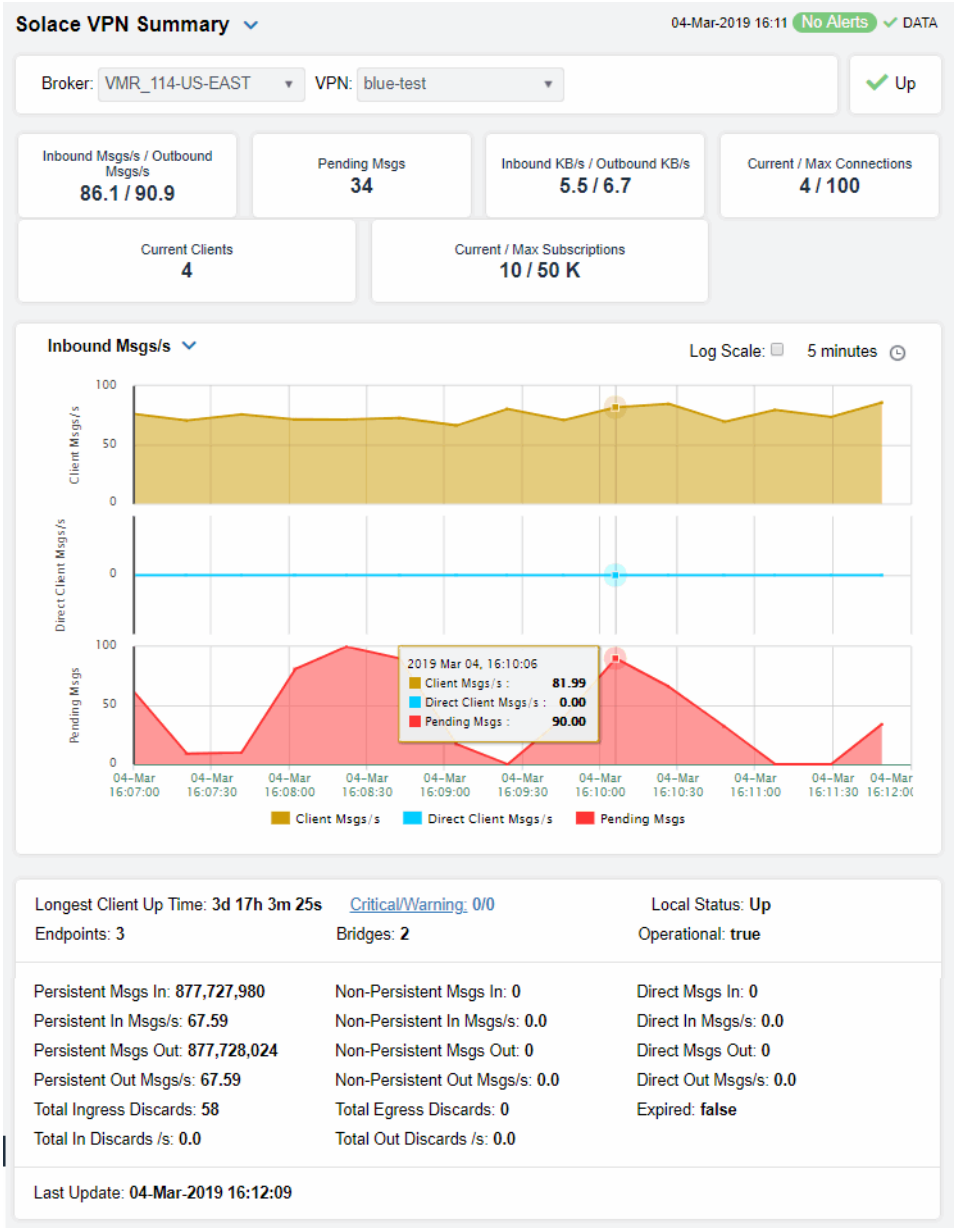
Client NonPersistant Bytes/sec Rcvd	The total number of bytes contained in the non-persistent messages received per second from clients connected to the VPN.
Client NonPersistent Bytes/sec Sent	The total number of bytes contained in the non-persistent messages sent per second to clients connected to the VPN.
Client Persistent Msgs Rcvd	The total number of persistent messages received from clients connected to the VPN.
Client Persistent Msgs Sent	The total number of persistent messages sent to clients connected to the VPN.
Client Persistent Bytes Rcvd	The total number of bytes contained in persistent messages received from clients connected to the VPN.
Client Persistent Bytes Sent	The total number of bytes contained in persistent messages sent to clients connected to the VPN.
Client Persistent Msgs/sec Rcvd	The total number of persistent messages received per second from clients connected to the VPN.
Client Persistent Msgs/sec Sent	The total number of persistent messages sent per second to clients connected to the VPN.
Client Persistent Bytes/sec Rcvd	The total number of bytes contained in the persistent messages received per second from clients connected to the VPN.
Client Persistent Bytes/sec Sent	The total number of bytes contained in the persistent messages sent per second to clients connected to the VPN.
Total In Discards	The total number of discarded incoming messages.
Total In Discards/sec	The number of discarded incoming messages per second.
Total Out Discards	The total number of discarded outgoing messages.
Total Out Discards/sec	The number of discarded outgoing messages per second.
Max Spool Usage (MB)	The maximum amount of disk storage (in megabytes) that can be consumed by all spooled message on the VPN.
Authentication Type	The defined authentication type on the VPN.

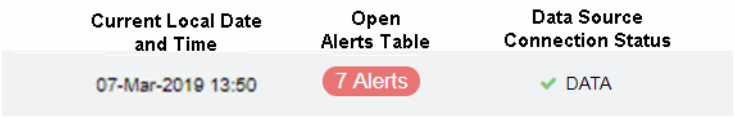
Expired	When checked, performance data about the VPN has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the VPN. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Time Stamp	The date and time the row data was last updated.

VPNs Summary

Select a broker and a VPN to view details about alerts, connections/destinations, incoming messages and outgoing/pending messages for a single VPN.

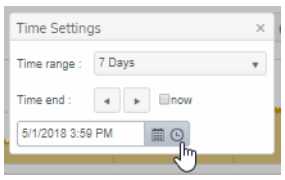




Alerts	Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Up	
Inbound/Outbound Msgs/s	The number of inbound/outbound messages per second.
Pending Msgs	The number of pending messages.
Inbound/Outbound KB/s	The number of inbound/outbound messages in KBs per second.
Current/Max Connections	The total number of current connections / maximum number of supported connections for the VPN.
Current Clients	The number of connected clients.
Current/Max Subscriptions	The total number of current subscribers and maximum number of supported subscribers for the VPN.

Inbound Msgs/s Trend Graphs
Traces the sum of inbound message processing for the selected VPN.

- **Pending Msgs**: The number of pending messages for the VPN.
- **Client Msgs/sec**: The rate of incoming messages (per second) from client.
- **Direct Client Msgs/sec**: The rate of direct incoming messages (per second) from the direct client.

Log Scale	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.
Time Settings	By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either: • choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu. • specify begin/end dates using the calendar . • specify begin/end time using the clock .  Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows . Restore settings to current time by selecting **now** .
Longest Client Up Time	The number of days, hours and minutes for the longest, currently active, client connection.
Endpoints	The number of endpoints.

Persistent Msgs In	The total number of incoming persistent messages.
Persistent In Msgs/s	The number of incoming persistent messages per second.
Persistent Msgs Out	The total number of outgoing persistent messages.
Persistent Out Msgs/s	The number of outgoing persistent messages per second.
Total In Discards	The total number of incoming messages that were discarded.
Total In Discards/sec	The total number of incoming messages that were discarded, per second.
Critical/Warning	The number of critical alerts / warning alerts which also opens the **Alerts Table**.
Bridges	The number of bridges.
Non-Persistent Msgs In	The total number of incoming non-persistent messages.
Non-Persistent In Msgs/s	The number of incoming non-persistent messages per second.
Non-Persistent Msgs Out	The total number of outgoing non-persistent messages.
Non-Persistent Out Msgs/s	The number of outgoing non-existent messages per second.
Total Out Discards	The total number of outgoing messages that were discarded.
Total Out Discards/sec	The total number of outgoing messages that were discarded, per second.
Direct Msgs In	The total number of incoming direct messages.
Direct In Msgs/s	The number of incoming direct messages per second.
Direct Msgs Out	The total number of outgoing direct messages.
Direct Out Msgs/s	The number of outgoing direct messages per second.

Expired	When **true**, performance data about the VPN has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the VPN. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Last Update	The date and time of the last data update.

Clients

These displays allow you to view the current and historical metrics for clients configured on a VPN. Displays in this View are:

- "Clients Table": A tabular view of data for all clients configured on a VPN.
- "Client Summary": Current and historical metrics for a single client configured on a VPN.

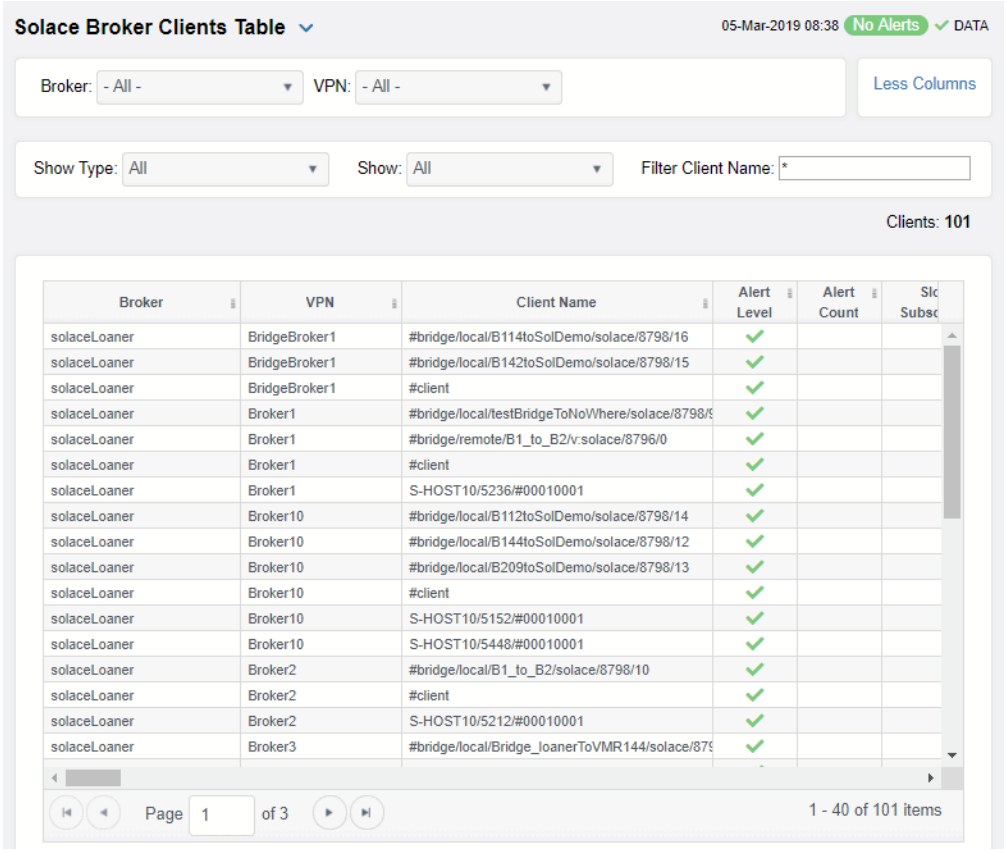
Clients Table

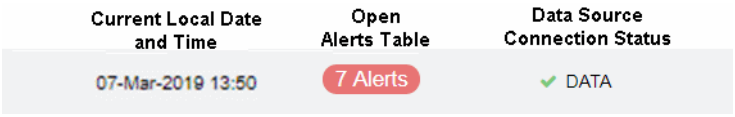
View VPN clients configured on all brokers, a single broker, all VPNs or a single VPN. Each table row is a different VPN client connection. Use the drop-down menus to show **All**, **Expired** or **Unexpired** clients as well as **All**, **Internal** or **Primary** clients (processes that run on the broker under the Solace OS). Enter a string for **Filter Client Name** to show only clients with this string in their name.

By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).

This display is populated by two caches, SolClientsStats and SolClients. SolClientsStats provides most of the data. SolClients provides the static data. If the SolClients cache encounters an issue the static fields in this display are blank.

Double-click a row to drill-down and investigate in the "Client Summary" display.





Broker	Lists the name of the selected broker.
VPN	Lists the name of the selected VPN.
Client Name	The name of the client.
Alert Level	The maximum level of alerts in the row: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	Total number of alerts for the client.
Slow Subscriber	This check box will be checked if the client consistently fails to consume their messages at the offered rate (which causes their egress queues to fill up).
Total Egress Flows	The total number of outgoing flows.
Total Ingress Flows	The total number of incoming flows.
Subscriptions	The total number of subscriptions.
Subscription Msgs Rcvd	The total number of messages received from subscriptions.
Subscription Msgs Sent	The total number of messages sent from subscriptions.
Type	Lists the type of alert.
Uptime	Lists the amount of time the client has been up and running.
Client ID	Lists the client ID.
Client UserName	Lists the user name for the client.
Client Address	The IP Address of the client.
Profile	The client profile that is assigned to the client.
ACL Profile	The access control list profile to which the client is assigned.
Description	Lists a description of the client.
Platform	Lists the platform of the client.
Software Version	The version of the platform.
Total Flows Out	The total number of outbound message flows for the client.
Total Flows In	The total number of inbound message flows for the client.

# Subscriptions	The number of subscribers connected to the client.
Add Sub Msgs Rcvd	The number of Add Subscription messages received.
Add Sub Msgs Sent	The number of Add Subscription Messages sent.
Already Exists Msgs Sent	Refer to Solace documentation for more information.
Assured Ctrl Msgs Rcvd	Refer to Solace documentation for more information.
Assured Ctrl Msgs Sent	Refer to Solace documentation for more information.
Total Client Msgs Rcvd	The total number of messages received by the client.
Total Client Msgs Sent	The total number of messages sent by the client.
Total Client Bytes Rcvd	The total number of bytes contained within the messages received by the client.
Total Client Bytes Sent	The total number of bytes contained within the messages sent by the client.
Total Client Msgs Rcvd / sec	The total number of messages received per second by the client.
Total Client Msgs Sent / sec	The total number of messages sent per second by the client.
Total Client Bytes Rcvd / sec	The total number of bytes contained within the messages received per second by the client.
Total Client Bytes Sent / sec	The total number of bytes contained within the messages sent per second by the client.
Ctl Bytes Rcvd	The number of control data bytes received by the client.
CTL Bytes Sent	The number of control data bytes sent by the client.
Ctl Msgs Rcvd	The number of control data messages received by the client.
Ctl Msgs Sent	The number of control data messages sent by the client.
Client Data Bytes Rcvd	The number of bytes contained within the data messages received by the client.
Client Data Bytes Sent	The number of bytes contained within the data messages sent by the client.
Client Data Msgs Rcvd	The number of data messages received by the client.
Client Data Msgs Sent	The number of data messages sent by the client.
Client Direct Msgs Rcvd	The number of direct messages received by the client.
Client Direct Msgs Sent	The number of direct messages sent by the client.
Client Direct Bytes Rcvd	The number of bytes contained within direct messages received by the client.
Client Direct Bytes Sent	The number of bytes contained within direct messages sent by the client.
Client Direct Msgs Rcvd / sec	The number of direct messages received per second by the client.
Client Direct Msgs Sent / sec	The number of direct messages sent per second by the client.
Client Direct Bytes Rcvd / sec	The number of bytes contained within the messages received per second by the client.

Client Direct Bytes Sent/sec	The number of bytes contained within the messages sent per second by the client.
Client NonPersistent Msgs Rcvd	The number of non-persistent messages received by the client.
Client NonPersistent Msgs Sent	The number of non-persistent messages sent by the client.
Client NonPersistent Bytes Rcvd	The number of bytes contained within the non-persistent messages received by the client.
Client NonPersistent Bytes Sent	The number of bytes contained within the non-persistent messages sent by the client.
Client NonPersistent Msgs Rcvd/sec	The number of non-persistent messages received per second by the client.
Client NonPersistent Msgs Sent/sec	The number of non-persistent messages sent per second by the client.
Client NonPersistent Bytes Rcvd/sec	The number of bytes contained within the non-persistent messages received per second by the client
Client NonPersistent Bytes Sent/sec	The number of bytes contained within the non-persistent messages sent per second by the client
Client Persistent Msgs Rcvd	The number of persistent messages received by the client.
Client Persistent Msgs Sent	The number of persistent messages sent by the client.
Client Persistent Bytes Rcvd	The number of bytes contained within the persistent messages received by the client.
Client Persistent Bytes Sent	The number of bytes contained within the persistent messages sent by the client.
Client Persistent Msgs Rcvd/sec	The number of persistent messages received per second by the client.
Client Persistent Msgs Sent/sec	The number of persistent messages sent per second by the client.
Client Persistent Bytes Rcvd/sec	The number of bytes contained within the persistent messages received per second by the client.
Client Persistent Bytes Sent/sec	The number of bytes contained within the persistent messages sent per second by the client.
Denied Dup Clients	Refer to Solace documentation for more information.
Denied Subscribe Permission	The number of denied subscription requests due to improper permissions.
Denied Subscribe Topic-ACL	The number of denied subscriptions to topics due to the fact that the client requesting was not on the Access Control List.
Denied Unsubscribe Permission	The number of denied unsubscribe requests due to improper permissions.
Denied Unsubscribe Topic-ACL	The number of denied unsubscribe requests to topics due to the fact that the client requesting was not on the Access Control List.
DTO Msgs Rcvd	The number of Deliver-To-One messages received by the client.
Egress Compressed Bytes	The number of compressed bytes contained within outgoing messages.
Ingress Compressed Bytes	The number of compressed bytes contained within incoming messages.

Total Ingress Discards	The total number of discarded incoming messages.
Total Egress Discards	The total number of discarded outgoing messages.
Total Ingress Discards/sec	The total number of discarded incoming messages per second.
Total Egress Discards/sec	The total number of discarded outgoing messages per second.
Keepalive Msgs Rcvd	The number of Keepalive messages received by the client.
Keepalive Msgs Sent	The number of Keepalive messages sent by the client.
Large Msgs Rcvd	The number of large messages received by the client.
Login Msgs Rcvd	The number of login message received by the client.
Max Exceeded Msgs Sent	The number of responses sent by the client informing the connected broker(s) that the number of the message(s) sent exceeded the maximum allowed.
Not Enough Space Msgs Sent	The number of responses sent by the client informing the connected broker(s) that the size of the message(s) sent exceeded the maximum allowable size, or that the message caused the client's Local Spool Quota to exceed the maximum amount of space.
Not Found Msgs Sent	Refer to Solace documentation for more information.
Parse Error on Add Msgs Sent	Refer to Solace documentation for more information.
Parse Error on Remove Msgs Sent	Refer to Solace documentation for more information.
Remove Subscription Msgs Rcvd	The number of remove subscription requests received by the client.
Remove Subscription Msgs Sent	The number of remove subscription requests sent by the client.
Subscribe Client Not Found	The number of subscription requests for clients that were not found.
Unsubscribe Client Not Found	The number of unsubscribe requests for clients that were not found.
Update Msgs Rcvd	Refer to Solace documentation for more information.
Update Msgs Sent	Refer to Solace documentation for more information.

Expired	When checked, performance data about the client has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the client. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Timestamp	The date and time the row of data was last updated.

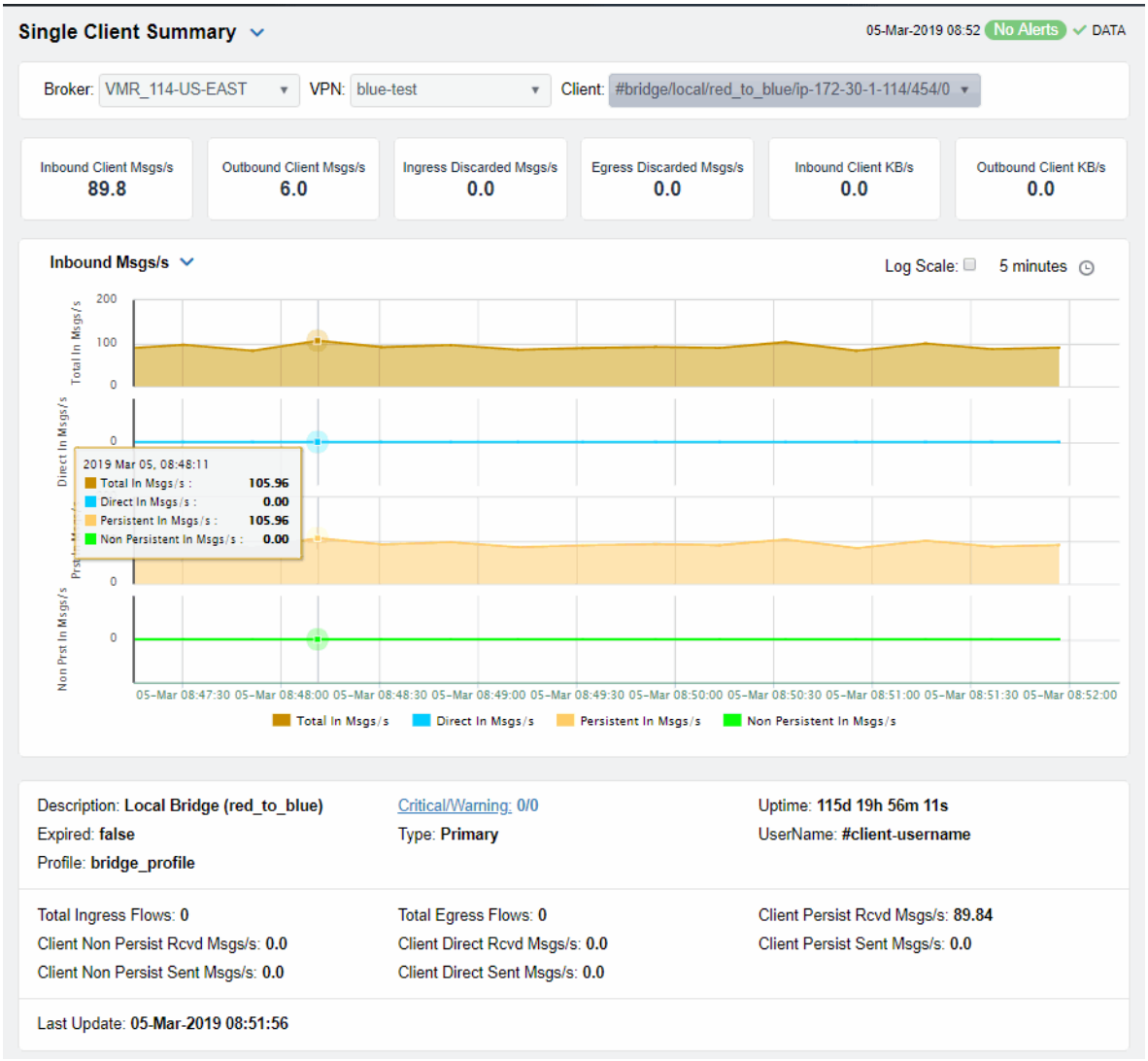
Client Summary

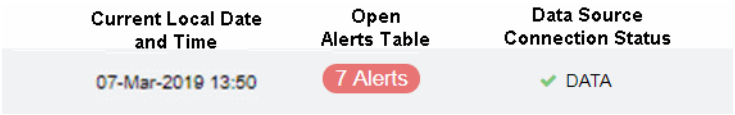
View the current and historical metrics for a single VPN client.

Select a broker, VPN and client from the drop-down menus. You can view the **Client Type**, the **User Name**, the **Client ID**, the associated **Platform**, the current **Up Time**, and additional information specific to the client. You can also view the total number of incoming and outgoing messages, as well as the number of incoming and outgoing persistent, non-persistent, direct, and discarded messages.

This display is populated by two caches, SolClientsStats and SolClients. SolClientsStats provides most of the data. SolClients provides the static data. If the SolClients cache encounters an issue the graphic elements that have no data are replaced with **N/A**.

This display also includes a trend graph containing the current and historical incoming messages per second, outgoing messages per second, incoming direct messages per second, and outgoing direct messages per second.





Inbound Client Msgs /sec The number of incoming client messages per second.

Outbound Client Msgs /sec The number of outgoing client messages per second.

Ingress Discarded Msgs /sec The number of discarded ingress messages per second.

Egress Discarded Msgs /sec The number of discarded egress messages per second.

Inbound Client KB/sec The amount of incoming data from the client in KBs per second.

Outbound Client KB/sec The amount of outgoing data for the client in KBs per second.

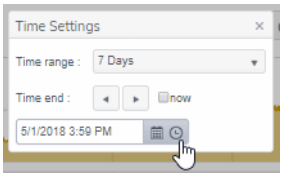
Trend Graphs
Traces the sum of message processing for the selected client.

- **Total In Msgs/sec**: The number of incoming messages (per second) for the client.
- **Dir-In Msgs/sec**: The number of incoming direct messages (per second) for the client.
- **Persistent In Msgs/sec**: The number of incoming persistent messages (per second) for the client.
- **Non Persitent In Msgs/sec**: The number of incoming non-persistent messages (per second) for the client.

Log Scale 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.

Time Settings By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either:

- choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu.
- specify begin/end dates using the calendar .
- specify begin/end time using the clock .



Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows .

Restore settings to current time by selecting **now** .

Description The description of the client.

Expired When checked, performance data about the client has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the client. To view/edit the current values, modify the following lines in the **.properties** file:

```
# Metrics data are considered expired after this number of seconds
#
collector.sl.rtview.sub=$solRowExpirationTime:45
collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600
```

In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Profile The client's profile.

Total Ingress Flows	The number of inflows coming to the client.
Persistent Msgs In/sec	The number of persistent incoming messages per second.
Persistent Msgs Out/sec	The number of persistent outgoing messages per second.
Last Update	The date and time of the last data update.
Critical/Warning	The number of critical alerts / warning alerts which also opens the **Alerts Table**.
Non Persistent Msgs In/sec	The number of non-persistent incoming messages per second.
NonPersistent Msgs Out/sec	The number of non-persistent outgoing messages per second.
Uptime	If the VPN's **Local Status** is **Up**, this field displays the length of time that the VPN has been up and running.
Username	The client's user name.
Direct In Msgs /sec	The number of non-persistent incoming messages per second.
Direct Out Msgs /sec	The number of non-persistent outgoing messages per second.

Bridges

These displays provide process data for bridges configured on a VPN. Displays in this View are:

- "Bridges Table": A tabular view of all available process performance data for all bridges configured on a VPN.
- "Bridges - Diagram": Topological view of Solace network bridges that shows bridge broker connections and status.
- "Bridge Summary": Current and historical metrics for a single bridge.

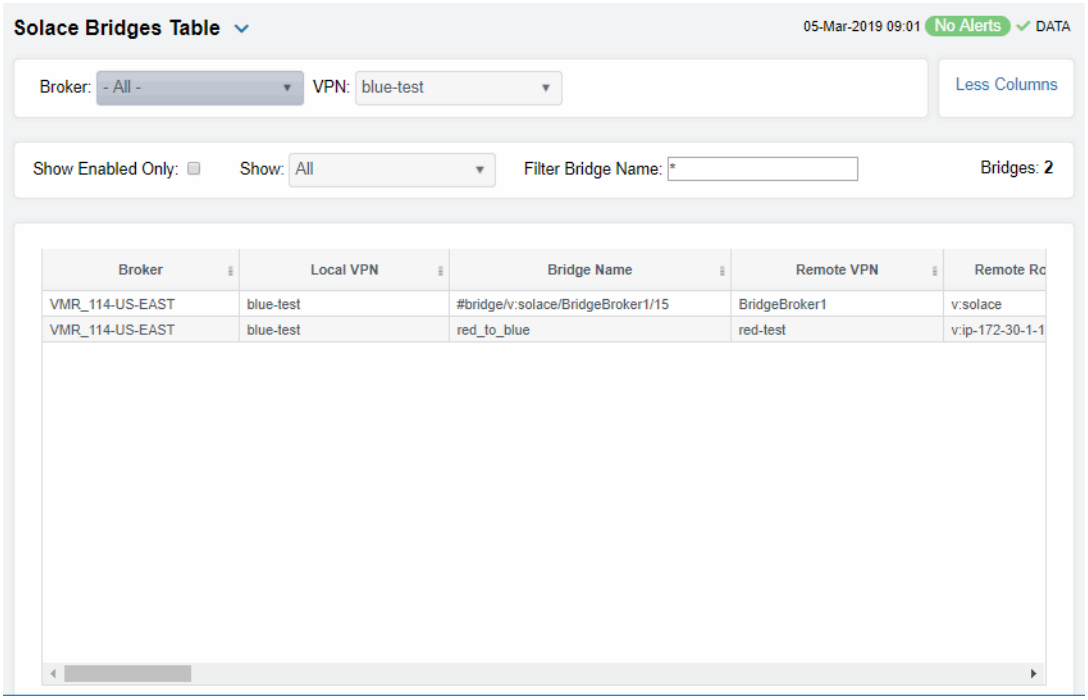
Bridges Table

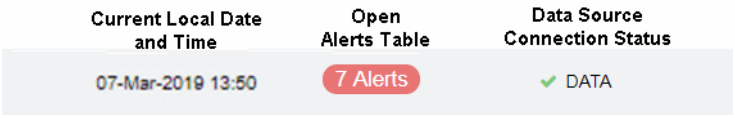
This display allows you to view data for all bridges configured for a VPN.

By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).

Select a broker and VPN from the drop-down menus. Use the check-boxes ☑ to include / exclude **Enabled** and **Expired** bridges. Each table row is a different bridge.

Rows listing bridges that are disabled or expired display with a shaded background. Double-click a row to drill-down and investigate in the "Bridge Summary" display.





Broker — Displays the name of the broker

Local VPN — The name of the local VPN.

Bridge Name — The name of the bridge.

Alert Level — The current level of alerts in the row.
Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.
Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.
Green indicates that no metrics have exceeded their alert thresholds.

Alert Count — The total number of active alerts for the process.

Remote VPN — The name of the remote VPN that is connected to the local VPN via the bridge.

Remote Router — The name of the remote broker.

Admin State — Indicates whether the bridge has been administratively enabled (via SolAdmin or the command line interface).

Inbound Operational State — The current inbound operational status of the bridge. (The administrator can turn off a bridge's input or output for maintenance or other reasons.)

Outbound Operational State	The current outbound operational status of the bridge. (The administrator can turn off a bridge's input or output for maintenance or other reasons.)
Queue Operational State	The current operational status of the queue.
Connection Establisher	Indicates whether the administrator created and configured the bridge directly on the broker using SolAdmin or the command line interface, or indirectly from another broker.
Redundancy	Displays whether the bridge is the **primary** bridge, the **backup** bridge, the **static** bridge (default bridge used when no other bridge is available), or whether it is the only bridge available (**none**).
Uptime	The current amount of time in which the bridge has been up and running.
Client Name	The name of the client.
Connected Via Addr	The local IP address and port used for the bridge.
Connected Via Interface	The name of the network interface used for the bridge.
Client Direct Bytes Rcvd	The number of bytes contained within direct messages received by the client via the bridge.
Client Direct Bytes/sec Rcvd	The number of bytes contained within direct messages received per second by the client via the bridge.
Client Direct Bytes Sent	The number of bytes contained within direct messages sent by the client via the bridge.
Client Direct Bytes/sec Sent	The number of bytes contained within direct messages sent per second by the client via the bridge.
Client Direct Msgs/sec Rcvd	The number of bytes contained within direct messages received per second by the client via the bridge.
Client Direct Msgs Sent	The number of direct messages sent by the client via the bridge.
Client Direct Msgs/sec Sent	The number of direct messages sent per second by the client via the bridge.
Client NonPersistent Bytes Rcvd	The number of bytes contained within non-persistent messages received by the client via the bridge.
Client NonPersistent Bytes/sec Rcvd	The number of bytes contained within non-persistent messages received per second by the client via the bridge.
Client NonPersistent Bytes Sent	The number of bytes contained within non-persistent messages sent by the client via the bridge.
Client NonPersistent Bytes/sec Sent	The number of bytes contained within non-persistent messages sent per second by the client via the bridge.
Client NonPersistent Msgs Rcvd	The number of non-persistent messages received by the client via the bridge.
Client NonPersistent Msgs/sec Rcvd	The number of non-persistent messages received per second by the client via the bridge.
Client NonPersistent Msgs Sent	The number of non-persistent messages sent by the client via the bridge.
Client NonPersistent Msgs/sec Sent	The number of non-persistent messages sent per second by the client via the bridge.
Client Persistent Bytes Rcvd	The number of bytes contained within persistent messages received by the client via the bridge.

Client Persistent Bytes/sec Rcvd	The number of bytes contained within persistent messages received per second by the client via the bridge.
Client Persistent Bytes Sent	The number of bytes contained within persistent messages sent by the client via the bridge.
Client Persistent Bytes/sec Sent	The number of bytes contained within persistent messages sent per second by the client via the bridge.
Client Persistent Msgs Rcvd	The number of persistent messages received by the client via the bridge.
Client Persistent Msgs /sec Rcvd	The number of persistent messages received per second by the client via the bridge.
Client Persistent Msgs Sent	The number of persistent messages sent by the client via the bridge.
Client Persistent Msgs/sec Sent	The number of persistent messages sent per second by the client via the bridge.
Total Client Bytes Rcvd	The number of bytes contained within all messages received by the client via the bridge.
Total Client Bytes/sec Rcvd	The number of bytes contained within all messages received per second by the client via the bridge.
Total Client Bytes Sent	The number of bytes contained within all messages sent by the client via the bridge.
Total Client Bytes/sec Sent	The number of bytes contained within all messages sent per second by the client via the bridge.
Total Client Msgs Rcvd	The total number of all messages received by the client via the bridge.
Total Client Msgs/sec Rcvd	The total number of all messages received per second by the client via the bridge.
Total Client Msgs Sent	The total number of all messages sent by the client via the bridge.
Total Client Msgs/sec Sent	The total number of all messages sent per second by the client via the bridge.
Total Out Discards	The total number of discarded outgoing messages sent by the client via the bridge.
Total Out Discards/sec	The total number of discarded outgoing messages sent per second by the client via the bridge.
Total In Discards	The total number of discarded incoming messages received by the client via the bridge.
Total In Discards/sec	The total number of discarded incoming messages received per second by the client via the bridge.

Expired	When checked, performance data about the bridge has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the bridge. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Timestamp	The date and time the row of data was last updated.

Bridges - Diagram

Use this topology view to monitor the health of your network bridges and VPNs. Quickly identify bridge and VPN connections, their health status and which resources their performance impacts. Drag and drop objects to arrange them on the screen (doing so does not logically impact the network bridges and VPNs). Arrows show the connections between VPNs and bridges.

Each object is a network bridge or VPN. Each is labeled with their name and color coded as follows:

- Red indicates that the object has one or more alerts in a critical state.
- Yellow indicates that the object has one or more alerts in a warning state.
- Green indicates that there are no alerts on the object.
- Gray indicates that the object is off-line.

Save: Saves the arrangement of the objects.

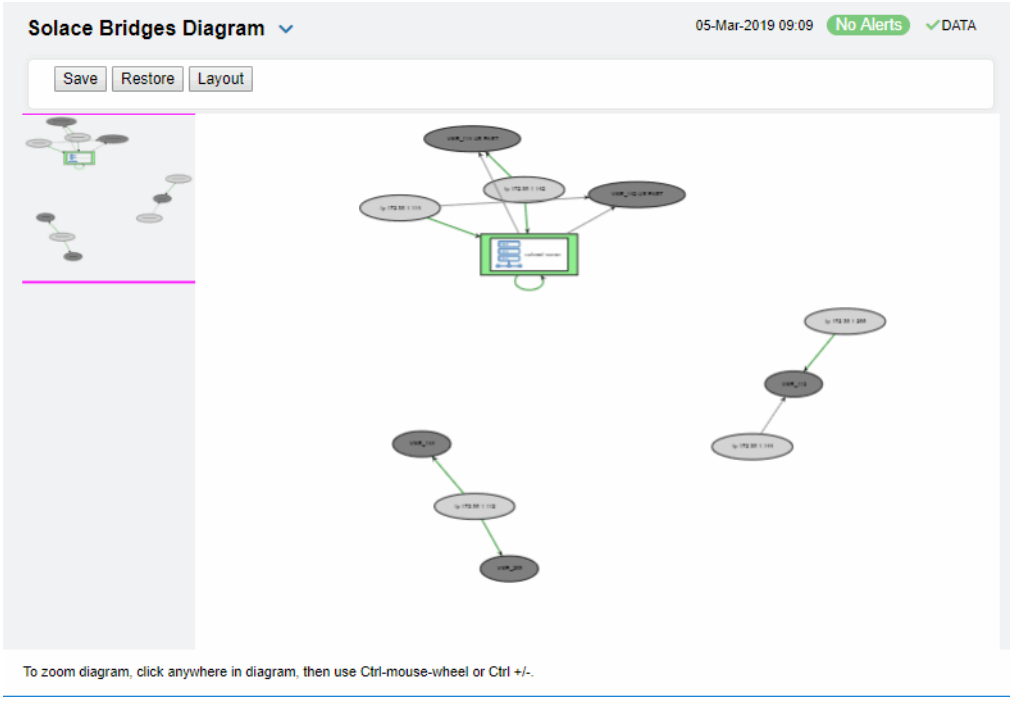
Restore: Returns objects to their previous positions.

Layout: Toggles between two types of layouts. One layout positions objects to the right so you might scroll in that direction to see them. The other layout pulls all the objects close together to the left, vertically, in hierarchical order.

Look at the miniature view in (upper left) to see all objects in either layout. Or zoom into the display using **Ctrl+/-** or **Ctrl+** mouse wheel.

Drill-down to investigate in the “Bridges Table”.

To monitor network brokers, VMRs and servers, see the “Neighbors Diagram”.

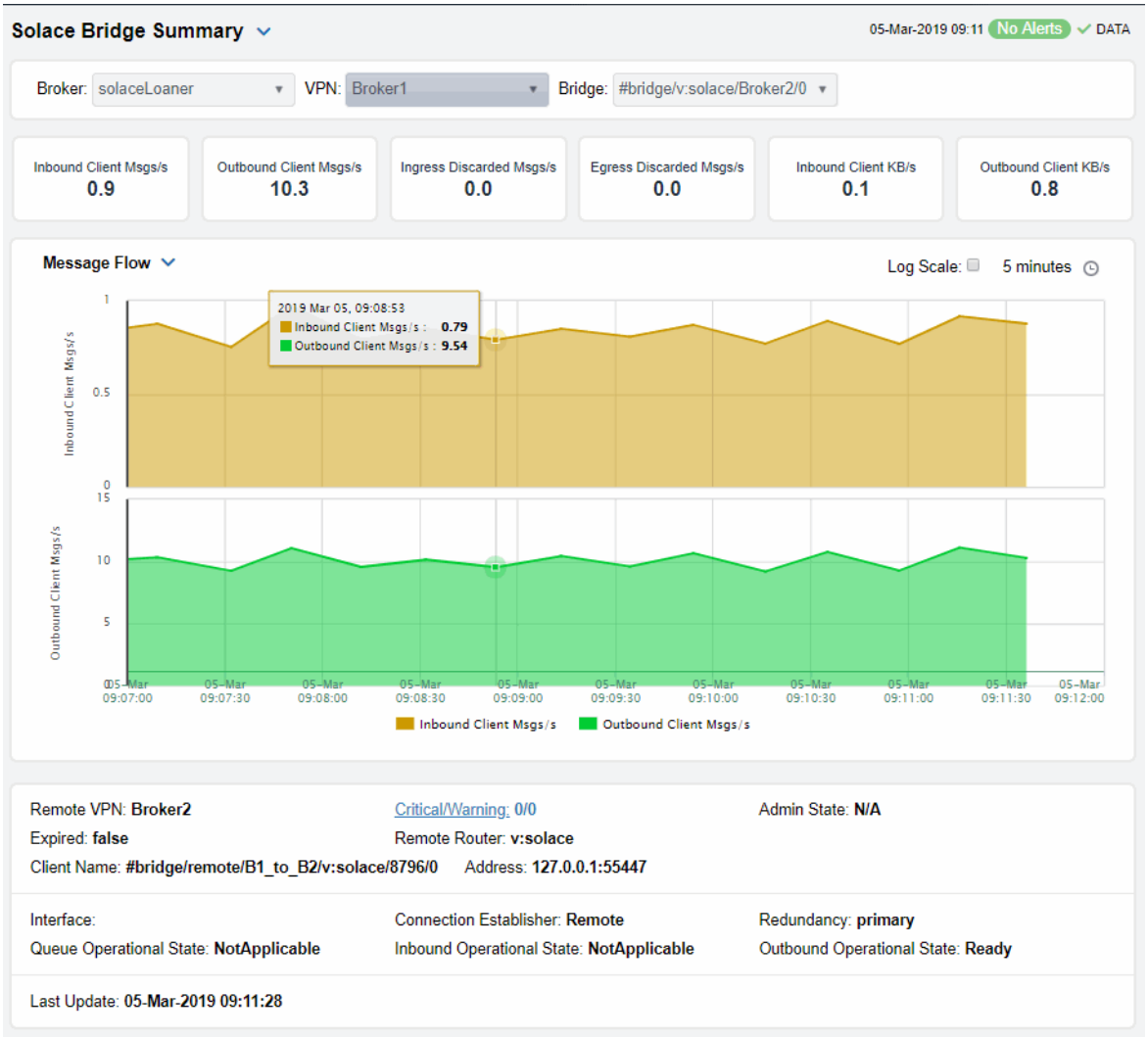


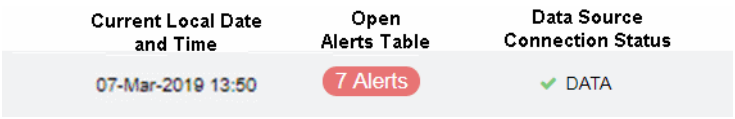
Current Local Date and Time	Open Alerts Table	Data Source Connection Status
07-Mar-2019 13:50	7 Alerts	DATA

Bridge Summary

This display allows you to view performance details for a specific bridge configured on a VPN.

Select a broker, VPN, and a bridge from the drop-down menus, and use the **Time-Range** to "zoom-in" or "zoom-out" on a specific time frame in the trend graph.

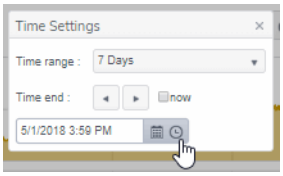




Inbound Client Msgs/s	The number of client messages received per second.
Outbound Client Msgs/s	The number of client messages sent per second.
Ingress Discarded Client Msgs/s	The number of discarded ingress messages per second.
Egress Discarded Msgs/s	The number of discarded egress messages per second.
Inbound Client KB/s	The amount of incoming client data, in KB per second.
Outbound Client KB/s	The amount of outgoing client data, in KB per second.

Messages Flow Trend Graphs
Traces the sum for the selected client.

- **Inbound Client Msgs/s**: The number of client messages received per second.
- **Outbound Client Msgs/s**: The number of client messages sent per second.

Log Scale	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.
Time Settings	By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either: • choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu. • specify begin/end dates using the calendar . • specify begin/end time using the clock .  Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows . Restore settings to current time by selecting **now** .
Remote VPN	The name of the remote VPN that is connected to the local VPN via the bridge.

Expired	When true, performance data about the bridge has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the bridge. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Address	The IP address.
Interface	The interface ID.
Queue Operational State	Refer to Solace documentation for more information.

Last Update	The date and time of the last data update.
Critical / Warning	The number of critical alerts / warning alerts which also opens the **Alerts Table**.
Remote Router	The remote broker.
Conn Establisher	Refer to Solace documentation for more information.
Inbound Operational State	The current inbound operational status of the bridge. (The administrator can turn off a bridge's input or output for maintenance or other reasons.)
Admin State	Indicates whether the bridge has been administratively enabled (via SolAdmin or the command line interface).
Client Name	The name of the client.
Redundancy	Indicates whether the bridge is the **primary** bridge, the **backup** bridge, the **static** bridge (default bridge used when no other bridge is available), or whether it is the only bridge available (**none**).
Outbound Op State	The current outbound operational status of the bridge. (The administrator can turn off a bridge's input or output for maintenance or other reasons.)

Endpoints

These displays list data for one or more endpoints configured on a VPN. Displays in this View are:

- "Endpoints Table"
- "Endpoint Summary"

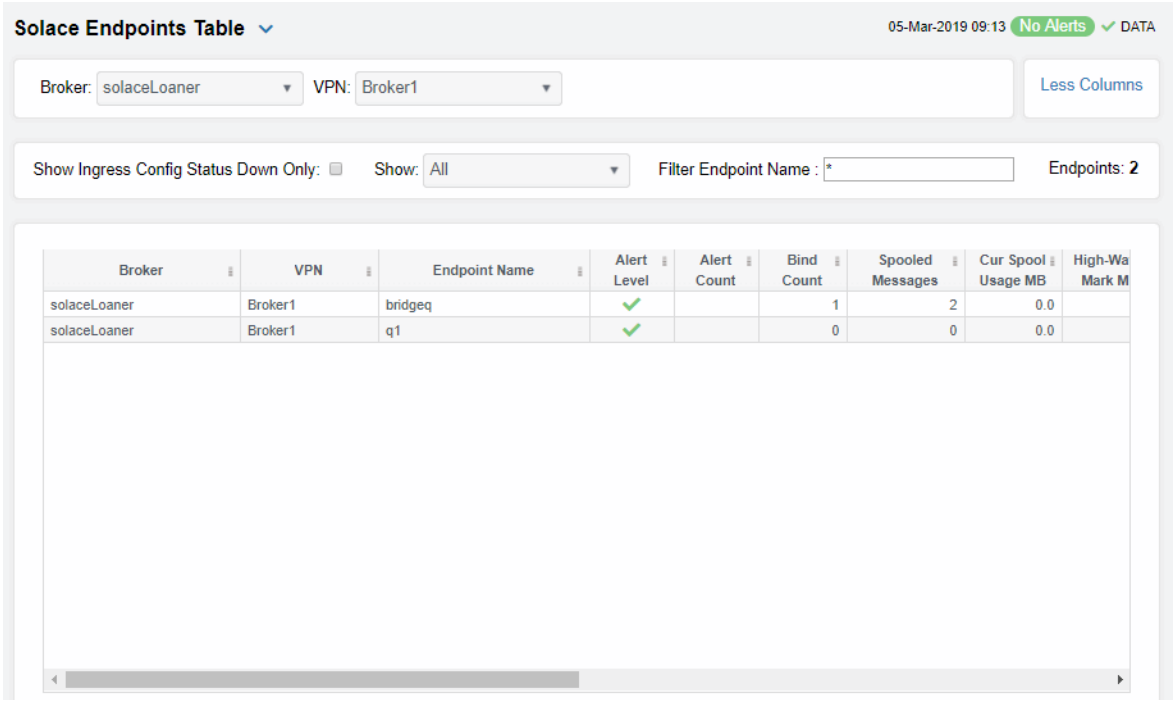
Endpoints Table

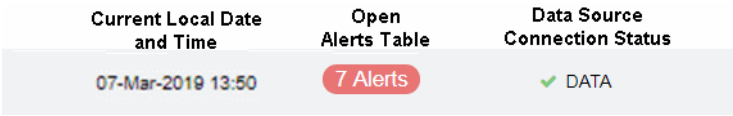
View all endpoints configured on a VPN. Each row in the table lists the details for a specific endpoint.

By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).

Select a broker and VPN from the drop-down menus. Filter the table using the **Show Ingress Config Status Down Only** check-box ☑ and use the **Show** drop-down menus to include **All**, **Expired** or **Unexpired**.

You can click a column header to sort column data in numerical or alphabetical order, or double-click a row to drill-down and investigate in the "Endpoint Summary" display.





Broker	Displays the name of the broker
VPN	The name of the VPN.
Endpoint Name	The name of the endpoint.
Alert Level	The current alert severity in the row. Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	The total number of active alerts for the endpoint.
Bind Count	The total number of binds connected to the endpoint.
Endpoint Type	The type of endpoint (either queue or topic).
Durable	Displays whether or not the endpoint is durable (checked) or non-durable (unchecked). Durable endpoints remain after an broker restart and are automatically restored as part of an broker's backup and restoration process.
In Config Status	Refer to Solace documentation for more information.

Out Config Status	Refer to Solace documentation for more information.
Type	Refer to Solace documentation for more information.
Access Type	Refer to Solace documentation for more information.
Pending Messages	The total number of pending messages on the endpoint.
Spool Usage (MB)	The total spool usage consumed on the endpoint (in megabytes).
High Water Mark (MB)	The highest level of spool usage on the endpoint (in megabytes).
In Selector	Refer to Solace documentation for more information.
Out Selector	Refer to Solace documentation for more information.

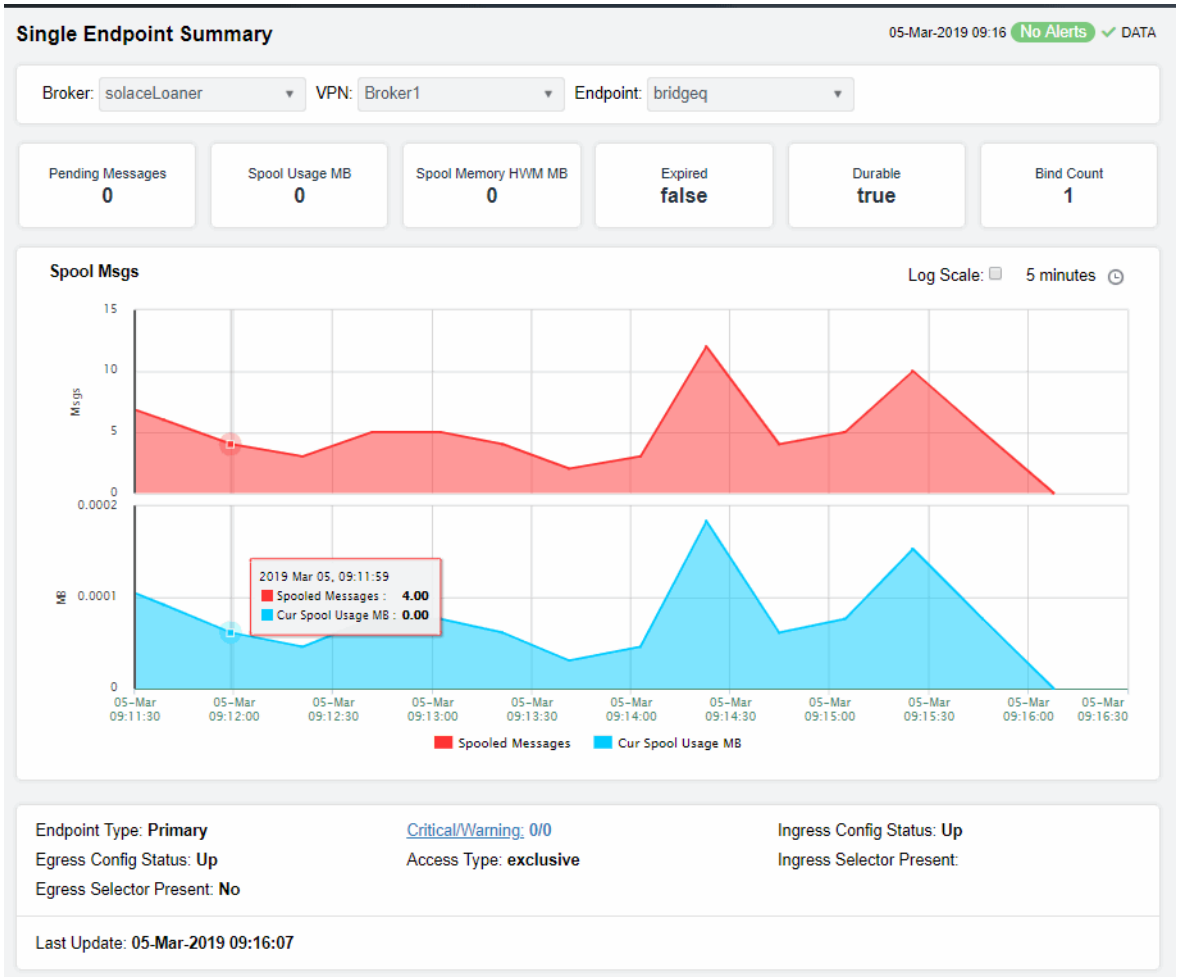
Expired	When checked, performance data about the endpoint has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the endpoint. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

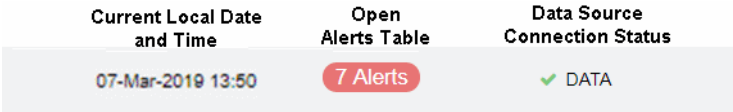
Time Stamp	The date and time the row of data was last updated.

Endpoint Summary

This display allows you to view endpoint information, message data, and a trend graph for pending and spool messages for a specific endpoint configured on a VPN. Choose a broker, a VPN, and an endpoint from the drop-down menus, and use the **Time Settings** to “zoom-in” or “zoom-out” on a specific time frame in the trend graph.

This display is provided by default and should be used if you do not want to collect message spool data for specific VPNs. However, if you do want to configure message spool monitoring for specific VPNs, then you should use the **Single Endpoint Summary Rates** display instead, which is not included in the navigation tree by default.





Pending Messages	The total number of pending messages on the endpoint.
Spool Usage (MB)	The current spool usage consumed on the endpoint (in megabytes).
Spool Memory HWM MB	Refer to Solace documentation for more information

Expired

When **true**, performance data about the endpoint has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the endpoint. To view/edit the current values, modify the following lines in the **.properties** file:

```
# Metrics data are considered expired after this number
of seconds
#
collector.sl.rtview.sub=$solRowExpirationTime:45
collector.sl.rtview.sub=$solRowExpirationTimeForDelete
:3600
```

In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Durable

Displays whether or not the endpoint is durable (checked) or non-durable (unchecked). Durable endpoints remain after an broker restart and are automatically restored as part of an broker's backup and restoration process.

Bind Count

The total number of binds connected to the endpoint.

Trend Graphs

Traces the sum of metrics for the endpoint.

- **Spooled Msgs**: The amount of spooled messages, in megabytes.
- **Cur Spool Usage**: The amount of space used by spooled messages, in megabytes.

Log Scale

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.

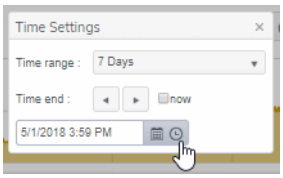
Base at Zero

Select to use zero (**0**) as the Y axis minimum for all graph traces.

Time Settings

By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either:

- choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu.
- specify begin/end dates using the calendar .
- specify begin/end time using the clock .



Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows .

Restore settings to current time by selecting **now** .

Endpoint Type	The type of endpoint.
Egress Config Status	Refer to Solace documentation for more information.
Egress Selector Present	Refer to Solace documentation for more information.
Last Update	The date and time of the last data update.
Critical / Warning	The number of critical alerts / warning alerts which also opens the **Alerts Table**.
Access Type	Refer to Solace documentation for more information.
Ingress Config Status	Refer to Solace documentation for more information.
Ingress Selector Present	Refer to Solace documentation for more information.

Capacity

These displays provide current broker capacity metrics, alert count and severity at the broker level. Displays in this View are:

- "Capacity Table": View client, spool usage, incoming messages, outgoing messages, incoming bytes, and outgoing bytes data for all brokers.
- "Capacity - Summary": View client, spool usage, incoming messages, outgoing messages, incoming bytes, and outgoing bytes data for a specific broker.
- "Capacity Trends": View the broker capacity data for a specific broker in a trend graph format.

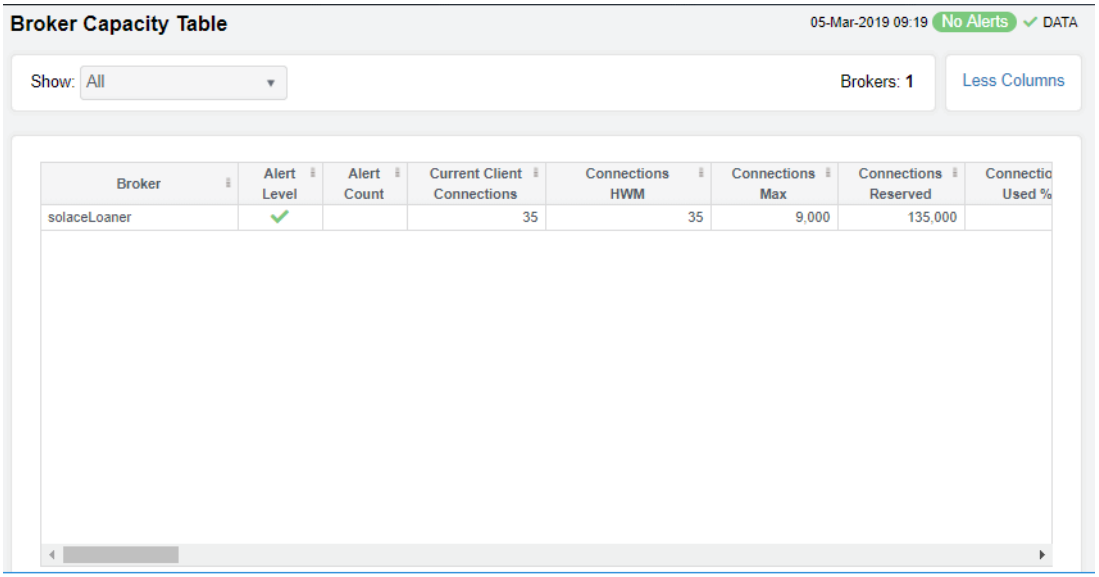
Capacity Table

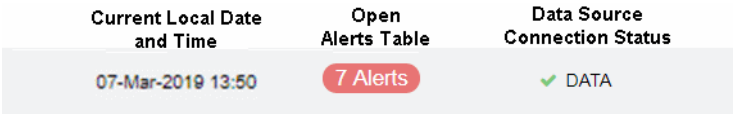
View current and HWM (high water mark for the last 30 days) capacity utilization data for all brokers.

By default, a subset of available metrics is shown. Use **More Columns**/**Less Columns** to toggle to the complete set of metrics available (and back to the subset).

You can view client, spool usage, incoming message, outgoing message, incoming bytes, and outgoing bytes data for the broker. Each table row is a different broker.

Double-click a row to drill-down and investigate in the "Capacity - Summary" display.





Broker	The name of the broker.
Alert Level	The maximum level of alerts in the row: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	The total number of active alerts.
Current Client Connections	The current number of clients connected.
Connections HWM	The greatest number of connections in the last 30 days.
Connections Max	The greatest number of connections since the broker last started.
Connections Reserved	The current number of reserved connections.
Connections Used %	The current amount of connections used, in percent.
Connections Used HWM %	The greatest amount of connections used, in percent, in the last 30 days.
Cur Spool Usage MB	The current amount of used spool disk, in megabytes.
Cur Spool Usage HWM	The greatest amount of spool disk used in the last 30 days.
Spool Disk Allocated	The amount of allocated spool disk.
Spool Reserved	The amount of reserved spool disk.

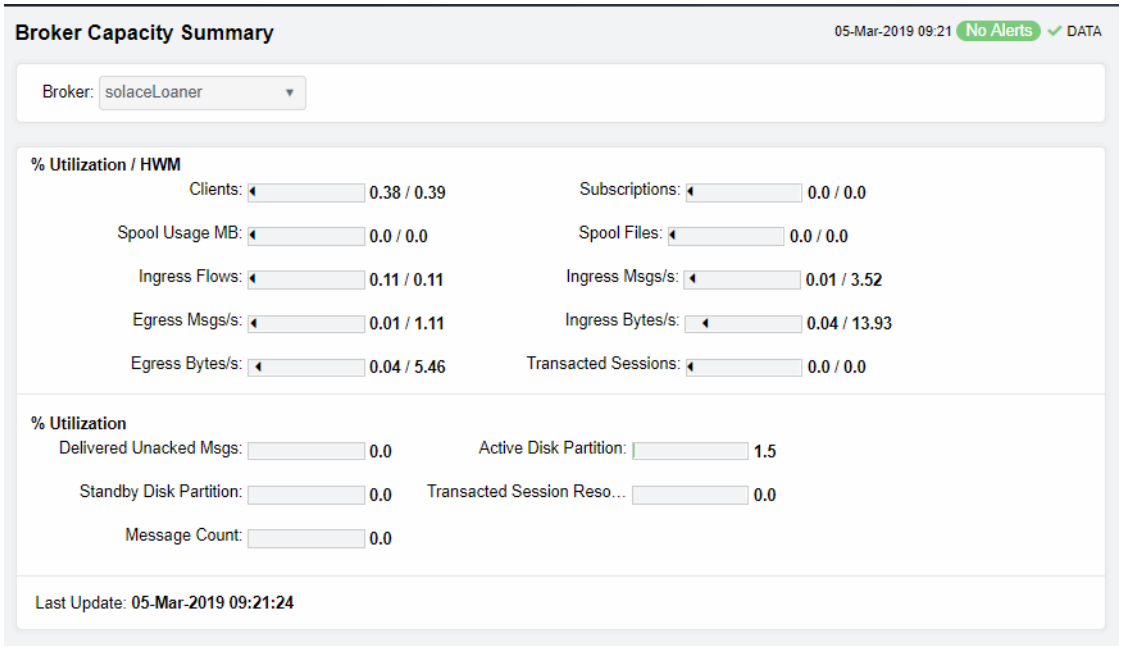
Current Spool Usage %	The current amount of used spool disk, in percent.
Current Spool Usage % HWM	The greatest amount of used spool disk in the last 30 days, in percent.
Delivered Unacked Msgs Util %	Refer to Solace documentation for more information.
Ingress Flow Count	The number of ingress flows.
Ingress Flow HWM	The greatest number of ingress flows in the last 30 days.
Ingress Flows Allowed	The maximum number of ingress flows allowed.
Ingress Flow Count %	The amount of ingress flows in percent.
Ingress Flow Count HWM %	The greatest amount of ingress flows in the last 30 days, in percent.
Ingress Msgs/s	The number of ingress messages per second.
Ingress Msgs/s HWM	The greatest number of ingress messages per second in the last 30 days.
Max Ingress Msgs/s	The maximum number of ingress flows per second allowed.
Ingress Msgs %	The amount of ingress messages in percent.
Ingress Msgs/s HWM %	The greatest amount of ingress messages in the last 30 days, in percent.
Cur Egress Msgs/s	The number of egress messages per second.
Egress Msgs/s HWM	The greatest number of egress messages per second in the last 30 days.
Max Egress Msgs/s	The maximum number of egress flows per second allowed.
Egress Msgs %	The amount of egress messages in percent.
Egress Msgs/s HWM %	The greatest amount of ingress messages in the last 30 days, in percent.
Cur Egress Bytes/s	The amount of egress in bytes per second.
Egress Bytes/s HWM	The greatest amount of egress, in bytes per second, in the last 30 days, in percent.

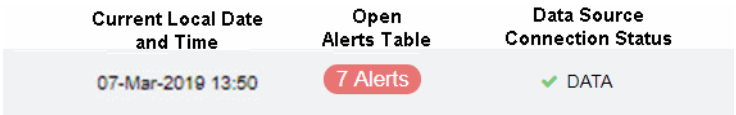
Expired	When checked, performance data about the VPN has not been received within the time specified (in seconds) in the **$solRowExpirationTime** field in the **conf\rtvapm_solmon.properties** file. The **$solRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the VPN. To view/edit the current values, modify the following lines in the **.properties** file:
	`# Metrics data are considered expired after this number of seconds`
	`#`
	`collector.sl.rtview.sub=$solRowExpirationTime:45`
	`collector.sl.rtview.sub=$solRowExpirationTimeForDelete:3600`
	
	In the example above, the **Expired** check box would be checked after 45 seconds, and the row would be removed from the table after 3600 seconds.

Time Stamp	The date and time the row of data was last updated.

Capacity - Summary

This display, a pivoted view of the "Capacity Table", allows you to view current and HWM (high water mark for the last 30 days) capacity utilization data for a single broker. Select a broker from the drop-down menu to view client, spool usage, incoming message, outgoing message, incoming bytes, and outgoing bytes data for the broker.





% Utilization / HWM These values show high water marks (peak capacity utilization) for the last 30 days.

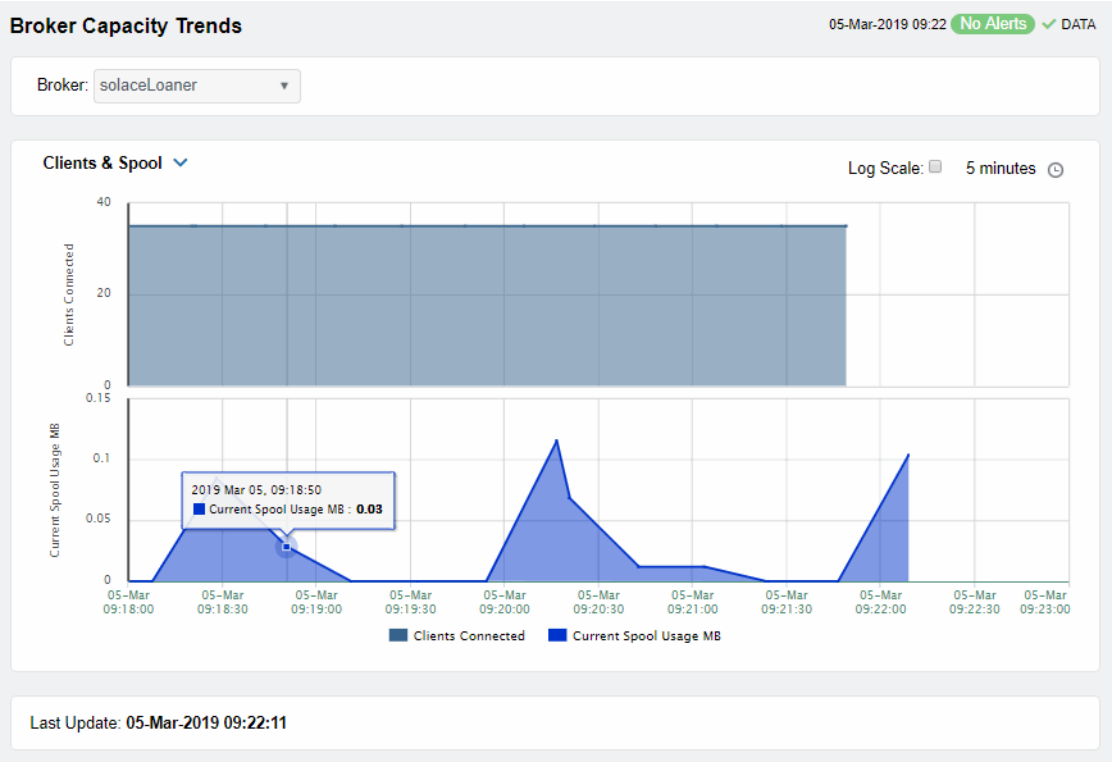
Clients	The current number of clients connected to the broker.
Spool Files	The highest number of spool files on the broker in the past 30 days.
Egress Msgs / s	The highest number of outgoing messages per second on the broker in the past 30 days.
Transacted Sessions	The highest number of transacted sessions on the broker in the last 30 days.
Subscriptions	The highest number of subscriptions on the broker in the last 30 days.
Ingress Flows	The highest number of inflows on the broker in the last 30 days.
Ingress Bytes / s	The highest amount of inflows, in bytes per second, on the broker in the past 30 days.
Spool Usage MB	The highest amount of spool utilization, in megabytes per second, on the broker in the past 30 days.
Ingress Msgs / s	The highest number of incoming messages per second on the broker in the past 30 days.
Egress Bytes / s	The highest number of outgoing messages per second on the broker in the past 30 days.

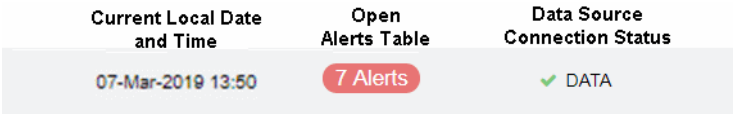
% Utilization These values show current capacity utilization.

Delivered Unacked Msgs	The current number of delivered messages that were not acknowledged divided by the maximum number of delivered messages that were not acknowledged allowed on the broker.
Transacted Sessions Reso...	The current number of transacted sessions that were resolved on the broker.
Active Disk Partition	The percentage of available active disk partition that is used.
Message Count	The current number of messages on the broker.
Standby Disk Partition	The percentage of available standby disk partition that has been used.
Last Update	The date and time of the last data update.

Capacity Trends

This display allows you to view a trend graph that traces broker performance data for clients & spool data, message flow and throughput. Select a broker and a performance metric from the drop-down menus.

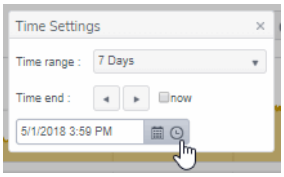




Clients & Spool The trend graph traces the following performance metrics:
Clients Connected: The current number of clients connected to the broker.
Current Spool Usage: The current spool usage, in megabytes, on the broker.

Message Flow The trend graph traces the following:
Ingress Msgs/sec: The number of incoming messages per second on the broker.
Egress Msgs/sec: The number of outgoing messages per second on the broker.

Throughput The trend graph traces the following:
Ingress KB/sec: The amount of incoming per second, in KB, on the broker.
Egress KB/sec: The number of outgoing data per second, in KB, on the broker.

Log Scale	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.
Base at Zero	Select to use zero (**0**) as the Y axis minimum for all graph traces.
Time Settings	By default, the time range end point is the current time. To change the time range, click the **Time Settings** and either: • choose a **Time range** from 5 Minutes to 7 Days in the drop-down menu. • specify begin/end dates using the calendar . • specify begin/end time using the clock .  Toggle forward/backward in the trend graph per the period you choose (from the **Time range** drop-down menu) using arrows . Restore settings to current time by selecting **now** .

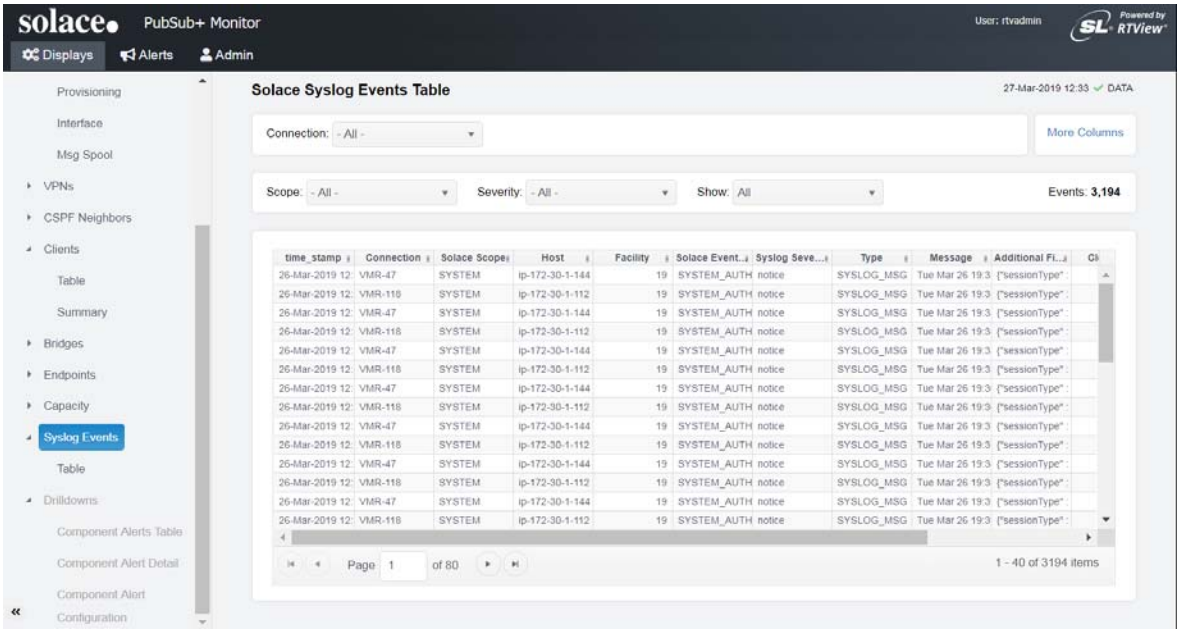
Syslog Events

The Solace Syslog Events Table allows you to supervise the last Syslog event messages from the Solace Message Brokers that have been configured for syslog monitoring. See the Solace product documentation for an in depth description of Syslog monitoring in Solace products and how to configure the Message Brokers and the Syslog destination.

This display requires the Solace Event Module from the RTView Solace Monitor to be properly configured with a Syslog destination and running. See “Solace Event Module” for additional information.

Syslog Events Table

This display lists all Syslog events collected from all Solace brokers. Each row in the table is a different message. Use the drop-down menus to filter the list by **Connection**, **Scope** and alert **Severity** level. Filter messages per single broker or all brokers. Click a column header to sort column data in numerical, alphabetical or chronological order.



Connection Select the connection string assigned when the message brokers connection properties were added with the RTView Configuration Application.

More / Fewer Columns Switches to another syslog events table display containing the full set of columns coming from Syslog.

Scope: This drop down selects the type of the event. The SYSTEM events are coming from conditions related to the state of the message broker. VPN events are events with the state of the message brokers VPNs. CLIENT events refer to the state of clients executions in the messaging infrastructure.

Available options are:

- SYSTEM
- VPN
- CLIENT
- ALL shows messages from all sources.

Severity: Selects the severity level of the events that will be presented in the table. All options go from the less severe to the most important to the health of the systems unless one specifies one single type of severity. For instance, Warning will only show the events that are defined as Warning, filtering out events more damaging, whereas Warning or higher will show all Syslog events that are either Warning, Error, Alert or Emergency. To avoid missing any key event, selection of Warning or higher is recommended.

Available options are:

- INFO
- NOTICE
- NOTICE or higher
- WARN
- WARN or higher
- ERROR
- ERROR or higher
- CRITICAL
- ALERT
- EMERGENCY
- ALL shows messages regardless of severity level from all sources.

Show: Selects the Expiration flag of the event. Due to the large number of events that can exist, it is recommended to select Unexpired Only to see exclusively the events that are active.

Available options are:

- Expired Only
- Unexpired Only
- ALL shows expired and unexpired messages from all sources.

Events: The number of events currently shown in the table.

Time Stamp The date and time the row of data was last updated.

Alerts

Alerts Table

Use this display to track and manage all alerts that have occurred in the system, where:

One or more alerts exceeded their ALARM LEVEL threshold in the table row

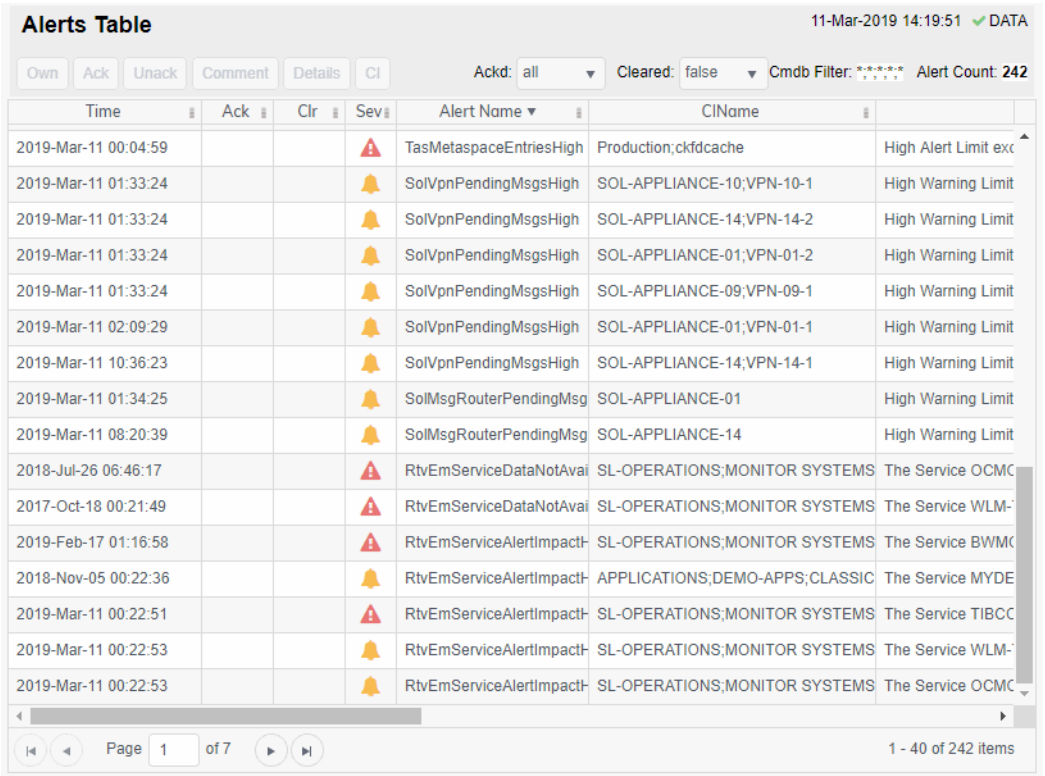
One or more alerts exceeded their WARNING LEVEL threshold in the table row

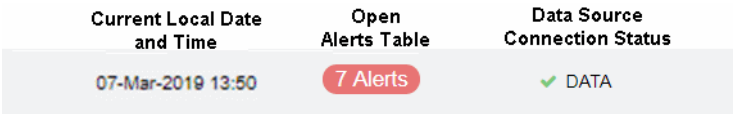
The alert has been resolved. An alert is automatically cleared when the value being monitored no longer in the alert threshold.

Filter the table content on any column by clicking a column header icon (located to the right of each column label), then choose **Filter**, **Sort Ascending**, **Sort Descending** or **Columns**. Use the **Ack'd** and **Cleared** drop-downs to filter the table by those columns. Click on a row in the table to select an alert. Use **Ctrl +** click to select multiple alerts.

With one or more alerts selected, use the **Own** button to set the alert(s) owner field, **Ack** button to acknowledge the alert(s), **Unack** button to clear the acknowledgement on previously acknowledged alert(s), **Comment** button to add a comment to the alert(s), **Details** button to drilldown to the Alert Detail display and the **CI** button to drilldown to the CI display that corresponds to the alert, if any.

You must be logged in as rtvalertmgr or rtvadmin role to perform the **Own**, **Ack**, **Unack**, or **Comment** actions. Otherwise, you get an error dialog.





Alert Count shows the current number of alerts in the table. Filter the alert list using the drop-down menus where:

Ackd:
- **All** - See acknowledged and unacknowledged alerts.
- **True** - See ONLY acknowledged alerts.
- **False** - See ONLY unacknowledged alerts.

Cleared:
- **All** - See cleared and uncleared alerts.
- **True** - See ONLY cleared alerts.
- **False** - See ONLY uncleared alerts.

Cmdb Filter

Alert Count The number of alerts currently in the table.

Table

Time The date and time that the row was last updated.

Ack When checked, this typically indicates that the alert is being addressed.

Clr When checked, this typically indicates that the alert has been resolved. An alert is automatically cleared when the value being monitored no longer in the alert threshold.

Severity The severity level of the alert:
Red indicates that the metric exceeded its ALARM LEVEL threshold.
Yellow indicates that the metric exceeded their WARNING LEVEL threshold.
Green indicates that no alert thresholds have been exceeded.

CIName The name of the CI that is associated with the alert.

Alert Name The name of the alert. For a complete list of available alerts, see the Alert Administration display.

Alert Text Descriptive text about the alert.

Owner The name of the user assigned as owner to the alert.

ID The unique identifier for the alert.

Source The application associated with the alert.

Comments Textual comments entered for the alert.

CmdbEnv The name of the service model Environment associated with the alert.

CmdbOwner The name of the service model Owner associated with the alert.

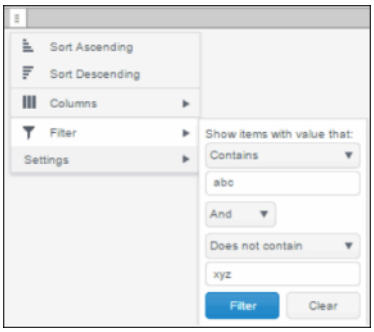
CmdbArea The name of the service model Area associated with the alert.

CmdbGroup The name of the service model Group associated with the alert.

You can create a filter on any column. If filters are created on multiple columns, then only the rows that pass all of the filters are displayed. That is, if there are multiple filters they are logically "ANDed" together to produce the final result.

The background of a column's menu icon changes to white to indicate that a filter is defined on that column. This is intended to remind you which columns are filtered.

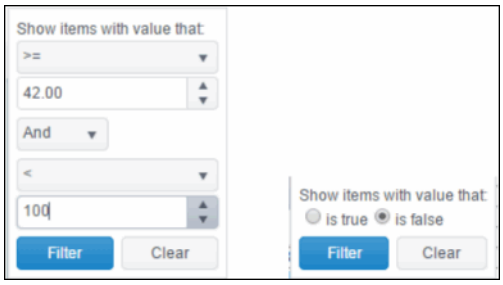
You can configure a filter on any column by clicking on the column's menu icon and choosing **Filter** from the menu. This opens the **Column Filter** dialog:



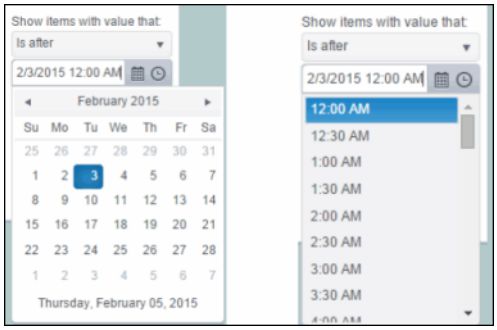
Options in the **Column Filter** dialog vary according to the data type of the selected column:

- **String columns**: You can enter a filter string such as "abc" and, from the dropdown list, select the operator (equal to, not equal to, starts with, contains, etc) to be used when comparing the filter string to each string in the column. All of the filter comparisons on strings are case-insensitive. You can optionally enter a second filter string (e.g. "xyz") and specify if an AND or OR combination should be used to combine the first and second filter results on the column.
- **Numeric columns**: You can enter numeric filter values and select arithmetic comparison operators, (=, !=, >, >=, <, <=). You can optionally enter a second filter value and comparison operator, and specify if an AND or OR combination should be used to combine the first and second filter results.
- **Boolean columns**: You simply select whether matching items should be true or false.

The numeric and boolean filter dialogs are shown below.



- **Date columns**: You can select a date and time and choose whether matching items should have a timestamp that is the same as, before, or after the filter time. The date is selected by clicking on the calendar icon and picking a date from a calendar dialog. The time is selected by clicking on the time icon and picking a time from a dropdown list:



  Alternatively, a date and time can be typed into the edit box. The strings shown in a date column are formatted by the Display Server using its time zone. But if a filter is specified on a date column, the date and time for the filter are computed using the client system's time zone. This can be confusing if the Display Server and client are in different time zones.

Data updates to the grid are suspended while the filter menu is opened. The updates are applied when the menu is closed.

Column filtering is reflected in an export to HTML and Excel.

Admin

These displays enable you to set alert thresholds, observe how alerts are managed, and view internal data gathered and stored by RTView (used for troubleshooting with SL Technical Support). Displays in this View are:

- "Alert Administration": Displays active alerts and provides interface to modify, enable and manage alerts.
- "Alert Overrides Admin": Set and modify alert overrides. Access this display from the **Alert Administration** display.
- "Cache Table": View cached data that RTView is capturing and maintaining, and use this data use this for debugging with SL Technical Support.

Alert Administration

The Alert Administration display allows an administrator to enable/disable alerts and manage alert definitions by setting thresholds and durations. The table describes the global settings for all alerts on the system.

Filter the table content on any column by clicking a column header icon (located to the right of each column label), then choose **Filter**, **Sort Ascending**, **Sort Descending** or **Columns**.

You can apply settings globally or use the **Override Settings** button to define thresholds that are specific to individual items or groups of items.

Global Alert Thresholds

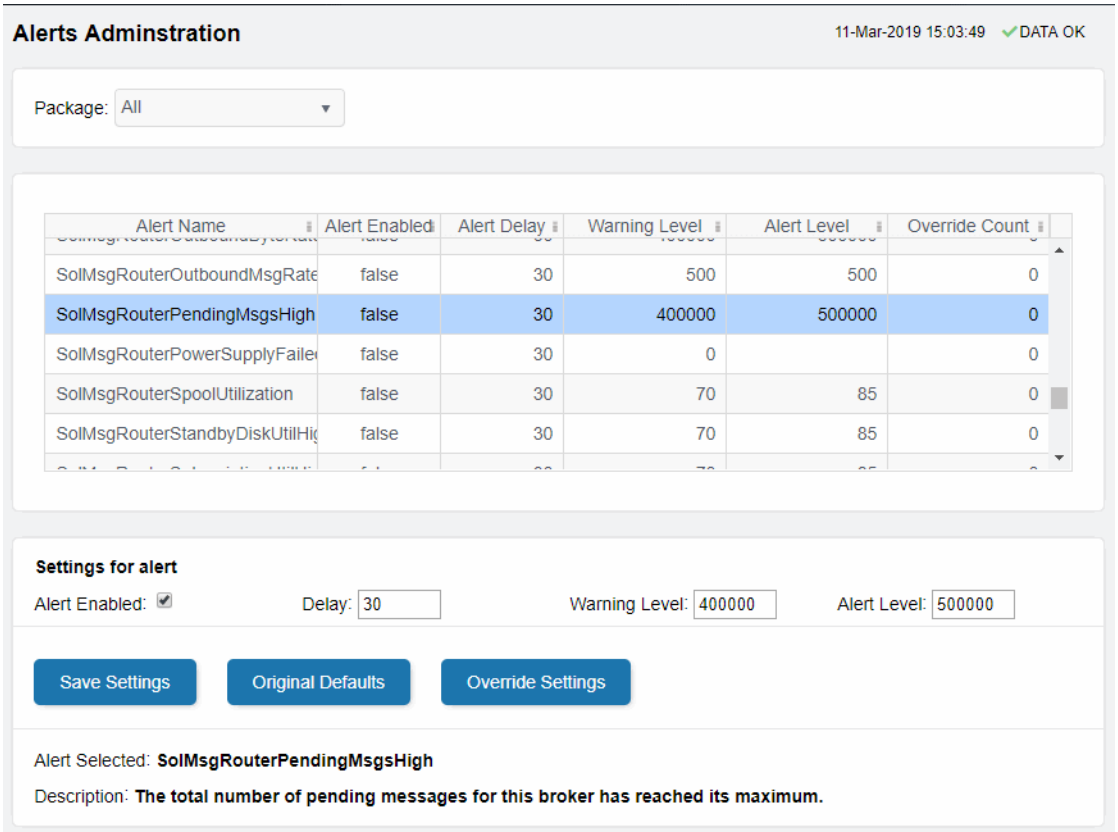
To set a global alert, select an alert, select the **Alert Enabled** check-box, edit the settings available for the alert (which appear below the table), then **Save Settings**.

Override Alert Thresholds

To set an override alert, select an alert, then select **Override Settings** to open the "Alert Overrides Admin" display.

Setting override alerts allows you to set thresholds for a single resource (for example, a single server). Override alerts are useful if the majority of your alerts require the same threshold setting, but there are other alerts that require a different threshold setting. For example, you might not usually be concerned with execution time at a process level, but perhaps certain processes are critical. In this case, you can apply alert thresholds to each process individually.

For details about alerts for Solace, see **Appendix A, Alert Definitions**.



Fields and Data
This display contains:

Table
This table describes the current global settings for all alerts on the system.

Alert Name	The name of the alert.
Alert Enabled	When checked, the alert is enabled globally.
Alert Delay	The amount of time (in seconds) that the value must be above the specified Warning Level or Alarm Level threshold before an alert is executed. **0** is for immediate execution.
Warning Level	The global warning threshold for the selected alert. When the specified value is exceeded a warning is executed.
Alert Level	The global alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed.
Duration (Secs)	The amount of time (in seconds) that the value must be above the specified Warning Level or Alarm Level threshold before an alert is executed. **0** is for immediate execution.
Override Count	The number of times thresholds for this alert have been defined individually in the **Tabular Alert Administration** display. A value of: **-0** indicates that no overrides are applied to the alert. **-1** indicates that the alert does not support overrides.

Settings for alert

Alert Enabled	When checked, the alert is enabled globally.
Alert Delay	Enter the amount of time (in seconds) that the value must be above the specified Warning Level or Alarm Level threshold before an alert is executed. **0** is for immediate execution.
Warning Level	Enter the Global warning threshold for the selected alert. When the specified value is exceeded a warning is executed. To set the warning to occur sooner, reduce the Warning Level value. To set the warning to occur later, increase the Warning Level value.
Alert Level	Enter the Global alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed. To set the alarm to occur sooner, reduce the Alarm Level value. To set the warning to occur later, increase the Alarm Level value. NOTE: For low value-based alerts (such as **EmsQueuesConsumerCountLow**), to set the alarm to occur sooner, increase the Alarm Level value. To set the alarm to occur later, reduce the Alarm Level value.
Save Settings	Click to apply alert settings.
Original Defaults	Click to revert to original alert settings.
Override Settings	Click to set an alert override in the **Alert Overrides Admin** display to set override alerts on the selected alert.

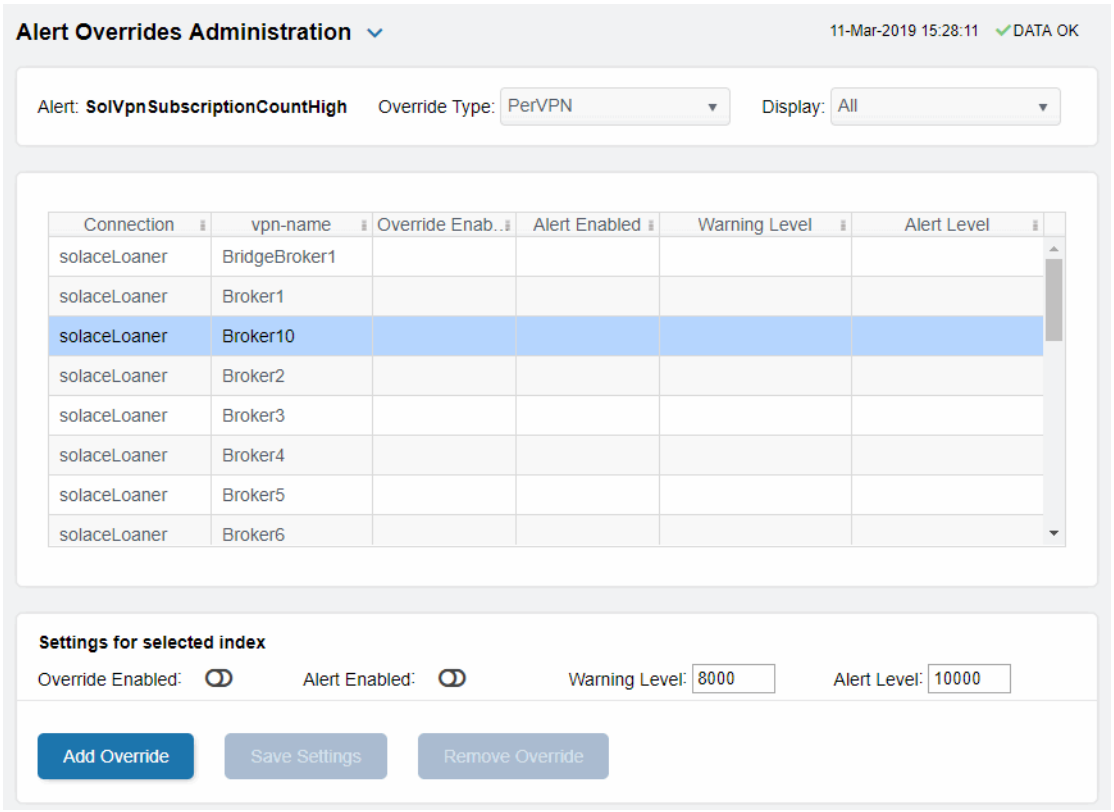
Alert Overrides Admin

Set override alerts (override global alert settings). This display opens when you select an alert in the **Alert Administration** display and then select **Override Settings**.

The options in this display are determined by the type of alert you selected in the **Alert Administration** display.

To set an override alert, select the **Override Type** from the drop-down menu, then select the item you want to apply the override to. The settings that are available for the alert (such as Warning Level) appear under **Settings for selected index**. Make the entries as appropriate, toggle on **Override Enabled**, click **Add Override** and **Save Settings**. The new settings are shown in the table.

For step-by-step instructions setting thresholds for individual alerts, see **Setting Override Alerts**.



Fields and Data
This display includes:

Override Type	Select the type of override.

Display: Filter the list of items in the table by choosing:
- All
- Overriden
- Free

Table The first few columns describe the item, followed by the alert settings columns.

Settings for selcted index

Override Enabled Toggle on to enable the override alert.

Alert Enabled Toggle on to enable the alert, then click **Save Settings**.

Warning Level Set the warning threshold for the selected alert. When the specified value is exceeded a warning is executed. To set the warning to occur sooner, reduce the Warning Level value. To set the warning to occur later, increase the Warning Level value.

Alert Level Set the alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed. To set the alarm to occur sooner, reduce the Alarm Level value. To set the warning to occur later, increase the Alarm Level value.

Add Override Click to add the override to the table.

Save Settings Click to save changes made to alert settings.

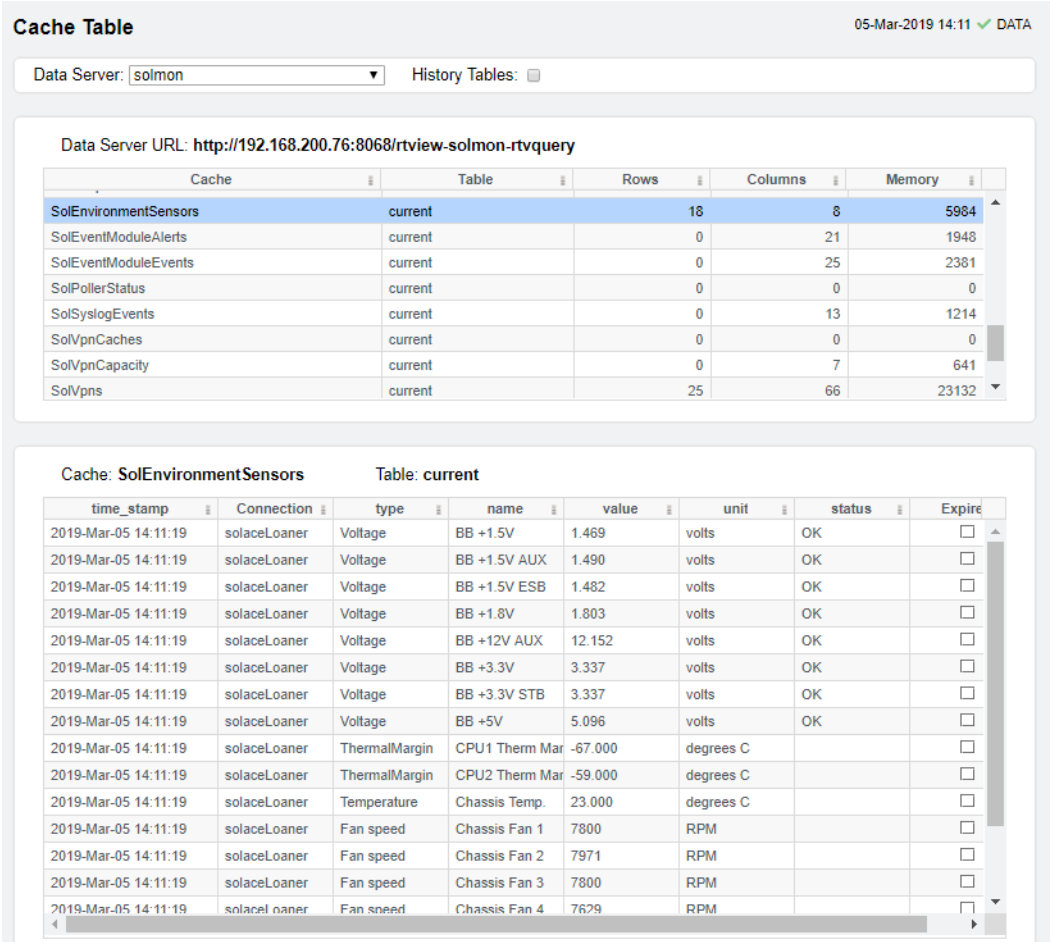
Remove Override Removes the override from the display.

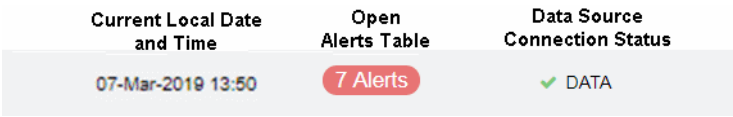
Cache Table

View the raw data that RTView is capturing and maintaining. Select a cache in the upper table to see details about that cache in the lower table.

This low-level option can be useful to identify the source of the problem when the displays are not showing the expected data. Use this data for debugging and troubleshooting with Technical Support.

Choose a cache table from the upper table to see cached data.





Fields and Data
This display includes:

Data Server Select a Data Server from the drop-down menu to view details for in the display.

Max Rows Enter the maximum number of rows to include in the lower table, then click Enter.

History Tables Select to include all defined history tables in the **RTView Cache Tables** list.

RTView Cache Tables
This table lists cache tables for the selected Data Server. Select a cache table to view details in the lower table.

CacheTable	The name of the cache table.	
TableType	The type of cache table.	
	current	This table is a current table which shows the current values for each index.
	current_condensed	This table is a current table with primary compaction configured.
	history	This table is a history table.
	history_condensed	This table is a history table with primary compaction configured.
	history_combo	This table is a history table with primary compaction configured, and which is also configured to store rows of recent raw data followed by rows of older condensed data.
Rows	The number of rows currently in the table.	
Columns	The number of columns currently in the table.	
Memory	The amount of space, in bytes, used by the table.	

(Lower Table)
This table shows the contents of the selected cache table. Available columns vary by cache. For example, a JVM cache table might provide **BootClassPath** and **InputArgument** columns, and a Tomcat cache might provide **RateAccess** and **cacheMaxSize** columns.

Rows	The number of rows currently in the table.

RTView Manager Displays

This section describes RTView Manager displays. Use RTView Manager displays to track the health of Solace Monitor components.

Note that the "MySQL Database" and "Docker Engines" displays are populated with performance data only if you are using the Solace PubSub+ Monitor AMI version.

The RTView Manager organizes displays under the following Views:

- "JVM Process Views"
- "Tomcat Servers"
- "RTView Servers"
- "MySQL Database"
- "Docker Engines"
- "Hosts"
- "Alert Views"

JVM Process Views

These displays present performance data for monitored Java Virtual Machine (JVM) Processes. Use these displays to examine the performance and resource use of JVMs in summary and detail. Any JVM that is enabled for monitoring can be included in these displays. The displays include summary overviews and detail pages with historical trends.

You can set alert thresholds on performance and resource metrics for your JVMs, including **CPU Percent**, **Memory Used** and **Gc Duty cycle**. Alerts are shown in the "All JVMs Heatmap" display. Use the detailed JVM displays to investigate further; for example a **Memory Used** alarm might take you to the "JVM Summary" display to get historical memory use, or a **Gc Duty Cycle** alarm might take you to the "JVM GC Trends" display.

Displays in this View are:

- "All JVMs Heatmap": Heatmap of alert states for all JVM connections
- "All JVMs Table": Table of connection details for all JVM connections.
- "JVM Summary": Table of connection details for a single JVM as well as performance trend graphs.
- "JVM System Properties": Table of system details for a single JVM.
- "JVM Memory Pool Trends": Trend graphs of memory pool utilization.
- "JVM GC Trends": Trend graphs of garbage collection memory utilization.

All JVMs Heatmap

View the most critical alert state for all monitored JVM connections for one or all sources, as well as CPU and memory utilization. The heatmap organizes JVM connections by source and host, and uses color to show the most critical Metric value for each JVM connection associated with the selected source. Each rectangle in the heatmap represents a JVM connection. The rectangle size represents the amount of memory reserved for that process; a larger size is a larger value. Each Metric (selected from the drop-down menu) has a color gradient bar that maps relative values to colors.

Choose one or **All Sources** from the **Source** drop-down menu. Use the check-boxes ☑ to include or exclude labels in the heatmap. Move your mouse over a rectangle to see detailed JVM connection information (including **PID**). Drill-down and investigate by clicking a rectangle in the heatmap to view details for the selected connection in the **JVM Summary** display.

Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data
This display includes:

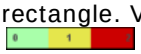
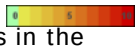
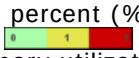
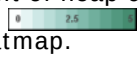
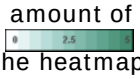
Source Choose one or **All Sources** to display.

JVM Count The number of JVM connections shown in the display.

Show Inactive Select to show inactive connections.

Connection Select to show JVM connections names.

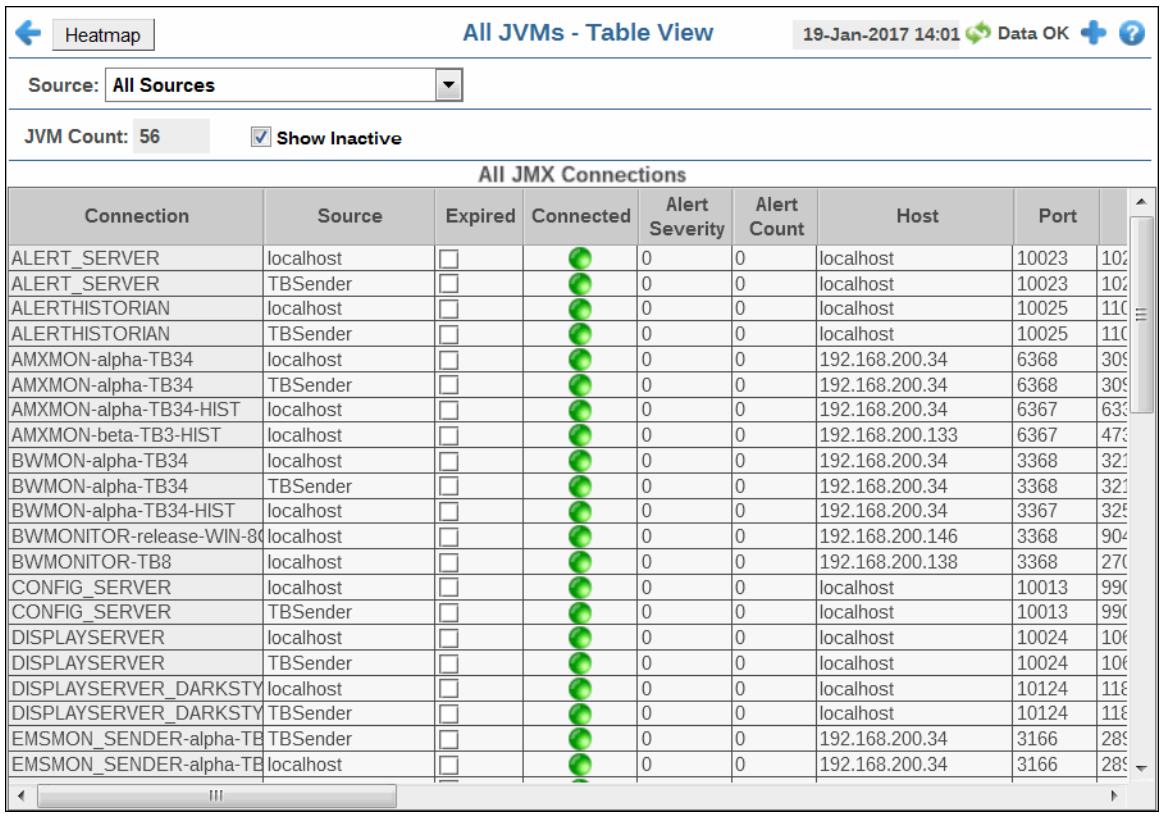
Metric
Select the Metric to display in the heatmap. Each Metric has a color gradient bar that maps relative values to colors.

Alert Severity	The maximum level of alerts in the heatmap rectangle. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity. Red indicates that one or more alerts have reached their alarm threshold. Alerts that have exceeded their specified ALARM LEVEL threshold have an Alert Severity value of **2**. Yellow indicates that one or more alerts have reached their alarm threshold. Alerts that have exceeded their specified WARNING LEVEL threshold have an Alert Severity value of **1**. Green indicates that no alerts have reached their alert thresholds. Alerts that have not exceeded their specified thresholds have an Alert Severity value of **0**.
Alert Count	The number of alerts for the rectangle. The color gradient  bar values range from **0** to the maximum number of alerts in the heatmap.
CPU %	The total percent (%) CPU utilization for the rectangle. The color gradient  bar values range from **0** to the maximum percent (%) CPU utilization in the heatmap.
Memory %	The total percent (%) memory utilization for the rectangle. The color gradient  bar values range from **0** to the maximum percent (%) memory utilization in the heatmap.
Current Heap	The current amount of heap committed for the connection, in kilobytes. The color gradient  bar values range from **0** to the maximum amount in the heatmap.
Used Heap	The total amount of heap used by the connection, in kilobytes. The color gradient  bar values range from **0** to the maximum amount used in the heatmap.

All JVMs Table

View JVM connection details for one or all sources, the most critical alert state for each JVM connection, as well as CPU and memory utilization in a tabular format. Each row in the table is a different connection.

Choose one or **All Sources** from the **Source** drop-down menu. Check the **Show Inactive** box to include inactive connections. The row color for inactive connections is dark red. Click Sort to order column data. Drill-down and investigate by clicking a row in the table to view details for the selected connection in the **JVM Summary** display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Row Color Code:
Tables with colored rows indicate the following:

- Red indicates that one or more alerts exceeded their ALARM LEVEL threshold in the table row.
- Yellow indicates that one or more alerts exceeded their WARNING LEVEL threshold in the table row.
- Green indicates that no alerts exceeded their WARNING or ALARM LEVEL threshold in the table row.

Fields and Data
This display includes:

Source Choose one or **All Sources** to display.

JVM Count: The number of JVM connections in the table.

Show Inactive Select to include inactive connections.

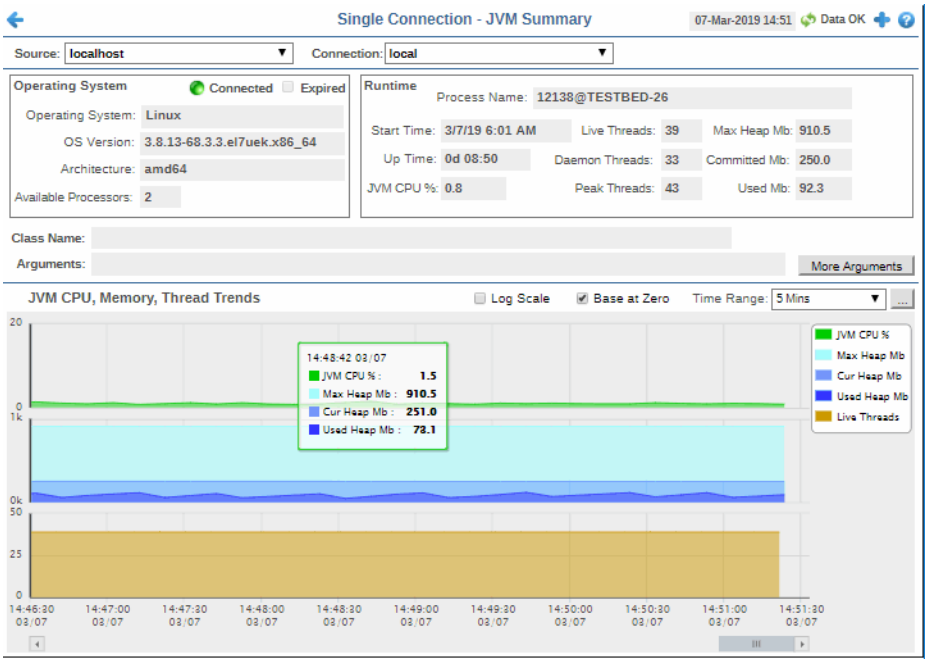
All JMX Connections Table

Connection	The name of the JVM connection.
Source	The name of the source.
Expired	When checked, this connection is expired due to inactivity.
Connected	The data connection state: Disconnected. Connected.
Alert Severity	The maximum level of alerts associated with the connection. Values range from **0** to **2**, where **2** is the greatest Alert Severity. One or more alerts associated with the connection exceeded their ALARM LEVEL threshold. One or more alerts associated with the connection exceeded their WARNING LEVEL threshold. No alerts associated with the connection have exceeded their thresholds.
Alert Count	The current number of alerts for the connection.
Host	The name of the host for this connection.
Port	The port number for the connection.
PID	The connection PID.
CPU %	The amount of CPU, in percent (%) used by this connection.
Max Heap	The maximum amount of heap used by this connection, in kilobytes.
Current Heap	The current amount of committed heap for this connection, in kilobytes.
Used Heap	The current amount of heap used by this connection, in kilobytes.
Mem % Used	The amount of JVM memory used by this connection, in percent (%).
RtvAppType	The type of RTView application, where: **1** is for the Historian, **3** is for the Data Server; **5** is for the Display Server, and **0** is a non-RTView application.
Source	The Data Server that sent this value.
time_stamp	The date and time this row of data was last updated.

JVM Summary

Track JVM memory and CPU usage, get JVM system information, application performance metrics, and input arguments for a single connection. Verify whether the memory usage has reached a plateau. Or, if usage is getting close to the limit, determine whether to allocate more memory.

Use the available drop-down menus or right-click to filter data shown in the display.



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Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data

This display includes:

Source Select the type of connection to the RTView Server.

Connection Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.

Operating System
Displays data pertaining to the operating system running on the host on which the JVM resides.

	Connected	The data connection state: Disconnected. Connected.
	Expired	When checked, this server is expired due to inactivity.
	Operating System	The name of the operating system running on the host on which the JVM resides.
	OS Version	The operating system version.
	Architecture	The ISA used by the processor.
	Available Processors	The total number of processors available to the JVM.
Runtime		
	Process Name	Name of the process.
	Start Time	The date and time that the application started running.
	Up Time	The amount of time the application has been running, in the following format: **0d 00:00** **<days>d <hours>:<minutes>:<seconds>** For example: **10d 08:41:38**
	JVM CPU %	The amount of CPU usage by the JVM, in percent.
	Live Threads	The total number of live threads.
	Daemon Threads	The total number of live daemon threads.
	Peak Threads	The total number of peak live threads since the JVM started or the peak was reset.
	Max Heap Mb	The maximum amount of memory used for memory management by the application in the time range specified. This value may change or be undefined. NOTE: A memory allocation can fail if the JVM attempts to set the **Used** memory allocation to a value greater than the **Committed** memory allocation, even if the amount for **Used** memory is less than or equal to the *Maximum* memory allocation (for example, when the system is low on virtual memory).
	Committed Mb	The amount of memory, in megabytes, guaranteed to be available for use by the JVM. The amount of committed memory can be a fixed or variable size. If set to be a variable size, the amount of committed memory can change over time, as the JVM may release memory to the system. This means that the amount allocated for **Committed** memory could be less than the amount initially allocated. **Committed** memory will always be greater than or equal to the amount allocated for **Used** memory.
	Used Mb	The amount of memory currently used by the application. Memory used includes the memory occupied by all objects including both reachable and unreachable objects.
Class Name	Class name used for JVM.	

Arguments The arguments used to start the application.

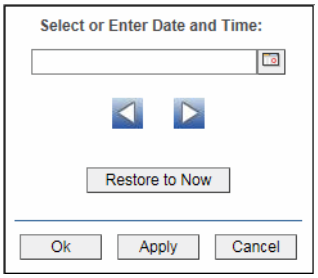
More Arguments Additional arguments used to start the application.

JVM CPU, Memory, Thread Trends
Shows JVM metrics for the selected server.

Log Scale Enable to use a logarithmic scale for the Y axis. 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.

Base at Zero Use zero 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

JVM CPU % Traces the amount of memory, in percent, used by the JVM in the time range specified.

Max Heap Mb Traces the maximum amount of memory used for memory management by the application in the time range specified. This value may change or be undefined.

NOTE: A memory allocation can fail if the JVM attempts to set the **Used** memory allocation to a value greater than the **Committed** memory allocation, even if the amount for **Used** memory is less than or equal to the **Maximum** memory allocation (for example, when the system is low on virtual memory).

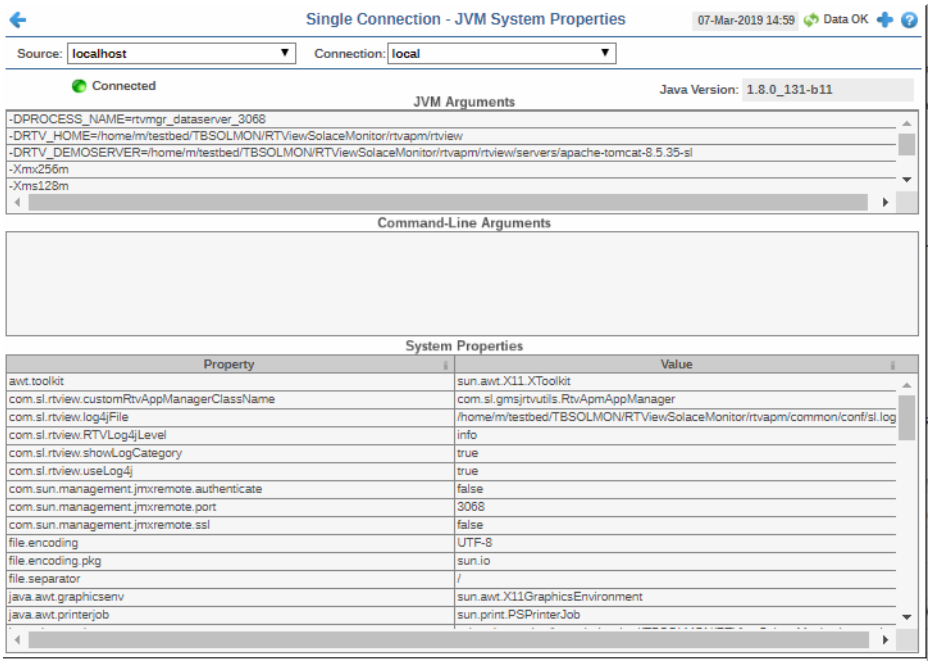
Cur Heap Mb Traces the current amount of memory, in megabytes, used for memory management by the application in the time range specified.

Used Heap Mb Traces the memory currently used by the application.

Live Threads Traces the total number of currently active threads in the time range specified.

JVM System Properties

Track JVM input arguments and system properties for a single connection. Use the available drop-down menus or right-click to filter data shown in the display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data

This display includes:

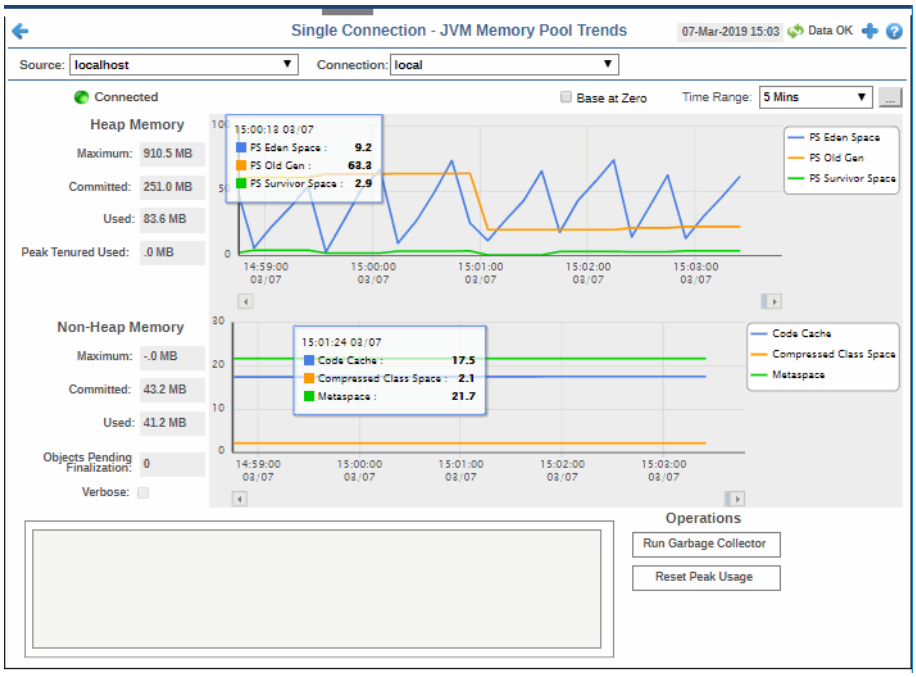
Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.
Connected	The data connection state: Disconnected. Connected.
Java Version	The Java version running on the selected server.
JVM Arguments	The JVM arguments in the **RuntimeMXBean InputArguments** attribute.
Command Line Arguments	Arguments used to start the application.

System Properties
This table lists and describes system property settings.

Property	Name of the property.
Value	Current value of the property.

JVM Memory Pool Trends

Track JVM heap and non-heap memory usage for a single connection. Use the available drop-down menus or right-click to filter data shown in the display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

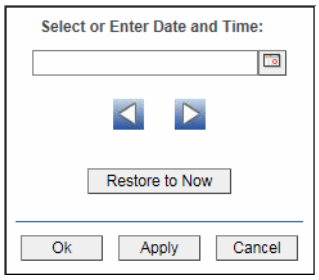
Fields and Data
This display includes:

Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.

Connected The data connection state:
- Disconnected.
- Connected.

Base at Zero Use zero 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

Heap Memory

Maximum	The maximum amount of memory used, in megabytes, for memory management by the application in the time range specified. This value may change or be undefined. NOTE: A memory allocation can fail if the JVM attempts to set the **Used** memory allocation to a value greater than the **Committed** memory allocation, even if the amount for **Used** memory is less than or equal to the **Maximum** memory allocation (for example, when the system is low on virtual memory).
Committed	The amount of memory, in megabytes, guaranteed to be available for use by the JVM. The amount of committed memory can be a fixed or variable size. If set to be a variable size, the amount of committed memory can change over time, as the JVM may release memory to the system. This means that the amount allocated for **Committed** memory could be less than the amount initially allocated. **Committed** memory will always be greater than or equal to the amount allocated for **Used** memory.
Used	The amount of memory, in megabytes, currently used by the application. Memory used includes the memory occupied by all objects including both reachable and unreachable objects.
Peak Tenured Used	The amount of memory, in megabytes, used by tenured JVM objects in the time range specified. Tenured refers to JVM objects contained in a pool that holds objects that have avoided garbage collection and reside in the survivor space. Peak tenured refers to the maximum value of the tenured memory over a specified period of time.
Eden Space	Traces the amount of memory used by the JVM eden pool in the time range specified. Eden refers to the JVM eden pool, which is used to initially allocate memory for most objects.
Survivor Space	Traces the amount of memory used by the JVM survivor pool in the time range specified. The JVM survivor pool holds objects that survive the eden space garbage collection.
Tenured Gen	Traces the amount of memory used by tenured JVM objects in the time range specified. Tenured refers to JVM objects contained in a pool that holds objects that have avoided garbage collection and reside in the survivor space. Peak tenured refers to the maximum value of the tenured memory over a specified period of time.

Non-Heap Memory

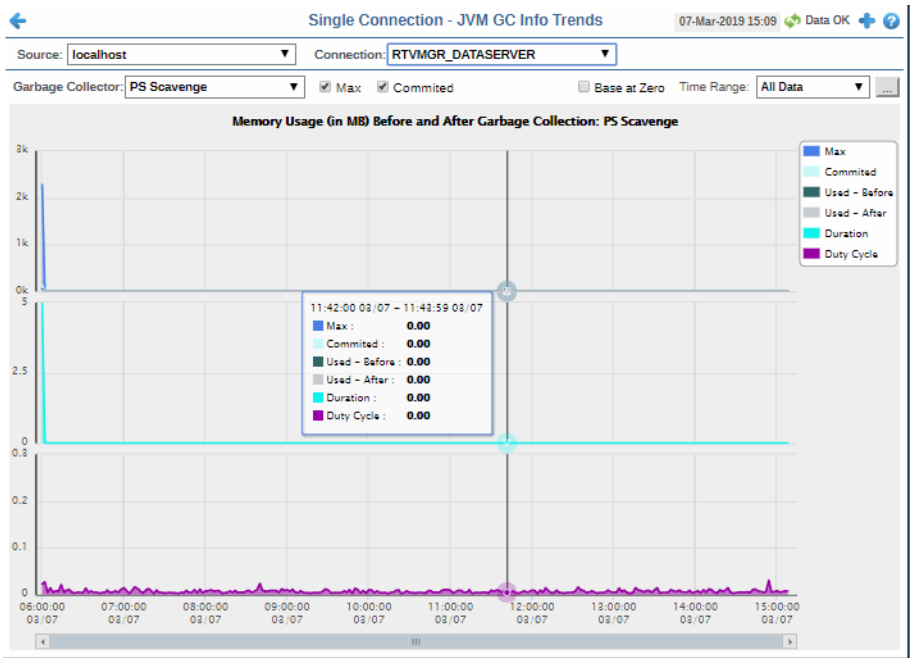
Maximum	The maximum amount of memory, in megabytes, used for JVM non-heap memory management by the application in the time range specified.
Committed	The amount of memory, in megabytes, guaranteed to be available for use by JVM non-heap memory management. The amount of committed memory can be a fixed or variable size. If set to be a variable size, it can change over time, as the JVM may release memory to the system. This means that the amount allocated for **Committed** memory could **be** less than the amount initially allocated. Committed memory will always be greater than or equal to the amount allocated for **Used** memory.
Used	The amount of memory, in megabytes, currently used by the application. Memory used includes the memory occupied by all objects including both reachable and unreachable objects.
Objects Pending Finalization	The value of the **MemoryMXBean ObjectPendingFinalizationCount** attribute.
Verbose	The value of the **MemoryMXBean Verbose** attribute.
Code Cache	Traces the amount of non-heap memory used in the JVM for compilation and storage of native code.
Perm Gen	Traces the amount of memory used by the pool containing reflective data of the virtual machine, such as class and method objects. With JVMs that use class data sharing, this generation is divided into read-only and read-write areas.

Operations

Run Garbage Collector	Performs garbage collection on the selected server.
Reset Peak Usage	Clears peak usage on the selected server.

JVM GC Trends

Track JVM garbage collection memory usage for a single connection. Use the available drop-down menus or right-click to filter data shown in the display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

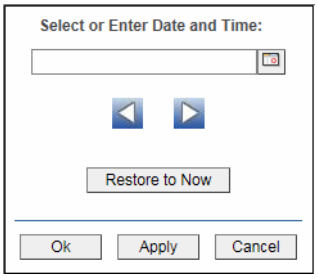
Fields and Data

This display includes:

Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.
Garbage Collector	Select a garbage collection method: **Copy** or **MarkSweepCompact**.
Max	Shows the maximum amount of memory used for JVM garbage collection in the time range specified.
Committed	Shows the amount of memory guaranteed to be available for use by JVM non-heap memory management. The amount of committed memory can be a fixed or variable size. If set to be a variable size, it can change over time, as the JVM may release memory to the system. This means that the amount allocated for **Committed** memory could be less than the amount initially allocated. **Committed** memory will always be greater than or equal to the amount allocated for **Used** memory.

Base at Zero Use zero 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

Memory Usage (in MB) Before and After Garbage Collection

Maximum Traces the maximum amount of memory used by garbage collection in the time range specified. This value may change or be undefined.

NOTE: A memory allocation can fail if the JVM attempts to set the **Used** memory allocation to a value greater than the **Committed** memory allocation, even if the amount for **Used** memory is less than or equal to the **Maximum** memory allocation (for example, when the system is low on virtual memory).

Committed Traces the amount of memory guaranteed to be available for use by the JVM. The amount of committed memory can be a fixed or variable size. If set to be a variable size, the amount of committed memory can change over time, as the JVM may release memory to the system. This means that the amount allocated for **Committed** memory could be less than the amount initially allocated. **Committed** memory will always be greater than or equal to the amount allocated for **Used** memory.

Used - Before Traces the amount of memory used before the last garbage collection.

Used - After Traces the amount of memory used after the last garbage collection.

Duration The duration, in seconds, of garbage collection.

Duty Cycle The percentage of time that the application spends in garbage collection.

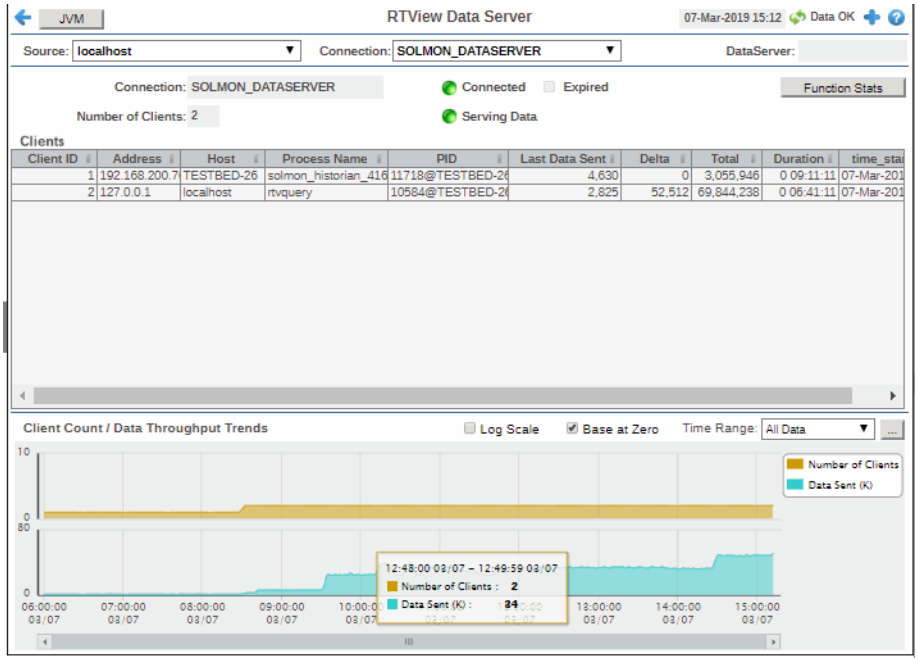
RTView Servers

These displays present performance data for all RTView Servers. Displays in this View are:

- "Data Servers": Shows metrics for RTView Data Servers.
- "Display Servers": Shows metrics for RTView Display Servers.
- "Historian Servers": Shows metrics for RTView Historian Servers.
- "Version Info": Shows the version information.

Data Servers

Track data transfer metrics for RTView Data Servers, client count and throughput trends. Use the available drop-down menus or right-click to filter data shown in the display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.
Connection	The connection selected from the **Connection** drop-down menu.

Number of Clients	The number of clients currently server on this Data Server.
Connected	The Data Server connection state: Disconnected. Connected.
Serving Data	The Data Server is not currently serving data. The Data Server is currently serving data.
Expired	This server has been marked as expired after no activity.
Function Stats	Opens the **RTView Function Stats** display which shows detailed performance statistics for RTView functions in the selected Data Server. This button is only enabled if the RTVMGR has a JMX connection defined for the selected Data Server.

Clients
This table describes all clients on the selected server.

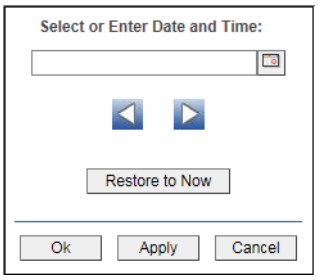
Address	The client IP address.
Client ID	The unique client identifier.
Duration	The amount of time for this client session. Format: **dd HH:MM:SS** **<days> <hours>:<minutes>:<seconds>** **For example:** **10d 08:41:38**
Host	The client host name.
Last Data Sent	The amount of data, in bytes, last sent to the client.
Delta	The amount of data, in bytes, sent since the last update.
Total	The total amount of data, in bytes, sent to the client.
TIME_STAMP	The date and time this row of data was last updated.

Client Count / Data Throughput Trends
Shows throughput metrics for all clients on the selected server.

Log Scale	Enable to use a logarithmic scale for the Y axis. 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.
Base at Zero	Use zero 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 Calendar ... .



By default, the time range end point is the current time. To change the time range end point, click Calendar ... 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.

Number of Clients

Traces the number of clients being served by the Data Server.

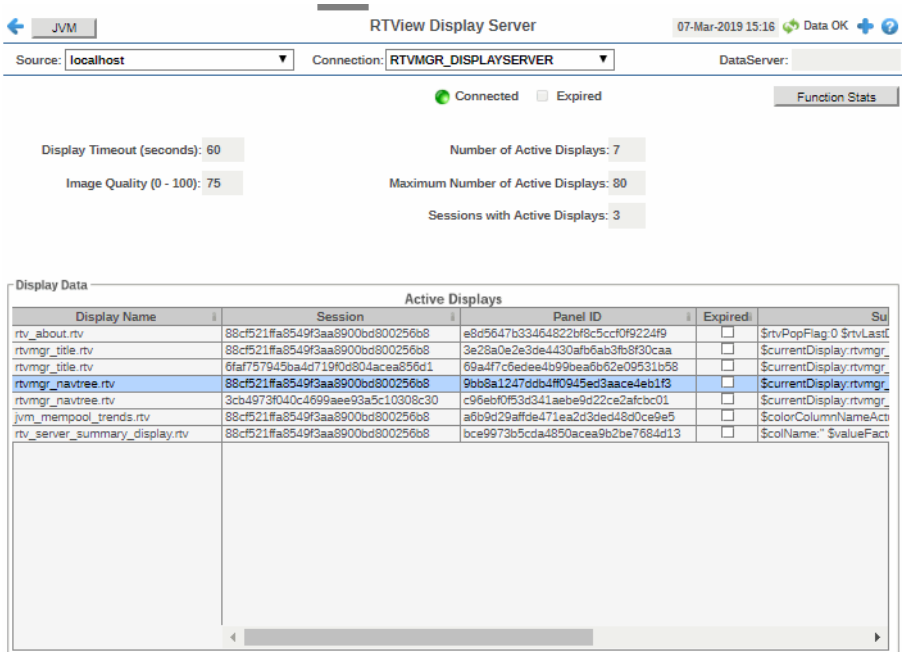
Data Sent

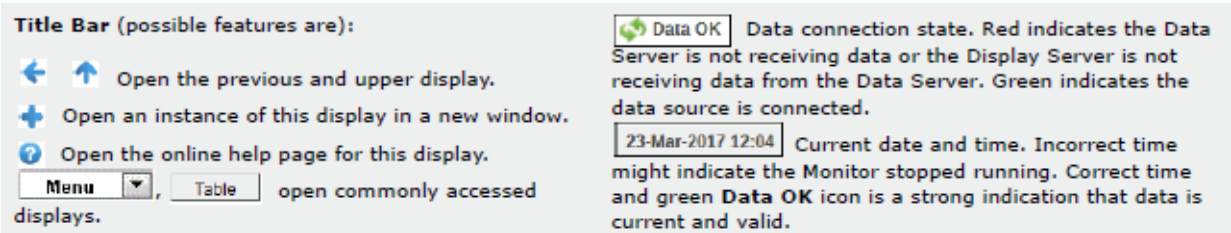
Traces the total amount of data, in Kilobytes, sent to all clients.

Display Servers

Track display utilization metrics for RTView Display Servers.

Use the available drop-down menus or right-click to filter data shown in the display.





Fields and Data
This display includes:

Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.
Connected	The Display Server connection state: Disconnected. Connected.
Expired	This server has been marked as expired after no activity.
Function Stats	Opens the **RTView Function Stats** display which shows detailed performance statistics for RTView functions in the selected Display Server. This button is only enabled if the RTVMGR has a JMX connection defined for the selected Display Server.
Display Timeout (seconds)	The amount of time, in seconds, that a display can be kept in memory after the Display Servlet has stopped requesting it. The default is **60** seconds (to allow faster load time when switching between displays).
Image Quality (0-100)	A value between **0** and **100**, which controls the quality of the generated images. If the value is **100**, the Display Server outputs the highest quality image with the lowest compression. If the value is **0**, the Display Server outputs the lowest quality image using the highest compression. The default is **75**.
Number of Active Displays	The total number of displays currently being viewed by a user.
Maximum Number of Active Displays	The maximum number of displays kept in memory. The default is **20** (to optimize memory used by the Display Server).
Sessions with Active Displays	Number of clients accessing the Display Server.

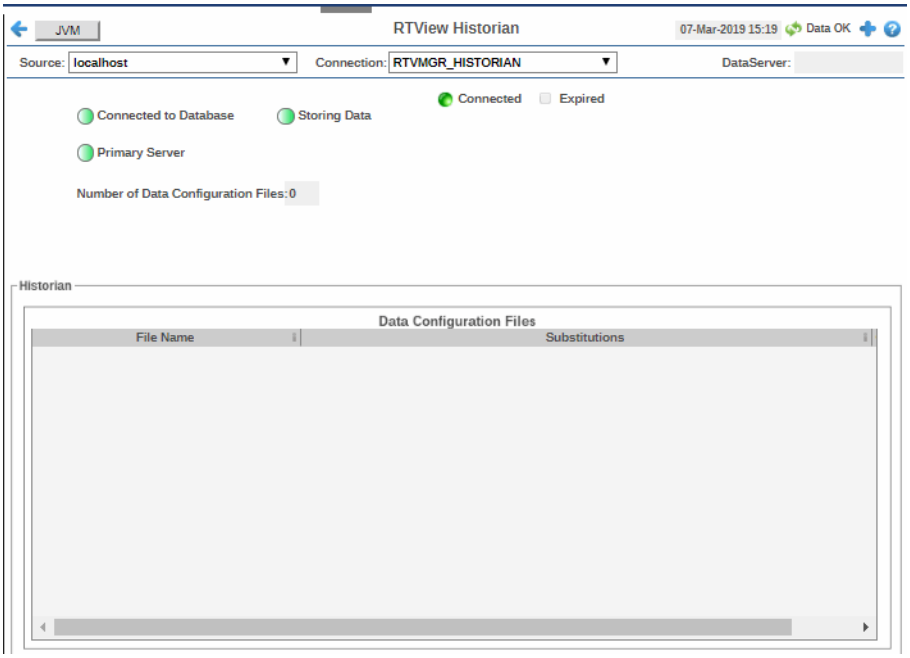
Display Data / Active Displays

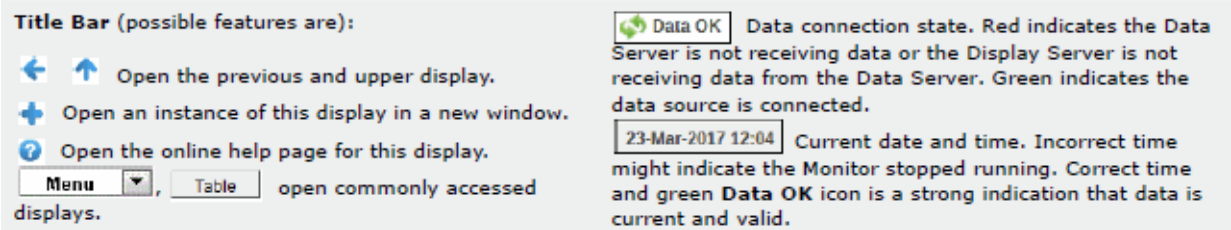
Display Name	The name of the currently open display.
Session	A unique string identifier assigned to each session.
Panel ID	A unique string identifier assigned to each panel. The Display Server loads each display requested by each client into a panel. This ID can be useful in troubleshooting.
Substitutions	Lists the substitutions used for the display.
Last Ref	The amount of time that has elapsed since the display was last requested by a client.
ID	The client ID.
Preloaded	When checked, indicates that the display (**.rtv**) file is configured in the **DISPLAYSERVER.ini** file to be preloaded. The **history_config** option is used to configure display preloading. Preloading a display makes data immediately available. Preloaded displays are not unloaded unless the Display Server is restarted or the display cache is cleared via JMX. This option can be used multiple times to specify multiple displays to preload.

Historian Servers

Track the status of RTView Historian Servers and data configuration file usage. View the caches that are archived by the Historian application, substitution variables associated with the history cache configuration file, as well as the history cache status. You can also stop and start the Historian, and purge data.

Use the available drop-down menus or right-click to filter data shown in the display.





Fields and Data
This display includes:

Source	Select the type of connection to the RTView Server.
Connection	Select an RTView Server from the drop-down menu. Names can be modified in the RTView Server configuration properties file.
Connected	The Historian Server connection state: Disconnected. Connected.
Expired	This server has been marked as expired after no activity.
Connected to Database	The Historian Server database connection state: Disconnected. Connected.
Primary Server	When green, indicates that this Historian, when used within a group of Historians, is the primary group member. If the primary member fails or shuts down, the standby member with the highest priority becomes the primary group member. When red, indicates that the Historian is a secondary server. The Historian Server member state: The Historian Server is a secondary group member. This Historian is the primary group member.
Number of Data Configuration Files	The number of configuration files that are used by the history cache.

Historian / Data Configuration Files

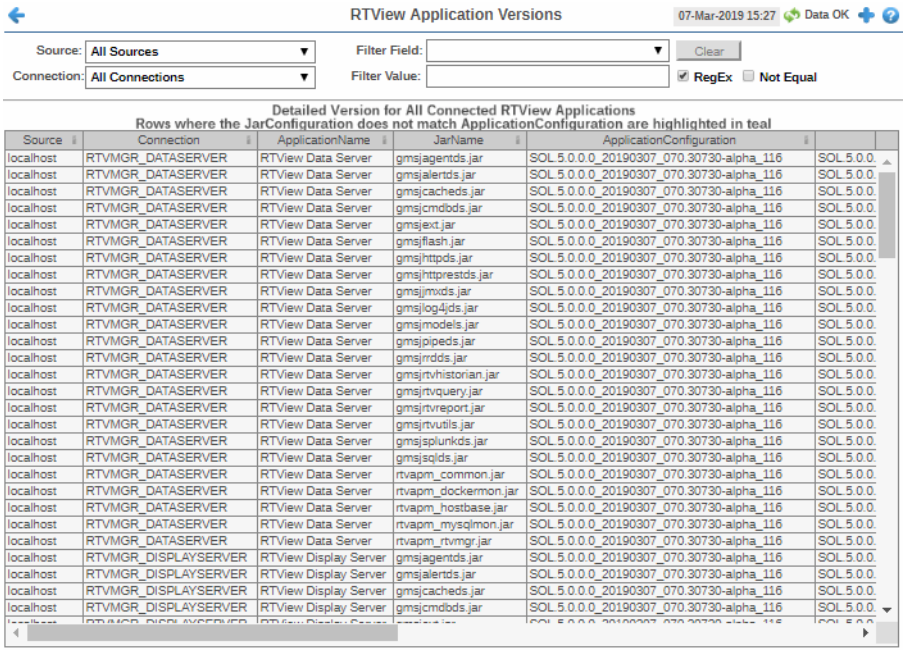
File Name	The name of the history cache configuration file.
Substitutions	Lists the substitutions specified in the history cache configuration file.

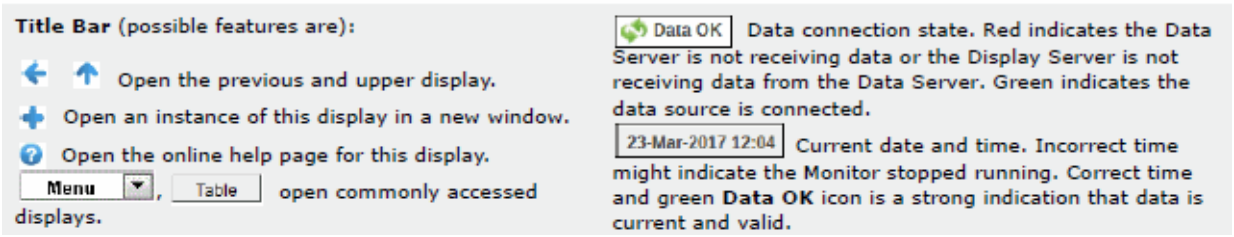
Version Info

This display provides detailed version information for all of the connected RTView applications. You can view specific applications by filtering data using the **Source**, **Connection**, **Filter Field**, and **Filter Value** fields at the top of the display. This display provides valuable information about the version of each jar that is used in each connected RTView application that can be used to help Technical Support when issues arise. Rows in the table where the **JarConfiguration** does not match the **ApplicationConfiguration** are highlighted in teal.

Note: RTView applications running versions previous to this enhancement will only have one row in the table and will display "version info not supported in this version" in the **ApplicationConfiguration** column.

Use the available drop-down menus or right-click to filter data shown in the display.





Fields and Data
This display includes:

Source	Select a filter value for the **Source** column.
Connection	Select a filter value for the **Connection** column.

Filter Field	Select a table column from the drop-down menu to perform a search in: **ApplicationName, JarName, ApplicationConfiguration, JarConfiguration, JarVersionNumber, JarVersionDate, JarReleaseDate,** and **JarMicroVersion**. Filters limit display content and drop-down menu selections to only those items that pass through the selected filter's criteria. If no items match the filter, you might have zero search results (an empty table). Double-clicking on a specific field in the table will populate this field with the selected field's content. For example, double-clicking on the **DataServerName** field in one of the rows displays the entire field's content into this field.
Clear	Clears entries in the **Filter Field** display list, **Filter Value** field, and **Not Equal** check box.
Filter Value	Enter the (case-sensitive) string to search for in the selected **Filter Field**.
RegEx	Select this check box to use the **Filter Value** as a regular expression when filtering. When selected, the **Not Equal** check box displays.
Not Equal	Works in conjunction with the **RegEx** field. Selecting this check box searches for values in the specified **Filter Field** that are NOT equal to the value defined in the **Filter Value** field. For example, if the **Filter Field** specified is **JarMicroVersion**, the **Filter Value** is specified as **317,** and this check box is selected, then only those rows containing **JarMicroVersion** fields NOT EQUAL to **317** will display. This field is only enabled when the **RegEx** check box is checked.
Source	The name of the source of the RTVMGR.
Connection	Lists the name of the JMX connection to the RTView application.
Application Name	Lists the name of the application.
JarName	Lists the name of the jar used in the connected application.
Application Configuration	Lists the configuration string of the application. This string contains the main application version that corresponds to the version information printed to the console at startup.
JarConfiguration	Lists the configuration string for the jar.
JarVersionNumber	Lists the version number for the jar.
JarVersionDate	Lists the version date for the jar.
JarReleaseType	Lists the release type for the jar.
JarMicroVersion	Lists the micro version for the jar.
Expired	When checked, this connection is expired due to inactivity.
time_stamp	The time at which the information in the current row was last received.
DataServerName	The name of the RTVMGR data server connection.

Tomcat Servers

These displays present performance data for monitored Tomcat Application Servers. Use these displays to examine the state and performance of your Tomcat servers as well as all installed web modules. The server displays include summary overviews and detail pages with historical trends. Displays in this View are:

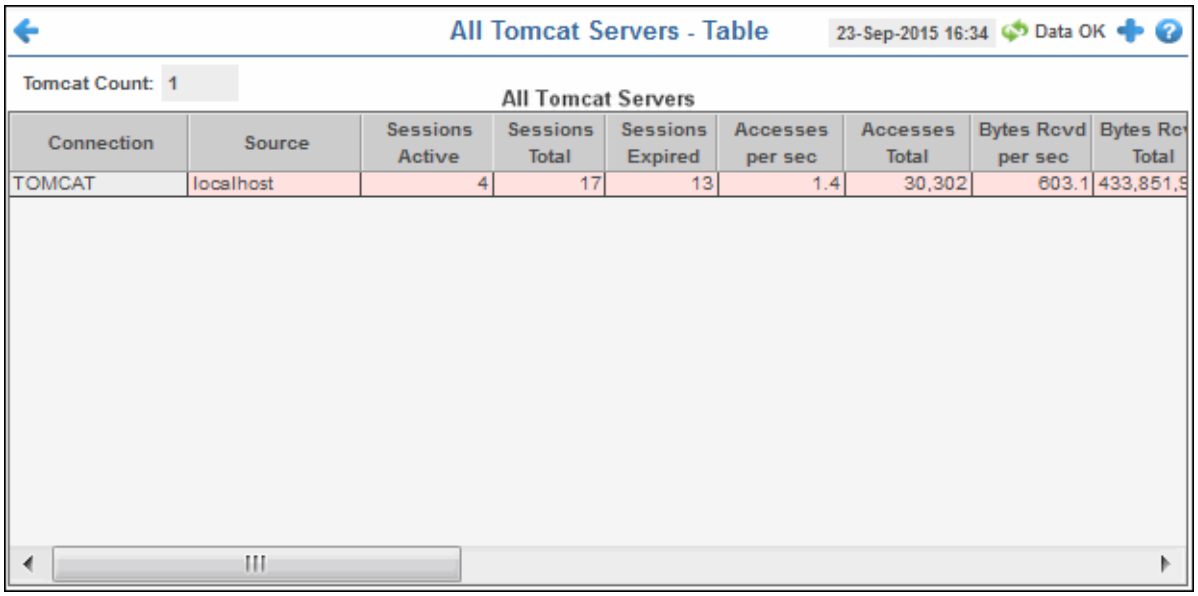
- "All Tomcat Servers": Table of connection details and performance metrics for all Tomcat connections.
- "Tomcat Server Summary": Performance metrics for one Tomcat Server, including current and historic performance metrics.
- "All Applications Heatmap": Heatmap of performance metrics for all Web modules for one Tomcat Server.
- "Single Application Summary": Table and trend graphs of performance metrics for Web modules.

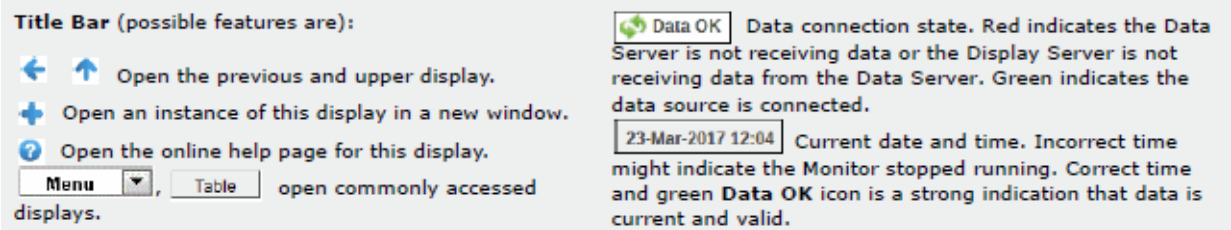
All Tomcat Servers

View Tomcat Server details per connection such as the total number of sessions, bytes sent/received, and processing time. Each row in the table is a different Tomcat Server. The row color for inactive connections is dark red.

Use this display to get Tomcat server session counts, access and request rates, cache hit rates and data transmission metrics.

Drill-down and investigate by clicking a row in the table to view details for the selected connection in the **Service Summary** display.



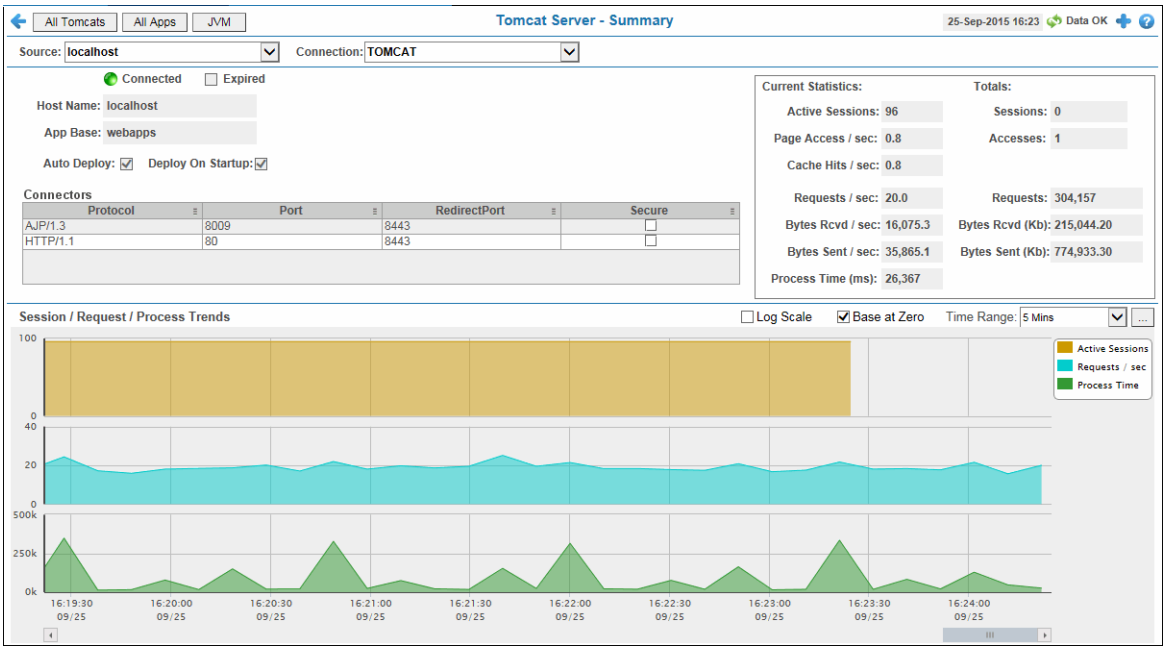


Fields and Data
This display includes:

Tomcat Count	The number of Tomcat connections in the table.
Connection	The name of the Tomcat connection.
Source	The host where the Tomcat Server is running.
Sessions Active	The number of currently active client sessions.
Sessions Total	The total number of client sessions since the server was started.
Sessions Expired	The total number of client sessions that expired since the server was started.
Accesses per sec	The number of times pages are accessed, per second.
Accesses Total	The total number of times pages have been accessed since the server was started.
Bytes Rcvd per sec	The number of bytes received per second.
Bytes Rcvd Total	The total number of bytes received since the server was started.
Bytes Sent per sec	The number of bytes sent per second.
Bytes Sent Total	The total number of bytes sent since the server was started.
Cache Hit Rate	The number of times the cache is accessed, per second.
Requests per sec	The number of requests received, per second.
Requests Total	The total number of requests received since the server was started.
Process Time	The average amount of time, in milliseconds, to process requests.
Error Count	The number of errors that have occurred since the server was started.
appBase	The directory in which Tomcat is installed.
Display Name	The name of the currently open display.
Expired	When checked, this connection is expired due to inactivity.
time_stamp	The date and time this row of data was last updated. Format: **MM/DD/YY HH:MM:SS** **<month>/ <day>/<year> <hours>:<minutes>:<seconds>**

Tomcat Server Summary

Track the performance of one Tomcat Server and get Tomcat hosting and connection details. You can drill down to this display from the Servers table for detailed information and historical trends for a specific server. The trends include Active Sessions, Requests per Sec, and Process Time.



Title Bar (possible features are):

- Open the previous and upper display.
- Open an instance of this display in a new window.
- Open the online help page for this display.
- Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data

This display includes:

Source	Select the host where the Tomcat Server is running.
Connection	Select a Tomcat Server from the drop-down menu.
Connected	The Tomcat Server connection state: Disconnected. Connected.
Expired	When checked, this server is expired due to inactivity.
Host Name	The name of the host where the application resides.
App Base	The directory in which Tomcat modules are installed.

Auto Deploy	When checked, indicates that the Tomcat option, automatic application deployment, is enabled. **Note:** This Tomcat option is set using the **autoDeploy** property in the **server.xml** file, located in the Tomcat **conf** directory. **autoDeploy=true** enables the option.
Deploy On Startup	When checked, indicates that the option to deploy the application on Tomcat startup is enabled. **Note:** This Tomcat option is set using the **deployOnStartup** property in the **server.xml** file, located in the Tomcat **conf** directory. When enabled (**deployOnStartup=true**), applications from the host are automatically deployed.

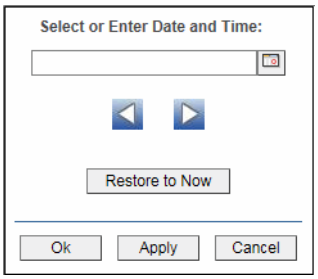
Connectors
This table shows Tomcat application connection information.

Protocol	The protocol used by the Tomcat application on the host.
Port	The port number used by the Tomcat application on the host.
RedirectPort	The redirect port number used by the Tomcat application on the host.
Secure	When checked, specifies that the Tomcat application uses a secure connection on the host.

Current Statistics / Totals

Active Sessions	The number of clients currently in session with the servlet.
Sessions	The total number of client sessions since the server was started.
Page Access / sec	The number of times pages are accessed, per second.
Accesses	The total number of page accesses since the server was started.
Cache Hits / sec	The number of times the cache is accessed, per second.
Requests / sec	The number of requests received, per second.
Requests	The total number of requests since the server was started.
Bytes Rcvd / sec	The number of bytes received, per second.
Bytes Rcvd (Kb)	The number of kilobytes received since the server was started.
Bytes Sent / sec	The number of bytes sent, per second.
Bytes Sent (Kb)	The total number of kilobytes sent since the server was started.
Process Time	The amount of time, in milliseconds, for the servlet to process client requests.

Session / Request / Process Trends
Shows metrics for the selected server.

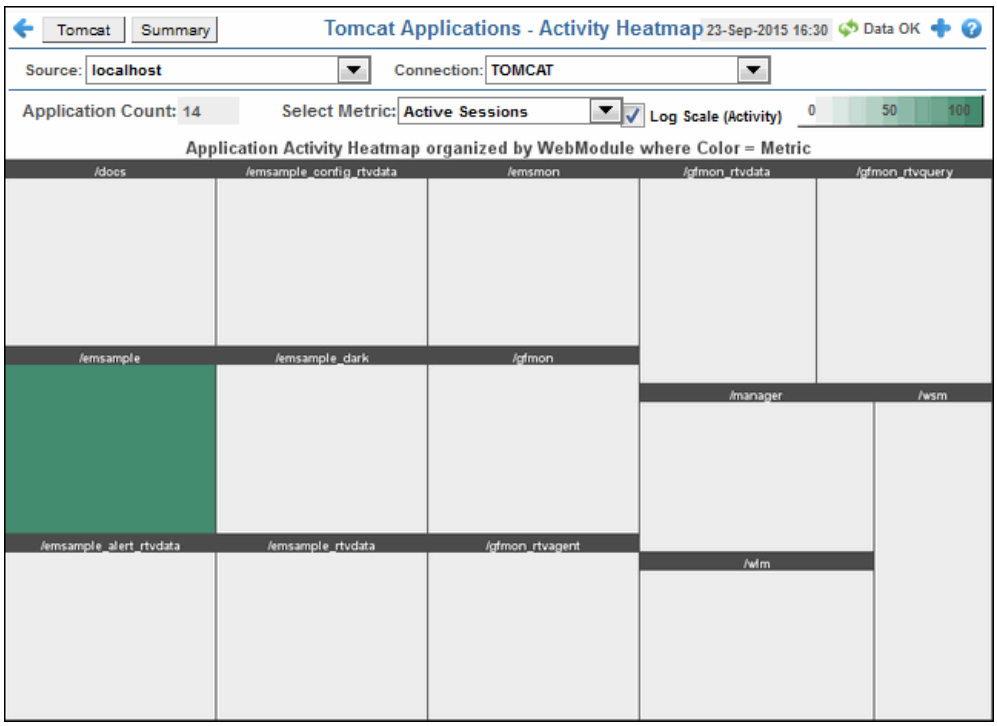
Log Scale	Select to enable a logarithmic scale. Use Log Scale to see usage correlations for data with a wide range of values. For example, if a minority of your data is on a scale of tens, and a majority of your data is on a scale of thousands, the minority of your data is typically not visible in non-log scale graphs. Log Scale makes data on both scales visible by applying logarithmic values rather than actual values to the data.
Base at Zero	Use zero 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 Calendar .  By default, the time range end point is the current time. To change the time range end point, click Calendar 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.
Active Sessions	Traces the number of currently active client sessions.
Requests /sec	Traces the number of requests received, per second.
Process Time	Traces the average amount of time, in milliseconds, to process requests.

All Applications Heatmap

View performance metrics for all monitored Tomcat Web modules for one Tomcat Server. The heatmap organizes Tomcat Web modules by server, and uses color to show the most critical Metric value for each Tomcat connection associated with the selected source. Each rectangle in the heatmap represents a Web module. In this heatmap, the rectangle size is the same for all Web modules. Each Metric (selected from the drop-down menu) has a color gradient bar that maps relative values to colors.

Use this display to see at-a-glance the health of all your web applications. You can select the heatmap color metric from a list including active sessions, access rate, and total access count.

Use the available drop-down menus or right-click to filter data shown in the display. Use the check-boxes ☑ to include or exclude labels in the heatmap. Move your mouse over a rectangle to see additional information. Drill-down and investigate by clicking a rectangle in the heatmap to view details for the selected Web module in the **Application Summary** display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data
This display includes:

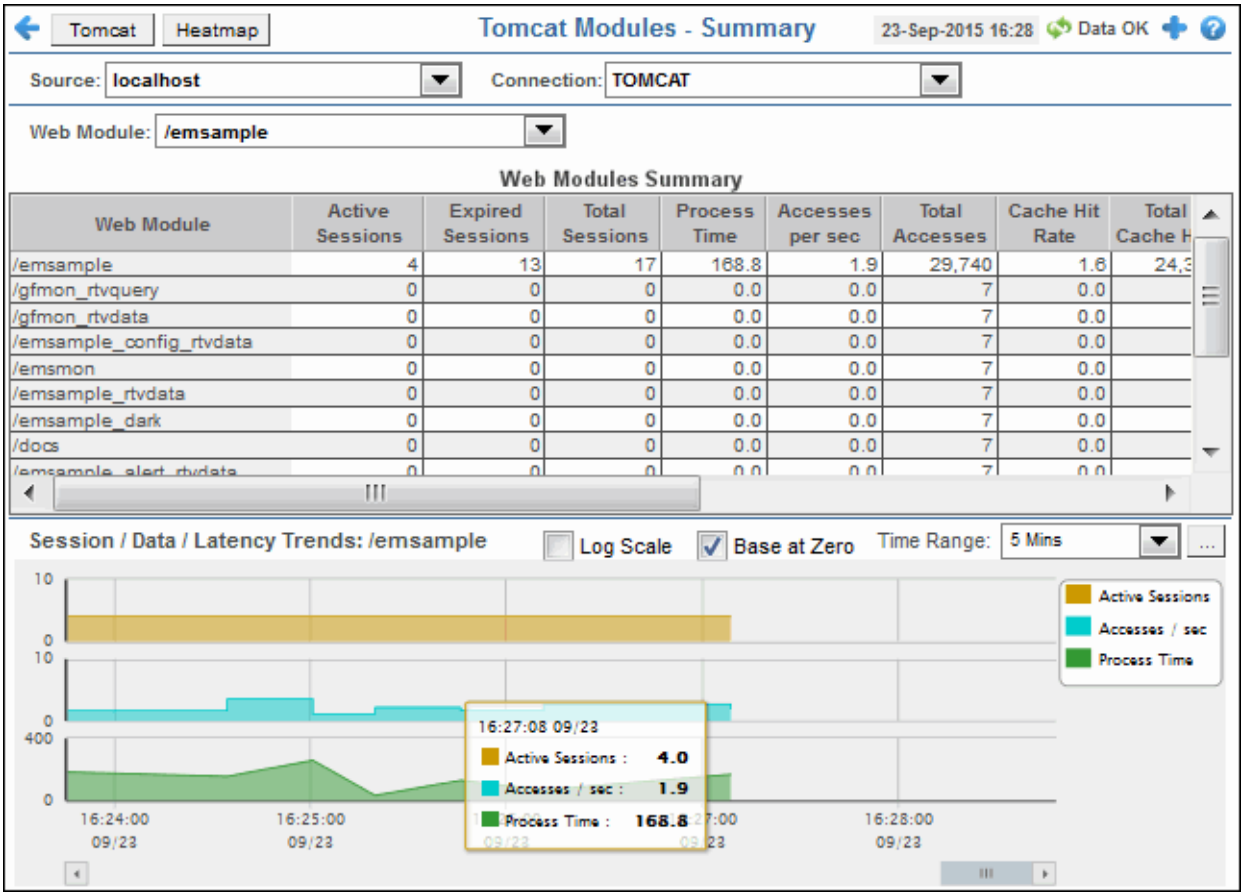
Source	Select the host where the Tomcat Server is running.
Connection	Select a Tomcat Server from the drop-down menu.
Application Count	The number of Tomcat applications in the heatmap.
Log Scale (Activity)	Select to enable a logarithmic scale. Use Log Scale to see usage correlations for data with a 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.
Select Metric	Select the metric to display in the heatmap. Each Metric has a color gradient bar that maps relative values to colors.

Single Application Summary

Track the performance of all web application modules in a server and view utilization details. The table summarizes the sessions, accesses, cache hit and so forth, for all installed web modules. Each row in the table is a different web application module. The row color for inactive modules is dark red. Select a web application module to view metrics in the trend graph.

Use this data to verify response times of your Web application modules.

Use the available drop-down menus or right-click to filter data shown in the display.



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Fields and Data

This display includes:

Source Select the host where the Tomcat Server is running.

Connection Select a Tomcat Server from the drop-down menu. This menu is populated by the selected Source.

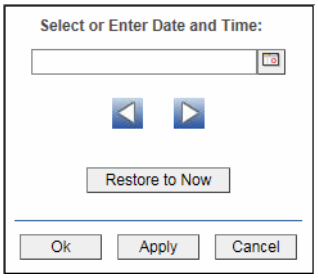
Web Module Select a Web module from the drop-down menu. This menu is populated by the selected Connection. The Web Module you select populates the trend graphs.

Web Module Summary

Web Module	The name of the Web module.
Sessions Active	The number of currently active client sessions.
Sessions Total	The total number of client sessions since the application was started.
Sessions Expired	The total number of client sessions that expired since the application was started.
Accesses per sec	The number of times pages are accessed, per second.
Accesses Total	The total number of times pages have been accessed since the application was started.
Bytes Rcvd per sec	The number of bytes received per second.
Bytes Rcvd Total	The total number of bytes received since the application was started.
Bytes Sent per sec	The number of bytes sent per second.
Bytes Sent Total	The total number of bytes sent since the application was started.
Cache Hit Rate	The number of times the cache is accessed, per second.
Requests per sec	The number of requests received, per second.
Requests Total	The total number of requests received since the application was started.
Process Time	The average amount of time, in milliseconds, to process requests.
Error Count	The number of errors occurred since the application was started.
appBase	The directory in which Tomcat is installed.
Expired	When checked, this connection is expired due to inactivity.
time_stamp	The date and time this row of data was last updated. Format: **MM/DD/YY HH:MM:SS** **<month>/ <day>/<year>** **<hours>:<minutes>:<seconds>**

Session/Data/Latency Trends
Shows metrics for the selected Web module. The Web module can be selected from the **Web Module** drop-down menu or the **Web Modules Summary** table.

Log Scale	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.
Base at Zero	Use zero 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

Active Sessions	Traces the number of currently active client sessions.
Accesses /sec	Traces the number of times pages are accessed, per second.
Process Time	Traces the average amount of time, in milliseconds, to process requests.

MySQL Database

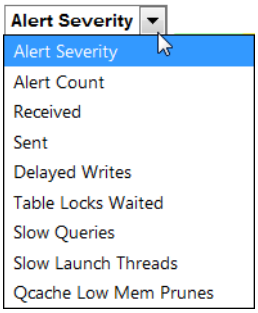
The MySQL Database displays provide extensive visibility into the health and performance of the MySQL database included in the Solace PubSub+ Monitor AMI version. These displays are populated with performance data if you are using the Solace PubSub+ Monitor AMI version.

Displays in this View are:

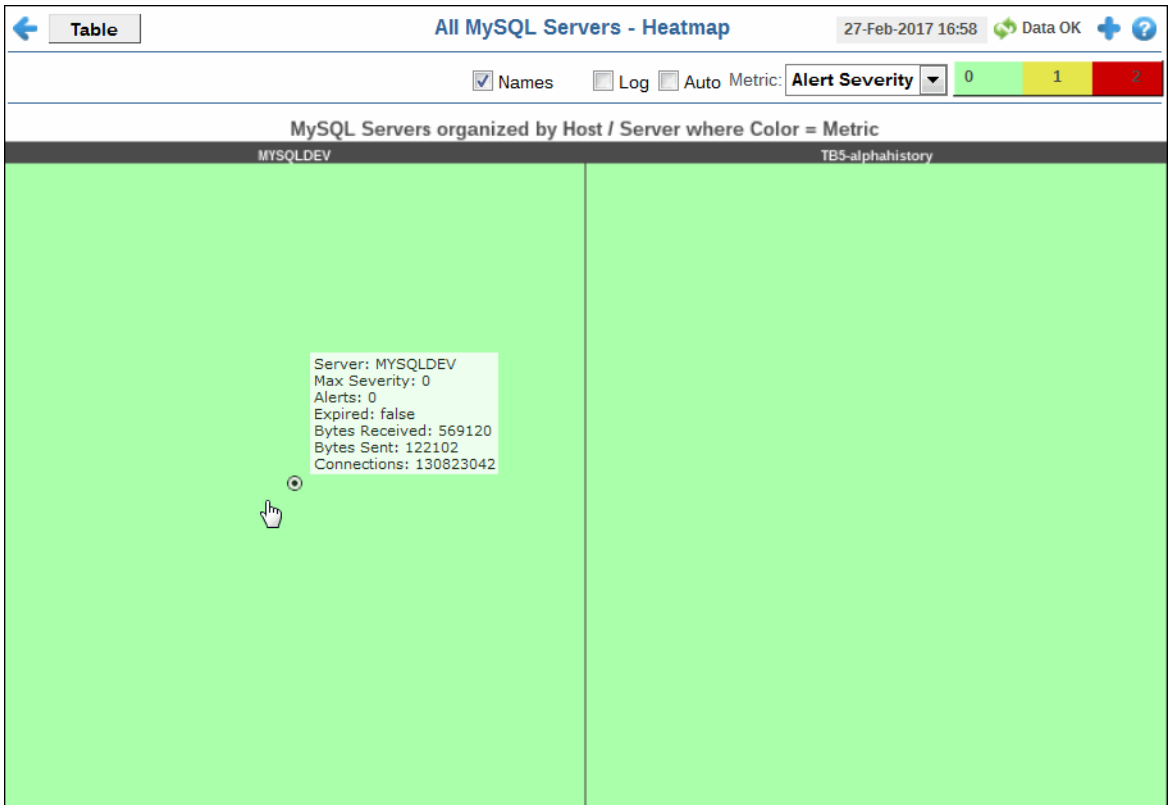
- "All Servers Heatmap": A heatmap view of all servers and their associated metrics.
- "All Servers Table": A tabular view of your servers and their associated metrics.
- "Server Summary": Displays performance, processing, alerts, memory, and trend data for a particular database server.
- "Servers Properties": Displays the values of properties on servers.
- "Servers Operations": Trend graph that traces server queries, slow queries, KB sent and KB received.
- "Servers Operations": A tabular view of cache tables performance and utilization metrics.

All Servers Heatmap

This heatmap display provides an easy-to-view interface that allows you to quickly identify the current status of each of your servers. Choose a metric from the **Metric** drop down menu. By default, this display shows the heatmap based on the **Alert Severity** metric. Other metrics are Alert Count, Received, Sent, Delayed Writes, Table Locks Waited, Slow Queries, Slow Launch Threads and Qcache Low Mem Prunes.



Each rectangle in the heatmap is a different server. Use the **Names** check-box ☑ to include or exclude labels in the heatmap, and mouse over a rectangle to see additional metrics for a server. Click a rectangle to open the "Server Summary" display and see additional details for the selected server.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data:

Names Select this check box to display the names of the instances at the top of each rectangle in the heatmap.

Log Select to this check box 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 Select to enable auto-scaling. When auto-scaling is activated, the color gradient bar's maximum range displays the highest value.

Note: Some metrics auto-scale automatically, even when **Auto** is not selected.

Metric Choose a metric to view in the display. For details about the data, refer to vendor documentation.

Alert Severity

The current alert severity. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count

The total number of critical and warning unacknowledged alerts. The color gradient  bar, populated by the current heatmap, shows 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 average alert count.

Received

The total number of bytes received. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the alarm threshold specified for the **MysqlBytesReceivedHigh** alert. The middle value in the gradient bar indicates the average count.

Sent

The total number of bytes sent. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the alarm threshold specified for the **MysqlBytesSentHigh** alert. The middle value in the gradient bar indicates the average count.

Delayed Writes

The total number of delayed writes. Values range from **0** to the alarm threshold specified for the **MysqlDelayedWrites** alert. The middle value in the gradient bar indicates the average count:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Table Locks Waited

The total number of table locks waited. Values range from **0** to the alarm threshold specified for the **MysqlLocksWaited** alert. The middle value in the gradient bar indicates the average count:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Slow Queries

The total number of slow queries. Values range from **0** to the alarm threshold specified for the **MysqlSlowQueries**. The middle value in the gradient bar indicates the average count:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

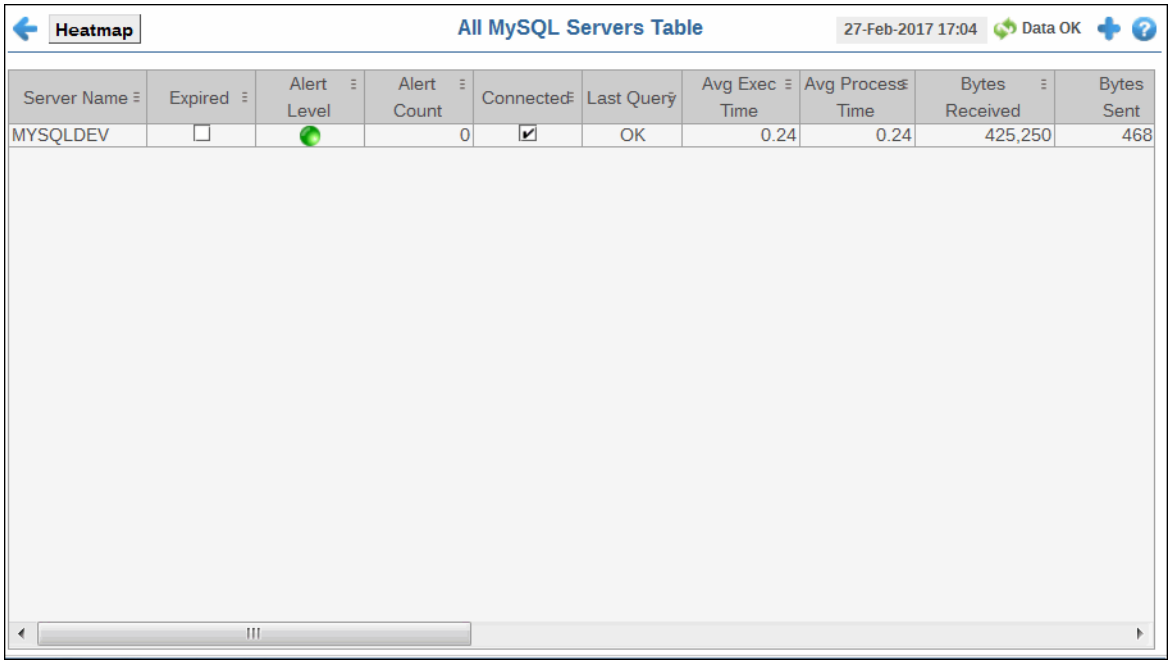
Green indicates that no metrics have exceeded their alert thresholds.

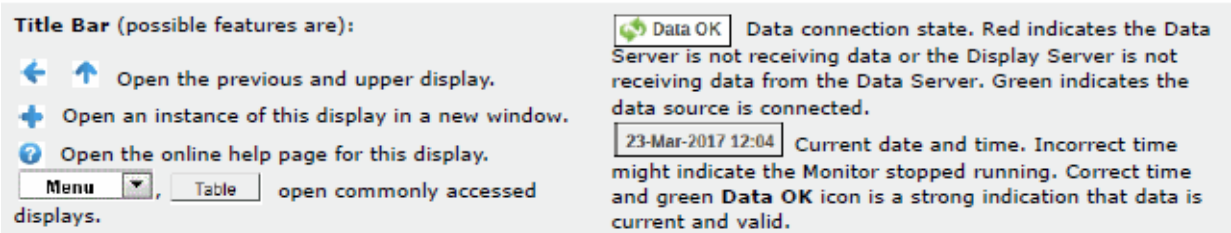
Slow Launch Threads	The total number of slow launch threads. Values range from **0** to the alarm threshold specified for the **MysqlSlowThreads**. The middle value in the gradient bar indicates the average count: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Qcache Low Mem Prunes	The total number of Qcache low memory prunes. Values range from **0** to the alarm threshold specified for the **MysqlQcacheLowMemPrunes**. The middle value in the gradient bar indicates the average count: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.

All Servers Table

This display provides a tabular view of the performance metrics shown in the "All Servers Heatmap" (alert level, alert count, bytes received, and so forth), as well as additional metrics (such as query information and uptime).

Each table row is a different server. Click a column header to sort column data in numerical or alphabetical order, and drill-down and investigate by clicking a row to view details for a server in the "Server Summary" display.





All MySQL Servers Table

Server Name The name of the server.

Expired When checked, performance data about the server has not been received within the time specified (in seconds) in the **$mysqlRowExpirationTime** field in the **conf\rtvapm_mysqlmon.properties** file. The **$mysqlRowExpirationTimeForDelete** field allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response from the server. To view/edit the current values, modify the following lines in the **.properties** file:

```
############################
# CACHE / HISTORIAN SETTINGS
#
collector.sl.rtview.sub=$mssqlRowExpirationTime:120
collector.sl.rtview.sub=$mssqlRowExpirationTimeForDelete:0
```

In the example above, the **Expired** check box would be checked after 120 seconds, and the row would never be deleted. If **$mysqlRowExpirationTimeForDelete** was set to 3600, then the row would be removed from the table after 3600 seconds.

Alert Level The current alert severity.

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count The total number of alerts for the server.

Connected When checked, the server is connected.

Last Query The status of the last query made:

Avg Exec Time The average amount of execution time, in seconds.

Avg Process Time The average amount of process time, in seconds.

Bytes Received The total number of bytes received since the server was last started.

Connections The total number of connections since the server was last started.

Delayed Writes The total number of delayed writes.

Queries The total number of queries.

Query Objects The total number of query objects.

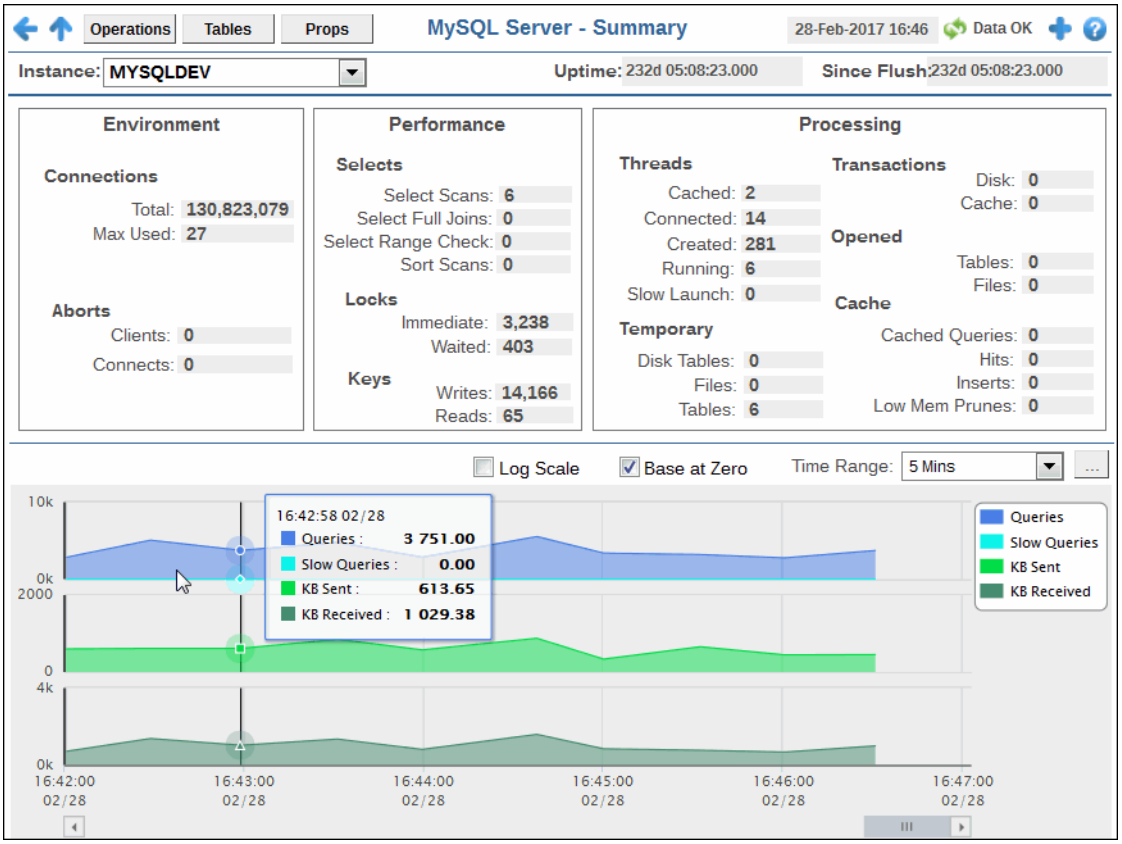
Slow Queries The total number of slow queries.

Total Executions The total number of executions.

Uptime	The amount of time since the server was last started, in seconds.
Concurrent	When checked, the database allows concurrent usage.
Enabled	When checked, the database is enabled for usage.
Timestamp	The data and time of the last data update.

Server Summary

View connection, performance and processing details for a single MySQL database server, as well as trending data for the number of kilobytes received and queries. Choose an instance from the **Instance** drop-down menu. Mouse over the trend graph to see performance metrics with time stamps.



Title Bar (possible features are):

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Open an instance of this display in a new window.

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Menu, Table open commonly accessed displays.

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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:

Instance: Select the instance for which you want to show data in the display.

Fields and Data: For details about the data in this display, please refer to vendor documentation.

Uptime The amount of time since the server was last started, in number of days, hours, minutes and seconds.

Since Flush The amount of time since the last flush, in number of days, hours, minutes and seconds.

Trend Graph Traces the following:

Queries: Traces the amount queries per second.

Slow Queries: Traces the amount of slow queries per second.

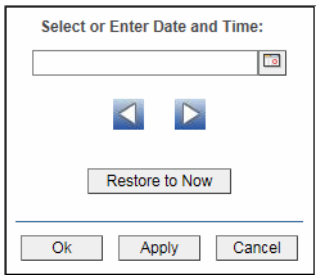
KB Sent: Traces the number of kilobytes sent per second.

KB Received: Traces the number of kilobytes received per second.

Log Select to this check box 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.

Base at Zero Select to use zero (**0**) 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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**.

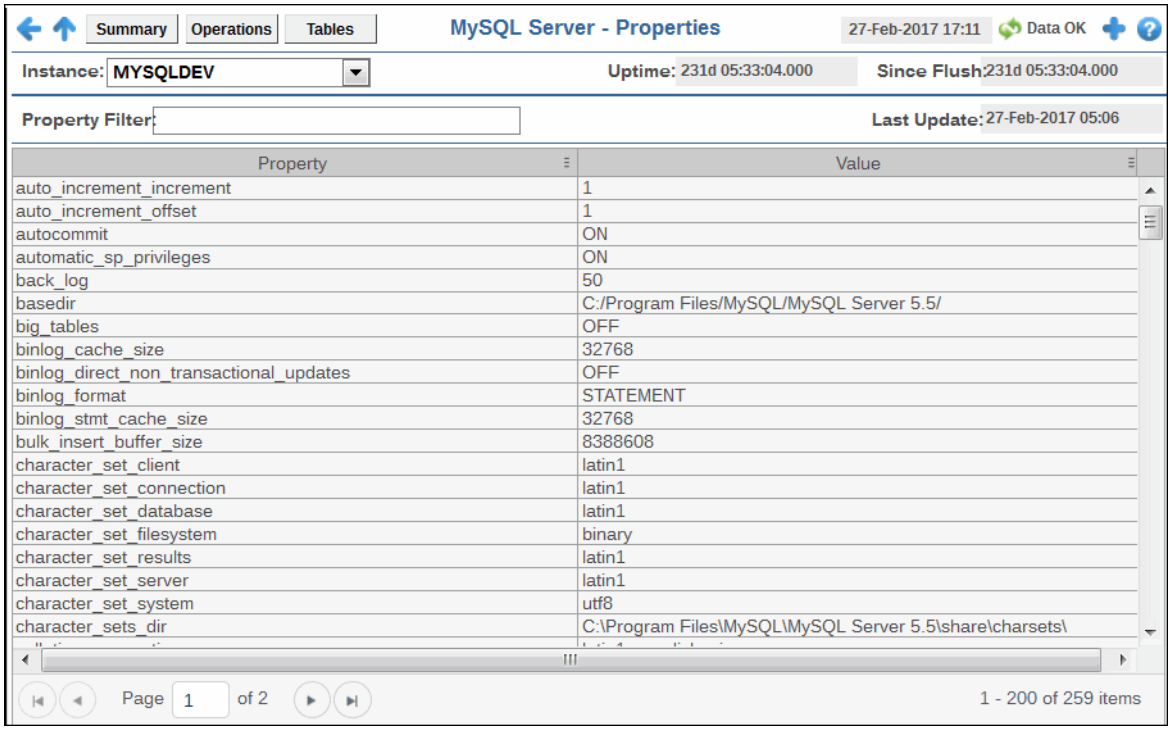
Use the navigation arrows to move forward or backward one time period. NOTE: The time period is determined by your selection from the **Time Range** drop-down menu.

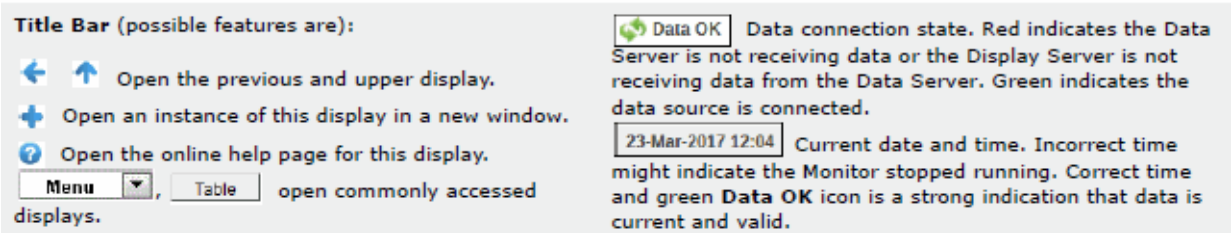
Click **Restore to Now** to reset the time range end point to the current time.

Servers Properties

View properties and property values for a single MySQL database server.

Choose an instance from the **Instance** drop-down menu. Each table row is a different property for the selected instance. Enter a search string in the **Property Filter** field to limit the number of table rows. Click a column header to sort column data in numerical or alphabetical order.





Filter By:

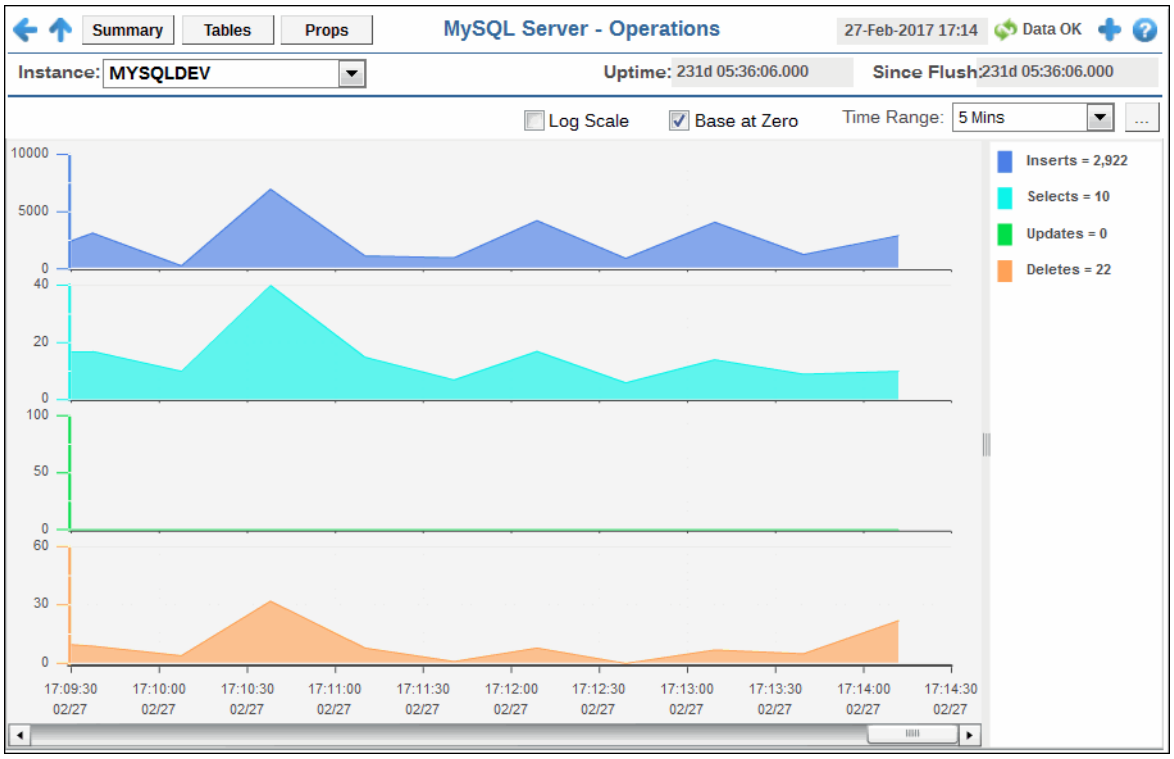
Instance	Select the database for which you want to show data in the display.

Fields and Data:

Uptime	The amount of time since the server was last started, in number of days, hours, minutes and seconds.
Property Filter:	Enter a search string to filter the number of table rows.
Since Flush	The amount of time since the last flush, in number of days, hours, minutes and seconds.

Servers Operations

View trending performance data for a single MySQL database server: **Inserts**, **Selects**, **Updates** and **Deletes**. Choose an instance from the **Instance** drop-down menu. Mouse over the trend graph to see performance metrics with time stamps.



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Filter By:

Instance	Select the database for which you want to show data in the display.

Fields and Data:

Uptime	The amount of time since the server was last started, in number of days, hours, minutes and seconds.
Property Filter:	Enter a search string to filter the number of table rows.
Since Flush	The amount of time since the last flush, in number of days, hours, minutes and seconds.

Trend Graph Traces the following:

Inserts: Traces the number of inserts per second.

Selects: Traces the number of selects per second.

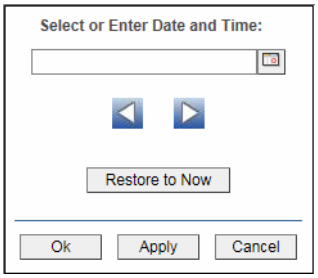
Updates: Traces the number of updates per second.

Deletes: Traces the number of deletes per second.

Log Select to this check box 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.

Base at Zero Select to use zero (**0**) 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 Calendar .



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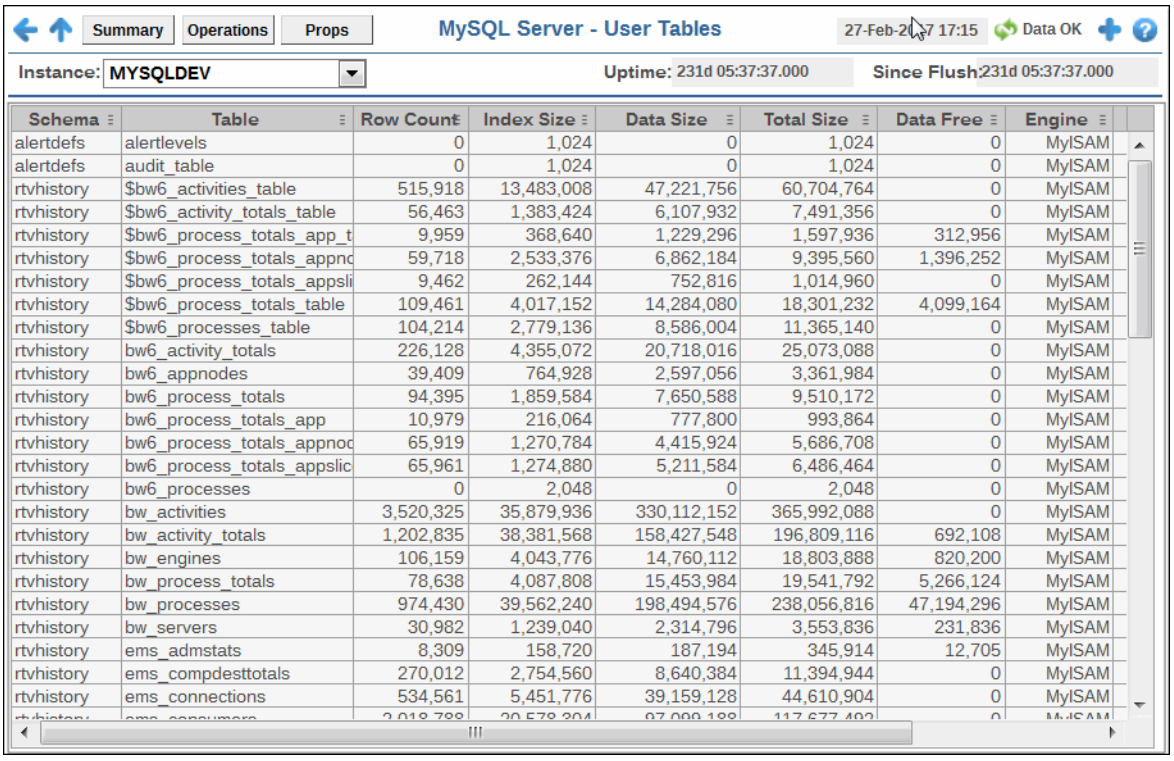
Use the navigation arrows to move forward or backward one time period. NOTE: The time period is determined by your selection from the **Time Range** drop-down menu.

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

User Tables

View performance and utilization details for cache tables for a single MySQL database server. Each row is a different cache table. Choose an instance from the **Instance** drop-down menu. Click a column header to sort column data in numerical or alphabetical order.



Schema	Table	Row Count	Index Size	Data Size	Total Size	Data Free	Engine
alertdefs	alertlevels	0	1,024	0	1,024	0	MyISAM
alertdefs	audit_table	0	1,024	0	1,024	0	MyISAM
rtvhistory	$bw6_activities_table	515,918	13,483,008	47,221,756	60,704,764	0	MyISAM
rtvhistory	$bw6_activity_totals_table	56,463	1,383,424	6,107,932	7,491,356	0	MyISAM
rtvhistory	$bw6_process_totals_app_t	9,959	368,640	1,229,296	1,597,936	312,956	MyISAM
rtvhistory	$bw6_process_totals_appnc	59,718	2,533,376	6,862,184	9,395,560	1,396,252	MyISAM
rtvhistory	$bw6_process_totals_appsli	9,462	262,144	752,816	1,014,960	0	MyISAM
rtvhistory	$bw6_process_totals_table	109,461	4,017,152	14,284,080	18,301,232	4,099,164	MyISAM
rtvhistory	$bw6_processes_table	104,214	2,779,136	8,586,004	11,365,140	0	MyISAM
rtvhistory	bw6_activity_totals	226,128	4,355,072	20,718,016	25,073,088	0	MyISAM
rtvhistory	bw6_appnodes	39,409	764,928	2,597,056	3,361,984	0	MyISAM
rtvhistory	bw6_process_totals	94,395	1,859,584	7,650,588	9,510,172	0	MyISAM
rtvhistory	bw6_process_totals_app	10,979	216,064	777,800	993,864	0	MyISAM
rtvhistory	bw6_process_totals_appnoc	65,919	1,270,784	4,415,924	5,686,708	0	MyISAM
rtvhistory	bw6_process_totals_appslic	65,961	1,274,880	5,211,584	6,486,464	0	MyISAM
rtvhistory	bw6_processes	0	2,048	0	2,048	0	MyISAM
rtvhistory	bw_activities	3,520,325	35,879,936	330,112,152	365,992,088	0	MyISAM
rtvhistory	bw_activity_totals	1,202,835	38,381,568	158,427,548	196,809,116	692,108	MyISAM
rtvhistory	bw_engines	106,159	4,043,776	14,760,112	18,803,888	820,200	MyISAM
rtvhistory	bw_process_totals	78,638	4,087,808	15,453,984	19,541,792	5,266,124	MyISAM
rtvhistory	bw_processes	974,430	39,562,240	198,494,576	238,056,816	47,194,296	MyISAM
rtvhistory	bw_servers	30,982	1,239,040	2,314,796	3,553,836	231,836	MyISAM
rtvhistory	ems_admstats	8,309	158,720	187,194	345,914	12,705	MyISAM
rtvhistory	ems_compdesttotals	270,012	2,754,560	8,640,384	11,394,944	0	MyISAM
rtvhistory	ems_connections	534,561	5,451,776	39,159,128	44,610,904	0	MyISAM

Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:

Instance Select the database for which you want to show data in the display.

Fields and Data: For details about the data in this display, please refer to vendor documentation.

Uptime The amount of time since the server was last started, in number of days, hours, minutes and seconds.

Property Filter: Enter a search string to filter the number of table rows.

Since Flush The amount of time since the last flush, in number of days, hours, minutes and seconds.

Table

Schema The name of the database.

Table	The name of the table.
Row Count	The number of rows currently in the table.
Index Size	The size of the table indexes, in bytes.
Data Size	The size of the data stored in the table, in bytes (Total Size - Index Size = Data Size).
Total Size	The total size of the table, in bytes.
Data Free RX	The amount of available space that can be reclaimed to store new data, in bytes.
Engine	The storage engine handling the SQL operations.
Last Updated	The time of the last data update.

Docker Engines

The Docker Engines displays provide extensive visibility into the health and performance of your Docker engines. These displays are populated with performance data if you are using the Solace PubSub+ Monitor AMI version.

Displays are:

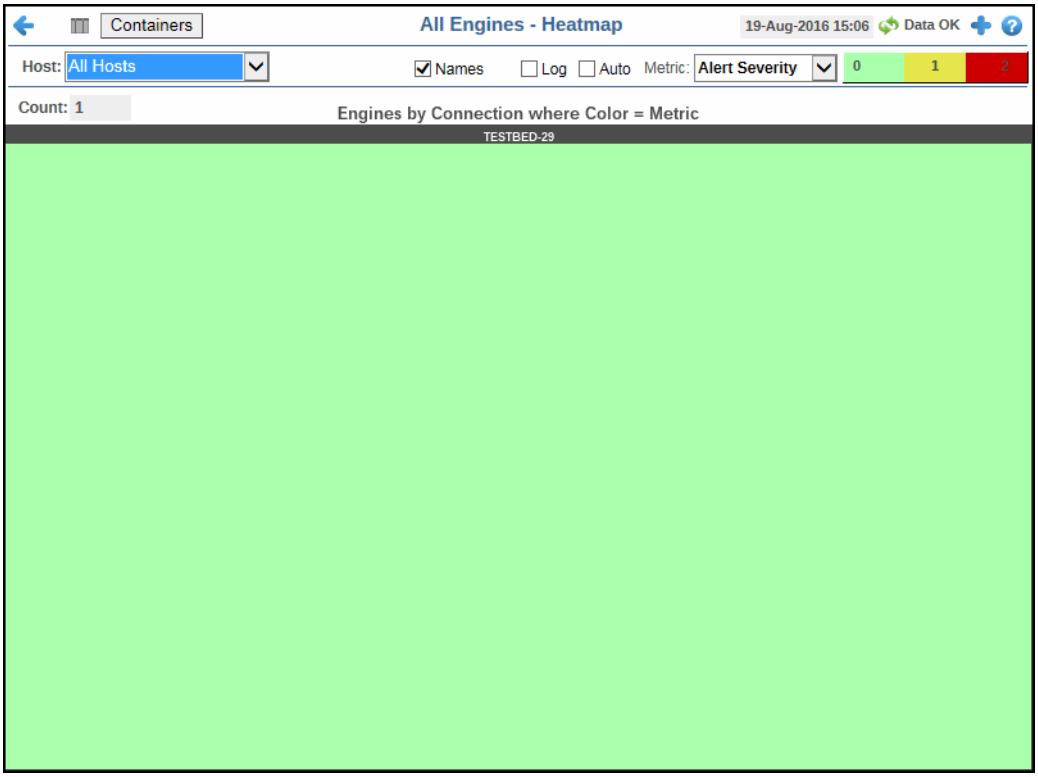
- "Engines Heatmap": A heatmap view of all engines and their associated metrics.
- "Engines Table": A tabular view of your engines and their associated metrics.
- "Engine Summary": Provides additional details and a way to view trending data for a single engine.
- "Containers Heatmap": A color-coded heatmap view of data for all containers for a particular host.
- "Containers Table": A tabular view of data for all containers for a particular host.
- "Container Summary": This display allows you to view current and trending data for a single container for a particular host.

Engines Heatmap

This heatmap display provides an easy-to-view interface that allows you to quickly identify the current status of each of your engines for each available metric. You can view the engines in the heatmap based on the following metrics: the current alert severity, the current alert count, the percentage of CPU used, the amount of memory used, the total incoming bytes, and the total outgoing bytes. By default, this display shows the heatmap based on the **Alert Severity** metric.

You can use the **Names** check-box ☑ to include or exclude labels in the heatmap, and you can mouse over a rectangle to see additional metrics for an engine. Clicking one of the rectangles in the heatmap opens the "Engine Summary" display, which allows you to see additional details for the selected engine.

Note: When the data for the engine being monitored expires, the color of the rectangle representing that engine in the heatmap automatically changes to a color that is not included in the color gradient bar so that you can easily identify when the data is stale. Expired data could occur for a number of reasons including, but not limited to, the connection to the engine may have been lost, or the engine could have experienced a problem and may no longer be up-and-running.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

6,047 The number of items currently in the display.

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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

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

Fields and Data:

Host	Select the host for which you want to show data in the display.
Count	Lists the total number of engines found using the search parameters.
Names	Select this check box to display the names of the engines at the top of each rectangle in the heatmap.
Log	Select this check box 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	Select to enable auto-scaling. When auto-scaling is activated, the color gradient bar's maximum range displays the highest value. **Note:** Some metrics auto-scale automatically, even when **Auto** is not selected.

Metric Choose a metric to view in the display.

Alert Severity The current alert severity. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

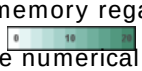
Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count The total number of critical and warning unacknowledged alerts in the engine. The color gradient  bar, populated by the current heatmap, shows 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 average alert count.

CPU Usage The percentage of CPU used by the engine. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocEngineCpuUsageHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Memory The current memory usage by the engine, in kilobytes, which includes all memory regardless of when it was accessed. 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.

Net Bytes In The total number of incoming bytes. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocEngineNetBytesInHigh**. The middle value in the gradient bar indicates the middle value of the range.

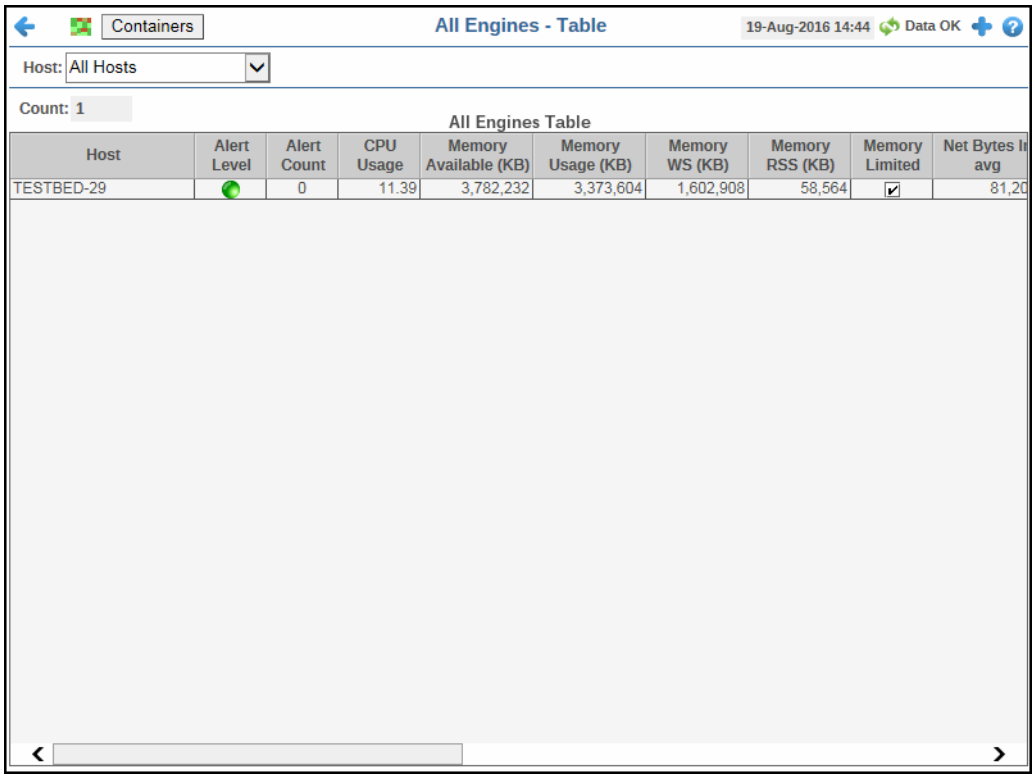
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Net Bytes Out The total number of outgoing bytes.The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocEngineNetBytesOutHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Engines Table

This table provides a view of all of your engines and their associated metric data including host, alert severity, alert count, and the current value of each gathered metric. You can click a column header to sort column data in numerical or alphabetical order, and drill-down and investigate by clicking a row to view details for the selected engine in the "Engine Summary" display



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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

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

Note: The **Containers** button takes you to "Containers Table".

Fields and Data:

Host Select the name of the host (or **All Hosts**) containing the engines for which you want to view data.

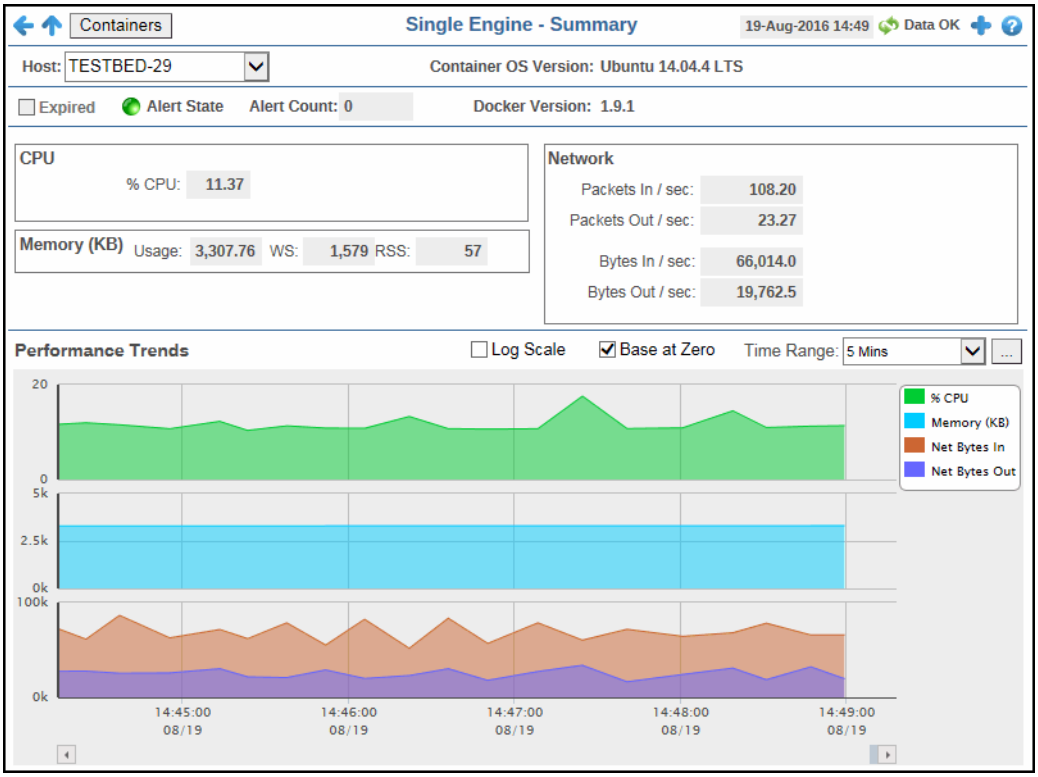
Count	The total number of engines being monitored based on your search criteria.

All Engines Table:

Host	The name of the host.
Alert Level	The current alert severity. Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	The total number of alerts for the host.
CPU Usage	The percentage of CPU used by the engine.
Memory Available (KB)	The amount of memory, in kilobytes, that is available to the engine.
Memory Usage (KB)	The current memory usage by the engine, in kilobytes, which includes all memory regardless of when it was accessed.
Memory WS (KB)	The amount of memory (in kilobytes) in the working set, which includes recently accessed memory, dirty memory, and kernel memory.
Memory RSS (KB)	The amount of anonymous and swap cache memory (including transparent/ hugepages), in kilobytes.
Memory Limited	When checked, the amount of memory available to the engine is limited.
Net Bytes In avg	The average number of incoming bytes per second.
Net Bytes Out avg	The average number of outgoing bytes per second.
Net Packets In avg	The average number of incoming packets per second.
Net Packets Out avg	The average number of outgoing packets per second.
Docker Version	The Docker software version of the Docker Engine.
Container OS Version	The version of the container's operating system on which the docker engine is running.
Container Kernal Version	The version of the container's Kernal in which the docker engine is running.
Expired	When checked, performance data has not been received within the time specified (in seconds) in the **Expire Time** field in the **Duration** region in the RTView Configuration Application > (**Project Name**) > **Solution Package Configuration** > **Docker** > **DATA STORAGE** tab. The **Delete Time** field (also in the **Duration** region) allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response.
Timestamp	The date and time the row data was last updated.

Engine Summary

This display allows you to view current as well as trending data for the percentage of CPU used by the engine, memory usage details, and network data details.



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- 23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.
- Open the **Alert Views - RTView Alerts Table** display.

Note: The **Containers** button takes you to "Containers Table".

Filter By:

Host	Select the host for which you want to show data in the display.
Container OS Version	The version of the container's operating system on which the docker engine is running.

Fields and Data:

Expired When checked, performance data has not been received within the time specified (in seconds) in the **Expire Time** field in the **Duration** region in the RTView Configuration Application > (**Project Name**) > **Solution Package Configuration** > **Docker** > **DATA STORAGE** tab. The **Delete Time** field (also in the **Duration** region) allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response.

Alert State The current alert severity.
- Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.
- Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.
- Green indicates that no metrics have exceeded their alert thresholds.

Alert Count The total number of current alerts.

Docker Version The Docker software version of the Docker Engine.

CPU

% CPU	The percentage of CPU used by the engine.

Memory (KB)

Usage	The current memory usage by the engine, in kilobytes, which includes all memory regardless of when it was accessed.
WS	The amount of memory (in kilobytes) in the working set, which includes recently accessed memory, dirty memory, and kernel memory.
RSS	The Resident Set Size, which is the amount of anonymous and swap cache memory (including transparent/hugepages), in kilobytes.

Network

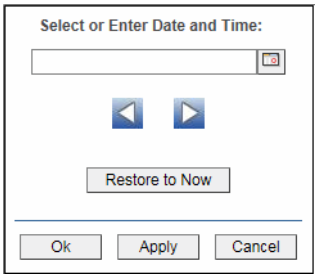
Packets In/sec	The average number of incoming packets per second..
Packets Out/sec	The average number of outgoing packets per second.
Bytes In/sec	The average number of incoming bytes per second.
Bytes Out/sec	The average number of outgoing bytes per second.

Performance Trends Graph Traces the following:
- **% CPU** -- traces the percentage of CPU being used on the engine.
- **Memory (KB)** -- traces the amount of memory, in kilobytes, used by the engine.
- **Net Bytes In** -- traces the average number of incoming bytes per second.
- **Net Bytes Out** -- traces the average number of outgoing bytes per second.

Log Scale 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.

Base at Zero Select to use zero (**0**) 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

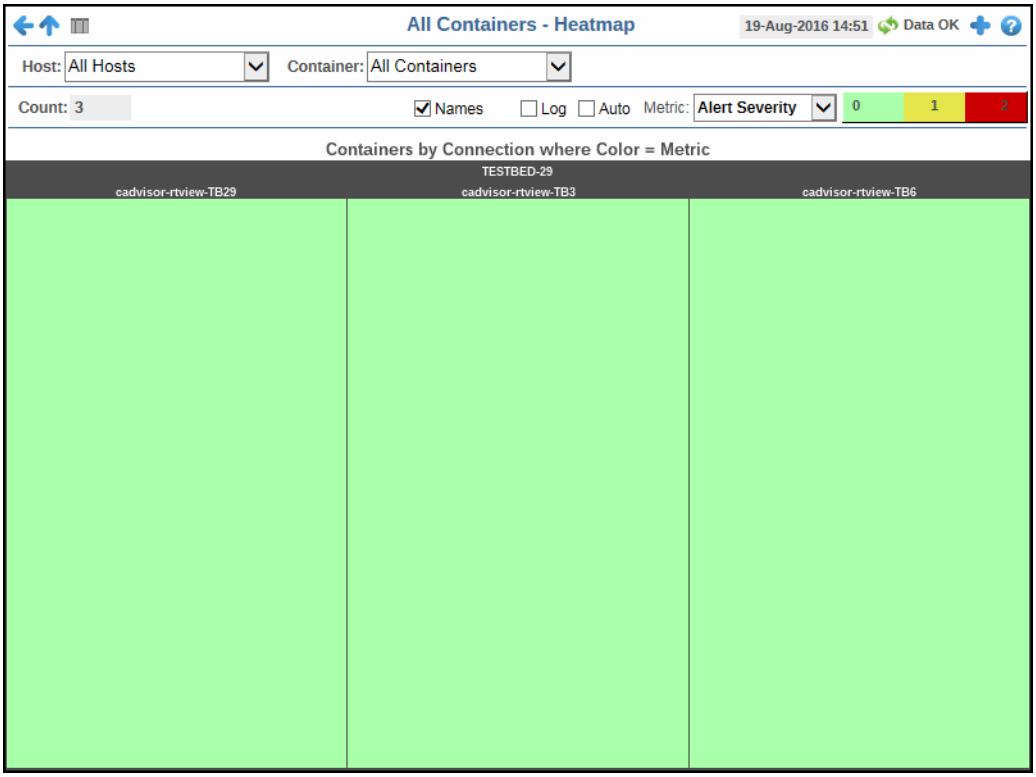
Click **Restore to Now** to reset the time range end point to the current time.

Containers Heatmap

This heatmap display provides an easy-to-view interface that allows you to quickly identify the current status of each of your containers for each available metric. You can view the containers in the heatmap based on the following metrics: the current alert severity, the current alert count, the percentage of CPU used, and the percentage of memory used. By default, this display shows the heatmap based on the **Alert Severity** metric.

You can use the **Names** check-box to include or exclude labels in the heatmap, and you can mouse over a rectangle to see additional metrics for a container. Clicking one of the rectangles in the heatmap opens the "Container Summary" display, which allows you to see additional details for the selected container.

Note: When the data for the container being monitored expires, the color of the rectangle representing that container in the heatmap automatically changes to a color that is not included in the color gradient bar so that you can easily identify when the data is stale. Expired data could occur for a number of reasons including, but not limited to, the connection to the container may have been lost, or the container could have experienced a problem and may no longer be up-and-running.



Title Bar (possible features are):

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23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

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

Fields and Data:

Host	Select the host (or **All Hosts**) for which you want to show data in the heatmap.
Container	Select the container (or **All Containers**) for which you want to show data in the heatmap..
Count	Lists the total number of containers (rows) found using the search parameters.
Names	Select this check box to display the names of the containers at the top of each rectangle in the heatmap.
Log	Select this check box 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 Select to enable auto-scaling. When auto-scaling is activated, the color gradient bar's maximum range displays the highest value.

Note: Some metrics auto-scale automatically, even when **Auto** is not selected.

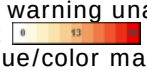
Metric Choose a metric to view in the display.

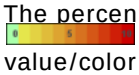
Alert Severity The current alert severity. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

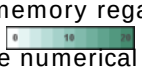
Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

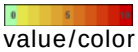
Alert Count The total number of critical and warning unacknowledged alerts in the instance. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of alerts in the heatmap. The middle value in the gradient bar indicates the average alert count.

CPU Usage The percentage of CPU used by the container. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocContainerCpuUsageHigh**. The middle value in the gradient bar indicates the middle value of the range.

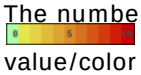
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Memory The current memory usage by the container, in kilobytes, which includes all memory regardless of when it was accessed. 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.

Net Bytes In The number of incoming bytes per second. The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocContainerNetBytesInHigh**. The middle value in the gradient bar indicates the middle value of the range.

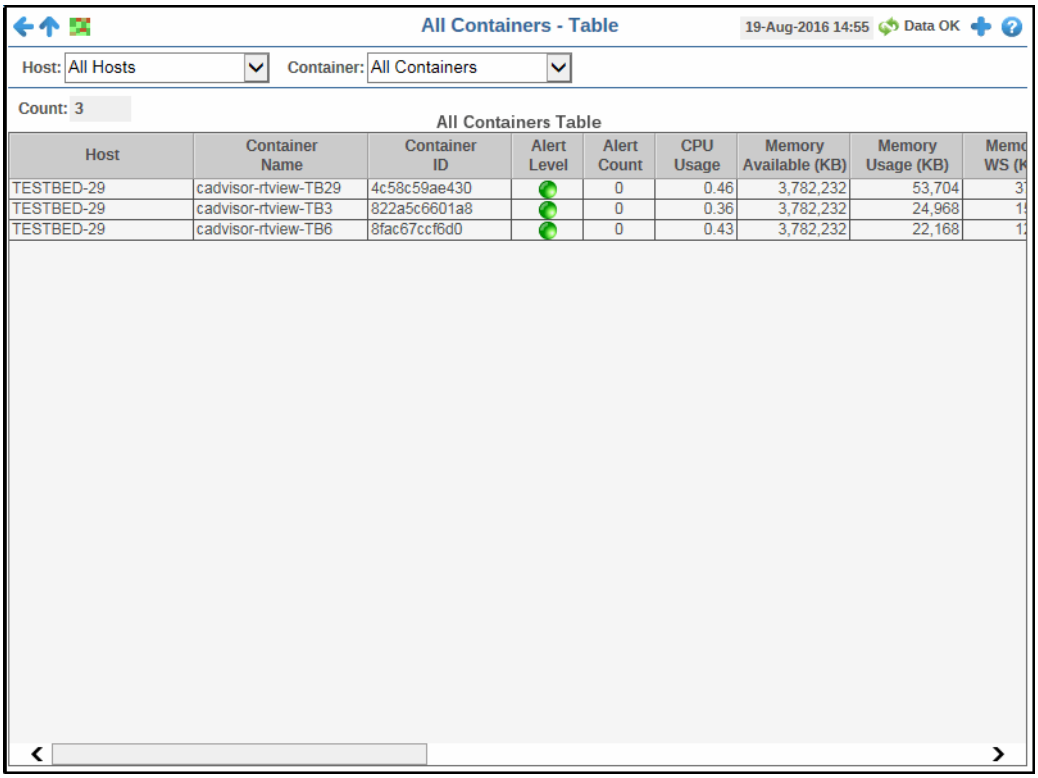
When **Auto** is checked, the numeric values in the color gradient bar show the range of the data being displayed rather than the default values. The middle value changes accordingly to indicate the color of the middle value of the range.

Net Bytes Out The number of outgoing bytes per second.The color gradient  bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from 0 to the defined alert threshold of **DocContainerNetBytesOutHigh**. The middle value in the gradient bar indicates the middle value of the range.

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.

Containers Table

This display allows you to view details in a table format for one container on a particular host, for all containers on a particular host, for a particular container on all hosts, or for all containers on all hosts. You can drill-down and view the details for a particular container in the "Container Summary" display by clicking on a row in the resulting table.



Title Bar (possible features are):

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Open an instance of this display in a new window.

Open the online help page for this display.

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

Filter By:

The display includes these filtering options:

Host	Select the host for which you want to show data in the display.
Container	Select the container (or **All Containers**) for which you want to view data..
Count	Lists the total number of containers (rows) found using the search parameters.

All Containers Table

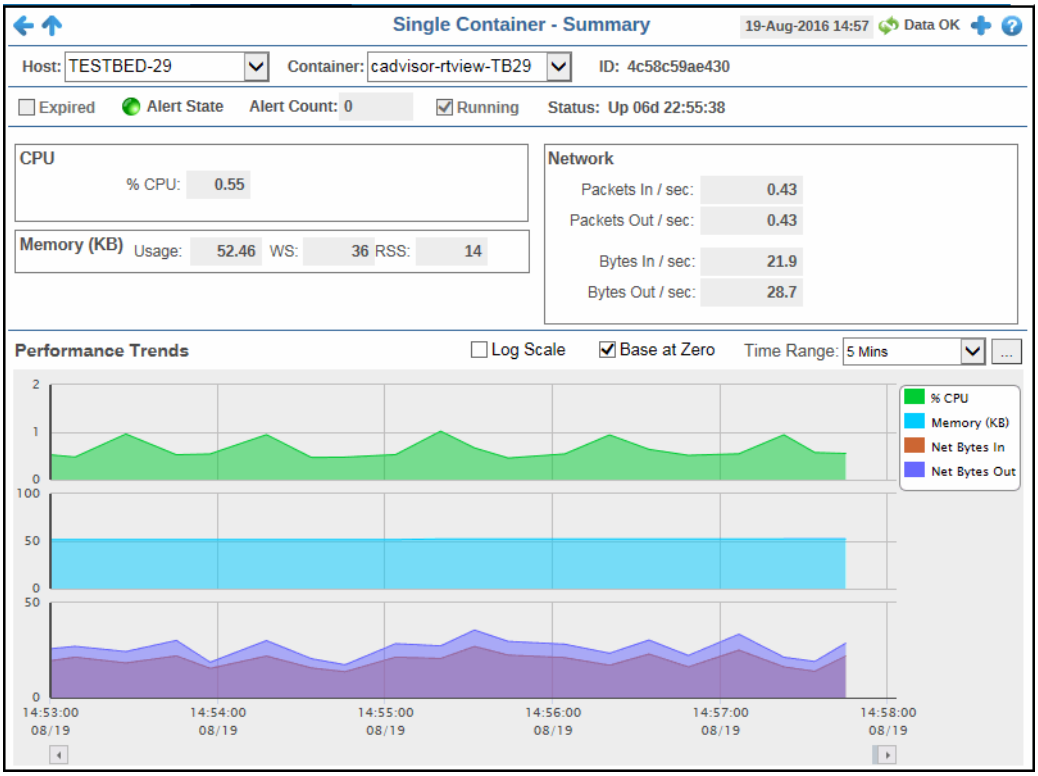
Host	The name of the host.
Container Name	The name of the container.
Container ID	The absolute container name.
Alert Level	The current alert status. Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics have exceeded their alert thresholds.
Alert Count	Total number of alerts for the process.
CPU Usage	The percentage of CPU used by the container.
Memory Available (KB)	The amount of memory, in kilobytes, that is available to the container.
Memory Usage (KB)	Current memory usage by the container, in kilobytes, which includes all memory regardless of when it was accessed.
Memory WS (KB)	The amount of memory (in kilobytes) in the working set, which includes recently accessed memory, dirty memory, and kernel memory.
Memory RSS (KB)	The Resident Set Size, which is the amount of anonymous and swap cache memory (including transparent/hugepages), in kilobytes.
Memory Limited	When checked, the amount of memory available to the container is limited. If not checked, then the amount of memory available to the container is unlimited, which means the amount of memory available to the container is the same as the memory available to the engine.
Net Bytes In avg	The average number of incoming bytes per second.
Net Bytes Out avg	The average number of outgoing bytes per second.
Net Packets In avg	The average number of incoming packets per second.
Net Packets Out avg	The average number of outgoing packets per second.
Uptime	The amount of time (in seconds) that the container has been up and running.
Running	When checked, this check box indicates that the container is running.
Status	The current status of the container. Values are: **Up** - indicates that the container is up and running, and lists the amount of time the container has been up and running (**Uptime**). **Created** - indicates that the container has been created but is currently not in use. **Exited** - indicates that the container has been stopped, and lists the error code as well as the amount of time since the container was stopped.
Starts	The number of times the container (re)started within the time specified (in seconds) in the **$docEventCacheTimeRange** field in the **conf\rtvapm_dockermon.properties** file. The default is 3600 seconds (1 hour). For example, by default, this row column lists the number of times the container has (re)started in the past hour. This number provides a good indication of the stability of the container; the higher the number, the more unstable the container.

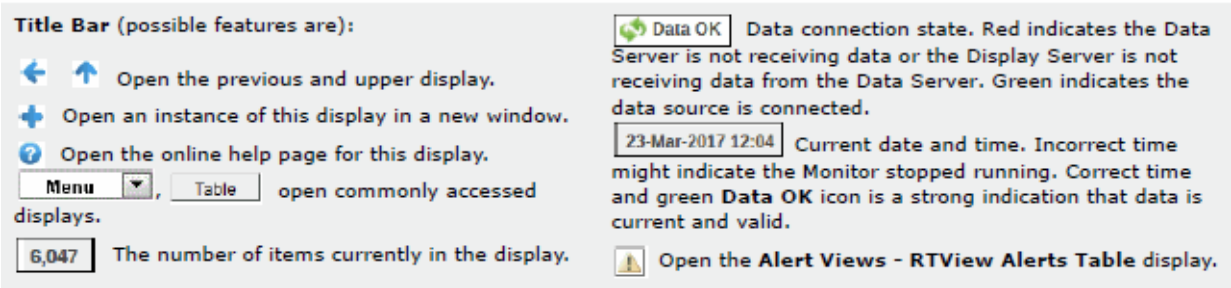
Expired When checked, performance data has not been received within the time specified (in seconds) in the **Expire Time** field in the **Duration** region in the RTView Configuration Application > (**Project Name**) > **Solution Package Configuration** > **Docker** > **DATA STORAGE** tab. The **Delete Time** field (also in the **Duration** region) allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response.

Timestamp The date and time the row data was last updated.

Container Summary

This display provides a view of the current and historical metrics for a single container. You can view the current information pertaining to CPU usage percentage, Memory details, Disk read and write details, and network data details in the upper portion of the display. The trend graph in the bottom half of the display traces the current and historical CPU usage, the average memory used, and the number of incoming and outgoing network bytes.





Filter By:

The display might include these filtering options:

Host Select the host for which you want to show data in the display.

Container Select the container for which you want to show data in the display.

ID The absolute container name.

Fields and Data:

Expired When checked, performance data has not been received within the time specified (in seconds) in the **Expire Time** field in the **Duration** region in the RTView Configuration Application > (**Project Name**) > **Solution Package Configuration** > **Docker** > **DATA STORAGE** tab. The **Delete Time** field (also in the **Duration** region) allows you to define the amount of time (in seconds) in which the row will be removed from the table if there is no response.

Alert State The current alert severity.

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count The total number of current alerts.

Running When checked, this check box indicates that the container is running.

Status The current status of the container. Values are:

Up - indicates that the container is up and running, and lists the amount of time the container has been up and running (**Uptime**).

Created - indicates that the container has been created but is currently not in use.

Exited - indicates that the container has been stopped, and lists the error code as well as the amount of time since the container was stopped.

CPU

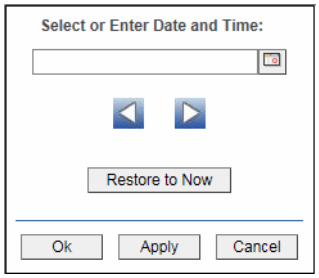
% CPU The percentage of CPU used by the container.

Memory (KB)

Usage The current memory usage by the container, in kilobytes, which includes all memory regardless of when it was accessed.

WS The amount of memory (in kilobytes) in the working set, which includes recently accessed memory, dirty memory, and kernel memory.

	RSS	The Resident Set Size, which is the amount of anonymous and swap cache memory (including transparent/hugepages), in kilobytes.
Network		
	Packets In/sec	The average number of incoming packets per second.
	Packets Out/sec	The average number of outgoing packets per second.
	Bytes In/sec	The average number of incoming bytes per second.
	Bytes Out/sec	The average number of outgoing bytes per second.
Performance Trends Graph	Traces the following: **% CPU** -- traces percentage of CPU used by the container. **Memory (KB)** -- traces the current memory usage by the container, in kilobytes, which includes all memory regardless of when it was accessed. **Net Bytes In** -- traces the average number of incoming bytes per second. **Net Bytes Out** -- traces the average number of outgoing bytes per second.	
	Log Scale	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.
	Base at Zero	Select to use zero (**0**) 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 Calendar .



By default, the time range end point is the current time. To change the time range end point, click Calendar 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.

Hosts

Hosts displays provide extensive visibility into the health and performance of your hosts.

Displays are:

- "All Hosts Heatmap"
- "All Hosts Table"
- "All Hosts Grid"
- "All Processes Table"
- "All Network Table"
- "All Storage Table"
- "Host Summary"

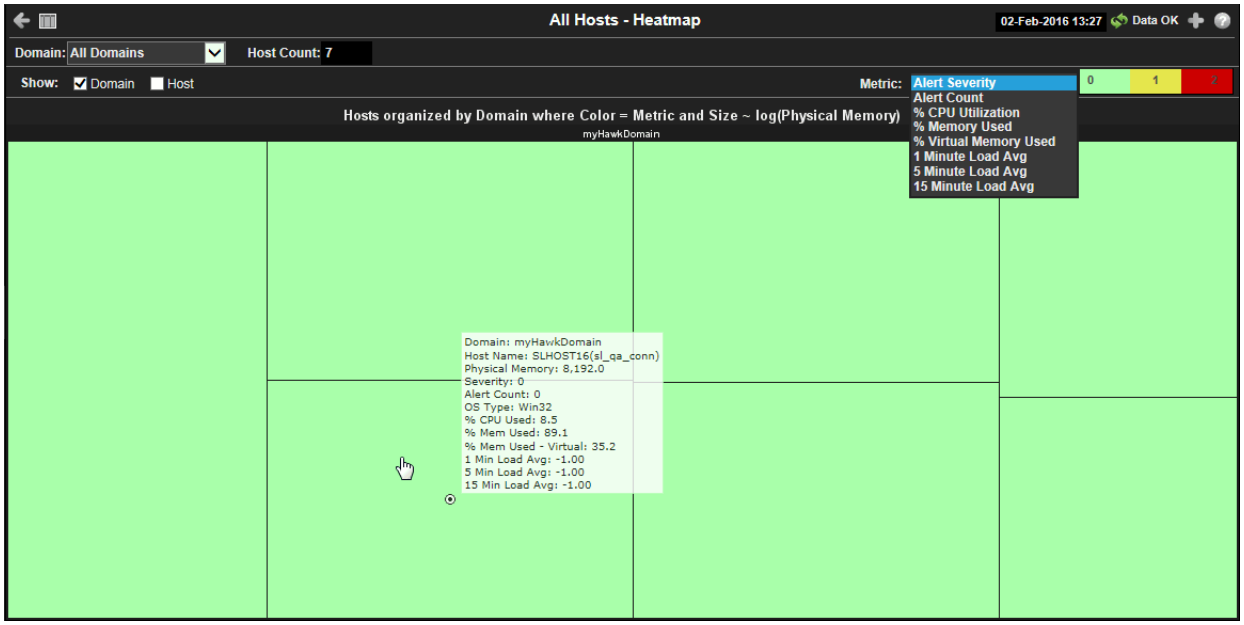
All Hosts Heatmap

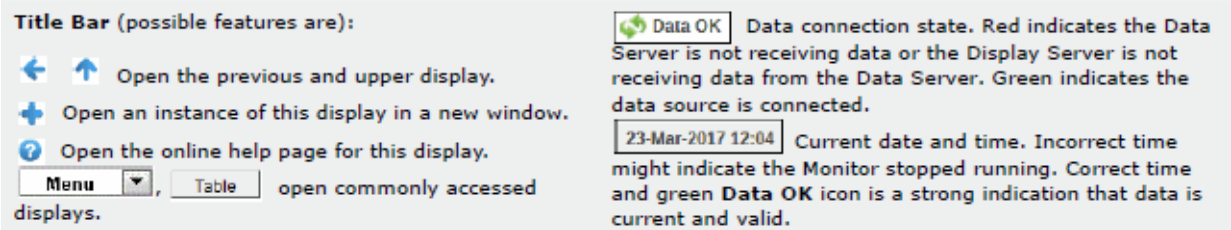
View the most critical alert states pertaining to your hosts. Use this display to quickly identify hosts with critical alerts.

Each rectangle in the heatmap represents a host. The rectangle color indicates the most critical alert state associated with the host for the selected **Metric**. The rectangle size represents the amount of physical memory present on the host; a larger size is a larger value.

Choose a domain or **All Domains** from the **Domain** drop-down menu to filter data shown in the display. Choose a different metric to display from the **Metric** drop-down menu. Mouse over a rectangle to see additional metrics. By default, this display shows **Alert Severity**.

Drill-down and investigate a host by clicking a rectangle in the heatmap to view details in the **Host Summary** display.





Filter By:
The display might include these filtering options:

Domain: Choose a domain to show data for in the display. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.

Fields and Data:

Host Count: The total number of hosts currently shown in the display.

Show:

Domain When selected, includes the Domain name in the display.

Host When selected, includes the Host name in the display.

Metric Choose a metric to view in the display.

Alert Severity The maximum level of alerts in the heatmap rectangle. Values range from **0** - **2**, as indicated in the color gradient bar, where **2** is the highest Alert Severity:

Red indicates that one or more metrics exceeded their ALARM LEVEL threshold.

Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold.

Green indicates that no metrics have exceeded their alert thresholds.

Alert Count The total number of critical and warning alerts in the heatmap rectangle. The color gradient bar, populated by the current heatmap, shows 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 average alert count.

% CPU Utilization The percent of CPU used in the heatmap rectangle. The color gradient bar, populated by the current heatmap, shows 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 average count.

% Memory Used The percent of memory used in the heatmap rectangle. The color gradient bar, populated by the current heatmap, shows 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 average count.

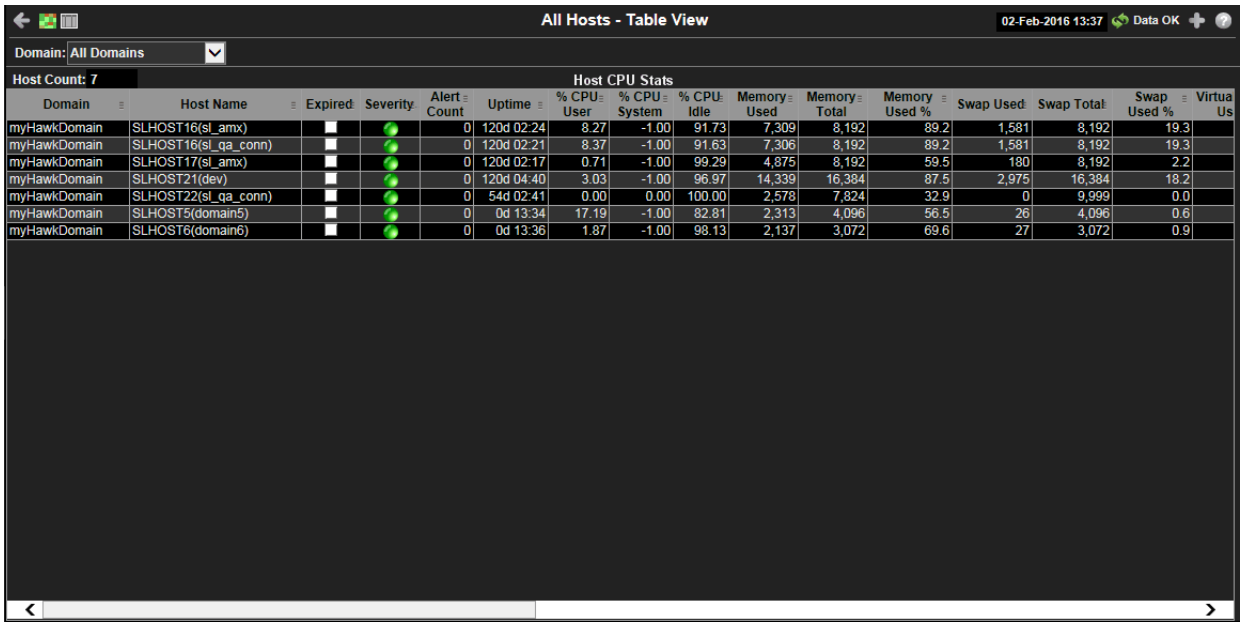
% Virtual Memory Used The percent of virtual memory used in the heatmap rectangle. The color gradient bar, populated by the current heatmap, shows the value/color mapping. The numerical values in the gradient bar range from **0** to the maximum count of alerts in the heatmap. The middle value in the gradient bar indicates the average count.

1 Minute Load Avg	The average number of processes running over 1 minute.
5 Minute Load Avg	The average number of processes running over 5 minutes.
15 Minute Load Avg	The average number of processes running over 15 minutes.

All Hosts Table

View host utilization data in a tabular format. Use this display to see all available data for this View.

Each row in the table is a different host. Choose a domain or **All Domains** from the **Domain** drop-down menu. Click a column header to sort column data in numerical or alphabetical order. Drill-down and investigate by clicking a row to view details for the selected application in the **Host Summary** display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:
The display might include these filtering options:

Domain: Choose a domain to show data for in the display.

Fields and Data:

Host Count: The total number of hosts in the table.

Table:
Each row in the table is a different host.

Domain	The domain in which the host resides. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.
Host Name	The name of the host.
Expired	When checked, data has not been received from this host in the specified amount of time. The host will be removed from the Monitor in the specified amount of time. The default setting is **60** seconds.
Severity	The maximum level of alerts in the row. Values range from **0** - **2**, as indicated in the color gradient  bar, where **2** is the highest Alert Severity: Red indicates that one or more metrics exceeded their ALARM LEVEL threshold. Yellow indicates that one or more metrics exceeded their WARNING LEVEL threshold. Green indicates that no metrics exceeded their alert thresholds.
Alert Count	The total number of active alerts associated with the host.
Uptime	The amount of time the application has been running, in the following format: **0d 00:00 <days>d <hours>:<minutes>:<seconds>** For example: **10d 08:41:38**
% CPU Used	The amount of CPU used, in percent.
% CPU System	The amount of CPU used, in percent.
% CPU Idle	The amount of CPU not used, in percent.
Memory Used	The amount of memory, in megabytes, currently used.
Memory Total	The total amount of memory, in megabytes.
Memory Used%	The amount of memory used, in percent.
Swap Used	The amount of swap space, in megabytes, currently used.
Swap Total	The total amount of swap space, in megabytes.
Swap Used %	The amount of swap space used, in percent.
Virtual Mem(ory) Used	The amount of virtual memory currently used, in megabytes.
Virtual Mem(ory) Total	The total amount of virtual memory, in megabytes.
Virtual Mem(ory) Used%	The amount of virtual memory used, in percent.
Load Avg 1 Minute	The average number of processes running over 1 minute.
Load Avg 5 Minute	The average number of processes running over 5 minutes.

Load Avg 15 Minute	The average number of processes running over 15 minutes.
OS Type	The type of operating system (for example, Linux, HP-UX, Windows 2003).
OS Description	The name of the operating system.
OS Version	The operating system version.
CPU Model	The CPU model.
# CPUs	The number of node connections.
Agent Type	The type of agent from which the data was collected: **HOSTMON** (a SL Host Agent), **Hawk**, **WMI** or **SNMP**.
Agent Class	The specific version of the agent software.
Source	The name of the SL Data Server where the host data was collected.
Timestamp	The date and time the data was last updated.

All Hosts Grid

This grid provides a list view of utilization metrics for all hosts. Use this display to track and view in parallel the general performance of your hosts. Drill down and investigate by clicking a host to view details in the **Host Summary** display.

Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:
The display might include these filtering options:

Domain: Choose a domain to show data for in the display. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.

Host Count Displays the number of hosts (including expired hosts) listed in the display.

Time Range: Choose a time range to show data for in the display. Options are: **All Data**, **2 Mins**, **5 Mins**, **20 Mins**, **1 Hour, 2 Hours**, **4 Hours**, **8 Hours**, **24 Hours**, **2 Days and 7 Days**.

Grid
Utilization data shown for hosts in the selected domain.

Host Name The name of the host.

OS Type The name of the operating system.

Uptime The amount of time (days, hours, seconds) the operating system has been running.

Phys Mem The amount of physical memory used, in megabytes.

Virtual Mem The amount of virtual memory used, in megabytes.

Load Avg

- **1** The average number of processes running over 1 minute.
- **5** The average number of processes running over 5 minutes.
- **15** The average number of processes running over 15 minutes.

CPU Usage The bar graph shows the amount of CPU currently used.

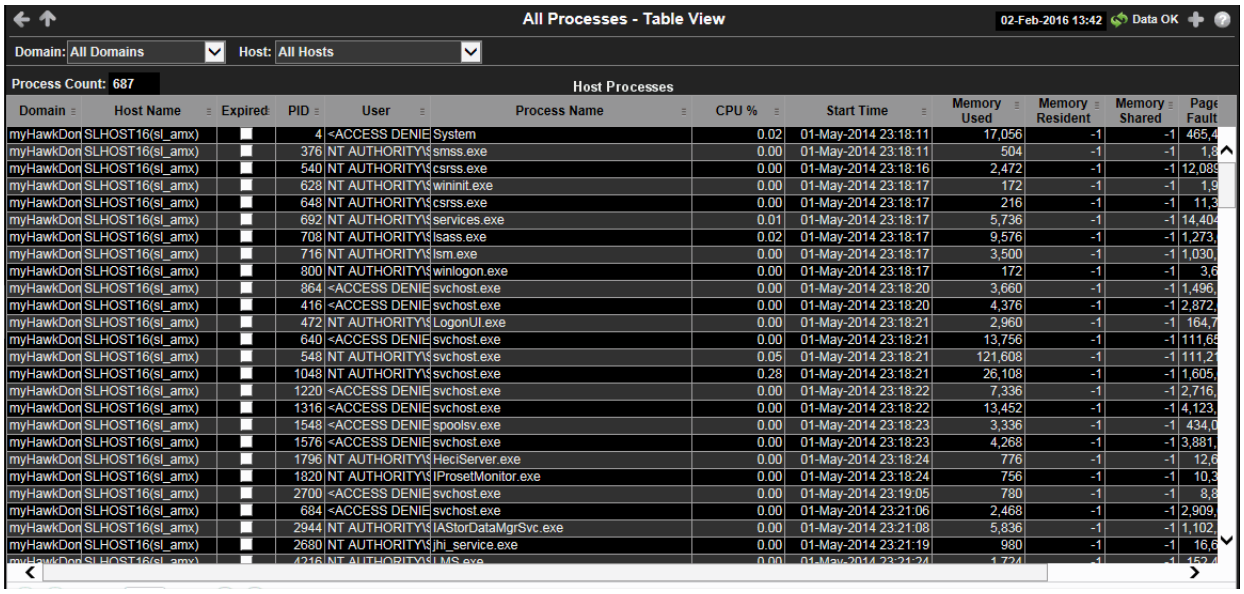
VMem Usage The bar graph shows the amount of virtual memory currently used.

Trend Graphs

- **CPU** Traces the amount of CPU currently used.
- **VM Usage** Traces the amount of virtual memory currently used.
- **Rx KB/s** Traces the amount data currently being received per second.
- **Tx KB/s** Traces the amount data currently being transmitted per second.

All Processes Table

View host utilization data in a tabular format. Use this display to see all available data for this View. Each row in the table is a different host. Choose a domain or **All Domains** and a host or **All Hosts** from the drop-down menus. Click a column header to sort column data in numerical or alphabetical order. Drill-down and investigate by clicking a row to view details for the selected application in the **Host Summary** display.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:
The display might include these filtering options:

Domain: Choose a domain to show data for in the display. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.

Host: Choose a host to show data for in the display.

Fields and Data:

Process Count: The total number of processes in the table.

Table:
Each row in the table is a different host.

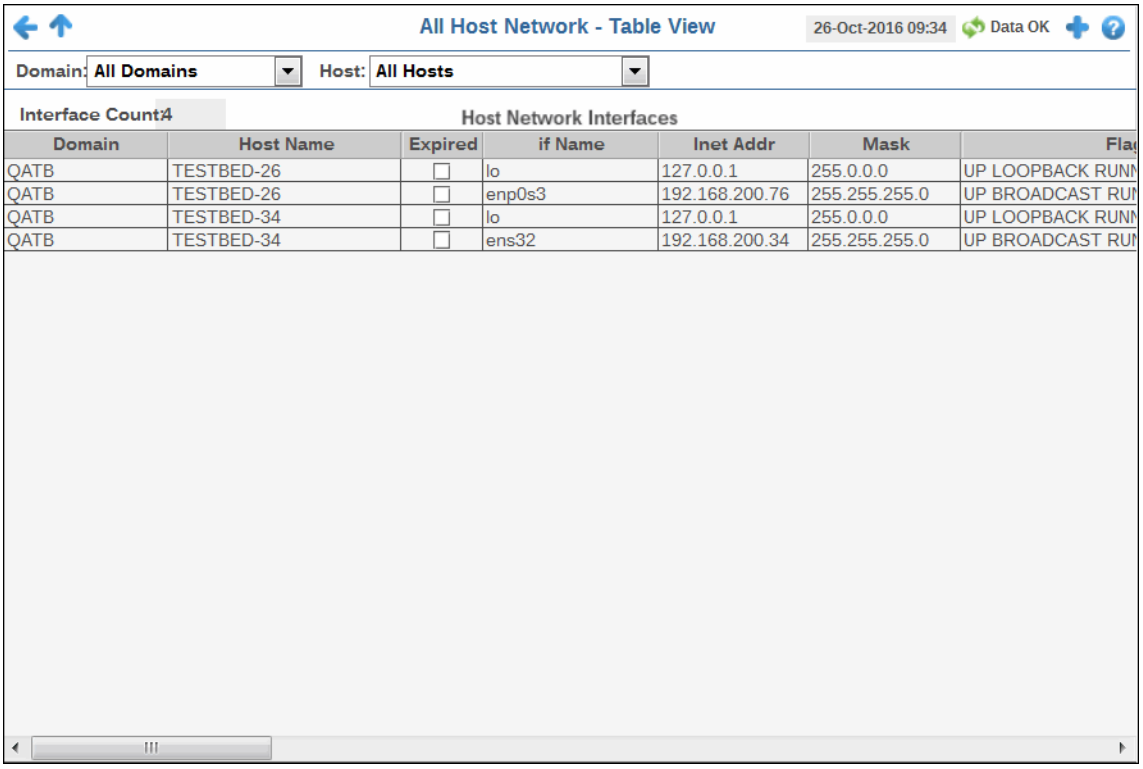
Domain The domain in which the host resides.

Host Name The name of the host.

Expired	When checked, data has not been received from this host in the specified amount of time. The host will be removed from the Monitor in the specified amount of time. The default setting is 60 seconds.
PID	The process ID.
User	The user name.
Process Name	The name of the process.
CPU%	The amount of CPU used, in percent.
Start Time	The host start time, in the following format: **0d 00:00 <days>d <hours>:<minutes>:<seconds>** For example: **10d 08:41:38**
Memory Used	The amount of memory currently used, in megabytes.
Memory Resident	The amount of memory currently used by the process that resides in physical memory and is not paged out. Set to **-1** when the data is not available from an agent. (Hawk does not provide this data.)
Memory Shared	The amount of physical memory that is shared with other processes. Set to **-1** when the data is not available from an agent. (Hawk does not provide this data.)
Page Faults	The number of page faults.
Page Faults /sec	The number of page faults per second.
Timestamp	The date and time the data was last updated.

All Network Table

View network interface data in a tabular format. Each row in the table is a different network interface card (NIC). Choose a domain or **All Domains** and a host or **All Hosts** from the drop-down menus. Click a column header to sort column data in numerical or alphabetical order.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

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Filter By:
The display might include these filtering options:

Domain: Choose a domain for which to show NIC data. Domain names are specified when your administrator configures your Data Server.

Host: Choose a host for which to show NIC data.

Fields and Data:

Interface Count: The total number of NICs in the table.

Table:
Each row in the table is a different NIC.

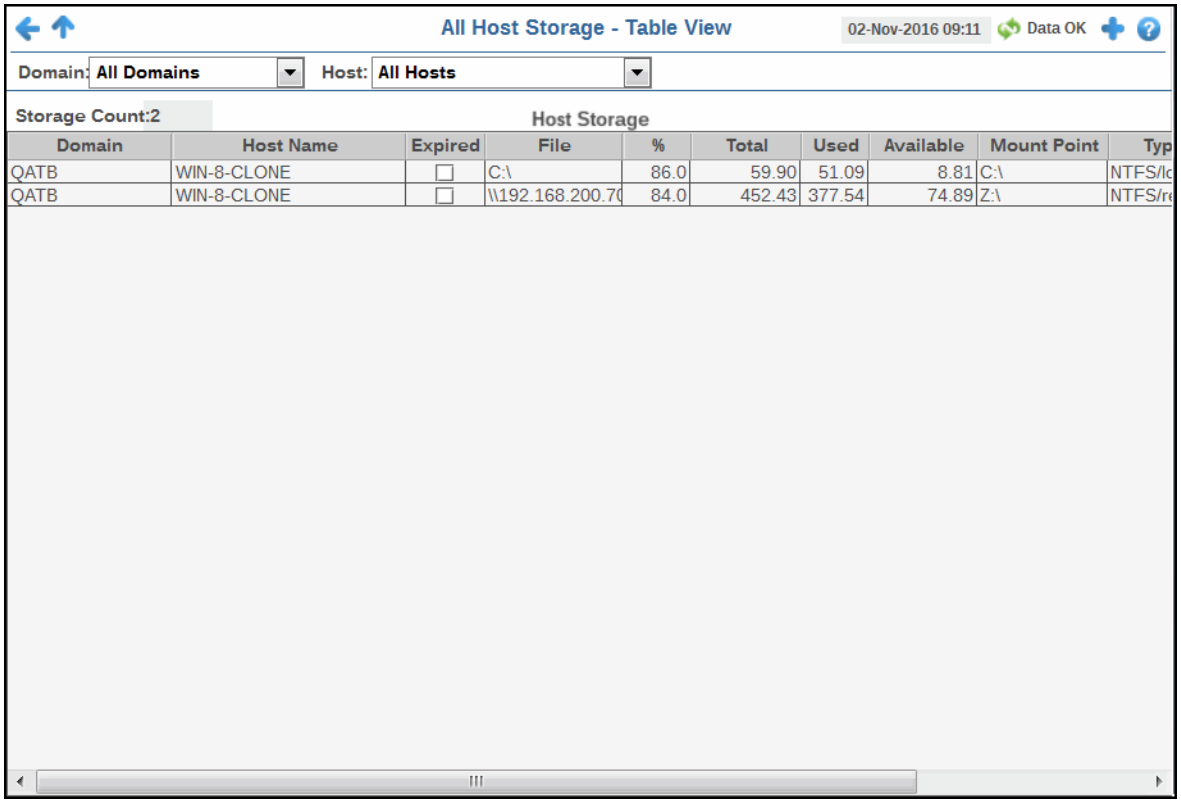
Domain	The domain in which the NIC resides.
Host Name	The name of the NIC in which the network interface resides.
Expired	When checked, data has not been received from this NIC in the specified amount of time. The NIC will be removed from the Monitor in the specified amount of time. The default setting is 60 seconds.
if Name	The name of the NIC.
Inet Addr	The NIC IP address.
Mask	The NIC subnet mask IP address.
Flags	Descriptive text for NIC flag.
MTU	The largest size packet or frame for the NIC.
Metric	Indicates...
Point To Point	Indicates whether the NIC is a point to point configuration.
Broadcast	Indicates whether the NIC is a broadcast configuration.
rxKBytes	The total number of kilobytes received by the NIC.
rxPackets	The total number of packets received by the NIC.
rxDropped	The total number of received packets that were dropped by the NIC.
rxErrors	The total number of received errors on the NIC.
rxOverruns	The total number of received overruns on the NIC.
rxFrame	The total number of received frames on the NIC.
txKBytes	The total number of kilobytes transmitted by the NIC.
txPackets	The total number of packets transmitted by the NIC.
txDropped	The total number of transmitted packets that were dropped by the NIC.
txErrors	The total number of transmission errors for the NIC.
txOverruns	The total number of transmission overruns for the NIC.
txCollisions	The total number of transmission collisions for the NIC.
txCarrier	The total number of transmission carrier errors for the NIC.
MAC Address	The NIC MAC address.
Rx KB/s	The number of kilobytes received per second.
Tx KB/s	The number of kilobytes transmitted per second.
Rx Packets/s	The number of packets received per second.

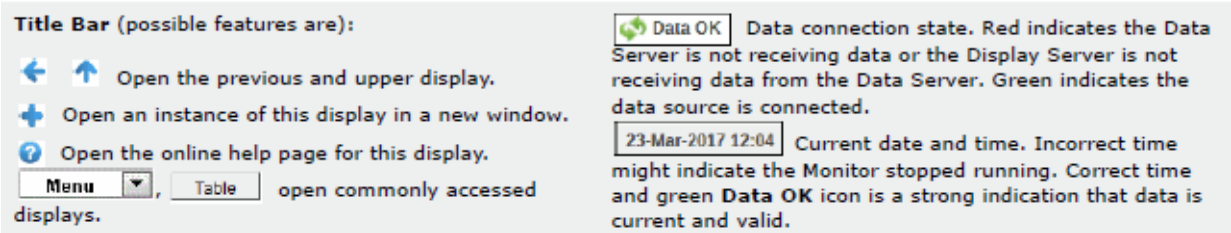
Tx Packets/s The number of packets transmitted per second.

Timestamp The date and time the data was last updated.

All Storage Table

View storage data in a tabular format. Each row in the table is a different storage partition. Choose a domain or **All Domains** and a host or **All Hosts** from the drop-down menus. Click a column header to sort column data in numerical or alphabetical order.





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Filter By:
The display might include these filtering options:

Domain: Choose a domain or **All Domains** to show data for in the display. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.

Host: Choose a host or **All Hosts** to show data for in the display.

Fields and Data:

Storage Count: The total number of storage partitions in the table.

Table:
Each row in the table is a different host.

Domain The domain in which the host resides.

Host Name The name of the host in which the storage partition resides.

Expired When checked, data has not been received from this host in the specified amount of time. The host will be removed from the Monitor in the specified amount of time. The default setting is 60 seconds.

File System The storage partition location.

% Used The amount of storage partition used, in percent.

Total Size (GB) The storage partition size, in gigabytes.

Used (GB) The amount of storage partition used, in gigabytes.

Available (GB) The amount of storage partition available, in gigabytes.

Mount Point The storage partition parent directory.

Type The file system type.

Timestamp The date and time the data was last updated.

Host Summary

This display provides a detailed view of utilization metrics for a single server.

Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Filter By:
The display might include these filtering options:

Domain:	Choose a domain to show data for in the display. Domain names are specified when your administrator configures your Data Server to collect Hawk data, and applies to all host data collected from Hawk by that Data Server.
Host:	Choose a host to show data for in the display.
Expired	When checked, data has not been received from this host in the specified amount of time. The host will be removed from the Monitor in the specified amount of time. The default setting is **60** seconds.
Last Update	The time the display was last updated.

Fields and Data:
Data describes the selected host except where noted.

OS:	The operating system.
Version:	The operating system version.
Uptime:	The number of days, hours and minutes since started.
#CPUs	The number of node connections.

CPU Type:	The type of CPU.	
%CPU	**User**	The amount of CPU used by the user, in percent.
	System	The amount of CPU used by the system, in percent.
	Idle	The amount of CPU that is not used, in percent.
Physical Memory	**Used**	The amount of physical memory used, in kilobytes.
	Total(MB)	The amount of physical memory available, in kilobytes.
	%Used	The amount of physical memory used, in percent.
Virtual Memory	**Used**	The amount of virtual memory used, in kilobytes.
	Total(MB)	The amount of virtual memory available, in kilobytes.
	%Used	The amount of virtual memory used, in percent.
Processes	The number of processes running.	
Load Avg:	**1 Min**	The average number of processes running over 1 minute.
	5 Min	The average number of processes running over 5 minutes.
	15 Min	The average number of processes running over 15 minutes.
Storage	**File System**	The amount of storage space used for the file system, in kilobytes.
	Mount Point	The name used by the operating system to mount and provide an entry point to other storage volumes.
	%Used	The amount of storage space used, in percent.
Network	**ifName**	The name assigned to the network interface by the operating system.
	RxKB/s	The amount of network data received per second, in kilobytes.
	TxKB/s	The amount of network data transmitted per second, in kilobytes.

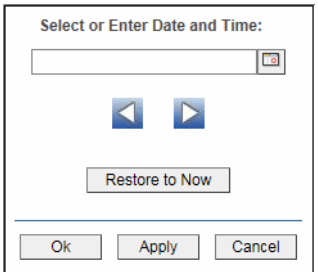
Trend Graphs
Traces metrics for the selected host.

- **CPU% Used**: The amount of CPU used, in percent.
- **Mem Total:** The amount of available memory, in kilobytes.
- **Mem Used**: The amount of memory used, in kilobytes.
- **Net Rx KB/s**: The amount of network data received per second, in kilobytes.
- **Net Tx KB/s**: The amount of network data transmitted per second, in kilobytes.

Log Scale 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.

Base at Zero Select to use zero (**0**) 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 Calendar ... .



By default, the time range end point is the current time. To change the time range end point, click Calendar ... 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.

Alert Views

These displays present detailed information about all alerts that have occurred in your monitoring system. Displays in this View are:

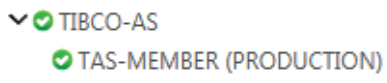
- "Alert Detail Table": Shows current alert data. Use this time-ordered tabular view to track, manage and assign alerts.

Alert Detail Table

Use this display to track and manage all alerts that have occurred in the system, add comments, acknowledge or assign Owners to alerts.

The color coded navigation tree shows the contents of the CMDB hierarchically ordered. Choose a node to filter alerts shown in the table. The **Alerts Table** only shows alerts associated with the node you select. A green indicator means the node has no associated alerts. A red indicator means the node has one or more associated alerts.

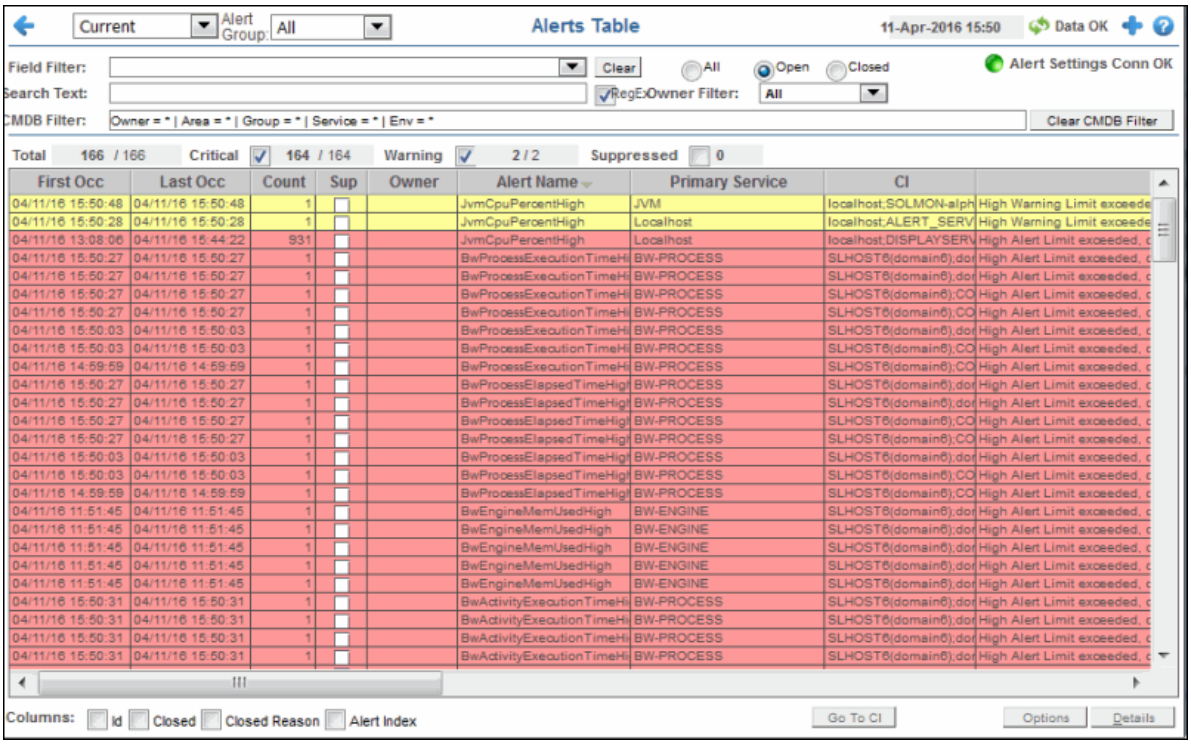
Service name labels are appended with the Environment and number of alerts. For example, the following illustrates that the **TBE** Service currently has no (**0**) associated alerts in the **PRODUCTION** Environment.



Each row in the table is a different active alert. Select one or more rows, right-click and choose **Alert** to see all actions that you can perform on the selected alert(s). Choose **Alert / Set Filter Field** to apply the selected cell data to the **Field Filter** and **Search Text** fields. Or enter filter criteria directly in the **Field Filter** and **Search Text** fields. Click **Clear** to clear the **Field Filter** and **Search Text** fields.

Click a column heading to sort the table on that column data.

Optionally, you can use the **$rtvUserShowDualTables** substitution to add a table that lists alerts owned by the logged in user.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

The row color indicates the following:

Row Color Code:
Tables with colored rows indicate the following:

- Red indicates that one or more alerts exceeded their ALARM LEVEL threshold in the table row.
- Yellow indicates that one or more alerts exceeded their WARNING LEVEL threshold in the table row.
- Green indicates that no alerts exceeded their WARNING or ALARM LEVEL threshold in the table row.
- Gray indicates that the alert engine that is hosting the alert is not connected, not enabled or not initialized. When you select a gray row the **Own**, **Suppress**, **Unsuppress**, **Close**, **Annotate**, **Options** and **Details** options are disabled.

Fields and Data
This display includes:

Field Filter Select a table column from the drop-down menu to perform a search in: **Alert Name**, **Alert Text**, **Alert Class**, **Service**, **CI**, **Closed Reason**, **Closed**, **CompId**, **Count**, **First Occ**, **ID**, **Last Occ**, **Owner**, **Primary Service**, **Sup**, **TicketGroup**, **TicketID**.

Filters limit display content and drop-down menu selections to only those items that pass through the selected filter's criteria. If no items match the filter, you might have zero search results (an empty table).

Clear Clears the **Field Filter** and **Search Text** entries.

Search Text Enter the (case-sensitive) string to search for in the selected **Field Filter.**

CMDB Filter Shows the selected Owner, Area, Group, Service and Environment filters. By default, all components of the CMDB (*) are included in the search.

These **CMDB Filter** fields are populated when you click Open Alerts Table  , which is accessible from the **Multi Area Service Views** displays, to open the **Alerts Table** in a new window. The filters selected in the **All Management Areas** and **Multi Area Service Views** displays are applied to the **Alerts Table** (that opens in the new window). NOTE: When you use the navigation tree (in the left panel) to open the **Alerts Table** display, the **Environment** filter is applied to the display if it has a value other than ***** (asterisk).

Clear CMDB Filter Clears all of the values in the **CMDB Filter** (**Owner**, **Area**, **Group**, **Service** and **Environment** filters). NOTE: This action is not applied to any other display.

RegEx Toggles the **Search Text** field to accept Regular Expressions for filtering.

All Click to show all alerts in the table: **Open** and **Closed** alerts.

Open Click to only show **Open** alerts in the table.

Closed Click to only show **Closed** alerts in the table.

Owner Filter Select the alert **Owner** to show alerts for in the table.

- **All** Shows alerts for all Owners in the table: **Not Owned** and **Owned By Me** alerts.
- **Not Owned** Shows only alerts without Owners in the table.
- **Owned By Me** Shows only alerts for the current user in the table.

Alert Settings Conn OK The Alert Server connection state:
- Disconnected.
- Connected.

Total **X / Y** where **X** is the total number of alerts in the table with all selected filters applied. **Y** is the number of alerts in the table with only the **CMDB** and **Cleared** filters applied.

Critical Check to show alerts in the table that are currently in a critical state. NOTE: You must check **Critical** to see alerts that are in a critical state.

X / Y where **X** is the total number of critical alerts in the table with all selected filters applied. **Y** is the number of alerts in the table with only the **CMDB Filter** and **Cleared** filters applied.

Warning	Check to show alerts in the table that are currently in a warning state. NOTE: You must check **Warning** to see alerts that are in a warning state. **X / Y** where **X** is the total number of warning alerts in the table with all selected filters applied. **Y** is the number of alerts in the table with only the **CMDB** and **Cleared** filters applied.
Suppressed	Check to show alerts in the table that are suppressed. The **Suppressed** count is not impacted by the **Critical** and **Warning** filters. It is impacted only by the **CMDB Filter** and the **Owner Filter**. NOTE: You must check **Suppressed** to see Suppressed alerts in the table.
Own	Click to assign an Owner for the alert. This option is only visible when logged in as one of the following roles: event, full, admin, super. This option is disabled when you select a gray row.
Suppress	Click to suppress the alert. This option is only visible when logged in as one of the following roles: event, full, admin, super. This option is disabled when you select a gray row.
UnSuppress	Click to unsuppress the alert. This option is only visible when logged in as one of the following roles: event, full, admin, super. This option is disabled when you select a gray row or when you select a row.
Close	Click to close the alert. This option is only visible to users with Administrator privileges. This option is disabled when you select a gray row or you select a row where the Primary Service is not in the $rtvManageableCompID list for the logged in user.

Alerts Table
This table lists all active alerts for the current filters. The table is empty unless you check **Critical**, **Warning**, or both. Filter the list using the search fields and drop-down menus (in the upper portion of the display). To view details about an alert, select an alert and click **Details** (in the bottom right portion of the display) to open the **Alert Detail** dialog. To view details about the CI source of the alert, select an alert and click **Go To CI** (in the bottom right portion of the display) to open its Summary display.

First Occ	The date and time the alert first occurred.
Last Occ	The date and time the alert last occurred.
Count	The number of times the alert was generated.
Sup	When checked, the alert has been suppressed by a user.
Owner	The named owner assigned by the administrator.
Alert Name	The name of the alert.
Primary Service	The name of the Service with which the alert is associated.
CI	The CI alert source.
Alert Text	Description of the alert.
AlertClass	An optional alert field which can be used when integrating with other alerting systems.
CompID	An optional alert field which can be used when integrating with other alerting systems.
TicketID	An optional alert field which can be used when integrating with other alerting systems.
TicketGroup	An optional alert field which can be used when integrating with other alerting systems.

Columns	**Id**	When checked, shows the **ID** column in the table.
	Closed	When checked, shows the **Closed** column in the table.
	Closed Reason	When checked, shows the **Closed Reason** column in the table.
	Alert Index	When checked, shows the **Alert Index** column in the table.
Go To CI	Select an alert from the **Alerts Table**, then click **Go To CI** to view details for the selected CI in the Summary display.	
Annotate	Select one or more alerts from the **Alerts Table**, then click **Annotate** to open the **Set Owner and Comments** dialog and enter comments or change alert owner. This option is only visible when logged in as one of the following roles: event, full, admin, super. This option is disabled when you select a gray row or when you select a row where the Primary Service is not in the $rtvManageableCompID list for the logged in user. For details, see **Configure User and Role Management**.	
	ID	Lists the alert IDs, separated by semicolons, for the alerts selected from the **Alert Table**.
	Source	Lists the name of the back-end Data Server reporting the alert, separated by semicolons.
	Enter Owner	Enter the name of the owner for one or more alerts, click **Set Owner of One Alert** to assign the Owner, then click **Close**. By default, this field displays the current user name.
	Enter Comment	Enter a comment for one or more alerts, click **Add Comment on One Alert** to apply the Comment, then click **Close**. By default, this field displays previously entered comments. The text appears in the **Comments** field for the alert.
	Set Owner	Applies the name of the alert owner in the **Enter Owner** field for one or more alerts.
	Add Comment	Applies the comment in the **Enter Comment** field for one or more alerts.
	Clear Comments	Removes all comments for one or more alerts.
	Close	Closes the dialog.
Options	Select a single alert from the **Alerts Table**, then click **Options** to open the **Alert Options** dialog. This dialog is provided for customizing your own alert options. This option is disabled when you select a gray row or more than one row.	
Details	Select a single alert from the **Alerts Table**, then click **Details** to open the **Alert Detai**l window and view alert details. This option is disabled when you select a gray row or more than one row.	

Administration

These displays enable you to set alert thresholds and observe how alerts are managed, and modify your Service Data Model. Displays in this View are:

- "Alert Administration"
- "Alert Administration Audit"
- "Metrics Administration"
- "RTView Cache Tables"
- "RTView Agent Admin"

Alert Administration

Set global or override alert thresholds. Alert settings are global by default.

The table describes the global settings for all alerts on the system. To filter the alerts listed in the table, enter a string in the **Alert Filter** field and press **<enter>** or click elsewhere in the display. Filters are case sensitive and no wildcard characters are needed for partial strings. For example, if you enter Server in the **Alert Filter** field, it filters the table to show only alerts with **Server** in the name. Choose **Clear** to clear the filter.

Global Thresholds

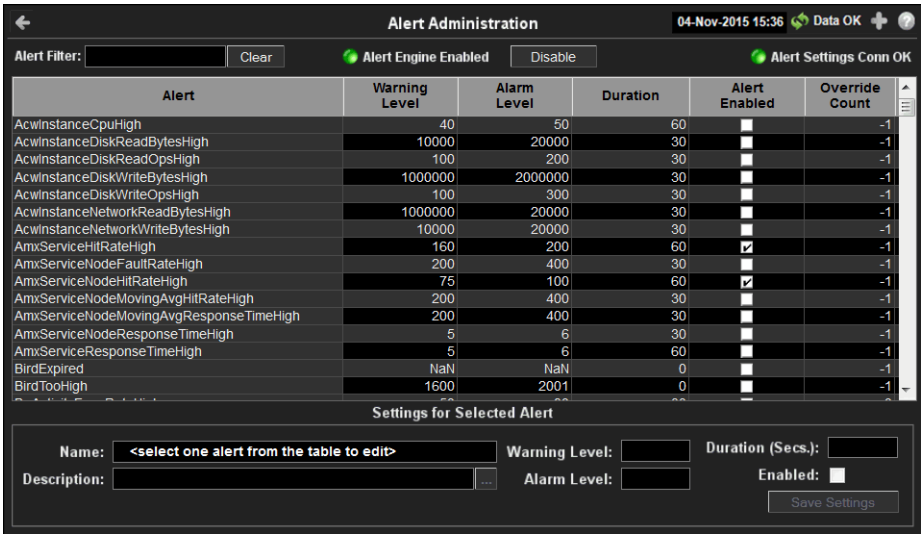
To set a global alert, select an alert from the **Active Alert Table**. The name of the selected alert populates the **Settings for Selected Alert Name** field. Edit the **Settings for Selected Alert** and click **Save Settings** when finished.

The manner in which global alerts are applied depends on the Solution Package. For example, the EMS Monitor Solution Package has queue alerts, topic alerts and server alerts. When a queue alert is applied globally, it is applied to all queues on all servers. Likewise, a server alert applies to all servers, and a topic alert applies to all topics on all servers.

Override Thresholds

Setting override alerts allows you to set thresholds for a single resource (for example, a single server). Override alerts are useful if the majority of your alerts require the same threshold setting, but there are other alerts that require a different threshold setting. For example, you might not usually be concerned with execution time at a process level, but perhaps certain processes are critical. In this case, you can apply alert thresholds to each process individually.

To apply an individual alert you Index the Monitored Instance or resource. The Index Types available are determined by the Solution Package installed. For example, the EMS Monitor package lets you set an alert for a specific *topic* on a specific *server* (such as the PerServerTopic Index option), rather than for all topics on all servers.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

Fields and Data

This display includes:

Alert Filter Enter the (case-sensitive) string to filter the table by the **Alert** table column value. **NOTE:** Partial strings can be used without wildcard characters. Press **<enter>** or click elsewhere in the display to apply the filter.

Clear Clears the **Alert Filter** entry.

Alert Engine Enabled
- Alerting is disabled.
- Alerting is enabled (by default).

Disable Suspends all alerting.

Alert Settings Conn OK The Alert Server connection state:
- Disconnected.
- Connected.

Active Alert Table

This table describes the global settings for all alerts on the system. Select an alert. The name of the selected alert populates the **Settings for Selected Alert Name** field (in the lower panel). Edit **Settings for Selected Alert** fields and click **Save Settings**.

NOTE: To filter the alerts shown in the table by Solution Package, use the **$rtvAlertPackageMask** substitution.

Alert	The name of the alert.
Warning Level	The global warning threshold for the selected alert. When the specified value is exceeded a warning is executed.
Alarm Level	The global alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed.
Duration (Secs)	The amount of time (in seconds) that the value must be above the specified Warning Level or Alarm Level threshold before an alert is executed. **0** is for immediate execution.
Alert Enabled	When checked, the alert is enabled globally.
Override Count	The number of times thresholds for this alert have been defined individually in the **Tabular Alert Administration** display.

Settings for Selected Alert
To view or edit global settings, select an alert from the **Active Alert Table**. Edit the **Settings for Selected Alert** fields and click **Save Settings** when finished.

To set override alerts, click on **Override Settings** to open the **Tabular Alert Administration** display.

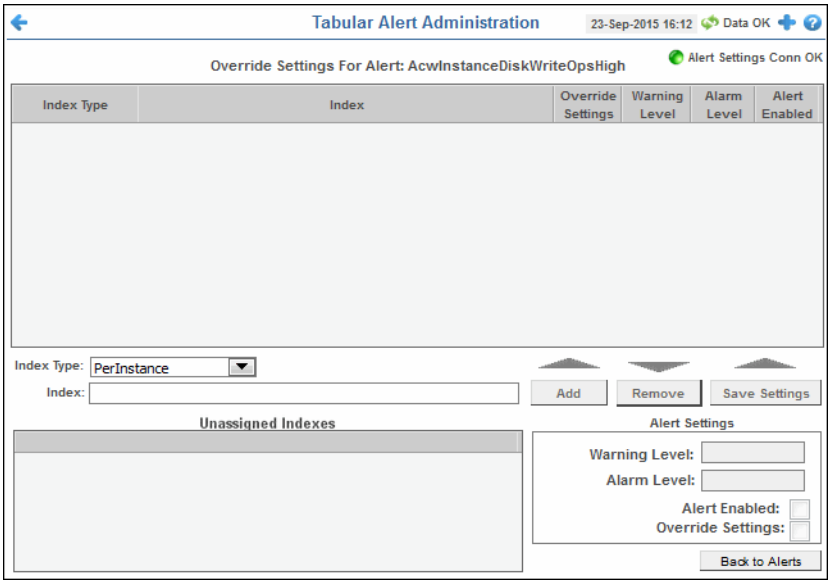
Name	The name of the alert selected in the **Active Alert Table**.
Description	Description of the selected alert. Click Calendar ... for more detail.
Warning Level	Set the Global warning threshold for the selected alert. When the specified value is exceeded a warning is executed. To set the warning to occur sooner, reduce the Warning Level value. To set the warning to occur later, increase the Warning Level value. **NOTE:** For low value-based alerts (such as **EmsQueuesConsumerCountLow**), to set the warning to occur sooner, increase the Warning Level value. To set the warning to occur later, reduce the Warning Level value.
Alarm Level	Set the Global alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed. To set the alarm to occur sooner, reduce the Alarm Level value. To set the warning to occur later, increase the Alarm Level value. **NOTE:** For low value-based alerts (such as **EmsQueuesConsumerCountLow**), to set the alarm to occur sooner, increase the Alarm Level value. To set the alarm to occur later, reduce the Alarm Level value.
Duration	Set the amount of time (in seconds) that the value must be above the specified Warning Level or Alarm Level threshold before an alert is executed. **0** is for immediate execution. This setting is global.
Enabled	Check to enable alert globally.
Save Settings	Click to apply alert settings.
Override Settings	Click to open the **Tabular Alert Administration** display to set override alerts on the selected alert.

Note: For more information on EMS Monitor alerts, see Appendix D, "Alert Definitions."

Tabular Alert Administration

Set override alerts (override global alert settings). This display opens when you select an alert in the **Alert Administration** display and then select **Override Settings**.

For step-by-step instructions setting thresholds for individual alerts, see **Setting Override Alerts**..



Fields and Data

This display includes:

Alert Settings Conn OK
The connection state.
- No servers are found.
- One or more servers are delivering data.

Override Settings For Alert:(name)
This table lists and describes alerts that have override settings for the selected alert. Select a row to edit alert thresholds. The selected item appears in the Index field. Edit settings in the Alert Settings fields, then click Save Settings.

Index Type	Select the type of alert index to show in the Values table. Options in this drop-down menu are populated by the type of alert selected, which are determined by the Package installed. For example, with the EMS Monitor package the following Index Types are available: • PerServer: Alert settings are applied to a specific server. • PerQueue: Alert settings are applied to the queue on each server that has the queue defined. • PerServerQueue: Alert settings are applied to a single queue on a specific server. • PerTopic: Alert settings are applied to the topic on each server that has the topic defined. • PerServerTopic: Alert settings are applied to a single topic on a specific server.
Index	The value of the index column.
Override Settings	When checked, the override settings are applied.
Alert Enabled	When checked, the alert is enabled.

Index Type	Select the index type. The index type specifies how to apply alert settings. For example, to a queue (topic or JVM, and so forth) across all servers, or to a queue on a single server. NOTE: Options in this drop-down menu are populated by the type of alert selected from the Alert Administration display. Index Types available depend on the Package installed.
Index	The selected index column to be edited. This field is populated by the selection made in the **Unassigned Indexes** table.
Unassigned Indexes	This table lists all possible indexes corresponding to the Index Type chosen in the drop-down list. Select a row to apply individual alert thresholds. The selected item appears in the **Index** field. Edit settings in the **Alert Settings** fields, then click **Add**.
Add	Click to add changes made in **Alert Settings**, then click **OK** to confirm.
Remove	Click to remove an alert selected in the **Index Alert Settings** table, then click **OK** to confirm.
Save Settings	Click to save changes made to alert settings.

Alert Settings
Select a topic, server or queue from the **Unassigned Indexes** table and edit the following settings.

Warning Level	Set the warning threshold for the selected alert. When the specified value is exceeded a warning is executed. To set the warning to occur sooner, reduce the Warning Level value. To set the warning to occur later, increase the Warning Level value. NOTE: For low value-based alerts (such as **EmsQueuesConsumerCountLow**), to set the warning to occur sooner, increase the Warning Level value. To set the warning to occur later, reduce the Warning Level value. **Click Save Settings to save settings.**

	Alarm Level	Set the alarm threshold for the selected alert. When the specified value is exceeded an alarm is executed. To set the alarm to occur sooner, reduce the Alarm Level value. To set the warning to occur later, increase the Alarm Level value. NOTE: For low value-based alerts (such as **EmsQueuesConsumerCountLow**), to set the alarm to occur sooner, increase the Alarm Level value. To set the alarm to occur later, reduce the Alarm Level value. Click **Save Settings** to save settings.
	Alert Enabled	Check to enable the alert, then click **Save Settings**.
	Override Settings	Check to enable override global setting, then click **Save Settings**.
Back to Alerts	Returns to the **Administration** - **Alert Administration** display.	

Setting Override Alerts

Perform the following steps to set an override alert. Index Types available depend on the Solution Package installed. In this example, we use the EMS Monitor Package to illustrate.

Note: To turn on an alert, both **Alert Enabled** and **Levels Enabled** must be selected.

To turn on/off, change threshold settings, enable/disable or remove an alert on a single resource:

1. In the **Alert Administration** display, select a tabular alert in the **Active Alert Table** and click **Override Settings**. The **Tabular Alert Administration** display opens.

Note: Alerts that do not support overrides have a value of **-1** for the **Override Count** column and the **Override Settings** option is not present when you select such an alert.

---

2. In the **Tabular Alert Administration** display, select the Index type from the **Index Type** drop-down menu (options are populated by the type of alert you previously selected). For example, with the EMS Monitor package, select PerServerQueue, PerServerTopic or PerServer. NOTE: If you select PerServerQueue or PerServerTopic, the alert settings are applied to the queue or topic on a single server.

3. In the **Unassigned Indexes** table, select the item you want to apply an override alert setting to, click **Add** and **OK** in the confirmation dialog. After a few moments the override setting appears in the **AlertLevels** table.

4. Select the item in the **AlertLevels** table.

5. In the Alert Settings panel (lower right), if needed, modify the Warning Level and Alarm Level settings.

6. In the **Alert Settings** panel, set the following as appropriate.

- To turn on the alert for this index with the given thresholds:

  Alert Enabled Select this option.

Override Settings Select this option.

NOTE: To turn on an alert, both **Alert Enabled** and **Override Settings** must be selected.

- To turn off the alert for only this index (global alert thresholds will no longer apply to this index):

  Alert Enabled Deselect this option.

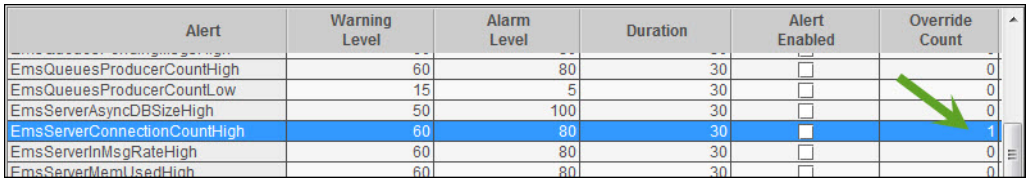
  Override Settings Select this option.

- To no longer evaluate this indexed alert and revert to global settings (or, optionally, Remove it if it is never to be used again):

  Alert Enabled Not used.

  Override Settings Deselect this option.

7. Click **Save Settings**. In a few moments the modifications are updated and a new record appears in the **AlertLevels** table. For example, in the following figure, the EmsServerConnectionCountHigh alert has a new override applied. New overrides increment the alert **Override Count** in the **ALERTLEVELS** table.

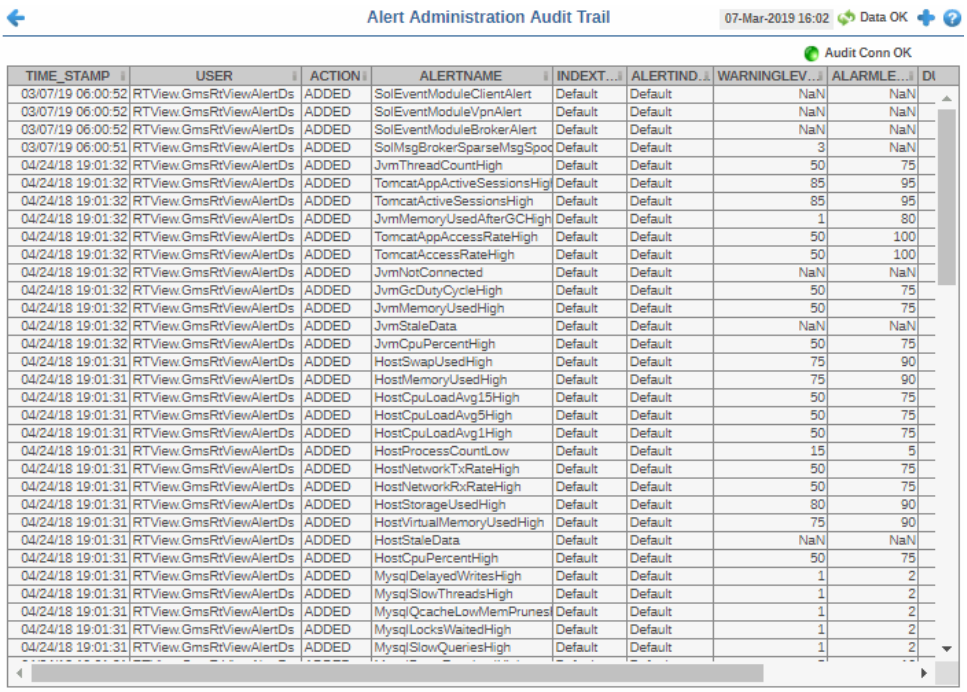


Alert	Warning Level	Alarm Level	Duration	Alert Enabled	Override Count
EmsQueuesProducerCountHigh	60	80	30	☐	0
EmsQueuesProducerCountLow	15	5	30	☐	0
EmsServerAsyncDBSizeHigh	50	100	30	☐	0
EmsServerConnectionCountHigh	60	80	30	☐	1
EmsServerInMsgRateHigh	60	80	30	☐	0
EmsServerMemUsedHigh	60	80	30	☐	0

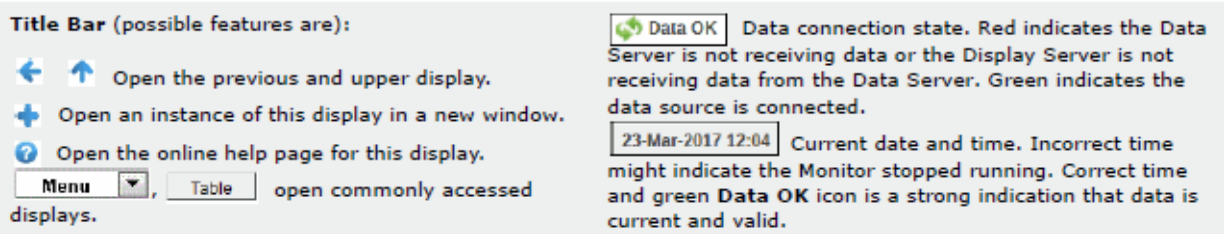
Alert Administration Audit

View alert management details such as alert threshold modifications.

Each table row is a single modification made to an alert. To view modifications for a single alert in a group, sort the **ALERTNAME** column using the button.



TIME_STAMP	USER	ACTION	ALERTNAME	INDEXT...	ALERTIND...	WARNINGLEV...	ALARMLE...	DI
03/07/19 06:00:52	RTView.GmsRtViewAlertDs	ADDED	SolEventModuleClientAlert	Default	Default	NaN	NaN	
03/07/19 06:00:52	RTView.GmsRtViewAlertDs	ADDED	SolEventModuleVpnAlert	Default	Default	NaN	NaN	
03/07/19 06:00:52	RTView.GmsRtViewAlertDs	ADDED	SolEventModuleBrokerAlert	Default	Default	NaN	NaN	
03/07/19 06:00:51	RTView.GmsRtViewAlertDs	ADDED	SolMsgBrokerSparseMsgSpoo	Default	Default	3	NaN	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmThreadCountHigh	Default	Default	50	75	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	TomcatAppActiveSessionsHigl	Default	Default	85	95	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	TomcatActiveSessionsHigh	Default	Default	85	95	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmMemoryUsedAfterGCHigh	Default	Default	1	80	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	TomcatAppAccessRateHigh	Default	Default	50	100	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	TomcatAccessRateHigh	Default	Default	50	100	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmNotConnected	Default	Default	NaN	NaN	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmGcDutyCycleHigh	Default	Default	50	75	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmMemoryUsedHigh	Default	Default	50	75	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmStaleData	Default	Default	NaN	NaN	
04/24/18 19:01:32	RTView.GmsRtViewAlertDs	ADDED	JvmCpuPercentHigh	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostSwapUsedHigh	Default	Default	75	90	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostMemoryUsedHigh	Default	Default	75	90	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostCpuLoadAvg15High	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostCpuLoadAvg5High	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostCpuLoadAvg1High	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostProcessCountLow	Default	Default	15	5	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostNetworkTxRateHigh	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostNetworkRxRateHigh	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostStorageUsedHigh	Default	Default	80	90	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostVirtualMemoryUsedHigh	Default	Default	75	90	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostStaleData	Default	Default	NaN	NaN	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	HostCpuPercentHigh	Default	Default	50	75	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	MysqlDelayedWritesHigh	Default	Default	1	2	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	MysqlSlowThreadsHigh	Default	Default	1	2	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	MysqlQcacheLowMemPrunes	Default	Default	1	2	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	MysqlLocksWaitedHigh	Default	Default	1	2	
04/24/18 19:01:31	RTView.GmsRtViewAlertDs	ADDED	MysqlSlowQueriesHigh	Default	Default	1	2	



Audit Conn OK The Alert Server connection state:
- Disconnected.
- Connected.

TIME_STAMP The date and time of the modification.

USER The user name of the administrator who made the modification.

ACTION The type of modification made to the alert, such as UPDATED.

ALERTNAME The name of the alert modified.

INDEXTYPE The type of alert Index.

ALERTINDEX The IP address and port number for the source (application, server, and so forth) associated with the alert.

WARNINGLEVEL The warning threshold value for the alert at the time this modification was made, as indicated in the **TIME_STAMP** column. The warning level is a threshold that, when exceeded, a warning is executed.

ALARMLEVEL	The alarm threshold value for the alert at the time this modification was made, as indicated in the **TIME_STAMP** column. The alarm level is a threshold that, when exceeded, an alarm is executed.
DURATION	The duration value for the alert at the time this modification was made, as indicated in the **TIME_STAMP** column. The alert duration is the amount of time (in seconds) that a value must exceed the specified Warning Level or Alarm Level threshold before an alert is executed. 0 is for immediate execution.
ENABLED	When checked, indicates the alert was Enabled at the time this modification was made, as indicated in the **TIME_STAMP** column.
USEINDEX	When checked, this action was performed on an override alert (the alert does not use the global settings).

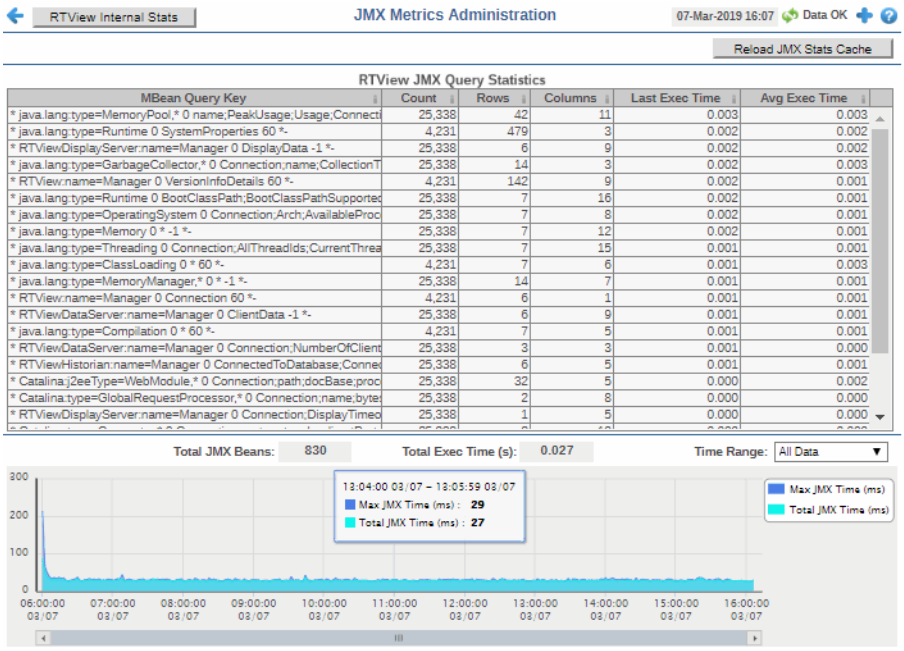
Metrics Administration

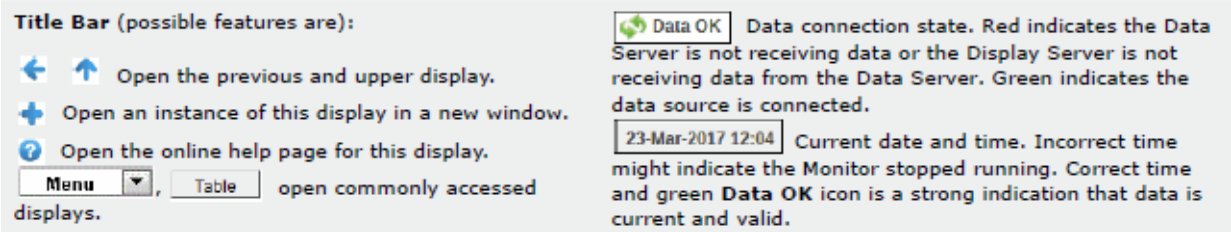
Verify when TIBCO metrics were last queried by the Monitor. The data in this display is predominantly used for debugging by SL Technical Support.

Debugging Notes

The **Filter Objects** and **hasParent** columns were added for debugging problems related to adding and removing filtered listeners. These two columns are very specific to internal RTView structures. For example, if you make a data attachment to **Topics**, where **Name**=**"My Topic"**, an unfiltered data object would be created internally for the Topic metric, and a filtered data object would be created internally for the **Name**=**"My Topic"** row filter. The filtered data object would be setup as a child of the **Topic** metric data object. Subsequently, the **Topic** metric would have one filtered data object, and the filtered data object would have **hasParent=true**.

Also, the following JMSADM data objects (listed in the **Admin Query Key Column** and where **Last Exec Time** is **0**) are for internally created and maintained RTView tables that reside in the data source: **FTServerTable**, **ServerRouteTable**, **ServerTable** and **__admin***. These are not TIBCO metrics that are queried. Therefore, their **Last Exec Time** remains **0**, even though they are updated.





Fields and Data
This display includes:

RTView Internal Statistics — This button opens the **RTView MBeans for Status and Timing Info** display (in a separate window), which is used primarily by SL Corporation's Technical Support team.

RTView JMSADM - TIBCO EMS Admin Statistics — This table lists all JMSADM data objects. Each row in the table is a JMSADM data object. Use this data to determine the last time a TIBCO metric was queried.

- **Admin Query Key** — The dsString used for the data attachment to this data object.
- **Count** — The number of listeners for this data object. For example, graphical objects and function arguments.
- **Filter Objects** — The number of filtered data objects in this data object.
- **hasParent** — True if the data object is a filtered data object.
- **Last Exec Time** — The last time a query was executed for the metric associated with this data object.

Trend Graph — Traces the cumulative and maximum execution times, in seconds, for all Admin Query Keys in the table.

Cum Exec Time -- Traces the Cumulative Execution Time for all Admin Query Keys for the specified time range.

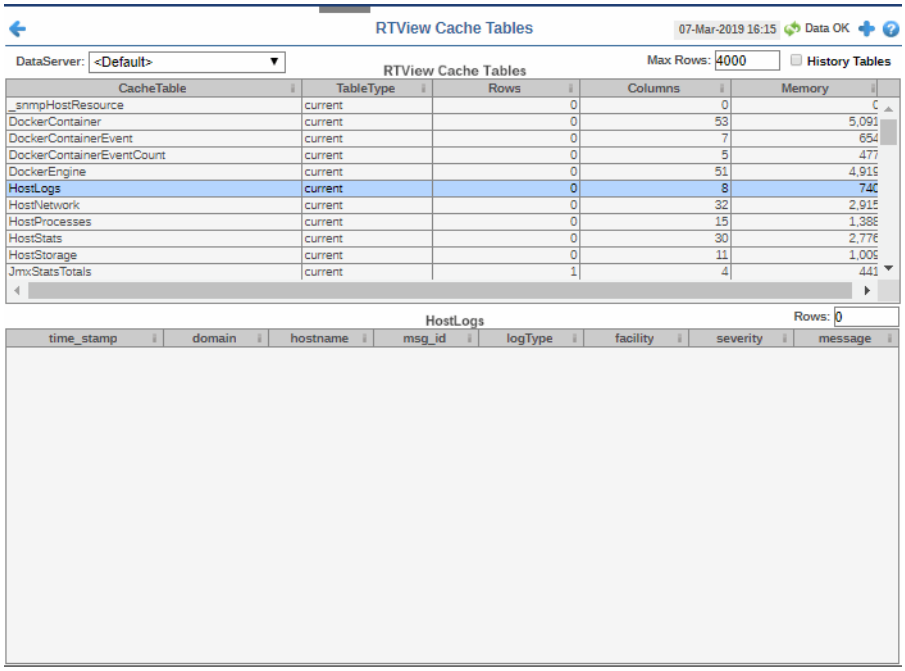
Max Exec Time -- Traces the Maximum Execution Time for all Admin Query Keys for the specified time range.

- **Max Execution Time** — The maximum execution time, in seconds, for all Admin Query Keys in the table.
- **Cumulative Execution Time** — The cumulative execution time, in seconds, for all Admin Query Keys in the table.
- **Time Range** — Choose All Data or a time range from 2 minutes to 7 days.

RTView Cache Tables

View data that RTView is capturing and maintaining. Drill down and view details of RTView Cache Tables. Use this data for debugging. This display is typically used for troubleshooting with Technical Support.

Click a cache table from the upper table to view cached data. .



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

DataServer Select a data server from the drop down menu.

Max Rows Enter the maximum number of rows to display in RTView Cache Tables.

History Tables Select to include all defined history tables in RTView Cache Tables.

RTView Cache Tables
This table lists and describes all defined RTView Cache Tables for your system. Cache tables gather Monitor data and are the source that populate the Monitor displays.

NOTE: When you click on a row in RTView Cache Tables a supplemental table will appear that gives more detail on the selected Cache Table.

CacheTable The name of the cache table.

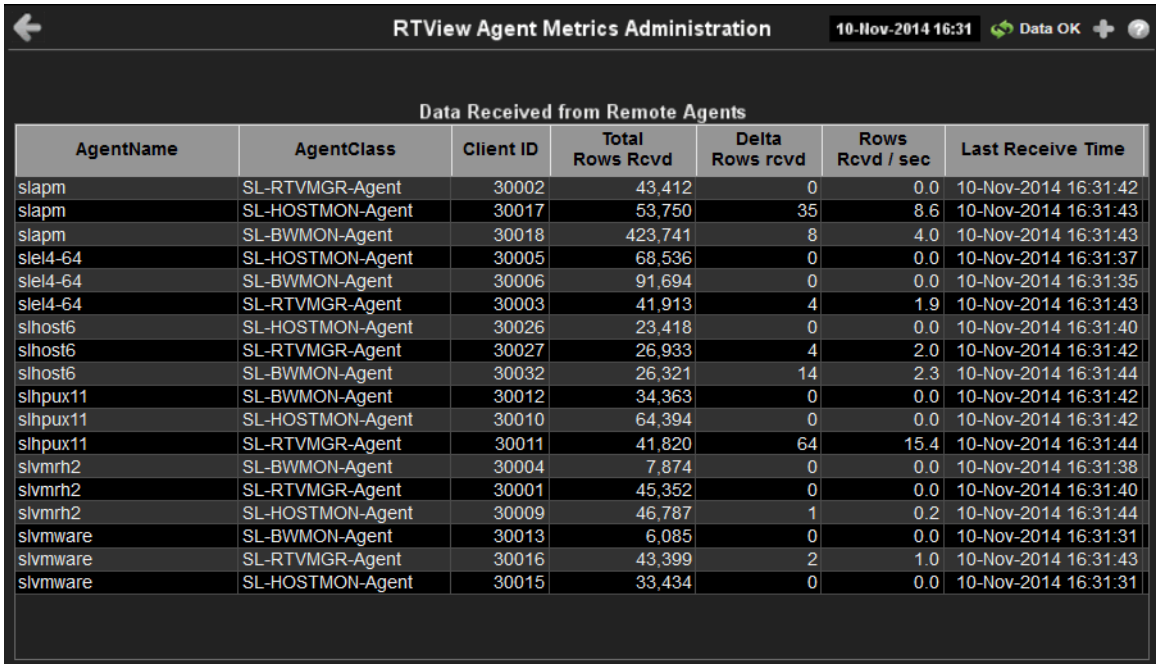
TableType The type of cache table:

- **current** Current table which shows the current values for each index.
- **current_condensed** Current table with primary compaction configured.

	history	History table.
	history_condensed	History table with primary compaction configured.
Rows	Number of rows currently in the table.	
Columns	Number of columns currently in the table.	
Memory	Amount of space, in bytes, used by the table.	

RTView Agent Admin

Verify when agent metrics were last queried by the Monitor. The data in this display is predominantly used for debugging by Technical Support.



Title Bar (possible features are):

Open the previous and upper display.

Open an instance of this display in a new window.

Open the online help page for this display.

Menu, Table open commonly accessed displays.

Data OK Data connection state. Red indicates 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.

23-Mar-2017 12:04 Current date and time. Incorrect time might indicate the Monitor stopped running. Correct time and green **Data OK** icon is a strong indication that data is current and valid.

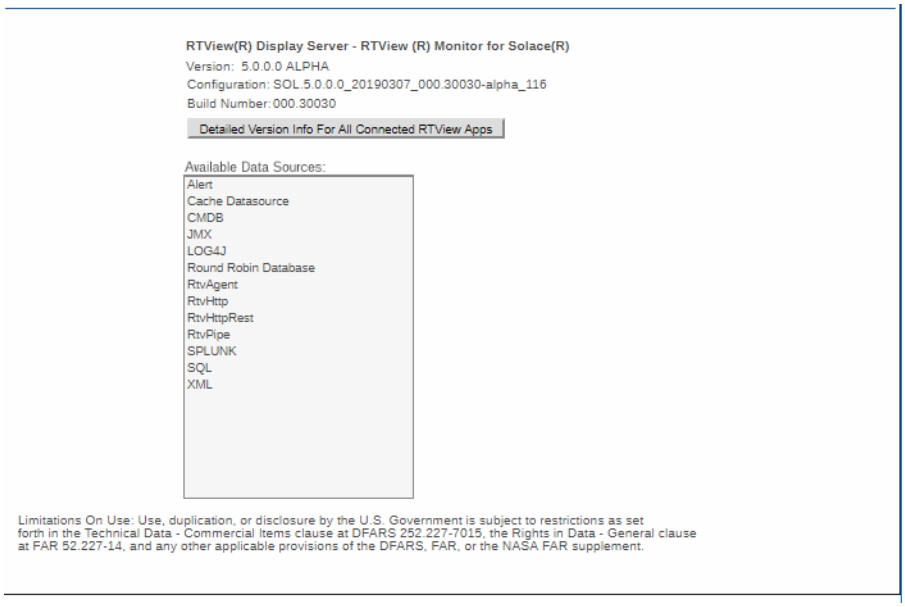
Data Received from Remote Agents Table

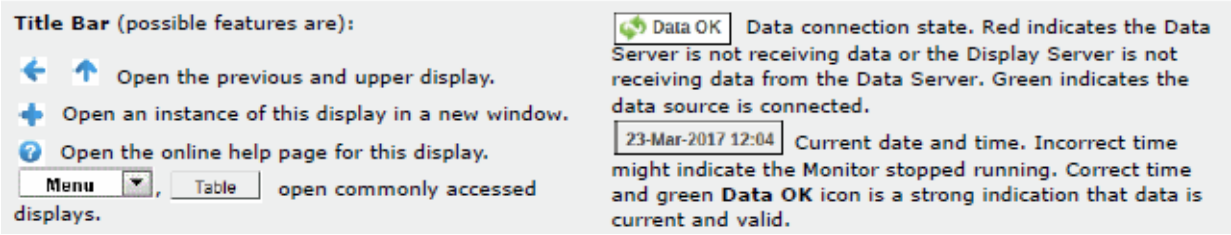
AgentName	Name of the agent.
AgentClass	Class of the agent.

Client ID	Unique client identifier.
Total Rows Rcvd	Total number of rows of data received.
Rows Rcvd/sec	Number of rows of data received per second.
Last Receive Time	Last time data was received from the agent.

About

Get RTView software version and configuration information and a list of all available data sources. For more detailed version information, click **Version Info For All Connected RTView Apps** to open the "Version Info" display. .





DataServer	Select a data server from the drop down menu.
Max Rows	Enter the maximum number of rows to display in RTView Cache Tables.
History Tables	Select to include all defined history tables in RTView Cache Tables.

RTView Cache Tables
This table lists and describes all defined RTView Cache Tables for your system. Cache tables gather Monitor data and are the source that populate the Monitor displays.

NOTE: When you click on a row in RTView Cache Tables a supplemental table will appear that gives more detail on the selected Cache Table.

CacheTable	The name of the cache table.	
TableType	The type of cache table:	
	current	Current table which shows the current values for each index.
	current_condensed	Current table with primary compaction configured.
	history	History table.
	history_condensed	History table with primary compaction configured.
Rows	Number of rows currently in the table.	
Columns	Number of columns currently in the table.	
Memory	Amount of space, in bytes, used by the table.	

APPENDIX A Monitor Scripts

This section describes scripts that are available for the Monitor as well as the **rtvservers.dat** configuration file. This section contains:

Scripts

The following scripts are available when used from an initialized command window. The scripts can be executed from a Windows Command Prompt or UNIX terminal window. On Windows, you can type the commands as described in this section. On UNIX systems, you must add **.sh** to each command. For example, **rtvapm_init.sh**. Also on UNIX systems, it is a requirement that the installation directory path not contain spaces.

These instructions assume use of a BASH or a BASH-compliant shell.

Script Name	Description
my_alert_actions.bat/sh	Sample script to define actions for alerts. Location: **rtvapm/common/bin** Format: **my_alert_actions** (Append **.sh** on UNIX)
rtv_setup.bat/sh	Initializes a command prompt or terminal window. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. This script references RTVAPM_HOME. Format: **rtv_setup** (Append **.sh** on UNIX)
rtvapm_init.bat/sh	Initializes a command window. Location: **rtvapm_home** This script must be executed in the directory in which it resides. This script references RTVAPM_HOME. Format: **rtvapm_init** (Append **.sh** on UNIX)

start_cmd.bat	Starts an initialized Command Prompt window on Windows. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window.

start_rtv.bat/sh	Starts processes in an RTView Enterprise Monitor configuration as specified in the **rtvservers.dat** configuration file.
	Location:
	project directory
	This script must be executed in the project directory (the directory containing the **rtvservers.dat** file). This script references RTVAPM_HOME.
	An RTView Enterprise Monitor configuration might include a Data Server or Display Server, an Historian and a Central Server Database. **start_rtv** only attempts to start processes it detects are not running. The action can be applied to all RTView Enterprise Monitor configurations, a single RTView Enterprise Monitor configuration or a single process in an RTView Enterprise Monitor configuration.
	Before starting an RTView server, this script detects port conflicts caused by another server. If the conflict is caused by another RTView server, it returns a message identifying that server by its **RTVAPM_HOME**. For example:
	`...start_rtv.bat: another dataserver running with JMX port 3268 under C:\rtview\RTViewDataServer\rtvapm`
	If the port conflict is caused by a non-RTView process, it returns a message similar to this, for example:
	`...start_rtv.bat: JMX port 3268 in use by PID 1234`
	In both cases the script includes this advice:
	`Warning: server not started, port conflict`
	To avoid port conflicts, run your start script with the **-portprefix:** command line argument to change the first two (**2**) digits of all your server ports.
	To persist these port changes, change the port prefix in the RTView Configuration Application or use the **-saveportprefix** command line argument.
	Additional arguments can be included on the command line in which case they are passed to every server specified by the command.
	Additional arguments can also be included in the **rtvservers.dat** file, in which case they are only applied to the specific server in whose command they are included.
	Note: If you use the **-properties** or **-propfilter** argument with **start_rtv**, you should also use them with **status_rtv** and **stop_rtv**. Those commands use the JMX ports defined for the server, and if any of the properties specified by **-properties** or **-propfilter** arguments change those ports, subsequent commands will be unable to find the server unless also given those properties.

–console (or **–c**) - Start the processes with a command window (which is useful for testing).

When used without arguments, this script returns usage information and a list of available configurations. For example, **start_rtv** returns:

```
Usage: start_rtv config or 'all' [server or 'all'] [args...]
Available configs:
     default
          dataserver
          historian
          displayserver
          database
     sender
          dataserver
```

all

Starts all RTView Enterprise Monitor configurations that are specified in the **rtvservers.dat** file.

all applies the action to all RTView Enterprise Monitor configurations specified in the **rtvservers.dat** file (and corresponding servers or clients specified in each configuration). **Note:** When multiple configurations are specified in the **rtvservers.dat** file and they have different project settings directory locations, the **all** argument processes all the configurations. However, if the configurations have the same project settings directory locations, the **all** argument processes only the first configuration as the others are considered alternative configurations.

Example:

start_rtv all
(Append **.sh** on UNIX)

[Configuration Name]

Starts a single RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file:

start_rtv [Configuration Name]
(Append **.sh** on UNIX)

Configuration Name is the RTView Enterprise Monitor configuration name specified in the **rtvservers.dat** file. The action applies to all servers or clients specified in the configuration.

Example:

start_rtv web_deployment
(Append **.sh** on UNIX)

[Server Name]

Starts a single process in an RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file:

start_rtv [Configuration Name] [Server Name]
(Append **.sh** on UNIX)

Server Name is the name of a server or client member in the configuration. For example, **dataserver**, **displayserver**, **historian** and **database**. The action applies only to that server or client in the configuration.

Example:

start_rtv web_deployment dataserver
(Append **.sh** on UNIX)

	Use With Secured JMX Ports This script works with RTView servers whose JMX ports are secured with either a username and password, or with SSL. You provide the scripts with the necessary credential information and the scripts manage authentication with the server. There are two ways that you can provide credential information to the scripts: via command-line arguments and via properties placed in any property file that is used by the server. **Securing with username and password** • To secure with a username and password via command-line, use the arguments as follows: **-jmxuser:...** **-jmxpass:...** • To secure with a username and password in a property file, use the properties as follows: **sl.rtview.jmxremote.username=...** **sl.rtview.jmxremote.password=....** **Securing with SSL** To secure with SSL, you provide the client KeyStore and TrustStore locations and their corresponding passwords. • To secure with SSL via command-line, use the arguments as follows: **-sslkeystore:...** **-sslkeystorepass:...** **-ssltruststore:...** **-ssltruststorepass:...** • To secure with SSL in a property file, use the properties as follows: **sl.rtview.ssl.client.keyStore=...** **sl.rtview.ssl.client.keyStorePassword=...** **sl.rtview.ssl.client.trustStore=...** **sl.rtview.ssl.client.trustStorePassword=....** **Password Encryption** To encrypt the passwords in your properties files, use the command-line tool "encode_string", for example: **encode_string encoder2 password** This will give you an encrypted value for "password" that you can use in your properties.
start_server.bat/sh	Starts the RTViewDataServerSP server. Location: **<installation directory>** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window. This script references RTVAPM_HOME. Format: **start_server** (Append **.sh** on UNIX)

start_servers.bat/sh	Starts the RTView Enterprise Monitor servers. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window. This script references RTVAPM_HOME. Format: **start_servers** (Append **.sh** on UNIX)
start_tomcat.bat/sh	Starts Apache Tomcat. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window. This script references RTVAPM_HOME. Format: **start_tomcat** (Append **.sh** on UNIX)
status_rtv.bat/sh	Returns the status of all RTView Enterprise Monitor configurations that are specified in the **rtvservers.dat** configuration file. Location: **project directory** This script must be executed in the project directory (the directory containing the **rtvservers.dat** file). This script references RTVAPM_HOME. This action uses defined JMX ports. An RTView Enterprise Monitor configuration might include a Data Server, a Display Server or Viewer, an Historian and a Central Server Database. **status_rtv** only attempts to start processes it detects are not running. The action can be applied to all RTView Enterprise Monitor configurations, a single RTView Enterprise Monitor configuration or a single process in an RTView Enterprise Monitor configuration. Additional arguments can be included on the command line in which case they are passed to every server specified by the command. Additional arguments can also be included in the **rtvservers.dat** file, in which case they are only applied to the specific server in whose command they are included. Note that if you use **-properties** or **-propfilter** arguments with **start_rtv**, you should also use them with **status_rtv** and **stop_rtv**. Those commands use the JMX ports defined for the server, and if any of the properties specified by **-properties** or **-propfilter** arguments change those ports, subsequent commands will be unable to find the server unless also given those properties.
	all Returns the status of all RTView Enterprise Monitor configurations specified in the **rtvservers.dat** file. **Note:** When multiple configurations are specified in the **rtvservers.dat** file and they have different project settings directory locations, the **all** argument processes all the configurations. However, if the configurations have the same project settings directory locations, the **all** argument processes only the first configuration as the others are considered alternative configurations. Example: **status_rtv all** (Append **.sh** on UNIX)

[Configuration Name]

Returns the status of a single RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file:

status_rtv [Configuration Name]
(Append **.sh** on UNIX)

Configuration Name is the RTView Enterprise Monitor configuration name specified in the **rtvservers.dat** file. The action applies to all servers or clients specified in the configuration.

Example:

status_rtv web_deployment
(Append **.sh** on UNIX)

[Server Name]

Returns the status of a single process in an RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file:

status_rtv [Configuration Name] [Server Name]
(Append **.sh** on UNIX)

Server Name is the name of a server or client member in the configuration. For example, **dataserver**, **displayserver**, **historian** and **database**. The action applies only to that server or client in the configuration.

Example:

status_rtv web_deployment dataserver
(Append **.sh** on UNIX)

	Use With Secured JMX Ports This script works with RTView servers whose JMX ports are secured with either a username and password, or with SSL. You provide the scripts with the necessary credential information and the scripts manage authentication with the server. There are two ways that you can provide credential information to the scripts: via command-line arguments and via properties placed in any property file that is used by the server. **Securing with username and password** • To secure with a username and password via command-line, use the arguments as follows: **-jmxuser:...** **-jmxpass:...** • To secure with a username and password in a property file, use the properties as follows: **sl.rtview.jmxremote.username=...** **sl.rtview.jmxremote.password=....** **Securing with SSL** To secure with SSL, you provide the client KeyStore and TrustStore locations and their corresponding passwords. • To secure with SSL via command-line, use the arguments as follows: **-sslkeystore:...** **-sslkeystorepass:...** **-ssltruststore:...** **-ssltruststorepass:...** • To secure with SSL in a property file, use the properties as follows: **sl.rtview.ssl.client.keyStore=...** **sl.rtview.ssl.client.keyStorePassword=...** **sl.rtview.ssl.client.trustStore=...** **sl.rtview.ssl.client.trustStorePassword=....** **Password Encryption** To encrypt the passwords in your properties files, use the command-line tool "encode_string", for example: **encode_string encoder2 password** This will give you an encrypted value for "password" that you can use in your properties.
stop_collector.bat/sh	Stops the RTViewDataCollectorSP server. Location: **<installation directory>** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window. This script references RTVAPM_HOME. Format: **stop_collector** (Append **.sh** on UNIX)

stop_rtv.bat/sh	Stops processes in an RTView Enterprise Monitor configuration as specified in the **rtvservers.dat** configuration file. Location: **project directory** This script must be executed in the project directory (the directory containing the **rtvservers.dat** file). This script references RTVAPM_HOME. This action uses defined JMX ports. An RTView Enterprise Monitor configuration might include a Data Server or a Display Server, an Historian and a Central Server Database. **stop_rtv** only attempts to start processes it detects are not running. The action can be applied to all RTView Enterprise Monitor configurations, a single RTView Enterprise Monitor configuration or a single process in an RTView Enterprise Monitor configuration. Additional arguments can be included on the command line in which case they are passed to every server specified by the command. Additional arguments can also be included in the **rtvservers.dat** file, in which case they are only applied to the specific server in whose command they are included. Note that if you use **-properties** or **-propfilter** arguments with **start_rtv**, you should also use them with **status_rtv** and **stop_rtv**. Those commands use the JMX ports defined for the server, and if any of the properties specified by **-properties** or **-propfilter** arguments change those ports, subsequent commands will be unable to find the server unless also given those properties. Location: **project directory** This script must be executed in the project directory (the directory containing the **rtvservers.dat** file).
	all Stops all RTView Enterprise Monitor configurations that are specified in the **rtvservers.dat** file. **all** applies the action to all RTView Enterprise Monitor configurations specified in the **rtvservers.dat** file (and corresponding servers or clients specified in each configuration). **Note:** When multiple configurations are specified in the **rtvservers.dat** file and they have different project settings directory locations, the **all** argument processes all the configurations. However, if the configurations have the same project settings directory locations, the **all** argument processes only the first configuration as the others are considered alternative configurations. Example: **stop_rtv all** (Append **.sh** on UNIX)
	[Configuration Name] Stops a single RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file: **stop_rtv [Configuration Name]** (Append **.sh** on UNIX) Configuration Name is the RTView Enterprise Monitor configuration name specified in the **rtvservers.dat** file. The action applies to all servers or clients specified in the configuration. Example: **stop_rtv web_deployment** (Append **.sh** on UNIX)

[Server Name]

Stops a single process in an RTView Enterprise Monitor configuration specified in the **rtvservers.dat** file:

stop_rtv [Configuration Name] [Server Name]
(Append **.sh** on UNIX)

Server Name is the name of a server or client member in the configuration. For example, **dataserver**, **displayserver**, **historian** and **database**. The action applies only to that server or client in the configuration.

Example:

stop_rtv web_deployment dataserver
(Append **.sh** on UNIX)

Use With Secured JMX Ports

This script works with RTView servers whose JMX ports are secured with either a username and password, or with SSL. You provide the scripts with the necessary credential information and the scripts manage authentication with the server. There are two ways that you can provide credential information to the scripts: via command-line arguments and via properties placed in any property file that is used by the server.

Securing with username and password

- To secure with a username and password via command-line, use the arguments as follows:

-jmxuser:...

-jmxpass:...

- To secure with a username and password in a property file, use the properties as follows:

sl.rtview.jmxremote.username=...

sl.rtview.jmxremote.password=....

Securing with SSL

To secure with SSL, you provide the client KeyStore and TrustStore locations and their corresponding passwords.

- To secure with SSL via command-line, use the arguments as follows:

-sslkeystore:...

-sslkeystorepass:...

-ssltruststore:...

-ssltruststorepass:...

- To secure with SSL in a property file, use the properties as follows:

sl.rtview.ssl.client.keyStore=...

sl.rtview.ssl.client.keyStorePassword=...

sl.rtview.ssl.client.trustStore=...

sl.rtview.ssl.client.trustStorePassword=....

Password Encryption

To encrypt the passwords in your properties files, use the command-line tool "encode_string", for example:

encode_string encoder2 password

This will give you an encrypted value for "password" that you can use in your properties.

stop_server.bat/sh	Stops the RTViewDataServerSP server. Location: **project directory/bin** This script must be executed in the directory in which it resides. This script references RTVAPM_HOME. Format: **stop_server** (Append **.sh** on UNIX)
stop_servers.bat/sh	Stops the RTView Enterprise Monitor servers. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. You can also execute the script by double-clicking in an Explorer window. This script references RTVAPM_HOME. Format: **stop_servers** (Append **.sh** on UNIX)
stop_tomcat.bat/sh	Stops Apache Tomcat. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. Format: **start_tomcat** (Append **.sh** on UNIX)
update_wars.bat/sh	Creates/updates the primary Enterprise Monitor servlets. Location: **<installation directory>/projects/rtview-server** This script must be executed in the directory in which it resides. Format: **update_wars.sh [appname [host [portprefix]]]** For example: **update_wars.sh my-appname my-hostname 99** The name, host, and portprefix are declared in variables at the top of the script for easy editing, and can be passed into the scripts on the command-line. You can use **?** or **help** to get a usage message. For example: **update_wars.sh help** You can edit other variables at the top of the scripts to set properties for high-availability (HA). **Set HA_HOST** to the hostname of the backup data server. **Set HA_DISPLAYHOST** to the hostname of the backup display server. **Set HA_FAILBACK** to true to automatically reconnect to the primary display server.

validate_install.bat/sh	Use this script if you encounter error messages when starting servers, to verify your system environment (for example, to verify that Java is installed) as well as your installation directories. Location: **<installation directory>/bin** This script must be executed in the directory in which it resides. Also, in Unix, this script checks and corrects file permissions and file formats (if, for example, the wrong unzip command was used during installation). If file permissions or formats are fixed, the script returns a count of the files fixed. Additionally, if invoked with the argument "-v" (verbose) it returns the names of the files fixed. The script returns the following information (where **<RTViewInstallation>** is your RTView installation): • In Windows Validating installation in /opt/rtview/<RTViewInstallation> ... Java installation correct. ... rtvapm installation correct. • In UNIX Validating installation in /opt/rtview/<RTViewInstallation> ... Java installation correct. ... rtvapm installation correct. ... file permissions correct. ... file formats correct.

rtvservers.dat

This section describes the **rtvservers.dat** configuration file which is used to manage your RTView Enterprise Monitor deployment and RTView Enterprise Monitor processes. This section includes:

- "Single Configuration File"
- "Multiple Configuration File"

The **rtvservers.dat** text file contains one or more RTView Enterprise Monitor configurations. An RTView Enterprise Monitor configuration is a group of servers that should be started together. For example, the configuration might include any of the following: a Data Server, Historian, HSQLDB database, and a Display Server (for a Web Deployment). The **rtvservers.dat** file is used when the following scripts are executed:

- start_rtv Starts RTView Enterprise Monitor processes specified in the **rtvservers.dat** file.
- stop_rtv Stops the RTView Enterprise Monitor processes specified in the **rtvservers.dat** file.
- status_rtv Returns status information for RTView Enterprise Monitor processes specified in the **rtvservers.dat** file.

Single Configuration File

The following **rtvservers.dat** file, located in your project directory, contains a single RTView Enterprise Monitor configuration, named **default**.

```
default . dataserver rundata
default . historian runhist -ds
default . displayserver rundisp -ds
default . database rundb
```

Note: The last line in the **rtvservers.dat** file must end with a new line, or be followed by a blank line.

In this example, to start the **default** configuration type: **start_rtv default** or **start_rtv all**. To start a single server in the configuration, type **start_rtv <Configuration Name> <Server Name>**. For example: **start_rtv default displayserver**.

Each line has the following format consisting of four fields:

<Configuration Name> <Project Settings Directory Location> <Property Filter Identifying the Server> <Command>

<Configuration Name>	The name of the RTView Enterprise Monitor configuration (**default** in this example).
<Project Settings Directory Location>	The RTView Enterprise Monitor project settings directory location, relative to the location of the **rtvservers.dat** file (**.**, the current directory, in this example).
<Property Filter Identifying the Server>	The property filter that identifies the server, which is the property filter under which the server's JMX port is defined. By default, this is the server name, such as **dataserver**, **displayserver** and **historian**.
<Command>	The script used to start the process. Valid values are: • rundata: Starts the Data Server. • runhist: Starts the Historian. • rundisp: Starts the Display Server. • rundb: Starts the HSQLDB Database.

Multiple Configuration File

When multiple configurations are specified in the **rtvservers.dat** file and they have different project settings directory locations, the **all** argument processes all the configurations. However, if the configurations have the same project settings directory locations, the all argument processes only the first configuration as the others are considered alternative configurations. Alternative configurations allow you to alternate between two configurations for a single RTView Enterprise Monitor deployment.

For example, the following **rtvservers.dat** file, located in your project directory**/servers** directory, contains two configurations, **bwmon** and **emsmon**. Note that the project settings directory locations differ (**./bwmon** and **./emsmon**, respectively).

```
bwmon ./bwmon dataserver rundata
bwmon ./bwmon historian runhist -ds
bwmon ./bwmon displayserver rundisp -ds

emsmon ./emsmon dataserver rundata
emsmon ./emsmon historian runhist -ds
emsmon ./emsmon displayserver rundisp –ds
```

Because the project settings directory locations differ, you can use type **start_rtv all** to start both configurations. To start only the bwmon configuration, type: **start_rtv bwmon**. To start a single server in the **bwmon** configuration, type **start_rtv <Configuration Name> <Server Name>**. For example: **start_rtv bwmon displayserver**.

APPENDIX B Alert Definitions

This section describes alerts for Solace and their default settings.

Alert	Warning Level	Alarm Level	Duration	Enabled
SolBridgeInboundByteRateHigh The number of inbound bytes per second across the bridge has reached its maximum. Index Type: PerBridge	8000000	10000000	30	FALSE
SolBridgeInboundMsgRateHigh The number of inbound messages per second across the bridge as a whole has reached its maximum. Index Type: PerBridge	40000	50000	30	FALSE
SolBridgeOutboundByteRateHigh The number of outbound bytes per second across the bridge has reached its maximum. Index Type: PerBridge	8000000	10000000	30	FALSE
SolBridgeOutboundMsgRateHigh The number of outbound messages per second across the bridge has reached its maximum. Index Type: PerBridge	40000	50000	30	FALSE
SolClientInboundByteRateHigh The number of outbound bytes per second for the client has reached its maximum. Index Type: PerClient	8000000	10000000	30	FALSE
SolClientInboundMsgRateHigh The number of outbound messages per second for the client as a whole has reached its maximum. Index Type: PerClient	40000	50000	30	FALSE
SolClientOutboundByteRateHigh The number of outbound bytes per second for the client has reached its maximum. Index Type: PerClient	8000000	10000000	30	FALSE
SolClientOutboundMsgRateHigh The number of outbound messages per second for the client as a whole has reached its maximum. Index Type: PerClient	40000	50000	30	FALSE
SolClientSlowSubscriber One or more clients are consuming messages too slowly; endpoints may drop messages! Index Type: PerClient	1	NaN	30	FALSE

SolCspfNeighborDown State is not “OK” for one or more CSPF neighbors. Index Type: PerNeighbor	1	NaN	30	FALSE
SolEndpointPendingMsgsHigh The number of pending messages on a queue has reached its maximum. Index Type: PerEndpoint	8000	10000	30	FALSE
SolEndpointSpoolUsageHigh The endpoint is consuming too much message router memory for storing spooled messages. (Threshold units are megabytes.) Index Type: PerEndpoint	40	50	30	FALSE
SolEventModuleBrokerAlert This is an Event Alert. Event Alerts do not have duration or threshold settings. If the Solace Event Module is properly configured and running and this alert is enabled, all Syslog Events that are selected as alerts from the Message Brokers that were enabled for being monitored with Syslog will trigger this type of alert from the SYSTEM scope. Alerts of this type refer to Syslog events that can be clearable and non-clearable of SYSTEM scope. Therefore this alert can be clearable and non-clearable, depending on the event that triggered its execution.				FALSE
SolEventModuleClientAlert This is an Event Alert. Event Alerts do not have duration or threshold settings. If the Solace Event Module is properly configured and running and this alert is enabled, all Syslog Events that are selected as alerts from the Message Brokers that were enabled for being monitored with Syslog will trigger this type of alert from the CLIENT scope. Alerts of this type refer to Syslog events that can be clearable and non-clearable of CLIENT scope. Therefore this alert can be clearable and non-clearable, depending on the event that triggered its execution.				FALSE
SolEventModuleVpnAlert This is an Event Alert. Event Alerts do not have duration or threshold settings. If the Solace Event Module is properly configured and running and this alert is enabled, all Syslog Events that are selected as alerts from the Message Brokers that were enabled for being monitored with Syslog will trigger this type of alert from the VPN scope. Alerts of this type refer to Syslog events that can be clearable and non-clearable of VPN scope. Therefore this alert can be clearable and non-clearable, depending on the event that triggered its execution.				FALSE
SolGuaranteedMsgingHbaLinkDown For Guaranteed Messaging only, the Operational State for each HBA Fibre-Channel should be Online (e.g., not Linkdown). Index Type: PerHbaLink	0	NaN	30	FALSE
SolGuaranteedMsgingMatePortDown For Guaranteed Messaging only, the Mate Link Ports for ADB should have status OK. Index Type: PerADB	0	NaN	30	FALSE
SolGuaranteedMsgingNoMsgSpoolAdActive For Guaranteed Messaging only with Redundancy, at least one message router in an HA pair should show “AD-Active.” Index Type: PerPair	0	NaN	30	FALSE
SolMsgRouterActiveDiskUtilHigh The utilization of the active disk partition for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE

SolMsgRouterByteEgressUtilHigh The egress rate (bytes/sec) utilization (current egress rate divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterByteIngressUtilHigh The ingress rate (bytes/sec) utilization (current ingress rate divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterConnectionUtilHigh The connection utilization for the message router (current number of connections divided by max allowed) is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterCpuTemperatureHigh CPU temperature margin is above threshold. Index Type: PerApplianceSensor	-30	-15	30	FALSE
SolMsgRouterCspfNeighborDown Link-detect = no for CSPF neighbor. Index Type: PerAppliance	1	NaN	30	FALSE
SolMsgRouterDelvrdUnAckMsgUtilHigh The delivered unacked messages as a percentage of all messages delivered for the application is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterFailoverDetected The backup message router in a HA pair has assumed control. Index Type: PerAppliance	1	NaN	30	FALSE
SolMsgRouterFanSensorCheckFailed The speed measured for one or more fans is below threshold. Index Type: PerApplianceSensor	5000	2657	30	FALSE
SolMsgRouterInboundByteRateHigh The number of inbound bytes per second for the message router has reached its max threshold. Index Type: PerAppliance	400000	500000	30	FALSE
SolMsgRouterInboundMsgRateHigh The number of inbound messages per second for the message router has reached its max threshold. Index Type: PerAppliance	400000	500000	30	FALSE
SolMsgRouterIngressFlowUtilHigh The ingress flow utilization (current flows divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterInterfaceDown Link-detect = no for one or more enabled network interfaces. Index Type: PerSolInterface	NaN	NaN	30	FALSE

SolMsgRouterMsgCountUtilHigh The message count utilization for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterMsgEgressUtilHigh The message egress rate utilization (current message egress rate divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterMsgIngressUtilHigh The message ingress rate utilization (current message ingress rate divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterNABUsageHigh Network Acceleration Blade memory usage is excessive. Index Type: PerNAB	60	80	30	FALSE
SolMsgRouterNotConnected The message router is not ready for collecting performance monitoring data. Index Type: PerAppliance	NaN	NaN	30	FALSE
SolMsgRouterOutboundByteRateHigh The number of outbound bytes per second for the message router has reached its max threshold. Index Type: PerAppliance	400000	500000	30	FALSE
SolMsgRouterOutboundMsgRateHigh The number of outbound messages per second for the message router has reached its max threshold. Index Type: PerAppliance	400000	500000	30	FALSE
SolMsgRouterPendingMsgsHigh The total number of pending messages for this message router has reached its maximum. Index Type: PerAppliance	400000	500000	30	FALSE
SolMsgRouterPowerSupplyFailed A power supply has failed. Index Type: PerAppliance	0	NaN	30	FALSE
SolMsgRouterSpoolUtilization The amount of spool space used for messages is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterStandbyDiskUtilHigh The utilization of the standby disk partition for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterSubscriptionUtilHigh The subscription utilization (current number of subscriptions divided by max allowed) for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE

SolMsgRouterSwapUsedHigh The amount of swap space used by the message router operating system is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterSyslogAlert This alert executes when a Solace Syslog Warning or Critical message is received. To get Syslog event alerts (in RTView Enterprise Monitor or the standalone Monitor), go to the Alert Administration display and enable the **SolMsgRouterSyslog** alert.	-	-	-	-
SolMsgRouterTemperatureSensorCheckFailed A chassis temperature measurement is above threshold. Index Type: PerAppliance	40	45	30	FALSE
SolMsgRouterTranSessionCntUtilHigh The transacted session count utilization for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterTranSessionResUtilHigh The transacted session resource utilization for the message router is excessive. Index Type: PerAppliance	70	85	30	FALSE
SolMsgRouterVoltageSensorCheckFailed A power supply voltage is high or low. Index Type: PerApplianceSesor	NaN	NaN	30	FALSE
SolSparseMessageSpoolFile This is a Limits Alert that issues a Warning alert and is enabled by default. **Important:** Do not modify thresholds for this alert as they were set up by Solace development team) This alert is defined to determine when there is a Sparse Message Spool File Condition. When disk space usage is several multiples of persistent store usage, then there is likely a large number of message spool files residing on the disk where each file contains few messages. This is referred to as a sparse message spool file condition, and requires urgent attention to mitigate and avoid the disk reaching capacity. For further information, refer to Solace documentation.				TRUE
SolVpnConnectionCountHigh The number of connections to the server has reached its maximum. Index Type: PerVPN	60	80	30	FALSE
SolVpnInboundByteRateHigh The number of inbound bytes per second for the vpn has reached its maximum. Index Type: PerVPN	8000000	10000000	30	FALSE
SolVpnInboundDiscardRateHigh The number of discarded inbound messages per second for the server is excessive. Index Type: PerVPN	1	5	30	FALSE
SolVpnInboundMsgRateHigh The number of inbound messages per second for the vpn as a whole has reached its maximum. Index Type: PerVPN	40000	50000	30	FALSE

SolVpnOutboundByteRateHigh The number of outbound bytes per second for the VPN has reached its maximum. Index Type: PerVPN	8000000	10000000	30	FALSE
SolVpnOutboundDiscardRateHigh The number of discarded outbound messages per second for the server is excessive. Index Type: PerVPN	1	5	30	FALSE
SolVpnOutboundMsgRateHigh The number of outbound messages per second for the server as a whole has reached its maximum. Index Type: PerVPN	40000	50000	30	FALSE
SolVpnPendingMsgsHigh The total number of pending messages for this destination has reached its maximum. Index Type: PerVPN	8000000	10000000	30	FALSE
SolVpnSubscriptionCountHigh The number of endpoints in this VPN has reached its maximum. Index Type: PerVPN	8000	10000	30	FALSE

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That's all there is to it!

APPENDIX D Limitations

This chapter defines the limitations experienced when using iPad Safari.

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 **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.