



Visual Statistics Display

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PATENTS

GemFire is protected by U.S. patent 6,360,219. Additional patents pending.

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GemStone Systems, Inc.
1260 NW Waterhouse Avenue, Suite 200
Beaverton, OR 97006

Introduction

This manual describes how to use the GemStone® Visual Statistics Display (VSD) tool to help monitor the performance of your GemFire product and to diagnose performance problems. For specific information on the statistics produced by your GemFire product, see the individual product manuals.

VSD may not be automatically installed with your GemFire product. To determine whether VSD is installed on your system, examine the product directory for a VSD subdirectory.

If you need to install VSD, run the product Installer, as described in the “Installation” chapter of the product manuals. During the installation process, choose VSD as an optional component to install.

Your GemFire product creates a statistical archive file named *filename.gfs*. The file logs useful statistics — counters and gauges that describe the state of the system at a particular moment in time. The file collects statistics at specific sampling intervals, which you can set at various levels to monitor different types of behavior.

The VSD tool reads the sampled statistics and produces graphical displays for analysis. Typically, the points on a line of a VSD graph represent the values for a particular statistic over time.

VSD’s extensive online help offers more complete reference information about the tool.

1.1 Starting VSD

To start VSD, enter the following command:

```
prompt> gemFireProductDir/vsd/bin/vsd
```

Loading a Statistics File into VSD

You can load a statistics file into VSD in a number of ways:

- ▶ You can include the name of one or more statistics files on the VSD command line:

```
vsd <filename.gfs> ...
```
- ▶ You can browse for an existing statistics file, through **Main > Load Data File**.
- ▶ If you know the name of the file, you can type the full path in the File entry box, then press Enter.
- ▶ To switch to a statistics file that you've already loaded, click the down-arrow next to the File entry box, then select a file from the list.

After you've loaded the data file, the VSD main window displays a list of entities for which statistics are available. VSD uses color to distinguish between entities that are still running (shown in green) and those that have stopped (shown in black).

Maintaining a Current View of the Data File

If you select the menu item **File > Auto Update**, VSD automatically updates your display, and any associated charts, whenever the data file changes.

Alternatively, you can choose **File > Update** periodically to update the display manually.

About Statistics

Some statistics are cumulative from when the GemFire system was started. Other statistics are instantaneous values that may change in any way between sample collection.

Cumulative statistics are best charted per second or per sample, so that the VSD chart will be readable. Absolute values are best charted as No Filter. (For details on how to filter or not, see "View Statistic Information" on page 9.)

1.2 Viewing Statistics in VSD

Statistic Levels

Each statistic has a characteristic called a *level* that reflects the amount of background knowledge that you would need to use the statistic with understanding. You can set up VSD to list (in its main window and in associated charts) only those statistics that are at, or below, a certain level of complexity — common, advanced, or wizard.

To establish the levels of statistics that you want to display in VSD, choose the menu item **Main > Statistic Level** in the main VSD window.

Select Statistics for Viewing

1. In the VSD list, click the left mouse button to select the entity or entities you want to view.
 - ▶ Search for a specific session name or process ID.

To find a specific entity, click the mouse in the process list, then press Ctrl-S. When the dialog box appears, enter the PID or name of the entity that you're looking for. VSD highlights the first entity with that PID or name. To find the next match, press Ctrl-S again.

To select the highlighted item, click on it. When you're done, press Return.
 - ▶ Select all entities or by statistic or by type.

Statistics are available for various entities, which are listed under the heading **Type** in the process list.

Alternatively, you can use the right mouse button menu to perform these useful functions:

- ▶ Combine multiple entities into a single line.

This can be quite helpful. For example, if you want to measure page reads per second for several hundred entities, you could select all the entities, then combine them into a single line in the chart, thus rendering the data much more readable.
 - ▶ Combine multiple entities from different files into a single line.
 - ▶ Eliminate *flatlines* — entities whose values are always zero.
 - ▶ Select Single File mode so only one loaded file can be enabled at a time.
 - ▶ Select for created lines to have absolute timestamps, which is useful when merging files.
2. Next, select a statistic for viewing from the statistics list just below the process list.
 3. After you've selected the statistic, do one of the following:
 - ▶ To display the statistic in a new chart, type the name of the chart in the Chart entry box, then click **New Chart**. (**Note:** If you don't explicitly specify a chart name, VSD will assign one for you.)
 - ▶ To display the statistic in an existing chart, select the chart name in the Chart entry box. Then click on **Add Line**.
 4. To add another statistic to the chart, repeat steps 1 through 3 as necessary.

Using VSD Chart Templates

VSD templates let you quickly add a set of lines to a chart. Templates are helpful if you find yourself performing the same task frequently in VSD — for example, monitoring the same five or six statistics. By creating a template for the statistics that you want to monitor most frequently, you can automate the task of building charts.

In your template, you can assign a filter for each statistic, to determine how much information is displayed for that statistic. You can also restrict the template to look for extreme conditions (for example, processes that are consuming 90% or more of the CPU).

VSD is shipped with a set of predefined templates, which are maintained in the `.vsdtemplates` file in your home directory.

You can use a text editor to change or delete templates in the `.vsdtemplates` file.

To do this...	Do this...
Create a new chart from a template	In the VSD main window, choose the menu item Template > New Template Chart . This is a good way to display some of the more useful system statistics.
Apply a template to the chart that you're viewing	In the Chart window , choose the menu item Chart > Add From Template . (Note: If you have zoomed in on a chart, the template filter is only applied to values within the zoomed range.)
Reread the template file <code>.vsdtemplates</code> into VSD after you've edited it	In the VSD main window, choose the menu item Template > Reload Template File .
Save the current chart as a template	In the Chart window , configure the chart as you desire, then choose the menu item Chart > Save Template . The template is saved to the <code>.vsdtemplates</code> file. If you save the current chart as a template, you may still need to edit the <code>.vsdtemplates</code> file so that you can give it a more useful name and make the information and patterns it captures more general.

The Chart Menu (Chart Window)

To customize the way VSD displays statistics in your chart, you can choose items from the Chart window's Chart menu.

Chart Menu Item	Effect
Add from Template	Expand template and add resulting lines to chart
Save Template	Save all lines on chart as a template
Paste	Paste last item on clipboard
Print	Print chart
Snapshot	Write this chart as a graphic to <code>snapshot.gif</code>
Help . . .	Open Help window
Zoom In	You can zoom to improve your view of the chart. After you choose this menu item, click to select one corner of the area that you want to zoom. Move the mouse pointer to the opposite corner of the zoom area, then click again. To quickly zoom in on an area, move the mouse pointer over the area and click the middle mouse button (if available).
Zoom Out	Click the right mouse button.
Compare Two Points	Log information by comparing two points.
Compute Scale All, Unscale All	To view multiple statistics on the same axis, you might find it helpful to adjust the scale of the chart.
Show Legend	Select this item to display the legend for this chart.
Time Format	Changes the format of the time displayed along the X axis.
Show Time Axis Title, Show Left Axis Title, Show Right Axis Title	Select these items to display the title alongside the respective axes.
Show Current Values	Select this item to display the current X and Y values for the selected line at the top of the chart.
Show Min and Max	Select this item to display the minimum and maximum values for the selected line at the top of the chart.
Show Line Stats	Select this item to display the following statistics for the selected line: the number of data samples, the min, the max, the mean, and the standard deviation. The statistics are calculated from all of the data points on the selected line in the region defined by the graph's current X axis. (To change the region, select Zoom In or Zoom Out from the Chart menu.)
Show CrossHairs	Draw crosshairs on graph of item
Show Grid Lines	Draw grid line on graph of item
Close	Close chart window

For additional information about what you can do in the Chart window, choose Help from the Chart menu.

The Line Menu (Chart Window)

You can also choose items from the Line menu (in the Chart window) to customize your VSD chart display. Line menu commands operate on the currently selected line.

To select a line, click on it or on its entry in the chart legend. VSD highlights the selected line.

Line Menu Item	Effect
Log Info	Displays a log file showing the line statistics for all data samples in the region defined by the graph's current X axis.
Log Delta	Use this menu item to measure the difference between two values on the selected line. Select the line before choosing this menu item. Then click on the two points whose difference you want to compute. VSD responds by displaying a log file showing the difference in time and value between the two points; the number of data samples in the selected line segment; and the min, max, mean, and standard deviation of those samples.
Compute Scale	Computes a scale value for the selected line that will make it visible on the current chart. You can also use the Scale entry box to manually change the scale. The default scale value is 1.
Unscale	Reverses the effect of Compute Scale.
Graph on Left Axis	Select this item to display the Y-axis for the selected line to the left of the chart. Otherwise, the Y-axis is displayed to the right. To view multiple lines on the same chart, you can use this menu item to graph large values on one axis and small values on the opposite axis.
Symbol	Selects a new symbol.
Style	Select a line style for connecting points: linear (default), step, natural, quadratic.
Update	Update files used by current line
Add Lines	Add a line to the current line
Diff Lines	Remove a line from the current line
Divide Lines	Divide current line by another line
Normalize	Normalize current line
Trim Left, Right	Trim line to left or right of a data point
Untrim Left, Right	Undo any trim line operations
Copy	Copy current line to clipboard
Cut	Cut current line to clipboard
Delete	Removes the selected line from this chart.

Customizing Your VSD Chart

You can customize and manipulate a VSD chart in many ways:

- ▶ To *select a line* in the chart, click on it or on its entry in the chart legend.
- ▶ To *delete a line* from the chart, click the middle mouse button (if available) on its entry in the chart legend. Alternatively, select the line's entry in the chart legend and choose **Line > Delete**.
- ▶ To *find out about a specific point* in a chart, hold the mouse pointer over it.

View Statistic Information

To view a description of the most recently selected statistic, along with information about its type, level, and default filter, go to the VSD main window, then choose the menu item **Main > Show Statistic Info**.

In the Statistic Information window, you can redefine the level and default filter for any VSD statistic.

- ▶ The statistic's *level* — common, advanced, or wizard — allows you to determine whether the statistic is displayed in the VSD statistic list.
- ▶ Whenever you add a line to a chart, the *filter* determines how information is displayed for the selected statistic. See Table 1.1.

Table 1.1 Statistic Filters

Default Filter	Effect
Default	None if the statistic represents a snapshot of a value; PerSecond if the statistic represents a value that always increases.
No Filter	Displays the raw values for the statistic with no filtering at all.
PerSample	Displays the difference between two consecutive samples of the statistic.
PerSecond	Displays the difference between two consecutive samples of the statistic, divided by the number of elapsed seconds between the two samples.
Aggregate	Displays a running total of per-sample deltas for the statistic. Resets to zero when the delta is zero or changes direction.

Once you've added the line to a chart, you can override its default filter by specifying a new filter from the drop-down menu at the top of the Chart window.

If you leave the Statistic Information window up as you work, it changes to reflect the current statistic. In this way, you can get a quick explanation of any statistic that you're currently examining.

