

Monitoring and Troubleshooting Single Domains

Introduction

The previous chapter described TrafficDirector tools that monitor multiple segments and domains. In this chapter you'll find tools that focus on a single agent and domain. You use these tools to more closely examine different aspects of network operation. Typically, you'll first use a multi-segment, multi-domain tool to get a general idea of the portion of your network you want to monitor, then use the single-agent, single-domain tools to zero in on the portion you want to examine more closely.

The single segment and domain monitoring tools are:

Tool	What It Does
Segment Zoom	Displays statistical data available from a particular agent and domain.
Host List	Displays a host list for the selected agent and domain. From the Host List, you can view the Host Stats Graph and display utilization, packets, bytes, destinations, and errors.
Conversation List	Displays a list that shows which hosts are exchanging packets on the segment. From the Conversation List, you can view the Conversation Stats Graph and display utilization, packets, bytes, and errors.
Host Zoom	Displays more detailed information about traffic to and from a single host. Both graphical and tabular displays are available.
Watchdog	Lets you set a threshold on any event, then sends you a trap message when the event falls above or below the threshold.
Segment Statistics Graph	Provides four data views for the selected segment: <ul style="list-style-type: none">• Vital Signs. A general indication of the health of the segment.• Size Distribution. Shows how different packet sizes are distributed in the segment.• Destination Breakdown. Lists packet destinations.• Error Breakdown. Lists errors.

Tool	What It Does
Short-Term History Graph	Displays short-term data (residing in the selected agent) for a period you select.
Long-Term History Graph	Displays long-term data (residing in the selected agent) for a period you select.

Launching Single Agent/Domain Monitoring Tools

In Traffic Monitor, Protocol Monitor, or Domain Monitor, you can launch a single agent/domain tool directly from the **Tools** menu. To do so:

- Step 1** Select the **Tools** menu from the network monitoring window.
- Step 2** Select the segment or domain tool you want to use. For all tools *except* Domain Manager, the Application Launch window appears. The tool you selected is highlighted.
- Step 3** Select the Application you want to launch if it is not already highlighted. Then select the appropriate Agent and Domain.
- Step 4** Click on **Launch**. The selected application appears.

Using Segment Zoom

Segment Zoom provides segment traffic information in tabular form. Note that the selected agent and domain appear at the top of the window. The display information shown in the figure is for Ethernet. It is different for Token Ring networks.

The display has three list boxes. The information displayed depends on the menus and selection buttons you select.

To use the Segment Zoom Display:

- Step 1** Launch it from a Multi-segment, multi-domain tool as described above.
- Step 2** Select **Properties** to determine the interval over which displayed data is taken and the type of statistics displayed. You can select short-term history or long-term history. For Token Ring segments, you can select either promiscuous statistics or MAC-level statistics. The default is Short-Term History for Ethernet, or TR Promiscuous Stats for Token Ring.
- Step 3** Select **Sort** to determine the sort criterion Segment Zoom uses for the Top N Hosts display. The sort variables are **per interval**. They are:
 - **Packets in.** The number of packets inbound to the host during the interval.
 - **Packets out.** The number of packets outbound from the host during the interval.
 - **Bytes in.** The number of bytes into the host during the interval.
 - **Bytes out.** The number of bytes outbound from the host during the interval.
 - **Errors out.** The number of errors outbound from the host during the interval.
 - **Broadcasts out.** The number of broadcasts outbound from the host during the interval.
 - **Multicasts out.** The number of multicasts outbound from the host during the interval. The default is Packets Out.

- Step 4** Select **Sample** to determine the sample interval. You can select an interval from 15 seconds to 2 minutes. The default is 1 minute.
- Step 5** You can select any of the tools available, either from the **Tools** menu or from the selection buttons. Your choices are:
- **Agent Info.** Provides information on the selected agent.
 - **Host List.** Displays activity for segment hosts.
 - **Host Zoom.** Displays conversations between the selected Top N host and other hosts.
 - **Watchdog.** Invokes the Watchdog tool.
 - **Segment Statistics Graph.** Provides a graphical summary of segment traffic information.
 - **Short-term History Graph.** Displays a graph of segment activity for a short period of time.
 - **Long-term History Graph.** Displays a graph of segment activity for a longer period of time.

Segment Zoom Display Information

The first list box displays cumulative traffic statistics for the domain. This information is obtained from the **etherStatsTable** for an Ethernet interface, or from the Promiscuous/MAC-level **tokenRingStatsTable** for a Token Ring interface.

The second list box displays Buckets, Interval, and either Short-Term History or Long-Term History for all hosts, depending on which history you selected from the **Properties** menu. This information is obtained from the long-term and short-term history tables associated with the domain.

Note For a Token Ring interface, either the Promiscuous or MAC-level history information appears, depending on the option you select.

The third list box displays traffic information for the top N hosts. Hosts are listed by name and address. You select the ranking of each host using the **Sort** menu at the top of the window. For IP, IPX, and DECNET domains installed in NET mode or SUBNET mode, the list box displays the name and logical address. Any other protocol or domain displays information in MAC mode.

Printing the Segment Zoom Display

You may want to print the contents of the Segment Zoom list box for your records. To print the contents of the Segment Zoom list box:

- Step 1** Select the **File** menu.
- Step 2** Select Print.

Exiting the Segment Zoom Display

To exit the Segment Zoom display:

- Step 1** Select the **File** menu.
- Step 2** Select Exit.

Host List

Host List provides you with a complete list of the hosts and host activity detected by the selected agent for the specified domain. You can specify that the list be sorted according to Discovery Order or MAC Order or by one of the statistical values available in the **Sort** menu. You can use Host List to verify the number of hosts in the domain. You can also use it to determine whether a specific host is included in that domain.

Both a tabular view and a graphical view are available. The tabular view provides more data, but the graphical view provides an excellent “at-a-glance” view of host activity. The Host List table can display a maximum of 512 hosts.

Also using Host List, you can select a host for the specified domain and view various statistics on the Host Stats Graph. You can use the Host Stats Graph to establish normal traffic patterns and later monitor to catch any emerging problems on the segment. Statistics you can display using the Host Stats Graph include utilization, packets, bytes, destinations, and errors.

Note If the Host/group option is not enabled for the agent/domain combination you select, you’ll see the error message:

Host/group not enabled for this agent/domain!

If this happens, modify the domain installation to enable the Host/group option as described in “Installing Domains at Agents”.

Using Host List Tabular View

Use the Host List tabular view to see a complete list of host activity.

Step 1 Select Domain Manager, Traffic Monitor, or Protocol Monitor from the TrafficDirector main window, or launch Segment Zoom from an appropriate tool.

Step 2 The next step depends on which tool you selected:

- If you selected Domain Manager, first select an agent and domain from the list box.
- If you selected Traffic Monitor or Protocol Monitor, launch **Host List** from the **Tools** menu, then select an agent and domain.
- If you launched Segment Zoom from another tool, simply launch **Host List** from the **Tools** menu.

Note If you launched Host List from either Domain Manager or Segment Zoom, the Host List tabular view appears initially. Otherwise, the Host List graphical view appears. If the graphical view appears, select the **Tools** menu, then select Show Text to see the tabular view.

Step 3 The Host List window appears. To sort the list of hosts according to different parameters, select the **Sort** menu. The sort parameters are:

- **Address Order.** Sorts by the address of each host.
- **Packets Out.** Sorts by cumulative number of packets outbound from the host.
- **Broadcasts Out.** Sorts by cumulative number of broadcasts outbound from the host.
- **Multicasts Out.** Sorts by cumulative number of multicasts outbound from the host.

- **Errors Out.** Sorts by cumulative number of errors in outbound transmissions from the host.
- **Bytes Out.** Sorts by cumulative number of bytes outbound from the host.
- **Packets In.** Sorts by cumulative number of packets inbound to the host.
- **Bytes In.** Sorts by cumulative number of bytes inbound to the host.
- **Time Order.** Sorts by the order in which the hosts were discovered.

The default is Time Order.

- Step 4** To get information about the agent you selected, click on the **Agent Info** button.
- Step 5** To refresh the display, click on the **Refresh** button.
- Step 6** To launch Host Zoom for a specific host, highlight the host in the list box and then click on the **Zoom** button. Host Zoom is described in the section “Host Zoom” later in this chapter.
- Step 7** To display the Host List graphical view, click on the **Show Graph** button.
- Step 8** To print the Host List list box data, select the **File** menu, then click on Print.
- Step 9** To exit Host List, select the **File** menu, then click on Exit.

Using Host List Graphical View

Use the Host List graphical view to obtain an at-a-glance view of host activity for a domain:

- Step 1** Select Domain Manager, Traffic Monitor, or Protocol Monitor from the TrafficDirector main window, or launch Segment Zoom from an appropriate tool.
- Step 2** The next step depends on the initial tool you selected:
- If you selected Domain Manager, first select an agent and domain from the list box.
 - If you selected Traffic Monitor or Protocol Monitor, launch Host List from the **Tools** menu and then select an agent and domain.
 - If you launched Segment Zoom from another tool, simply launch Host List from the **Tools** menu.

Note If you launched Host List from either Domain Manager or Segment Zoom, the Host List tabular view appears initially. Otherwise, the Host List graphical view appears. If the tabular view appears, select the **Tools** menu, then select Show Graph to see the graphical view.

- Step 3** The Host List graphical view appears. To sort the graphical display, select the **Sort** menu. The sort criteria in the graphical view are different from those in the tabular view. They are:
- **Packets Out.** Sorts by cumulative number of packets outbound from the host.
 - **Broadcasts Out.** Sorts by cumulative number of broadcasts outbound from the host.
 - **Multicasts Out.** Sorts by cumulative number of multicasts outbound from the host.
 - **Errors Out.** Sorts by cumulative number of errors outbound from the host.
 - **Bytes Out.** Sorts by cumulative number of bytes outbound from the host.

- **Packets In.** Sorts by cumulative number of packets inbound to the host.
 - **Bytes In.** Sorts by cumulative number of bytes inbound to the host. The default is Bytes Out.
- Step 4** The **Tools** menu lets you get agent information using Agent Info, switch to the tabular view using Show Text, or set an alarm using Watchdog.
- Step 5** You can print the contents of either Host List window by selecting the **File** menu and then clicking on Print.
- Step 6** You can exit either Host List graphical window by selecting the **File** menu and then clicking on Exit.

Using Host List to View Host Stats Graph

Use the Host List graphical view to display statistics (utilization, packets, bytes, destinations, and errors) about a specific host for the selected agent and domain:

- Step 1** Select Domain Manager, Traffic Monitor, or Protocol Monitor from the TrafficDirector main window, or launch Segment Zoom from an appropriate tool.
- Step 2** The next step depends on the initial tool you selected:
- If you selected Domain Manager, first select an agent and domain from the list box. Now select Host List from the **Tools** menu.
 - If you selected Traffic Monitor or Protocol Monitor, launch Host List from the **Tools** menu and then select an agent and domain. Click the Launch button to display the Top N Hosts graph. Select Show Text from the **Tools** menu.
 - If you launched Segment Zoom from another tool, simply launch Host List from the **Tools** menu.
- Step 3** When the Host List is displayed, first select the address for the host you want to see statistics for, then click on **Host Graph**.
- Step 4** You can choose from five data views for the selected host. To view different statistics, select the View Menu and choose from the following:
- **Utilization.** Shows all statistics (packets, bytes, destinations, and errors) for the host.
 - **Packets.** Shows the number of packets to and from the host.
 - **Bytes.** Shows the number of bytes to and from the host.
 - **Destinations.** Shows broadcasts and multicasts originating from the host.
 - **Errors.** Shows any errors originating from the host.
- The default graph shown is Utilization.
- Step 5** The **Tools** menu lets you get agent information using Agent Info or set an alarm using Watchdog.
- Step 6** You can print the contents of the Host Stats Graph window by selecting the **File** menu and then clicking on Print.
- Step 7** You can exit the Host Stats Graph window by selecting the **File** menu and then clicking on Exit.

Conversation List

Conversation List is the tool you'd want to use to see more detailed information about conversations between hosts on a segment. Conversation List shows you a listing of all the hosts on a segment that are exchanging packets. For example, if host A is exchanging packets with hosts D and G, the list shows a separate line for the conversation between host A and host D as well as a separate line for the conversation between host A and host G.

You can also use Conversation List to display the Conversation Stats Graph. The Conversation Stats Graph shows you the utilization, packets, bytes, and error statistics related to a specific conversational path between two selected hosts on a segment.

Using Conversation List to View Conversation Stats Graph

Use the Conversation List graphic view to display statistics (utilization, packets, bytes, and errors) for conversations between selected hosts:

- Step 1** Select **Domain Manager** from the TrafficDirector main window.
- Step 2** From the agents and domains listed, select the one you want. Make sure that the agent and domain selection you chose shows a number under the **Convs** heading. A number under this heading indicates that conversations are enabled; if there is no number shown, you must click on **Install**, then select **Conversations** to enable them. See the instructions described in "Installing Domains at Agents".
- Step 3** Select **Conversation List** from the **Tools** menu.
- Step 4** From the list displayed, select the source and destination hosts you want to display statistics for, and click on **Show Graph**.
- Step 5** You can choose from four data views for the selected host. To view different statistics, select the **View** menu and choose from the following:
 - **Utilization.** Shows all statistics (packets, bytes, and errors) for the hosts.
 - **Packets.** Shows the number of packets the hosts are exchanging.
 - **Bytes.** Shows the number of bytes the hosts are exchanging.
 - **Errors.** Shows any errors that occur as the hosts exchange packets.

The default graph shown is Utilization.
- Step 6** The **Tools** menu lets you get agent information using Agent Info or set an alarm using Watchdog.
- Step 7** You can print the contents of the Conversation Stats Graph window by selecting the **File** menu and then clicking on **Print**.
- Step 8** You can exit the Conversation Stats Graph window by selecting the **File** menu and then clicking on **Exit**.

Host Zoom

You can see more detailed information about a host or group of hosts for a given agent/domain by using **Host Zoom**. Host Zoom lists the Top N hosts with which the selected host is having conversations.

Like Host List, Host Zoom includes both graphical view and tabular windows. The Host Zoom Graphical window displays only one of seven host traffic criteria at a time, while the tabular view displays all seven.

Using Host Zoom, the Tabular View

To select Host Zoom:

Step 1 Do **one** of the following:

- Click on **Zoom** from the **Tools** menu in the graphical Host List window.
- Select the desired host and then click on **Zoom** on the tabular Host List window.

The Host Zoom tabular view appears. Note that the agent and domain you selected appear at the top of the window. The window lists the addresses of all the hosts that the selected host is currently having conversations with, along with a number of variables. The name and address of the host you selected appears at the top of the window.

Step 2 To change the sort criterion, select the **Sort** menu. The selections are:

- **Utilization In.** Sorts by instantaneous percentage of inbound bandwidth to the host.
- **Utilization Out.** Sorts by instantaneous percentage of outbound bandwidth from the host.
- **Packets In.** Sorts by cumulative number of packets inbound to the host.
- **Packets Out.** Sorts by cumulative number of packets outbound from the host.
- **Bytes In.** Sorts by cumulative number of bytes inbound to the host.
- **Bytes Out.** Sorts by cumulative number of bytes outbound from the host.
- **Errors In.** Sorts by cumulative number of errors inbound to the host.
- **Errors Out.** Sorts by cumulative number of errors outbound from the host.

The default is Utilization Out.

Step 3 To change the interval at which samples are taken, click on one of the choices from the **Sample** menu. You can select a sample from 15 seconds to 2 minutes. The default is 1 minute.

Step 4 To get information on the agent, select the **Agent Info** button.

Step 5 To see the graphical view, select the **Show Graph** button.

Step 6 To view a graphical presentation of host activity, select the **Host Graph** button.

Step 7 To view host conversations graphically, select the **Conv Graph** button.

The bottom of the window displays conversations in/out and the update time.

Using Host Zoom, the Graphical View

The Host Zoom graphical view uses the same sort and sample interval criteria as the tabular view. In addition, you can switch to the text view or set an alarm using Watchdog from the **Tools** menu.

The Host Zoom graphical view gives you an overview of a host's conversations, but it provides less detailed host information than the tabular view.

Getting a Graphical View of Segment Statistics

You can choose to see graphical views of the selected segment statistics. The available graphical segment statistics views are:

- **Vital Signs.** A general indication of segment health.
- **Size Distribution.** A graph by packet size.
- **Destination Breakdown.** A graph by packet destination.
- **Error Breakdown.** A graph by error occurrence.

The default is Vital Signs.

When you select Segment Statistics from the Application Launch window, the Segment Statistics graph appears. Note that the selected agent and domain appear at the top of the window. The other three views are similar.

Selecting a Statistical Variable

You can select the statistical variable you view on the Segment Statistics graph. The default variable is Vital Signs.

To select a variable:

Step 1 Select the **View** menu. The four variable selections appear:

- Vital Signs
- Size Distribution
- Destination Breakdown
- Error Breakdown

Step 2 Select one of the variables.

Note The statistics that are graphed for each variable are different for Ethernet, Fast Ethernet, Token Ring, and FDDI/CDDI segments.

Selecting the Sample Interval

You can select the interval over which TrafficDirector collects the data displayed in the Statistics graph. The range is from 15 seconds to 2 minutes. The default interval is 1 minute.

To select the sample interval:

Step 1 Select the **Sample** menu.

Step 2 Click on the appropriate interval.

Selecting the Type of Statistics Displayed

You can select the type of statistics displayed. The type of statistics that are available depends on whether you are looking at an Ethernet segment or a Token Ring segment.

The default is Short-Term statistics. In addition, the default for a Token Ring segment is Promiscuous statistics.

To select the type of statistics displayed:

Step 1 Select the **Properties** menu.

Step 2 Select one of the following:

- Click on either Long- or Short-Term History.
- For a Token Ring segment, click on either Promiscuous or MAC-level statistics.

Selecting the Sample Rate

You can select the statistical sample rate, the interval at which TrafficDirector takes new data and updates the segment statistics. The sample rate ranges from 15 seconds to 2 minutes. The default is 1 minute.

To select the sample rate:

Step 1 Select the **Sample** menu.

Step 2 Click on the desired sample rate.

Launching Watchdog from the Segment Statistics Graph

You can launch Watchdog and set alarm thresholds directly from the Segment Statistics graph. Watchdog is described in Chapter 12.

To launch Watchdog:

Step 1 Select the **Tools** menu.

Step 2 Click on **Watchdog**. The Watchdog window appears.

Getting Agent Information

You can view a description of the selected agent's system information and interface configuration directly from the Segment Statistics Graph.

To view agent information:

Step 1 Select the **Tools** menu.

Step 2 Select **Agent Info**. The Agent Information window appears.

Step 3 Click on **OK** when you are finished viewing the agent information.

Exiting the Segment Statistics Graph

To exit the Segment Statistics graph:

Step 1 Select the **File** menu.

Step 2 Click on **Exit**.

Getting Short- and Long-Term History Graphs

Short and long-term histories reside in the agent and show statistical histories over preset time periods.

Note History statistics are derived from the segment statistics groups of RMON, so in order to get history graphs the statistics group must be installed in the agent and must have privileges to view the group history statistics. To confirm or install the statistics group, see Chapter 6.

The default sample period for a short-term history is 30 seconds. The default is 30 minutes for a long-term history. The actual sample time appears at the top of the graph. The number of samples, or buckets, stored in the agent is determined when the domain is installed. See “Installing Domains at Agents”.

Selecting a Statistical Variable

You can select the statistical variable you view on the Short-Term and Long-Term History graphs. The default variable is Vital Signs.

To select a variable:

Step 1 Select the **View** menu. The four variable selections appear:

- Vital Signs
- Destination Breakdown
- Error Breakdown

Step 2 Select one of the variables.

Note The Ethernet history graph is shown in the figure. The Token Ring and FDDI graphs are the same, but there is no collision graph for WAN segments.

Selecting the Graphical Representation

You can select the type of graphical representation used with the History graphs. The default graph type is Plot.

To select the graph type:

Step 1 Select the Properties menu.

Step 2 Select the graph type. Your choices are:

- Plot
- Area
- 2-D bar chart

Setting Alarms from the History Graphs

You can launch Watchdog and set alarm thresholds directly from the history graphs. Watchdog is described in Chapter 12.

To launch Watchdog:

- Step 1** Select the **Tools** menu.
- Step 2** Click on Watchdog. The Watchdog window appears.

Getting Agent Information

You can view a description of the selected agent's system information and interface configuration directly from the history graphs.

To view agent information:

- Step 1** Select the **Tools** menu.
- Step 2** Click on Agent Info. The Agent Information window appears.
- Step 3** Click on **OK** when you are finished viewing the agent information.

Printing the History Graphs

You can print the history graphs at any time. To do so:

- Step 1** Select the File menu.
- Step 2** Click on Print. TrafficDirector prints the history graph to your default printer.

Exiting the History Graphs

To exit the history graphs:

- Step 1** Select the **File** menu.
- Step 2** Click on Exit.