Meridian Administration Tools

Traffic Analysis
User Guide

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Introduction

This user guide provides basic information on setting up and running Traffic Analysis. In order to ensure optimum operation of this application, read the material in this user guide before attempting to run Traffic Analysis.

Overview

Traffic Analysis performs the following functions:

— Collects traffic data from a specific system's Meridian 1

— Maintains a database of collected traffic data

— Defines report and graph parameters

— Generates reports to extract significant information from raw traffic data, such as trunk usage, peak periods, process loads and junctor and loop traffic

About this user guide

This user guide is intended as an introduction to the Traffic Analysis application as well as an overview of its major functions. It discusses how you can best use it to manage traffic data and generate meaningful reports.

This user guide does not discuss each Traffic Analysis function and command in detail. It only discusses the major functions and how they are accessed. For detailed information on each Traffic Analysis function and command, use on-line Help. You can use Help to obtain information for topics either directly or via its index and word-search functions. You can obtain context-sensitive help on any topic by simply pressing <F1> during the Traffic Analysis session or by clicking **Help** in the dialog or window in which it appears.

Conventions used in this user guide

This user guide uses the following terms.

— *Computer system* refers to the hardware and software of an IBM-PC™ or 100% compatible PC.

— Windows—Refers to Microsoft Windows 95, Windows 98, and Windows NT Workstation V4.0.

— *Mouse* refers to any standard PC pointing device. Common mouse actions include *point*, *click*, *right-click* and *double-click*.

— Standard Windows terminology includes: *icon, window, dialog box* (or *dialog*) and *menu*.

— Angle brackets denote a single keyboard key. For example, <Esc> denotes the Escape key, labeled Esc on PC keyboards. Angle brackets with multiple keys denote keyboard keys to use simultaneously. For example, <Ctrl-Alt-Del> denotes the key sequence for rebooting a PC.

— **This font** is used to designate buttons, menu choices and information you are to enter.

Traffic Analysis system sizing guidelines

System sizing for Traffic Analysis must consider several factors to ensure adequate capacity and throughput to retrieve, store and report on traffic data. The major factors are as follows.

1 Does the system have enough free disk space to store and maintain the traffic data?

2 Is there sufficient communications bandwidth to perform traffic data collection from all systems in time?

3 Does the system have sufficient resources to provide reports on time?

Traffic Database capacity

The size of the Traffic Database varies depending on the Meridian 1. The Traffic Database will also grow rapidly depending on how much data is kept for reporting purposes. Since the active database should normally be archived monthly (thus retaining the previous month's traffic data for reporting as well as updating statistics on the current month), you should expect to store about two months of data in the Traffic Database. Older data should be routinely archived and moved to external storage. Since, however, it will normally be stored transiently on disk as well, you should reserve capacity for the archive operation.

The actual size of the database depends on your specific configuration parameters such as: the number of loops, trunks, consoles, etc.

Use the following example formula to estimate the size of the Traffic Database (including a one-month archive). This example formula assumes that traffic data collection will be scheduled for each hour in the day (i.e., you are not excluding any time for maintenance on the Meridian 1) and that you have 31 days of archived data and 61 days of active data.

24 hours x (61 days + 31 days of archive) = 2208 Traffic Database samples

Thus, you should allow for 2500 samples (this will allow for temporary files used during reporting). Use the following calculation to determine the total bytes required for once (1) Traffic Database sample. Once you have calculated the total bytes for 1 sample, you must then multiply it by the total number of samples.

1 Traffic Database sample =

[(Network Loops x 29) + (Junctor Groups x 17) +

((C/S Links + A/M Links) x 240) + (D-Channels x 115) +

(Multi-Purpose ISDN Signaling Processors x 59) +

(Customers x 424) + (Route Lists x 299) +

(Individual Attendants x 39) + (Network Classes of Service x 35) +

(Incoming Trunk Groups x 35) + etc.]

Communications throughput

The amount of time that it takes a system to collect traffic data depends on the number of systems to collect, the Meridian 1 configuration, the communication line speed and the number of communication ports available on the MAT system.

Traffic data is produced hourly by the Meridian 1. This data is either collected hourly by Traffic Analysis from the Meridian 1 or daily from an optional data buffer device which is connected to the Meridian 1 and stores the hourly data. Once retrieved, the data is compressed by a 4-1 ratio for reporting. Having calculated the size of the database sample, you can calculate the time required to transfer the data. These calculations allow for dialing, connection, logon, traffic data requests, logout and disconnect.

— No buffer device—hourly:

Seconds to Collect Sample = [Setup + (Compression Ratio x Size of Traffic Sample) ÷ Modem Speed]

— With a buffer device—daily:

Seconds to Collect Sample = [Setup + (Hours per Day x Compression Ratio x Size of Traffic Sample) ÷ Modem Speed]

Note: For both cases, allow 40 seconds for setup and allow 85% throughput on modem speed for buffer protocol.

The goal is to ensure that the time required to collect data from all systems, using all available communications paths, is less than the interval between collection cycles. Note that modem speeds are typically rated by baud rate—which roughly translates to bits per second. As a rule of thumb, use 10 bits per byte in calculating modem speed. A 2400 baud modem delivers about 240 bytes per second.

Sample calculation

The following is an example for Traffic Database sizing and a communication throughput estimate:

Switch Option 61 + 2400 baud modem (no buffer device)

7 Network Loops	x 29	= 203
1 Junctor	x 17	= 17
1 Link	x 240	= 240

0 D-Channels	x 115	= 0
0 MISP's	x 59	= 0
1 Customer	x 424	= 424
9 Route Lists	x 299	= 2691
1 Ind. Attendant	x 39	= 39
0 NCOS's	x 35	= 0
2 In. Trunk Groups	x 35	= 70
		3,684 bytes total

Disk Requirements = 2,500 x 3,684

= 9,210,000 bytes (assumes two months on-line)

Hourly:

Data Collection Duration   = 40 + (4 x 3,684) ÷ (240 x 0.85)

= 112 seconds = 1:52 minutes each hour

Daily:

Data Collection Duration   = 40 + (24 x 4 x 3,684) ÷ (240 x 0.85)

= 1,774 seconds = 29:34 minutes each day

System resources

The resources required to produce reports are provided by the Windows environment and are affected by activities on the system. System loads use CPU, memory, disk storage and bandwidth. A typical application such as a word processor or electronic mail might generate little CPU load, but might put large demands on memory.

In any Windows environment, memory (RAM) can be extended through the use of virtual memory. Virtual memory allows the PC to use disk space as if it were RAM. Both RAM and virtual memory must be available in sufficient quantity for all concurrent system activities. A shortage of memory will either prevent an application from running or will slow the overall system.

CPU loading depends on the frequency and number of reports. While the system is designed to concurrently generate multiple reports (only for multiple systems), the system runs at maximum throughput when generating one report at a time.

The Windows Print Manager ensures that data from separate reports are not mixed-up on the printer. In order to perform this function, the Print Manager temporarily stores reports on disk (the Print Manager has a backlog limit of 99 print jobs). Therefore the CPU speed, available virtual memory and printer speed dictate the time required to produce the reports and the practical system limits to traffic data throughput.

Getting Started

This chapter contains information used for running and setting up Traffic Analysis for initial use.

Before using Traffic Analysis, you must install and configure it as part of Meridian Administration Tools. Refer to Getting Started in the *MAT Common Services User Guide* for complete details on installing Traffic Analysis and assigning it to a site and system.

System access

To access Traffic Analysis from the MAT Navigator, click the desired site and system and click **Traffic Analysis** from the Telemanagement menu. The main Traffic Analysis window will appear.

After you have assigned Traffic Analysis to a site and system, you can use it to collect traffic data, generate reports and graphs and maintain its databases.

Before you can begin collecting traffic data and report on it, you must enter the parameters for the data collection and report generation processes. The following section provides a complete example of how to accomplish these tasks, as well as instructions for scheduling and starting data collection from the Meridian 1.

WARNING

When a Limited Access Password (LAPW) is defined to collect traffic data from Overlay 2, configure the password to have access to all customers by setting the CUST prompt to ALL. For more information about Limited Access to Overlays, see the X11 Software Features Guide.

Traffic Analysis example

The following example is provided to assist you in setting up Traffic Analysis.

Note: The instructions in this example assume that you have successfully installed the MAT software and completed the MAT configuration tasks described in the *MAT Common Services User Guide.*

This example illustrates how to accomplish the following tasks:

— Run MAT and open a site and system

— Run Traffic Analysis

— Set up the Meridian 1 for traffic collection

— Collect traffic data from the Meridian 1

— Print a D-Channel Report that contains data for incoming and outgoing calls

Run MAT & open site/system

Before you run Traffic Analysis, you must first run the MAT Navigator and open this site and system. You can then select Traffic Analysis from the Telemanagement menu in this system's window.

Note: This system must already have been created using the System Configuration function. Refer to the *MAT Common Services User Guide* for more details on the System Configuration function.

Perform the following steps to open the site and system.

1 Run the MAT Navigator by clicking the **MAT Navigator** icon. At the Login dialog which appears, enter your user ID and password and click **OK** to continue.

2 To open the site and system for this example (e.g., site name is Acme Company and system name is Head Office), click **Acme Company** in the MAT Navigator window and double-click **Head Office** from this site.

This will access the system window for Head Office.

Figure 1
MAT Navigator Site/System
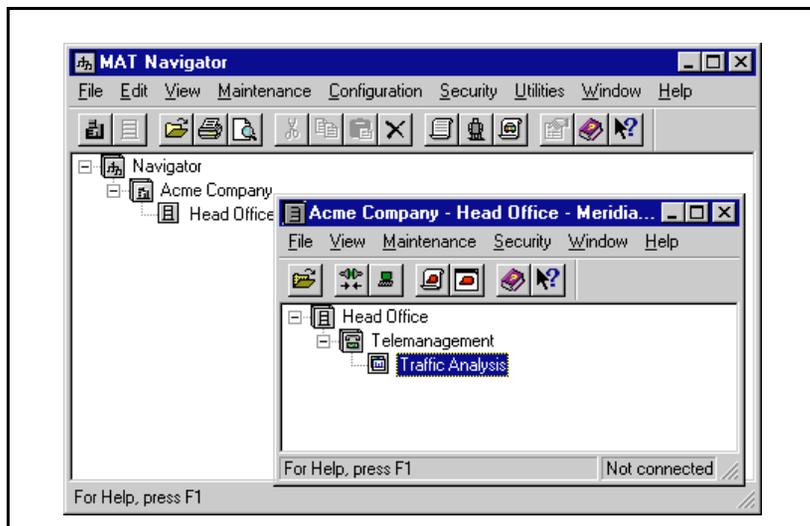
Run Traffic Analysis

Perform the following steps to run Traffic Analysis.

1   From the system window, click the **Telemanagement** menu item. This will display the MAT applications which have been assigned to the system Head Office under **Telemanagement** (e.g., Call Accounting, Call Tracking and Traffic Analysis).

2   To run Traffic Analysis, double-click **Traffic Analysis** from this menu. The Traffic Analysis main window will appear.

Assign Traffic Analysis to system (if not already assigned)

If Traffic Analysis has not been assigned to this system, it will not appear in the **Telemanagement** menu. To assign Traffic Analysis to this system, perform the following steps.

1   Click **Properties** from the File drop-down menu to access the System Properties dialog.

2   From the System Properties dialog, first enter a communications profile for Traffic Analysis by clicking the **Communications** tab. In the Communications Profile field, enter a profile for Traffic Analysis.

Figure 2
Traffic Analysis main window
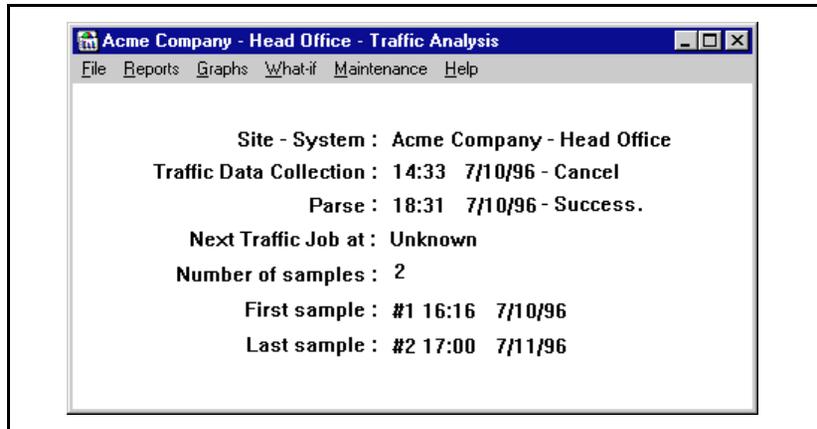
3   Click the **Applications** tab to assign Traffic Analysis to this system.
From the Communications Profile drop-down list box, select the
communications profile which you just entered in the Communications
tab. Click **Traffic Analysis** in the Applications list box to highlight it and
turn on the **Enable** check box. Notice that the flag **Yes** will appear in the
Enabled field next to Traffic Analysis in this list box.

4   Click **OK** to assign Traffic Analysis to this system. The Traffic Analysis
icon will appear under **Telemanagement** for the system **Head Office**.

Set up Meridian 1 for traffic

Follow these steps to set up the Meridian 1 for traffic data collection. You
only need to perform this step once when you initially set up Traffic Analysis.

1   Click **Traffic Data Collection** from the Maintenance drop-down menu of
the Traffic Analysis main window.

2   Turn on the **Set up PBX for Traffic** check box. This enables the Meridian
1 to collect and transmit data.

Collect traffic data from Meridian 1

Follow these steps to collect traffic data from the Meridian 1.

1   Click **Traffic Data Collection** from the Maintenance drop-down menu.

2   Turn on the **Schedule Traffic Collection** check box.

3   From this dialog, click **OK** to start the traffic data collection. This will schedule, on an hourly basis, the load of traffic data from the Meridian 1 to a temporary data file **TRAFFIC.DMP** for parsing and report processing.

Once the system collects the initial traffic data, it will then parse it into files with the names **TFnnnn.DAT** (where **nnnn** identifies the type of report which will be generated).

If you used the MAT Call Accounting application to collect data from the Meridian 1 to the **TRAFFIC.DMP** file, then you only need to schedule a data parse procedure. To parse this collected data, enable the **Schedule Traffic Parse** check box from the Traffic Data Collection dialog. When you click **OK**, Traffic Analysis will schedule the data parsing procedure (similar to the **Schedule Traffic Collection** option except without traffic data collection).

Print traffic report for incoming & outgoing calls

Follow these steps to print a report for incoming and outgoing calls.

1   Before requesting a printed report, you must select your printer as the output device. From the Traffic Analysis window, click **File** and click **Specify Output Device** from its drop-down menu. In the resulting dialog, click **Printer** and click **OK**.

2   Click **Print Setup** from the File drop-down menu to select the printer for this report. Click **OK** to save this information and return to the Traffic Analysis main window.

3   To print the report, click **System Reports** from the Reports drop-down menu. The System Reports dialog appears.

4   Click on the **Report** down arrow to open the list of available system reports. To select the D-Channel Report, click **D-Channel**.

5   Click on the **Profile** down arrow to view a list of available profiles for the D-Channel report. Select **DCHANL.PRO - D-Channel Report**. This is the default report profile used to select data for the D-Channel Report.

6   Click **Edit** next to the Profile list box to access the Profile Editor for the DCHANL.PRO report profile. A dialog will appear listing the profile's description, options and parameters. You can enter information here to tailor the report.

7   In the Options list, click to select only the following items:

   Incoming
   Outgoing

   De-select any other highlighted items in the list.

8   To save this default profile to a new profile name, click **Save As** from the File drop-down menu. In the Save As dialog, type: **DCHANL1.PRO** for the file name.

9   Click **Close** from the File drop-down menu to exit the Profile Editor and return to the System Reports dialog.

10   Click on the Filters down arrow to view a list of available filters for the report. Click **None**. This clears the Filters box so that the report includes all collected traffic data.

11   Click **OK** to print this report. A report status box indicates printing progress.

Help

As with the other MAT applications, Traffic Analysis contains an extensive Help facility which provides you with details on all of its functions and commands. At any time during your Traffic Analysis session, you can press <F1> or click **Help** to access information on a specific topic. You can also click **Help Topics** from the Help drop-down menu of the Traffic Analysis main window and search for Help using the Windows Help search functions.

To obtain help for a topic, press <F1> or click **Help** from the currently selected dialog or window. This will access the Windows Help function and display context sensitive help information on the current topic.

Once you have accessed Help, use it to scroll through the other help topics, search for a specific topic and print help information.

User's Reference

This chapter contains a general overview of the main Traffic Analysis functions as they are accessed from its main window. It briefly describes their main function and purpose. For complete details on each of these functions and their operation, refer to the Traffic Analysis on-line Help function.

File menu

This menu contains functions used to select an output device, set up a printer and exit from Traffic Analysis.

To access these functions, click **File** from the main window and select from the following menu items:

— Select Output Device

— Print Setup

— Close

Reports & graphs

The Traffic Analysis reports and graphs provide the details for the traffic data collected from the Meridian 1. These can be printed to an output device, to the screen for review, or to a disk file. Traffic Analysis provides a set of profiles and filters to allow you to tailor the output of these reports and graphs to suit your needs. Once you have collected the traffic data from the Meridian 1, use the commands in the Reports and Graphs menus (following sections) to generate the required reports and graphs.

Reports menu

The Reports menu contains functions and commands to print reports based on the collected traffic data.

The following are the reports available from Traffic Analysis.

— System Reports

- • Network Loops

- • Service Loops

- • Dial Tone Delay

- • Processor Load

- • Selected Terminals

- • Junctor Group

- • Command and Status Links and Application Module Links

- • D-Channel

- • Multi-Purpose ISDN Signaling Processor Traffic

- • Multi-Purpose ISDN Signaling Processor DCH Management

- • Multi-Purpose ISDN Signaling Processor Messages

- • ISDN Generic Functional Protocol

- • General Microcellular Operational Measurements

- • UWIN Operational Measurements

— Customer Reports

- • Networks

- • Trunks

- • Customer Console Measurements

- • Individual Console Measurements

- • Feature Key Usage

- • Radio Paging

- • Parallel Radio Paging

- • Serial Radio Paging

- • Call Park

- • Messaging and Auxiliary Processor Links

- • Output Message Traffic

- • Input Message Traffic

- • Message Attendant Queue

- • Telephone Set Status

- • Telephone Messaging

- • Network Attendant Service

- • Semi-Permanent Connection Links Establishment

- • Music Broadcast

- • RAN Broadcast

— Customer Network Reports

- • Route Lists

- • Off Hook Queuing

- • Call Back Queuing

- • Remote Virtual Queuing

- • Network Class-of-Service

- • Incoming Trunk Group

— System Threshold Reports

- • Dial Tone Speed

- • Loop Traffic

- • Junctor Traffic

- • Super Loop Traffic

— Customer Threshold Reports

- Incoming Matching Loss

- Outgoing Matching Loss

- Average Speed of Answer

- Percent Last Trunk Busy

- Off-Hook Queue Overflow Threshold

— Customer Summary Reports

- Traffic System Summary

- Trunks Summary

- Customer Console Summary

- Individual Console Summary

Graphs menu

Similar to the Reports menu, the Graphs menu contains functions and commands to print graphs based on the collected traffic data.

The following are the graphs available from Traffic Analysis.

— System Graphs

- Network Loops

- Processor Load

— Customer Graphs

- Trunks

- Customer Console Measurement

- Messaging and Auxiliary Processor Links

— Customer Network Graphs

- Route Lists

- Off Hook Queuing

— System Threshold Graphs

- • Loop Traffic

- • Super Loop Traffic

— Customer Threshold Graphs

- • Percent Last Trunk Busy

Generating reports & graphs

To generate a report or graph, select the report or graph type from the Reports menu or the Graphs menu. When the Report or Graph dialog appears, enter its optional profile and filter information and click **OK** to print it.

The following is an example dialog in which you can enter reporting criteria and generate the report. The corresponding Graphs dialog operates similarly.

Figure 3
System Reports dialog
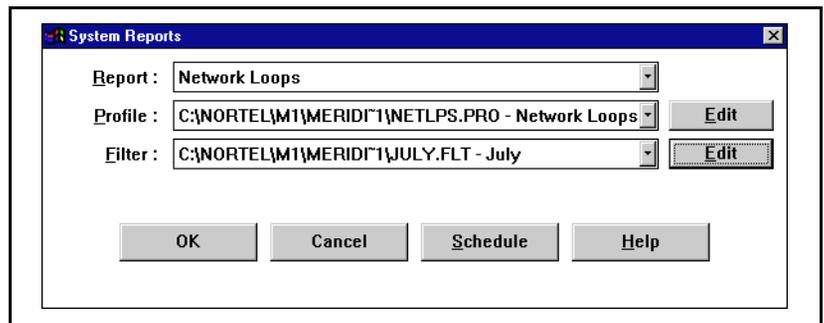
Click on the drop-down button to display a list of the reports or graphs in that category. Each entry in the list has one or more associated profiles and filters. After you click to select a report (or graph), use the same process to select the appropriate profile and filter. Edit buttons next to the Profile and Filter boxes let you review and modify the selected profile and filter.

Profiles

Profiles define the kind of information to include in a report or graph. Each report or graph requires at least one profile. Traffic Analysis includes several default profiles for commonly-used reports and graphs. You can define a new profile by editing one of the default profiles and saving your work under a new profile name. Profile file names use the **.PRO** extension.

Filters

Filters define the range of traffic data to be included on a report or graph, such as data for a specific month. Filter file names use the **.FLT** extension.

Exporting Reports

The Export function allows you to export traffic data from its reports to disk files in specific formats. This function is invoked when a report is generated to screen.

After you have completed your work with profiles and filters, click on one of the following buttons to proceed:

OK to produce the report or graph

Schedule to specify the time at which the report or graph is to be produced

Help to obtain help for this function

Cancel to cancel the request and return to the main window

When you have printed or scheduled the output, the system will return to the Traffic Analysis window.

"What-if" menu

In addition to generating reports and graphs, you can use Traffic Analysis to ask "What if?" questions on data output from the Meridian 1. This is accomplished by defining scenarios and viewing hypothetical results. These "What if" scenarios provide different results based on new situations that you input into the system.

To define a scenario, select it from the list of available scenarios. Next, select a profile to define its contents and a filter to set a range for its data. This process is similar to producing a report or graph.

You can define the following "what if" scenarios:

— Processor Load

— Trunk

— Attendant Console

To access this function, open the What-if menu in the Traffic Analysis window.

Processor Load scenario

The Processor Load scenario provides information on rated capacity for your Meridian 1. It lists overall and itemized information on the busy hour and the number of attempts at the busy hour rate over the rated capacity. It allows you to adjust the call attempts or the CPU type and view the resulting change in busy hour CPU loading time.

Note: In the filter for this scenario, enter a range with a minimum of 24 hours to make the scenario data valid.

Trunk scenario

The Trunk scenario allows you to determine the offered traffic, monthly cost and probability of blocking a trunk or a set of trunk groups. Use this scenario to change the offered traffic or the probability of trunk blocking and view the results for the trunks.

Attendant Console scenario

The Attendant Console scenario provides information on console response and service levels. Use this scenario to change response times and service levels and view the results.

Maintenance menu

Traffic Analysis provides maintenance functions which are used to: manually collect traffic data; manage the Traffic Database; edit report profiles and filters; and edit text files.

Traffic Database

The Traffic Database function is used to archive a range of traffic data as well as merge, delete and reindex traffic data files.

Traffic Data Collection

The Traffic Data Collection function is used to initiate data collection from the current system's Meridian 1. Use this function to: set up the Meridian 1 for traffic collection; schedule traffic data collection; and schedule parsing of traffic data which was previous collected by MAT Call Accounting.

Profile Editor

Every report or graph requires a profile that defines the data to be included in a report or graph. MAT provides default profiles for common reports and graphs. Use the Profile Editor to view and edit the options and parameters in a profile. You can also use profiles to store and manage sets of configuration and customization information.

Filter Editor

Filters define the range of traffic data to be included in a report or graph. The Filter Editor allows you to create or edit report filters.

Text File Editor

In certain cases, you may periodically need to view or edit a text file used by Traffic Analysis. For example, you may edit the traffic data file collected from the Meridian 1 to correct any errors before the system processes the file. Use the Text File Editor command to edit any text files for Traffic Analysis.

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