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Expert Performance Reporter

PC USER'S GUIDE

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STORAGETEK™

ExPR **Expert** **Performance** **Reporter**

PC User's Guide

Release 5.0

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About This Book

Overview

This book describes how to set up and use the ExPR PC reporting applications.

Audience

This book is intended for storage administrators and others who will use the ExPR PC applications to display ExPR real-time monitors and to construct historical graphical reports to track system performance over time and analyze trends.

Organization

This book is organized as follows:

Chapter 1 – *Getting Started*, describes how to install the ExPR client software on a PC and set up connections with the MVS host server system or systems.

Chapter 2 – *Graphical Reports*, describes how to construct graphical reports from historical data in the ExPR mainframe database.

Chapter 3 – *Host Reports*, describes how to request and display ExPR mainframe host reports in tabular format on the PC.

Chapter 4 – *VSM Monitor*, describes how to monitor VSM activity for display on the PC.

Chapter 5 – *Nearline Monitor*, describes how to monitor Nearline activity for display on the PC.

Chapter 6 – *Device Monitor*, describes how to monitor current device activity for display on the PC.

Chapter 7 – *Host Messages Monitor*, describes how to monitor MVS console messages in a separate window on the PC.

Chapter 8 – *TAPECAT GUI Reports*, describes how to use the TAPECAT GUI to produce TAPECAT reports on a PC.

Chapter 9 – *Web-Based Reports and Monitors*, describes the ExPR 5.0 web-based browser interface and how you use it to generate and display browser-based reports and monitors within your internal network.

Related Documentation

- *Introduction to ExPR*
- *ExPR Installation, Configuration, and Administration Guide*
- *ExPR Mainframe User's Guide*
- *ExPR Messages Guide*
- *ExPR MONTAPE/MONREPT Utility Guide*

StorageTek Support

StorageTek Software Support and the StorageTek Customer Resource Center (CRC) maintain information about known ExPR problems and updates. You can contact Software Support or access the CRC for the latest information available concerning product updates (i.e., documentation, PTFs, PUTs).

See the *Requesting Help from Software Support* guide (included in the ExPR package) for information about contacting StorageTek for technical support and for requesting changes to software products, or access StorageTek's CRC homepage at:

<http://www.support.storagetek.com>

Note: You must obtain a login ID and password in order to access the CRC. You can request a login ID and password from the CRC homepage.

Refer also to the *ExPR Messages Guide*, appendix B, *Reporting ExPR MVS Problems* and appendix C, *Reporting ExPR PC GUI Problems* for instructions about specific information you will need to provide when reporting a problem.

Chapter 1: Getting Started

Overview

This chapter describes how to install the ExPR client software on a PC and set up connections with MVS host server systems to retrieve data for display in the ExPR PC reporting and monitoring applications.

- ✓ The instructions in this chapter are only for PCs where this version of ExPR is not already installed and configured. For such PCs, you must follow the installation and configuration steps in this chapter.
- ✓ The PC you used to perform ExPR host configuration during the mainframe installation process is already set up and ready to run the applications described throughout this book. For that PC, you can skip this chapter.

Minimum PC Requirement

The ExPR PC component can be installed on a Microsoft Windows PC capable of connecting via TCP/IP to an MVS host system.

- ✓ 128Mb RAM (minimum), 25Mb hard disk (minimum) available.
- ✓ Windows95/98/2000/Me/XP (any version) or WindowsNT (Version 4.0 or higher).
- ✓ Microsoft Internet Explorer 4.0 or higher (this can be downloaded for free at www.microsoft.com).
- ✓ TCP/IP-capable communication software.

Recommended Monitor Specification

A monitor resolution of at least 1024x768 is recommended for ExPR, and the display must be set to Small Fonts. Both of these settings are in the Display parameters of the Windows Control Panel.

Note: On heavily loaded systems, some components may give errors such as “ImageList must be initialized before use.” Reducing system load cures these problems.

Installing ExPR on the PC

The ExPR PC component can be installed on any number of PCs. As a rule, ExPR applications are not shared across a network, because required run-time DLLs and related files must still be installed on each PC.

Important Note for Existing ExPR Sites

If a previous version of ExPR is already installed on your PC, **DO NOT UNINSTALL** that version before installing ExPR 5.0. The ExPR setup program will search the previous version and automatically transfer network configuration and rules files to the new version.

To install the ExPR PC component:

1. Insert the ExPR CD in a PC’s CD drive and follow the installation prompts.
2. If the setup program does not start automatically when you insert the CD (because your system is configured to prevent this, for example), browse to the CD drive and run the setup program.

How to Start ExPR Applications

Once the installation is complete, you can open ExPR PC applications using any of the following methods:

- If you selected the install option to create desktop icons, you can open the applications using those icons on your desktop.
- You can use the Windows Start menu or Windows Explorer. You can also create shortcuts to the ExPR applications using standard Windows desktop tools.
- You can use the ExPR Launcher application from its desktop icon (if you created it during the installation) or from the Windows Start menu or Windows Explorer. This application provides a graphical interface where you can select an application and the host to connect to or select a host to connect to and then an application. You can also save “favorites” that connect to a preselected host and launch a preselected application.

Getting Help

In addition to this book, the following help is available while using this application:

- For general help, click **Help** at the right-hand side of the menu bar and select **Help Topics**.
- For screen help, click the **What's This?** toolbar icon and then click the item on the screen for which you want help.

Configuring Network Host Connections on the PC

The ExPR PC applications communicate with the mainframe host systems via a TCP/IP connection, usually through your internal network but alternatively using a dial-up connection.

To connect with the host systems, you need to define the host connections to the ExPR PC software. The ExPR Network Configurator application on the PC performs this function.

Configuration Tip

The network configuration process described below produces a local configuration file on the PC (filename *expr.xml*). Since you have already built this file on the PC where you performed ExPR host configuration during the installation process, you could copy that file to the directory where ExPR is installed on each PC instead of configuring each machine manually.

Organizing the Hosts into Host Groups

Hosts you will communicate with must be organized into host groups on your PC, with each group representing all hosts that share a common HSC CDS (and therefore a common ExPR configuration).

✓ If your site shares a single CDS among all hosts, you only need one host group.

The host system where the ExPR database and configuration reside must be designated on your PC as the *primary host* in the host group.

If your site has designated more than one primary host (indicating multiple ExPR configurations) and you want to be able to connect to those hosts, then you need to create a separate host group for each primary host that you will connect to.

The primary host in each host group is queried by the PC for information to generate graphical and tabular reports from the ExPR database and to obtain status information for the Monitor applications.

All other hosts in the host group are considered to be *secondary hosts*. These hosts are not queried directly by ExPR reporting applications because their collected data is stored in the ExPR database on the primary host. However, you can connect directly to these hosts with the Monitor applications.

Information You Need to Supply

You will need the following site-specific information to define your host connections:

- ✓ For each host your PC will connect to, you need to supply the host description, IP address, and the assigned port number where the ExPR PC will connect to the host. **Note:** Optionally, and depending on how your network is configured, the host domain name can be entered instead of the IP address.
- ✓ You also need to know which host is designated as the *primary* host in the ExPR mainframe environment. In multi-site or very large environments, there may be more than one host group (see previous page) and thus more than one primary host. You need to identify each primary host you will connect to from this PC.

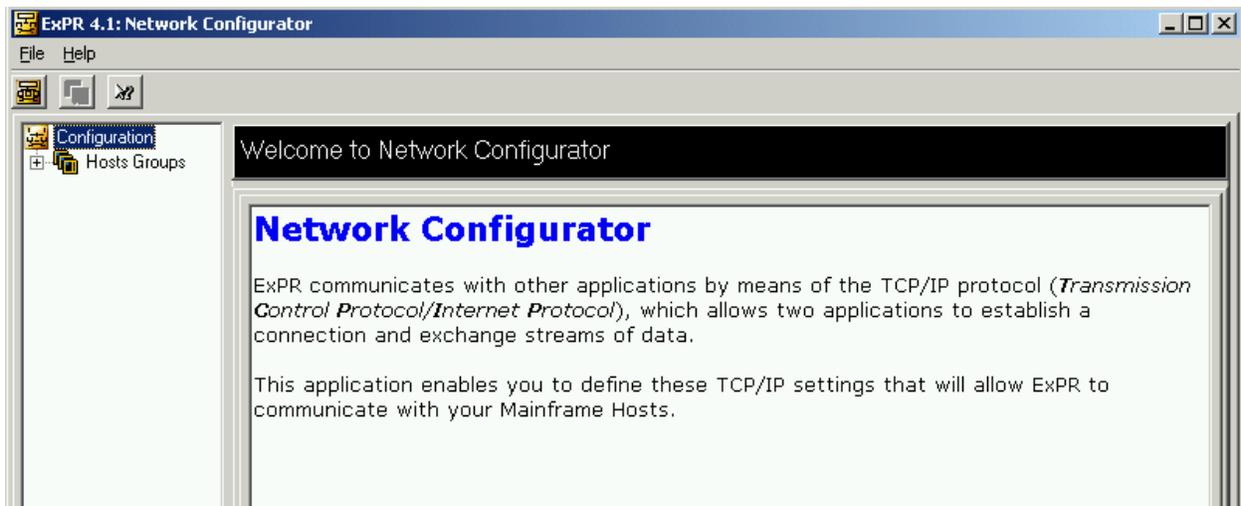
Your system programmer or network administrator should be able to provide this information to you.

Setting Up the Connections

Perform the following steps to set up your host connections:

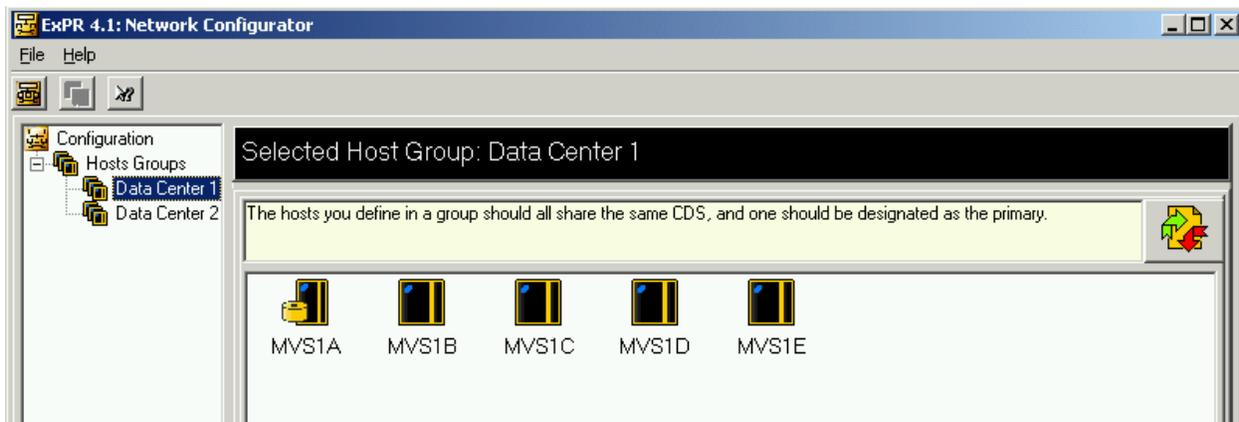
1. Open the ExPR Network Configurator application. (See *How to Start ExPR Applications* in this chapter if you do not know how to do this.)

Note: Existing ExPR sites should see their current network configuration already displayed when the Network Configurator application opens. If not, refer to *ExPR Conversion Note* below for instructions.



Note: Functions can be accessed by selecting an object in the navigation tree and then clicking a pull-down menu at the top of the window, or from the toolbar below the pull-down menus, or by right-clicking the mouse to display a menu. In this book, the pull-down menus are generally used in the instructions but you could also use the toolbar or right-mouse for many tasks.

2. Click **File** and select **New Group**.
3. In the dialog box, enter a group name that is meaningful to you (e.g., the name of the CDS used by hosts in this group, the data center name, etc.) and click **OK**.
4. Select the host group you created above and then click **File** and **Group 'x'** (where 'x' is the name you created) and select **Add New Host to Group**.
5. In the dialog box, enter the host description, IP address, and port number:
 - The host description could be the MVS SYSID or informal host name.
 - Optionally, and depending on how your network is configured, the host domain name can be entered instead of the IP address. To do this, enter the name in the IP address field, enclosed in square brackets, for example [*name*].
 - The port number must match the port specification defined at the mainframe in the TCP/IP-PARMS started task control statement for each host.
6. Repeat steps 4 and 5 for each host in the host group.



7. The first host you enter in each group is automatically designated as the primary host for that group. If this is not correct, click the icon for the host that will be the primary host and then right-mouse and select **Designate as Primary Host**.
8. If you determined in the previous section that you will need more than one host group, repeat these steps until all hosts in all host groups are defined.
9. When all hosts have been defined, click **File** and **Save** to save your network configuration on the PC.
10. To close the application, click **File** and select **Exit**.

ExPR Conversion Note

During the ExPR PC installation process, the existing ExPR network configuration file should be automatically converted to the internal XML format. However, under certain circumstances, the Windows registry entries fail to correctly indicate that ExPR was previously installed.

If you find that the Network Configurator does not have details of your existing host groups and TCP/IP addresses, then you should perform the following steps:

1. Close the Network Configurator application.
2. Browse the program folder where you have previously installed ExPR (the default is C:\Program Files\StorageTek\ExPR *version*).
3. Double click on Translate.exe to open the **ExPR Configuration Importer** dialog box.
4. In the dialog box, enter the complete directory path to where the existing ExPR (e.g., ExPR 4.1) is installed and click the **Import** button.

Note: You do not need to include file names, just the directory path.

5. Re-launch the ExPR Network Configurator, which should now show the host group details.

ExPR Login Security

If your site has activated the ExPR Security exit on the mainframe, you may be prompted for a login ID and password when you attempt to connect to the MVS host systems. Your system programmer or network administrator should be able to provide this information to you.

Testing the Host Connections

You can test your host connection by starting one of the ExPR reporting applications that will automatically attempt to connect to a host system at startup.

To test the connection to the primary host:

1. Open the ExPR Graphical Reports application.
2. If prompted, select the primary host to connect to. (This prompt only appears if you have multiple host groups.)
3. The display panel messages will tell you when the host is connected. If you cannot connect to the host, refer to *Troubleshooting Host Connections* below.

Note: The status bar message “Host Version:” indicates the version of the ExPR started task that is running on the connected host system.

4. Close the application by clicking **File** and then **Exit**.
5. Repeat this test for each primary host you will connect to from this PC.

To test the connection to a secondary host:

1. Open the ExPR Nearline Monitor application.
2. When prompted, select a secondary host to connect to.
3. The display panel messages will tell you when the host is connected. If you cannot connect to the host, refer to *Troubleshooting Host Connections* below.
4. Close the application by clicking **File** and then **Exit**.

5. Repeat this test for each secondary host you will connect to from this PC.

Troubleshooting Host Connections

If you cannot connect to the host system (i.e., the message “Connection Refused” appears in the status bar at the bottom of the application window), you need to ensure that:

- You have correctly identified the IP address and port number for the host.
- The mainframe TCP/IP software has been correctly configured to allow such communication.
- The host is running the ExPR started task.
- Your PC has all necessary communication hardware and software installed and correctly configured to allow TCP/IP communication with the host.

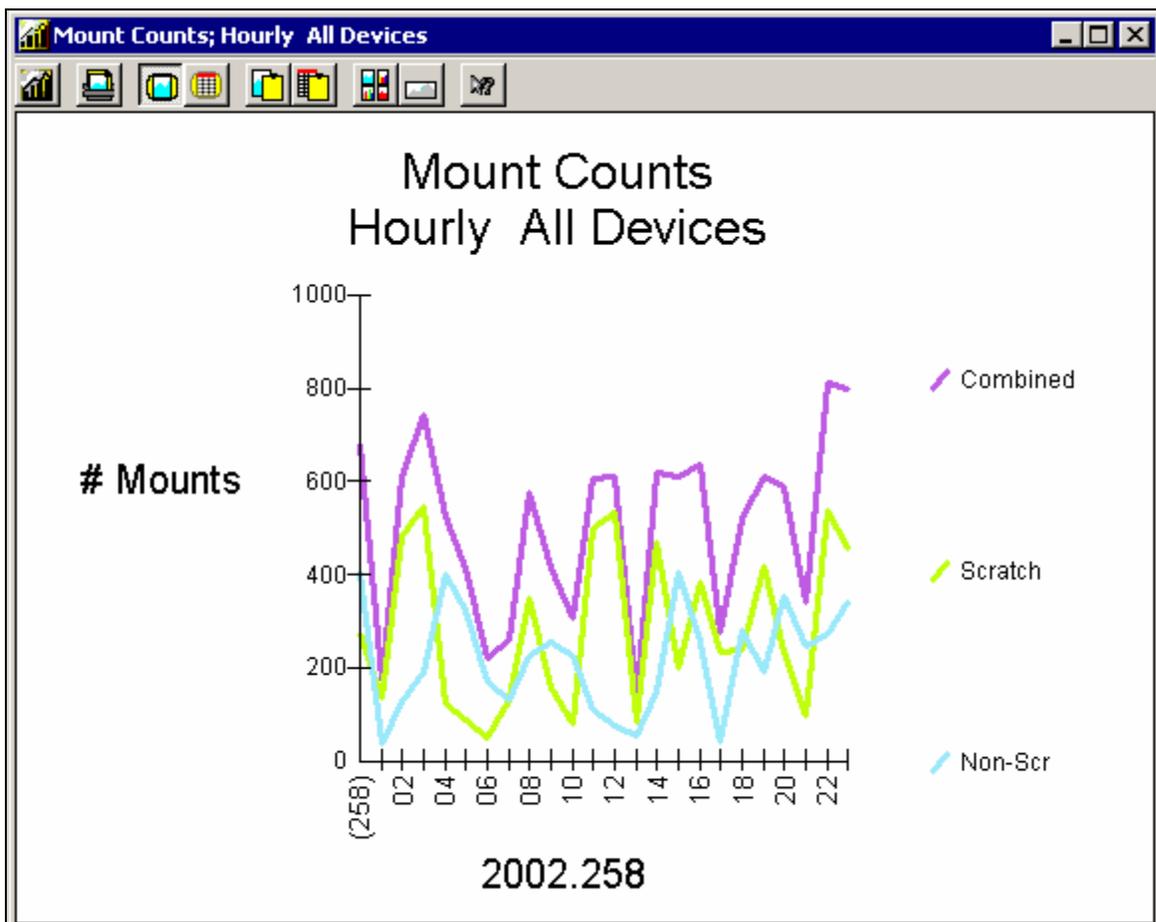
Your system programmer or network administrator should assist you in troubleshooting these issues.

Chapter 2: Graphical Reports

Overview

This chapter describes how to use the ExPR Graphical Reports application.

Graphical reports are generated from historical data in the ExPR mainframe database. When you select a Graphical Report, a request is made to the primary host system to produce the report. The results are then made available to the PC for graphical display.



List of Available Graphical Reports

ExPR graphical reports are organized as Nearline reports, VSM/VTSS reports, Manual Device reports, Control Units reports, Tape Errors reports, and System-Wide reports.

Nearline Reports

Nearline reports provide graphical analysis of activities within the Nearline system for the period and selection criteria defined on the Granularity tab. Nearline reports are organized as Mounts reports, Performance reports, Cartridges reports, Slot Management reports, and Inventory reports.

Mounts Reports

Mounts reports provide statistics about cartridge mounts during the selected period. Reports can be generated to include all LSMs in all ACSs, all LSMs in a specified ACS, or a specific LSM. Optionally, these reports can be generated for a single jobname workload group.

Mount Counts Report

This report graphs the number of Nearline cartridge mounts for each interval during the specified period. Depending on selected options, the report may include scratch, non-scratch, and/or total cartridges, each plotted separately.

Mount Response Report

This report graphs the average time in seconds it took to mount Nearline cartridges for each interval during the specified period. The elapsed time measurement is taken from the time when the mount message is issued to the point at which the device is READY. Depending on selected options, the report may include scratch, non-scratch, and/or total cartridges, each plotted separately.

Maximum Mount Time Report

This report graphs the maximum time in seconds it took to mount a Nearline cartridge for each interval during the specified period. Depending on selected options, the report may include scratch, non-scratch, and/or total cartridges, each plotted separately.

Mount Breakdown Report

This report graphs a series of mount-time components that show how much elapsed Nearline mount time was attributable to each component for each interval during the specified period. The elapsed time measurement is the same as that reported in the Mount Response report. Depending on the selected option, the report may include either scratch, non-scratch, or total cartridges.

The following mount breakdown components may be graphed:

- Drive Wait Time: The duration of drive tape threading/loading.
- Robotics Destination Time: The time the robotics arm was busy/moving.

- Robotics Destination Queue Time: The time awaiting the robotics arm to become free.
- Robotics Other Time: The time the robotics arm in the adjacent LSM was busy.
- Robotics Other Queue Time: The time awaiting the robotics arm in the adjacent LSM.
- Robotics Passthru Time: The time cartridges were traveling between LSMs.
- Robotics Passthru Queue Time: The time awaiting the passthrough port to become free.
- Other Time: The time spent while HSC processed other events. HSC queue time will be present, for example, if a cartridge currently located in the target drive needs to be returned to its cell.

Utility Mounts Report

This report graphs the total number of Nearline utility cartridge volumes (not attributable to user-initiated jobs, such as cleaning cartridges) were mounted for each interval during the specified period.

Nearline Mount Analysis Report

This report graphs the total number of Nearline mounts for each interval during the specified period, and depending on the selected options, the total amount of data (in 4K blocks) that was read, written, and/or transferred, each plotted separately.

Performance Reports

Performance reports provide information about the utilization of various Nearline hardware components and other external hardware during the specified period. Reports can be generated to include all LSMs in all ACSs, all LSMs in a specified ACS, or just a specific LSM.

Drive Utilization Report

This report graphs the average percentage of time that Nearline cartridge drives were in use for each interval during the specified period. Scratch and non-scratch percentages are shown separately.

Concurrent Drives in Use Report

This report graphs the percentage of time a given number of Nearline cartridge drives were in use in a selected LSM for each interval during the specified period. The report is color-coded to indicate how many drives were in use for each percentage that is graphed. You can specify the maximum number of color-coded bands to include in the report.

No Free Units Report

This report graphs the percentage of time when all Nearline cartridge drives were in use in the selected LSM for each interval during the specified period.

Nearline Allocation Recovery Event Summary Report

This report graphs the total number of allocation recovery events in the Nearline environment and the total batch throughput time in seconds that was lost as a result for each interval during the specified period.

Nearline Allocation Recovery Action Analysis Report

This report graphs the total number of operator replies to allocation recovery events in the Nearline environment and the total number of WAITs serviced for each interval during the specified period.

Nearline Allocation Recovery Delay Analysis Report

This report graphs the longest reply time and the longest wait time related to allocation recovery events in the Nearline environment in seconds for each interval during the specified period.

Cartridges Reports

Cartridges reports measure the movement of cartridges into or between LSMs during the selected period. Reports can be generated to include all LSMs in all ACSs, all LSMs in a specified ACS, or a specific LSM.

Cartridge Movements Report

This report graphs the total number of Nearline cartridges that were (depending on cart movement option selections) entered, ejected, passed through, and/or demand entered into the selected LSM for each interval during the specified period.

Passthrough Analysis Report

This report graphs the total number of passthroughs that occurred and the average mount time in seconds for Nearline cartridges that were passed to a different LSM for mounting for each interval during the specified period.

Slot Management Reports

Slot Management reports detail available scratch volumes and free cells during the selected period. Reports can be generated to include all LSMs in all ACSs, all LSMs in a specified ACS, or a specific LSM.

Scratch Profile Report

This report graphs the number of available Nearline scratch cartridges in the selected LSMs for each interval during the specified period. Depending on selected options, the report may indicate the lowest, highest, and/or average number of available scratch cartridges. The report can also be generated for a selected scratch subpool.

Free Cells Profile Report

This report graphs the number of available free cells in a selected LSM for each interval during the specified period. Depending on selected options, the report may indicate the lowest, highest, and/or average number of available free cells.

Total Available Scratch Report

This report graphs the total number of scratch cartridges that were available in all selected LSMs for a selected system.

Total Free Cells Report

The total number of free cells that were available in all selected LSMs for a selected system.

Scratch Availability Report

The total number of scratch cartridges that were available in all selected LSMs for a selected system. It also shows the site-defined exception threshold for scratch cartridge availability. The threshold is established in the ExPR MVS exception processing JCL.

Free Cell Availability Report

The total number of free cells that were available in all selected LSMs for a selected system. It also shows the site-defined exception threshold for free cell availability. The threshold is established in the ExPR MVS exception processing JCL.

Inventory Reports

Inventory reports use data obtained from your mainframe tape management catalog system to generate graphs for a single system. These graphs profile the data held on cartridge volumes in your libraries for each interval during the selected period. Inventory reports can be produced using all data or for just a specified dataset workload group.

Percentage of Cartridges Stacked Report

The percentage of cartridge volumes that contain more than one dataset.

Percentage of Cartridges Multi-Volume Report

The percentage of cartridge volumes that hold part of a multi-volume dataset.

Cartridge Last Reference Bands Report

The number of cartridges in each ageband. Agebands are user-specified in the ExPR MVS configuration on the host system.

Oldest Last Reference Date Report

The single oldest last reference date found for each interval during the specified period.

Cartridge Utilization Estimate Report

An estimate of the average “fullness” of cartridges in the selected LSM(s) or dataset workload group(s).

Cartridge Utilization Bands Report

An estimate of the amount of tape that is utilized by the cartridges in the selected LSM(s) or dataset workload groups(s). The graph is divided into percentage bands and the number of cartridges in each band is reported.

VSM/VTSS Reports

VSM/VTSS reports provide graphical analysis of activities within the Virtual Storage Management (VSM) system’s Virtual Tape Subsystems (VTSSs) for the period and selection criteria defined in General Preferences.

VSM/VTSS reports are organized as VTSS Mounts reports, VTSS Performance reports, Host Links reports, RTD Links reports, Residency reports, and Data Transfer reports.

Mounts Reports

VTSS Mounts reports provide information about VTSS VTD and RTD mount activities originating from all hosts or a selected host for each interval during the selected period.

VTD Mount Counts Report

The number of Virtual Tape Volumes (VTVs) that were mounted in the Virtual Tape Drives (VTDs) associated with the selected VTSSs. Depending on selected options, the report may include scratch, non-scratch, and/or total VTVs.

VTD Mount Response Report

The average time in seconds to mount Virtual Tape Volumes (VTVs) in the Virtual Tape Drives (VTDs) associated with the selected VTSSs. Depending on selected options, the report may include scratch, non-scratch, and/or total VTVs.

VTD Maximum Mount Time Report

The maximum time in seconds to mount a Virtual Tape Volume (VTV) in the Virtual Tape Drives (VTDs) associated with the selected VTSSs. Depending on selected options, the report may include scratch and/or non-scratch VTVs.

RTD Mounts Report

The number of mounts that occurred in the Real Tape Drives (RTDs) associated with the selected VTSSs. Depending on selected options, the report may include RTD mounts for migrates, recalls, and/or combined RTD mounts.

VSM Mount Analysis (VTSS)

Depending on selected options, the total number of VSM mounts and total data read, total data written, and/or total data transferred due to those mounts.

Performance Reports

VSM/VTSS Performance reports provide information about general VTSS performance for each interval during the selected period.

VTD Utilization Report

The average percentage of time that each band of drives was in use for each period. Bands are associated with Virtual Tape Drives (VTDs) on all or selected VTSSs.

VTSS Concurrent VTDs Report

The maximum number of VTDs in use concurrently in all or selected VTSSs for each period.

VTSS Maximum Disk Buffer Utilization Report

The maximum disk buffer utilization percentage for all or selected VTSSs for each period.

VTSS Throughput Report

The throughput (staged, destaged, and/or total) for all or selected VTSSs for each period, shown either as a percentage of total throughput or as total megabytes. This statistic is only available for sites using NCS 4.0 or higher; otherwise the statistic will always be displayed as zero.

VTV Movements Report

The number of Virtual Tape Volumes (VTVs) that were recalled from the disk buffer, migrated to Nearline, and/or reclaimed from Nearline for each period.

Cache Hit Ratio Report

The percentage of cache hits for all or selected VTSSs based on the number of successful read requests from the buffer for each period. This statistic is only available for sites using NCS 4.0 or higher; otherwise the statistic will always be displayed as zero.

Scratch Compression Ratio Report

The scratch volume compression percentage for scratch volumes in all or selected VTSSs for each period.

Host Links Reports

VSM/VTSS Host Links reports measure host interface activity.

Host Interface Busy Percentage Report

The percentage of time the internal VTSS Host channel interfaces are busy, as measured internally by the VTSS microcode.

Host Interface Total I/O Report

The total number of I/Os on the internal VTSS Host channel interfaces, as measured internally by the VTSS microcode.

Host Interface Busy Time Report

The time in seconds that the internal VTSS Host channel interfaces are busy, as measured internally by the VTSS microcode.

RTD Links Reports

VSM/VTSS RTD Links reports measure RTD interface activity on the selected VTSS.

RTD Interface Busy Percentage Report

The percentage of time that the internal VTSS RTD channel interfaces are busy, as measured internally by the VTSS microcode.

RTD Interface Total I/O Report

The total number of I/Os on the internal VTSS RTD channel interfaces, as measured internally by the VTSS microcode.

RTD Interface Busy Time Report

The time in seconds that the internal VTSS RTD channel interfaces are busy, as measured internally by the VTSS microcode.

Residency Reports

VSM/VTSS Residency reports measure activity in the disk buffer on the selected VTSS.

Number of Migrated VTVs Deleted Report

The number of VTVs migrated then deleted for a selected management class, all management classes, or all VTVs. NCS 4.0 or higher is required for management classes.

Average Residency Migrated VTVs Report

The average over each PERIOD for the difference between the time of migration and the last referenced time for VTVs which are migrated then deleted from the buffer. This does not include VTVs deleted for reclaims. If there are no such VTVs migrated within each period, zero is displayed. A datum line on the graph shows the residency target value. Graphs can be produced for a selected management class, all management classes, or all VTVs. NCS 4.0 or higher is required for management classes.

Idle in Buffer Time Migrated Report

The total amount of time migrated VTVs were idle in the buffer. Graphs can be produced for a selected management class, all management classes, or all VTVs. NCS 4.0 or higher is required for management classes.

VTVs That Missed Residency Target Report

The number of VTVs that were migrated before the residency target specified in the ExPR configuration was reached. Graphs can be produced for a selected management class,

all management classes, or all VTVs. NCS 4.0 or higher is required for management classes.

Percentage VTVs That Missed Residency Target Report

The percentage of VTVs that were migrated before the residency target specified in the ExPR configuration was reached. Graphs can be produced for a selected management class, all management classes, or all VTVs. NCS 4.0 or higher is required for management classes.

Number of VTVs Cycled in Buffer Report

The number of VTVs that were cycled in the buffer for all or selected VTSSs.

Number of VTVs Scratched Report

The number of VTVs that were scratched for all or selected VTSSs.

Percentage Scratched VTVs Cycled in Buffer

The percentage of scratched VTVs that were cycled in the buffer for all or selected VTSSs.

Data Transfer Reports

VTSS Data Transfer reports analyze the data transfer performance of a VTSS.

VTSS Data Transfer Summary Report

The total throughput in megabytes for all or selected VTSSs, shown separately for application activity, system activity, and/or combined.

VTSS Data Transfer Application Detail Report

The total application throughput in megabytes for all or selected VTSSs, shown separately for data read or written by the mainframe, read for recall, and written for migration.

VTSS Data Transfer System Detail Report

The total system throughput in megabytes for all or selected VTSSs, shown separately for free space collection and reclaims.

Device Group Reports

Device Group reports provide graphical analysis information about a specified device group during the selected period:

Device Group Mounts Report

For the selected device group, the total number of cartridge volumes that were mounted in the selected LSMs. Depending on selected options, the report may include scratch, non-scratch, and/or total cartridges.

Note: This report was called the Manual-Mounts report in earlier versions of ExPR.

Device Group Utilization Report

For the selected device group, the percentage of time that devices mapped by the selected device group were being utilized. The report is categorized by scratch or non-scratch activity.

Note: This report was called the Manual-Utilization report in earlier versions of ExPR.

Data Transfer Report

For the selected device group, the total data read, total data written, and total data transferred.

Concurrent Drives in Use Report

For the selected device group, the percentage of time a given number of drives were in use for each interval during the specified period. The report is color-coded to indicate how many drives were in use for each percentage that is graphed.

Control Units Reports

Control Units reports provide device-level statistics about control unit performance for each interval during the specified period.

Control Unit Load Report

The average percentage load and the high load point for the selected control unit. These figures are based on the combined average disconnect time for all the drives attached to the control unit, and the single highest recorded figure for the control unit.

Device Disconnect Summary Report

The number of drives that exceeded the percentage threshold specified for device disconnect time. The threshold percentage can be used to detect high control unit loading as a result of device disconnect time. For example, 70% disconnected represents a point at which bottlenecks occur, so a threshold of 50% or 60% could be used to issue a warning.

Device Disconnect Detail Report

The average and high percentage value for disconnect time for the selected drive.

SSCH Report

The number of start subchannel commands that were issued for the selected control unit.

Control Unit Busy Report

The average percentage of disconnected time for the selected control unit. These figures are based on the combined average disconnect time for all the drives attached to the control unit, and the single highest recorded figure for the control unit.

Tape Errors Reports

Tape Errors reports provide information about the errors that occurred. Permanent or temporary errors (or both) can be included in the reports. Nearline or non-Nearline (or both) can also be selected to further isolate error information for each interval during the selected period.

Tape Error Events Report

For the selected error type, the number of tape errors (read, write, or both) that occurred in each period.

Volumes with Errors Report

For the selected error type, the number of volumes that were recorded as having errors in each period.

System-Wide Reports

System-Wide reports provide information from each system about the total tape environment, including Nearline, VSM, and manual activity.

Channel Busy Report

For each interval during the selected period, a percentage busy figure for channel groups. These groups are defined in the ExPR mainframe software at your installation to logically organize sets of channels that you wish to analyze together.

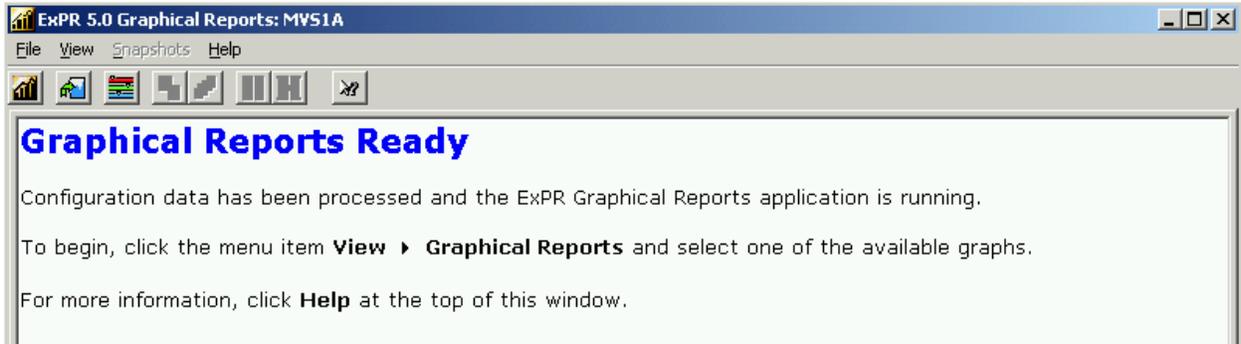
Total Mount Analysis Report

For each interval during the selected period, the total number of cartridge mounts that were processed system-wide and the total transferred data. Depending on selected options, the report may include Nearline, VSM, and device group mounts or any combination of the three.

Starting the Application

Start the Graphical Reports application using any of the methods described in chapter 1, *Getting Started*. If prompted, select the primary host to connect to. (This prompt only appears if you have multiple host groups.)

The application window will appear shortly after you make your selection.

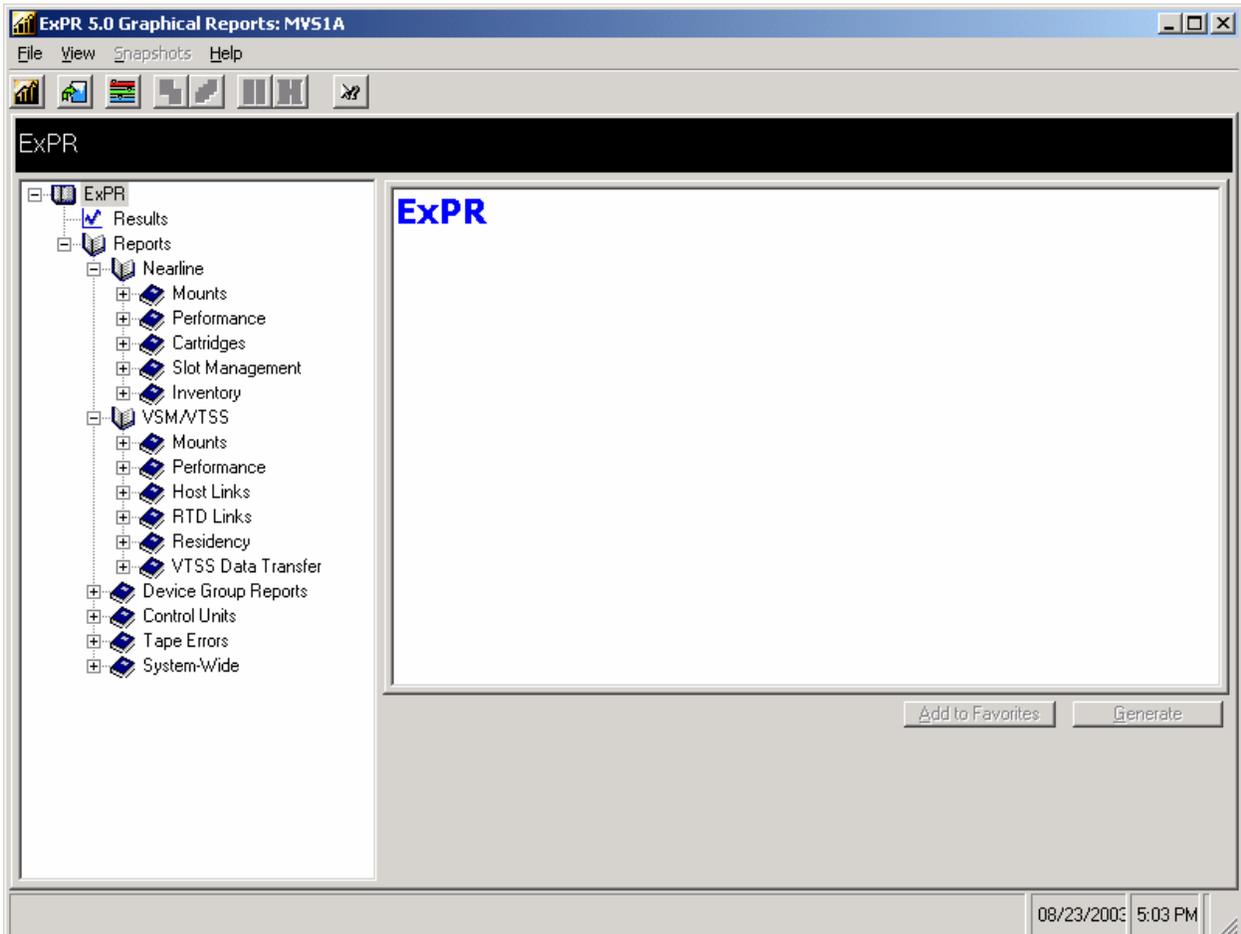


Constructing Graphical Reports

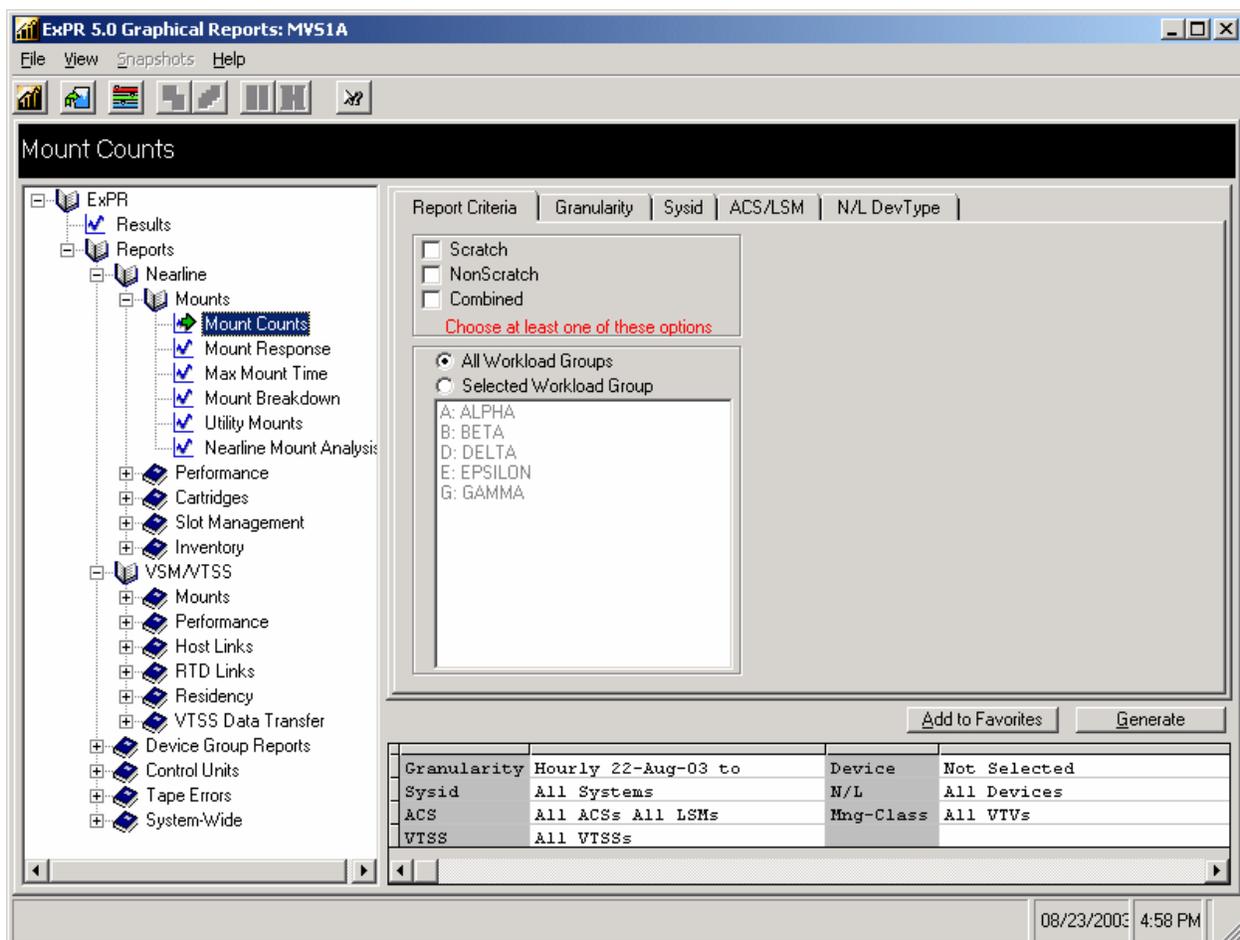
Graphical reports are constructed using the navigation tree on the left panel of the display window.

To construct a graphical report:

1. Open the Graphical Reports application if you have not already done so.
2. Click **View** and then click **Graphical Reports**.



3. Reports are organized into books on the navigation tree, such as Nearline, VSM/VTSS, Device Groups, and Control Units:
 - Some books, such as Device Groups, list their available reports when you click the book. In this case, click the book to display the available reports and then click the report you want to construct.
 - Other books, specifically Nearline and VSM/VTSS, have additional report subtypes, also organized into books, such as Mounts and Performance. In this case, click the book to display its subtypes, click a subtype to display its available reports, and then click the report you want to construct.



4. After a report is selected, Report Criteria may appear in the main panel, depending on the report. For example:
 - Mounts reports generally allow you to include or exclude scratch or non-scratch mounts, with each type plotted separately or combined or excluded altogether.
 - Mount analysis reports allow you to include or exclude data read, data written, and total data, each plotted separately or excluded altogether from the report.

- Cartridge movement reports allow you to show enters, ejects, passthroughs, and demand enters, each plotted separately or excluded altogether from the report.

Select Report Criteria as required for your report.

5. The remaining tabs across the top of the main panel allow you to further customize the report. These tabs will vary with the report. For example, depending on the report you selected:
 - Click **Granularity** to set the date range, days, and hours to include in the report.
 - Click **SYSID** and select **All Systems** or a specific ID.
 - Click **ACS/LSM** and select **All ACSs** or a specific ACS. To select a specific LSM, double click the selected ACS and then click the LSM.
 - Click **VTSS** and select **All VTSSs** or a specific VTSS.
 - Click **Device Groups** and select a specific device group if you do not want all device groups included in the report.
 - Click **N/L Device Types** and select **All Devices** or a specific device type.
6. Click the **Generate** button to produce the report.

Note: You could click the **Add to Favorites** button at this point to save the report as a template in the Favorites book on the navigation tree instead of generating it for one-time display. Favorites are described later in this chapter.
7. The report request is sent to the host and the relevant data is extracted from the database and returned to the PC for graphical display. The report name will appear in the Results book at the top of the navigation tree when the data has been returned by the host.
8. Repeat steps 3 through 7 if you want to construct additional reports.

Displaying Reports from the Results Book

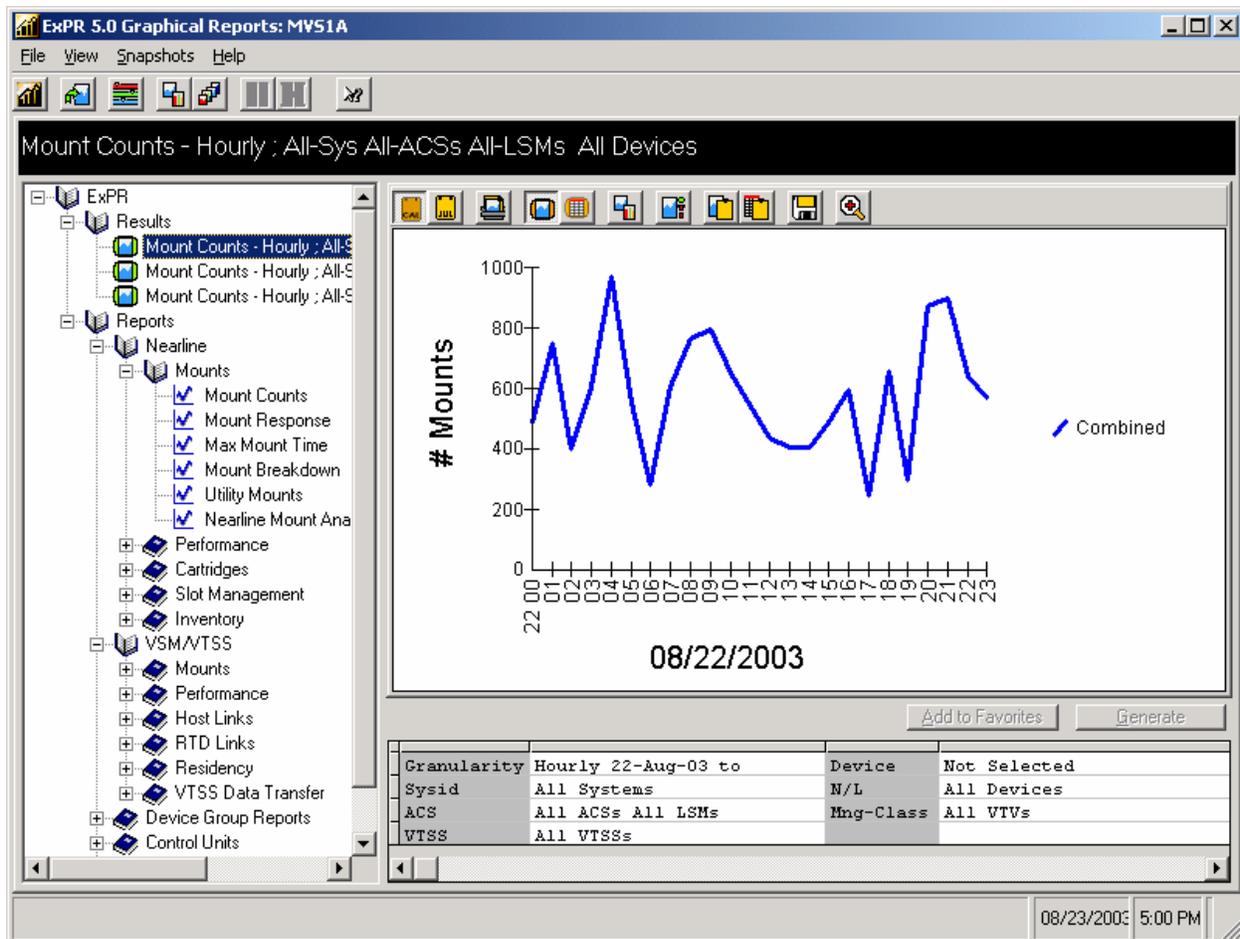
When a report request has been returned from the host, the report name appears in the Results book at the top of the navigation tree.

If the reports are not displayed, click the plus sign (+) left of the Results book to display the reports.

To display a graph, click the report name in the Results book.

Report requests are color-coded in the results book:

- Green indicates the graph is ready for display.
- Yellow indicates only zeros were returned. The graph will not plot.
- Red indicates the graph will not plot. A warning like "no data" also appears at the bottom of the window.



While a graphical report is displayed, you can:

- Display the data behind the graph as a table.
- Change the graph type (for example, from line graph to 3D area graph).
- Zoom a point on the graph to the next level of granularity.
- Display the graph in a separate window.
- Export, print, save, or clipboard copy the data or graph image.

These functions are performed with the toolbar icons at the top of the display panel.

Additionally, you can construct graphical reports as “favorites” with the selection criteria predefined and have them be available for immediate generation in the Favorites book or have them be generated automatically into the Results book when you open the application.

Displaying Graphical Report Data in Tabular Format

The data behind a graphical report can be displayed at any time while the graph is displayed.

1. Click the **Display in Tabular Format** toolbar icon above the graph.
2. To redisplay the report as a graph, click the **Display as a Graph** toolbar icon above the graph.

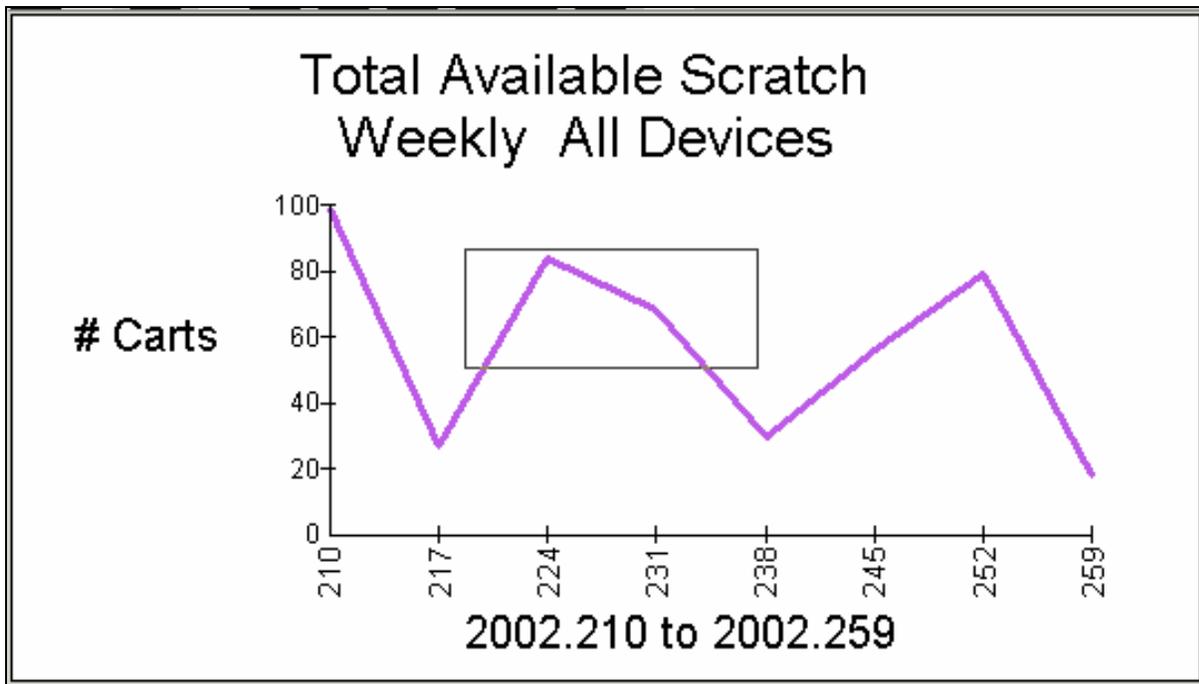
Changing the Graph Type

Displayed graphical reports can be redrawn as a different graph type at any time. Available graph types vary with different reports but generally include line, bar, tape, and area in 2D and 3D views.

1. Click the **Change Graph Style** toolbar icon above the graph or right-click the mouse on the graph.
2. Select a graph style from the pull-down menu.

Zooming in for a Closer Look

The Zoom feature allows you to generate a new graph showing a subset of an existing graph.



You can either select a single point on the graph or drag a box around a portion of the graph:

- If you drag a box around a portion of the graph, the new graph will plot just the area that you boxed in the original graph, resized to fit the graph display panel.
- If you select a single point (or if the area you box contains just a single point), the new graph will plot details for that point at the next lower level of granularity. For example, you can zoom a point on a weekly graph to see daily details for the selected week and zoom a point on a daily graph to show hourly details for a selected day. The new graph will also include the day or week on either side of the selected day or week.

To zoom a graph:

1. Click the **Zoom** toolbar icon above the graph to activate the zoom mode.
2. Move the cursor over the graph. The normal cursor is replaced with a “+” when zoom mode is active.
3. Position the cursor at the point on the graph you wish to zoom and click the mouse, or leave the mouse depressed and move the cursor over the graph to draw a box around the portion of the graph you wish to zoom.
 - If you selected a single point (or if your box contained only a single point), a new graph report with the next level of granularity for the selected day or week will be generated and placed in the Results book. The graph will also include the day or week on either side of the selected day or week.
 - If your box included more than one point, the new graph will plot just those points and the granularity will remain the same.
4. Click the **Zoom** toolbar icon above the graph to deactivate the zoom mode.

An alternate method: Zoom mode is activated when the CTRL key is pressed. Hold down the CTRL key and move the cursor over the graph to the point you want to zoom. Click the mouse while continuing to hold down the CTRL key. The new graph will be sent to the Results book. Zoom mode is deactivated when you release the CTRL key.

Displaying Calendar or Julian Dates

Dates in graphical reports can be displayed in either calendar or Julian formats. Whichever format you select will be applied to all graphical reports.

1. Display dates in calendar format with the **Calendar Date** toolbar icon above the graph. Display the dates in Julian format with the **Julian Date** toolbar icon.

Saving Graphical Reports

A graphical report can be saved as a disk file at any time while the graph is displayed.

1. Click the **Save to File** toolbar icon above the graph.
2. In the dialog box, select the directory to save the report in, the file name, and file type:
 - Select file type ***.bmp** to save the report graph as a Windows bitmap.
 - Select file type ***.jpg** to save the report graph as a JFIF (JPEG file).

- Select file type ***.txt** to save the report data as a tab-separated text file.

Exporting Graphical Reports

A graphical report can be exported at any time while the graph is displayed. The graph is copied to the Windows Clipboard in either a graphic (bitmap) format or as tabbed text.

- To export the report as a bitmap, click the **Copy Bitmap to Clipboard** toolbar icon.
- To export the report as tabbed text, click the **Copy Values to Clipboard** toolbar icon.

You can then paste the graph or text into other applications, such as Word or Excel.

Printing Graphical Reports

A graphical report can be printed at any time while the graph is displayed.

1. Click the **Print Graph** toolbar icon above the graph.
2. In the dialog box, click **Print Setup** if you need to set up or modify the printer configuration.
3. Click **Color** or **Monochrome** to select the print type.

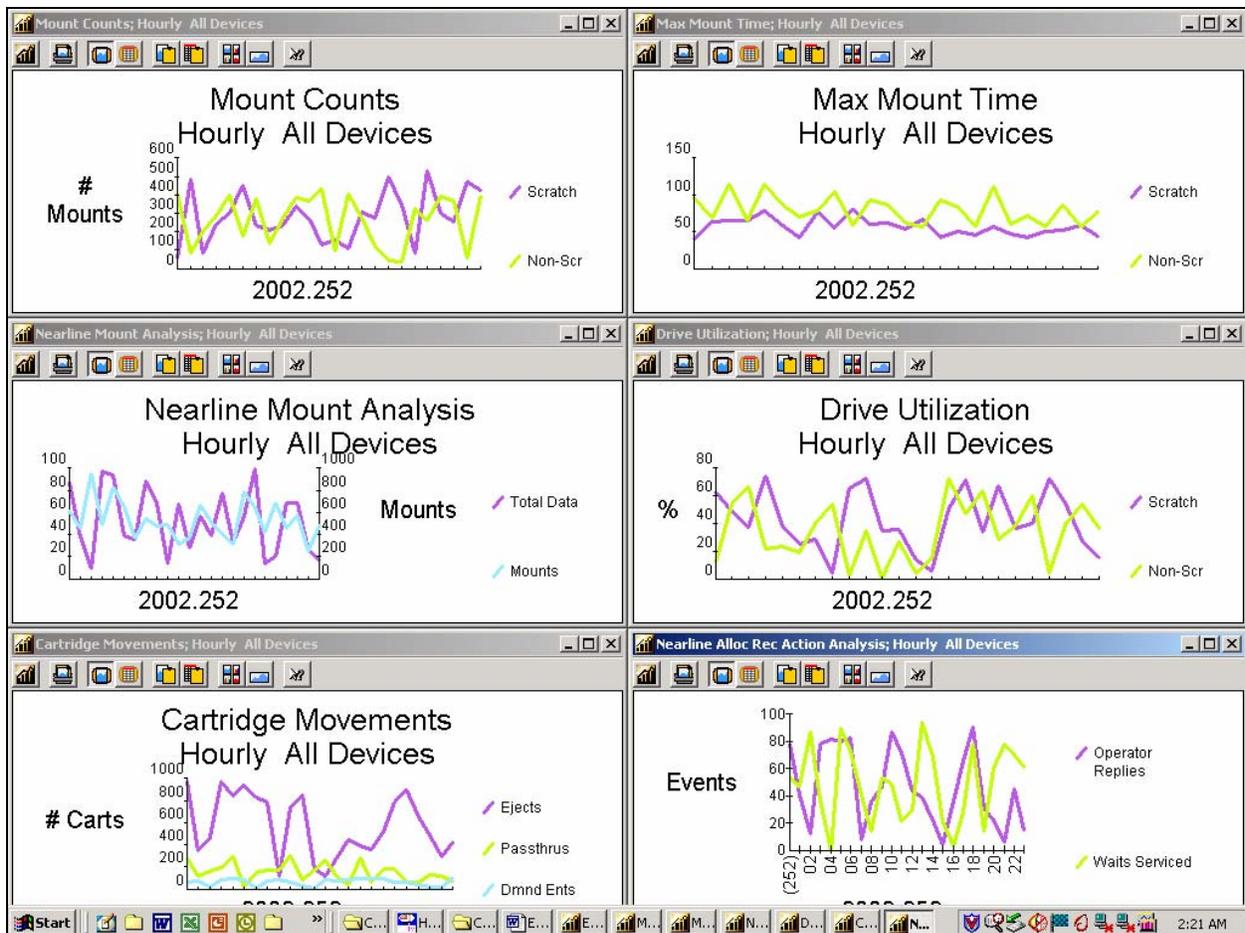
Tip: Most non-color printers will render colored images using grey-scale substitution. If this is what you want, leave the print type option set to **Color**. If your printer cannot produce grey-scale output (for example, if you are using a plotter), then select **Monochrome**. The graph will then be drawn using symbols and cross-hatching rather than colors to differentiate the data sets.

4. Click **Border** to select or deselect borders on the graph printout.
5. Click **Print** to print the report.
6. Click **Cancel** to exit the dialog box.

Displaying Multiple Graphical Reports

Graphical reports in the Results book can be displayed simultaneously in separate windows and tiled on the PC screen for comparison purposes.

1. Click the **Snapshot of All Graphs in the Results Book** toolbar icon to display the graphs in separate windows.
2. Click the **Tile the Snapshot Windows** toolbar icon to tile the windows. If this icon is hidden by the snapshot windows, use the **Tile Snapshot Windows** toolbar icon in one of the snapshot windows.



3. Use the toolbar icons in the snapshot windows to perform the following additional functions:
 - Print the current graph.
 - Display the current graph's data in tabular format (or redisplay as a graph).
 - Copy the current graph to the Windows Clipboard as a bitmap or as text.
 - Expand the current window to full screen width.
4. Use the **Main Window** toolbar icon in any snapshot window to redisplay the main ExPR Graphical Reports window.
5. In the main window, use the **Close All Snapshot Graphs** toolbar icon to close the snapshot windows.

Alternatively, you can close, minimize, or resize snapshot windows individually with the standard Windows icons in the upper right corner of each snapshot window.

Deleting Graphical Reports

Graph reports remain in the Results book until you exit from the Graphical Reports application (at which point the Results book is emptied).

You can delete individual reports during a session. Select the report in the Results book and then click the right mouse button and select **Delete**.

You can also delete reports by clicking the Results book and selecting reports to delete from a displayed list. Select reports to delete and then click the **Remove** button.

Constructing “Favorite” Report Templates

ExPR graphical reports can be constructed and saved as templates in a Favorites book on the navigation tree. This allows you to preselect general preferences, device selection, and filtering criteria for recurring reports.

The date range you select for these reports will be converted to a relative period and applied each time you generate the report. For example, if your selected date range converts to thirty consecutive days prior to today, then all future iterations of the report will be for thirty consecutive days prior to the run date.

Individual favorite reports can be set up so they are generated automatically and placed in the Results book for display when you start the Graphical Reports application, or they can be generated on demand from the Favorites book at any time.

To construct a report and save it as a template in the Favorites book:

1. Follow the instructions in *Constructing a Graphical Report*.
2. Instead of clicking the **Generate** button, click the **Add to Favorites** button.
3. In the dialog box, enter a name for the report that is meaningful to you. This name will appear in the Favorites book on the navigation tree.
4. Optionally, enter a report name to appear in the report header, or skip this step to accept the proposed default.
5. If you want the report to be generated automatically and placed in the Results book when you open the Graphical Reports application, click the checkbox.

Note: Reports that are not generated automatically can be quickly generated from the Favorites book on the navigation tree at any time.

6. Click **OK** to exit the dialog box.

Displaying Favorite Reports

Favorite reports can be displayed with any of the following methods:

- If the report was automatically generated, click the report name in the Results book to display the graph.
- If the report is in the Favorites book but not in the Results book, click the report name and then click the **Generate** button. When the generated report appears in the Results book, click the report name to display the graph.

- To generate and display multiple reports from the Favorites book, click the Favorites book. A list of the report templates in the Favorites book will be displayed. Select the reports you want to display and then click the **Generate** button. When the reports appear in the Results book, click a report name to display that graph, or click the **Snapshots** menu options to display graphs in separate windows tiled on the screen.

Displaying and Changing Favorite Report Properties

To display a favorite report's properties, click the report name in the Favorites book.

A dialog box will be displayed with the report name, date range, and the auto-generate checkbox. Change any of these items and then click the **Save** button.

Deleting "Favorite" Report Templates

To delete reports from the Favorites book, click the Favorites book.

A list of the report templates in the Favorites book will be displayed.

Select the reports you want to delete and then click the **Delete Selected Items** button.

Setting Color Preferences

You can set default colors for graphical reports, including the background color and the color to use for seven different plot lines.

To set color preferences:

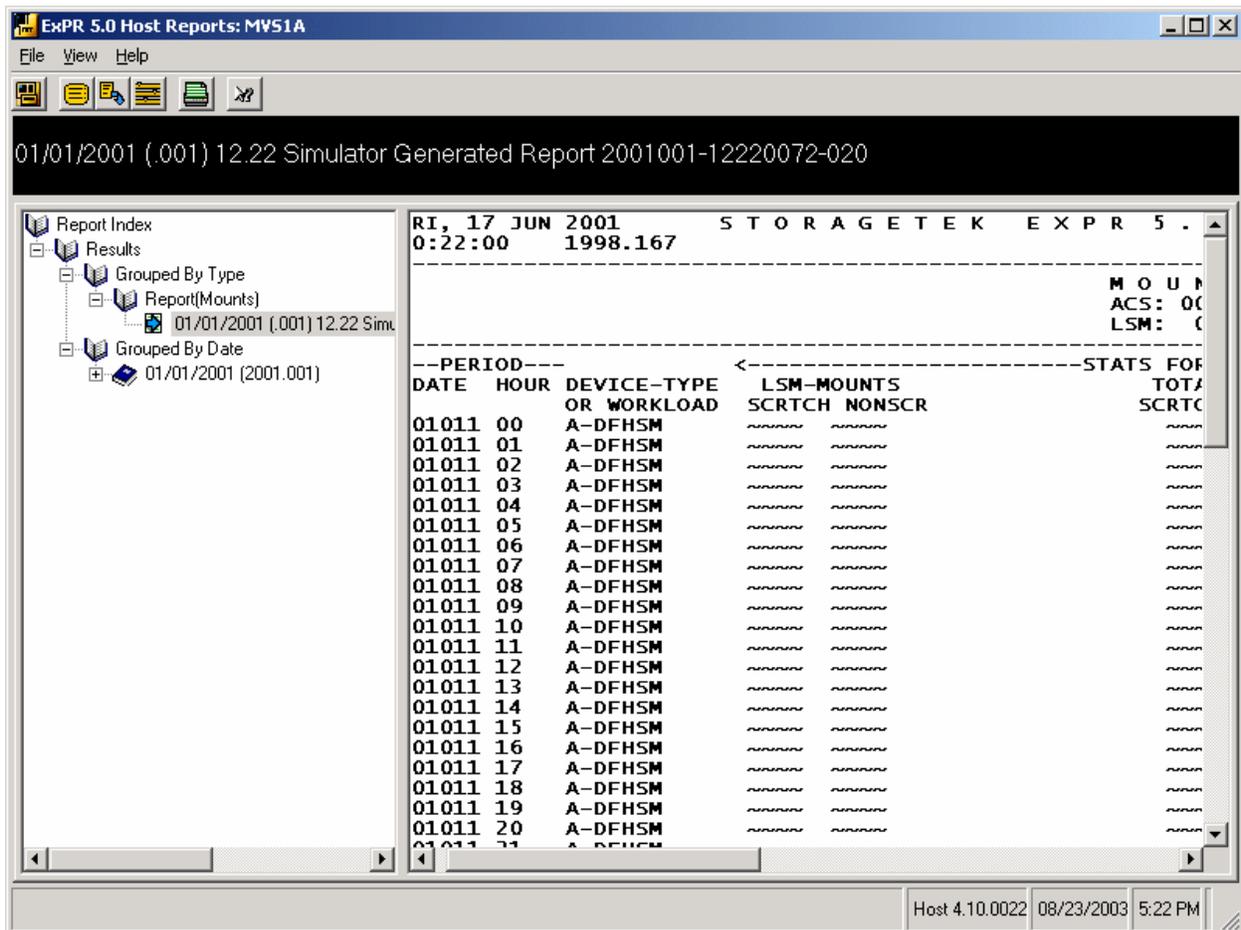
1. Open the Graphical Reports application if you have not already done so.
2. Click **View** and then click **Color Preferences**.
3. In the dialog box, select the element to change from the left panel and the color to apply from the right panel. The middle panel will preview your color selections.
4. Repeat the previous step for each element of the graph you want to define colors for.
5. Click **OK** to exit the dialog box.

Chapter 3: Host Reports

Overview

This chapter describes how to use the ExPR Host Reports application.

Host reports are the ExPR mainframe tabular reports, displayed on your PC screen.



When you request a host report, the request is literally translated into a control statement (PERFORM REPORT) at the host and submitted in the MVS jobstream. The results are made available to the PC when the report has been generated.

The generated report is placed in the Online Report File (ORF) on the host and its name appears in the Results book in the Host Reports application on the PC. You display the report by selecting it from the Results book. The report is formatted in standard MVS tabular format.

List of Available Host Reports

ExPR host reports that you can initiate from the PC are listed below.

Mounts Report

This report displays mount activity for each ACS/LSM and if requested, additional lines for each device type and Jobname Workload Group. Mount count, mount timing, and data throughput information is presented.

Mounts-ACS Report

This report lists, per ACS, the number of Nearline mounts, average mount time, maximum mount time, and data transferred. Separate tallies are reported for scratch and non-scratch volumes.

Mounts-Detail Report

This report shows the component parts of the mount time reported on the MOUNTS report. If mount response times are a cause for concern this report can be used to determine where the time is accumulating. The report shows the 8 elements of mount time, along with the average and total timing. This information is provided for both scratch and non- scratch mounts.

Mounts-LSMs-Used Report

This report shows the impact of passthrough activity. Specifically it illustrates the number of LSMs involved in servicing mounts and require passthrough.

Scratch-Subpool Report

This report provides additional detail on scratch availability for users of scratch subpools. It details the low, average and high value per hour for each subpool defined.

Contents Report

This report displays the database records present in the ExPR database to assist in identifying gaps in the database. Each record type is presented showing how many records exist for the day reported. The level field indicates the level of summarization. 00 reflects hourly records, 01 reflects daily records and 02 weekly records.

Utilization Report

This two-part report provides drive utilization and drive concurrency information for Nearline systems. The reports are generated per LSM.

Part 1, drive utilization shows percentage of each hour that drives were in use. For systems with more than 16 transports attached, this information is grouped into bands. This report can help identify peak hour, in terms of utilization and particularly, how long the utilization levels remain at their high point.

Part2, drive concurrency, shows for drive concurrency distribution for each hour. This report highlights both under and over utilization of transports and can be used to determine if transports can be better reassigned or if insufficient transports are available to meet the workload demands.

Thresholds Report

ExPR enables you to specify thresholds for certain measurements. When these values are exceeded, they are highlighted on this Thresholds report. Thresholds can be used either as a means of highlighting potential problems, or a mechanism to track service levels.

A database record is only produced when an exception occurs. This means not all hours will necessarily be shown on the report.

Demand-Enters Report

This report provides information about ‘demand enter’ activity into an LSM that has caused potential disruption to the production workload. The timing of events listed on these reports should therefore be checked against peak processing periods. The time, system, volume serial and Jobname are provided on the report.

VTSS-Mounts Report

This report lists the volume of data and number of mounts being directed at the selected VTSS and shows the performance of that activity. It presents information about the various mount activity relating to the selected VTSS and is an ideal starting point for further VSM analysis. Mounts are classified by VTD and RTD, and are accumulated on an hourly basis. Mount count, mount response time and data throughput information is presented. RTD mounts also have an additional report automatically produced showing the type of RTD mount that occurred.

The cache hit percentage figure shows the ratio of VTV reads that were serviced in the disk buffer.

VTSS-Utilization Report

This two-part Host report provides, per VTSS, virtual drive utilization and virtual drive concurrency information for VSM systems.

Part 1, drive utilization shows the percentage of each hour that drives were in use. This

information is grouped into bands. This report can help identify peak hour, in terms of drive utilization and, particularly, how long the utilization levels remain at their high point. It is unlikely that a VTSS will reach a level where all 64 virtual drives are in use. This report, however, still has value in terms of tracking the increase that might occur from initial implementation onwards.

Part 2, drive concurrency, shows for each hour, drive concurrency distribution.

VTSS-Thresholds Report

ExPR enables you to specify thresholds for certain measurements. When these values are exceeded, they are highlighted on this report. Thresholds can be used either as a means of highlighting potential problems or as a mechanism to track service levels.

A database record is only produced when an exception occurs. This means not all hours will necessarily be shown in the report.

VTSS-Interface-Performance Report

This host report shows how busy the front end and back end channel interfaces are for the selected VTSS. The report provides statistics for Host links and RTD links. Host links reflect Host application demands for reading existing VTVs or creating new VTVs. RTD links represent the activity to the real tape drives and can be for application based migrate and recall activity or for internal VTCS actions such as reclaim, drain, audit, consolidation, or export. For both links, interface busy, total i/o and interface busy seconds are presented.

Maximum disk buffer utilization is also shown on this report.

VTSS-Internal-Performance Report

This report shows the internal throughput of data for the selected VTSS and what that data flow represents in terms of the total throughput capability of the VTSS. Four sections are provided covering disk buffer utilization, compression rate, data transfer and throughput.

VTSS-Residency Report

This report lists the performance of the VTSS disk buffer in terms of the period of time VTVs remain resident in the buffer. It supports the use of VTCS Management Classes and shows the average residency time and the number/percentage of VTVs that miss the target residency set for the VTSS or a Management Class.

Residency is expressed in several ways:

VTVs that are cycled in the buffer – the VTV is created, used and deleted before migration occurs

VTV idle in buffer time – period of time from last reference to migration

VTV residency time – This is the period of time from creation to migration

Statistics are also provided for the number of VTVs that are scratched, deleted and migrated.

Device-Group-Mounts Report

This report provides mount statistics for any of the Device Groups that you have specified. Mount count, mount timing and data throughput information is presented.

Note: This report was called the Manual-Mounts report in earlier versions of ExPR.

Device-Group-Utilization Report

This report lists, for the selected device group, the percentage over the period that the devices mapped by the selected device group were being utilized. The report is categorized by scratch or non-scratch activity.

Note: This report was called the Manual-Utilization report in earlier versions of ExPR.

System-Mounts Report

This report presents an overall view of tape activity and is an ideal starting point for further analysis. Mounts are classified by LSM, VTD and Manual and are accumulated on an hourly basis. For each category, mounts are further classified by scratch/non scratch activity. In the case of RTD mounts, a migrate/recall breakdown is provided. Data throughout read/write/total statistics are also displayed.

Allocation Recovery Report

This report provides information about allocation recovery tasks on JES2 or JES3 systems, including the number of events and the delay times.

Tape-Errors Report

This report is provided to identify failing media or potentially defective transports. It provides a summary of tape errors detected for each system and then a number of supplementary pages sorting the errors by date/time, volser and drive address. This highlights a particular volume if it is failing and showing errors on any transport it is mounted on, or if a transport is defective and is causing errors on any volume mounted.

The report shows the number of permanent and temporary errors recorded and indicates if the activity was a read or write action. Supplementary information showing the volume of data transferred and SSCH count is also provided.

CU-Busy Report

This report displays the average disconnect time for each control unit and each attached device. The average and high values are provided. This report also provides statistics to show the volume of data going through the control unit and devices. This is presented as the total number of start sub channel commands (SSCH) issued and the data transferred broken down by read and write activity.

Path-Busy Report

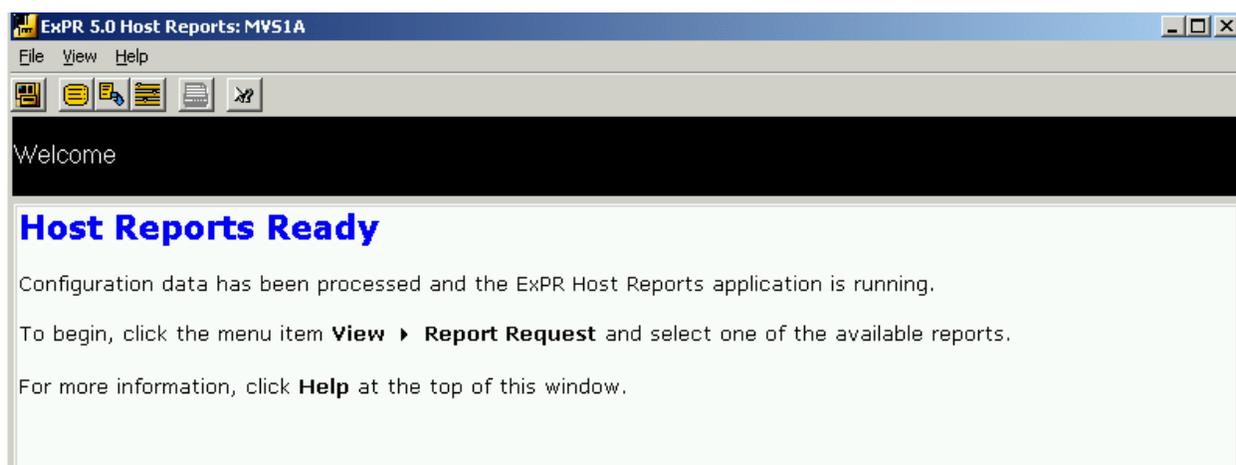
This report produces information about user-defined channel group utilization.

Starting the Application

Start the Host Reports application using any of the methods described in chapter 1, *Getting Started*.

If prompted, select the primary host to connect to.

The application window will appear shortly after you make your selection.

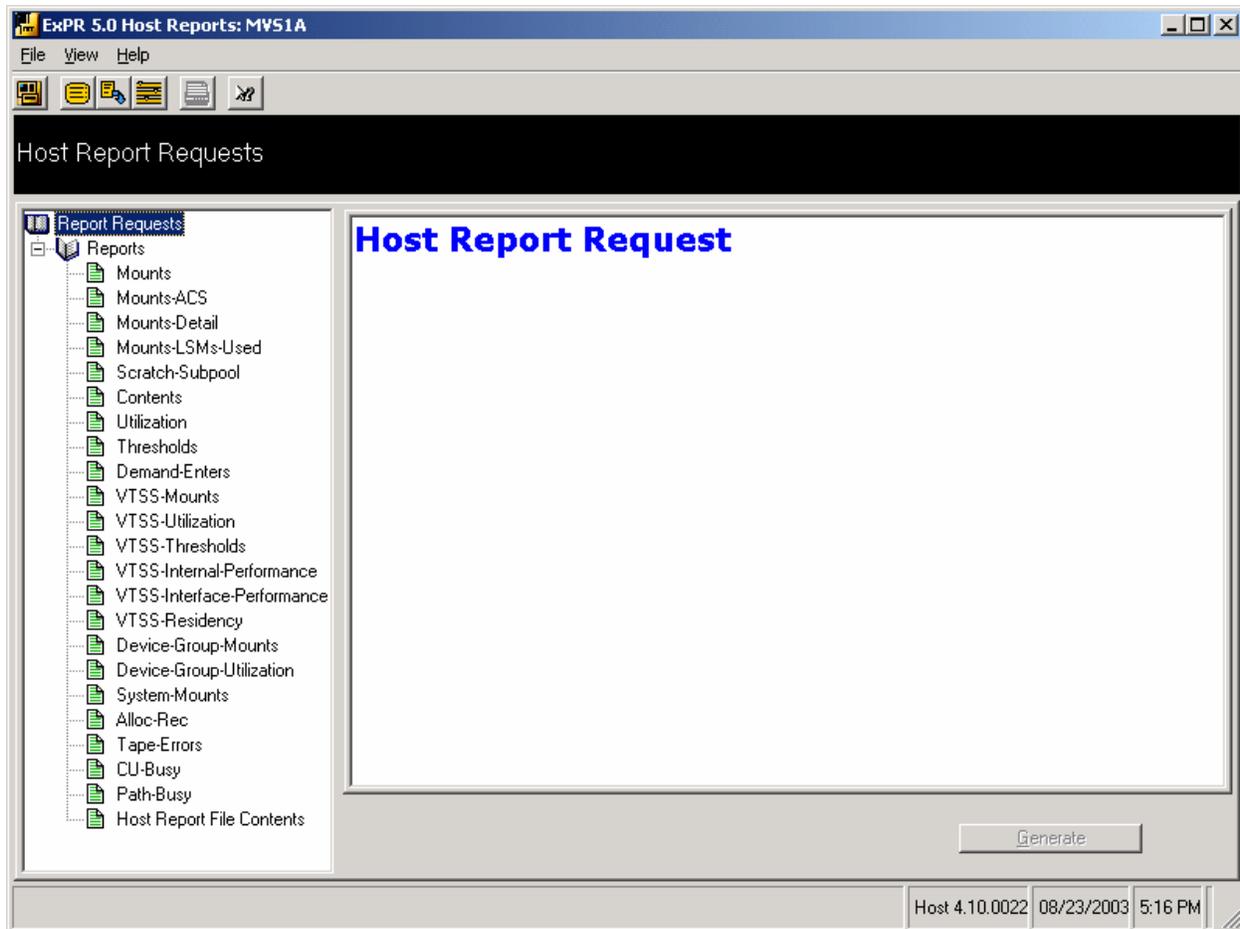


Constructing Host Reports

Host reports are constructed using the navigation tree on the left panel of the display window.

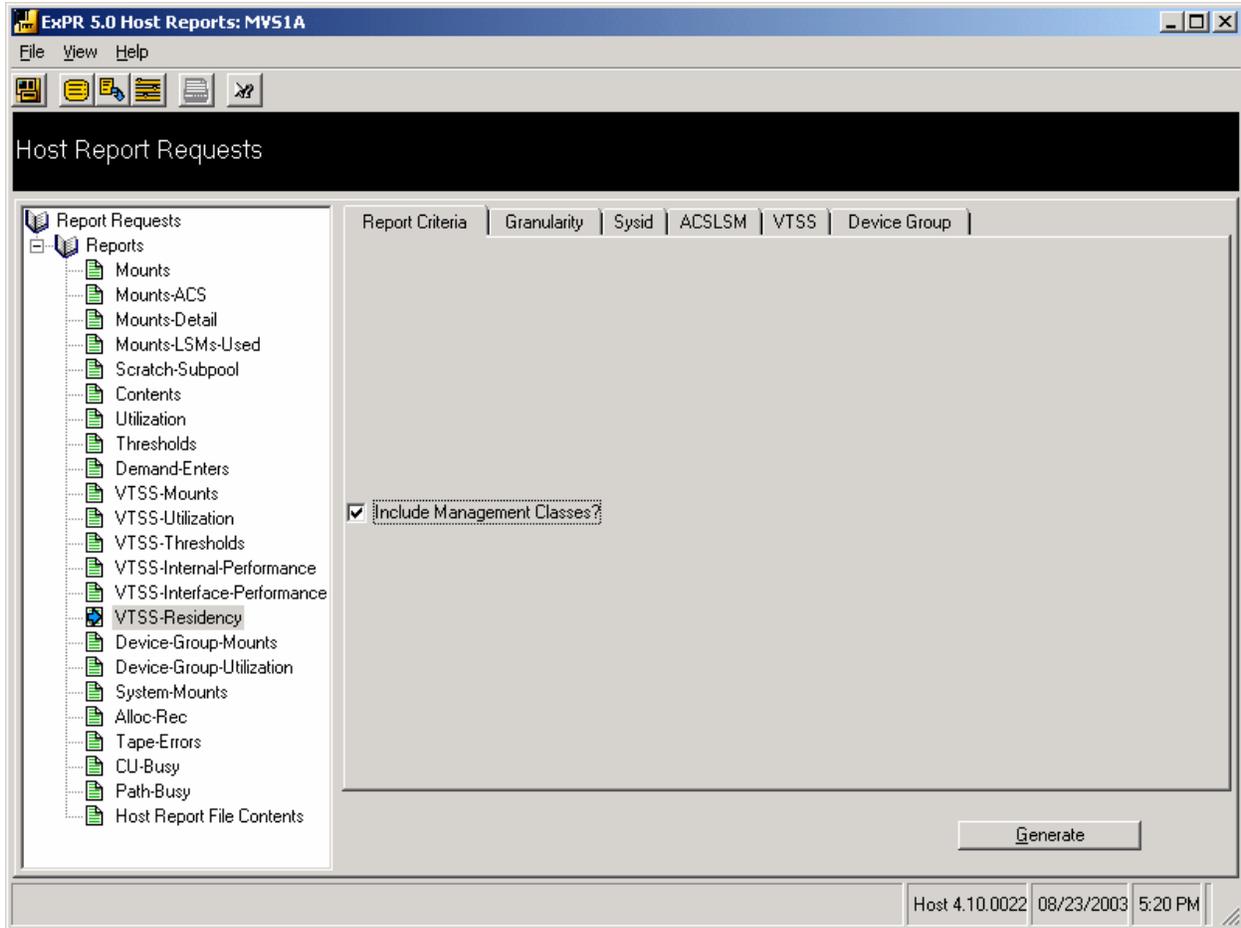
To construct a host report:

1. Open the Host Reports application if you have not already done so.
2. Click **View** and then click **Report Request**.



3. In the navigation tree, click the report you want to request.
4. After a report is selected, Report Criteria may appear in the main panel, depending on the report. For example, the VTSS-Residency report allows you to include or exclude management classes. (NCS 4.0 or higher is required for management classes.)

Select Report Criteria as required by your report.



5. The remaining tabs across the top of the main panel allow you to further customize the report. These tabs will vary with the report. For example, depending on the report you selected:
 - Click **Granularity** to set the date range and hours to include in the report.
 - Click **SYSID** and select **All Systems** or a specific ID.
 - Click **ACS/LSM** and select **All ACSs** or a specific ACS. To select a specific LSM, double click the selected ACS and then click the LSM.
 - Click **VTSS** and select **All VTSSs** or a specific VTSS.
 - Click **Device Groups** and select a specific device group if you do not want all device groups included in the report.
6. Click the **Generate** button. Your report request will be sent to the host system for processing.

Note: ExPR host reports are stored in the Online Report File (ORF) on the host and made available to the PC. It is important to note that report requests from all ExPR PCs are stored in the ORF and thus are available to each PC, not just the one that requested the report.

Customizing Host Report Settings

Customization options in the Host Reports application allow you to manage the update frequency and control the number of days reports are displayed in the Results book.

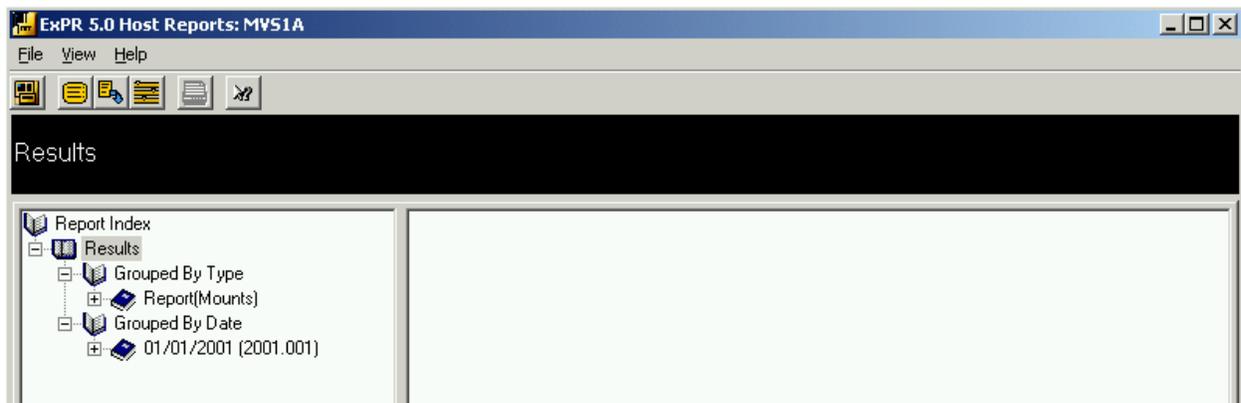
1. Click **View** and then click **Customization**.
2. Select from the following:
 - **Show Whole Index** displays all available Host reports in the Results book on the navigation tree.
 - **Only Show Index for Last __ Days** limits the available Host reports in the Results book to just the specified number of days backward from today.
 - **Request Latest Host Report Index Every __ Seconds** sets the frequency for querying the host to update the availability of requested Host reports.

Displaying Generated Reports

When your requested Host report is ready for display, it will appear in the Results book in the Report Index panel.

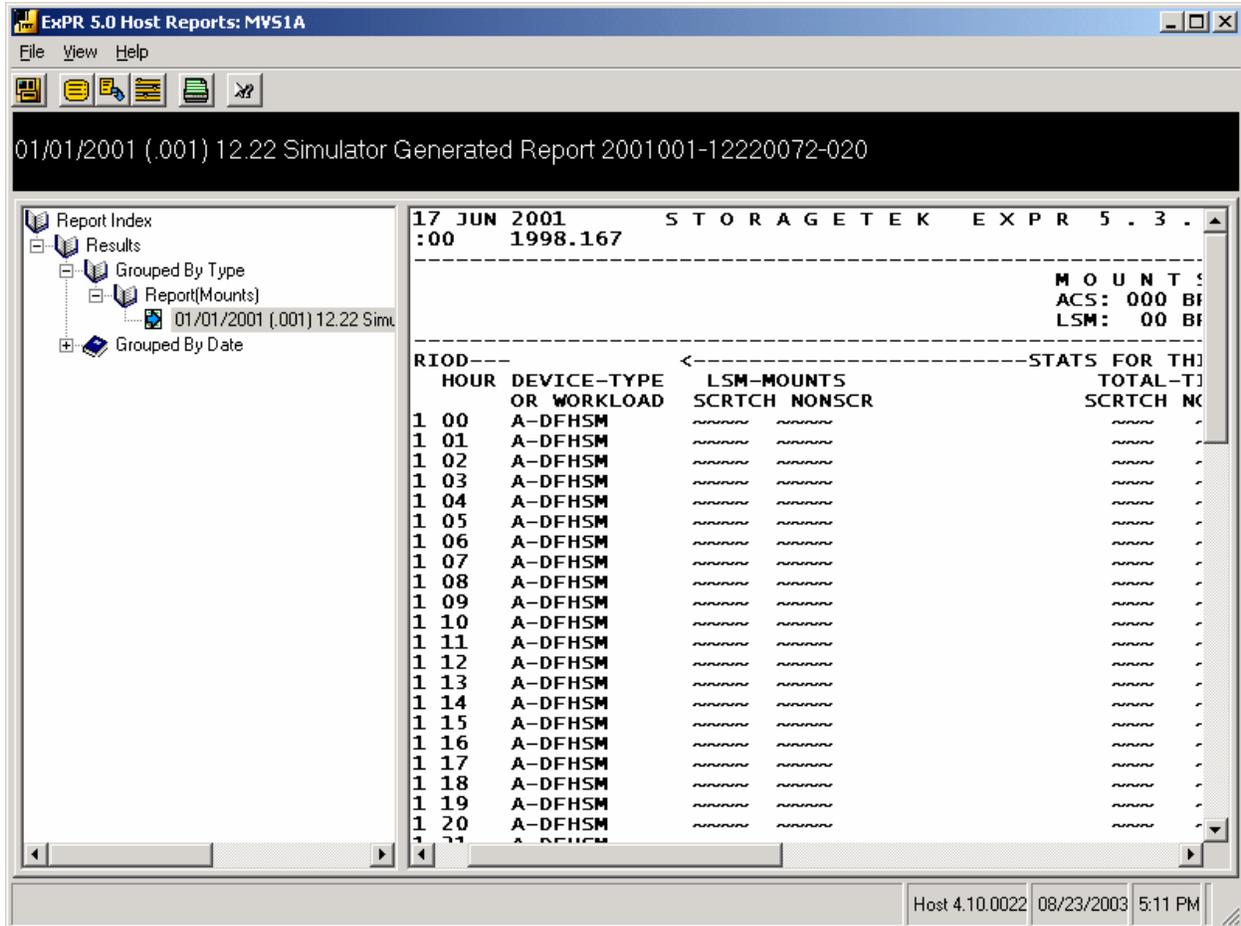
1. Click **View** and then click **Report Index**.

The Report Index panel will be displayed. The navigation tree lists reports that are available for display. Each report is listed twice, once in a book where reports are grouped by type, and again in a book where reports are sorted by construction date.



2. To display the report, click the report name in the Results book.

The report will appear on the display panel.



Printing a Displayed Host Report

1. To print a displayed report, click the **Print** button.
2. In the dialog box, click **Print Setup** if you need to set up or modify the printer configuration. Click **Color** or **Monochrome** to select the print type.

Tip: Most non-color printers will render colored images using grey-scale substitution. If this is what you want, leave the print type option set to **Color**. If your printer cannot produce grey-scale output (for example, if you are using a plotter), then select **Monochrome**. The graph will then be drawn using symbols and cross-hatching rather than colors to differentiate the data sets.

3. Select **All** or a range of lines to print.
4. Click **Print** to print the report.
5. Click **Cancel** to exit the dialog box.

Deleting Reports from the Results Book

You can delete a report in the Results book for the current session by selecting the report and then right-clicking the mouse and selecting **Delete**.

However, the report will reappear when you next run the application because the Results book is built from the Online Report File (ORF) on the host. You can control this by limiting the number of days to display reports (see *Customizing Host Report Settings*) and your system programmer can also control the number of days back to automatically delete reports in the ORF.

Viewing the Host Report File Contents

The Host Report File Contents report lists all Host reports that have been generated to the Online Report File (ORF) on the host system. This includes all Host reports that have been requested from all PCs that connect to the host group. The file is flushed of reports at regular intervals; the frequency is set in the host configuration (seven days is the proposed default).

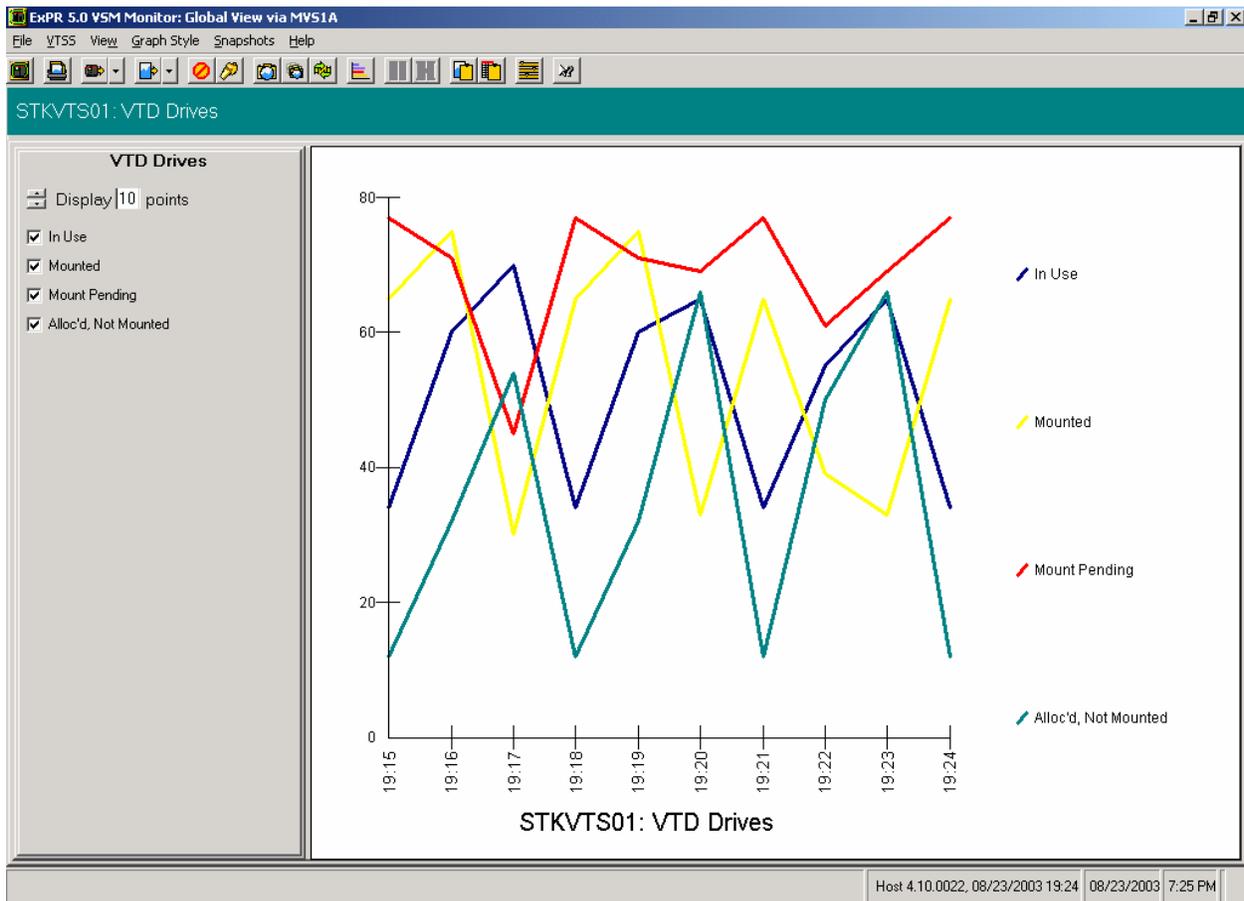
The Host Report File Contents report is selected from the Reports book on the Request Reports navigation tree.

Note: If a report is listed in the ORF but not in the Results book, refer to *Customizing Host Report Settings* in this chapter. Ensure that you have not set your PC to display fewer days back than the date of the report you are requesting.

Chapter 4: VSM Monitor

Overview

This chapter describes the ExPR VSM Monitor application, which provides “real-time” monitoring of VTSS activity. The VSM Monitor displays current information about VSM activity, including VTV events, VTD drives, RTD drives, space usage, and residency times. The display is updated once each minute.



VSM Monitor Report Types

The VSM Monitor displays the following reports:

VTV Events

VTV Events monitors the following VTV activity:

- Migrates: Count of HSC subtype 18 SMF records. This includes all movements from the VTSS to an MVC (including those for reclaim or consolidate processing).
- Recalls: Count of HSC subtype 19 SMF records. This includes all movements from an MVC to the VTSS (including reclaim processing).
- Reclaims: Count of HSC subtype 26 SMF records. For a reclaim, HSC will write a recall, migrate, and reclaim record.
- Mounts: Count of HSC subtype 13 records. Mounts include both scratch and non-scratch mounts.
- Scr Mounts: Count of HSC subtype 13 records for scratch mounts.
- Nonscr Mounts: Count of HSC subtype 13 records for non-scratch mounts.
- Mounts with Recall: Count of mounts requiring recall.

VTD Drives

VTD Drives monitors the UCBs of all VTDs and displays the highest values for drives in each state for each minute.

VTD drive activity includes the following:

- In Use: A VTD is in use if the UCB has the allocated bit set.
- Mounted: A VTD is mounted if the allocated and mount pending bits are set.
- Mount Pending: A VTD is mount pending if the allocated and mount pending bits are set.
- Alloc'd Not Mounted: A VTD is allocated but not mounted if the allocated bit is set, but the mounted bit is not set.

RTD Drives

RTD Drives monitors HSC subtype 16 SMF records for RTD mounts.

Space usage

Space Usage monitors HSC subtype 10 SMF records and displays the following information:

- Disk Buffer Utilization, including lines for the High and Low Auto Migration Thresholds (HAMT and LAMT respectively), calculated as: $100 - (\text{collected free space} / \text{total back end capacity}) * 100$

- Uncollected Free, calculated as: $(\text{total free space} - \text{collected free space}) / \text{total back end capacity} * 100$
- Available Free Space, calculated as: $100 - \text{disk buffer utilization}$
- Cache Hit Ratio, based on the number of successful read requests from the buffer (requires NCS 4.0 or higher; otherwise the graph will show all zeros).

Note: Subtype 10 records are written by HSC every 15 minutes. Consequently, the graph only changes every 15 minutes.

Residency Time

Residency Time monitors the Average Residency Time, defined as the average of the difference between the time of migration and the last referenced time for each VTV that is migrated and then deleted (except VTVs deleted for reclaims). If there are no such VTVs migrated within the minute, zero is displayed. All VTSSs or all or specific management classes can be monitored. NCS 4.0 or higher is required if management classes are monitored.

Missed Residency Target

Missed Residency Target monitors VTVs that missed the residency target, defined as the number of VTVs migrated that remain resident for less than the specified residency target.

Missed Residency Target Percentage

Missed Residency Target Percentage is the percentage of VTVs that missed the residency target, defined as the number of VTVs that missed residency target as a percentage of all VTVs deleted.

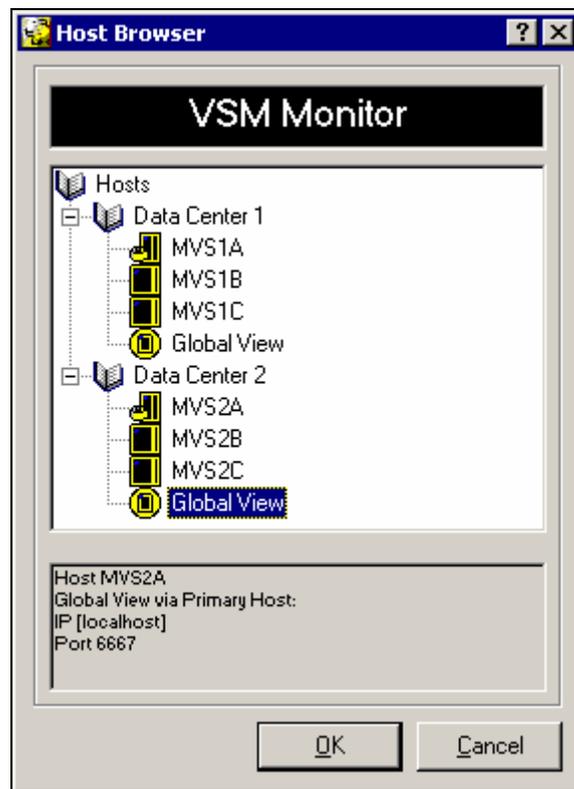
Start the Application and Select the Host Connection

Start the VSM Monitor application using any of the methods described in chapter 1, *Getting Started*.

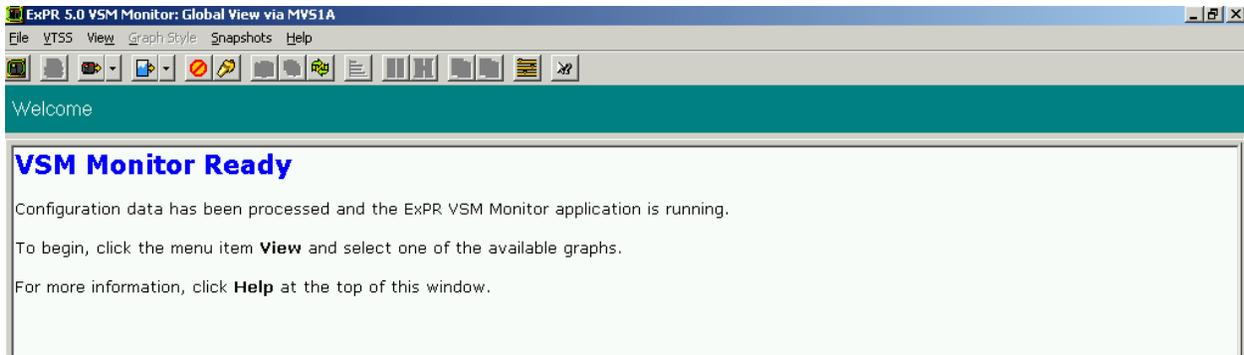
Using Global View

When prompted, select the host to connect to, or select Global View.

For the VSM Monitor, you can connect to any primary or secondary host you want to monitor, or you can select Global View to connect to the primary host and receive system-wide information that reflects activity from all hosts in the host group. (This is possible because device numbering and naming are the same across VSM systems.)



The application window will appear shortly after you make your selection.



Define Graph Settings

Click **View** and **Settings** to display current settings. You may want to accept the defaults at least initially.

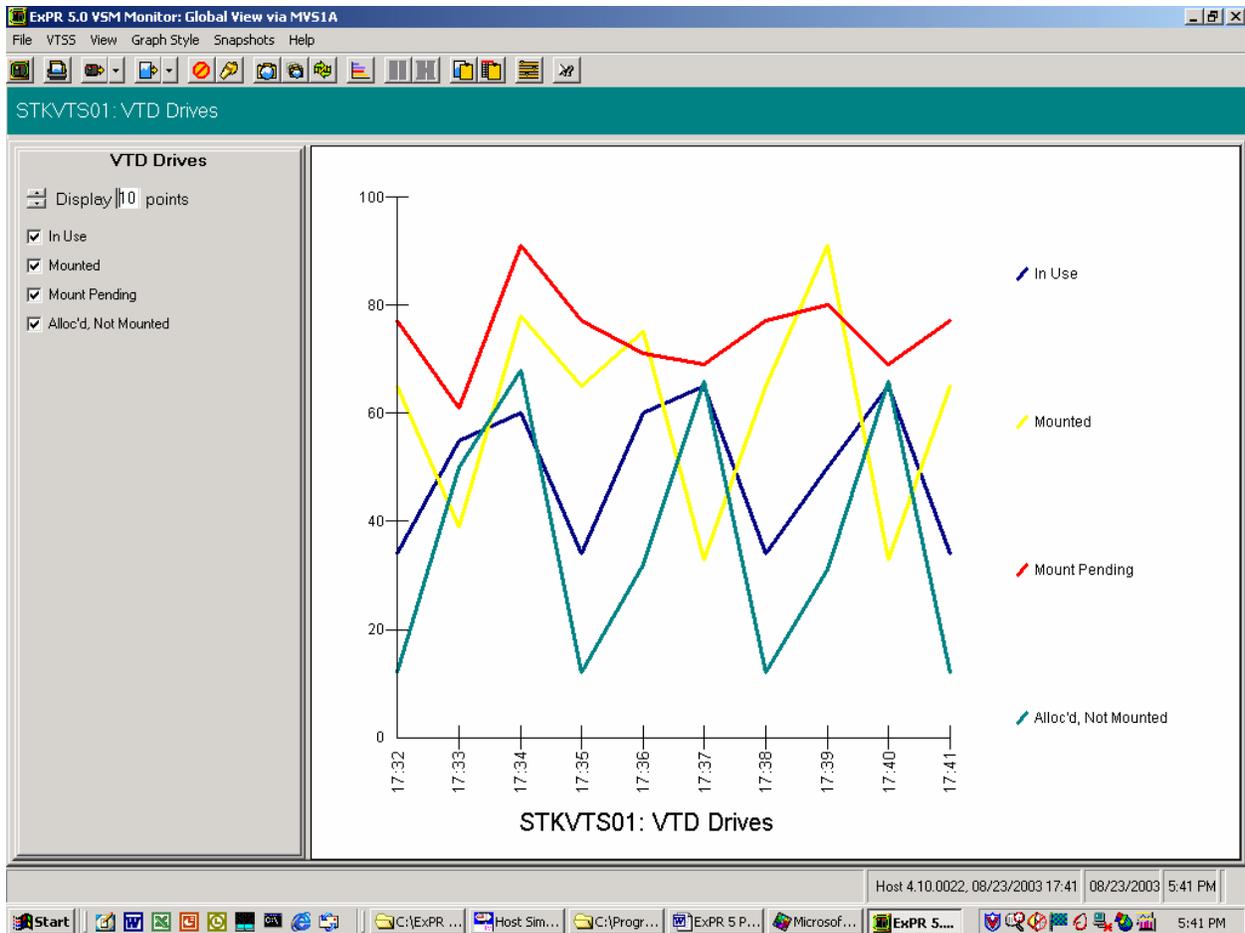
- **Perform exception threshold checking** activates exception processing and allows you to select whether exception events should be noted by flashing a title bar and/or warning sounds.
- **Automatically rearrange windows** specifies if remaining windows are to be rearranged on the screen when a snapshot is closed.
- **Limit exception window** determines how many items to allow in the exception window (the oldest are dropped as new events are recorded).
- **Display this number of points** effectively determines how many minutes appear on the graph. You can set a number and apply it to all current graphs (excluding snapshots) and you can optionally make that number the default for future VSM Monitor sessions.

Select the VTSS to Monitor

Click **VTSS** and select the VTSS to monitor, or use the toolbar.

Select the Report to Display

Click **View** and select the report to display. In the left panel, click on the report items you want to include in the graph. The graph is displayed in the right panel.



Changing the Graph Style

Click **Graph Style** to select a new graph style for the current graph.

Note: You can also change the graph style by right-clicking the graph.

Creating a Snapshot of the Current Graph

Click **Snapshots** and select **Snapshot of Current Graph in Own Window**.

Note: You can also create a new snapshot by double-clicking the graph.

This feature has several uses. You can capture a picture of the current graph for further analysis, or you can set the snapshot to be automatically or manually refreshed and then effectively use it as a separate monitor for that graph type.

Important: If you create a snapshot of a given report and then create another snapshot of the same report, the new snapshot will replace the existing snapshot. If you are intending to keep the existing graph, you should save it as a file or copy it to the clipboard and paste it into a different application before you create the new snapshot.

Use the toolbar above the snapshot graph to perform the following functions:

- Redisplay the Main Window

- Change the graph style
- Print the graph
- Refresh the graph on demand or automatically
- Copy the graph or graph data to the Windows Clipboard
- Tile all of the snapshot graphs
- Stretch the snapshot horizontally for a better view

Displaying All Graphs in Snapshot Windows

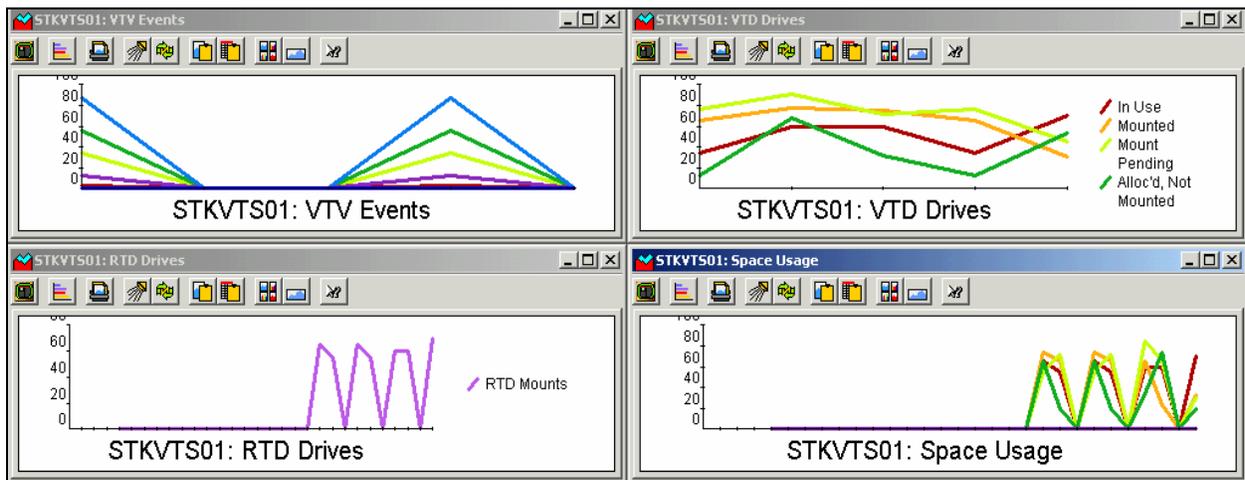
Click **Snapshots** and select **Snapshot of All Graphs for Current VTSS**.

Then click **Snapshots** again and select **Tile All Snapshot Windows**.

Note: You can also “tile the windows” using the toolbar in a snapshot window.

Use the toolbar in any of the snapshot windows as described previously to redisplay the main window or perform functions on the snapshot graph.

To close all of the snapshots, redisplay the main window and click **Snapshots** and then select **Close All Snapshot Windows**.



Refreshing the Snapshots

Graphs in the main window are automatically refreshed with new observations from the host each minute. This new information can also be optionally applied to the snapshot windows.

- To refresh a snapshot window on demand, select the snapshot you want to refresh and click the Refresh toolbar icon in the selected window.
- To refresh all current snapshots each minute automatically, select any snapshot window and click the Auto-Refresh toolbar icon in the selected window.

- To set all current and future snapshots to Auto-Refresh for this session, click (in the main window) **Snapshots** and then select **Auto-Refresh All Snapshot Windows**.

Copying a Graph to the Windows Clipboard

Graphs can be exported as either graphics or text to be pasted into other applications.

In the main window, click **File** and select **Copy Bitmap to Clipboard** (for graphics) or **Copy Values to Clipboard** (for text). Then paste the clipboard contents into Word or Excel or other applications.

Note: Snapshots can also be exported, using the toolbar in the snapshot window.

Printing a Graph

1. To print the current graph in the main window, click **File** and select **Print**. A dialog box will appear with printer setup options.
2. Click the **Print Graph** toolbar icon above the graph.
3. In the dialog box, click **Print Setup** if you need to set up or modify the printer configuration.
4. Click **Color** or **Monochrome** to select the print type.

Tip: Most non-color printers will render colored images using grey-scale substitution. If this is what you want, leave the print type option set to **Color**. If your printer cannot produce grey-scale output (for example, if you are using a plotter), then select **Monochrome**. The graph will then be drawn using symbols and cross-hatching rather than colors to differentiate the data sets.

5. Click **Print** to print the report.
6. Click **Cancel** to exit the dialog box.

Note: Snapshots can also be printed, using the toolbar in the snapshot window.

VSM Monitor Exception Reporting Features

Exception thresholds can be locally set for each element of the reports that were described above. Exceptions that occur are then logged for display (click **View** and select **Exceptions**). Additionally, alarms can be set for each type of exception. Exception processing is activated from the View menu Settings and controlled with the Rules Manager.

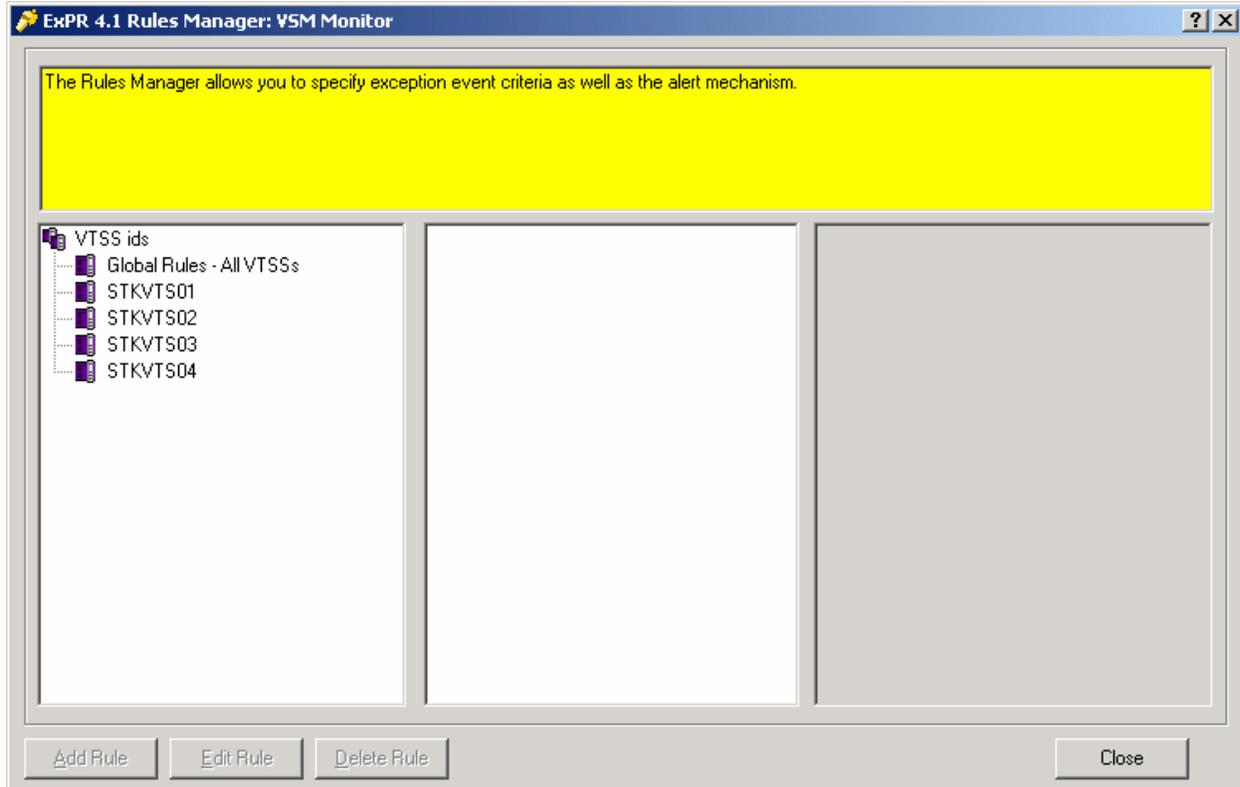
Define or Review Monitor Settings for Exception Processing

Click **View** and select **Settings**. Be sure that **Perform exception threshold checking** is activated and that you have activated or deactivated exception alarm features as you want them for this PC.

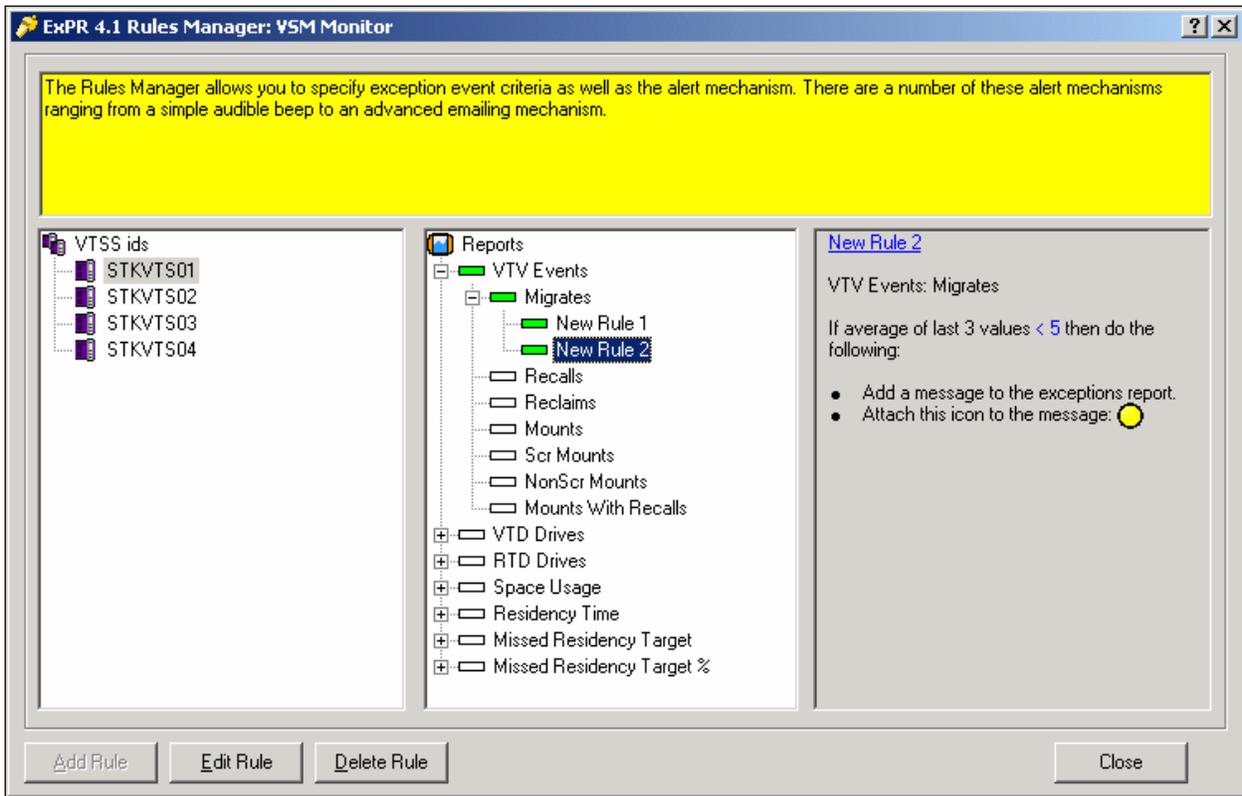
Define or Review Exception Processing Rules

The Rules Manager allows you to set, for each element in each report and globally for all VTSSs or for a specific VTSS, exception threshold values that should be logged or trigger an alarm if they occur. These rules are typically in the format “if the last *x* number of observations were (pick one) greater than or less than *y*, then do *z*.”

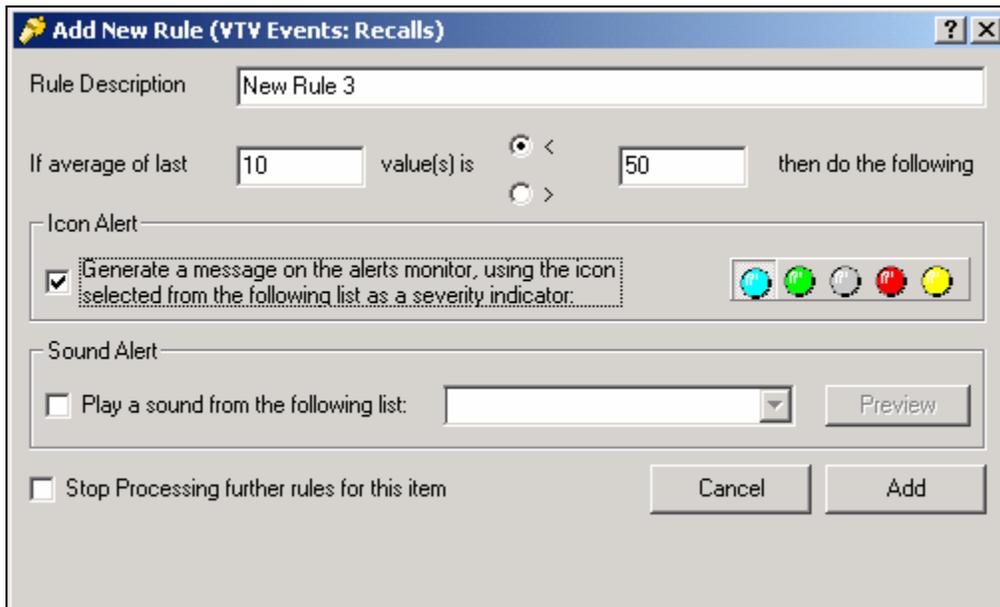
1. To display the Rules Manager, click **View** and then select **Rules Manager**.



2. Select the VTSS whose reports you want to apply rules to, or select **Global Rules – All VTSSs** to establish the rule for all VTSSs.
3. Double-click the specific report and then select the specific report item you want to apply a rule to.
4. Click the **Show Rules** button.



5. In the **Rules** dialog box, click the **Add Rule** button.
6. In the **Rule Definition** dialog box, enter the rule description and definition.



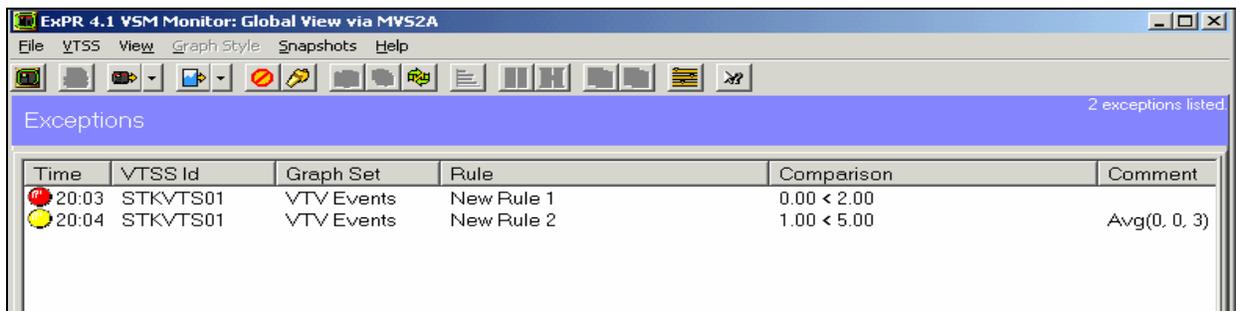
7. Indicate if you want messages and/or sound alarms to accompany violations of this rule, and if so, select from the available lists.

8. Indicate if you want to stop processing other rules for this item when this rule is violated. For example, since an observation could break more than one rule, you could stop rules processing with the first rule that is violated or you could choose to log all subsequent violations caused by that observation. Either way, rules processing would continue with the next observation.
9. Click **OK** to close the **Rule Definition** dialog box.
10. In the **Rules** dialog box, select the buttons on the right to create more rules for this item, or to edit or delete rules or to move rules up or down the Rules sequence. When you are finished with rules for this item, close the dialog box.
11. Repeat steps 2 through 10 for each item in each report for which you want to create rules. Close the Rules Manager when you are finished.

View Exception Events

Exception events are logged on the exceptions list. If you activated messages and severity indicator icons in Rules Manager for the violated rule, these will also appear with the exception.

Click **View** and select **Exceptions** to display exception events.



Time	VTSS Id	Graph Set	Rule	Comparison	Comment
20:03	STKVTS01	VTV Events	New Rule 1	0.00 < 2.00	
20:04	STKVTS01	VTV Events	New Rule 2	1.00 < 5.00	Avg(0, 0, 3)

Select an exception and click the right mouse to remove the exception from the list, display the graph for the selected item, or show the rule for the selected item.

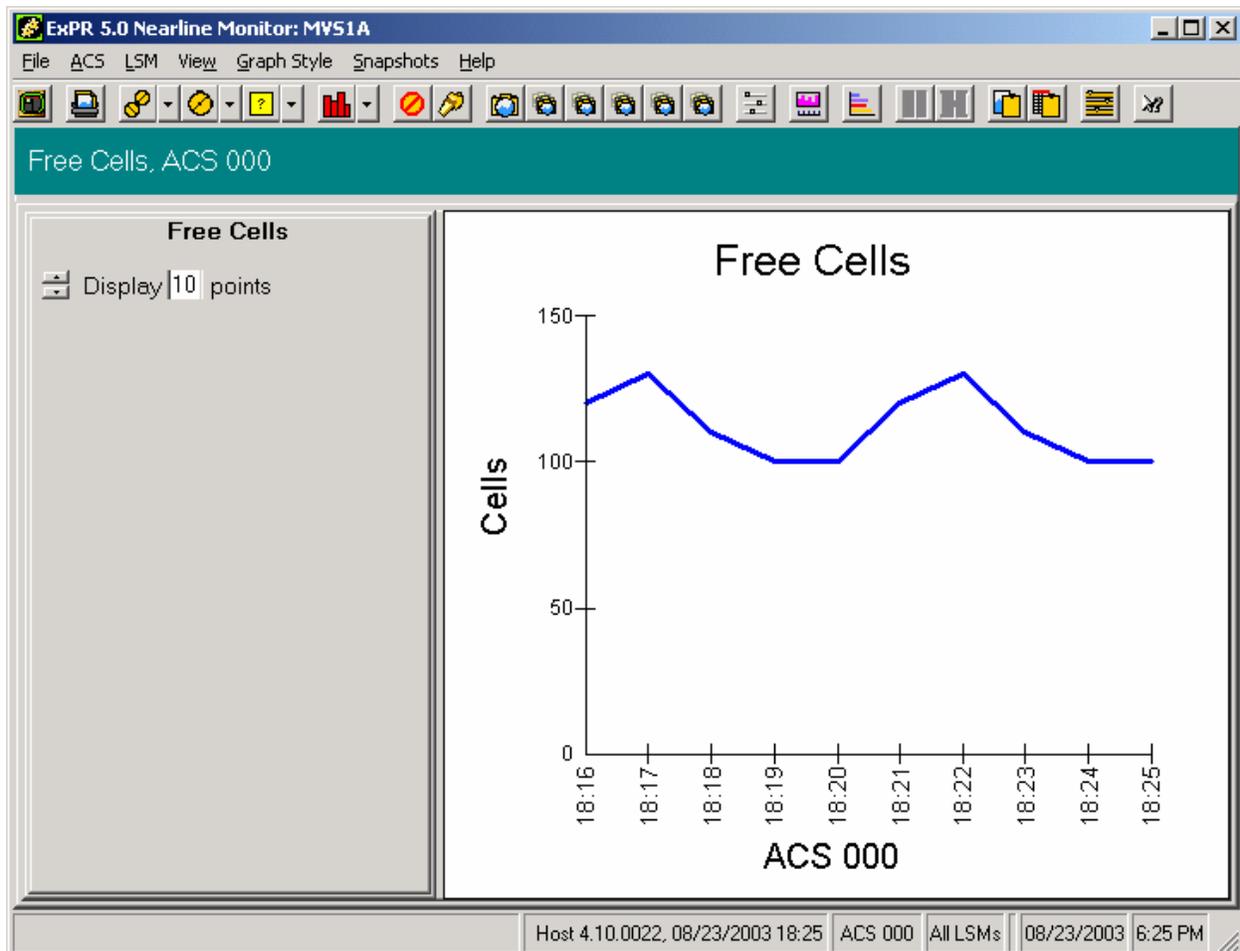
Note: The title bar only flashes in the main window, not in snapshot windows.

Chapter 5: Nearline Monitor

Overview

This chapter describes the ExPR Nearline Monitor application, which provides “real-time” monitoring of Nearline activity.

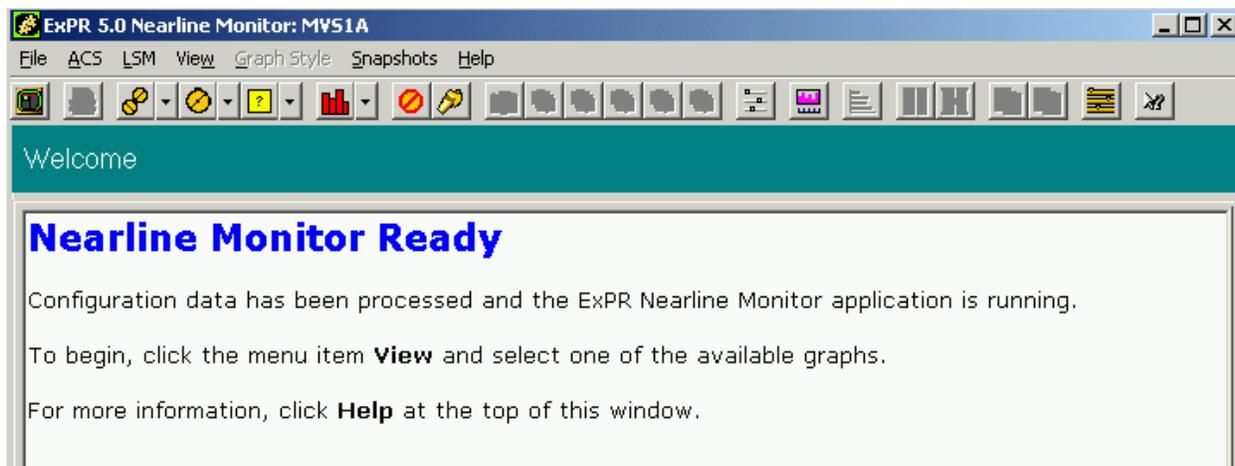
The Nearline Monitor displays current information about Nearline activity, including Free Cells, Scratch Volumes, and Scratch Subpools. The display is updated once each minute.



Start the Application and Select the Host Connection

Start the Nearline Monitor application using any of the methods described in chapter 1, *Getting Started*. When prompted, select the host to connect to. (You can connect to any primary or secondary host you want to monitor).

The application window will appear shortly after you make your selection.



Nearline Monitor Report Types

The Nearline Monitor displays free cell, scratch volume, and scratch subpool information.

Free Cells

Free Cells monitors the number of available free cells in the selected ACS or specific LSM.

Scratch Volumes

Scratch Volumes monitors the number of available scratch volumes in the selected ACS or specific LSM.

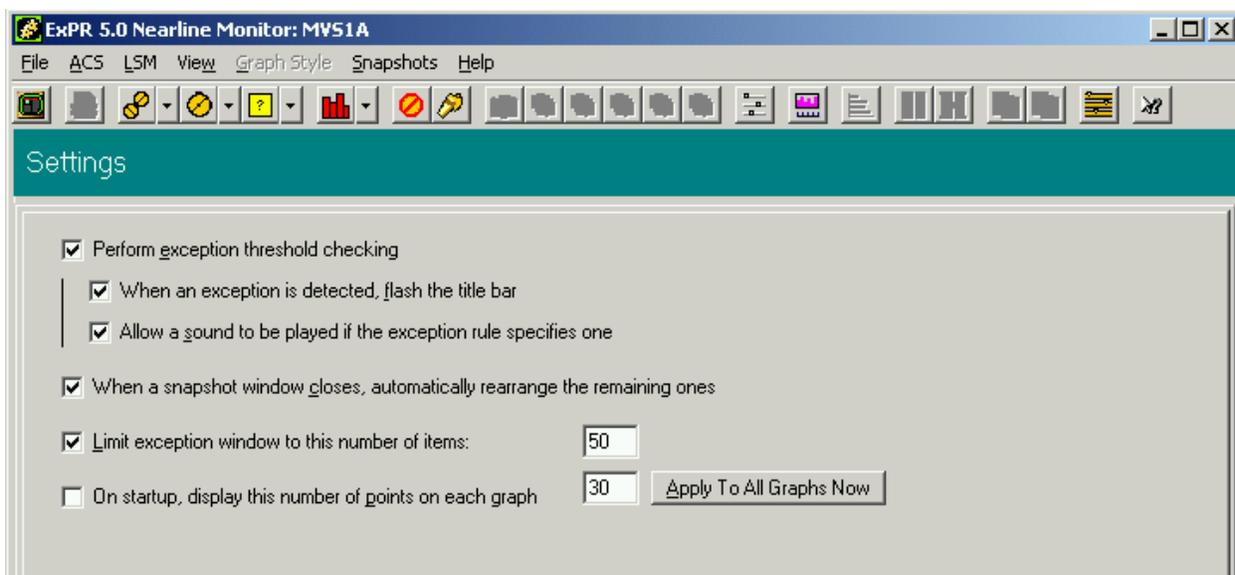
Scratch Subpools

Scratch Subpools monitors the number of available scratch volumes in the selected scratch subpool.

Define Graph Settings

Click **View** and **Settings** to display current settings. You may want to accept the defaults at least initially.

- **Perform exception threshold checking** activates exception processing and allows you to select whether exception events should be noted by flashing a title bar and/or warning sounds.
- **Automatically rearrange windows** specifies if remaining windows are to be rearranged on the screen when a snapshot is closed.
- **Limit exception window** determines how many items to allow in the exception window (the oldest are dropped as new events are recorded).
- **Display this number of points** effectively determines how many minutes appear on the graph. You can set a number and apply it to all current graphs (excluding snapshots) and you can optionally make that number the default for future Nearline Monitor sessions.



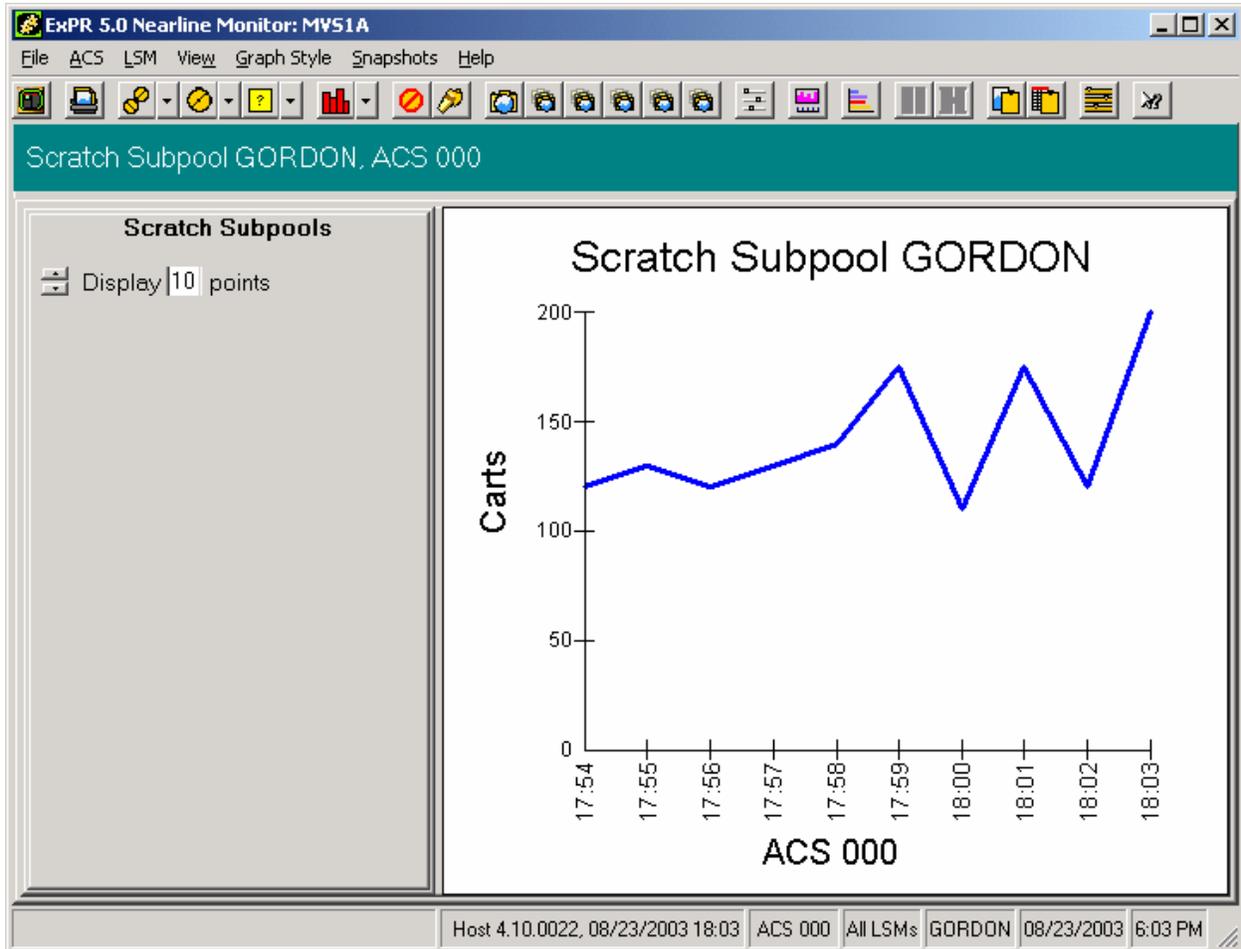
Select the ACS, LSM, or Subpool to Monitor

- Click **ACS** (or click the Next ACS toolbar icon) to select the ACS to monitor. Click the toolbar icon again to select the next ACS in sequence.
- Click **LSM** (or click the Next LSM toolbar icon) to select the LSM to monitor. Click the toolbar icon again to select the next LSM in sequence.
- Click **View** and select **Subpools** (or click the Next Subpool toolbar icon) to select the scratch subpool to monitor. Click the icon again to select the next subpool in sequence.

Select the Graph Report to Display

Click **View** and select the graph to display. The graph is displayed in the right panel.

Click the Next Graph toolbar icon to display the next report in sequence.



Changing the Graph Style

Click **Graph Style** to select a new graph style for the current graph.

Note: You can also change the graph style by right-clicking the graph.

Creating a Snapshot of the Current Graph

Click **Snapshots** and select **Snapshot of Current Graph in Own Window**.

Note: You can also create a new snapshot by double-clicking the graph.

This feature has several uses. You can capture a picture of the current graph for further analysis, or you can set the snapshot to be automatically or manually refreshed and then effectively use it as a separate monitor for that graph type.

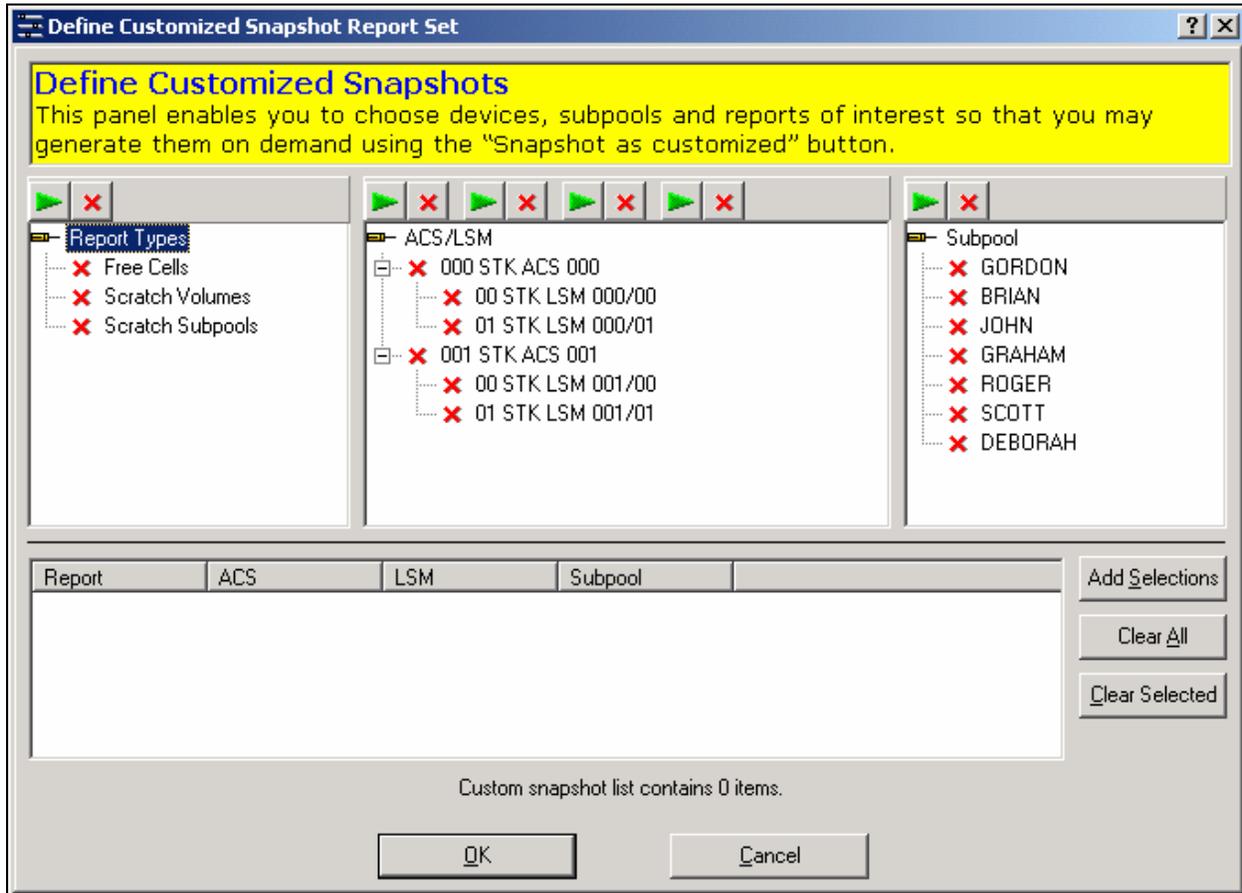
Important: If you create a snapshot of a given report and then create another snapshot of the same report, the new snapshot will replace the existing snapshot. If you are intending to keep the existing graph, you should save it as a file or copy it to the clipboard before you create the new snapshot.

Use the toolbar above the snapshot graph to perform functions redisplay the main window, change the graph style, print the graph, refresh the graph on demand or automatically, copy the graph or graph data to the Windows clipboard, tile all of the snapshot graphs, or stretch the snapshot horizontally for a better view.

Using the Customize Snapshots Feature

The Customize Snapshot feature allows you to preselect monitor reports for specific ACSs, LSMs, and scratch subpools. You can then snapshot these preselected reports at any time.

1. To define customized snapshots, click **View** and select **Customize Snapshot**.



2. In the dialog box, select report(s), ACS(s), LSM(s), and subpool(s) you want to include in the Custom Snapshot list and then click the **Add Selections** button. Click the **OK** button to close the dialog box.

3. To display the custom snapshots, click **Snapshots** and select **Snapshot as Customized**.
4. To add additional reports to the Custom Snapshot list, repeat steps 1 and 2.
5. To remove reports from the Custom Snapshot list, use the **Clear All** or **Clear Selected** buttons in the dialog box.
6. Use the toolbar in any of the snapshot windows as described previously to tile the snapshots, redisplay the main window, or perform functions on the snapshot graph.
7. To close all of the snapshots, redisplay the main window and click **Snapshots** and then select **Close All Snapshot Windows**.

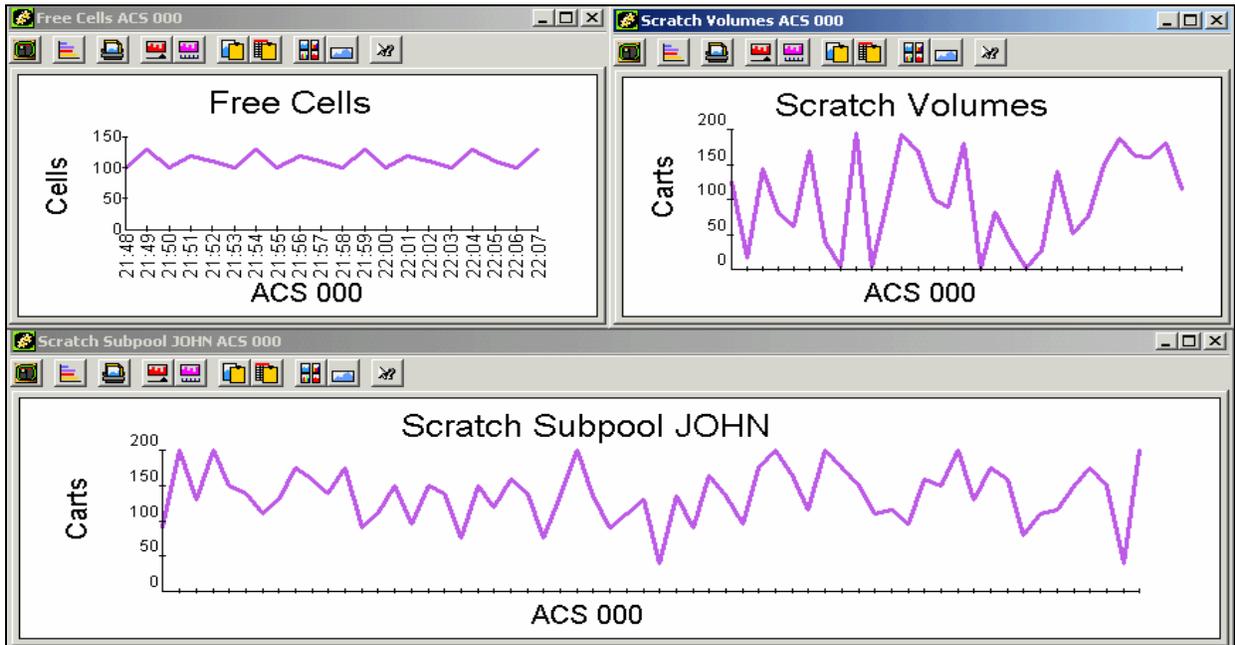
Displaying Multiple Graphs in Snapshot Windows

To display multiple graphs in snapshot windows, click **Snapshots** and select one of the following:

- Snapshot for all ACSs
- Snapshot for all LSMs in this ACS
- Snapshot for all LSMs
- Snapshot for all Subpools in Selected ACS/LSMs
- Snapshot as Customized

Then click **Snapshots** again and select **Tile All Snapshot Windows**.

Note: You can also “tile the windows” using the toolbar in a snapshot window.



Use the toolbar in any of the snapshot windows as described previously to redisplay the main window or perform functions on the snapshot graph.

To close all of the snapshots, redisplay the main window and click **Snapshots** and then select **Close All Snapshot Windows**.

Refreshing the Snapshots

Graphs in the main window are automatically refreshed with new observations from the host each minute. This new information can also be optionally applied to the snapshot windows.

- To refresh a snapshot window on demand, select the snapshot you want to refresh and click the Refresh toolbar icon in the selected window.
- To refresh all current snapshots each minute automatically, select any snapshot window and click the Auto-Refresh toolbar icon in the selected window.
- To set all current and future snapshots to Auto-Refresh for this session, click (in the main window) **Snapshots** and then select **Auto-Refresh All Snapshot Windows**.

Copying a Graph to the Windows Clipboard

Graphs can be exported as either graphics or text to be pasted into other applications.

In the main window, click **File** and select **Copy Bitmap to Clipboard** (for graphics) or **Copy Values to Clipboard** (for text). Then paste the clipboard contents into Word or Excel or other applications.

Note: Snapshots can also be exported, using the toolbar in the snapshot window.

Printing a Graph

1. To print the current graph in the main window, click **File** and select **Print**. A dialog box will appear with printer setup options.
2. Click the **Print Graph** toolbar icon above the graph.
3. In the dialog box, click **Print Setup** if you need to set up or modify the printer configuration.
4. Click **Color** or **Monochrome** to select the print type.

Tip: Most non-color printers will render colored images using grey-scale substitution. If this is what you want, leave the print type option set to **Color**. If your printer cannot produce grey-scale output (for example, if you are using a plotter), then select **Monochrome**. The graph will then be drawn using symbols and cross-hatching rather than colors to differentiate the data sets.

5. Click **Print** to print the report.
6. Click **Cancel** to exit the dialog box.

Note: Snapshots can also be printed, using the toolbar in the snapshot window.

Nearline Monitor Exception Reporting Features

Exception thresholds can be set for each report element and applied globally for all LSMs, an ACS, or a specific LSM. Exceptions that occur are then logged for display (click **View** and select **Exceptions**). Additionally, alarms can be set for each type of exception. Exception processing is activated from the View menu Settings and controlled with the Rules Manager.

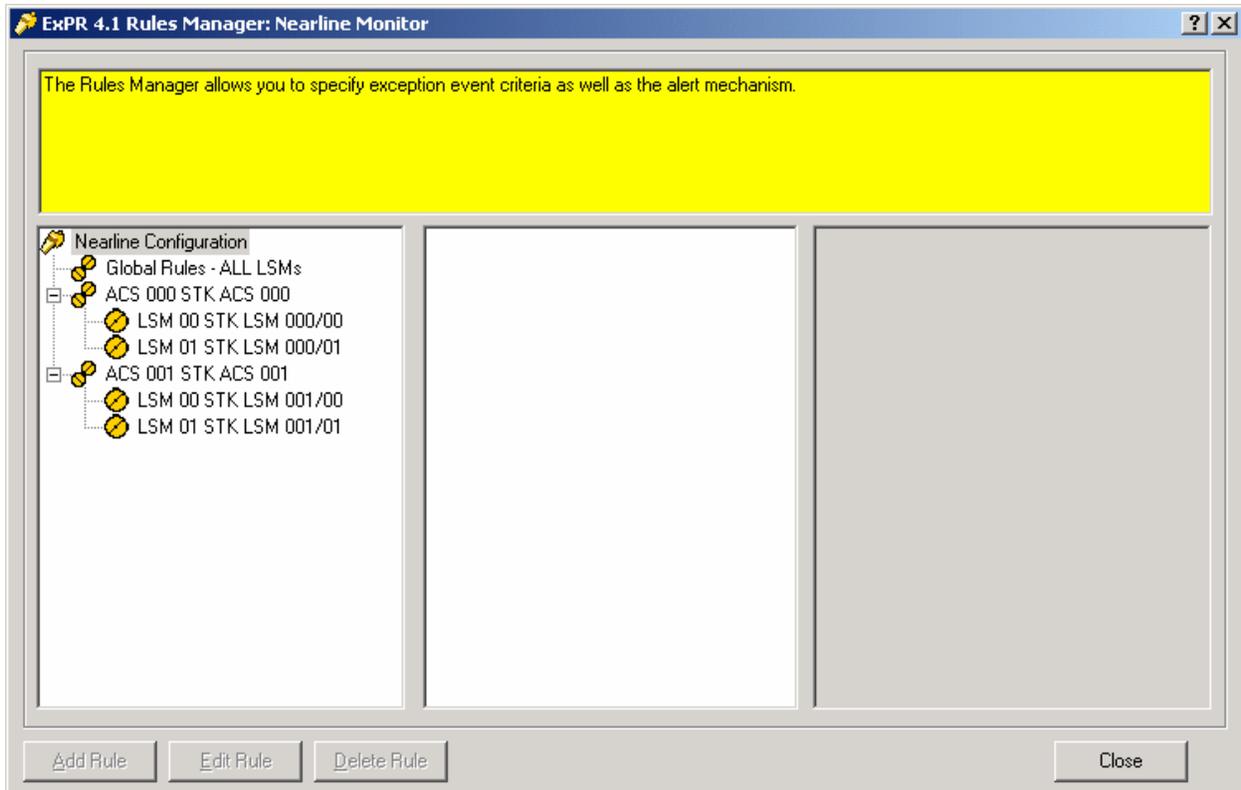
Define or Review Monitor Settings for Exception Processing

Click **View** and select **Settings**. Be sure that **Perform exception threshold checking** is activated and that you have activated or deactivated exception alarm features as you want them for this PC.

Define or Review Exception Processing Rules

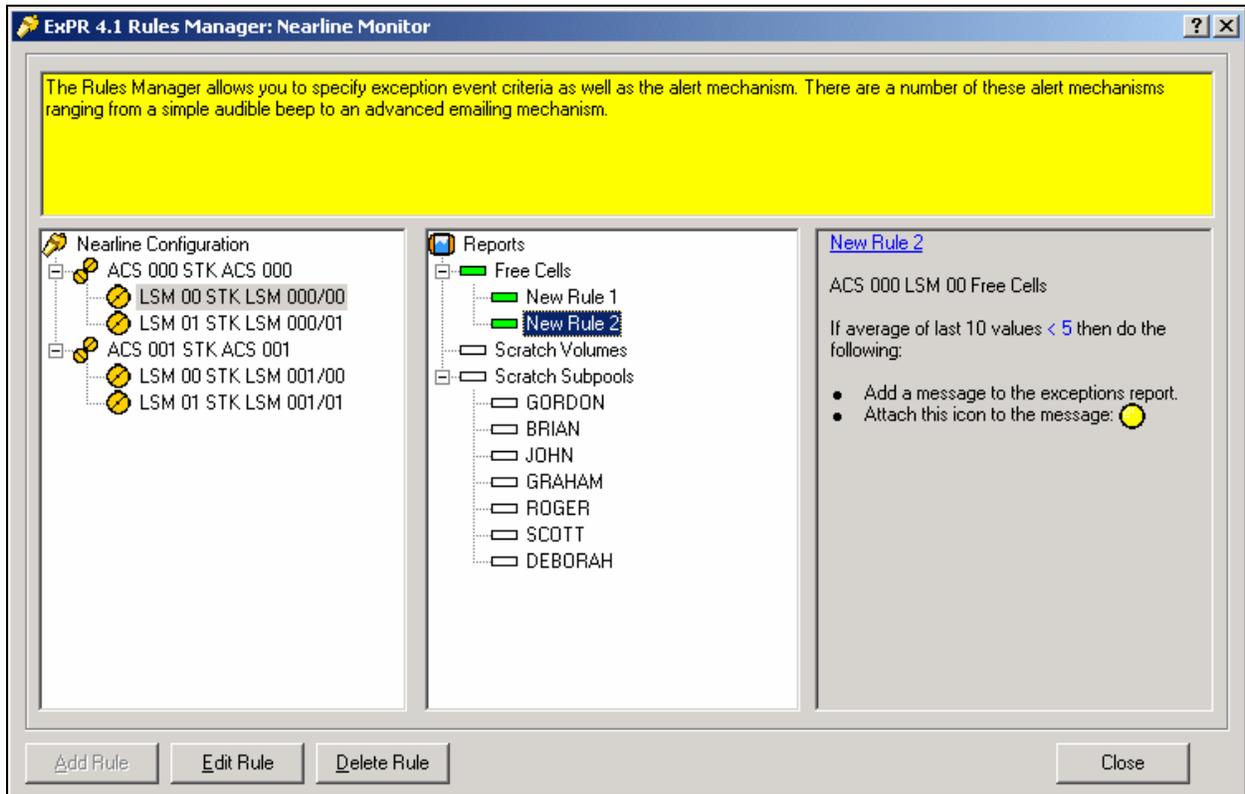
The Rules Manager allows you to set, for each element in each report and applied globally to all LSMs, an ACS, or a specific LSM, exception threshold values that should be logged or trigger an alarm if they occur. These rules are typically in the format “if the last x number of observations were (pick one) greater than or less than y, then do z.”

1. To display the Rules Manager, click **View** and then select **Rules Manager**.

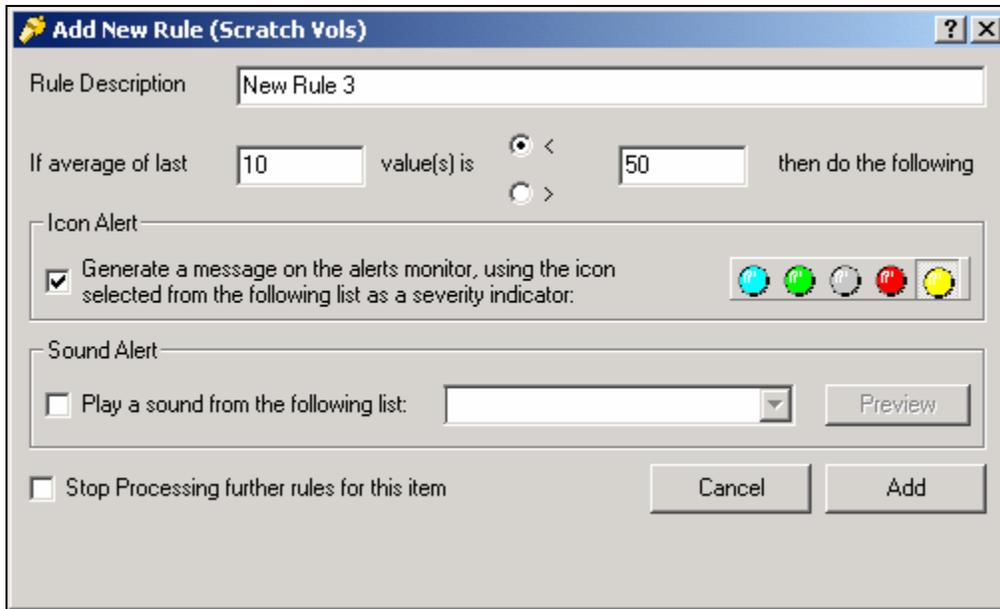


2. Select the ACS or LSM whose reports you want to apply rules to, or select **Global Rules – All LSMs** to establish the rule for all LSMs.

3. Click the specific report you want to apply a rule to. For subpools, select the specific subpool.
4. Click the **Show Rules** button.
5. In the **Rules** dialog box, click the **Add Rule** button.



6. In the **Rule Definition** dialog box, enter the rule description and definition.

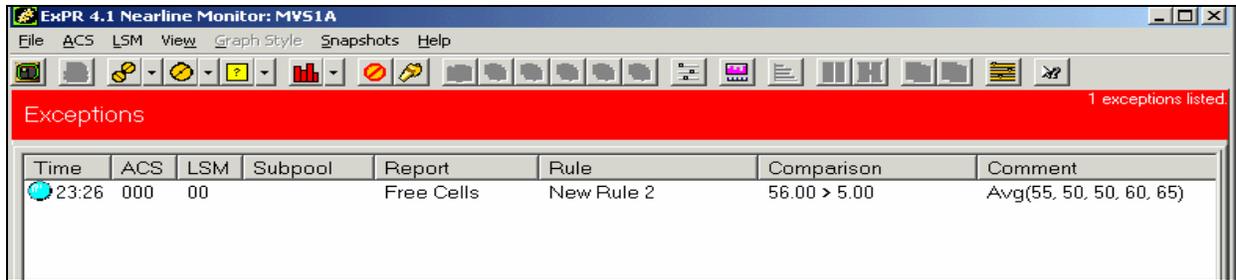


7. Indicate if you want messages and/or sound alarms to accompany violations of this rule, and if so, select from the available lists.
8. Indicate if you want to stop processing other rules for this item when this rule is violated. For example, since an observation could break more than one rule, you could stop rules processing with the first rule that is violated or you could choose to log all subsequent violations caused by that observation. Either way, rules processing would continue with the next observation.
9. Click **OK** to close the **Rule Definition** dialog box.
10. In the **Rules** dialog box, select the buttons on the right to create more rules for this item, or to edit or delete rules or to move rules up or down the Rules sequence. When you are finished with rules for this item, close the dialog box.
11. Repeat steps 2 through 10 for each item in each report for which you want to create rules. Close the Rules Manager when you are finished.

View Exception Events

Exception events are logged on the exceptions list. If you activated messages and severity indicator icons in Rules Manager for the violated rule, these will also appear with the exception.

Click **View** and select **Exceptions** to display exception events.



Select an exception and click the right mouse to remove exceptions from the list, display the graph for the selected item, or show the rule for the selected item.

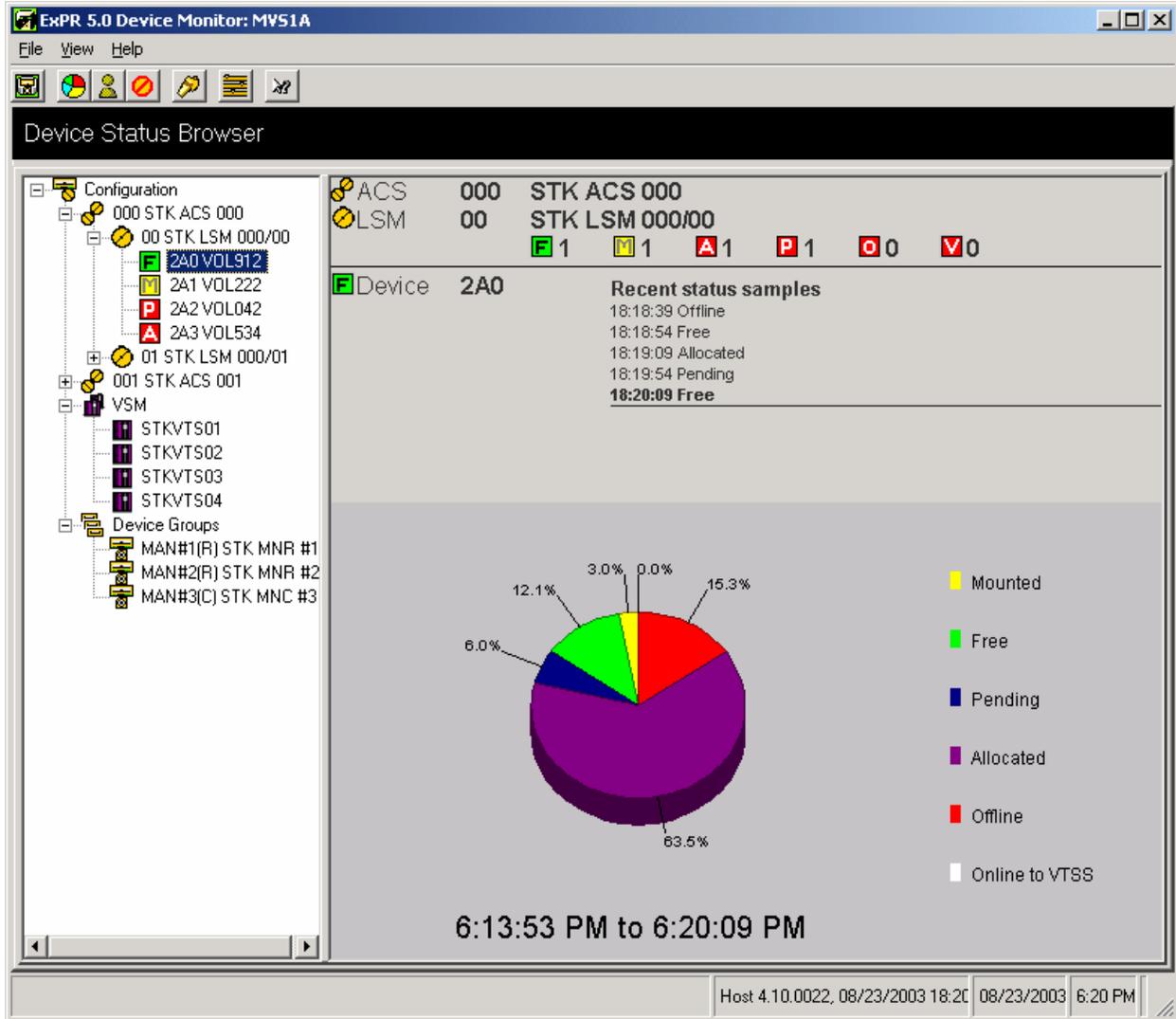
Note: The title bar only flashes in the main window, not in snapshot windows.

Chapter 6: Device Monitor

Overview

This chapter describes the ExPR Device Monitor application, which provides “real-time” monitoring of Nearline activity. The Device Monitor displays current device status summaries at the ACS, LSM, device group, and individual device level, complete with graphical recent history reports for each device.

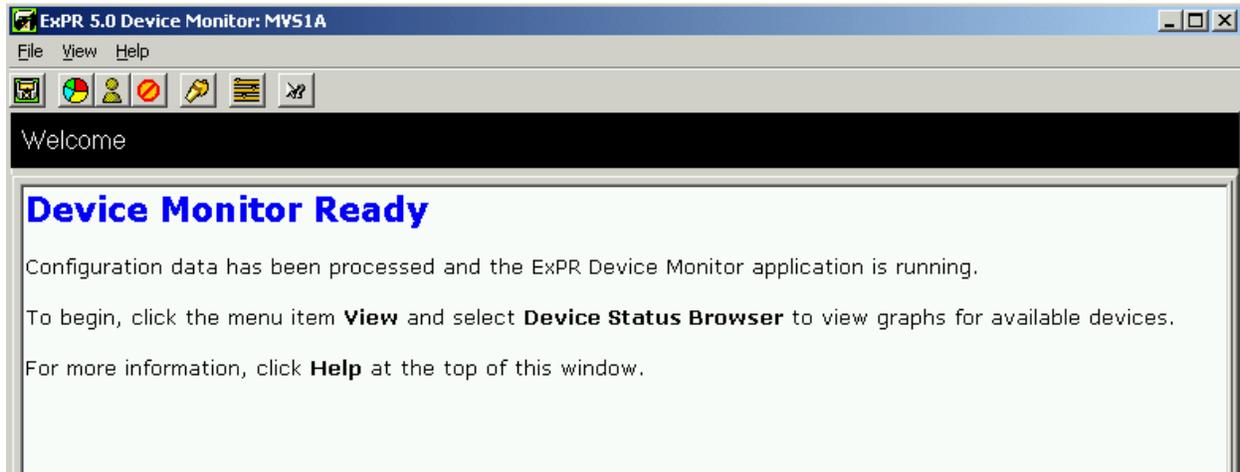




Start the Application and Select the Host Connection

Start the Device Monitor application using any of the methods described in chapter 1, *Getting Started*. When prompted, select the host to connect to.

The application window will appear shortly after you make your selection.



Device Monitor Report Types

The Device Monitor displays current device status summaries at the ACS, LSM, device group, and individual device level, complete with graphical recent history reports for each device. Status measurements include Mounted, Pending, Allocated, Offline, Free, No Free Drives, and Online to VTSS.

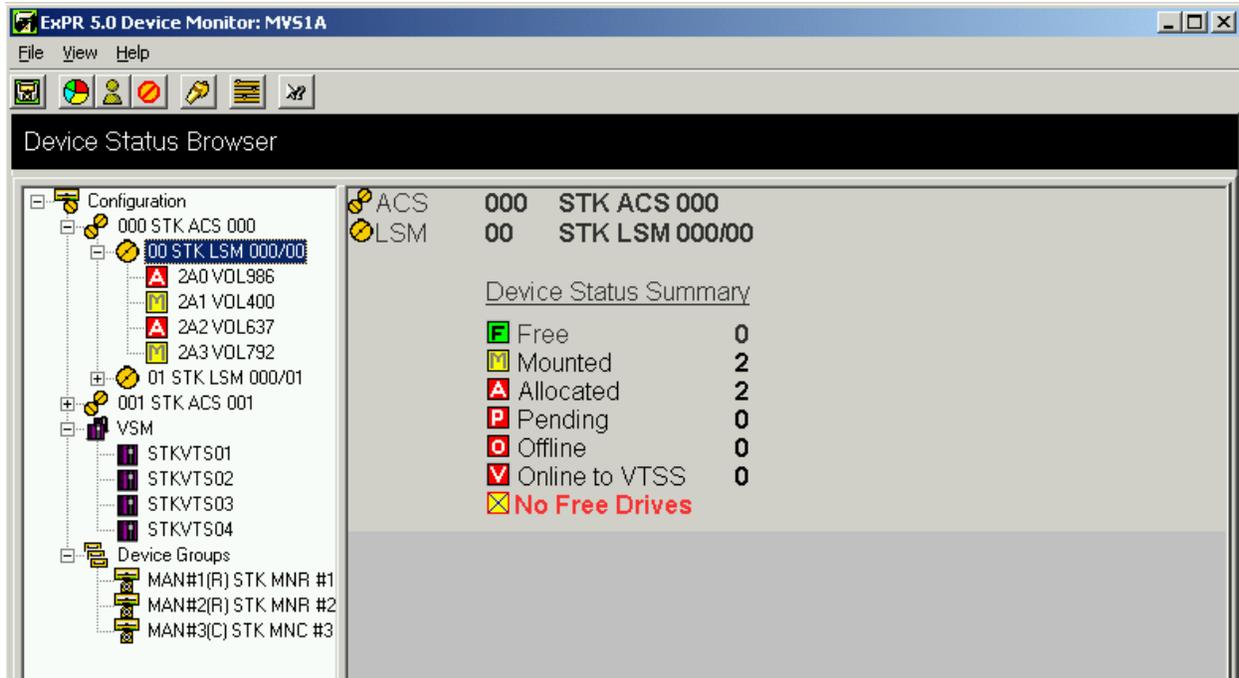
Define Graph Settings

Click **View** and **Settings** to display current settings. You may want to accept the defaults at least initially.

- **Perform exception threshold checking** activates exception processing and allows you to select whether exception events should be noted by flashing a title bar and/or warning sounds.
- **Limit exception window** determines how many items to allow in the exception window (the oldest are dropped as new events are recorded).
- **Interval in seconds between status refresh requests** determines the frequency for requesting status updates from the host.
- **Remove exceptions when device status returns to normal** clears the exceptions list for a device when the problems that caused an exception have been resolved.
- **Include Volser, Jobname, Sysid in the device status tree** includes the selected information in the device status tree for each listed device, along with the device's current status.

Select the ACS, LSM, Device Group, or Device to Monitor

1. Click **View And Device Status Browser** to display the device status tree.



2. Click an ACS to display its current status.
3. Double click an ACS to display its LSMs.
4. Click an LSM to display its current status.
5. Double click an LSM to display its devices.
6. Click a device to show its current status and recent history graph.

For device groups, click Device Groups in the tree to display the groups, then click a group to display its devices, and click a device to display its current status and recent history graph.

Device Monitor Exception Reporting Features

Exception thresholds can be locally set for each element of the reports that were described above. Exceptions that occur are then logged for display (click **View** and select **Exceptions**). Additionally, alarms can be set for each type of exception. Exception processing is activated from the View menu Settings and controlled with the Rules Manager.

Define or Review Monitor Settings for Exception Processing

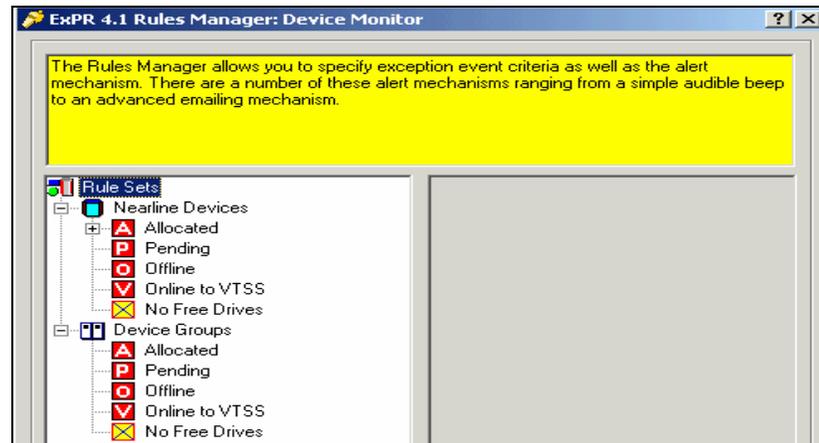
Click **View** and select **Settings**. Be sure that **Perform exception threshold checking** is activated and that you have activated or deactivated exception alarm features as you want them for this PC.

Define or Review Exception Processing Rules

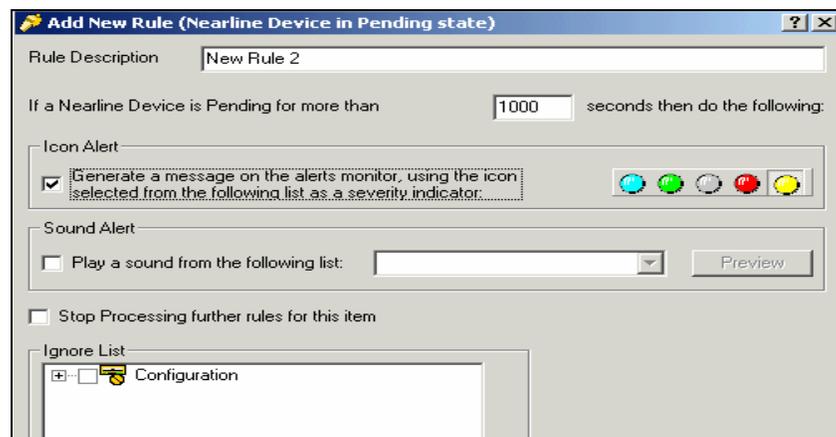
The Rules Manager allows you to set exception threshold values for certain device status codes that should be logged or trigger an alarm if they occur. These rules are in the

format “if the device status is x for y seconds, then do z ” where x is the status code (for example, Pending) and y is the number of seconds the device is in that state before an exception is generated and z is to generate an exception and optionally an alarm.

1. To display the Rules Manager, click **View** and then select **Rules Manager**.



2. Select the device status code you want to apply rules to.
3. Click the **Add Rule** button.
4. In the dialog box, enter the rule description and definition.



5. Indicate if you want messages and/or sound alarms to accompany violations of this rule, and if so, select from the available lists.
6. Indicate if you want to stop processing other rules for this item when this rule is violated. For example, since an observation could break more than one rule, you could stop rules processing with the first rule that is violated or you could choose to

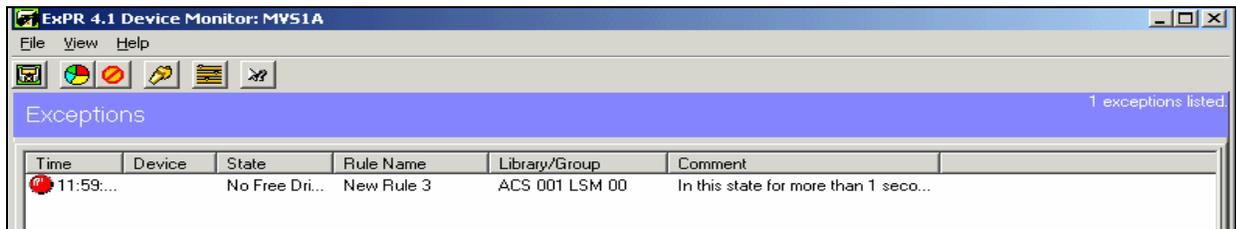
log all subsequent violations caused by that observation. Either way, rules processing would continue with the next observation.

7. Click **OK** to close the **Rule Definition** dialog box.
8. In the **Rules** dialog box, select the buttons on the right to create more rules for this item, or to edit or delete rules or to move rules up or down the Rules sequence. When you are finished with rules for this item, close the dialog box.
9. Repeat steps 2 through 8 for each status code. Note that Nearline and device group exceptions are set separately. Close the Rules Manager when you are finished.

View Exception Events

Exception events are logged on the exceptions list. If you activated messages and severity indicator icons in Rules Manager for the violated rule, these will also appear with the exception.

Click **View** and select **Exceptions** to display exception events.



Select an exception and click the right mouse to remove exceptions from the list, display the graph for the selected item, or show the rule for the selected item.

Chapter 7: Host Messages Monitor

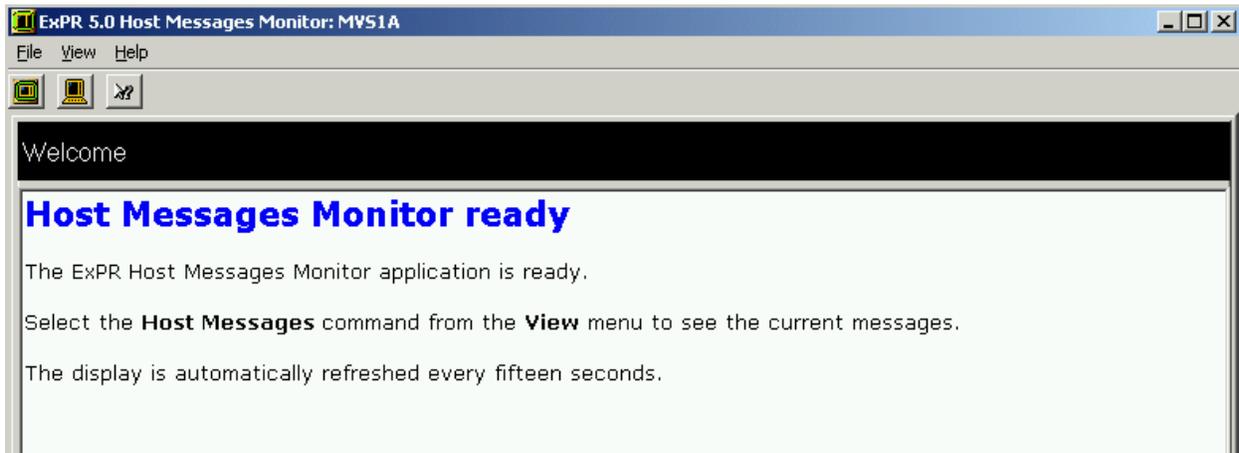
Overview

This chapter describes the ExPR Host Messages Monitor application, which displays MVS console messages in a separate window on the PC. The display is updated every 15 seconds.

Starting the Application

Start the Host Messages Monitor application using any of the methods described in chapter 1, *Getting Started*. When prompted, select the primary host to monitor.

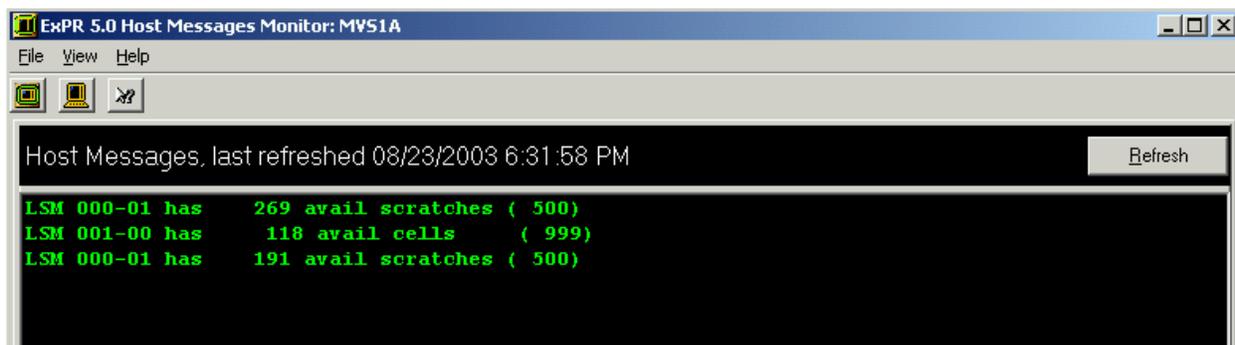
The application window will appear shortly after you make your selection.



Displaying Host Messages

Click **View** and **Host Messages** to display console messages on the PC.

Click the **Refresh** button to refresh the display on demand. (The display is refreshed automatically every 15 seconds.)



Chapter 8: TAPECAT GUI Reports

Overview

This chapter describes the ExPR TAPECAT GUI (Graphic User Interface) query function, which allows you to display and sort any of the existing TAPECAT Volume or Dataset details on the PC. TAPECAT information is extracted from the host tape catalog extract by ExPR mainframe processes.

Report 00000000

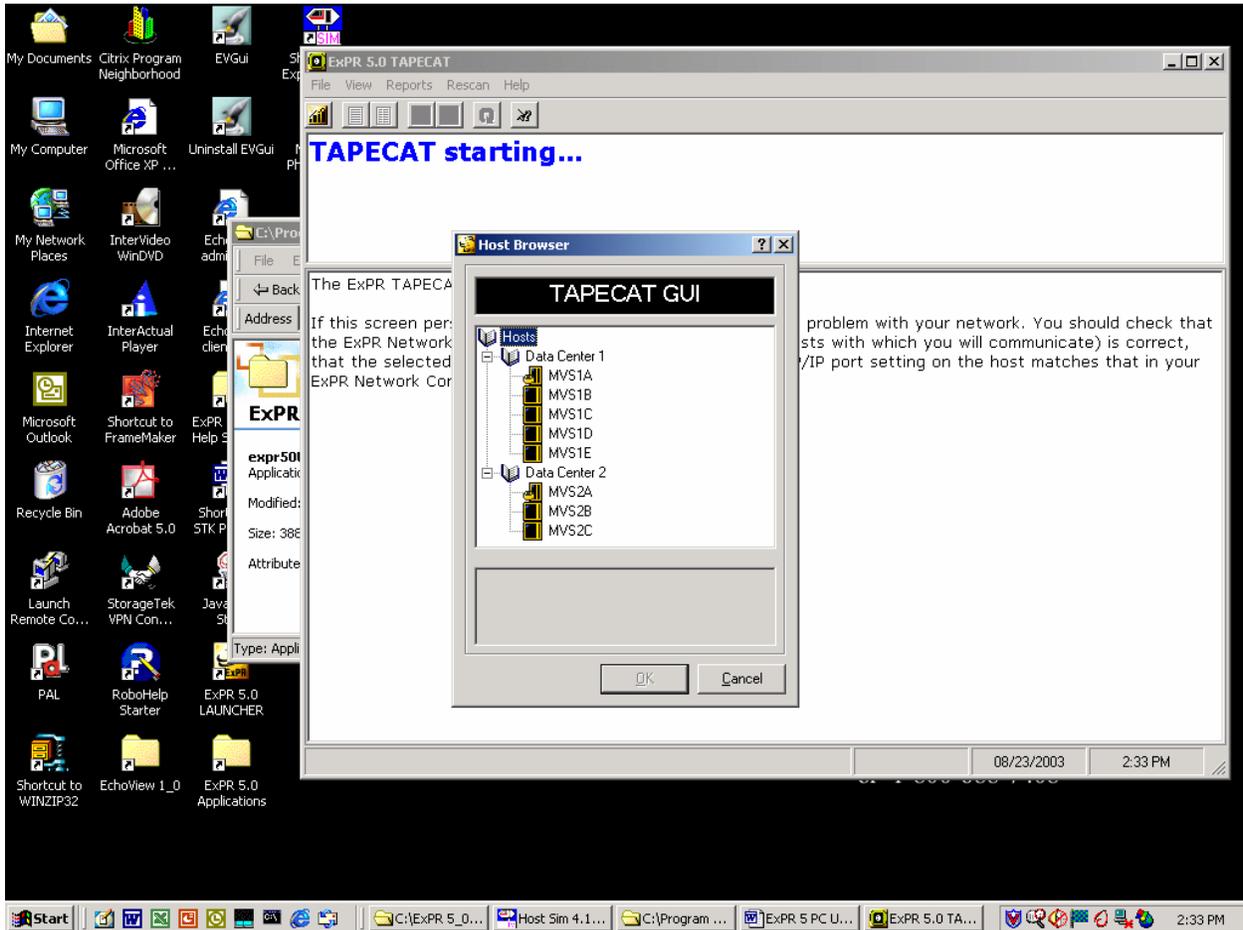
Volume serial	Dataset name	Creation date	Expiry date	Volume set	Volume seq	ACSLSM	MEDIAT	VLTNAM
C02	\$\$\$DSN.UNAVA...	?		C02	0	00000	3480/18U	
C02323	\$\$\$DSN.UNAVA...	?		C02323	0	00100	3480/18U	
C03880	\$\$\$DSN.UNAVA...	?		C03880	0	00000	3480/18U	
C04476	\$\$\$DSN.UNAVA...	?		C04476	0	00000	3480/18U	
C1H769	\$\$\$DSN.UNAVA...	?		C1H769	0	00000	3480/18U	
C10263	\$\$\$DSN.UNAVA...	?		C10263	0	00000	3480/18U	
C10264	\$\$\$DSN.UNAVA...	?		C10264	0	00000	3480/18U	
C10442	\$\$\$DSN.UNAVA...	?		C10442	0	00000	3480/18U	
C11754	\$\$\$DSN.UNAVA...	?		C11754	0	00100	3480/18U	
C11951	\$\$\$DSN.UNAVA...	?		C11951	0	00100	3480/18U	
C11966	\$\$\$DSN.UNAVA...	?		C11966	0	00100	3480/18U	
C11978	\$\$\$DSN.UNAVA...	?		C11978	0	00100	3480/18U	
C11990	\$\$\$DSN.UNAVA...	?		C11990	0	00100	3480/18U	
C11997	\$\$\$DSN.UNAVA...	?		C11997	0	00100	3480/18U	
C12061	\$\$\$DSN.UNAVA...	?		C12061	0	00100	3480/18U	
C12079	\$\$\$DSN.UNAVA...	?		C12079	0	00100	3480/18U	
C12082	\$\$\$DSN.UNAVA...	?		C12082	0	00100	3480/18U	
C12088	\$\$\$DSN.UNAVA...	?		C12088	0	00100	3480/18U	
C12100	\$\$\$DSN.UNAVA...	?		C12100	0	00000	3480/18U	
C12510	\$\$\$DSN.UNAVA...	?		C12510	0	00100	3480/18U	
C13096	\$\$\$DSN.UNAVA...	?		C13096	0	00100	3480/18U	
C13109	\$\$\$DSN.UNAVA...	?		C13109	0	00000	3480/18U	
C13110	\$\$\$DSN.UNAVA...	?		C13110	0	00000	3480/18U	
C13111	\$\$\$DSN.UNAVA...	?		C13111	0	00000	3480/18U	
C13186	\$\$\$DSN.UNAVA...	?		C13186	0	00100	3480/18U	
C83100	\$\$\$MVC.VOLSE...	2001338		C83100	0	00000		
C83100	\$\$\$MVC.VOLSE...	2000255		C83100	1			

Report 00000000 - Special MVC Report

Volume serial	Dataset name	Creation date	Expiry date	Volume set	Volume seq	ACSLSM	MEDIAT	VLTNAM
301114	FAT1	1995052	1995052	301114	1		3490/36U	
500870	FATS5A6	1996167	1996167	500870	1		3490/36C	
500871	FATS5A7	1996168	1996168	500871	1		3490/36C	
500872	FATS5A4	1996153	1996153	500872	1		3490/36C	
500873	FATS5A7	1996168	1996168	500873	1		3490/36C	
500874	FATS5A6	1996167	1996167	500874	1		3490/36C	
500875	FATS5A6	1996167	1996167	500875	1		3490/36C	
500876	FATS5A6	1996167	1996167	500876	1		3490/36C	
500877	FATS5A6	1996167	1996167	500877	1		3490/36C	
500878	FATS5A6	1996167	1996167	500878	1		3490/36C	
500879	FATS5A6	1996167	1996167	500879	1		3490/36C	
500880	FATS5A4	1996167	1996167	500880	1		3490/36C	
500881	FATS5A4	1996167	1996167	500881	1		3490/36C	
500882	FATS5A4	1996167	1996167	500882	1		3490/36C	
500883	FATS5A4	1996167	1996167	500883	1		3490/36C	
500884	FATS5A4	1996167	1996167	500884	1		3490/36C	
500885	FATS5A4	1996167	1996167	500885	1		3490/36C	
500887	FATS5A4	1996167	1996167	500887	1		3490/36C	
500888	FATS5A4	1996167	1996167	500888	1		3490/36C	
500889	FATS5A4	1996167	1996167	500889	1		3490/36C	
500890	FATS5A7	1996167	1996167	500890	1		3490/36C	
500891	FATS5A7	1996167	1996167	500891	1		3490/36C	
500892	FATS5A7	1996167	1996167	500892	1		3490/36C	
500893	FATS5A7	1996167	1996167	500893	1		3490/36C	
500894	FATS5A5	1996153	1996153	500894	1		3490/36C	
500895	FATS5A5	1996153	1996153	500895	1		3490/36C	
500896	FATS5A5	1996153	1996153	500896	1		3490/36C	

Starting the Application

Start the TAPECAT GUI application using any of the methods described in chapter 1, *Getting Started*.



If prompted, select the host to connect to. (This prompt only appears if you have multiple hosts.)

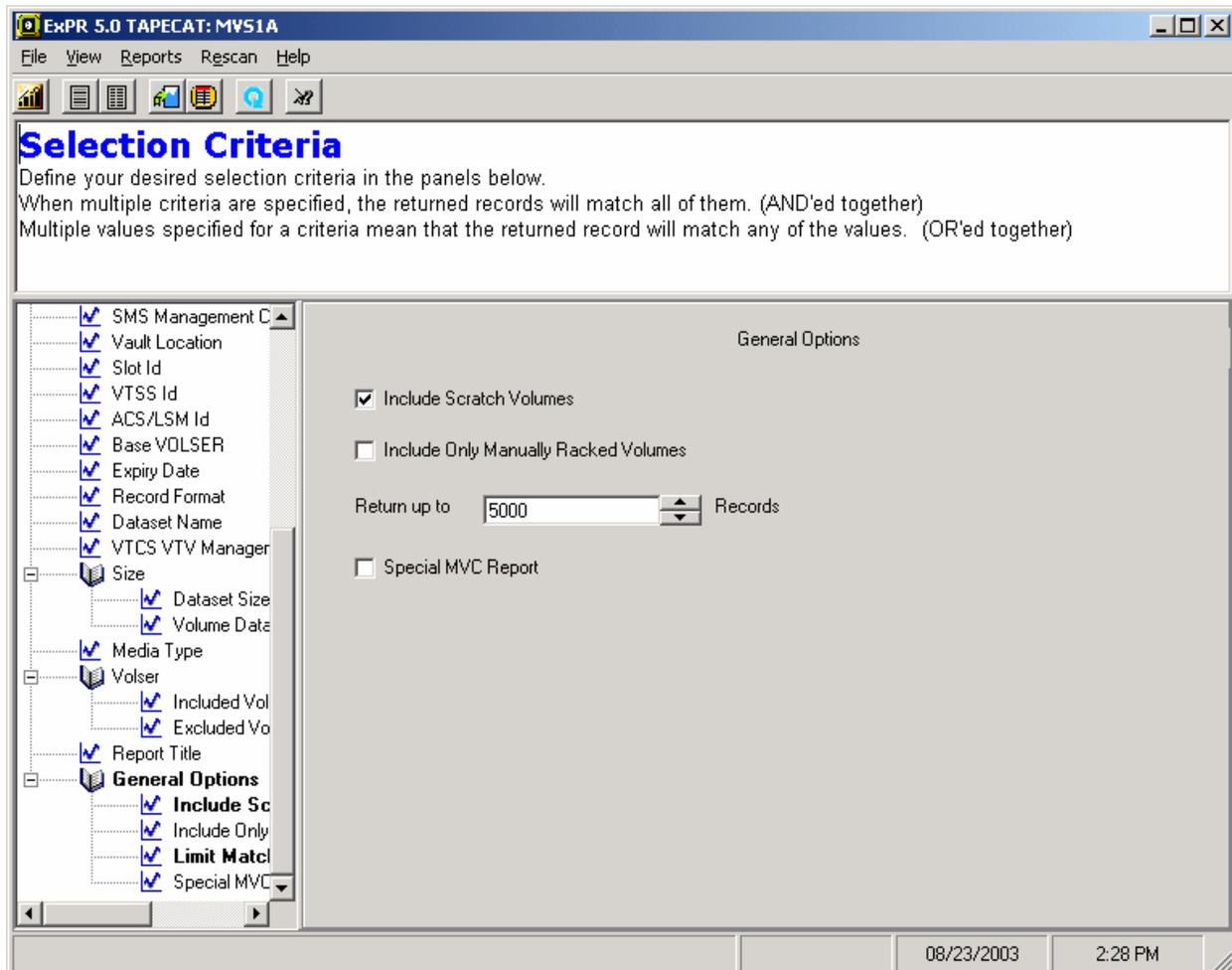
The Selection Criteria application window will appear shortly after you make your selection.

Constructing TAPECAT GUI Query Requests

TAPECAT GUI query requests are constructed using the navigation tree on the left panel of the display window.

To construct a request:

1. Open the TAPECAT GUI application if you have not already done so.
2. The Selection Criteria window is displayed. The following General Options are available:
 - Include or exclude scratch volumes
 - Include only manually racked volumes
 - Return up to _____ records
 - Automatically generate the Special MVC Report, showing all MVVs and their attributes.



3. For each item you want to add to your selection criteria:
 1. Select the item from the navigation tree.
 2. Enter any additional information that is requested.
 3. Press the **Add** button.

To remove an item, select it and click the **Delete** button.

Note: You can access Selection Criteria at any time while in the TAPECAT GUI by clicking **View** and then **Selection Criteria**. To redisplay General Options, click **General Options** in the navigation tree.

Special Considerations When Displaying TAPECAT GUI Fields

When using the TAPECAT GUI feature to display volume and dataset fields, you should be aware that some of the supported Tape Management Systems do not store all data items within their respective catalogs.

The unsupported fields are:

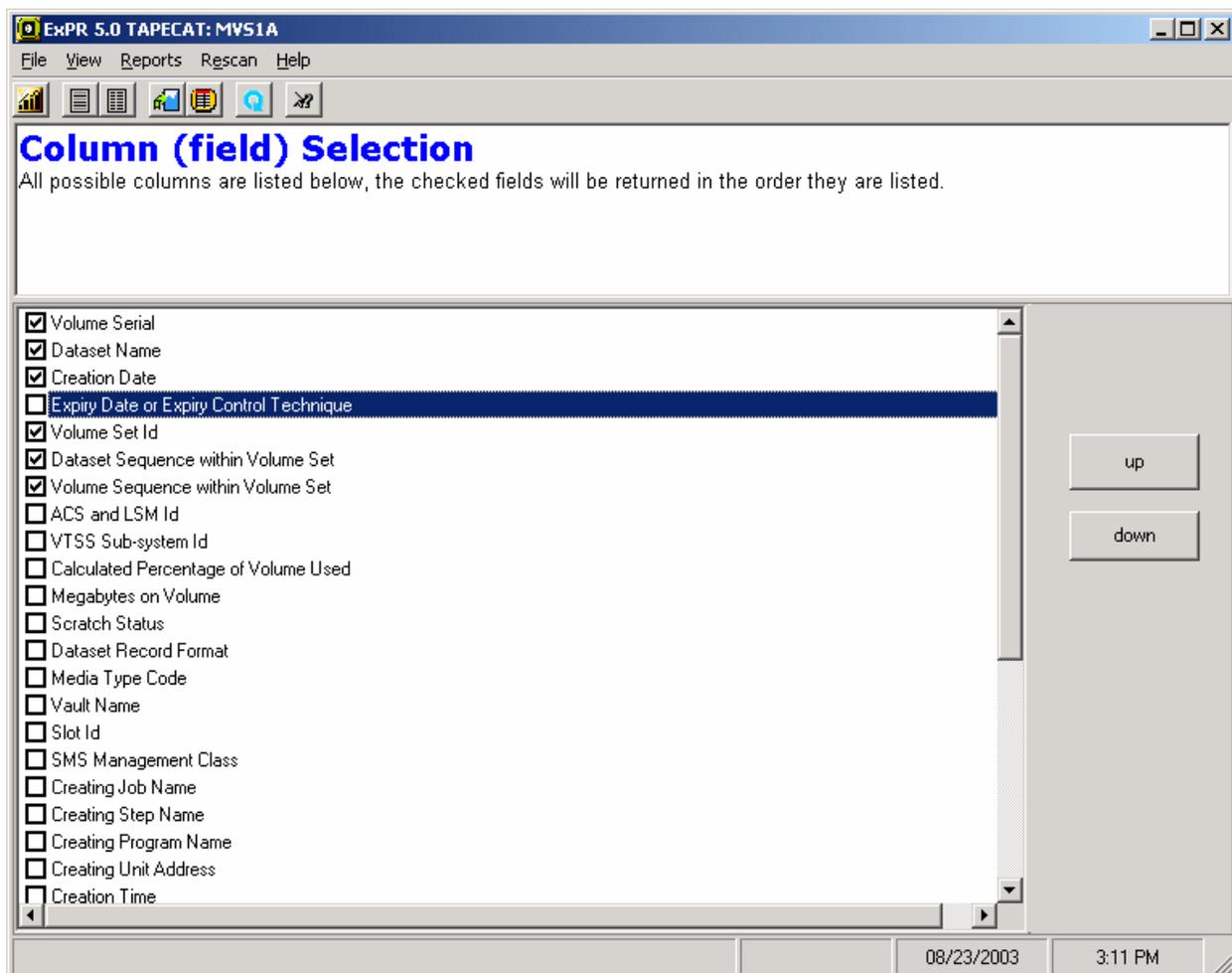
- CA-1 – Last ref/use step name (always set to blanks)
- CA-TLMS – Last ref/use program name (may be set to creation program name or blanks) and Last ref/use step name (may be set to creation step name or blanks)
- DF/SMSrmm – Last ref/use time (always set to 00:00)
- Control-T – None
- ASG-Zara – SMS management class (always set to blanks)

All other fields are populated by all of the supported TMS systems. You should not specify selection/filtering criteria based on fields that are set to blanks. If you do, then the search will return no matching volumes or datasets.

Select Columns to Include in the Request

Choose from among 34 columns of information to include in the report. You can later sort the report by any of the selected columns.

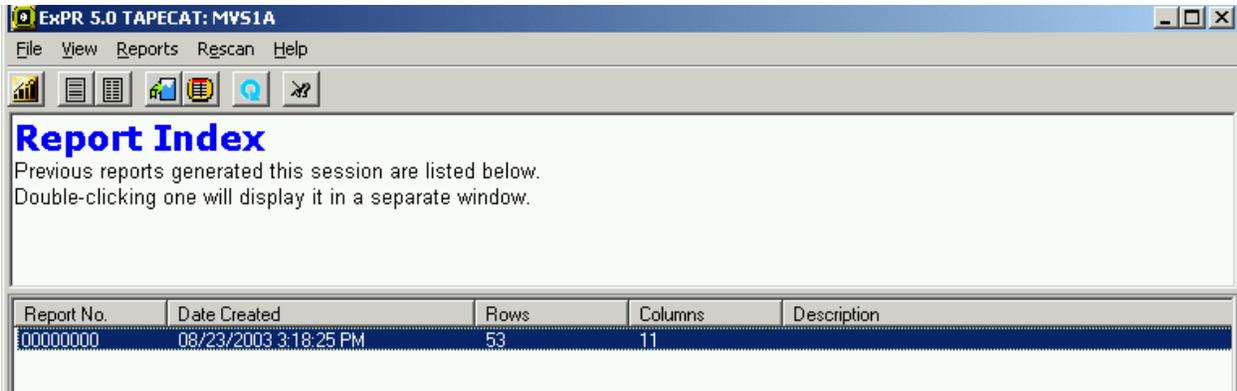
1. Click **View** and then click **Display Criteria**.
2. The Column (field) Selection window is displayed. Check the columns you want to include in the report.
3. Drag columns (or use the up/down buttons) to reorder them. This determines their order in the output.



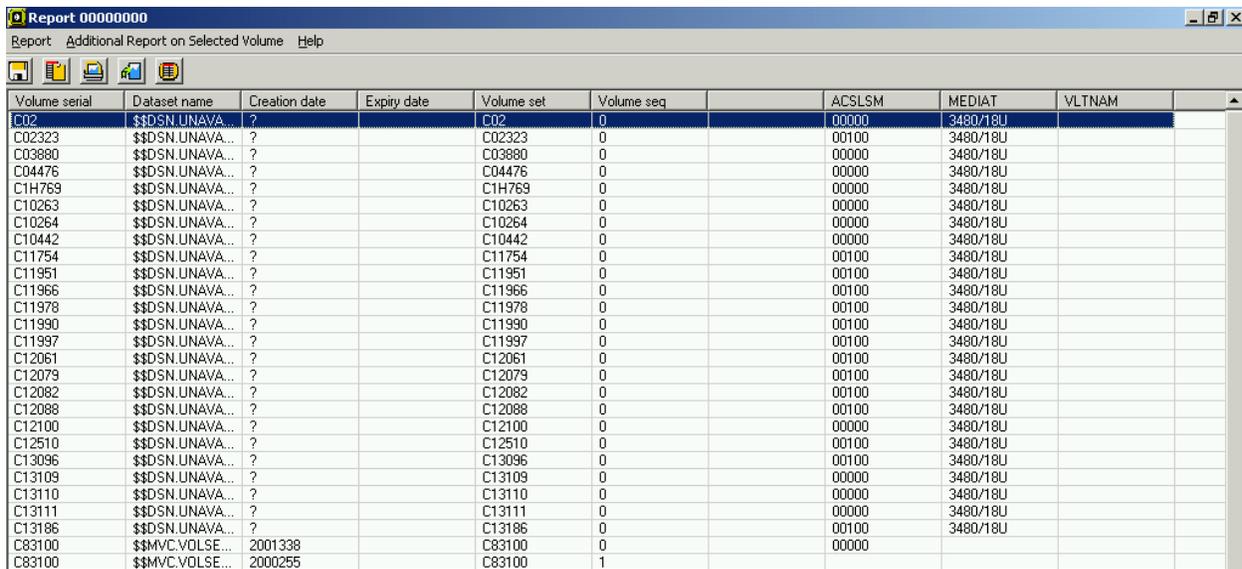
Generate and Display TAPECAT GUI Reports

When you have completed your selection criteria for your query and selected the columns to include in the report:

1. Click **Reports** and select **Request Report**. This generates the report.
2. A list of all reports you have requested this session will be displayed. The report you just created will appear at the top of the listing.



3. Double-click a report in the index to display it.



4. To sort the displayed report by any of its fields, click the header box for that field. Secondary sorts can be performed by control-clicking or shift-clicking the headers.
5. You can also create any of the following additional reports from the displayed report:

- All Datasets on the Selected Volume
 - All Volumes in the Volume Set for the Selected Volume
 - Query Contents of the Selected MVC
 - Query Contents of the Selected VTV
6. To create these reports, click **Additional Report on Selected Volume** and select the desired report.
 7. Alternatively, right-click on the volume to select a report.
 8. The new report will be displayed in the Report Index.

 00000003 | 08/23/2003 3:40:29 PM | 1 | 11 | All datasets on volume C83100 || 00000004 | 08/23/2003 3:46:12 PM | 53 | 11 | |
| 00000005 | 08/23/2003 3:46:29 PM | 1 | 11 | All volumes in volume set containing C83100 |
| 00000006 | 08/23/2003 3:48:00 PM | 15 | 7 | Contents of MVC 301114 |

9. Click the report in the index to display it.

10. Note that you can create additional reports from this new report using the **Additional Report on Selected Volume** option.

Rescan the Reports

TAPECAT GUI can be dynamically rescanned at any time. To do so, click Rescan and select Dynamic Rescan Refresh.

Note: The dynamic rescan refresh takes effect on the mainframe only. The TMS tape catalog is rescanned to update the extract file. Reports already generated on the PC are unchanged.

Toolbar Options for Printing and Saving Reports

When a report is displayed, the following operations can be performed using the toolbar icons at the top of the report window:

- Save to a file
- Copy to Windows clipboard
- Print to a printer
- Create additional Reports on the selected volume
- Return to the Report Index

The Special MVC Report

The Special MVC Report is produced automatically when Speceial MVS Report is checked in General Options. This report lists all MVCs and their attributes.

Volume serial	Dataset name	Creation date	Expiry date	Volume set	Volume seq	ACSLSM	MEDIAT	VLTNAM
301114	FAT1	1995052	1995052	301114	1		3490/36U	
500870	FATS5A6	1996167	1996167	500870	1		3490/36C	
500871	FATS5A7	1996168	1996168	500871	1		3490/36C	
500872	FATS5A4	1996153	1996153	500872	1		3490/36C	
500873	FATS5A7	1996168	1996168	500873	1		3490/36C	
500874	FATS5A6	1996167	1996167	500874	1		3490/36C	
500875	FATS5A6	1996167	1996167	500875	1		3490/36C	
500876	FATS5A6	1996167	1996167	500876	1		3490/36C	
500877	FATS5A6	1996167	1996167	500877	1		3490/36C	
500878	FATS5A6	1996167	1996167	500878	1		3490/36C	
500879	FATS5A6	1996167	1996167	500879	1		3490/36C	
500880	FATS5A4	1996167	1996167	500880	1		3490/36C	
500881	FATS5A4	1996167	1996167	500881	1		3490/36C	
500882	FATS5A4	1996167	1996167	500882	1		3490/36C	
500883	FATS5A4	1996167	1996167	500883	1		3490/36C	
500884	FATS5A4	1996167	1996167	500884	1		3490/36C	
500885	FATS5A4	1996167	1996167	500885	1		3490/36C	
500887	FATS5A4	1996167	1996167	500887	1		3490/36C	
500888	FATS5A4	1996167	1996167	500888	1		3490/36C	
500889	FATS5A4	1996167	1996167	500889	1		3490/36C	
500890	FATS5A7	1996167	1996167	500890	1		3490/36C	
500891	FATS5A7	1996167	1996167	500891	1		3490/36C	
500892	FATS5A7	1996167	1996167	500892	1		3490/36C	
500893	FATS5A7	1996167	1996167	500893	1		3490/36C	
500894	FATS5A5	1996153	1996153	500894	1		3490/36C	
500895	FATS5A5	1996153	1996153	500895	1		3490/36C	
500896	FATS5A5	1996153	1996153	500896	1		3490/36C	

Chapter 9: Web-Based Reports and Monitors

Overview

This chapter describes the ExPR 5.0 web-based browser interface (ExPR GUI) and how you use it to generate and display browser-based reports and monitors within your internal network.

What is the ExPR GUI?

The ExPR Web GUI is a web-based tool that lets you use a web browser to run ExPR reporting and monitor applications within your site's intranet environment. The ExPR Web GUI application and HTTP: Server software are installed on an MVS host in your network. You simply point your browser to the assigned URL for the ExPR Web GUI and you can run and manage monitor applications and generate historical graphs.

Getting Started with the ExPR GUI

1. Specify the URL of the server in the browser window. For example, to connect to the web server if it is running MVS system abcde in the fghijk domain on port 8888, the URL is:

`http://abcde.fghijk.com:8888/`

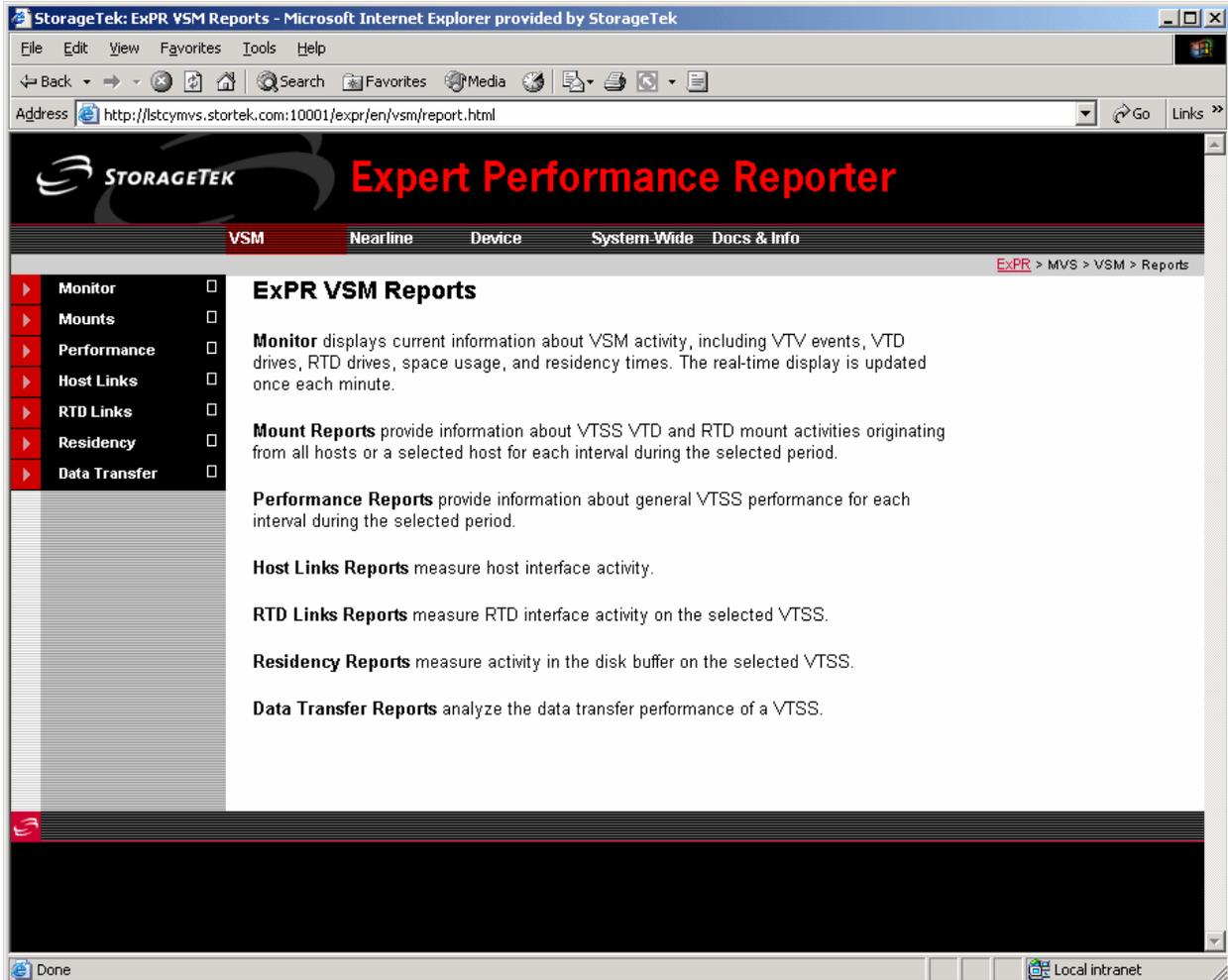
To connect to this server using default port 80:

<http://abcde.fghijk.com/>

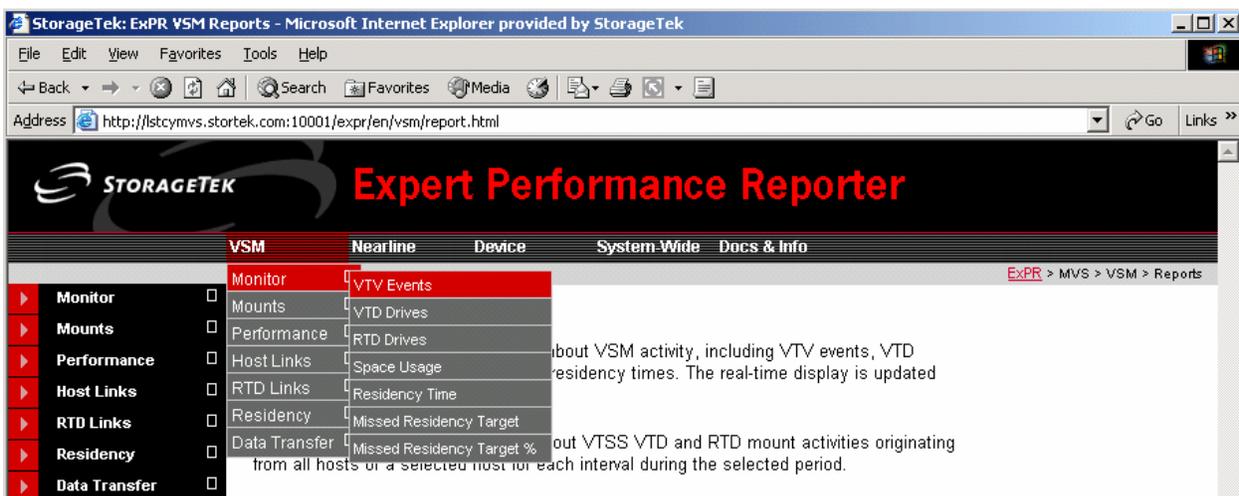
The ExPR MVS Reporting page is initially displayed.



1. Click an icon in the main panel, for example Virtual Storage Manager if you wish to display VSM monitors and/or historical VSM graphical reports.



- Click the tab at the top of the panel, for example VSM, and then select the report type and the report from the pulldown menu. Alternatively, select the report type in the left pane and then select the report to generate from the pulldown menu.



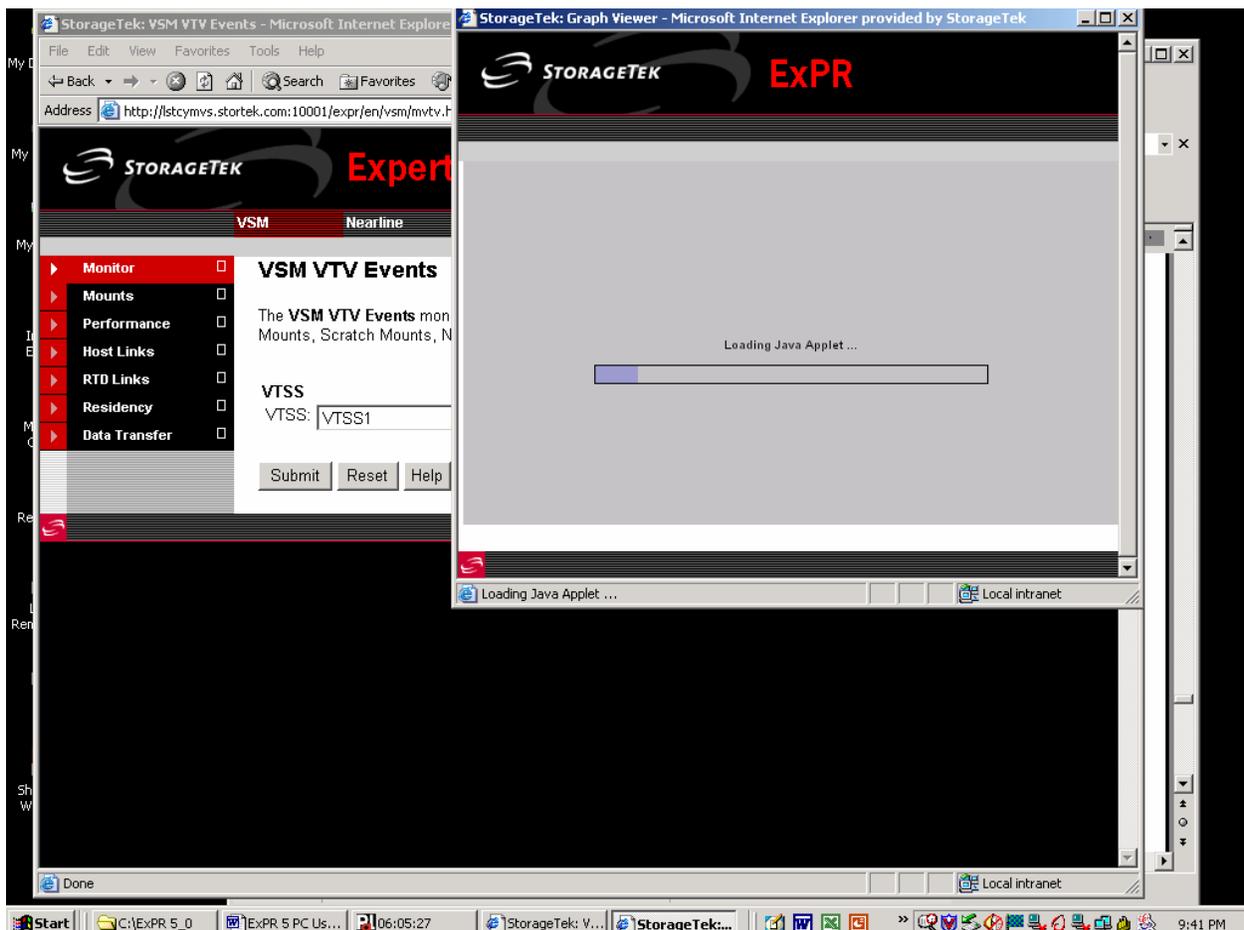
How to Display a Report or Monitor

The example below illustrates how to display and manage VSM Monitors.

The process described here is also used for displaying Nearline and Device Monitors and also for historical graphical reports.

To display a VSM Monitor:

1. As shown above, select the **VSM** tab and then select **Monitor** and (for this example) **VTV Events** from the pulldown menu.
2. The ExPR VSM VTV Events page is displayed and the ExPR Graph Viewer is displayed on top of it. When the Java applet has loaded, you are ready to continue. You must wait until the applet has completed loading before you can submit a graph.



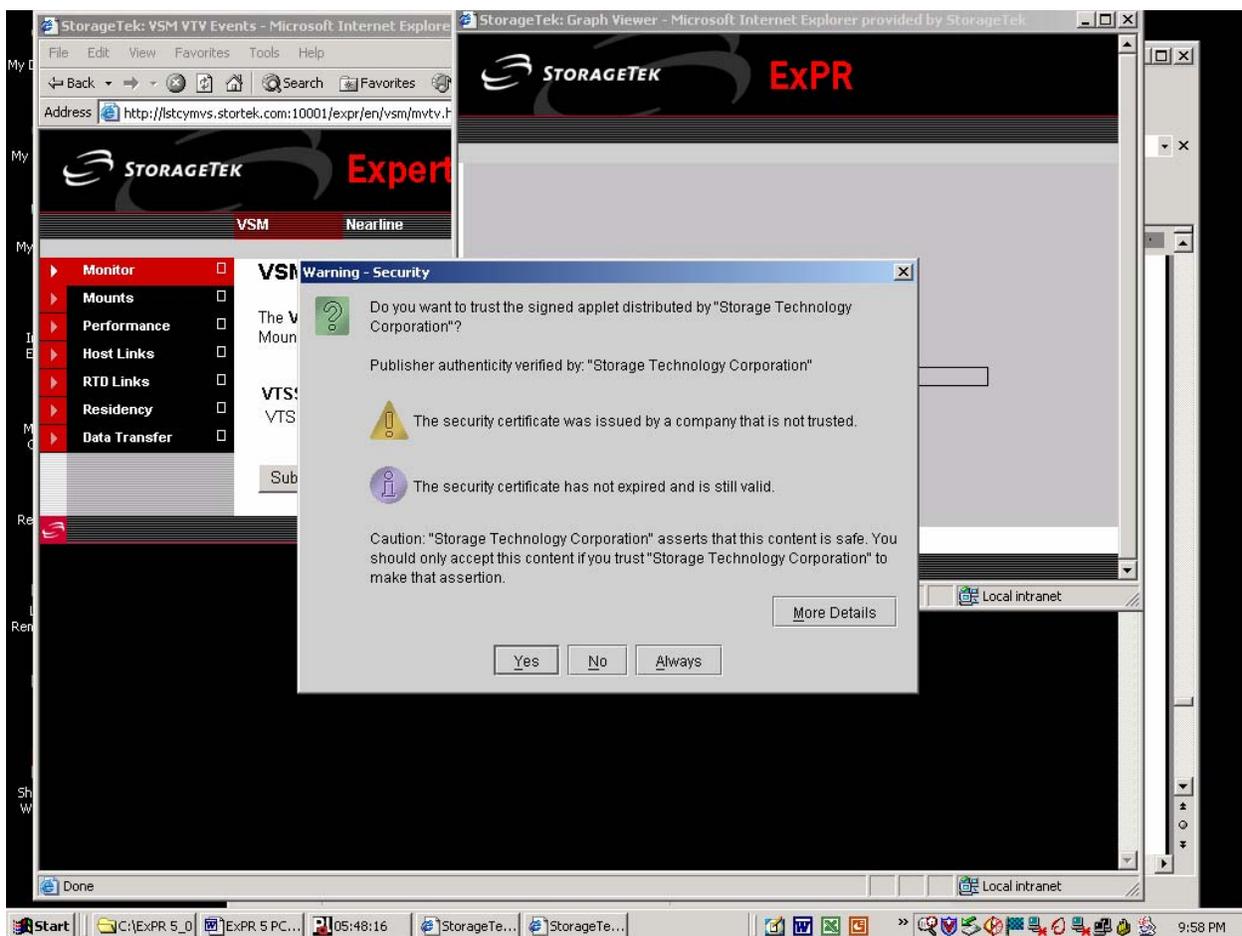
Note: As the Java applet loads, it checks to see if there are locale-specific versions of the configuration files that it uses. It does this by sending requests to the web server to see if the files exist on the server. Since there are no locale-specific configuration files for the

ExPR Web GUI, error messages 403 and 404 are logged to the web server's Syslog. These messages indicate that the requested files do not exist on the server. This is expected behavior. You should ignore these messages in the Syslog.

IMPORTANT:

When the applet has loaded, a Warning – Security message box appears asking if you want to trust the signed applet by Storage Technology Corporation. Trusting this applet is required for ExPR GUI functions.

You should answer Always to trust this applet each time you open ExPR GUI, or Yes to trust this signed applet for this session only.

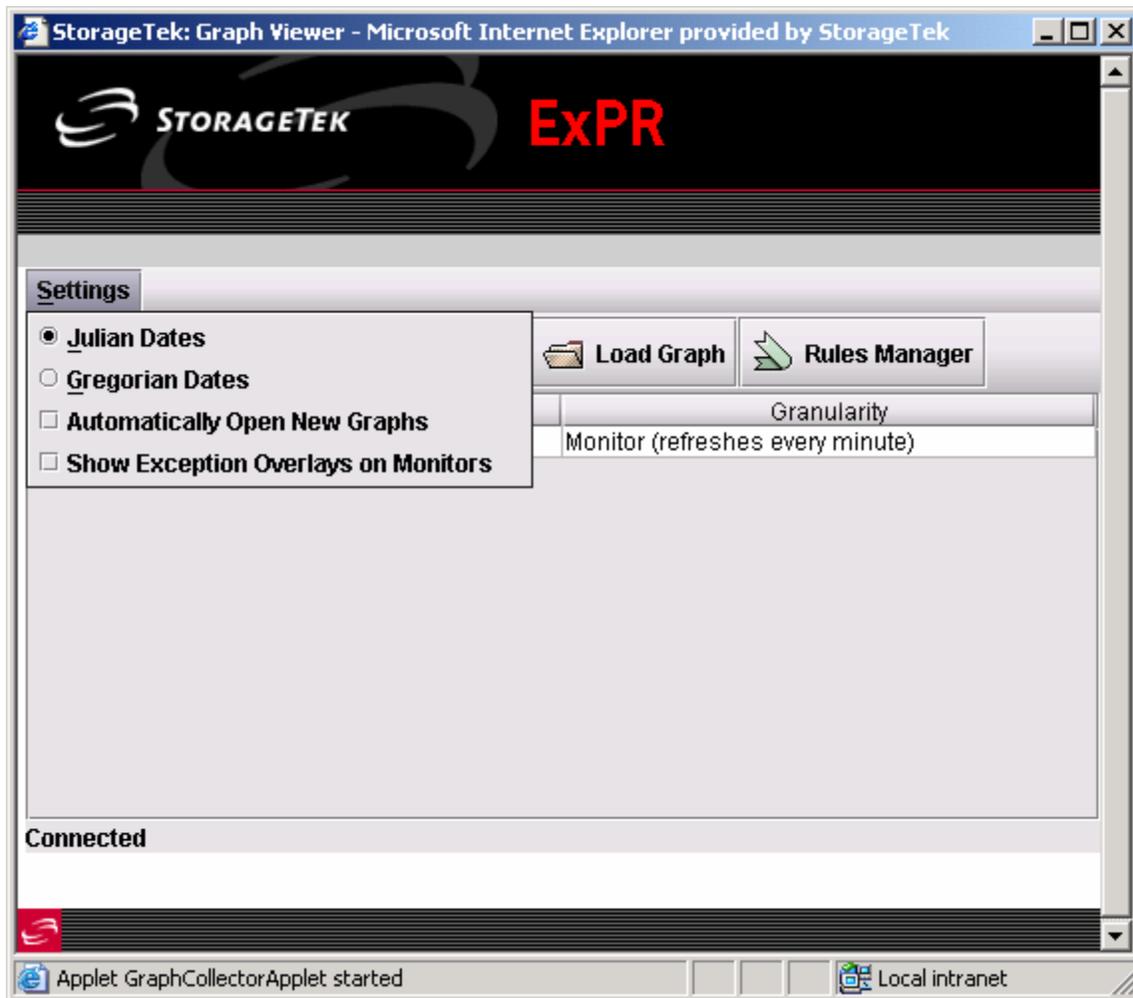


- When the applet has completed loading, (indicated at the bottom of the Graph Viewer window by the message “*Applet GraphCollectorApplet Started*”), you are ready to submit a graph.

An error will occur if you attempt to submit a graph before the applet has completed loading.



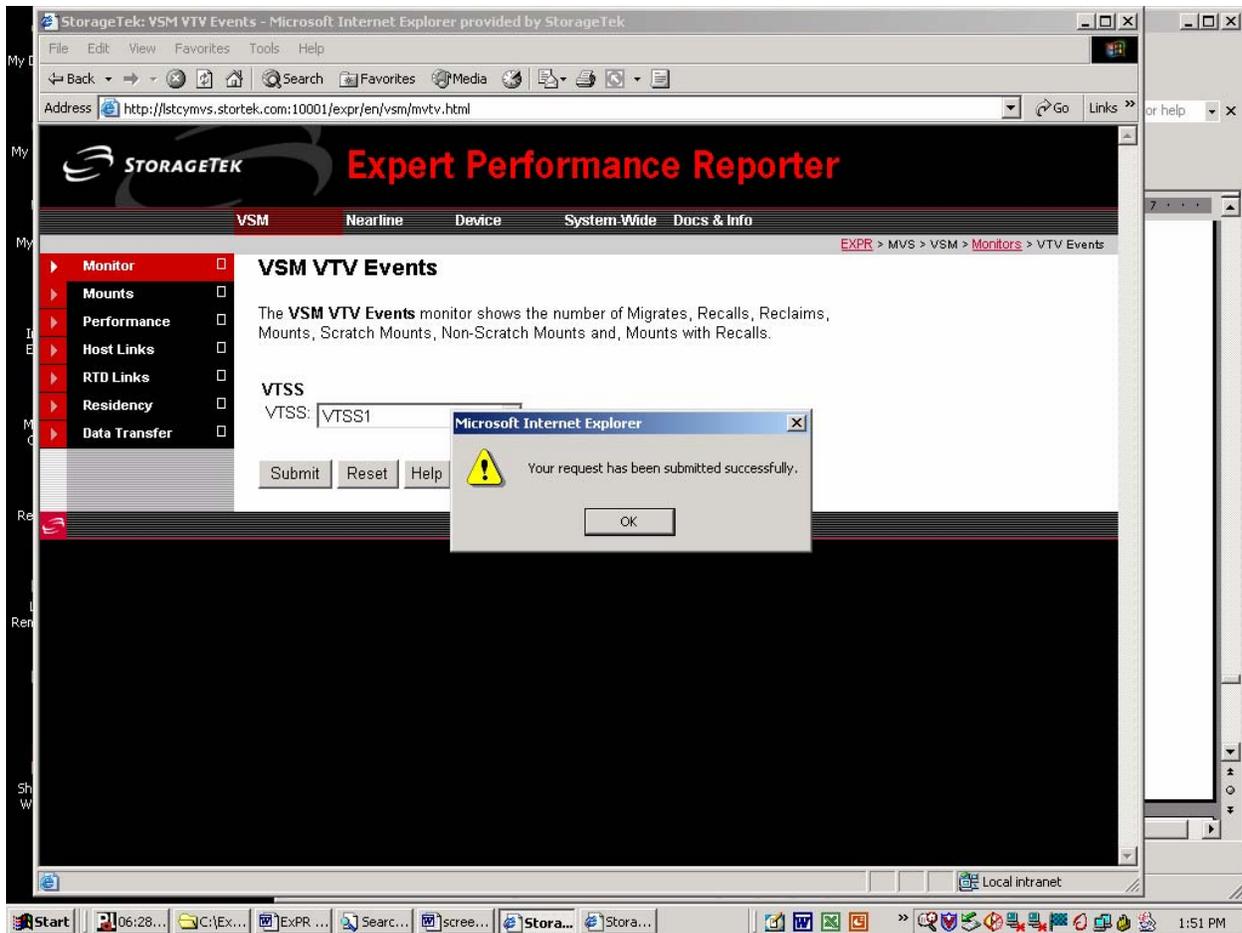
4. To set local variables for your graphs, click **Settings**. Select whether to display dates in Julian or Gregorian format, if you want graphs displayed automatically when they arrive in the Graph Viewer, and whether to show exception overlays on monitor reports.



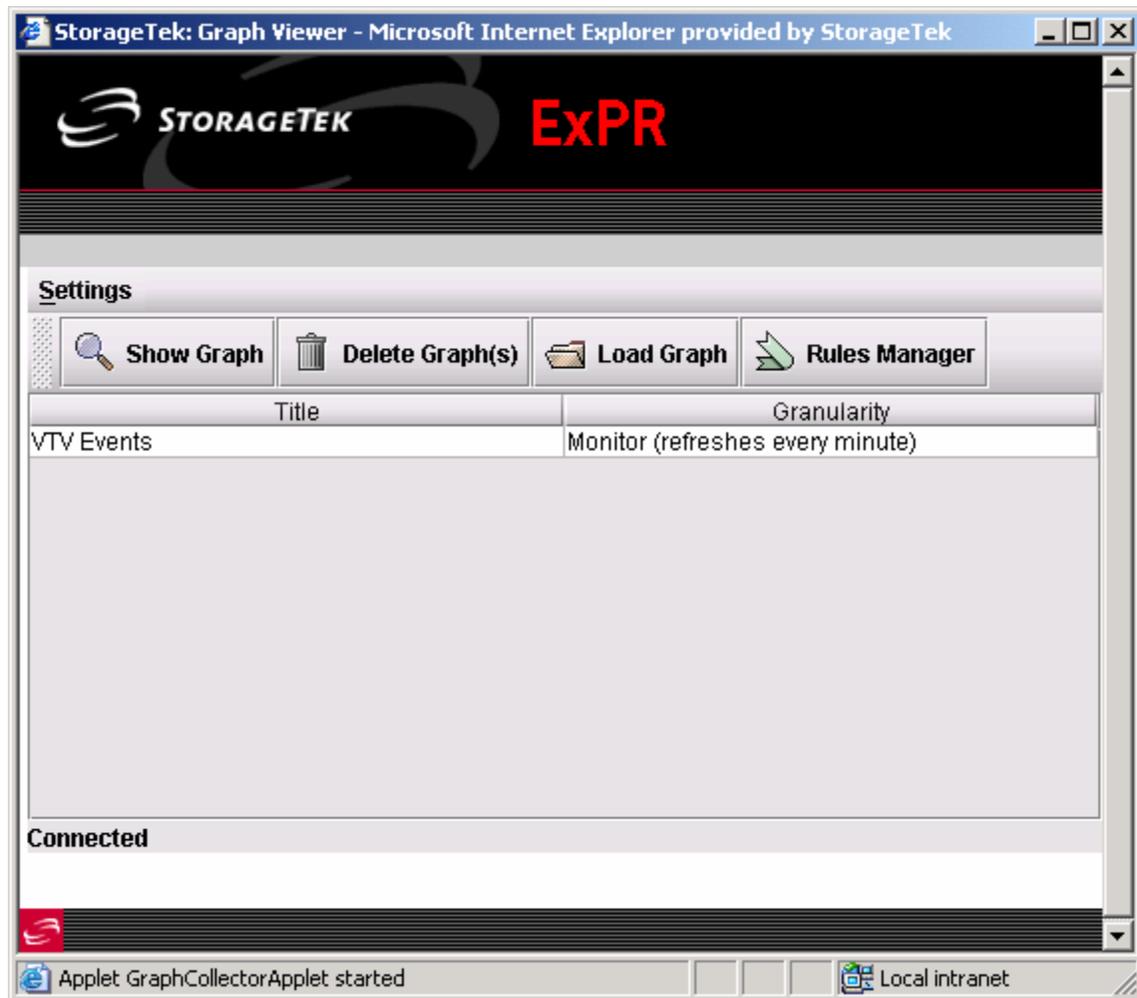
5. Note the buttons at the top of the Graph Viewer:
 - Show Graph – displays the graph
 - Delete Graph – deletes the selected graph and removes it from the list of titles
 - Load Graph – loads a saved graph title into the Graph Viewer for display
 - Rules Manager – sets exception thresholds and alarms for ExPR monitors. See *Example of Monitor Exception Reporting* below for details about this feature.
6. Click the ExPR VSM Reports window to bring it to the forefront. This panel describes the monitor you have selected and is where you identify the VTSS to monitor. Select the VTSS and then click the **Submit** button.



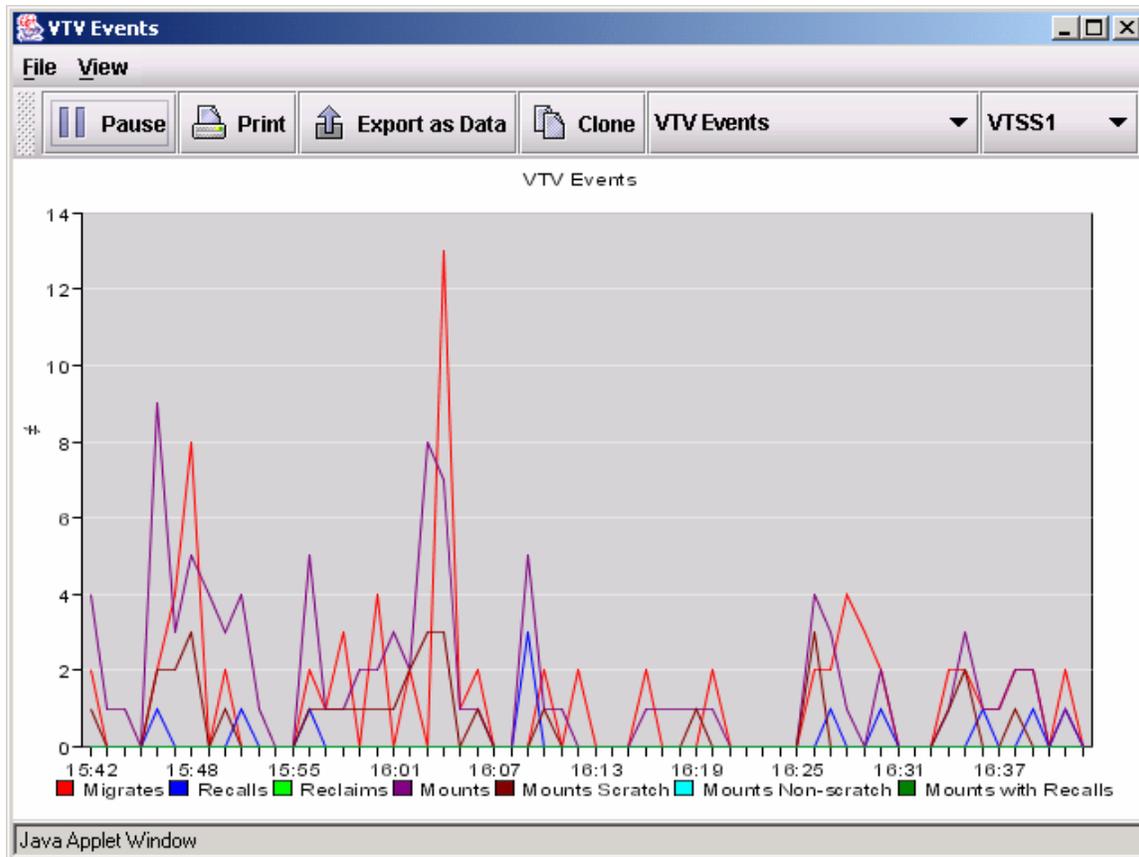
7. Click **OK** when the Request Submitted Successfully message box appears.



8. The graph is listed in the Graph Viewer window when it is ready for display (or automatically in a separate window if elected to do so in Settings).



9. Select the graph title from the list and click the **Show Graph** button to display the monitor. The monitor will be displayed in a separate window.



The displayed monitor is “live” in that it is updated automatically every minute, with the most recent activity plotted on the right side of the graph and the oldest activity rolling off the left side.

- To display the data for a point on the graph, click a data point.
- To display the data for the entire graph, select **View** and **Display Data**.

Saving, Printing, Cloning, and Exporting Graphs

To save, print or export a graph, use the buttons at the top of the report window:

- Save as Graph – saves the graph as a graph file. For ExPR monitors, you can use this feature to create snapshots.
- Print – prints the graph on your printer.
- Clone – creates a copy of the graph
- Export as Data – copies the data behind the graph to the Windows Clipboard to be pasted into an application (e.g., Excel, Word, etc.).

If you receive the following message:



In order to use the ExPR GUI print, save, and export options, you will need to grant permissions to the Java applet that controls these processes. This message only occurs if you did not elect to trust the Java applet distributed by Storage Technology Corporation when you first started the ExPR GUI.

To grant permissions:

1. Navigate to the directory where the Java runtime environment is installed on your machine (in Windows this defaults to C:\Program Files\Java\j2re1.4.x, where *x* is the minor version number of the Java installation).
2. At j2re1.4.x, navigate to the directory lib\security.
3. Edit the file java.policy in lib\security by adding the following lines:

```
grant codeBase "http://XXXX/expr/en/graphv/*" {  
    permission java.security.AllPermission;  
};
```

where *XXXX* is the name and port of the http server.
4. Restart Internet Explorer for these changes to take effect.

Using the Zoom Feature

The Zoom feature allows you to generate a new graph showing a subset of an existing graph.

You can either select a single point on the graph or drag a box around a portion of the graph:

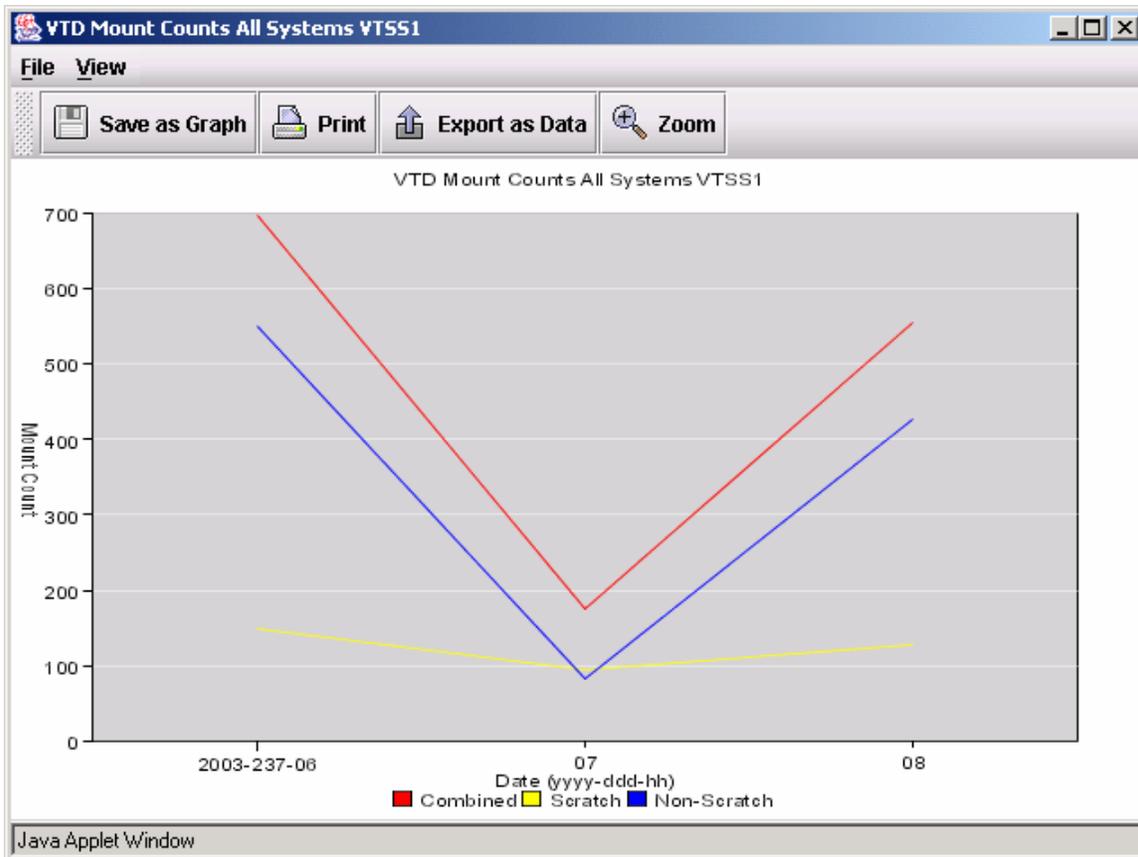
- If you drag a box around a portion of the graph, the new graph will plot just the area that you boxed in the original graph, resized to fit the graph display panel.
- If you select a single point (or if the area you box contains just a single point), the new graph will plot details for that point at the next lower level of granularity. For example, you can zoom a point on a weekly graph to see daily details for the selected week and zoom a point on a daily graph to show hourly details for a selected day. The new graph will also include the day or week on either side of the selected day or week.

To zoom a graph:

1. Click the **Zoom** button on the graph window to activate the zoom mode.
2. Move the cursor over the graph. The normal cursor is replaced with a “+” when zoom mode is active.
3. Position the cursor at the point on the graph you wish to zoom and click the mouse, or leave the mouse depressed and move the cursor over the graph to draw a box around the portion of the graph you wish to zoom.
 - If you selected a single point (or if your box contained only a single point), a new graph report with the next level of granularity for the selected day or week will be generated. The graph will also include the day or week on either side of the selected day or week.
 - If your box included more than one point, the new graph will plot just those points and the granularity will remain the same.



4. Click the **Zoom** button again to deactivate the zoom mode.
5. Select the new report from the Graph Viewer when it appears in the list of titles.



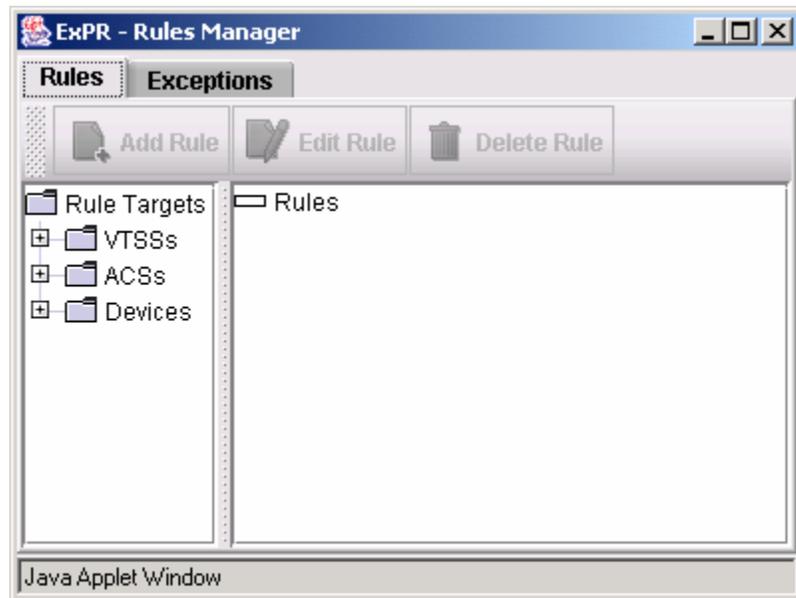
Monitor Exception Reporting

Exception thresholds can be locally set for the ExPR monitors. Exception processing is controlled with the Rules Manager in the Graph Viewer window.

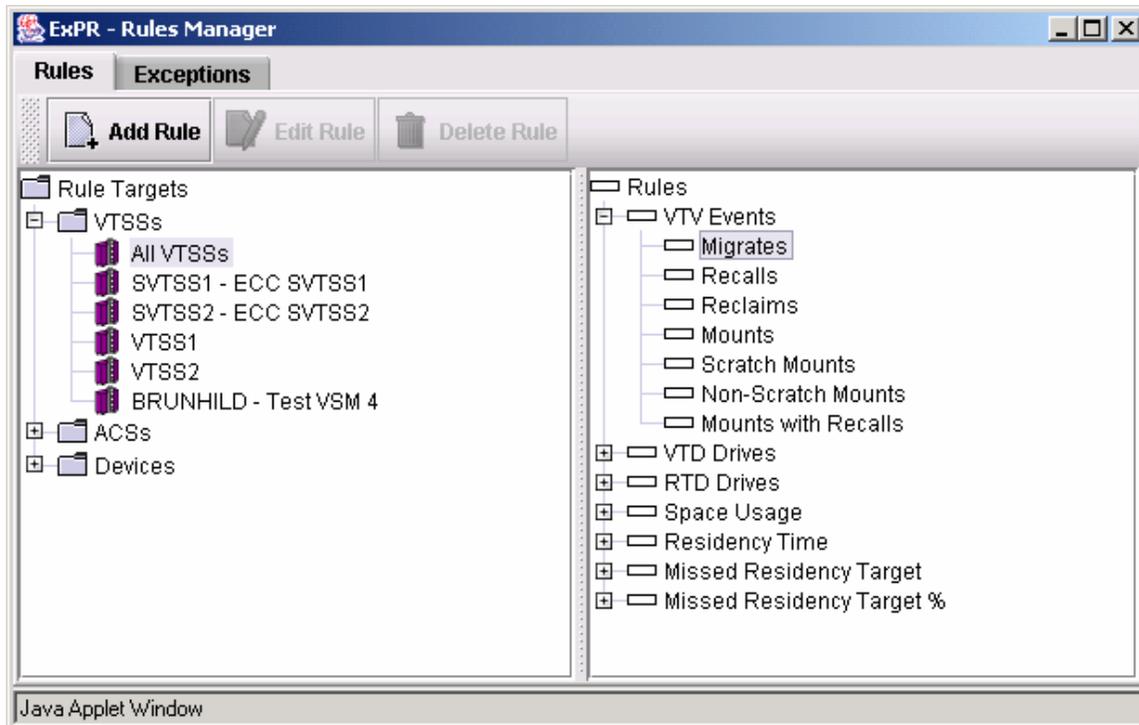
The Rules Manager allows you to set, for each element in each monitor report, exception threshold values that should be logged or trigger an alarm if they occur. These rules are typically in the format “if the last x number of observations were (pick one) greater than or less than y , then do z .”

Rules can be defined globally for all VTSSs or all ACSs, or for a specific VTSS, ACS, LSM, or device group. This example will define a rule for a specific VTSS.

1. In the Graph Viewer, click the **Rules Manager** button. The Rules Manager is displayed in a separate window.



2. Select the Rule Target in the left pane. Continuing with the previous example, open **VTSSs** in the navigation tree and then select a VTSS to create a rule for (or select **All VTSSs**).
3. In the right pane, select the report element for which you want to create a rule, in this example **VTV Events** and then **VTV Migrates**.



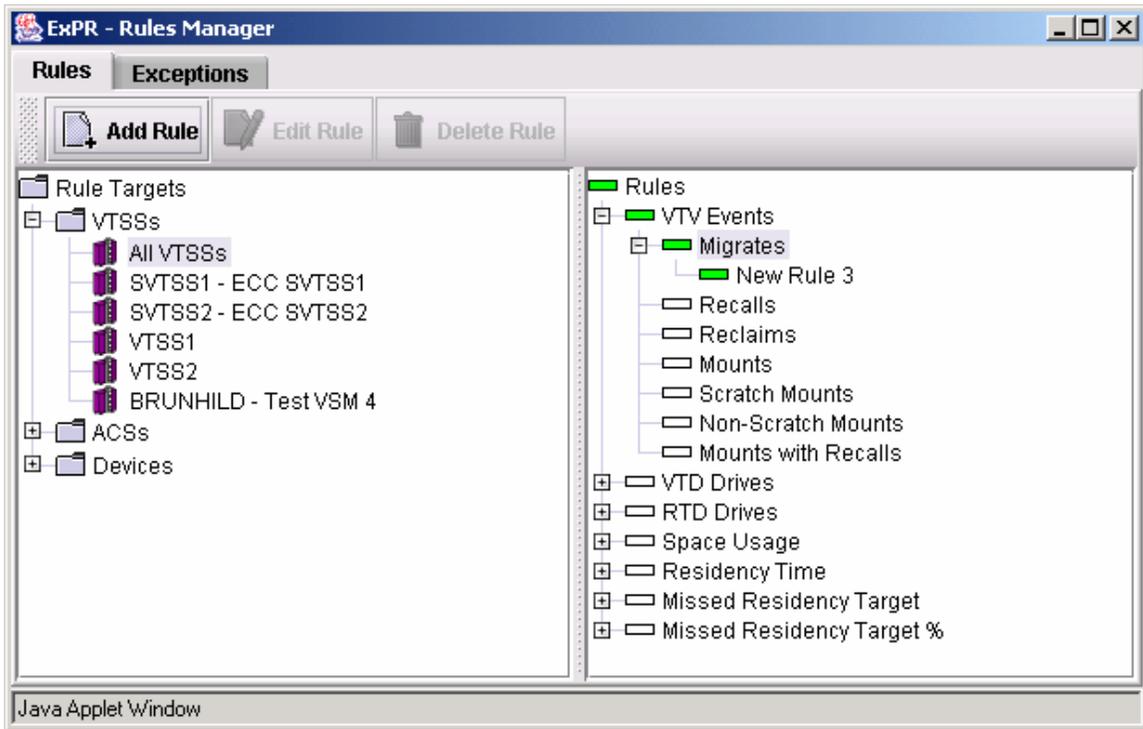
- Click the **Add Rule** button. The Add New Rule dialog box is displayed.



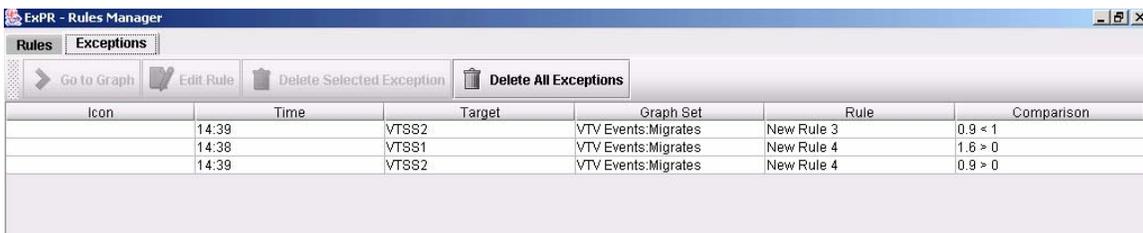
- Enter the rule description and definition.
- Indicate if you want exception messages to appear on the Alerts Monitor for this rule, and if so, select from the available list of severity indicators.
- Indicate if you want to stop processing other rules for this item when this rule is violated. For example, since an observation could break more than one rule, you could stop rules processing with the first rule that is violated or you could

choose to log all subsequent violations caused by that observation. Either way, rules processing would continue with the next observation.

8. Click the **Add** button to accept the rule definition and close the dialog box.
9. In the Rules Manager, the new rule appears in the right pane navigation tree. Use the buttons at the top to create more rules, to edit or delete rules, or to move rules up or down the Rules sequence.



10. Close the Rules Manager when you are finished.
11. Exception events are logged on the exceptions list, which is displayed when an exception is logged or by clicking the **Exception** button on the Rules Manager.



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