

# **StorageTek**

## **Expert Performance Reporter (ExPR)**

### **PC User's Guide**

**Version 1 Release 1**

**PN: 112193901**

Information contained in this publication is subject to change. In the event of changes, the publication will be revised. Comments concerning the contents of this manual should be directed to the following address:

*Storage Technology Corporation  
Software Information Development  
Software Engineering Department  
2270 South 88th Street  
Louisville, CO 80028-5209*

StorageTek® and Nearline® are registered trademarks of Storage Technology Corporation.

Expert Performance Reporter (ExPR)™ is a trademark of Storage Technology Corporation.

IBM® is a registered trademark of International Business Machines Corp.

MVS/XA™ and MVS/ESA™ and VTAM™ are trademarks of International Business Machines Corp.

CA-1™ and CA-TLMS™ are trademarks of Computer Associates International Inc.

VSVBX Copyright (c) Videosoft Corporation.

Other VBXs and DLLs Copyright (c) Microsoft Corporation.

If this software is used by the Government, use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause of DFARS 252.7-7013.

Copyright © 1996 by

Storage Technology Corporation

All Rights Reserved

# Contents

Preface .....	5
Audience .....	5
Organization .....	6
Related Documentation .....	6
StorageTek Support .....	6
Chapter 1: Introduction.....	7
Overview.....	7
What ExPR PC Does .....	7
How ExPR PC Works.....	8
ExPR PC Reports.....	8
The ExPR Help System.....	9
Chapter 2: Installation .....	11
Overview.....	11
Installation Prerequisites.....	11
Software Installation .....	12
Housekeeping Considerations .....	12
Chapter 3: Getting Started .....	15
Overview.....	15

Transferring Data from the Mainframe.....	15
Main Menu Functions .....	16
Creating a Database.....	16
Quick Summary Reports .....	17
Performance Reports .....	17
Starting the Report Function .....	18
Setting Up the Report .....	18
Generating Performance Reports.....	19
Jobname Workload Groups .....	23
Dataset Workload Groups .....	23
Exception Reports .....	24
Selecting Exception Reports from the ExPR Main Menu.....	25
Selecting Exceptions from the Performance Report Screen.....	26
Scanning a Database .....	27
Compacting a Database .....	27
Repairing a Database .....	28
Purging a Database .....	28
Problem Reporting Tool.....	28
Index.....	29

# Preface

This document describes how to install, configure, and use the PC component of the StorageTek Expert Performance Reporter (ExPR) software product.

**Note:**

Information in this PC User's Guide is also available as a Windows-based Help system to be used with the manual.

The ExPR PC Help system can be accessed from the ExPR PC main window or contextually from within ExPR PC screens.

## Audience

The audience for this document includes MVS database administrators, network administrators, and system analysts who install, configure, and use the ExPR PC component, as well as StorageTek support personnel who support ExPR customers in these efforts.

## Organization

This document is organized as follows:

- Chapter 1, Introduction, describes the ExPR PC software product, including what ExPR PC does and how it works.
- Chapter 2, Installation, describes ExPR PC installation prerequisites and software installation instructions.
- Chapter 3, Getting Started, provides an introduction to the ExPR PC screens and processes.

## Related Documentation

ExPR MVS User's Guide - describes the ExPR MVS software product, including instructions for configuring and using the software in the MVS environment, collecting and storing Nearline data, building and maintaining the mainframe database, and producing mainframe-based tabular reports. This document also describes MVS requirements for extracting data from the ExPR mainframe database for file transfer by multiple PC users.

## StorageTek Support

To report problems and receive support from StorageTek Software Support Representatives (SSRs), refer to the separate document, *How to Request Help or Software Enhancements*.

# Chapter 1

## Introduction

### Overview

This chapter describes the PC component of the StorageTek ExPR software product, including what ExPR PC does and how it works.

### What ExPR PC Does

ExPR collects performance data and generates reports about StorageTek Nearline Automated Cartridge System (ACS) status and performance. ExPR has two components, ExPR MVS and ExPR PC.

- ExPR MVS resides on an MVS host system and maintains a database of historical performance data that it collects from the Nearline system, the MVS operating system, and the installation's tape management catalog.
- ExPR PC (this application), resides on a PC and manages a downloaded subset of the mainframe database to display graphical reports, including quick summary reports, performance reports, and exception reports.

The process of transferring collected data from the mainframe to the PC is independent of ExPR. You input the transferred data and manage the PC database using ExPR database functions, including create, update, scan, compact, and repair.

Each of these ExPR reporting and database functions is started from the ExPR main window on your PC.

## How ExPR PC Works

ExPR PC takes data that has been transferred to the PC, inputs it to a relational database, and generates graphical reports based on user requests.

For each ExPR PC user, Nearline performance and status data is extracted from the ExPR MVS mainframe database as specified in an MVS batch job on the mainframe that controls the frequency of extraction for each PC user. This data is placed in a file on the mainframe and formatted for file transfer to the PC. The actual file transfer process, which is initiated at the PC, is a site-specific function that is independent of ExPR.

After the data file has been transferred to the PC, an ExPR command is used to input the file to the ExPR database. After the database has been updated, ExPR commands are used to display the ExPR PC reports.

## ExPR PC Reports

Three types of reports are available:

- Quick Summary Reports

ExPR quick summary reports provide line graphs comparing “then” and “now” for two user-specified parallel reporting periods, such as last Monday and the previous Monday. Quick summary reports are displayed with a single keystroke and do not require any additional data selection.

- Performance Reports

ExPR performance reports provide graphs for user-specified LSMs during selected reporting periods. Information can be further categorized by user-defined jobname and dataset workload groups. Nearly 40 different performance reports can be generated.

- Exception Reports

ExPR exception reports provide event-level and summary reports based on user-specified exception thresholds for selected mainframe database fields.

## The ExPR Help System

You can use the ExPR Help system interactively with the ExPR software or independent of ExPR:

- To use Help interactively with ExPR, click the Help button on any ExPR screen to display Help for that specific screen or function.
- To use Help independent of ExPR, click the Help button at the ExPR main menu to display the Contents menu, or click the Contents bar at the top of any ExPR Help window. Then click any item on the Contents menu to display help for an ExPR topic.

If you are unfamiliar with Windows Help systems in general, press F1 at the Contents menu to display information about how to move about efficiently in a Windows Help system.

# Chapter 2

## Installation

### Overview

This chapter describes how to install the ExPR PC software on your PC.

### Installation Prerequisites

ExPR PC requires one or more PCs running DOS 5.0 or higher and Windows 3.1 or higher.

The minimum PC hardware configuration is:

- 486-33 processor
- 8Mb RAM
- SVGA monitor
- 3.5" Floppy disk drive
- 400Mb hard disk (less if data is stored on a network drive)

The following model can be used to calculate the disk space required to hold the ExPR database(s).

- Minimum allocation for internal indexes = 170K
- Subsequent allocations are in 32K increments

- One day per LSM for all records = 10K

Additional consideration should be made for large numbers of workload groups.

## Software Installation

To install the ExPR PC software:

1. Insert the installation disk in your floppy drive.
2. At the Windows Program Manager, select File and then select Run. In the Run window, type

A:SETUP

and press Enter. (If your floppy drive is not A:, enter the letter for your floppy drive instead.)

3. When prompted, enter the target drive and directory (defaults are proposed). This is where ExPR will reside. Press Continue to install ExPR, or press Exit Setup to quit the installation.

Note: If another program is currently running, a message may be displayed indicating that open files cannot be overwritten. If you get this message, shut down the other program(s) that are running and then retry the installation.

4. ExPR copies the files to your target directory. When the installation is complete, a message is displayed. Select OK to display the ExPR program group.

## Housekeeping Considerations

ExPR uses the Microsoft Access database engine. Use of this database engine requires that a far higher number of locks should be available at runtime than is likely to be defined in a system that has not previously had such a database installed.

Locking can be implemented through use of the DOS SHARE.EXE program, normally loaded by AUTOEXEC.BAT. However, for users who work exclusively in a Windows environment, a better method is the use of VSHARE.386.

During installation, ExPR checked whether you had a locking mechanism installed. If you did not, it will have installed VSHARE.386, and warned you that it did so. All you then have to do is restart Windows. However, if you did already have a locking mechanism installed, you will receive a warning that you may need to change your SHARE parameters.

# Chapter 3

## Getting Started

### Overview

This chapter provides an introduction to the ExPR PC screens and processes.

### Transferring Data from the Mainframe

File transfers from the mainframe are performed with communications software on your PC that is capable of connecting with the mainframe and downloading data files to the PC. This function is independent of ExPR and may be done using any communications software package with this capability.

The ExPR file to transfer from the mainframe is the FTEXTTR (file transfer extract) file. Check with your system programmer for its exact name and location at your site and for any additional site-specific instructions you may need (such as logon procedures and acceptable protocols).

Perform the file transfer in an ASCII CR/LF format. Receive the file as INPUT.XEX (or whatever you like, just be sure to use the file type .XEX).

## Main Menu Functions

ExPR main menu icons initiate the following functions:

- ExPR Utilities displays options for creating, compacting, repairing, and purging the ExPR database. It also provides access to the problem reporting tool, which provides a vehicle for identifying software problems you may encounter and records them in a log file.
- ExPR Update updates a specified database with data from a specified input file.
- ExPR Performance Reports generates the performance reports.
- ExPR Quick Summary generates the quick summary reports.
- ExPR Exception Reports generate the exception reports.
- ExPR Database Scan provides a graphical report of database contents.
- ExPR PC Help opens the PC Help system.
- ExPR MVS Help opens the MVS help system.

## Creating a Database

You must create a database on your PC's hard disk that will contain data that you transfer from the mainframe for use in ExPR reports. Multiple databases may be created and maintained separately for historical analysis purposes. These databases may reside in the same directory or in different directories. Additional databases may be created at any time.

Click the ExPR Utilities icon on the ExPR main window and select the Create action bar. Use the Help system for additional instruction.

## Updating the Database

You must update the ExPR database with the downloaded data file after each data transfer from the mainframe.

Click the ExPR Update icon on the ExPR main window. Use the Help system for additional instruction.

## Quick Summary Reports

Quick summary reports provide trend analysis for key Nearline metrics. A single keystroke displays "now" and "then" comparisons for two selected reporting periods, such as last Monday and the previous Monday.

Click the ExPR Quick Summary icon on the ExPR main window to produce quick summary reports. Use the Help system for additional instruction.

Quick Summary reports are produced at the LSM level for mounts, average mount time, enters and ejects, passthroughs, free cells, and available scratch volumes. Separate reports are produced for scratch and non-scratch volumes where appropriate.

## Performance Reports

Performance reports are graphical displays of data selected from your PC's ExPR database. Literally dozens of ExPR reports are available to chart Nearline performance using information from the ExPR database on your PC.

The best way to learn to use ExPR performance reports is to read the information below for a general understanding of what you are going to do and why, and then experiment with building reports.

Use the ? help buttons to navigate through the reporting system. The ExPR help system provides contextually displayed information about

each report and each of the functions you will perform to select the exact data and format you want for a report.

## Starting the Report Function

Click the ExPR Performance Reports button in the ExPR main window. The report generation window is displayed. The database file in the screen name is the currently active database.

## Setting Up the Report

Use the function buttons and action bars to set up the report.

### Function Buttons

Function buttons on the right side of the window are used to generate reports, change the database being reported, display and set local exception thresholds, load existing saved reports, display ExPR help, and quit to the previous function. Use these functions as appropriate during the report generation process.

### Action Bars

Action bars across the top of the window determine the function you are performing and the information that is displayed in the main portion of the screen. Activate bars by clicking on them. The active bar is highlighted.

- Date/time sets the date range, days of the week, hours to include in the report, reporting format (hourly, daily, etc.), and whether the report is to be displayed as a graph or in a tabular grid format.
- Reports selects performance reports to generate.
- Device selects MVS systems LSMs to include data from in the report.

- Chan Grp allows you to select channel path groups to include in Control Unit reports. Channel groups contain one or more channel path IDs that are logically grouped together when analyzing channel paths. Multiple paths can be associated with each group. The groups are defined in the MVS CONFIG dataset.
- Customize changes the default data selection period and preset hour ranges for all performance reports.
- Exceptions selects exception reports to generate.

## Generating Performance Reports

Select the Report action bar. Notice the set of tab bars that have now appeared at the bottom of the window. These report selection tabs each control a menu of reports related to the function described by the tab. The active tab (initially Mounts, but subsequently the last-used tab) is highlighted. To select a different report menu, click on the appropriate report selection tab.

- Mounts reports provide statistics about cartridge mounts for the selected LSMs and jobname workload groups. Most of the Mounts reports can be produced using data for just a specified jobname workload group.
- Library performance reports provide information about the utilization of various Nearline hardware components and other external hardware for the selected LSMs.
- Cart activity reports measure the movement of cartridges into or between LSMs.
- Slot management reports monitor available scratch volumes and free cells in the selected LSMs.
- Inventory reports use data obtained from your mainframe tape management catalog system to generate graphs profiling the data held on cartridge volumes in your library. Tape catalog

processing is an optional ExPR feature, so reports are only available if this feature is used at your site and if collected data has been transferred to your database. Otherwise, the inventory reports will appear deactivated on your screen. Inventory reports can be produced using data for just a specified dataset workload group.

- Global reports provide mount information about cartridge activity outside of the Nearline environment, such as external drives.
- Robotics reports provide breakdowns of the time that the Nearline robotics were busy performing Nearline activities.
- Control Units reports provide device-level statistics about control unit performance. Reports can be tailored from the scrolling configuration menu to include specific CPUs, control units, and tape cartridge devices.
- Tape errors reports provide information about the errors that occurred, including the number of tape errors and the number of volumes that were recorded as having errors. All or selected error types (read, write, permanent, temporary) can be included in the reports. Nearline or non-Nearline (or both) can also be selected to further isolate error information.

To select a report, click the report on the menu and then click the Generate button, or just double-click the report. The graph will be displayed in the ExPR Graphs window.

Function buttons above the report allow you to change the format of the graphic display in the current window (title bar highlighted):

- 3D:C formats the report as a Three-dimensional:Cluster (3D:C) graph. In this format, two sets of data can be compared side-by-side in parallel vertical bars.
- 3D:Z formats the report as a Three-dimensional:Z-Cluster (3D:Z) graph. In this format, the differences between two sets of data are easily noted; one set of data appears hidden behind the other.

- 3D:S formats the report as a Three-dimensional:Stacked (3D:S) graph. In this format, two sets of data can be effectively consolidated into a cumulative chart, with each set still retaining its color-coded identity.
- 2D:C formats the report as a Two-dimensional:Clustered (2D:C) graph. In this format, two sets of data can be compared side-by-side in parallel vertical bars.
- Format 2D:S formats the report as a Two-dimensional:Stacked (2D:S) graph. In this format, two sets of data can be effectively consolidated into a cumulative chart, with each set still retaining its color-coded identity.
- Format A:A formats the report as an Area:Absolute (A:A) graph. This format displays an area graph, where charted values are displayed in a graph that is filled solid from zero to a point-to-point horizontal line plotted between the values. In this format, the differences between two sets of data are easily noted; one set of data appears hidden behind the other.
- Format A:S formats the report as an Area:Stacked (A:S) graph. This format displays an area graph, where charted values are displayed in a graph that is filled solid from zero to a point-to-point horizontal line plotted between the values. In this format, two sets of data can be effectively consolidated into a cumulative chart, with each set still retaining its color-coded identity.

Function buttons below the report allow you to change the graph's text and color, control the display of multiple graphs, export graphs to a file, printer, or spreadsheet, and import saved graphs for redisplay.

- Thresholds changes the local exception threshold for the displayed exception report. This button is only active for displayed exception reports.
- Change Text changes the text that surrounds the graph. You can add or change the text above, below, or on either side of the

graph. You can also create vertical and/or horizontal grid lines within the graph.

- Change Report Colors changes the colors in the report. Two color sets are selectable. The first color set appears on all graphs, while the second color set is only active for graphs where two sets of data are graphed.
- Vertical Report Stack displays multiple reports stacked vertically (top to bottom) on the screen.
- Horizontal Report Stack
- Click this button to display multiple reports stacked horizontally (side by side) on the screen.
- Cascade Report Stack displays multiple reports in a Windows cascading stack where just the title bar is showing for each window behind the current window, similar to a stack of index cards.
- Arrange Icons lines up all report icons left-to-right in the window.
- Reduce to Icon reduces all displayed reports to icons that can be redisplayed by clicking on the icon.
- Input Graph inputs a saved ExPR graphics file for display in the ExPR Graphs window.
- Output Graph outputs ExPR graphs to a printer, to a file (for redisplay later), or to the Windows clipboard (for exporting to an outside application). Graphs that are output to the Windows clipboard can be formatted as Windows metafiles, as bitmap files, or as Excel-compatible spreadsheet files.
- Help displays ExPR Help for the current report (title bar highlighted).
- Exit terminates this ExPR report screen and returns to the report selection screen.

To generate another report, click the report selection window to re-activate it. Then repeat the selection process. Each report you generate is displayed in the ExPR Graphs window with any others that you might already have generated. Each new report you generate is displayed as the current window (title bar highlighted). Click on any report to make it the current window.

**Note:** Some reports are only available with specific selection criteria. For example, Concurrent Drives in Use is only available at the LSM-level. If this criteria is not met, the report will be grayed out.

## Jobname Workload Groups

Jobname workload groups are established on the mainframe to logically map Nearline activity from specified jobnames into workload groups against which reports can be generated.

**Note:** This feature is optional and may not be implemented for your site.

If jobname workload groups are implemented for your site, you can specify on the performance report selection screen which workload group to include in the report. The report will then reflect just the selected jobname workload group.

## Dataset Workload Groups

Dataset workload groups are established on the mainframe to logically map the contents of a Nearline library, based on dataset names, to particular systems or applications against which reports can be generated.

**Note:** This feature is optional and may not be implemented for your site.

Dataset workload groups are built in conjunction with ExPR mainframe tape catalog processing, which is also optional and may not be implemented for your site.

If dataset workload groups are implemented for your site, you can specify on the report selection screen which workload group to include in the report. The report will then reflect just the selected dataset workload group.

## Exception Reports

Exception processing at the mainframe compares performance data against site-specified exception thresholds. The results of this processing are part of the data that is transferred to your PC for further processing and graphical report generation.

Exception thresholds can be maintained to produce reports for the following:

- Mount Count Scratch exceptions
- Mount Count Non-Scratch exceptions
- Mount Response Scratch exceptions
- Mount Response Non-Scratch exceptions
- Enters exceptions
- Ejects exceptions
- Passthroughs exceptions
- Free Cells exceptions
- Available Scratch exceptions
- Control Unit exceptions

Exception reports are useful for monitoring system performance. For example, exception reports would show when mount response times

exceed the mainframe or local threshold values. You might then generate some other reports to determine why thresholds were exceeded, and possibly take corrective action.

Two reporting methods are provided:

- The ExPR Exception Reports selected from the ExPR main menu show which LSMs in which ASCs have exceptions, and then generate exception reports for a selected LSM.
- The Exceptions action bar in the ExPR Performance Reports function provides a list of available exception reports and then generates the report(s) you select.

## Selecting Exception Reports from the ExPR Main Menu

Exception Reports selected from the ExPR main menu generate detailed graphical exception reports for a specified LSM.

1. Click the ExPR Exception Reports icon on the ExPR main window. The exception report generation window is displayed. The database file in the screen name is the currently active database.
2. Select the thresholds to check by clicking individual exception types at the bottom of the screen (or use the All, None, and Flip buttons to select exception types).
3. Click the Use local thresholds option if you want to override mainframe thresholds with local values you have saved. (Click the Threshold function button to display a list of mainframe threshold values and set or change local thresholds.).
4. Press the Scan button to generate the selected reports. An icon will appear for each ACS in the current database. Icons with a Red-shaded background contain exceptions.
5. Click on a Red-shaded ACS icon to proceed. Icons representing the LSMs for the selected ACS will be displayed. The different

LSM icons represent different LSM types (i.e., Powderhorn, Timberwolf, etc.). As before, the LSM or LSMs containing exceptions have a Red-shaded background.

6. Notice that the ACS List button becomes active when the LSM icons are displayed. Click this button if you want to redisplay the ACS icons.
7. Click on an LSM icon with a Red-shaded background to generate exception reports for that LSM. The selected reports will be displayed in the ExPR graphs window. The last report generated is displayed as the current window (title bar highlighted). Click on any report to make it the current window.

## Selecting Exceptions from the Performance Report Screen

The Exceptions action bar in the ExPR Performance Reports function provides a list of available exception reports and then generates the report(s) you select.

1. Click the ExPR Performance Reports icon on the ExPR main window. The performance report generation window is displayed. The database file in the screen name is the currently active database.
2. Click the Exceptions action bar. The Exception reports screen is displayed.
3. At the Exception reports screen, click the Identify all exceptions button to display a list of available exception reports.
4. Click the Use local thresholds option if you want to override mainframe thresholds with local values you have saved. (Click the Threshold function button to display a list of mainframe and local threshold values and to change local exception values.)
5. Select exception reports by clicking on the report or range of reports you want to produce, or use the Select all, Select None,

and Flip buttons to select reports (Flip reverses the current selections to off and the rest to on).

6. Press the Generate button to produce the reports. The selected reports will be displayed in the ExPR Graphs window.

The last report generated is displayed as the current window (title bar highlighted). Click on any report to make it the current window.

## Scanning a Database

The database scan function is a diagnostic tool that scans the database and indicates, for each record type, periods where data may be missing or incomplete (for example, if data transfers or database update procedures were not performed).

Click the ExPR Database Scan icon on the ExPR main window to start the database scan. Use the Help system for additional instruction.

## Compacting a Database

You should compact your ExPR database periodically to reclaim unused disk space and reorganize the data to improve access efficiency. This process builds a new (compacted) version of the database, deletes the old one, and then renames the new one. These steps are all performed automatically by ExPR.

Click the ExPR Utilities icon on the ExPR main window and select the Compact action bar. Use the Help system for additional instruction.

**Important: Backup your database file before you run this ExPR function.**

## Repairing a Database

The database repair function verifies that the database structure is intact, and if so, makes the database available to applications. It is normally only necessary to repair the database if an application is unable to open it. This may occur if the PC was powered off with the database open.

Click the ExPR Utilities icon on the ExPR main window and select the Repair action bar. Use the Help system for additional instruction.

## Purging a Database

The database purge function removes selected records from the ExPR database based on date or number of days from the current date.

Click the ExPR Utilities icon on the ExPR main window and select the Purge action bar. Use the Help system for additional instruction.

## Problem Reporting Tool

The problem reporting tool provides a convenient vehicle for recording software problems to report to StorageTek. A report log is created from this screen listing the problems you record by date and function.

Click the ExPR Utilities icon on the ExPR main window and select the Report action bar. Use the Help system for additional instruction.

# Index

- A—
- Audience, 5
- C—
- Compacting a Database, 27  
Creating a Database, 16
- D—
- Data Transfer from the Mainframe, 15  
Database  
    Compacting, 27  
    Creating, 16  
    Purging, 28  
    Repairing, 28  
    Updating, 17
- E—
- Exception Reports, 24  
ExPR PC Reports, 8
- F—
- File Transfer, 15
- H—
- Hardware Prerequisites, 11  
Help System, 9  
Housekeeping Considerations, 12  
How ExPR PC Works, 8
- I—
- Installation, 12  
Installation Prerequisites, 11
- M—
- Main Menu Functions, 16
- P—
- Performance Reports, 17  
Prerequisites, 11  
Problem Reporting Tool, 28  
Purging a Database, 28
- Q—
- Quick Summary Reports, 17
- R—
- Related Documentation, 6  
Repairing a Database, 28  
Reports  
    Exception Reports, 24  
    Performance, 17  
    Quick Summary, 17
- S—
- Scanning a Database, 27  
Software Prerequisites, 11  
Summary Reports, 17  
Support, 6
- T—
- Transferring Data from the Mainframe, 15
- U—
- Updating the Database, 17

